A CASE STUDY OF NON-FERROUS METAL THEFT AT A SELECTED MINE IN SOUTH AFRICA

by

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Abstract

The threat posed by non-ferrous metal theft to industries in South Africa is substantial but is also regarded with indifference. A reason for this view may be that the criminal act is ordinarily not accompanied by violence and the target of the crime is an object that is far removed from the vicinity of the majority of South Africans. Non-ferrous metal theft may sometimes even be erroneously termed a victimless crime. This study endeavours to shed light on the complexities of non-ferrous metal theft and the industrial dangers that may be suffered if this crime is not eradicated. A case study from the mining industry was used to examine the nature and extent of non-ferrous metal theft. A mixed methods approach was followed in terms of which qualitative and quantitative research was done sequentially to provide the best possible representation of the situation. The participant allowed access to data over a six-year period as well as access to mine employees for interviews to assist with understanding the safety and security measures that the mine put in place to protect its workforce. This information led to another realisation, namely that if non-ferrous metal thieves cut an electricity supply line that is critical for life support and transportation in the mine, mineworkers may succumb to the harsh conditions underground. It also became evident that the police and the criminal justice system must develop a better understanding of the seriousness of non-ferrous metal theft. If this does not happen in the near future, managing the consequences of non-ferrous metal theft at South African mines will become a mammoth task. Such mines and other industries affected by non-ferrous metal related theft must collaborate with each other and the police in order to understand the nature of the crime and to ensure that the prosecution of the perpetrators is handled properly. These industries should also subscribe to a pragmatic approach to crime prevention whereby various components from different crime prevention strategies are used to address the issues being experienced and whereby a unique crime prevention model for each industry and mining site can be developed.

Key terms

South African mine; mining industry; theft; copper cable; non-ferrous metal theft; copper cable theft; crime prevention; management; threat.
Acknowledgements

This study represents the next step in a long and multifaceted developmental journey, which I embarked on a decade ago. During which I had to make the transition from a hands-on operations specialist to an objective observer and rapporteur, and where the accurate reporting of the facts and the evaluation of the situation became as important as the result of the intervention. I discovered that it was more challenging to observe from a distance than to provide solutions to the problem I was exploring.

I wish to thank the mining house and all the managers that participated in my journey for their willingness to share their experience and their knowledge with me. I hope that I can reward your participation by increasing the understanding of the threat faced by your industry.

My sincere gratitude goes to Professor Rika Snyman. Professor, your patience and enthusiasm never wavered, even when I got trapped in a maelstrom of conflicting thoughts and ideas. Thank you for being a guiding light, for offering good advice, and for sharing your wealth of knowledge.

To my wife and partner: I can only express my sincerest gratitude and eternal respect; you are the person who motivates me to be more than what I am.
Language editing

27 February 2013

To whom it may concern

I confirm herewith that I did the language editing of the dissertation:

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Independent editor
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<tbody>
<tr>
<td>BAC</td>
<td>Business Against Crime</td>
</tr>
<tr>
<td>CPTED</td>
<td>Crime Prevention Through Environmental Design</td>
</tr>
<tr>
<td>CRAVED</td>
<td>Concealable, Removable, Available, Valuable, Enjoyable and Disposable</td>
</tr>
<tr>
<td>CRCC</td>
<td>Cape Regional Chamber of Commerce</td>
</tr>
<tr>
<td>CSIR</td>
<td>Council for Scientific and Industrial Research</td>
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<tr>
<td>DPS</td>
<td>Department of Public Safety</td>
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<tr>
<td>Eskom</td>
<td>Electricity supplier in South Africa</td>
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<tr>
<td>FMCG</td>
<td>Fast-moving consumer goods</td>
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<tr>
<td>GDP</td>
<td>Gross domestic product</td>
</tr>
<tr>
<td>IDASA</td>
<td>Institute for Democracy in Africa</td>
</tr>
<tr>
<td>IED</td>
<td>Improvised explosive device</td>
</tr>
<tr>
<td>JCPS</td>
<td>Justice, Crime Prevention and Security Cluster</td>
</tr>
<tr>
<td>MRA</td>
<td>Metal Recyclers Association</td>
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<td>NCPS</td>
<td>National Crime Prevention Strategy</td>
</tr>
<tr>
<td>NFTCC</td>
<td>Non-Ferrous Theft Combating Committee</td>
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<tr>
<td>POCA</td>
<td>Prevention of Organised Crime Act</td>
</tr>
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<td>SACCI</td>
<td>South African Chamber of Commerce and Industry</td>
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<td>SAPS</td>
<td>South African Police Service</td>
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<tr>
<td>SARPA</td>
<td>South African Revenue Protection Association</td>
</tr>
<tr>
<td>Telkom</td>
<td>Telecommunications service provider in South Africa</td>
</tr>
<tr>
<td>Transnet</td>
<td>Transnet is a critical part of the transportation logistics chain in South Africa. Transnet ships thousands of tons of goods around South Africa. It manages pipelines, railways and port terminals</td>
</tr>
</tbody>
</table>
Declaration of Authenticity

Student number: 38167859

I declare that A CASE STUDY OF NON-FERROUS METAL THEFT AT A SELECTED MINE IN SOUTH AFRICA is my own work and that the sources I have used or quoted have been indicated and acknowledged by means of complete references.

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Chapter 1

Research design

1.1 INTRODUCTION

Research in general has to contribute to the general body of knowledge available. Researchers therefore have the responsibility to ensure that the phenomenon they are researching conforms to proven and tested methodological processes. The reason for this conformity is to provide a basis of trustworthiness whereby the work of one researcher and contributor to the body of knowledge on the subject can be compared to the work of another. Even though researchers do not necessarily have to agree - they do not even have to come to the same conclusions - the process that they follow to arrive at their results has to be clear.

In Chapter 1 the need for and rationale of the research undertaken are described. The researcher’s motivation and the process that was followed are explained and the choices that were made during the planning and execution of the research are clarified.

1.2 RATIONALE FOR THE RESEARCH

The South African economy and political stability are under pressure from numerous threats, but few are as pervasive as the theft of non-ferrous metals. The greatest danger posed by non-ferrous metal theft is not the inconvenience of not being able to contact loved ones when Telkom’s telephone cables have been stolen, or being stuck in traffic when the metro’s traffic lights do not work because of cable theft - it is society’s total apathy to the crisis.

The idea for this study originally came about during a research project undertaken on the theft of precious metals from South African mines commissioned by the Chamber of Mines of South Africa between 2003 and 2005 (Coetzee & Horn, 2006, p. 5). Two questions arose: ‘What can the consequences be of rampant non-ferrous metal theft for a mine in South Africa?’ and ‘Can the consequences be managed in order to prevent loss of life at the mine as well as loss of economic viability of the mine?’

1.2.1 Problem statement

During the 6th annual revenue protection conference of the South African Revenue Protection Association (SARPA) in July 2002, Leon van den Berg, chairman of the South African Non-Ferrous Theft Combating Committee (NFTCC) at the time, stated that theft of non-ferrous metals, copper and aluminium in particular, was a serious problem in South Africa and that non-ferrous metal theft had escalated to such an extent that losses ran into millions of rand annually (Van den Berg 2002). During the 2009/10 annual
Transnet report to Parliament. Tau Morwe, chief executive of Transnet Freight Rail, said that ‘there had been some reduction in copper theft and that currently [only] around 12 km [of cable] was being stolen per month’ (Parliamentary Monitoring Group, 2010).

In most instances it was extremely difficult to determine the exact losses because the theft of non-ferrous metals impacts on victims on many levels financially. Victims are forced to expend capital on product to repair or replace the stolen cable; replacement costs include the cost of time and labour to replace the stolen section of cable (Van den Berg, 2002). In this study, the repair costs were multiplied by production losses for the period the production plants were without electricity (Van den Berg, 2002).

Simpson (2006) made it clear that non-ferrous metal theft is not merely a South African problem; it has become a global dilemma. For example, non-ferrous metal thieves are stripping Italy in a ‘red gold’ rush that has snarled train services, damaged catacombs, and caused at least one blackout as worldwide demand for the metal has sent prices spiralling to previously unimaginable highs. General copper prices, for 2006, peaked at over US$8 800 a tonne (Edelstein, 2008, p. 20.1) largely due to the robust demand for raw materials from countries such as China. This confluence of factors made it possible for non-ferrous metal bandits to reap the benefits of the market demand.

‘There have always been thefts of non-ferrous metals because of their high value, but there’s clearly been a rebirth of this kind of activity with the added value of copper,’ said Claudio de Cani, director of the Assomet non-ferrous metals association in Italy (Simpson, 2006). Suhr (2007) stated that ‘Scrap metal thieving is out of control, it really is.’ Among the proposals for cracking down on theft, Illinois, Hawaii, Texas and Washington amended legislation in an effort to address theft of non-ferrous metals.

In a news article the then US Department of Public Safety (DPS) commissioner, Rebecca Warfield, stated that there ‘is a huge, huge problem!’ when asked to assess the havoc caused by non-ferrous metal wire thieves in Saipan (De La Torre, 2007). Acting DPS spokesman Sergeant Thomas Blas Jr added that: ‘Copper wire theft is a growing problem and is affecting everyone in the community because not only the businesses or government agencies are targeted by these criminals’ (De La Torre, 2007).

In an effort to address and combat the problem in South Africa, the Non-Ferrous Theft Combating Committee (NFTCC) was established in 1993 (Telkom SA, 2011) with representation from all the major roleplayers, including Eskom, Telkom, Transnet, the Council for Scientific and Industrial Research (CSIR), the Chamber of Mines, the Metal Recyclers Association, the Non-ferrous Metals Industries Association of South Africa, Business Against Crime (BAC), as well as electricity departments of several metros as well as City Power in Johannesburg. It was the objective of the NFTCC to plan national strategies and initiate or co-ordinate joint ventures and operational activities between the
roleplayers to address theft of non-ferrous metal (Chamber of Mines of South Africa, 2011, p. 20). It was self-evident - although not generally spelled out - that non-ferrous metal theft poses a significant financial risk to the affected mines that may lead to the closure of marginally profitable mining operations if the expense of protecting infrastructure and personnel escalates above justifiable thresholds in the industry.

According to Van den Berg (2002) efforts of the NFTCC and other roleplayers to combat non-ferrous metal theft are hampered by a number of constraints. These include:

- **Legislation:** Until the Second–Hand Goods Act (Act 6 of 2009) came into force and the regulations in support of the Act was developed for operationalisation in 2012. There had been no specific legislation in place that dealt with the control of non-ferrous metals, other than the Second-Hand Goods Act (Act 23 of 1955).

- **Closure of South African Police Service (SAPS) special investigation units:** The SAPS announced its intention to reorganise the detective service early in 2000. The restructuring entailed collapsing 503 specialised branches into 200 detective units at local or station level. One of the disbanded specialised units was the Transito Theft Unit, at the end of March 2001 (Coetzee & Horn, 2006, p. 68). This unit dealt with all non-ferrous theft cases nationally and the unit’s activities had a major impact on the investigation of non-ferrous theft. After negotiations with the SAPS, an agreement was reached that dedicated task groups in the Organised Crime Section of the SAPS would handle these investigations.

- **Costs:** The cost of non-ferrous metal theft to victims, commerce and the industry showed a dramatic increase in the past few years. Clearly, the need for better asset protection is directly linked to loss of revenue due to non-ferrous metal cable theft.

According to Damarupurshad (2002, p. 11) non-ferrous metal theft in South Africa has escalated to a very serious problem with a substantial cost to the affected parties (power and communication service providers, railway companies, electrical undertakings, mining companies, metal processing works and metal recyclers). In 2000, cost of non-ferrous metal theft to the South African economy totalled more than R1 billion (R1 000 000 000). Some contributing factors were unregulated and uncontrolled processing, sale, import and export of non-ferrous metal. In particular, the scrap metal industry was identified as a major contributor to the re-sale, export, processing and re-manufacturing of the stolen material. Other than the outdated Second-Hand Goods Act, 1955 (Act 23 of 1955) there had been no specific legislation in place to control trade in non-ferrous metals such as copper.
Subsequently the state recognised the need to update the legislation and drafted a new Second–Hand Goods Act, Act 6 of 2009 (South Africa, 2009) based on the Second-Hand Goods Bill (South Africa, 2005), which was drafted in 2005. The Second-Hand Goods Act, 2009 (Act 6 of 2009) was drafted to address shortcomings in the regulation of the business of pawnbrokers and dealers in second-hand goods. The main objective of the new legislation was to limit the trade in stolen goods, promote ethical standards in the second-hand goods trade, and provide for matters incidental thereto. In Chapter 6 of the Second-Hand Goods Act of 2009, the legislator deals with provisions relating to controlled metals including any used, broken, worn out, defaced or partly manufactured goods that were made of or contain non-ferrous or ferrous metal such as lead, copper, tin, aluminium, brass or zinc or any substance of metallic waste (South Africa, 2009).

The Chamber of Mines of South Africa (2008, p. 15) acknowledged as early as 2008 that one of the threats faced by the mining industry was the theft of essential infrastructural items such as copper cabling and various types of operational equipment. These losses underscore a mostly overlooked factor related closely to the theft of non-ferrous metal: the threat to human life if electrical cable was cut and power was lost from a critical life support and evacuation system in a mine.

From preliminary discussions with mining houses during 2005 it became evident that there was an urgent need to ascertain and quantify the threat posed by non-ferrous metal theft to South Africa in general and the mining industry in particular. It became necessary to establish the impact and potential cost of non-ferrous metal theft, in particular copper theft, on the South African mining industry and to contribute to the growing body of knowledge that would eventually lead to the effective management of the problem in a greater South Africa.

1.2.2 Key theoretical concepts

During the research process and through interaction with different groups of people as well as during presentations at conferences on the subject of non-ferrous metal theft, it became clear that the terminology and concepts used by the industries threatened by the problem were not familiar to all roleplayers. This was taken into account during the development of the list of key theoretical concepts to assist with understanding unfamiliar principles and concepts encountered during the study. This was by no means an exhaustive list and for the sake of clarity more concepts were introduced during the study as it became necessary to explain industry-accepted terminology. Most of these concepts take the form of working definitions and would be used consistently throughout the study; however it is important to note that during the discussion of a broad category of non-ferrous metals specific reference may be made to, for example, conductor cable or communications cable, to draw emphasis to a specific product under threat.
1.2.2.1 Non-ferrous metals

These include copper, aluminium, tin, zinc and brass metals recovered through a non-ferrous metallurgy process. The process recovers other common metals but excludes any iron from the final product (Wolf, 1982, p. 34). Preliminary interviews conducted at the participating mine concluded that copper theft in particular posed a problem to the mining industry. Copper is a non-ferrous metal and one of the most abundant elements present in the earth’s crust (Schugar, 1992, p. 414). For the purpose of this study non-ferrous metal will include all types of non-ferrous metal, bearing in mind that copper cable theft was the most prevalent type of non-ferrous metal theft in the mining industry.

1.2.2.2 Theft

Snyman (2012, p. 511) defines theft as the unlawful and intentional removal (appropriation) of movable property (including non-ferrous metal) belonging to another (the participating mine).

1.2.2.3 Cost

According to Capobianco (2005, p. 13) estimating costs of crime committed within and against businesses can be challenging. Examples of the incalculable costs of crime that extend beyond the direct impacts and losses of the property of business owners were increased expenditure on the criminal justice system for the taxpayer, higher prices for the consumer, loss of revenue for the government, higher insurance premiums for clients, job losses for employees, and increased closures affecting the viability of surrounding businesses.

Usry and Hammer (1991, pp. 23-24) stated that the term ‘cost’ was frequently used synonymously with the term ‘expense’. The measurement of the expense depends heavily on the traceability of costs to the cost object. The cost object can be defined as any unit, activity or phenomenon measured in terms of accumulated expenses. The traceability of these expenses determine how objective, reliable and meaningful the resulting cost measure was, and therefore how confident the manager can be in understanding the cost measure as a basis for prediction and decision-making. For the purpose of this study, the term cost applies to all primary and secondary financial losses and/or expenses in rands, as well as potential risk due to the possible loss, through death or injury, of skilled workers. The cost factor therefore refers not only to the actual losses and production losses of the mine but also to the possible loss of human life if critical life support functions cannot be maintained as a result of electricity failures caused by theft. The primary losses will include all non-ferrous metal stolen and the expenses incurred to replace the stolen items. Secondary losses will include any production downtime and the potential risk of losing skilled workers, through death or
injury. The cost of losing skilled workers will include all expected financial implications such as training costs for replacement workers and death or injury benefits payable to families in the event of a serious mine safety incident.

1.3 AIM OF THE RESEARCH

The aim of the research was to explore how effectively non-ferrous metal theft was managed at a mine in South Africa while focusing on the consequences of non-ferrous metal theft as a challenge to safety and security at the mine. Factors that were taken into consideration were financial costs as well as the potential threat to the lives and livelihood of mineworkers, based on a case study conducted at a South African mine.

The study contributes to the understanding of the threat posed by non-ferrous metal theft and how it can be managed. Factors that were taken into account were that not only the mining industry was threatened by non-ferrous metal theft, but also that all communication industries and transport infrastructure agencies, as well as the man in the street, feel the impact of non-ferrous metal theft.

1.3.1 Transferability

One of the key components of this study is the conscious attempt the researcher made to provide sufficient information and background for others to implement the recommendations and findings at another mining site or even any other site that suffers from non-ferrous metal theft. Where complicated factors unique to the participating mine affected the case study, ensuring transferability was the best option to add value to the research field. This, however, places the burden of implementation on the implementer, who will have to ensure that all the factors at the site where the implementation is planned are taken into consideration (Creswell, 2013b, pp. 244-255).

1.3.2 Title

The title of the research study, ‘A case study of non-ferrous metal theft at a selected mine in South Africa’, was decided upon after in-depth discussions with the numerous roleplayers referred to in the study. The title intends to focus the research on the threat posed by non-ferrous metal theft and to contextualise the threat based on the management of the danger it presents to a mining operation in South Africa.

1.3.3 Purpose statement

A purpose statement is the central controlling idea in a study. It sets forth the intent of the study and is not to be confused with the research questions or the research problem. This idea builds on a need, the problem, and was refined to specific questions, the research questions (Creswell, 2013b, p. 112).
When the research project was conceptualised in 2005, the main objective was to identify trends in criminal activity in order to quantify the consequences of non-ferrous metal theft focusing on indicators such as primary losses, secondary losses and the potential loss of life in the event of non-ferrous metal theft. This would assist the mining industry in its fight against non-ferrous metal theft.

The initial focus of the research study was subsequently expanded to improve the understanding of the risks and consequences of non-ferrous metal theft at a South African mine by examining the crime prevention methods used to address the problem and manage the threat.

During the period of the study new legislation was promulgated and the SAPS developed regulations for implementation of the new Act (South Africa, 2009). The progress made in addressing legislation to combat non-ferrous metal theft in the period the study was conducted was therefore also considered in the research undertaken.

In order to achieve his research aims, the researcher decided to engage a South African mine affiliated with the Chamber of Mines of South Africa and member of the NFTCC task team in a long-term anonymous case study over five years to explore how they dealt with this challenge.

1.3.4 Research objectives

The objective of this study was, first, to evaluate the most threatening problem the participating mine faced, which during preliminary discussions was identified as the safety threat to mine employees. This threat could only be examined if contextualised in a worst-case scenario, as any theft could result in a life-threatening situation.

- The nature of non-ferrous metal theft was outlined on an international, regional and national level.
- The type of safety risks posed to employees underground and the impact of the potential cost of non-ferrous metal theft to the participating mine relating to the safety risks posed to mine employees were examined.

Second, the aim was to quantify the primary losses, secondary losses, and potential loss of life in the event of non-ferrous metal theft at the participating mine. To achieve this, it was necessary to measure the relationship between the number of incidents that took place and the cost to the participating mine to repair the damage caused by these incidents.

- The potential extent of the cost of non-ferrous metal theft on the South African mine for the period January 2006 to December 2011 was established with reference to:
o The number of incidents in the period under review.

o The type of non-ferrous metal at risk.

o Actual values and losses involved.

o Potential values and losses involved.

o Type of perpetrators (employees, contractors or non-mine employees).

o Results of incidents (criminal cases).

Third, the aim of this study was to explore how the participating mine managed the problem in view of the crime prevention methods available.

- Crime prevention methods and strategies that can be used to manage non-ferrous metal theft were considered.

- The crime prevention methods implemented by the participating mine to manage non-ferrous metal theft during the period January 2006 to December 2011 were explored.

Finally, it was necessary to review legislation available to the participating mine to support its efforts to combat the threat of non-ferrous metal theft.

- South African legislation that was applied to address non-ferrous metal theft, namely the Second-Hand Goods Act 23 of 1955 (South Africa, 1956) and the Second-Hand Goods Act of 2009 (South Africa, 2009), was reviewed.

For the purpose of this research study the primary research question can be stated as follows: ‘If the total number of occurrences and the value of incidents of non-ferrous metal theft can be reduced at the participating mine, the cost in terms of primary, secondary and potential losses will be reduced.’ If the primary research question was found to be true, then it would stand to reason that the same would be true for a larger sample, such as all South African mines.

1.3.5 Value of the research

The value of the research lies in the awareness that is raised through the dissemination of knowledge and the contribution to the understanding of the threat. Stone (2006, p. 9) stated that crime inflicts costs on businesses (direct losses plus the costs of security and prevention) that reduce profits and divert funds that could be invested in productive capacity. Furthermore, crime erodes human capital by encouraging emigration and by injuring or even killing skilled workers. It also discourages foreign investment and other public investments that would have supported long-term growth.

In the North West Barometer (2003, p. 20) it was stated that crime had become a major obstacle to growth and development in South Africa. In opinion surveys conducted by the
Institute for Democracy in South Africa (IDASA), the importance of crime and security as an issue to be resolved by government increased from a fourth position with a relative low priority of 6% to the second highest national priority with a rating of 65% in 1999 (Herzenberg, 2004, p. 15).

Krkoska and Robeck (2006, p. 2) stated that the need to protect property rights and the fight against crime continue to be the most urgent challenges for authorities in developing and transition countries. However, it was found that there was a surprising lack of detailed multi-country analysis of how crime affects the business sector. A thorough interrogation of the cost of non-ferrous metal theft (financially, potentially and in terms of risk to life) would provide a better understanding of the crime phenomenon and related issues.

The South African business community was largely uninformed about the imminent threat posed by non-ferrous metal theft but the realisation of several larger companies steered the South African Chamber of Commerce and Industry (SACCI) to develop a Copper Theft Barometer designed to measure and monitor the magnitude of copper cable theft on a monthly basis (SACCI, 2010). This development assisted the business community to begin to understand the extent of the threat.

The researcher attempted to develop an understanding of the phenomenon and to convey that understanding to the reader. The outcome may be a better understanding of the threats posed by uncontrolled and rampant non-ferrous metal theft, which understanding could lead to the development of better social interventions and better crime prevention methods to address the threat. The aim was to provide the necessary information to understand the threat of non-ferrous metal theft in the broader context of economic development by using one case study in the South African mining industry and contextualising the threat to such an extent that it can be applied to all relevant industries and roleplayers involved in the non-ferrous metal business, locally and internationally.

Understanding the crime may be useful to security divisions in the mining industry in their efforts to secure the mining operation, but other parties that may also benefit by considering the findings and recommendations when formulating crime prevention strategies to address non-ferrous metal theft include the South African mining industry, the Chamber of Mines of South Africa, the Non-Ferrous Theft Combating Committee, the South African Justice Department, and the South African Police Service.
1.4 RESEARCH METHODOLOGY

When deciding on the design of this study the researcher took into account the limited information that was available on the topic at the time, as well as the growing need to understand the threat faced by a largely oblivious public.

Every researcher brings their own personal worldview to their body of work (Creswell, 2013b, p. 3) however. These assumptions impact on the strategy followed during the study and the way in which data was collected, analysed and interpreted. These were also the considerations that the researcher needed to understand when a specific research design was chosen to investigate the research topic.

1.4.1 Philosophical worldview

Guba (1998, p. 17) defines a person’s worldview as simply ‘a basic set of beliefs that guide action’. During the planning of this research study the researcher had to determine which worldview would inform the methodology. Such worldview would be a key aspect of the study. The beliefs the researcher brought to the project were reflected in the way he approached the subject under investigation. These beliefs shaped the ways in which the researcher obtained data and structured the methodology. This was one of the fundamental components of the research project.

'It is said that if you know your enemies and know yourself, you will not be imperilled in a hundred battles; if you do not know your enemies but do know yourself, you will win one and lose one; if you do not know your enemies nor yourself, you will be imperilled in every single battle’ - Sun Tzu (6 BCE), *The art of war*.

The philosophical worldview that informed this study was based on pragmatism. Creswell described a practitioner of pragmatism, or a pragmatist, if you will, as a person who considers the situation, the actions that could be taken, and the consequences of these actions (Creswell, 2013b). The need to address issues in the ‘now’ and to solve problems and challenges as they arise is inherent to a pragmatic worldview.

The best design for the purpose of this study was found in the work of John W Creswell referred to above (Creswell, 2013b). A pragmatic approach enabled the researcher to consider the use of multiple methods and approaches in conducting this research (Creswell 2013b, p. 11). Once the research problem had been determined, the research approach was therefore not limited to one primary method of exploring the problem. The past and the cause of the related problems were only examined in order to help solve the current problem.

Using a pragmatic approach had the additional benefit of basing implementable suggestions on suggestions how to address the problem once it was identified.
Pragmatism also allows the researcher to develop a broader and more inclusive understanding of all aspects of the research problem.

The researcher’s pragmatic worldview and philosophy permitted him to follow a mixed methods approach to find answers to the research problem. The works of Tashakkori and Teddlie (1998, pp. 20-39), Morgan (2007) and Patton (2001, pp. 369-504) supported this methodological approach. Parallel to previous mixed-methods researchers, this study followed a pluralistic approach in an effort to develop knowledge and understanding of a problem in social science research by focusing on the research problem itself. Creswell (2013b, pp. 10-11) grounded the philosophical basis for research in pragmatism and during the research process this dogma informed the execution of the study.

The collection and analysis of data was not limited to either qualitative or quantitative methods; both were used in the pursuit of understanding the research question. Creswell pointed out that pragmatic researchers drew on both the qualitative and quantitative disciplines in conducting their research (Creswell, 2013b). There is no absolute truth and there are many ways to collect and analyse data. There is therefore no reason that one approach should exclude the other: qualitative research can be used to support qualitative work and vice versa. In principle the one methodology can and should corroborate the other in order to achieve as complete an understanding of the research problem as possible.

1.4.2 Research approach

The research was based on the principle of case studies. According to Welman and Kruger (2005, pp. 182-184) the term ‘case study’ refers to an in-depth study of a limited number of units of analysis, for example institutions. The term does not refer to a technique that was applied.

One South African mine participated in the case study on condition that it remained anonymous. The mine is located in the North West Province and comprises two mining operations that cover an area of more than 300 square kilometres.

The focus of the research was to estimate and analyse the cost of non-ferrous metal theft at this particular mine and to extrapolate from this evidence the effectiveness of the crime management model utilised that would enable managers to improve their control over and understanding of non-ferrous metal theft.

It was decided that Creswell’s mixed methods design, as summarised in Creswell (2013b, p. 10) from Rossman and Wilson (1985), formed the preferred basis for a study of this nature. Research methodologies could be mixed in an attempt to understand the problem as quickly as possible and then to monitor how the problem was solved as comprehensively as possible over an extended period of time. However, four aspects
were important when the design of procedures for a mixed methods study were formulated – timing, weighting, mixing and theorising (Creswell, 2013b, p. 206).

1.4.2.1 Sequential connected mixed method

The mixed methods design enabled the researcher to use both the qualitative and quantitative methodologies to analyse data. The intended result was to achieve maximum understanding of the research topic where the priority component of research (qualitative) would inform the other (quantitative) to produce reliable conclusions.

The researcher was also in a position to gather and analyse the data in phases (sequentially) in the period under study. This process allowed the researcher to compare the data analysis of the first phase (qualitative) with the data analysis of the second phase (quantitative) before the datasets were integrated. The integrated research then formed the basis of a qualitative interview with the crime information manager to ensure that the integrated data reflected the situation accurately and it fulfilled the function of member checking. This methodological mixture had several advantages over other research approaches considered for this study. The main reason for combining quantitative and qualitative data was to better understand the research problem by interpreting the broad numeric trends of quantitative data with the detailed views and explanations found in the qualitative data.

1.4.3 Data collection

Data collection was conducted through a literature review, one-on-one interviews, and a questionnaire survey (Addendum A).

The data were collected during different data collection phases, which allowed the researcher to gain different perspectives from various types of data and from different sources. The integration of the data was done at the final analysis phase of the study, as prescribed by Tashakkori and Teddlie (2007, p. 203). The extended timeframe used for collecting and verifying both qualitative and quantitative information was drawn up in an effort to understand the research problem more comprehensively. This contributed to the large scope of the study upon completion (Creswell, 2013b, p. 19).

The challenge was to avoid too much data and information as this might clutter the research project and detract from the main research focus. Fortunately the operations that the participating mine agreed to make available are geographically separated by almost 100 kilometres with two separate workforces that live close to the respective mining sites. Around the location of the workforces’ settlements, secondary industries such as food suppliers, transportation and schools developed. Unfortunately these settlements are drawing cards for a large group of unemployed people who hope to secure a job on the mine.
The participating mine is a member of the Non-Ferrous Theft Combating Committee (NFTCC) and the Chamber of Mines of South Africa and has a large workforce of several thousand employees that works directly for the company. The secondary industries that provide services to the mine are even larger and employ even more people in the area where the mine is situated. These service providers make up the bulk of the subjects referred to in the study as ‘contractors’.

1.4.3.1 Qualitative data

The qualitative components of the analysis include in-depth interviews with the relevant roleplayers to extrapolate their opinions regarding the threat of theft of non-ferrous metal.

The purpose of the interviews was to obtain an in-depth understanding of the phenomenon. A non-probability sampling method, namely purposive sampling, was used to determine the most informative participants. According to Welman et al. (2005) purposive sampling involves units of analysis regarded as being representative of the relevant population based on the researcher’s own experience and/or previous (preliminary) research findings.

Based on the preliminary interviews conducted, eight participants were identified. One-on-one in-depth interviews were conducted focusing primarily on the research question. The interviews were unstructured to explore the interviewees’ insight regarding the extent and impact of the potential cost to the mining industry of non-ferrous metal theft. The interviews were prepared in such a way that it surveyed their personal experience in relation to their position at the mine. This relationship may be as a component of safety risk reduction and evaluation, the immediate response, investigation and/or prosecution of non-ferrous metal theft events.

The participants interviewed for this study were:

- The safety manager of the participating mine.
- The security manager of the participating mine.
- The crime information manager of the participating mine.
- The head of the investigations unit of the participating mine.
- The senior prosecutor of the court in which jurisdiction the participating mine was located.
- The magistrate of the court in which jurisdiction the participating mine was located.
• The head of investigation at the relevant SAPS offices in the district of the participating mine.

• A representative from the NFTCC.

Three interviews were conducted at the participating mine during 2007 by means of one-on-one consultations with the safety manager, the security manager and the head of the investigations unit of the participating mine in order to document the threat posed by non-ferrous metal theft to the participating mine (at the time).

Another four interviews were conducted in 2008 with the senior prosecutor and the magistrate of the court in which jurisdiction the participating mine was located, as well as the head of investigation at the relevant SAPS offices in the district of the participating mine. The NFTCC representative was interviewed to provide a better industry-wide interpretation of trends.

After the quantitative data of the theft incidents had been analysed, the crime information manager of the participating mine was interviewed in 2012 to clarify the impact of the crime prevention methods implemented during the period under study.

During the preliminary interviews it was established that at the participating mine, the safety manager was responsible for assessing the potential risks faced by employees and for implementing safety procedures based on risk assessments.

The security manager at the participating mine was notified of each crime incident on the mine premises and was responsible for implementing security measures to manage crime (A002, 2006). In addition the participating mine established a centralised investigations unit (CIU) that was responsible for investigating high-risk criminal incidents that occurred in the mining group.

The interviews highlighted the close working relationship between investigators from the mine and the head of investigation at each SAPS service centre. Preliminary interviews were also conducted at the court having jurisdiction over the participating mine. It was established that the senior prosecutor dealt with most of the non-ferrous metal cases heard by the magistrate of the regional court.

The last person on the list that was interviewed was a representative of the NFTCC. Members of the NFTCC were well informed of the problem posed by non-ferrous metal theft and one of the objectives of the NFTCC was to plan and co-ordinate roleplayers’ operational activities in order to address the threat posed by the theft of non-ferrous metals.
1.4.3.2 Quantitative data

The participating mine agreed to complete a detailed report for every incidence of property theft (specifying when it was related to non-ferrous metal) reported in the period January 2006 to December 2011. During preliminary interviews it was established that a total number of 1 393 incidents of theft were reported to the security division at the participating mine. In this period, 704 non-ferrous metal thefts or related incidences and 689 thefts of other property were reported at the participating mine.

A questionnaire was prepared based on several open-ended and closed questions relating to non-ferrous metal theft (as per Annexure B: Incident questionnaire). The responses to the questionnaires were supplied to the researcher in computerised format (Microsoft Access file).

The aim of the incident questionnaire survey was to establish the recorded losses and potential losses during the above period at the particular mine. Factors such as the type of property at risk, type of offender, type of mining area as well as the criminal outcome where arrests were made were included in the questionnaire in order to explore the phenomenon more holistically.

During the design of the survey several sampling techniques were tested and subsequently discarded because none of them provided statistical information comparable to the results obtained through analysing the whole population. Using the whole population reduced the possibility of introducing invalid generalisations into the study (Misra, 2002, p. 47).

1.4.4 Data analysis

This research consisted of a literature component that reviewed the available South African legislation and initiatives relevant to the research topic, a qualitative component that consisted of interviews with roleplayers relating to non-ferrous metal theft in the mining industry, and a quantitative component that comprised statistical analysis based on incident questionnaires.

The literature component of the analysis comprised the following:

- A review of the South African legislation and initiatives concerning the theft of non-ferrous metal. The legislation covered in the literature review was discussed in the context of the research question with a focus on how and if the current legislation was sufficient to address the phenomenon adequately.
- An outline of the nature of non-ferrous metal theft from an international, regional and national perspective.
1.4.4.1 Qualitative data

The participants in the study were concerned about their anonymity and therefore insisted that no voice or video recordings be used. This resulted in copious field notes being taken during the interviews. Although a lack of modern recording equipment hampers the speed with which discussions and interviews are conducted, it does not necessarily affect the accuracy of the data recorded during the process. Field notes forms the basis of many scientific fields such as ethology, where it is highly valued as a resource (Lehner, 1996, p. 61).

The researcher prepared an interview schedule with detailed follow-up questions before the interview and systematically worked from an open-ended questionnaire to ensure consistency and comparability between participants’ interviews. Where participants diverged from the questionnaire, supplementary questions were asked in order to re-focus on the relevant topic. The reliability of the field notes was enhanced by completing the field note data capturing process in four steps, the first step being the word-perfect recording of the interview as it transpired in a condensed form. The second step was expanding the condensed notes to reflect an accurate log of the events that transpired. Third, some notes about the general experience such as emotions and observations were added to enrich the data and to serve as a personal memorandum of the event. Finally, a concise record was kept of analysis and interpretation of information as it occurred to the researcher. These records were meticulously kept, as suggested by Franklin and Ballan (2010, p. 276).

The information obtained from the interviews was analysed for recurring and consistent comments using Tesch’s manual qualitative analysis technique (Tesch, 1990). The researcher analysed emerging themes by coding them and grouping them into categories. The identified themes were based on the information obtained during the eight interviews, primarily focusing on the different types of threats posed by the theft of non-ferrous metal to the mine, as well as the responses to these identified threats.

The findings from the interviews were integrated applying methodological triangulation principles outlined by Denzin (2006). The use of more than two methods of data gathering in the study was an intentional strategy used by the researcher to verify the outcomes of each component of the study through cross-examination of the research results (Cheng, 2005, p. 72). The main benefit of the triangulation process is that the researcher can be more confident if the outcomes of different methods lead to the same overall result and in that way corroborate one another. Using one research method leaves the researcher exposed to a situation where too much trust might be placed on the outcome of the research study as a consequence of not being able to measure the results and findings independently against other sources participating in the study. Two
methods may contradict one another and invalidate the study. However, if more than two methods are used the strengths and weaknesses of each method can support the validity and the findings of the study (Bogdan & Biklen, 2007).

1.4.4.2 Quantitative data

The quantitative component of the analysis was based on a survey research strategy whereby 1393 questionnaires were completed by the crime information manager of the participating mine at the end of the period under investigation in December 2011. (See Annexure D). The participating mine supplied completed incident questionnaires for every incident of theft of non-ferrous metal as well as every incident of theft of other type of property, for the mentioned period.

Content analysis was conducted on all completed incident questionnaires. Typically considering the relationship between two variables in crime-related data would not be sufficient for drawing valid conclusions. However if individual variables are identified and their relationships with more variables are considered a better understanding of the crime phenomenon becomes possible. Frequency analysis techniques were therefore applied to establish relationships in the data, which was also helpful to establish if a similar relationship existed in subsets of the data. In order to estimate the cost of non-ferrous metal theft when measured against the cost of other property theft, the statistical data was analysed and portrayed as percentages, univariate equations, and multivariate cross-tabulations.

1.4.5 Validity, reliability and accuracy

Owing to the pragmatic worldview of the researcher and the choice of using a mixed-methods approach for this study, reliability, validity and accuracy of the data need to be briefly discussed. The discussion covers both the qualitative research method and the quantitative research method, as both were used in the study.

1.4.5.1 Qualitative research

Qualitative research when broadly defined and discussed by Corbin and Strauss is any kind of research that produces findings that were arrived at by means other than statistical procedures or any other quantification method (2008, p. 48). Denzin and Lincoln (2012, p 13) surmise that qualitative researchers stress the socially constructed nature of reality and argue that an intimate relationship exists between the researcher and the subjects being researched in the context of the situational constraints that shapes the inquiry. Patton (2001, p. 15) agrees in principle with these approaches and provides some valuable insight into the methodological approach of a qualitative researcher. He reflects that a qualitative researcher would use a naturalistic approach to try and understand facts and occurrences in the context and settings in which they are
manifested. In other words, the qualitative researcher would try and do research in a ‘real world setting [where] the researcher does not attempt to manipulate the phenomenon of interest’ (Patton, 2001, p. 39).

This diversion in research theory resulted in different requirements for validity and reliability of research (Golafshani, 2003, p. 599). Qualitative researchers do not consider themselves restricted by the quantitative requirement of replicability of results. The qualitative researcher know and accepts that in most instances another researcher doing the exact same research and using the exact same research question and following the exact same procedure would more often than not produce a variation on the original body of work. This was due to the researchers’ perspectives and attributes that they bring to the interview (Huberman & Miles, 2009, p. 174). What was of more concern to the qualitative researcher was the precision of the research (Winter, 2000, p. 2), the credibility of the results and the transferability of the work (Hoepfl, 1997, p. 59). These were the three lenses that provided the basis for the evaluation of qualitative research and which determine if a research project achieves the required reliability standard.

Golafshani (2003, p. 600) rightly surmises that the credibility of quantitative research depends by and large on the instrument that was constructed to facilitate the research, while in the case of qualitative research the credibility of the research relies on the researcher’s ability and effort because ‘the researcher is the instrument’ (Patton, 2001, p. 14). It would then seem that although reliability and validity were separated in quantitative studies as two distinctive components of a whole concept, the same would not hold true for qualitative studies. In qualitative studies, terminology such as credibility, transferability and trustworthiness would be used to describe the combined concept of validity and reliability (Golafshani, 2003, p. 600).

A purposive sampling technique was applied based on preliminary interviews conducted at the participating mine to identify the participants that would be in a position to contribute to the study and that would be able to add most value to the research. Members of this group were deliberately selected to achieve the main aim of the research project (Bureau of Justice Assistance, 1993, p. 13). The question of inferring the findings to other mines was mitigated by the fact that the group interviewed was made up of people involved in the combating of non-ferrous metal theft. The participants did not respond as individuals but as representatives of their company or the SAPS and Justice Department.

As pointed out above, eight participants were selected for the in-depth interviews including the safety manager and the security manager of the participating mine, the senior prosecutor and magistrate of the court, the head of investigation at the relevant SAPS office, the crime information manager as well as the head of the investigations unit.
of the participating mine, and a representative from the NFTCC. This strategy was deemed appropriate because the outcome depended on the detailed information that could be provided by the sample group and would complete the qualitative requirement of the project. Between them they have years of experience with non-ferrous metal theft prevention and prosecution and they were able to provide contextual explanation to the data that was acquired quantitatively (Boyce & Neale, 2006, p. 2).

The interviews surveyed the participants’ personal experience in relation to the role they played. The researcher did not influence the interviewee’s responses through facial expressions, tone of voice or body language. Various factors had to be considered when the choice was made to use in-depth interviews as a method of acquiring data, however. In particular, the advantage of conducting in-depth interviews had to outweigh the disadvantages and limitations of the method. In this instance it was advantageous to apply the in-depth interview technique because the participants were able to provide many insights and observations regarding the non-ferrous metal theft phenomenon that would not have been recorded had any other technique been used.

One of the pitfalls that were taken into account was researcher bias. Throughout the research project the researcher was constantly aware of the danger of trying to prove the threat posed by non-ferrous metal theft. This bias could easily be transferred to the research subjects that were interviewed. To mitigate and counter any possible bias the researcher prepared interview schedules with a set of questions which, although open-ended, guided the in-depth interview and provided a baseline for objective questioning of the research subjects (Boyce & Neale, 2006, p. 4).

The quantitative data used for descriptive statistics in the research study consisted of completed questionnaires. Detailed reports of every incident of non-ferrous metal theft that occurred at the mine during the period January 2006 to December 2011 were electronically recorded. The security manager verified each of the incidents for accuracy. The incident questionnaires were completed from the electronically recorded incidents by the participating mine. The questionnaires were provided to the researcher in a Microsoft Access file.

The data analysis techniques that were used to estimate the cost of non-ferrous metal theft include content analysis of all the completed incident questionnaires and transcriptions of all interviews conducted. Based on the incidences that occurred at the participating mine, multi-variate techniques including cross tabulations, equations and classification trees were used to estimate the cost of non-ferrous metal related crime in the specific period and to find relationships in the data to establish crime trends and potential risks.
The triangulation method was used to integrate the recurrent themes identified during the interviews through the application of Tesch’s technique. According to Mushin (2000, p. 927) the practical means of qualitative analysis is to see the text from a deictic point of view, using evidential markers in the text to build a perspective structure for the research text as a narrative. In practice, the overall compilation of the study provided a good understanding of the phenomenon as the research were ‘meaning intensive’ in terms of building the scientific perspective based on in-depth assessment of the research. The purpose of the intended interviews was to obtain an in-depth understanding of the threat posed by non-ferrous metal theft to the participating mine.

1.4.5.2 Quantitative research

Bogdan and Biklen (2007, p. 4) captured the popular understanding of what research was as follows:

Charts and graphs illustrate the results of the research, and commentators and journalists employ words such as ‘variables’, ‘sample size’ and ‘result’ as part of their daily vocabulary. So, we come to think about research in terms of this vocabulary, even if we do not always know just what all of the terms mean. Research, then, as it is publicly, is a synonym for quantitative research.

Quantitative research techniques are used to test hypothetical generalisations based on the distinctive inquiry paradigm and the actions that researchers had to take based on their understanding of the principles of the paradigm (Hoepfl, 1997, pp. 47-48). Quantitative research methodology is useful when determining the causal relationship between variables, because it emphasised data measurement and analysis (Denzin & Lincoln, 2012, p. 13) and not the process of research.

The practicality of quantitative research lies in allowing researchers to acquaint themselves with the problem that needs to be studied and providing an opportunity for said researchers to develop hypotheses that may be tested through research (Golafshani, 2003). This theory relies on four principles:

- The facts and the causes of behaviour are emphasised (Bogdan & Biklen, 2007, p. 24).
- It is possible to manipulate the information to such an extent that it is presented in mathematical format thus allowing it to be quantified and summarised.
- It is acceptable that the mathematical process used would be the norm for analysing the numeric data.
- The result or conclusion may be expressed in accepted statistical terminology (Bashir, Afzal, & Azeem, 2008, p. 36).
In the end everything boils down to the reliability and validity of quantitative research. Joppe (2000, p. 1) gives a comprehensive and practical definition of the reliability of quantitative research: ‘the extent to which results are consistent over time and an accurate representation of the total population under study is referred to as reliability and if the results of a study can be reproduced under a similar methodology, then the research instrument is considered to be reliable’.

Joppe went further and outlined validity as follows: ‘validity determines whether the research truly measures that which it was intended to measure or how truthful the research results are’ (Joppe, 2000, p. 1). In other words, does the research instrument allow you to hit ‘the bull’s eye’ of your research object? Most researchers establish validity by asking topical questions and regularly search for corroboration in the works of other researchers (Joppe, 2000, p. 1) in their efforts to demonstrate that the research they were performing was valid.

A conclusion based on the available definitions - of which there are many - is that there are basically two threads that tie the qualitative research project together. The first is the question of replicability: Would it be possible for another researcher that uses the same methodology and data to replicate the findings and results of the study? The second thread is accuracy: How accurate are the means of measurement and, above all, did it actually measure what the researcher intended to measure? If these two strings are tied together, the quantitative research study was successful.

1.4.6 Trustworthiness of research

One of the results of following a mixed methods research design is the ability to triangulate data sources. This entails the possibility to achieve a convergence between otherwise unrelated data sources and in this way achieve validity and corroboration throughout the study - a concept developed by Todd Jick (1979, pp. 602-611).

In mixed methods research it is important for the researcher to keep the requirements of quantitative research, namely validity and reliability, in mind in order to ensure that the study is trustworthy. The researcher also has to keep the requirements of the qualitative research method in mind. These are credibility, transferability and trustworthiness (Golafshani, 2003, p. 600). During and at the conclusion of this study several trustworthiness checks were completed to ensure that the research was credible.

1.4.6.1 Triangulation

Trustworthiness of a research project that uses both qualitative and quantitative research relies on the principle of triangulation (Golafshani, 2003, p. 603). In this instance ‘methods triangulation’ formed a core component of the research project. Methods triangulation was used where multiple research methods were used to study a
phenomenon (Johnson, 1997, p. 283). The concept is more applicable to qualitative research but for the purpose of this study each research method would form a supporting component of the other in order to create a trustworthy document.

The trustworthiness of the document is critical for its future use because it needs to be generalisable. The research document is not envisioned to be exclusively applicable to the research subject that participated and the situation as experienced by the subject with reference to the time and space the subject was located in at the moment the research took place. The ability to test the trustworthiness of the qualitative research ensures that the results are more ‘credible and defensible’ (Johnson, 1997, p. 282). Mathison (1988, p. 13) elaborated on this by saying: ‘Triangulation has risen an important methodological issue in naturalistic and qualitative approaches to evaluation [in order to] control bias and establishing valid propositions because traditional scientific techniques are incompatible with this alternate epistemology.’

The use and application of triangulation over multiple sources of information ensures that a study is credible and trustworthy and should allow the results to be generalised to the larger community.

1.4.6.2 Member checking

Creswell (2013b, p. 191) provides insight into this method of trustworthiness checking. The principle of member checking is usually applied during qualitative research to determine the accuracy level of the study by having the participants confirm the basic themes that emerged from the research. At the conclusion of data analysis phase of the study the analysed interviews are made available to the participants that were interviewed to evaluate if the themes identified through the convergence of data and information sources such as the perspectives of participants, field notes of observations completed by the researcher during site visits, the review of available literature on crime prevention, and the interpretation of the data on non-ferrous metal crime are relevant and applicable.

1.4.6.3 Extensive field research

Creswell (2013a, p. 192) is of the opinion that spending a prolonged period in the field increases the validity of the study and theorises that the researcher will only develop a true in-depth understanding of the phenomenon if extensive time is spent learning to understand all the factors contributing to the phenomenon. The development of themes will only follow after an understanding of the subject under study was achieved. In the case of this research work, the researcher had been involved with work relating to the mine industry and non-ferrous metal theft since 2003 and had built up extensive knowledge of and experience in the subject.
1.4.6.4 Peer briefing

A fellow researcher investigating similar topics and who has experience in the mining industry conducted a peer briefing of the research. This process augmented the accuracy of the study and thus the validity. The peer briefing strategy ensured that the evaluation of the study went beyond the interpretations of the researcher (Creswell, 2013b, p. 192) and that it was based on real-world application.

1.4.6.5 Secondary assessments

Secondary assessments were applied to the enquiry’s discoveries in an effort to enhance the validity and replicability of the quantitative research findings.

1.4.6.6 Clarification of possible researcher bias

The first part of this chapter contains an open and honest account by the researcher detailing how the findings were shaped by his experience and background. This ‘self-reflection’, if you will, formed a crucial part of the cycle to establish the trustworthiness of the study (Creswell, 2013b, p. 192).

Throughout the study the researcher consciously minimised his personal impact on the data-gathering aspect of the study. According to Crabtree and Miller (1999, p. 24) researcher bracketing is the process through which researchers must recognise their own preconceptions and understand that their preconceptions would impact on their understanding of the research subject’s world.

In this study the experience of the researcher impacted on the initial development of the study as well as the general execution of the work. This is the result of previous research, by the author, on the theft of precious metals from South African mines (Coetzee & Horn, 2006), which laid the foundation for the current study. In addition the researcher is involved in applied policy research and capacity-building in his day-to-day work with a research institute in South Africa. However, the impact of the researcher’s own experience was managed through rigorously following the questionnaires and ensuring that his notes and data formed part of a methodological triangulation process to mitigate the possibility of undue researcher influence on the study.

1.5 ETHICAL CONSIDERATIONS

Ethical considerations form a pivotal point of successful research, and the same would be true for this research project.

The research project was measured against two complementary standards of research ethics. The first was the ethical considerations as outlined in the Code of Ethics for Research at the University of South Africa (UNISA) (2000, pp. 128-134). The particulars of the participating South African mine and the identities of all participants were
protected (anonymity) and all information received was treated as confidential. The appropriate standards were upheld by obtaining consent to undertake research from the relevant authorities. Acknowledging all sources of information and implementing accurate referencing techniques meticulously avoided plagiarising. This consideration would form the basis of the ethical approach followed during the research.

The second standard, which complements the first principle, was the Belmont Report’s standards for ‘Ethical principles and guidelines for the protection of human subjects of research’ (Harms, 1979, pp. 1-13).

1.5.1 Ethical research pillars

The Belmont Report established pillars that uphold the ethicality of research. These basic principles were to respect the person that the research impacts upon; the research must take the beneficence of the people involved in the study into account; and comments made and burdens assigned would be the product of judicious consideration.

1.5.1.1 Respect for the person

Respect for the person impacted by the research study raised at least two considerations. Each person has the right to be regarded as an independent individual and the individual is entitled to protection (Harms, 1979, p. 4). Respect is only achieved when both considerations are satisfied met by the design of the study and the execution of the actions performed during the study. Participants have the right to have their opinions respected and their choices considered while the researcher should not interfere with those choices unless it is clearly to the detriment of others.

In this research study the participants were of sound mind and entered into conversation with the researcher voluntarily. Each participant was informed about the purpose of the study and the extent of the role each was required to play in the research process that was to follow. The mining house that agreed to participate in the study stipulated that its identity be kept anonymous, however: this request was purely based on business considerations.

1.5.1.2 Beneficence

For the purpose of the Belmont Report the principle of beneficence is defined as ‘do no harm’ and it transcends acts of kindness or charity. The Belmont Report formulated two basic rules for beneficence. The first was not to do any harm and the second to maximise any benefit that might be gleaned from the work while minimising any harm that might result from the study (Harms, 1979, p. 6).
1.5.1.3 Justice

Justice is a principle that had to be followed throughout the research process and is closely related to all the other aspects that were taken into consideration during the process. Justice was the scale on which actions and consequences were weighed and in principle the weighting always benefited the research subject.

1.5.1.4 Free from harm

In the process of conducting the study physical or psychological harm were not factors that influenced the process. The participants were of sound body and mind. The researcher however had to keep in mind that even the act of talking to people in the security division, the SAPS and the Department of Justice and Constitutional Development (DOJ & CD) might raise the expectations of these people to expect change to happen that would assist them in their plight. The researcher had to manage said expectations.

1.5.1.5 Free from exploitation

For the purpose of this research study the confidential material comprising data from the crime recording system of the participating mine and personal interviews conducted with individuals during the research process was safely stored and destroyed after the completion of the study.

1.5.2 Application of principles

The ethicality of the research undertaken was based on the general principles of the Belmont Report. However these principles were not detailed enough and for the purpose of the study they were broken down into smaller categories. The following categories were considered during the study.

1.5.2.1 Informed consent

The participating mine was provided with the concept paper and research proposal outlining exactly what their role was if they participate in this research study. They agreed to the terms of reference and consented to participation.

1.5.2.2 Right to information

Participants had the right to be fully informed regarding the research process, the purpose of the research, and risks and benefits that might be derived from participation in the study. As the participants were invited to participate, they could withdraw from the study at any time.
1.5.2.3 Comprehension of information

Providing information to the test subject is not enough to ensure that the researcher complies with the ethical considerations as stipulated in the Belmont Report. The researcher has to ensure that the subject understood the information before the study is embarked upon. This was the case with the participating mine. A committee decided to participate in the study and approved the principle as well as the methodology that was to be followed.

1.5.2.4 Right of choice

Application of the general principles of ethical research leads to the point where the participant has the right to choose whether to participate in the study or not. No remuneration offered for participation and the participating mine was a willing participant. The mining house complied with the requirements set for voluntariness in participation in the study.

1.5.2.5 Risk versus benefit of participation

The risk to the participating mine was kept to a minimum and security information that might expose the mining operations to attacks was not included in the research document. The participating mine was pleased to be of assistance because the research addressed one of its growing concerns. It benefited not only the mining industry but also other industries and individuals that were concerned with non-ferrous metal theft. One of the most promising benefits of the research is the possibility of raising awareness regarding the threat posed by non-ferrous metal theft, which was going unnoticed and unaddressed by government departments that should be working on mitigation strategies.

1.5.2.6 Subject selection

The selection of subjects was based on the principle of justice, which ensured that the selection process was fair and that the procedures did not disadvantage or benefit individuals or organisations indiscriminately. The selection of the participating mine was based on their previous participation on other research projects related to precious metal theft. In addition the mine was also willing to provide records that would under normal circumstances not be available for research and examination. The participating mine was also willing to allow the researcher to use this research to the benefit of all the victims of non-ferrous metal theft.

The convenience sampling method was used because the study was based on the examination of the situation at a specific mine. Checks and balances were put in place to ensure that the research remained relevant to the non-ferrous metal theft situation in South Africa at the time. A large volume of news media reports were studied to
determine how non-ferrous metal thefts impact the general economy and organisations. The NFTCC and BAC were contacted to provide information on the current trends and losses suffered by victims of non-ferrous metal theft. In addition the Parliamentary Monitoring Group was monitored to find comments made in Parliament about the non-ferrous metal theft situation as experienced by political figures and discussed in parliamentary fora.

1.5.3 Matters that complicated the study

This study started in 2005 with the development and approval of the research proposal. During the conceptualisation phase the mine was very supportive of the study and agreed to make its personnel and data available for in-depth interrogation regarding the non-ferrous metal theft phenomenon. However, neither the researcher nor the participating mine could have foreseen the changes that would occur in the mining industry and the research environment before completion of the study. Factors such as the economic decline impacted the mine and led to the reduction of personnel, which in turn increased the pressure on the remaining security officers to do more with fewer resources at their disposal. Subsequently the participating in the research project was deprioritised to some degree. To commend the participating mine, as soon as the situation stabilised, the security and safety officers involved in the process were made available again to complete their work with the researcher. However, since the economic situation continued to deteriorate in 2011 and 2012, several of the participants that formed part of the group that were interviewed initially were not available for continued participation. This made it impossible to conduct follow-up interviews in some of the cases. However, the crime information manager of the participating mine was still in the same position and was more than helpful when asked to assist with interpretation of the crime data as well as contextualisation and interpretation of some of the information.

Continuous throughout the study was the non-negotiable requirement of the mine that no interviews were to be recorded by any audio or visual means. The interviews had to be recorded and summarised by hand in research notes and the researcher was allowed to submit a research questionnaire to the participants. This increased the time needed to analyse the information and the data exponentially and delayed the completion of the study each time any follow-up work had to be done. In addition the participating mine cautioned the researcher that although they were participating in the project they needed assurances that their identity would be kept confidential and that the scope of the study would in no way encroach on their primary business. This is a legitimate concern in the volatile mining industry where shareholders are extremely concerned with the public image of the company and where any negative publication might lead to a collapse in their share price.
Nonetheless, the study came to a conclusion at the end of 2012, when all the data were finally made available and the final chapters could be completed. This in itself complicated the study because the data that were available covered the period January 2006 to December 2011, which technically made it somewhat outdated. However, realistically the lack of 2012 data can be explained by taking into consideration that the judicial process takes a considerable time to run its course and if the 2012 data had been included many would still have been classified as ‘pending’. This in itself would have been an undesirable outcome.

One of the criticisms that can be expected in a study of this nature is the lack of in vivo statements. This can however be explained by referring back to the security and financial concerns of the participating mine. As part of the agreement between the researcher and the participating mine it was specified that there no audio or video recordings would be made of the interviews or the site visits. The utmost care has been taken to ensure that the participating mine would not be easily identifiable and that the anonymity of the respondents was assured. As a result of the constraints of the agreement between the researcher and the participant mine it was not possible to use of the participants’ exact words and phrases in the study, as referred to by Willig (2008, p. 36).

1.6 SUMMARY

Developing a thesis on a subject that, although it touches everyone's lives, is not well understood or often written about is a challenge that can only be mitigated by a strong research design and adherence to the principles of research. One of the lessons learnt was that research is not limited to providing impetus or a catalyst to change, even if that change is for the better. Research in the true sense of the word is to build trust in what the research discovered. Building trust is a process and depends on the foundation that is laid at the outset. To achieve the desired balance of trust and comprehensiveness much time was spent deciding on a research methodology that would fit the worldview of the researcher and achieve the desired outcome without excessive impact on the results of the study. Creswell was an invaluable resource in this regard and his work formed the basis of the design that became the study.

Each step of the study provided insights into a world largely unknown to the man in the street. The dangers of the world the miners find themselves in were highlighted, as well as the limited resources that are available to the state if the lives of the miners are put in danger through reckless acts of vandalism and theft.

The spotlights also fell on the threat posed by random non-ferrous metal theft to the world. Examples were given of the situation on other continents to give an indication of the prevalence of non-ferrous metal theft elsewhere.
Chapter 2

The nature and extent of non-ferrous metal theft

2.1 INTRODUCTION

The Southern African Development Community (SADC) region has become the breeding ground for various organised crime syndicates. Impoverished states, plagued with weak leadership, brought about this unfortunate situation. This general state of unruliness has lead to widespread internal conflict, the continuation of civil war and political turmoil. The unstable environment is typical of a milieu in which criminal activity and organised crime flourish. Criminals tend to identify these circumstances as low-risk opportunities and profit from them (Gastrow, 2001, p. 1).

One indicator of a weak state is the lack of legislation to address the challenges posed by the various areas threatened by organised crime and money laundering. The conundrum faced by freedom fighters turned politicians is the challenge of relying on legitimate and declarable sources of income to fund their political ambitions in a democratic environment. Many of these ‘new’ politicians do not have a strong sense of civic responsibility or the will to contribute to the upliftment of their fellow citizens. This may lead to disassociation between the new leaders and their constituents as well as increased susceptibility to corruption, misuse of power and the abuse of their positions of trust - all of which are weaknesses that can be exploited by crime syndicates.

Newly liberalised citizenry are faced with several post conflict challenges, of which the most physically and conceptually challenging is poverty. Many of the poor were avid supporters of the freedom fight in their respective countries. They were under the impression that all their problems would be solved once the group they supported ascended to power. In cases where transformation and change are not taking place to the extent or as quickly as anticipated, the populace start to look at alternative sources of income to fund their needs, such as crime. This unstable environment creates the opportunity for organised crime syndicates to approach normally law-abiding citizens with the proposition of providing alternative sources of income. Many people who, under better circumstances, would not have considered breaking the law are drawn into criminal gangs and transnational criminal organisations that flourish in these circumstances because of disillusionment with the new governmental structure and the lack of post conflict social cohesion. According to Thibault le Pichon (2005) the World Bank found that homicide rates increased by 25% in the five years following the cessation of a civil war. During this period several factors contribute to the increase in crime and violence. Some of these factors are instances where crime becomes a post
conflict form of livelihood as a result of the lack of support to re-establish the social cohesion and the lack of opportunities to move to alternative non-violent livelihoods. The convergence of violent past behaviour and the lack of opportunities lead to an extended career as a violent predator that creates personal wealth through smuggling and organised crime.

According to Fabre (2003, p. 1), the growth of a worldwide ‘gray economy’ escalated unchecked and rampant after the Cold War. The result of finance driven globalisation was the unprecedented multiplying of offshore markets and tax havens. These countries contributed to the institutionalisation of tax evasion. Criminals are known to make use of these untraceable banking facilities to launder unlawful gains back into the recognised banking system.

In the case of non-ferrous metal theft, there were two possible scenarios to consider. Both were not properly regulated by legislation in place at the time, namely the Second-Hand Goods Act, 1955 (Act 23 of 1955). The legislation was antiquated, according to Van den Berg (2002, p. 2), and did not take modern trends and business practices into account, while sentencing failed to recognise the seriousness of the threat and the extent of the problem. The Second-Hand Goods Act, 2009 (Act 6 of 2009) has been promulgated in the meantime.

In one scenario, stolen non-ferrous metal is exported covertly from countries. This process would be viable for well-organised crime syndicates that are able to move large consignments by rail, road or sea to international clients. The illicit gain from copper theft is, in this instance, funnelled back to the criminals by means of the ‘gray’ or ‘alternative’ financial system of tax-havens. Another scenario is more dangerous initially but the financial benefits are more easily available and the process is much less complicated. In this instance, the money laundering takes place on ground level once the stolen copper is bought from the thief into the licensed business of a scrap metal dealer. The illegally obtained product is then given a legitimate veneer by mixing it with legally obtained non-ferrous metal and selling it to larger recycling plants or to the smelters (Van den Berg, 2002, p. 2).

In both instances the outcome remains the same: the stolen non-ferrous metal is recycled back to the legitimate market. The international scrap metal recycling industry is, currently, not effectively controlled by states, nor is it self-regulating. The lack of control over the industry has led to criminal exploitation of law-abiding scrap metal merchants and the scrap metal recycling industry.

Unscrupulous international scrap metal buyers are contributing to the creation and sustaining of the market for stolen non-ferrous metal through ruthless and unprincipled acquisition of resources worldwide. These international criminal scrap metal dealers, it is
thought, sell the recycled metal to markets such as China, India and other parts of Asia where there is unprecedented industrial growth and the demand for building materials. Non-ferrous metal and copper in particular, is in high demand, according to McWhirter (2007, pp. 1-2).

2.2 BACKGROUND

Borders of any kind do not constrain non-ferrous metal theft - it does not conform to policing districts or areas and it does not discriminate between race, economic status, education, gender, political views, sexual orientation, or religious beliefs. Non-ferrous metal theft is truly a universal equaliser on a grand scale.

The multi-fold perspective on this dilemma is depicted in Figure 2.1.

<table>
<thead>
<tr>
<th>International perspective</th>
<th>Worldwide occurrences of non-ferrous metal theft</th>
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<tbody>
<tr>
<td>Regional perspective</td>
<td>African experience of non-ferrous metal theft</td>
</tr>
<tr>
<td>National perspective</td>
<td>South Africa's experience with non-ferrous metal theft</td>
</tr>
<tr>
<td>Victim's perspective</td>
<td>Participating mine</td>
</tr>
</tbody>
</table>

**Figure 2.1 Multi-fold perspective**

This study will start with an overview of non-ferrous metal theft on the international scale, followed by a view of the situation on a regional scale. This will be followed by a national perspective, culminating in a review of the situation at a participating mine in South Africa.

2.3 INTERNATIONAL PERSPECTIVE

To elucidate the scope of the threat the researcher embarked on a review and scrutiny of reported instances of non-ferrous metal theft worldwide. As it was not feasible to report on non-ferrous metal theft in individual countries, reports were therefore categorised into the seven conventional continents. Three reports are reflected in the overview.

2.3.1 Antarctica

At the time of writing Antarctica was the only continent that had not reported non-ferrous metal theft. This may be the result of the limited number of people on the continent, the educational level of the residents, or several other causal factors that might play a role.
For the purposes of this research project the causality of the phenomenon fell outside the scope of the study.

2.3.2 North America

- ‘Copper thieves cost TELUS more than just wire’. The cost to company to replace stolen telecommunication lines are in the range of US$50 000 per incident. Telecommunication company TELUS from Canada estimated that their losses for 2007 amounted to US$2 million from 40 incidents, not to mention the fact that 400 customers were out of service for 30 hours from an incident where 2 metres of cable worth US$5 were stolen (Vancouver Sun, 2007).
- ‘PSC warns against copper theft: activity is both illegal and extremely dangerous’. Theft of copper cable may have lethal consequences for the perpetrators of the crime. PSC Chairman Mark David Goss said three people have been electrocuted and those deaths were unacceptable to the Commonwealth of Kentucky (Melynykovych, 2006).
- ‘Copper prices and incidences of copper theft rise’. Persistent thefts of copper wire from under the streets of Fresno, California, have driven the city to seal thousands of its manhole covers with concrete. And in Picher, Oklahoma, someone cut down the town’s utility poles with a chain saw, allowing thieves to escape with 3 000 feet of copper wire (Williams, 2011).

2.3.3 South America

- ‘Copper theft hits 421 tons thru May’. In Brazil 421 tons of copper were stolen within five months. This equates to the loss of US$3 400 000 (Pregnaca, 2007).
- ‘Copper cable theft triples in Chile’. In 2010 Chile lost 842 miles of copper wire infrastructure as a result of theft. The cost is estimated at US$3 300 000 (Locker, 2011).
- ‘Mining for copper in the streets of Argentina’. Argentina did not know a crime such as non-ferrous metal theft existed before the devaluation of the Argentine peso and the economic crisis. Since then the theft of copper cables has exploded. People are more willing to risk being caught as the amount paid for scrap metal escalates and the perpetrator is paid in US dollars. This resulted in large-scale copper theft and a mafia-like organisation of scrap metal dealers (Barbano & de Corso, 2006).

2.3.4 Africa

- ‘150 tons of stolen copper cables discovered in metal waste recycling company’. In Algeria detectives from the Criminal Brigade in Annaba Province seized ten containers with 150 tons of copper. The content was in the form of water
pipelines, telephone cables and electrical cables. It is suspected that the goods were stolen from Sonelgaz Algeria Post and Algeria Water (Algeria Events, 2008).

- ‘Six on trial for phone cable theft’. In Nigeria six men were arraigned before the Shomolu Magistrate Court for allegedly vandalising NITEL cables valued at over N5 000 000 (US$31 000) (Ogbo, 2011).

- ‘Zamtel, cops team up to curb copper cables vandalism’. In Zambia off-line automated teller machines (ATMs) frustrates citizens, especially over weekends when banks are closed. But most of the clientele do not realise that the theft of copper cables is responsible for the disruption of some of the machines (Kalunga, 2011).

### 2.3.5 Europe

- ‘Churches to tackle metal thefts’. Metal theft from churches in the England has led to significant increases in insurance claims. The Anglican Church has claimed for 270 incidents totalling £900 000 as a result of non-ferrous metal theft (BBC News, 2007).

- ‘Rail police: cable crime is biggest threat after terror’. The Chief Constable of the British Transport Police in the UK declared that the increase in theft of rail signalling and electrical cabling is the biggest threat after terrorism (Buckley, 2007).

- ‘Spanish police smash copper-theft gang’. Spanish police caught a gang of copper thieves. They are suspected of stripping metal from railways, electricity and telephone lines across Catalonia (Govan, 2011).

### 2.3.6 Asia

- Internationally non-ferrous metal thieves are becoming bolder and more organised. One glaring example was reported in September 2008 when a 13-metre iron footbridge stolen from the city of Prague in the Czech Republic. The police investigation concluded that oxy-fuel torches were used to cut the structure into manageable portions for transportation. More worrying is that this was not an isolated incident. Early in 2008 a four tonne iron railway bridge disappeared, and it could mean that there might be a developing trend in this kind of large-scale theft (Sapa-dpa, 2008).

- Countries such as Vietnam are not exempt from cable theft. In 2007 the Vietnamese police arrested several shipping captains who were in the possession of tons of communications cable. In the case of Vietnam the captains were in direct violation of article 231 of the Vietnamese penal code when they were ‘damaging important works of the national security’, and they might be put to death for the crime (Vietnam News Brief Service, 2007).
• ‘Virtual guards’ foil metal thieves, saving SLA S$1.87 million’. To most people the loss of a few manhole covers or some copper wire would not be a matter for concern; however, if all the losses are added up the bill for the restoration of damaged infrastructure can run into millions for the Singapore Land Authority (SLA). The SLA spent S$2 100 000 in six months to replace stolen items (Teo, 2007).

2.3.7 Oceania including Australia

• ‘Anger at theft of plaques from headstones at cemetery’. Thieves stole headstone plaques to an estimated value of $600 from a Kilmore cemetery in Australia (Herald Sun, 2007).
• ‘Four arrested over industrial copper theft’. Four men were arrested and charged with the burglary of a city electrical supplier in Christchurch, New Zealand. The police estimated copper cable to the value of $20 000 had been stolen. Some of the copper was recovered but most remained lost (New Zealand Police, 2007).
• ‘58 arrested in copper theft crackdown’. Fifty-eight people were arrested in the western division of Fiji in an operation cracking down on copper theft (Fiji Broadcasting Corporation, 2011).

One of the most challenging factors for the researcher was to find data to support the premise that non-ferrous metal theft is actually a national, regional and international threat, simply because very little is known about the phenomenon. This is largely due to the misconception that these are isolated incidences with little impact on anybody. The police feel compelled to devote most of their resources to priority crimes such as violent crime and drug trafficking. Little resources are devoted to the investigation and prosecution of the disappearance of infrastructure and the (metal) foundation of society. However, by using secondary data sources, and web-based news sources, it quickly became discernable that this type of crime is rampant in most countries.

These reports are indicative of a very serious threat to every country and every region because it is clear that this type of crime has become the new focus of organised criminal expansion. Syndicates can operate under the radar of law enforcement agencies because this type of crime does not draw their attention and there is very limited regulation of the trade. Once metal is loaded onto a truck or into a container it becomes anonymous and although customs and police might search through the ‘scrap’ metal for signs of hidden weapons or smuggled drugs very little consideration is given to the metal that is being worked through.
2.4 REGIONAL PERSPECTIVE

The purpose of a regional non-ferrous metal theft overview is to focus the attention on the non-ferrous metal theft situation in countries neighbouring South Africa. Non-ferrous metal theft is not only a European or American problem - some of the countries worst hit by this type of crime are in the Southern African region. The aim is to raise the awareness of all levels of society across borders and without limiting the target audience to race, gender, nationality or religious orientation. Everyone can become victims of non-ferrous metal related crime, and the criminals are unscrupulous, they will use children to commit the thefts without a moment’s consideration for the child’s safety and wellbeing.

2.4.1 Southern Africa

• ‘Copper theft increases as police arrest suspects’. Botswana police reported an increase in the theft of copper cables. The police arrested ten suspects for possession of stolen copper cables in six separate incidents (Mmegionline, 2011).
• ‘Copper theft silences Erongo phones’. The town and surrounding area of Erongo, Namibia, have been without telephone services because of rampant copper theft (Hartman, 2008).
• ‘US$28 000 cables found at city home’. Police arrested three suspected copper cable thieves at a house in Glen Norah B, Harare. In the process they recovered more than three tons of non-ferrous metal worth US$28 000. The recovered cables belong to Zesa Holdings, the National Railways of Zimbabwe and TelOne (Herald Reporters, 2011). In Nairobi, Kenya, utilities such as Telkom Kenya and Kenya Power & Lighting Company are calling for ‘a total ban on the export of scrap metal’. The Telkom Kenya reported that the company has lost Sh500 million (R49 million (OANDA, 2007)) to plundering of the national infrastructure and initial attempts to control the rampant theft through raised export taxes did not seem to have any effect on the losses (The Nation, 2007).

Mozambique is hard hit by non-ferrous metal theft. This country has recently emerged from a civil war that devastated its population and infrastructure. There is almost no industrial infrastructure and little opportunity to obtain foreign currency; international donors and donor countries have funded much of the redevelopment of the country. This country do not have the resources or the capital to combat non-ferrous metal theft, it also does not have the resources to continue to replace stolen cables and transformers and other infrastructural components. At some point the power utility would have to stop replacing infrastructure in high-risk areas, or be exposed to certain bankruptcy. One of the ways cable thieves are moving non-ferrous metal from Mozambique is to change the appearance of the transported goods. In one instance 55 kilometres (Wines, 2004) of aluminium cable was stolen and shortly afterwards a company in Mozambique started
trading in and exporting cast aluminium pots through Swaziland and South Africa. This in itself would not have raised suspicion if it were not for two facts; Mozambique has one aluminium smelter and it sells its entire production abroad, and the country does not officially import any aluminium. This begs the question: Where did the pot manufacturer source the raw material for the manufacturing of the aluminium pots; was it from stolen cable?

South Africa has a well-developed infrastructure consisting of a large rail network, road system, telephone network and electricity distribution network. The infrastructure was built up over decades during a time when US$8 000 for a metric ton of copper was inconceivable. Metal was inexpensive and was used copiously in the construction of roads, bridges, railway lines, as well as electricity and telecommunication distribution networks. During the design, development and installation of the networks it was never considered that it might become necessary to defend it against criminals.

One of the biggest threats related to non-ferrous metal theft faced by South Africa is posed by the influx of foreigners into the country. These, mostly illegal, immigrants have no way of finding legal work and have to be absorbed by the informal sector. The threat manifests in a situation where illegal immigrants have to support their families or send money to their country of origin (Amisi, 2009, p. 19). This situation could compel them to consider committing a crime and although not undisputedly conclusive may serve as an indicator of an increased likelihood that the subject might consider committing a crime, this seems to be supported by several researchers and institutes (Solomon, 1996, p. 14; Tashakkori & Teddlie, 2007).

One such an incident took place near Makhado/Louis Trichardt when police arrested seven suspects for the possession of suspected stolen copper wire. In this particular instance the group arrested were of Zimbabwean origin and included two women (Hoffmann, 2008). Another variation on the non-ferrous metal theft phenomenon is illustrated by the Bandelierskop case where the police arrested three male suspects. The officers discovered, hidden inside a freight truck, a large quantity of scrap metal and copper wire. This would not have raised much attention if not for the fact that the truck was travelling from Malawi to a destination in Gauteng, South Africa. All three suspects were of Malawian origin. The truck was registered in Malawi and the value of the metal was estimated at R500 000 (Zoutpansberger, 2007). This instance of cross border non-ferrous metal smuggling has prompted the realisation that South Africa is not only a victim of the crime but may also be used as a transit point for syndicates involved in non-ferrous metal theft.
2.5 NATIONAL PERSPECTIVE

The overview entails the South African crime situation with particular focus on non-ferrous metal theft. The purpose of this section is to illustrate the far-reaching effects of uncontrollable non-ferrous metal related theft. It would also contribute to establish a foundation for the quantification of cost from a citizen’s point of view. The aim is to create awareness of this particular crime threat in order to campaign for quick action from government before the situation becomes unmanageable.

2.5.1 South Africa

Former South African National Police Commissioner General Jackie Selebi (Selebi, 2007) told Members of Parliament during a meeting with the National Council of Provinces that an organised crime syndicate could impair South Africa’s economic growth through copper cable theft. Selebi made this statement based on the consideration that electrical cable theft contributes to crippling power outages throughout South Africa, which in turn leads to business disruption and financial losses to both government and private enterprise. The conclusion that was put forward as explanation for the large number of cases relating to non-ferrous metal theft was that it could be the work of one organised crime syndicate and not as previously thought the actions of individuals who wanted to sell the metal to scrap dealers.

Selebi also disclosed that the police initially was under the impression that there were no linkages between the individuals perpetrating cable theft. It was thought that these were crimes of opportunity where individuals committed a crime in an attempt to make a bit of money quickly. Subsequent investigations led him to believe that these acts constituted a planned attack on the South African economy. He singled out the town of Germiston in Gauteng as one of the areas most affected by copper cable theft. This area is of particular importance to the general growth of the South African economy because large volumes of the country’s industrial cargo pass through this point by rail or road (Selebi, 2007).

Another possible consequence of copper cable theft is that it may lead to municipalities, local government and ultimately the national government being held accountable for losses suffered by businesses and communities affected by power outages. Eskom sells electrical power to municipalities, which sell the commodity to the consumer. The protection of the infrastructure needed for the final distribution of the electricity remains the responsibility of the municipality and according to Lorinda Nel (2007, p. 3) the costs related to this function is continuously increasing in both actual and associated expenditure.
The SAPS has subsequently changed its stance toward non-ferrous metal theft and copper cable theft in particular. The SAPS recognised the seriousness of the threat to the economy and the Crime Intelligence Division was tasked to identify the criminal organisations orchestrating the cable thefts. Crime pattern analysis, according to Selebi, indicated that in the Western Cape, Telkom, the South African telecommunications provider, is most affected by copper cable theft with the City Council and Eskom respectively second and third most affected (Selebi, 2007).

The City of Cape Town has responded to the threat of copper cable theft by establishing a specialised copper theft combating unit consisting of members from the Cape Town Metro Police, private security companies, and the utility services most affected by copper theft. Rens Bindeman (2007, p. 2), at the time a consultant for a private investigating company, Revenue Investigation, stated in the outcome of the probe the company did into copper theft that ‘An increase in theft could be linked to a huge increase in copper prices’ as quoted by Peters (2007, p. 2). This finding based on the increase in demand for non-ferrous metals worldwide is supported by the analysis of several international policing agencies and economists. According to Bindeman, during the investigations into copper cable theft in and around the City of Cape Town it was established that one copper thief is believed to have sold one kilogram of copper for between R25 and R36 on the ‘black’ market. At that time, on the legitimate market, a kilogram of copper was priced at R70 per kilogram. This is a lucrative and low-risk arrangement for both the buyer and the seller of illegally acquired copper and other non-ferrous metals. The victim of the crime experienced the opposite effect according to Melanie Peters (2007, p. 1); the expense report of the City of Cape Town can attest to this fact. The City of Cape Town had to spend R3 million to replace electrical cable that was stolen during 120 incidences of reported theft from the beginning of August to the end of December 2006.

The cost of electrical cable theft should however not be measured in monetary terms alone. The cost must be reflective of both the losses suffered by the victims and the losses that may be suffered by the perpetrators of the crimes. According to Councillor Peter van Dalen (Walker, 2007, p. 1) the emerging trend is that children as young as eleven are recruited into crime syndicates to steal copper cable. These children and youths are as much victims of crime as the individuals and organisations losing copper and other non-ferrous metals to theft. Conscienceless crime syndicates that care nothing for their future or their safety lure these young perpetrators into a life of crime. They are used and discarded at will, as an expendable resource. One of the youths was found, unconscious; at the scene of an unsuccessful attempted copper cable theft in the Western Cape was suffering from severe electrical burn wounds. Further investigation led the investigation team to conclude that the youth was wanted for thirty-three charges
mainly in connection with copper cable theft. This youth was 16 years old at the time of the incident (Walker, 2007).

According to Shaun Smillie (2007) of The Star the National Intelligence Agency has also started to investigate the conductor (non-ferrous metal) theft phenomenon. The Department of Safety and Security is concerned about the billions of rands lost to the South African economy through businesses and communities that fall victim to copper cable theft. Investigators of the joint public/private initiative Business Against Crime (BAC) were the first to report that they had uncovered a link between Gauteng scrap wholesalers and crime syndicates based in Cape Town. The investigation led the BAC investigators to believe that the stolen copper is sold to international buyers such as China, who has a great need for copper to sustain its economic and industrial growth (Rheede Rabie, 2007).

The challenge presented to the City of Cape Town by copper cable theft was highlighted during the 2007 copper cable theft summit, which was hosted by the city mayor, Helen Zille (2007). During the address it became clear that a limited number of vandals and thieves are destroying the city’s ‘entire infrastructure’ for a few rands. Mbola (2007) reported that Pieter van Dalen of the city’s cable theft task team said Zille would appeal to scrap metal dealers to stop supporting the copper theft syndicates. The summit drew participation from representatives from a range of sectors affected by copper cable theft: participants were from the scrap metal recycling industry, Eskom, Telkom, BAC and the Cape Regional Chamber of Commerce and Industry (CRCCI).

A 2007 media release (Directorate, Communication, 2007) from the Directorate: Communication of the City of Cape Town stated that although there was no copper mining activity in the Western Cape, Cape Town was used as a conduit to export R77 million of copper to China during 2006. An economist from the Western Cape trade and investment agency Wesgro, Craig Lemboe, qualified this figure: ‘It is difficult to ascribe a specific number to theft’ (Venter, 2008). Furthermore, it was clarified that the Western Cape Province exported R230 million of copper in 2007 and R204 million in 2006 but these figures include legal copper scrap exports. The large export figures have to be considered in the context of the large seaport of Cape Town, with a considerable number of ships docking each year transporting cargo accumulated from over Southern Africa.

The main concern for the managers of the City of Cape Town was that the ratepayer has to foot the bill for non-ferrous metal crime. The City had to spend R22 million during 2006 to replace and repair stolen or vandalised cables and equipment at electrical substations, sewage pumping stations and city streetlights. The areas that were mostly targeted were Ravensmead, Bishop Lavis, Athlone, Mitchell’s Plain and Manenberg, which are areas that were neglected in the past due to socio economic and political conditions.
These areas urgently need infrastructure development to cope with the growing population density (Prince, 2007).

Bindeman has been investigating copper cable theft syndicates for more than 14 years. He said investigations led him to believe that syndicates hire people to steal copper cables and other non-ferrous items such as water meters, taps and manhole covers that are easily accessible (2007, p. 1). The opportunistic thieves, commonly referred to as ‘runners’, are the first tier in the organised crime syndicate. They have little knowledge of the role they play in international crime and the other members of the syndicate are usually unknown to them.

The legal non-ferrous metal recycling industry functions in much the same way as the legal precious metal industry. The manufacturing process for recycled metal begins with metal recovered from waste products such as scrapped motor vehicles. The scrap metal is mechanically reduced to a workable consistency that is mixed into existing melted recycled material to obtain the required material strength for use in manufacturing new products. The illegal non-ferrous metal recycling market functions in much the same way as the illegal precious metal market.

The precious metal mining industry classified organised crime syndicates into five levels or tiers. Level 1 represents theft at the source; Level 2 is made up runners and illegal smelt houses; Level 3 are the illegal regional buyers; Level 4 are the illegal national buyers; and Level 5 consists of illegal international networks (Coetzee & Horn, 2006, p. 81). (See Figure 2.2 that was adapted from Coetzee and Horn, 2006).

The lowest tier of scavenging criminals literally walks around picking up loose pieces of scrap metal. They also
scout for metal that is not scrap and which may be acquired with little risk or effort. This is then sold on to the second tier, the so-called ‘bucket shops’, on the street for minimum financial benefit.

The bucket shops sell their daily or weekly haul to small scrap metal dealers, the third tier - those that do not adhere to legislative requirements and do not ask for clients’ identification documents. The Level 3 illegal scrap metal dealer would then mix the illegally obtained metal into legally obtained and verifiable scrap metal consignments that are sent to the fourth tier, the metal recycler, who legally changes the appearance of the scrap metal. In some cases the recycler may have knowledge of the criminal activities of the dealer, and in others the recycler might be an unwitting participant in the crime. The last, fifth tier is the international consumers of non-ferrous metals. These unscrupulous consumers are the originators and the driving force behind the worldwide illegal trade in non-ferrous metal. These countries and industries do not take any responsibility for the origin of the scrap metal; they are only interested in purchasing it at the lowest price possible. Free State Province has not been excluded from the conductor (non-ferrous metal) theft threat. Long distances spanned by electrical and communications cables necessary to provide services to remote rural areas are extremely vulnerable to theft. This province was also the site where one of the most dramatic conductor theft trials in South Africa was staged. The prosecutor, Orpa Wessels, led a trial and achieved precedent-setting convictions against organised crime. During the trial 24 accused from eight gangs were tried on 58 counts of copper and aluminium theft, as reported by Honey (2007). Wessels however pointed out that the prosecutors in remote areas where many of these crimes take place do not get the necessary support from the police. According to her the police do not prioritise copper cable theft even though it is costing South Africa millions through primary and secondary losses. Wessels also commented that the South African Police Service’s area bound policing system and the disbanding of several specialised investigative units complicates the detection and investigation of organised crime syndicates (Honey, 2007). Crime and non-ferrous metal theft related crime in particular, is not bound by police jurisdictions, the perpetrators know that the risk of being arrested in one police district, for crimes committed in another area is remote and openly exploits this opportunity.

One of the main driving forces behind the criminal exploitation of the inability of the South African security services to prevent non-ferrous metal theft is the sharp rise in international non-ferrous metal prices. Internationally prices of non-ferrous metals have risen sharply because of the demand for conductive material from rapidly developing countries such as China and India. According to Robertson (2007) the trebling of copper prices since 2000 corresponds with the dramatic international increase in copper theft. The implication for South Africa is that one kilometre of high-tension power cable
weighing approximately 1 000 kilogram has increase in value to approximately US$5 500/t (US$5 500/t x R7,00 = R38 500) on the scrap metal market. One solution to combat illegitimate copper exports might be to clamp down on unscrupulous scrap metal dealers, according to BAC organised crime project director Lorinda Nel (2007, p. 1). The effect of such a measure would however severely impact the trade between South Africa and its trading partners and it might negatively impact the legal metal recycling industry. But if the threat continues to escalate it might come to the point where every consignment of non-ferrous metal would have to be registered as part of a control process to certify that it consist of legitimately acquired non-ferrous metal sources.

2.6 SUMMARY

Non-ferrous metal theft is an international threat that affects all countries, and all communities. Based on resources that are available internationally it can be ascertained that this type of crime does not receive nearly enough attention from law enforcement agencies. The reason for this uncaring attitude might be attributed to the perception that most cases of non-ferrous metal theft are ‘victimless’ crimes. Another contributing factor might also be the fact that most often the value of the incident is very low and subsequently does not receive priority attention of authorities because it is seen as a ‘nuisance’ crime.

During the interviews with the participating magistrate and the safety manager of the participating mine it was clear that the safety manager regarded the threat to the safety of the mine posed by indiscriminate non-ferrous metal theft as one of the highest priorities (A003, 2006) and was extremely concerned about the lackadaisical approach of the police. This concern was also voiced by the security manager (A004, 2006) of the mine in question and led to a process where the magistrate and other participants in the judicial process were invited to information sessions hosted by the mine in an effort to highlight the danger posed by the crime and to build relationships between the victims of the crime and the prosecutorial process. As a result of this type of collaboration, the magistrate was in an informed position regarding the seriousness of the crime and he could send a directive to the police in his district that all non-ferrous metal theft related cases must be brought before his court and that the police should not grant bail to the suspect even for small amounts of stolen non-ferrous metal in the suspect’s possession (A001, 2006).

Concerns raised by the interviewees were the lack of proper legislation to combat non-ferrous metal theft effectively. The most prominent identified problem was the absence of up to date legislation controlling non-ferrous metal trade and that the existing legislation did not progress with the changing circumstances encountered by the non-ferrous metal
traders. This complaint has since been addressed and new legislation has come into effect in 2012.

The safety manager and the security manager’s concerns were more practical in nature: they were looking to enhance the crime prevention and crime management procedures available to them in a process of securing the infrastructure of the mine and, more importantly, ensuring that no lives would be lost if a disastrous non-ferrous metal related theft should occur.
Chapter 3

Non-ferrous metal theft in South Africa

3.1 INTRODUCTION

In this chapter the concerns and challenges of the participating magistrate (A001, 2006) and the safety manager (A003, 2006) and security manager (A004, 2006) of the participating mine are examined within the context of the South African legal framework. These legislative measures are available to all industries in their fight against non-ferrous metal theft. This is not an exhaustive list of the relevant legislation, but it is an examination of the six most important and relevant Acts. This chapter includes an analysis of the current Second-Hand Goods Act, 2009 (Act 6 of 2009). This Act was promulgated in 2009 and came into force in 2012.

Through the examination of the relevant legislation, an emphasis was placed on the use of the law to prosecute non-ferrous metal thieves effectively. Catching a non-ferrous metal thief is the beginning of a long and, in most cases, costly process, the success of which is based on the knowledge of the law and the experience of both the prosecutor and the magistrate.

The context of the criminal behaviour should also not be neglected during the investigation of non-ferrous metal theft related crimes. The investigators have very effective legislative tools to assist them in the investigation in the form of the Financial Intelligence Centre Act (Act 38 of 2001) and Regulation of Interception of Communications and Provision of Communication-related Information Act (Act 70 of 2002). These Acts will however not be part of the demarcated study.

3.2 SOUTH AFRICAN LEGISLATION

The study focused on the following legislation:

These Acts are by no means the only tools that can be used in the fight against non-ferrous metal theft, but they will contribute to a general understanding of some of the armour available in the current legislative framework.

The importance of even one failed attempt at non-ferrous metal theft has to be recognised. A failed attempt might be a test of the security measures that are in place to protect the targeted items as well as a test of the priority companies and the state give to protect the infrastructure necessary for conducting its business. Tolerating non-ferrous metal theft even in the smallest degree opens the door to large and unprecedented attacks on critical infrastructure. Every non-ferrous metal theft related incident should be dealt with to the full extent of the law if the tide is to be stemmed.

### 3.3 SECOND-HAND GOODS ACT, 1955 (Act 23 of 1955)

For the purpose of this study it was necessary to include an analysis of Act 23 of 1955 because it was the only piece of active legislation governing the trade in second-hand goods during the period under investigation. The mine, police, prosecution and magistrate had to work within the confines of this Act when prosecuting non-ferrous metal thieves.

Although this law was promulgated more than half a century ago, at a time when television and cellular phone communication were unknown in South Africa, it was until recently the only active legislation regulating the trade in second-hand goods in South Africa. This law did not keep up with developments in the second-hand goods industry and was totally out-dated considering the goods it was supposed to regulate. Many items that found their way into the second-hand goods market could not be classified into the categories provided for in the 1955 Act.

Kotie Geldenhuys, writing in the police publication *Servamus*, put the situation in context from a policing perspective: 'It is difficult to police the scrap metal market effectively due to the fact that the legislation that regulates it is out-dated and inadequate (Act 23 of 1955). This Act was not designed to deal with scrap trading in the modern day environment' (Geldenhuys, 2008). Werner de Lange (2007), a state prosecutor in the Middelburg Magistrate’s Court in Mpumalanga, observed that catching non-ferrous metal thieves was one thing, but that successful prosecution relied entirely on the preparation of the docket. (The State President repealed Act 23 of 1955 and proclaimed that the Second-Hand Goods Act of 2009 would come into full operation as from 30 April 2012. This proclamation is definitely a step in the right direction but it remains uncertain how the Act would impact the trade in stolen non-ferrous metals.)
For the purpose of this study the focus is on the application of the 1955 Act on the non-ferrous metal industry. The legislation is examined section by section and each section is interpreted in the context of non-ferrous metal theft.

3.3.1 Section 3: Certificate required in connection with certain businesses

Section 3 of the Act (had to be read with sections 11 and 13) prohibited any person from dealing in second-hand goods without a certificate issued to him/her in terms of Section 4 of the Act. The certificate had to specify the extent of the trade that may be conducted and exceeding or contravening the restrictions is a crime. The certificate was issued at the discretion of the National Police Commissioner or the commissioned officer authorised by the Commissioner to grant certificates. The Commissioner, or the responsible officer, may grant a certificate authorising the applicant to deal in all kinds of second-hand goods or may exclude a specific category of goods.

This posed a problem to the police who are mandated to enforce the law, largely because of a lack of manpower. It is unreasonable to expect the police to be aware of every person buying non-ferrous metal in South Africa. This left the small buyers unregulated and once illicitly acquired metal has changed hands two or three times, every time mixed in with larger and larger consignments of metal, prosecution and investigation becomes almost impossible. This issue was not addressed by the Second-Hand Goods Act of 2009 either, although this Act makes provision for some form of self regulation within the industry, in effect making the industry responsible for ensuring that the metal that is bought by registered dealers are from legitimate sources and in that way reducing the regulatory burden of the police.

3.3.2 Section 6: Keeping records by dealers

Detectives and prosecutors sometimes overlooked Section 6 of the Act, which had to be read with sections 11 and 13. They focused on prosecuting the suspects found in possession of stolen non-ferrous metal. It should however always be considered that the small-time criminals that were caught with recently stolen non-ferrous metal had to sell it to someone and that those buyers perpetuated a crime by purchasing highly suspicious goods. By addressing the buyers, the market for stolen non-ferrous metal diminish and criminals had to start travelling longer distances to sell their ill-gotten gains. This in itself provided the victims with more time to discover the crime and the Police with more opportunities to apprehend the criminals.

In Section 6(1) recordkeeping was made compulsory for anyone involved in the second-hand goods industry. Every dealer was required to keep a register in one of the official languages of South Africa that would reflect all the transactions that took place. The range of transactions included all acquisitions and all disposals of goods. Section 6 (1) (a)
specified that the name and address of the person the goods were obtained from or disposed to must be recorded. Section 6 (1) (b) required the dealer to record the date and time of said acquisition and or disposal of items. The dealer in effect had to keep a stock register of every item purchased and disposed of that could be classified as second-hand goods.

The simplest excuse the scrap metal dealers offered when caught with stolen scrap metal in their possession was that they did not know that it was stolen. The Police had to contend with these types of claims when investigating second-hand goods transactions such as non-ferrous metal theft cases. Section 6 (1) (c) made provision for space in the dealer’s register where the dealer had to note the consideration given to the possibility that the goods might have been stolen. Section 6 (1) (d) required that the dealer provide a full description of the goods, including quantity and colour, to assist with the identification process. Any identification marks had to be noted as well as any distinguishing features. It also specified that the dealer must, in the case of metals, record the form in which these metals were acquired and the form in which said metals were disposed of. The dealer had to assign a number to the acquisition lot and record it in the register according to Section 6 (1) (f).

In instances where the dealer’s records did not reflect the quantity and form of the goods on the premises, dealers tried to defend their position by stating that they were in the process of updating their records. Section 6 (2) however took this into account by requiring the dealer to make an entry into the register at the time such transaction took place. This had the effect that the records had to be up to date at all times and that the police was able to inspect those records at any time.

Section 6(6) clearly stated the intention of the Act. The Act cautioned that should the dealers fail to make an entry into the register in respect of the second-hand goods that were acquired the dealers may have been liable for a penalty relating to the failure to comply with the administrative requirement of the Act. However, more importantly, the dealers were deemed to have knowingly received stolen goods if said goods were found in their possession without being recorded in the register and was proven to be stolen. This section of the Act therefore placed the burden of proof on the dealers, who had to prove that it was not possible for them to have known that the goods were stolen.

Section 6 (7) placed an obligation on the persons trading with the dealer for either acquisition or disposal to provide their full name and address to the dealer.

**3.3.3 Section 7: Acquisition, storage and disposal of goods**

Section 7(a) of the Act had to be read with sections 11 and 13. Section 7 dealt with receiving or delivering second-hand goods outside ordinary business hours, except in
cases of emergency or after notifying the officer in charge at the nearest police station. The main aim of this section was to regulate the movement of second-hand goods. It focused on the premise that stolen property was moved outside of normal business hours to reduce the possibility of being apprehended by the authorities.

Section 7(b) of the Act had to be read with sections 11 and 13. This section stipulated that second-hand goods could only be stored at the location that was declared to the police in the scrap metal dealers’ application for a licence to conduct business. The section prohibited the storage of second-hand goods either permanently or temporarily at any other location. The police officer in charge of regulating and monitoring the scrap metal dealers of that district had to be notified in writing of the new location where the dealer proposed to store any second-hand goods. This section restricted the dealer to a known location from where the business had to be conducted. It also anticipated the possibility that more than one set of registers could have been kept to circumvent close scrutiny by the police.

Section 7 (c) of the Act had to be read with sections 11 and 13 and prevented the scrap metal dealers from performing certain action before a period of seven days expired after acquisition of the goods. These prohibitions included the delivery of any goods acquired to any person or changing the form or altering the appearance thereof. Except in instances where the officer in charge at the nearest police station was notified of the scrap metal dealers’ intentions. The intention of this section was to provide the police with at least seven days to trace stolen goods from the scene of the crime to the second-hand-goods dealer, before the dealer was allowed to dispose of the goods.

3.3.4 Section 8: Smelting of metals and possession of smelting apparatus

Section 8 of the Act (had to be read with sections 11 and 13) stipulated that no dealer shall smelt or melt or cause to be smelted or melted any metal or any article or substance containing metal, or have in their possession any apparatus which can be used for the smelting or melting of metal or any such article or substance. In this section scrap metal dealers were restricted in what they were allowed to do with any metal they might acquire. The Act went to the extent that the dealer was not allowed to possess any apparatus that could have been used to change the appearance of metal. The dealer was also not allowed to have the metal smelted or melted in any way what so ever. This allowed the police to inspect the scrap metal in question in the state in which the dealer acquired it without the form of the metal being changed and its origin obscured.

3.3.5 Section 9: Reports to be furnished by dealers

Section 9 (a) of the Act had to be read with sections 11 and 13. Whenever any second-hand goods were offered to a dealer by persons who refused to furnish their full name
and address or furnish a name and address, which such a dealer had reason to believe was not their correct name or address, such a dealer had to immediately report the circumstances to the nearest police station.

Section 9 (b) of the Act had to be read with sections 11 and 13. Whenever any dealer had reason to believe, whether from information furnished to them by a police official or otherwise, that second-hand goods offered to them were stolen goods, such dealer had to immediately report the circumstances to the nearest police station.

The purpose of Section 9 of the Act was to encourage the second-hand goods dealers to provide information about possible stolen goods to the police and to report the incident ‘immediately’, without delay.

3.3.6 Section 11: Offences and penalties

Section 11 (b) of the Act stated that any person who made any incorrect entry in any register that had to be kept in compliance with this Act shall be guilty of an offence.

Section 11 (c) of the Act provided that persons who knowingly made a false statement in connection with any information or explanation that they were required to furnish in terms of this Act shall be guilty of an offence.

Section 11 (d) of the Act made provision that any persons who obstructed or interfered with police officials in the exercise of their powers or the performance of their functions under this Act or refused or failed to afford to any police official any assistance or facilities lawfully required by them shall be guilty of an offence.

3.3.7 Section 13: Acts or omissions of manager, agent or employee

Section 13, stipulates that any transgression of the Act, whether through action or omission by any manager, agent or employee of the dealer in question, would be considered an action or omission by the dealer in person. The dealer will be liable for prosecution and, even tough the dealer might have issued instructions not to act or omit an action to the transgressing parties, this would not automatically be accepted as sufficient proof that the dealer took all reasonable steps to prevent the action or omission. The manager, agent or employee will be prosecuted in addition to the dealer if there is proof of a transgression in term of this Act. Thereby placing an onus on the dealer to ensure that all transactions entered into by the business are legitimate and that the personnel involved in the business follow the rules and regulations stipulated in the Act.

3.3.8 Summary: Act 23 of 1955

Even though there were several useful sections in Act 23 of 1955, it is extremely difficult to detect the origin of cable once its plastic insulation has been stripped away. The result
of this challenge was that scrap metal merchants caught with stolen cable were frequently charged with a lesser offence of being in possession of ‘suspected’ stolen material and not theft. This offence had a penalty of a maximum of one year of incarceration. The newly operationalised Second-Hand Goods Act of 2009 is more up to date and it is clear that the legislator is trying to provide the police with a proper tool to fight the non-ferrous metal theft scourge.

3.4 CRIMINAL PROCEDURE ACT, 1977 (Act 51 of 1977)

One of the most effective weapons in the arsenal against theft of non-ferrous metals is the Criminal Procedure Act, 1977 (Act 51 of 1977). The Act criminalises several actions and provides for the punishment of most of the crimes that can be committed under South African law. This Act contains the definition of what may be considered a 'premises', which 'includes land, any building or structure, or any vehicle, conveyance, ship, boat or aircraft'. Defining a 'premises' is important because it sets the boundaries within which the non-ferrous metal theft can be perpetrated, and can be directly linked to the ownership of the area or place. In combating non-ferrous metal theft all the parties need to know that this threat has to be addressed from more than one perspective. Detectives and prosecutors will have to learn to use all the legislation available to its best effect, to address this new phenomenon. The reason for non-traditional application of the legislation is simply the fact that legislation takes too long to change. Legislation is always trying to catch up to the criminals, and in the case of non-ferrous metal theft, South Africa cannot afford to wait until better legislation is in place to combat this threat.

To understand the context of the Act one first need to look into the actions that are criminalised in the ‘Schedule’ included in the Act. For the general application of the Act only particular Schedule 1 offences will be looked at.

3.4.1 Schedule 1 (extract)

The following are Schedule 1 offences:

- Malicious injury to property.
- Breaking or entering any premises, whether under the common law or a statutory provision, with intent to commit an offence.
- Theft, whether under the common law or a statutory provision.
- Receiving stolen property knowing it to have been stolen.
- Any conspiracy, incitement or attempt to commit any offence referred to in this Schedule.
3.4.2 Section 20: State may seize certain articles

The first section that is of relevance is Section 20. This section gives the State the authority to seize ‘anything’ which is connected with the commission or suspected commission of an offence or which is intended for such an offence. If Section 20 is interpreted in its widest sense it would seem plausible for the State to seize all the equipment and scrap metal they might find on the premises of a scrap metal dealer if the detectives on reasonable grounds believed that the metal being processed was concerned in the commissioning of an offence. This is a very valuable tool if only the SAPS would begin to use it effectively. It will serve as a strong deterrent for scrap metal dealers not to buy any metal that might be in any way concerned in the commissioning of an offence. This section also broadens the place where the offence might have been committed to outside of South African borders and thus provides the SAPS with an opportunity to address metal theft in countries such as Lesotho and Swaziland, Botswana, Zimbabwe and many more that use the South African harbours and railway system for large-scale exportation of stolen metal.

3.4.3 Section 21: Article to be seized under search warrant

Section 21 supports Section 20 and stipulates the conditions under which an article can be seized ‘under a search warrant’. The investigative officer can apply to a magistrate or justice to issue such a warrant. The Magistrate or Justice of the peace under the provisions of the Justice of the Peace and Commissioner of Oaths Act, 1963 (Act 16 of 1963) will then consider the application and if it ‘appears to such a magistrate or justice from information on oath that there are reasonable grounds for believing that any such article is in the possession or under the control of or upon any person or upon or at any premises within their area of jurisdiction’, the warrant is issued to the police official for the seizure of an article as specified in Section 20. A judge or judicial officer that presides at criminal proceedings follows a similar process. Both the judge and the judicial officer may issue a warrant for a Schedule 20 article ‘if it appears to such judge or judicial officer that any such article in the possession or under the control of any person or upon or at any premises is required in evidence at such proceedings’. This search warrant will require a police official to seize articles mentioned in the document and to search people mentioned in the document. It might provide the police official with more room to manoeuvre if the warrant stipulates that the police official may ‘enter and search any premises identified in the warrant and … search any person found on or at such premises’. There are some restrictions placed on the execution of a search warrant, such as that the warrant must be executed during the day unless otherwise specified by the person issuing the warrant. This is an issue that has to be argued before the officer of the court where the application is made for the warrant to be issued. If a compelling case
can be made that the criminal activity takes place during the night and after working hours the relaxation of this requirement was considered favourably. The police official executing the search warrant will have to provide the person whose rights were affected with a copy of the warrant.

3.4.4 Section 22: Seizure without search warrant

Section 22 makes provision for a police official to ‘search any person or container or premises for the purpose of seizing any article referred to in Section 20’ without a search warrant if the person with authority over the premises consents to such a search or if the official believes, on reasonable grounds, that a search warrant will be issued if applied for and that the delay in obtaining the warrant will defeat the object of the search. This means that in a situation where the police official is aware of the commitment of a non-ferrous metal theft crime, the premises of a scrap metal dealer can be searched with or without a warrant, depending on the circumstances. The most practical application of the search proviso would be in a situation where there was significant easily identifiable cable stolen and all scrap metal dealers’ premises are subjected to searches. This would serve as both a crime prevention and awareness raising campaign; such a process would also remove the possibility that unscrupulous merchants might argue that they did not have prior knowledge that certain goods might have been stolen. This process would have to be followed in the primary district, where the theft took place, as well as all neighbouring police districts to be effective. The premise is that most non-ferrous metal cable thieves would not have the resources to move large consignments of stolen non-ferrous metal very far.

3.4.5 Section 23: Search of arrested person and seizure of article

Section 23 can be used to seize ‘anything’ which is concerned in the commission or suspected commission of an offence or which is intended for such an offence. The fruit of the seizure has to be delivered to a police official ‘forthwith’. The focus should be to obtain as much information from the perpetrator as possible. This would include obtaining information from cellular phones, which is used to facilitate the crime. The perpetrator uses the device to communicate with the other members of the syndicate, or to contact the buyer of the stolen non-ferrous metal. It can also be used to warn other members of the crime syndicate of increased police activity against non-ferrous metal cable theft in a particular area.

3.4.6 Section 26: Entering of premises for purposes of obtaining evidence

Having established that the police official and peace officer may search for and seize anything that might be concerned in committing a crime, it is important to look to the rights of police officials to enter any premises without a warrant as stipulated in Section
26. The police official may legally enter the premises if the police official reasonably suspects that ‘a person who may furnish information with reference to any such offence is on any premises’. The police official may interrogate the person to obtain a statement from the person. The only condition is stipulated in Section 23 and states that the police official must obtain the consent of the occupier of the premises before entering.

3.4.7 Section 27: Resistance against entry or search

While Section 26 stipulates that the consent of the occupier has to be asked for, Section 27 provides the police official with the discretionary power not to adhere to the proviso. In cases where the police official may lawfully enter the premises and the occupier resist the entry, the police official may use such force as is reasonably necessary to overcome the resistance. It is however required that the police official audibly demand entry to premises. Should the police official ‘on reasonable grounds [be] of the opinion that any article which is the subject of the search may be destroyed or disposed of if the provisions of the said [section] are first complied with’ the police officer is not bound by the requirement to audibly demand entry to the premises. This implies that scrap merchants’ premises can be entered and searched at any time, with or without their consent, if the police official, on reasonable grounds, believes that there might be persons or articles relating to a crime on the premises.

3.4.8 Section 37: Powers in respect of prints and bodily appearance of accused

Section 37 is one of the most powerful sections available to the police official with the focus on prevention of non-ferrous metal theft in the future, the reason being that non-ferrous metal theft has reached epidemic proportions and is threatening the security of South Africa. This has escalated to levels that can no longer be considered ‘petty’ crime. Security forces must address this new threat urgently. Combating non-ferrous metal theft is a long-term project and the basis for effective combating is in effective control of the scrap metal industry. Much of the control over the industry will have to be in the form of regulation. However, another deterrent can be developed by identifying the suspects that may be involved in non-ferrous metal theft, this would include trespassers and other categories of suspects. For this purpose Section 37 is very important and provides that any police official may ‘take the finger-prints, palm-prints or foot-prints or may cause any such prints to be taken’ of any person arrested upon any charge. But most important from the mining sector perspective is the following:

Section 37 (1): Any police official may (a) take the finger-prints, palm-prints or foot-prints or may cause any such prints to be taken (v) of any person convicted by a court or deemed under Section 57 (6) to have been convicted in respect of any offence which the Minister has by notice in the Gazette declared to be an offence for the purposes of this subparagraph. Section 57 deals with the admission of guilt and payment of fine without
appearance in court (1) Where (6) An admission of guilt fine paid at a police station or a local authority in terms of subsection 1 and the summons or, as the case may be, the written notice surrendered under subsection 3, shall, as soon as is expedient, be forwarded to the clerk of the magistrate's court which has jurisdiction, and such clerk of the court shall thereafter, as soon as is expedient, enter the essential particulars of such summons or, as the case may be, such written notice and of any summons or written notice surrendered to the clerk of the court under subsection 3, in the criminal record book for admissions of guilt, whereupon the accused concerned shall, subject to the provisions of subsection 7, be deemed to have been convicted and sentenced by the court in respect of the offence in question. This is a very important proviso in the Act, because it would allow police officials to gather identifiable information from all criminals that are suspected of being involved with non-ferrous metal theft, including trespassers on mine property and suspects arrested for small amounts of cable in their possession, the reason being that there is a trend among trespassers apprehended by mine security of carrying an admission of guilt fine in an envelope on their person. Clearly this trend stems from prior knowledge that the police would have them pay an admission of guilt fine and release them without the taking any identification information from the accused. This practice might have been sufficient in the past to lessen the courts’ caseload burden but as the level of threat from non-ferrous metal theft increases this practice has become counter-productive and is used against the police and law enforcement in general to thwart the legal process.

Section 37 should be applied to the full and finger, palm and footprints must be taken for future identification and reference. The police official can make use of the mine’s medical facilities, and thus the mine’s ‘registered medical practitioner or registered nurse’ to ascertain if the ‘body of any person’ arrested has any mark, characteristic or distinguishing feature or shows any condition or appearance that might provide clues for future identification, this process would include the ‘taking of a blood sample’. Blood sampling might seem excessive but in the near future might be very useful in the same way fingerprinting is useful with the individualisation of suspects. The police official can also use the mine security facilities to have the arrested suspect photographed, adding another layer to the identification process. This is especially important with the advent of facial recognition software becoming commercially available. Making it possible to identify the trespassers and suspects based on facial appearance in support of the other identification methods, which would be added to the charge sheet and may lead to more appropriate sentences based on repeated transgression of the law.

Section 37 (4) also provides for a process whereby identification markings can be obtained from a person that was convicted of a crime. It allows that a ‘court which has convicted any person of any offence, or any magistrate, may order that the fingerprints,
palm-prints or footprints, or a photograph, of the person concerned be taken.’ If Section 37 (4) is read with Section 57 that deals with the admission of guilt and payment of fine without appearance in court, a number of key components can be identified. Where an admission of guilt fine was paid at a police station or a local authority in terms of Subsection 1 and the summons or, as the case may be, the written notice surrendered under Subsection 3, shall, as soon as is expedient, be forwarded to the clerk of the magistrate's court which has jurisdiction, and such clerk of the court shall thereafter, as soon as is expedient, enter the essential particulars of such summons or, as the case may be, such written notice and of any summons or written notice surrendered to the clerk of the court under subsection 3, in the criminal record book for admissions of guilt, whereupon the accused concerned shall, subject to the provisions of Subsection 7, be deemed to have been convicted and sentenced by the court in respect of the offence in question. It seems clear that the court may order the police to have finger-, foot-, and palm-prints as well as photographs taken of the person who pays an admission of guilt fine for cases that might relate to non-ferrous metal theft.

Section 57 makes provision for the payment of an admission of guilt fine at a police station. The admission is entered in the ‘criminal record book for admissions of guilt’. An admission of guilt has the effect that the accused is considered ‘convicted and sentenced by the court in respect of the offence in question’. However there is a caveat in Section 37 (5), which makes provision for the destruction of all identification markings taken under this section if the suspects were found not guilty, or their conviction set aside by a superior court. The destruction would also take place if no criminal proceedings were instituted against the person. Nonetheless, observed against the background of the mining industry, this scenario would rarely be encountered. If only the persons who pay admission of guilt fines for trespassing is identified properly the problem might already be addressed in some way. These arrestees would know that there is a drive to identify them and that they would be punished severely when they are caught again. The process in itself would serve as a deterrent in the long run, and would conceivably contribute to the reduction in the pool of vulnerable people that might be recruited into crime. The mine security personnel would be expected to prove that a crime took place they would also carry the burden of ensuring convictions to assist with the crime deterrent process.

3.4.9 Section 40: Arrest by peace officer without warrant

Section 40 provides for arrests by a peace officer without a warrant. A peace officer includes any magistrate, justice, police official, correctional official as defined in Section 1 of the Correctional Services Act, 1959 (Act 8 of 1959) and, in relation to any area, offence, class of offence or power referred to in a notice issued under Section 334 (1), any person who is a peace officer under that section. Peace officers may arrest any
person without a warrant who commits or attempts to commit a crime in their presence or whom they reasonably suspects of having committed an offence referred to in Schedule 1. The peace officer may also effect an arrest if the person is found in possession of anything which the peace officer might reasonably suspects to be stolen property or suspect that the property was dishonestly obtained. Another valuable subsection of the of the act is that the peace officer may arrest, without a warrant, any person ‘who is found at any place by night in circumstances, which afford reasonable grounds for believing that such person has committed or is about to commit an offence’.

The mine can use this section when working in collaboration with the SAPS in combined operations to combat non-ferrous metal theft. The investigators on the mine may even apply to become peace officers under Section 334 (1).

3.4.10 Section 41: Name and address and power of arrest without warrant

Section 41 is a section that might become important in the identification process where the legal obligation is placed on the person that stands to be arrested (legally) to provide the peace officers with their ‘full name and address’. If the person fails to provide the correct details or fails to co-operate the penalty would be R 300 or imprisonment not exceeding three months. This is useful as an additional charge for the mine security personnel, as it is well known that trespassers either do not carry identification papers or intentionally provides false information to the police, mine security and the courts in an attempt to defeat the course of justice. These perpetrators have realised that the Police is unable to determine if the information they provide is correct. Subsequently they would provide information that is incorrect in an effort to prevent the Police from linking more convictions to them.

3.4.11 Section 42: Arrest by private person without warrant

Private persons can also affect arrests without a warrant according to Section 42. This scenario would take place if the private persons witness any person committing or attempting to commit a crime or whom they may reasonably suspects of having committed an offence referred to in Schedule 1 in their presence. The private person legally entitled to ‘pursue that person, and any other private person to whom the purpose of the pursuit has been made known, may join and assist therein’ to affect the arrest. This right is extended to the ‘owner, lawful occupier or person in charge of property on or in respect of which any person is found committing any offence, and any person authorized thereto by such owner, occupier or person in charge’ which may, without warrant, arrest the person so found on the premises in the process of committing a crime. Under this section the mine may use security personnel to arrest people that are not authorised to be on the premises of the mine.
3.4.12 Simple procedure

The steps are simple if there is any suspicion that the person that stand to be arrested has committed or is in the process of committing a non-ferrous metal theft related crime:

- **Step 1:** If the person does not have authorisation to be on the premises or in the area on the premises where the person was confronted, arrest the person for trespassing.
- **Step 2:** Search the area where the person was arrested for damage to property, housebreaking equipment, as well as non-ferrous metal theft related equipment and non-ferrous metal on their person or in their proximity.
- **Step 3:** Hand the person over to the SAPS.
- **Step 4:** Take as many identification markings as possible.
- **Step 5:** Present the evidence in court including the context wherein non-ferrous metal theft is a life-threatening crime.
- **Step 6:** Secure a conviction by ensuring that the court where the case is presented has knowledge about the graveness of the crime and the threat it poses in general.

3.4.13 Section 48: Breaking open premises for purpose of arrest

Section 48 can be used effectively in cases where a member of the mine security has knowledge of a non-ferrous metal theft and states that ‘[any] person who may lawfully arrest another in respect of any offence and who knows or reasonably suspects such other person to be on any premises, may, if he first audibly demands entry into such premises and notifies the purpose for which he seeks entry and fails to gain entry, break open, enter and search such premises for the purpose of effecting the arrest’. Thus the law makes provision for mine security to pursue the criminals and apprehend them as soon as the crime was detected. The mine security does not have to wait for the police to start the investigation or the pursuit. It would however be prudent to have the police on the scene before the pursuit or forced entry into the premises takes place.

3.4.14 Section 57: Admission of guilt and payment of fine

To lessen the burden of cases to the court, Section 57 provides for an opportunity to make an admission of guilt and pay a fine. The ‘public prosecutor or the clerk of the court concerned’ can endorse the summons to the effect that the fine can be paid before a court appearance is required. An admission of guilt can also be made to a peace officer, before the accused appear in court.

Section 6 state that an admission of guilt fine paid at a police station or a local authority in terms of Subsection 1 and the summons or, as the case may be, the written notice
surrendered under Subsection 3, shall, as soon as is expedient, be forwarded to the clerk of the magistrate's court which has jurisdiction, and such clerk of the court shall thereafter, as soon as is expedient, enter the essential particulars of such summons or, as the case may be, such written notice and of any summons or written notice surrendered to the clerk of the court under Subsection 3, in the criminal record book for admissions of guilt, whereupon the accused concerned shall, subject to the provisions of Subsection 7, be deemed to have been convicted and sentenced by the court in respect of the offence in question.

Section 7 however makes it clear that the judicial officer presiding at the court in question shall examine the documents and if it appears to him that a conviction or sentence under Subsection 6 is not in accordance with justice or that any such sentence, except as provided in Subsection 4, is not in accordance with a determination made by the magistrate under Subsection 5 or, where the determination under that subsection has not been made by the magistrate, that the sentence is not adequate, such judicial officer may set aside the conviction and sentence and direct that the accused be prosecuted in the ordinary course, whereupon the accused may be summoned to answer such charge as the public prosecutor may deem fit to prefer: Provided that where the admission of guilt fine which has been paid exceeds the amount determined by the magistrate under Subsection 5, the said judicial officer may, in lieu of setting aside the conviction and sentence in question, direct that the amount by which the said admission of guilt fine exceeds the said determination be refunded to the accused concerned. By implication a magistrate can make a declaration in such an instance that no admission of guilt fines can be issued by any person in any case that concerns non-ferrous metal theft. If such an instruction is given nationally many of the ‘runners’ or first tier opportunistic non-ferrous metal scavengers may be tried and convicted without the opportunity to use the legislative process to frustrate prosecution and conviction.

3.4.15 Section 211: Evidence during criminal proceedings of previous convictions

When prosecuting offenders the prosecution has to be very careful to remember that Section 211 excludes all previous convictions from the current case. Unless the previous conviction is an element of any offence with which an accused is charged. This rule is however relaxed by Section 241 when the accused is charged with receiving stolen property, which they knew to be stolen property. Evidence can be given at any stage of the proceedings regarding a conviction on an offence involving fraud or dishonesty. The caveat is that the previous convictions need to be within the five-year period immediately preceding the current proceedings. This evidence may be taken into consideration to prove that the accused knew that the property found in their possession was stolen.
property. The only proviso is that the accused is given notice in writing of the states intention to adduce the previous conviction, not less than three days before the introduction of the evidence in court. For the mining industry and all other industries in the war against non-ferrous metal theft this is crucial information about the statutory process. This section provides that if the initial case could be proven subsequent prosecution would be much simpler. Thus both the complainant and the State have to accept the responsibility of making absolutely sure that all avenues are exhausted in an effort to prosecute non-ferrous metal thieves and the businesses unscrupulously buying non-ferrous metal from dubious sources. Even in cases where the scrap metal merchant is convicted and receives a relatively small fine or a suspended sentence, it might lead to a more substantial sentence the next time the merchant commits a crime. This would include cases where the merchant is given the option of paying an admission of guilt fine.

3.4.16 Sections 264 and 265 respectively: Theft and the receipt of stolen property

These two sections provide more room for conviction if the evidence does not prove either of the two charges specifically. If the evidence proves the alternative charge the accused can be convicted on the alternative charge based on the evidence presented to the court.

3.4.17 Section 271: Previous convictions may be proved

Section 271 deals with accused that were previous convicted. It provides the prosecution with the opportunity to introduce to the court records of previous convictions. This opportunity affords itself after the accused has been convicted but before sentencing. The accused may deny the previous convictions but if the judicial and investigative processes were followed properly the previous convictions are undeniable based on photographic, fingerprint, footprint, and palm print evidence. The court, when imposing sentence for the ‘offence of which the accused has been convicted’, will consider this evidence accordingly. Being able to prove that a trespasser or a person previously convicted of a non-ferrous metal related crime, even if it was only malicious damage to property during a failed attempt to steal copper cable, becomes crucial in future crime prevention, detection and finally sentencing. The previous convictions would allow the presiding officer to hand down a more severe sentence. The severity of the sentence would serve as a deterrent to occasional non-ferrous metal thieves that do not want to be incarcerated.

3.4.18 Section 274: Evidence on sentence

The prosecution has to be informed as to the extent of the consequence of non-ferrous metal theft by the victim in the case. For the mining industry it would mean spending
valuable resources in the form of detectives on monitoring the progress of the case through court and ensuring that these cases are not regarded as ‘petty’ which would result in the prosecutor or the judicial officer giving the accused the choice of paying an admission of guilt fine as opposed to going through the court process. The continuous monitoring of the case’s progress would also enable the victim to provide the prosecution with the necessary evidence it can present to the court before the court passes sentence. This opportunity must be used in order to inform the court of the gravity of the crime and the bigger context surrounding the crime. It has to be remembered that in all likelihood the accused was found in possession of a small amount of copper or other non-ferrous metals. The court can only take what is in front of it into consideration when sentencing is considered (A001, 2006). Thus if no evidence is presented regarding the gravity of the crime, the court cannot use it to determine what a proper sentence would be.

3.4.19 Section 286: Declaration of certain persons as habitual criminals

Recordkeeping and identification of persons convicted in non-ferrous metal theft related cases are a key component in the battle against this type of crime. The victims of non-ferrous metal theft have to contend with subsistence pilferers and scavengers who target any object that they might be able to sell to unscrupulous scrap metal merchants. The very nature of this type of crime makes it extremely difficult to protect all the components of the victims’ widespread infrastructure. In addition to this challenge, in the case of the mines and other operations that need electrical power, some components of the supply grid may be in areas that are not actively monitored. Some of the infrastructures that must be protected, for the mine to continue operating, do not even belong to the mine. This creates a challenge in itself; the mine must secure infrastructure, which does not belong to it, on land that belongs to another party, in order to continue functioning and ensure the safety of its workforce.

Thus all perpetrators have to be properly identified and screened against the database of previous offenders. This would enable the victim to assist the prosecution in declaring a person a habitual criminal in line with Section 286. All things considered, this might be one of the few truly significant threats in the legislation against non-ferrous metal pilferers. These small time criminals know that the crimes they were arrested for are not serious. They expect to receive a fine for trespassing and nothing more. When the police arrest them a non-commissioned officer would offered them the opportunity to pay an admission of guilt fine, they would not even have to appear in court. In most instances the court’s time is taken up by cases more important than hearing an R 50 non-ferrous metal theft case. These criminals also depend on the police to assist them by taking the easiest option of offering them an admission of guilt fine, which in turn means that the detectives can focus on the serious cases piled on their desks and not waste valuable
time and resources on a petty crime. To compound the situation the prosecutors can offer admission of guilt fines, or may even consider withdrawing the case from prosecution, based on the low value and perceived inconsequentiality of non-ferrous metal theft in general. All these perceptions contribute to an environment where metal scavengers can pilfer and raid functioning infrastructure without significant threat of punishment.

3.5 CRIMINAL PROCEDURE SECOND AMENDMENT ACT, 1996 (Act 85 of 1996)

The Criminal Procedure Second Amendment Act, 1996 (Act 85 of 1996), which inserts Section 252 A into the Criminal Procedure Act, 1977 (Act 51 of 1977), deals with the ‘[a]uthority to make use of traps and undercover operations and admissibility of evidence so obtained’. This is a very important weapon in the fight against non-ferrous metal theft. If this section is properly used within the boundaries set by the Attorney General and the Court it can be very effective in combating of non-ferrous metal pilfering. Investigating officers and security personnel protecting the assets of the mine should study the extent of the section and plan operations to identify and capture second and third level syndicate members by means of Section 252 A.

3.5.1 Provisions of Section 252 A. (1)

Section 252 A. (1) makes provision for: ‘Any law enforcement officer, official of the State or any other person authorised thereto for such purpose may make use of a trap or engage in an undercover operation in order to detect, investigate or uncover the commission of an offence, or to prevent the commission of any offence, and the evidence so obtained shall be admissible if that conduct does not go beyond providing an opportunity to commit an offence: Provided that where the conduct goes beyond providing an opportunity to commit an offence a court may admit evidence so obtained subject to subsection 3.’

The nature of the non-ferrous metal theft business has to be examined if insight is to be gained in the mechanics of the business. At the bottom of the organised crime pyramid one would find the subsistence and opportunistic criminals. These people in some cases do not even know that they form part of a criminal chain or that their actions endanger the lives of thousands. Above them the organised crime levels begin to form more clearly, here you will find people who know what they are doing is illegal and they also know that they form part of the criminal economy, buying and selling to scrap metal merchants as unscrupulous as themselves. On this level of the illegal trade pyramid and the levels above, the perpetrators are deliberately endeavouring to change the appearance of the stolen goods to disguise it from superficial scrutiny. At this point the unscrupulous scrap pirate may integrate the stolen metal with legitimate consignments and deliver it to legitimate scrap metal dealers who are not part of the criminal economy.
In this way the illegal scrap is ‘laundered’ back into the legal economy and the scrap metal pirate gets quick return on their initial investment. There is also less opportunity of being caught with stolen property in your possession. The down side to this arrangement is that the scrap pirate does not get a significant return on investment because the transactions will out of necessity have to be relatively small and inconspicuous in order not to arouse suspicion.

In this context Section 252 A provides the opportunity to conduct undercover operations and to set traps for the criminal syndicates. The victims of non-ferrous metal theft can mark for example, copper cable and place it in areas where they know it might be stolen. The advantage in the mining scenario is that this ‘trap’ can be set on property belonging to the mine and effective control can be maintained over the goods. The procedures of moving goods are also in place, for example cable cannot be moved from a cable yard without a waybill (authorisation document), thus if a person is found with the cable in their possession they cannot claim that it was picked up from the side of the road; to be in possession of the cable implies that the possessor or an agent had to have trespassed and gained access to the cable yard with or without the cooperation of an internal accomplice. These measures will assist in the process to establish prior knowledge of and intent to commit a crime. The police and the victim from the mining industry in particular will have to work together during the application to the attorney general for permission to launch an undercover operation. The task team has to consider the questions the court will ask when the case goes to trial. The court has to determine if ‘the conduct goes beyond providing an opportunity to commit an offence’. To make such a determination the court will consider several aspects. The first aspect would be if the detective obtained authorisation for the operation from the Attorney General beforehand and if the guidelines stipulated by the Attorney General were adhered to. The court will consider the nature of the offence under investigation to determine if the persons committing the offence seriously threatened the safety of the general public, which in the case of non-ferrous metal theft would include the lives of mine workers and the national economy. In addition to this the prevalence of the crime in the area as well as the seriousness of the offence is considered. Once again the police and the victims will have to ensure that the supporting documentation is in place for the court to make an informed determination. The documentation has to impress on the Court the seriousness of the offence. In general the undercover operation has to be designed to be fair to the person it intends to trap. The operation should not induce the target to commit a crime that they would normally not be inclined to commit.
3.6 FENCING ACT, 1963 (Act 31 of 1963)

This is a very old Act dating from 1963 and is based on knowledge and experience as well as the financial situation of that era. The dynamics of the economy has changed significantly since the promulgation of this legislation and the Act did not keep up with the changing conditions. However, for the purposes of protecting the mines security perimeter this is one of the Acts that is most often applied.

It is difficult to prove that a person is guilty of this type of offence, however, if said person is not caught in the act of cutting through the fence. The Fencing Act of 1963 defines a boundary fence as ‘any fence (including, in an area in respect of which a proclamation under Section 3 is in force, a jackal-proof fence), together with any necessary gate or any contrivance forming part or serving the purpose of such a gate, erected on or as near as possible to the boundary of any holding and separating such holding from any other holding’. The Fencing Act criminalises several actions such as ‘leaving gates open’ (Section 22); ‘Climbing or crawling over or through fences without permission’ (Section 23); ‘Wilful damaging or removal of fences’ (Section 24); ‘Unintentional damaging of fencing’ (Section 26); and ‘Failure to give name after damaging fence’ (Section 27). The problem with this Act is that it failed to keep pace with the costs of repairing fences and the reasons why fences are damaged. Since the inception of the Act the price of scrap metal has increased dramatically and the trend is currently to remove fencing posts from boundary fences and to sell it to scrap metal dealers. If the penalties of the Act is analysed it is clear that it does not provide any significant deterrent to the prospective criminal.

The most effective section of this Act is Section 27. This section places the lawful obligation on persons who climbed over or crawled through any fence or gate without permission, to provide their correct names and addresses to the ‘owner or lessee of the land on which such fence or gate is situated or [to] some person authorized thereto by such owner or lessee’ to request such information. Section 27 can be used to assist the mine security personnel with the process of identification of suspected offenders that they find in the ‘buffer zone’. It is an important component of the Act because in most cases people found on the mines property give the excuse that they did not realise that it was mine property that they were trespassing on. They are then escorted out of the security area. The usefulness of the legislation does not lie within the penalties, but in the application of the obligation to provide personal information to the owner, lessee or their authorised agent. Thus providing the mine, which is a non-state entity, the opportunity to gather identifiable information from unauthorised people found on the premises of the mine. There is also no obligation to place warning signs on the fence to inform people not to enter the area.
### Table 3.1 Provisions of the Fencing Act

<table>
<thead>
<tr>
<th>Sections from the Fencing Act (Act 31 of 1963)</th>
<th>Offence (Act)</th>
<th>Fines and punishment</th>
<th>Punishment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section 22</td>
<td>Leaving gates open</td>
<td>Fine not exceeding fifty rand or in default of payment</td>
<td>Imprisonment for a period not exceeding three months</td>
</tr>
<tr>
<td>Section 23</td>
<td>Climbing or crawling over or through fences without permission</td>
<td>Fine not exceeding fifty rand or, in default of payment</td>
<td>Imprisonment for a period not exceeding three months</td>
</tr>
<tr>
<td>Section 24</td>
<td>Wilful damaging or removal of fences [or gates]</td>
<td>Fine not exceeding one hundred and fifty rand or, in default of payment</td>
<td>Imprisonment for a period not exceeding six months</td>
</tr>
<tr>
<td>Section 26</td>
<td>Unintentional damaging of fencing</td>
<td>Fine not exceeding fifty rand or, in default of payment</td>
<td>Imprisonment for a period not exceeding three months</td>
</tr>
<tr>
<td>Section 27</td>
<td>Failure to give name after damaging fence</td>
<td>Fine not exceeding fifty rand or, in default of payment</td>
<td>Imprisonment for a period not exceeding three months</td>
</tr>
</tbody>
</table>

### 3.7 PREVENTION OF ORGANISED CRIME ACT, 1998 (Act 121 of 1998)

The purpose of the Prevention of Organised Crime Act, 1998 (Act 121 of 1998), hereafter referred to as the POC Act, as amended by the Prevention of Organised Crime Amendment Act, 1999 (Act 24 of 1999), is to prevent criminals from profiting from their criminal activity, even after the crime has been punished. The Act also places an obligation on people to report specific information under certain circumstances and regarding matters addressed by this Act. Thus it would serve as a measure to prevent or
deter crime as well as a vehicle through which there is a way of recovering some of the losses the victims sustained.

The POC Act describes a person who benefited or profited from a crime as a person who has at any time, before or after the commencement of the POC Act, received any payment or other reward in connection with any criminal activity carried out by him/her or any other person. Any person, who, in accordance with the POC Act, purchases goods that might reasonably be considered to be stolen property, can be liable for prosecution. This has the consequence that the scrap metal dealers suspected of dealing in illegal non-ferrous metal, in this instance, would have to prove that they did not knowingly commit a crime and that they did not derive any profit from the purchase and resale of the stolen metal. If they fail to do so all the assets that might have accrued due to the illicit proceeds, that the defendant have effective control over at any time in connection with the criminal activity by him/her or another person, shall be regarded as proceeds of crime. This also implies that the owner and/or general manager of a scrap metal dealership is held accountable for criminal activity conducted by staff and site managers working for them. These people will lose the benefits obtained through the criminal activity – at least as much as can be proven in court.

For the Act to come into effect the public prosecutor must ask the court convicting the defendant, to enquire into the possible benefit the defendant might have derived from the criminal act or any other criminal act related to the activity which they were convicted of. The court may then issue an order against the defendant to pay the State an appropriate amount subject to conditions. To add to the effectiveness of the POC Act is the presumptions relating to the proceeds of crime. Article 22 (1) makes provision for the court to presume that property belonging to the defendant acquired within seven years of the date of committing the crime in question, for which the defendant had no income sufficient to acquire such property, was derived from the offence. The State may then lay claim to such property.

In the case of a scrap metal dealer the prosecutor may apply to a Superior Court to issue a restraint order against the property of the defendant. The Superior Court will have to consider the facts and be satisfied that there is a case against the defendant and that there are reasonable grounds for believing that a confiscation order may be made against the defendant. The court will attach a reasonable timeframe to the restraint order. The Proceeds of Crime Act do not attempt to prohibit scrap metal dealers or retailers from acquiring stolen metal. The POC Act does place a responsibility on the dealers to provide the SAPS with timeous information about possible stolen property. Should scrap metal merchants not report the acquisition or location of possible stolen material to the Police
while they knew or had reasonable grounds to believe that the property is the result of or forms part of a crime shall be guilty of an offence.

### 3.7.1 Money Laundering

In the course of the investigation relating to non-ferrous metal theft the State would be required to prove certain elements of the crime. These elements are contained in Chapter 3, Section 4 of the Act, which states that the State will have to prove that the defendant:

- Entered into an agreement, arrangement or transaction, of any type, in connection with the property, and that the defendant performed an act, of any kind, related to the property which had the effect of concealing or disguising the:
  - Nature of the property.
  - Source of the property.
  - Location of the property.
  - Disposition of the property.
  - The movement of the property.
  - The ownership of the property.
  - Any interest they might have in the property.

- Of enabling or assisting any person who has committed or commits an offence, whether in the Republic or elsewhere to:
  - Avoid prosecution, or
  - Remove or diminish any property acquired directly or indirectly as a result of the commission of an offence.

The POC Act also places a responsibility on a person not to enter into any arrangement with a person who they, on reasonable grounds, suspect of obtaining stolen property. This compels the metal merchant not to buy any metal from a person who might have committed a crime in relation to the product. The merchants commit an offence if they facilitate a process whereby the suspect retain control over the product or makes funds available to the other person, or acquire property on their behalf, or benefit them in any other way. In the case of scrap metal merchants the POC Act places an obligation on the merchant to report any and all suspicions regarding the proceeds of crime.

The POC Act states that persons who carries on a business or is in charge of a business undertaking who has reason to suspect that any property which comes into their possession or the possession of the said business undertaking forms the proceeds of crime, shall be obliged to report their suspicion and the grounds on which it rests, within a reasonable time to a person designated by the Minister and shall take all reasonable
steps to discharge such obligation. Provided that nothing in this section shall be construed so as to infringe upon the common law right to professional privilege between an attorney and their client in respect of information communicated to the attorney so as to enable them to provide advice, to defend or to render other legal assistance to the client. This applies to any offence under any law, of which they are charged, in respect of which they were arrested or summoned to appear in court or in respect of which an investigation with a view to instituting criminal proceedings is being conducted against them. If the scrap metal merchants or their personnel fail this obligation they are guilty of an offence. The POC Act makes provision that all obligations relating to secrecy and ‘other restriction on the disclosure of information, whether imposed by any law, the common law or any agreement, shall affect any obligation imposed’ effectively only excluding attorney client privilege. This means that the defaulter has the obligation to disclose information about the illegal transaction and any related information.

3.8 SECOND-HAND GOODS ACT, 2009 (Act 6 of 2009)

Although the Second-Hand Goods Act, 2009 (Act 6 of 2009) was published in the Government Gazette (Republic of South Africa, 2009) and should have come into effect on 1 April 2009, there has been a delay in operationalising the Act. It finally came into full operation on 30 April 2012. Until then the SAPS website offered the document with a red notice across each page stating that the Act was ‘NOT YET IN OPERATION. SEE ACT 23 OF 1955’ (South African Police Service, 2011). When the Act was promulgated, the following Acts were repealed either completely or in part: the Second-Hand Goods Act, 1955 (Act 23 of 1955); the General Law Amendment Act, 1956 (Act 50 of 1956); the General Law Amendment Act, 1957 (Act 68 of 1957); the Second-Hand Goods Amendment Act, 1978 (Act 18 of 1978); and the Abolition of Restrictions on the Jurisdictions of Courts Act, 1996 (Act 88 of 1996).

This Act has undergone two extensive consultative processes, the first in 2003 and the second in 2005. The South African Police Service was driving and coordinating the process, as described by General Philip Jacobs (Jacobs, 2008). The General explained that the new Act would provide a much more structured environment, which would increase the effectiveness of the regulatory process. The consultative process allowed interested and affected parties and industries to contribute to the decision-making process as is illustrated by the presentation of Mr Cross the Chairperson of the Copper Development Association of Africa to the Parliamentary Portfolio Committee chaired by Ms M Sotyu during the public hearings on the Second-Hand Goods Bill [B 2-2008] (Cross, 2008). This consultative process had the effect that most parties had an opportunity to contribute to the development of the legislation and that some of the implementing issues could be addressed during the development phase.
3.9 REGULATION/LAW AND COST

The question however has to be asked: Would a better regulatory environment stem the spate of thefts? If, as contemplated by Peter Honey (2007), ‘tackling the crime itself rather than its sources may be futile’; legislation and regulation might not be the final answer to the problem. One of the factors contributing to the escalation of non-ferrous metal theft incidents may be attributed to the indifference of some of the victims of non-ferrous metal theft. For example, according to Honey (2007) if the total turnover for a company such as City Power is compared to total losses due to cable theft the losses are negligible.

In 2006 City Power experienced 1 400 incidents of theft and vandalism in the Johannesburg area. The replacement and repair costs amounted to R4,8 million, which is a significant amount if considered in isolation however the turnover for City Power was R3,8 billion, leaving the company with losses due to theft and vandalism of less than 1,25% and thus effectively reducing the urgency with which cable theft is addressed.

This perception is changing, however, as business start to realise that calculating the primary losses due to non-ferrous metal theft suffered by the affected companies does not quantify all the losses suffered. If South Africa were unable to guarantee an environment safe and conducive to business, which includes reliable power supply, international investors would think twice before investing in the country. This cost to South Africa in general, the mining industry as well as the power supply industry, is one of the incalculable effects of non-ferrous metal theft that has an immediate and continuous effect on the whole country as well as its citizens.

The purpose of the Second-Hand Goods Act of 2009 is to enhance the regulatory process relating to dealers in second-hand goods and pawnbrokers. The Act focuses on the limitation of trade in stolen goods and is an attempt to promote ethical standards in the second-hand goods trade. BAC’s Lorinda Nel (2008) stated that BAC acted as a conduit between the business sector and the SAPS. Nel recognised that there was an ever-increasing demand for second-hand goods in South Africa and was of the opinion that the most effective way of reducing crime lay in the removal of the market for stolen goods. The BAC’s analysis indicated that the market for stolen non-ferrous metals continued to be rooted predominantly within the local recycling industry. This industry is large and had an estimated turnover in excess of R 15 billion annually. It was stated that there was an urgent need for the relationship between the SAPS and the whole second-hand goods industry to be strengthened to address non-ferrous metal theft issues. Act 6 of 2009 would have significant impact on the way the scrap metal merchants are expected to conduct their business. The Act introduced restrictions and regulatory processes that
have to be complied with before a licence can be issued to scrap metal dealers and recyclers to conduct their business.

First, Act 6 of 2009 institutes an obligation on every person who wants to conduct business as a scrap metal dealer to register with the SAPS. It makes provision to ensure that there is a ‘natural person’ who can be held accountable if a business is registered as a dealer. If a person conducts business as a scrap metal dealer and neglects to register with the SAPS, that person ‘is guilty of an offence and liable on conviction to a fine or to imprisonment for a period not exceeding ten years or to both a fine and such imprisonment’. This confirms the commitment the legislature has toward the self-regulation of this industry in general. Registration entails the disclosure of full names, residential address, identity number, and the name under which business is conducted, street address of the all the business premises, which is used for conducting the business, as well as postal addresses for the business. If a business entity applies for registration all the partners’ information has to be disclosed in the application.

The application to conduct business as a dealer has to be made to the National Police Commissioner of the SAPS. All the premises from which the applicant will conduct business including those that the scrap metal dealer intends to use to store goods must be named and applied for or the applicant would be guilty of an offence. If the dealer fails to meet the terms required for an application, the Commissioner will not grant the registration and the applicant is informed of the fact. This is especially important in the scrap metal recycling industry where goods take up large amounts of storage space and dealers tend to make use of additional premises as storage yards while the actual recycling takes place in another area. This obligation to disclose all premises linked to the business will assist the Police with the regulation of the industry. This regulation will contribute to the process of preventing unscrupulous dealers from using alternative premises to conduct illegal business from.

When a dealer is registered, the Commissioner will issue a certificate for each premise contained in the application. The certificate will specify ‘the classes of goods’ that may be handled on the premises by the registered dealer. The certificate is valid for a period of five years from the date of issued. The registration can be cancelled if the dealer fails to comply with the restrictions imposed on the registration or stops conducting business as a scrap metal dealer. The Act (Act 6 of 2009) will attempt to reduce the manner in which unscrupulous dealers register their businesses, and forms part of a resolute effort to make it easier for the police to regulate scrap metal dealers. The Act disqualifies any person from acquiring a dealer’s licence if that person was sentenced in or outside of the Republic of South Africa to imprisonment without the option of a fine for a period of three years prior to the application. In instances where the applicant was convicted of an
offence in terms of this or the previous Second-Hand Goods Act that period of exclusion increases to ten years prior to the application being made if another conviction according to the same Act resulted in a fine exceeding R 200. More disqualification standards are cases where the applicant is an unrehabilitated insolvent or is under 18 years of age or is disqualified by any other legislation from carrying on a business. Applicants who are not permanently resident in the Republic of South Africa are also disqualified from obtaining a dealers’ licence.

The Act was compiled in such a way that it took the modus operandi of criminals into account. For instances; in some cases where one person was convicted of a crime in relation to this Act, another member of the business would apply for registration and the business would continue as if nothing changed, the convicted partner would also remain in the business structure. The Act disqualifies these convicts on every level from being involved in the registered business. This disqualification includes any person with an interest in the company, close corporation or trust; who is a partner in a partnership; and even people that are beneficiaries under a trust, a company, corporation or a partnership. In compliance with the Act certificates to conduct business, as issued by the General of the SAPS or the General’s delegate, have to be displayed prominently in public view and be protected in such a way that it remains legible and undamaged throughout the five-year period of validity.

The Act makes provision for a degree of self-regulation within the second-hand goods industry and there is a particular focus on the scrap metal dealers and recycling industry (Jacobs, 2008). Both the SAPS and the scrap metal recycling industry recognise the fact that the SAPS do not have the manpower to effectively monitor and regulate the second-hand goods market. The parties agreed that it would be prudent and beneficial for them to work together to regulate the industry with the aim to curb non-ferrous metal theft without limiting the scope of the metal recycling industry with cumbersome legislation and rules.

Thus it became essential to introduce a form of self-regulation into the legislation. This requirement was addressed with the legal constitution of metal recycling associations that all the scrap metal recycling industry members must be associated and registered with. These metal recycling associations would form an extension of the police’s regulatory enforcement capacity, and would perform the monitoring and overseeing functions that would normally have been the responsibility of the police. The delegation of power however does not imply that the police lose any inspection and oversight rights and duties required from them or granted to them by this or any other Act. The police must still conduct inspections and demand to see registers even if the dealer to be inspected is a member of an accredited association. The purpose of self-regulation is to
reduce the administrative burden of the SAPS by ensuring that proper registers are kept and that all the associations’ members comply correctly with the letter of the law. The National Police Commissioner must accredit dealers’ associations. These associations must differentiate between the classes of its members and have minimum standards in place on both legal and ethical principles. The associations must have the capacity to inspect its members’ business premises and make recommendations to the Commissioner in support of registration applications by each dealer. The association must be able to assist members with research and development regarding matters of interest in addition to making recommendations to the Commissioner on ‘industry standards and technological developments in the industry, which may affect the application of this Act’ (Section 16 (f)).

Recordkeeping is an integral component of Act 6 of 2009. Registered dealers must keep a register in which the particulars of every acquisition or disposal are recorded. The minimum particulars in respect of the identity of the person, from whom the goods were acquired, include the person’s full names, contact address and contact telephone number, the person’s identity number and the manner in which the person’s identity was verified. Furthermore information relating to the goods and the transaction has to be recorded including a description of the goods and markings on the items, the purchase price, the number assigned to the goods by the dealer, the particulars of the person who conducted the transaction for the dealer. The purchase and disposal dates as well as the manner of disposal have to be recorded. Persons who ‘purchase goods from the dealer or sell goods to the dealer must provide the dealer with their full names, physical addresses and original identity documents or passports as proof of their identity’ (Section 21 (4)). The dealer must obtain and keep this copy with the registers for at least five years (Section 21 (6)).

The Second-Hand Goods Act of 2009 has been the subject of much debate in Parliament. Mr N Mack (Mack, 2008) from the African National Congress in the Western Cape commented during the Parliamentary Portfolio Committee meeting on Security and Constitutional Affairs that there were three scrap yards operating in Beaufort West and that the local youth go there to sell copper and other household appliances, without having to show identification. Mack was concerned that the SAPS were not affecting enough control over the scrap metal dealers in Beaufort West. This situation is the convergence of the lack of regulation and the lack of control exerted by the SAPS. The dealer that required identification is ignored and those dealers who do not ask for identification are frequented. Mack also mentioned that the theft of municipal property such as drain lids and water taps should be addressed in particular as this had a major financial impact on municipalities that are responsible for the maintenance and upkeep of national infrastructure.
In reply to Mr Mack’s comment Ms M Sotyu (Sotyu, 2008), chairperson of the Portfolio Committee on Safety and Security, highlighted the fact that certain municipalities did make written submissions to the Portfolio Committee and that there needed to be a drive to eliminate this market for municipal assets by stopping businesses from buying these lids and taps. The custodian of the Second-Hand Goods Act (Act 6 of 2009), Brigadier Van der Walt (Van Der Walt, Second-Hands Goods Amendment Bill: briefing, 2008) replied that scrap yards currently conducted their business without a great deal of interference from the State. The intention of the Act (Act 6 of 2009) is to ensure that tighter controls were put in place to regulate scrap yards but not to place undue administrative burden on the police or the industry. Another member of the Portfolio Committee, Mr D van der Merwe (Van Der Merwe, 2008) of the Democratic Alliance in the Northern Cape asked if the effectiveness of the dealer registers and the accredited associations registers would focus on preventing corruption. The concern was raised about the auditing of the registers and an enquiry was made to determine how many times the registers would be checked for accuracy per year. Brigadier van der Walt (Second-Hands Goods Amendment Bill: briefing, 2008) replied that Section 28 (4) (a) makes provision for an ‘annual inspection’ by the police and Section 28 (1) entrenches the right of a police official to ‘enter the premises of any registered dealer’, ‘during times when business activity in respect of second-hand goods is taking place’, ‘to investigate compliance with this Act’. Transactions have to be recorded immediately and electronic registers must be printed daily to prevent unrecoverable data loss.

In addition to proper recordkeeping systems Act 6 of 2009 compels the dealer to be vigilant about the possibility that goods might have been stolen. It warns the dealer to be cautious when goods are accepted, particularly where an attempt was made to disguise the nature of the item. The dealers are required by law to inform the police station duty officer of their suspicion and the police must furnish the dealer with a reference number of the incident. Monitoring of dealers and the implementation of the Act is made easier by the inclusion of a seven-day period during which time the goods may not be resold or the appearance changed in any way. The most common way of changing the appearance of copper cable is by burning the outer, marked, plastic sleeve of on an open fire.

One of the Portfolio Committee members raised the question if there was any other way in which the identity of copper cable could be destroyed apart from burning. Ms D Kohler-Barnard (Kohler-Barnard, 2008) from the Democratic Alliance said that the drafters of the legislation should make sure that there are no other loopholes for criminals to exploit. Mr Cross (Cross, 2008) responded that were other methods of destroying the identity of copper cable such as smelting or granulating but that burning of copper cable was singled out because it was very easy and cheap to accomplish.
The Second-Hand Goods Act of 2009 does not make any distinction between methods used to change the appearance of any category of second-hand goods but does prohibit changing its appearance for at least seven days after acquisition. The Act makes provision for certain metals to be declared controlled metal. This group of metals currently include: copper, aluminium, zinc, chrome, lead, white metal, nickel, tungsten, tin, ferrovanadium, ferrosilicon, ferrochrome, brass, bronze and precious metals as defined in the Precious Metals Act, 2005 (Act 27 of 2005), or any article consisting wholly or principally of any of those metals.

Every dealer who also recycles controlled metal has to register as a recycler additionally. The application has to be made to the National Police Commissioner for consideration. One of the major restrictions is that no person on the registered licensed premises may have any apparatus that can be used for recycling of controlled metal in their possession. The exception is where the said person is registered as a recycler/dealer or is authorised to possess and recycle precious metals under the Precious Metals Act of 2005, or any other applicable legislation.

This clause was included to stem the tide of cable theft in particular (Van der Walt, 2008). Compliance with the law in this instance would benefit legitimate dealers and recyclers while making it increasingly difficult for illegal dealers and recyclers to function undetected. The purpose of a self-regulatory environment is to encourage specialists in the recycling industry to willingly enforce the law and to report transgressions to the police. In an industry as large as the recycling industry this is a crucial component of future regulatory success. Police powers were increased with the development and promulgation of this Act. However the basic principles as determined by the Criminal Procedure Act still have to be followed. In an instance where police officials have to exercise the powers in terms of this Act they must identify themselves to the person in control of the premises. A police official may enter the premises during times when transactions are taking place to verify the dealer’s registration certificate as well as the dealer/recyclers recordkeeping system. The dealer/recycler has to assist the police official with the inspection, and the official must sign the register after the inspection. This forms part of the administrative regulation and control process.

In instances where the police suspect that the scrap metal dealer is involved in criminal activities; entry and search of premises is regulated by the requirements of the Criminal Procedure Act. A warrant has to be obtained from a magistrate or a judge of the High Court who has jurisdiction in the area in which the premises in question are situated. The warrant has to stipulate the premises to be searched, the actions that can be taken and the period for which the premises can be locked down and if the warrant may be executed at night. In addition to the stipulations in the Act the Minister may issue any
regulations that may be deemed necessary, specifically aimed at individual second-hand goods dealers with unique challenges and situations.

One of the important inclusions in Act 6 of 2009 is that it makes provision to extend the powers entrenched in this Act to other inspectors. The Act increases the cooperation between inspectors and departments with the powers and responsibilities extended to the Metro Police. This extension of power effectively increased the number of inspectors that monitor the industry to govern if proper regulatory processes were followed (Van der Walt, 2008).

3.10 ESTABLISHING THE FINANCIAL IMPACT

The Ministry of Safety and Security is constantly under pressure to reduce crime and save on expenditure, therefore managerial decisions are becoming more reliant on cost of crime estimates. The cost estimates include considerations such as the primary losses directly due to the crime, secondary losses after the crime and the cost to the State if the perpetrator was caught, prosecuted, convicted and incarcerated. If accurate cost models can be developed, Government can evaluate the crime reduction efforts against evidence-based cost analysis, which would in turn lead to more effective initiatives.

Evaluation of cost analysis should have a broad focus if it is to be applied successfully to crime. The cost of crime should take the full range of impacts of crime into account in the broadest sense and it should be understood that not all impacts can or should be reduced to financial terms (Brand & Price, 2001, p. vii). When investigating cost models to apply to crime it must be considered that cost is incurred at the outset without any crime been committed, in anticipation of possible crime. This phenomenon is evident in the fight against non-ferrous metal theft in South Africa and is mirrored in the international arena. The main challenge is the protection of non-ferrous metals that were used for infrastructure such as communication, transportation, housing and artistic contributions to society. These categories were not considered at risk to theft in the past and little thought went into the physical protection of the infrastructure components. When opportunistic criminals realised that non-ferrous metal is very valuable and the acquisition thereof a relatively low risk crime, it sparked an international crime wave. Previously unaffected service providers and businesses had to come to grips with a situation where financial planning and cost projection had to include security budgets and insurance costs. The cost incurred as consequence of a crime can be grouped into categories such as structures and property damaged in the process of getting to the desired object, the value of the property when it is stolen, the impact the crime had on health services and the emotional impact on the victims of the crime. Costs should also be considered for responding to crimes such as the cost each crime has to the criminal justice system as well as on the various industries affected by non-ferrous metals theft.
Many of these industry members have invested significant amounts of money in the establishment of private ‘in-house’ investigative components. These units were the result of the industry acknowledging that the SAPS is not in a position to effectively investigate crimes relating to their business, the SAPS needed dedicated assistance from the affected industries to address the challenge (A004, 2006) and (A002, 2006).

This component of the research project will take a closer look at the cost that is associated with the theft of non-ferrous products from a mine in an attempt to contribute to the understanding of the problem. The focus is based on the criminal events that was reported to a participating the mine’s security division. The mine was able to provide a complete dataset for the period under analysis from the beginning of January 2006 to the end of December 2011. The possible cost related to the risk to life is also investigated in an attempt to establish a baseline ‘cost to mine’ model. The study does not attempt to quantify the possible impact of loss of life to mine workers in monetary terms but acknowledges the possibility of further work related losses due to distrust by mineworkers in the mining procedures and general mine safety. The study did not attempt to quantify the cost of prosecution, incarceration, rehabilitation, loss of income or the absence of the primary breadwinner. Nor was the impact of incarceration quantified. All these factors would contribute to the complete understanding of the phenomenon but is of little significance if preventative strategies are evaluated and implemented. The surrounding factors should however not be discarded, as their value and importance may increase as preventative measures start to have an influence on the social economical circumstances of the community around the affected mine.

Crime inflicts a huge cost burden on society (Brand & Price, 2001, p. 1). The researcher was motivated by several studies conducted in the UK that placed an estimated costing of crime in the range of £35 billion to £60 billion per year. If the State could convert its crime prevention intentions into actual effective crime prevention and reduction measures, individuals, households, businesses and the public sector may experience large savings directly related to personal security. Accurate estimates of the social and economic costs of crime can therefore play a significant role in achieving the balance between the greatest impacts on crime for the least amount of money spent. According to Brand and Price (2001, p. 3) policy-makers would be better equipped to evaluate the effectiveness of crime prevention methods if accurate estimates of the costs of individual crimes were available. Crime cost analysis provides meaningful comparisons of the costs and benefits offered by different crime reduction measures. The analysis could be used to increase the awareness of both policy-makers and the public in general about the full impact of crime on society and the potential gains if crime is reduced. Another benefit of effective crime cost analysis is that it can be used to focus the efforts and resources of
This study would not be the first to interrogate the cost of crime to society: there has been numerous studies based on a variety of methodologies that attempted to contribute to the general understanding of the subject. In the case of the UK the Association of British Insurers (Association of British Insurers, 1998, p. b) gauged that the total cost of crime surpassed £35 billion in 1998. The Audit Commission Report (Audit Commission, 1999) approximated the cost of crime closer to £50 billion a year. The Observer newspaper (Thompson, 2000) adjusted figures from a study published by Anderson (Anderson, 1999) in the USA and calculated that the annual cost of crime in Britain could have been as high as £60 billion in 2000.

These crime cost estimations were based on various different crimes related to different costs and the data were from several different years, which negate any comparison between the estimations resulting from the individual studies. It also does not imply that the cost of crime in the UK had risen from £35 billion to £60 billion between 1998 and 2000. It does however provide an indication of the extent of the crime burden on society in general. In the USA the cost of violent and property crime to victims were investigated by Miller, Cohen and Wiersema (1996). It was found that the total cost may exceed US$450 billion per annum. Cohen (1998, pp. 5-33) attempted to estimate the monetary value of saving a high-risk youth from a lifetime of delinquency and criminal activity, this concept is a step in the right direction if the emerging trend of using youths as first tier syndicate members in non-ferrous metal theft continuous to gain momentum.

The use of young people in cable theft was brought to the attention of the South African public in the case of a 'brazen' 16 year old that had broken into an electrical sub-station belonging to the City of Cape Town. The child almost died of third degree burn wounds caused by electrocution on 11 January 2007. Officials of the City of Cape Town rescued the youth and the wounds were treated in hospital. The same youth was caught again on the 8 May 2007 during an attempted non-ferrous metal theft. Further investigation led to the realisation that the 'child' was a suspect in 33 other non-ferrous metal theft related cases that was being investigated against him (Santosh, 2007). Councillor Van Dalen of the City of Cape Town stated (2007, p. 2), 'An alarming trend is emerging in which children as young as 11 are being recruited by crime syndicates to steal cable and vandalise municipal facilities. This juvenile should be protected from himself and urgently be put in a place of safety for juveniles.' Aos, Phipps, Barnoski and Lieb (1999) developed a cost-benefit model for Washington State in the USA. This model compares the cost of the prevention of crime with the savings to the criminal justice system and to victims of crime. In principle this model is an attempt to focus the resources of the
justice system on policies that have the most impact on lessening the harm caused by crime in addition to lowering the number of crimes. This model might be useful if employed in conjunction with several other crime-cost models on the non-ferrous metal theft phenomenon.

In South Africa, Altbeker found that in 1997 the Republic of South Africa had spent 2.7% of its gross domestic product (GDP) on the criminal justice sectors. In comparison the rest of the world spent an average of 1% of GDP. By 2004/05, the Republic of South Africa was spending 3.1% of GDP on criminal justice while global spending, as a proportion of GDP, remained at 1% (Altbeker, 2005, p. 17). Altbeker deduced that because of high crime rates South Africa has to allocate more resources to the safety and security sector address it (2005, p. 1). To some extent this type of response was required to mitigate the growing fears of society that it would increasingly become victimised as the Police struggle to control and reduce crime in general. This response however led to the question: Why do crime rates remain high even though spending on criminal justice increased?

These observations led Altbeker (2005, p. 15) to believe that there may be more than one answer to the problem statement. The first answer may be that expenditure on the criminal justice sectors is not the primary determinant of the crime rate in a country, in the case of South Africa state spending on the criminal justice system increased but contrary to expectations, the level of crime also increased (Schönteich, 1999, p. 1). This corresponds to the suggestions that a decrease in certain crime rates may be the result of social spending (Donohue & Siegelman, 1998, p. 1) as opposed to increased criminal justice priority during the corresponding period sources to triangulate Altbeker’s viewpoint. The conclusion was that in order to reduce certain types of crime, social spending needed to increase and not necessarily criminal justice expenditure. Altbeker also considered the possibility that crime rates may not be influenced by expenditure on criminal or social systems. It might be possible for social and cultural influences to play a role and that these influences are beyond the reach of government programmes. This explanation may provide some insight into why some very poor countries appear to have low crime rates and, in contrast, some richer countries have higher levels of crime, especially crimes of violence.

These observations may be the key to address the theft of non-ferrous metal theft in the long term. The nature of these thefts is small, regular, opportunistic crimes perpetrated for relatively small amounts of money and at low risk to the perpetrator. The perpetrators of these crimes are as much victims of the lacking social system as they are criminals (Hirschfield & Bowers, 1997). Larger crime syndicates recruit them as ‘runners’, the lowest tier in larger crime organisations with a more organised structure.
The Altbeker (2005, p. 15) study took another possible reason for the lack of crime rate reduction into account. Altbeker theorised that South Africa may be following an inappropriate cost structure of delivering criminal justice services. The structure may not be as effective in South Africa as in the case of other countries. Constant evaluation and reassessment of crime prevention and crime management structures are essential for optimal control over crime. The success of the criminal justice system has to be measured against the dual purpose it has to fulfil. On the one hand it has to prevent crime and on the other it has to process offenders and cases. The extent to which the criminal justice system can fulfil these functions depends on the resources available to it. Unfortunately, the number of cases that have to be processed depends on how many crimes occur. Therefore in a country with high crime rates the resources needed to process crime incidents will also have to be more.

3.10.1 Types of cost analysis

Stone (2006, p. 9) critically examined the loosely grouped mechanisms that it is commonly used to substantiate the claims that crime restrains the growth of a country, namely:

- Crime inflicts costs on businesses (direct losses as well as the costs of security and prevention) that reduce profits and divert funds that could have been invested in productive capacity.
- Crime induces government to spend money and resources on law enforcement, crime prevention, and the administration of justice that would otherwise be used to stimulate growth in the country.
- Crime causes households to spend money on health care and security precautions rather than on education and other investments.
- Crime consumes human capital by encouraging emigration and by injuring or killing skilled workers.
- Crime restrains workers in the labour market by discouraging them from accepting jobs in off-hours or opportunities far from home.
- Crime discourages foreign investment in the country.
- Crime disrupts schooling and other public investments that support long-term growth (such as public transport), diminishing the effectiveness of these investments.

Stone (2006, p. 10) found that although each of these concepts might be plausible it is difficult to reliably and independently prove their effects, and even if the effects can be proven it might not be possible to provide practical intervention to improve the situation. Stone (2006, p. 11) suggested that the list of seven be distilled into a more manageable
assumption that can be converted into actionable points. It was proposed that crimes such as theft, fraud, corruption, destruction of property, and violent attacks against staff impose direct and indirect costs on businesses that reduce profits, deter new investment, and increase business failures. It was also suggested that there should be distinguished between the actual crimes and the perception about crimes. The general perception is that violent crime is high and beyond the control of government, which causes South Africans to restrict their work and leisure activities, restrains investment, and reduces tourism - all of which slow economic growth. This two-pronged approach focuses on business as victims of crime on the one hand and the general business climate on the other.

In the case of non-ferrous metal theft the impact of the criminal activity on business is self-evident. Communications companies such as the South African telecommunications service provider Telkom is in an unenviable position, as it is contractually bound to deliver landline communications infrastructure throughout South Africa. It is also one of the companies most targeted by copper cable thieves. The perception is that the copper cables used in the Telkom telecommunications network conduct a relative low-voltage current and the risk of electrocution, if the cable is cut, is minimal. The cable networks are easily accessible; they follow the same path as the road infrastructure throughout South Africa, and across remote areas. Albert Schuitmaker, of Cape Town’s Chamber of Commerce and Industry, said that ‘as soon as Telkom … came to replace the cables they were stolen again’ (Clare, 2007).

The direct cost to government is strikingly illustrated by the R22 million loss Cape Town ratepayers suffered in 2006/07 because of theft and vandalisation of cables and equipment at sub-stations, newly developed areas, streetlights, reservoirs, sewage pumping stations and other council property (Van Dalen, 2007). In many cases theft of infrastructure directly and negatively impacts on service delivery by elected town councils and other service providers. Each item that is lost will have to be replaced by re-allocation of money that was initially earmarked for other purposes. The re-allocation of funds diverts crucial resources from health, education and further infrastructure upgrading that should have been used for the benefit of the community. In effect the whole community is suffering because relatively few unscrupulous individuals are enriching themselves. The two components, namely, the direct cost to government and the impact of the criminal activity on business, that constitutes the ‘cost of crime’ are easily identifiable and can be determined with relative accuracy.

Frank (2005, pp. 33-35) divided cost related studies into three broad categories, which are discussed below.
3.10.1.1 Accounting studies and cost analysis

Accounting studies and cost analysis projects are designed with the premise that it would be possible to apply accounting principles to incidences of crime and derive a figure that would represent the total monetary cost of the crime, to a specific group or in a specific area. In theory this sounds quite plausible, but in practice there are challenges with applying the methodology to the reality. For instance, it is nearly impossible to calculate all the possible ‘costs’ related to any crime. Costs may result from direct losses, indirect losses or even perceived losses. Some losses may not be directly linked to the crime in the first place, such as the perception that a shaft at a mine is unsafe because the power was lost due to non-ferrous metal theft.

The researcher consequently has to make choices about the specific crime that needs to be examined as well as the categories of cost that are going to be investigated. The choices are influenced by the availability of verifiable and reliable data that needed to establish the ‘real’ rates of the crimes in the first place. Meaningful studies of this type are typically dependent on the existence and availability of a reliable set of data of a reasonable size. Datasets that might be of use would be official crime statistics or proper victimisation surveys. In this study the mining security division provided the dataset and each case was verified before being released to the analytical system, providing the researcher with a complete set of data for the required timeframe at the specific mine.

Costs associated with incidents of crime may be categorised as either direct costs or indirect costs. The direct cost of a car hijacking for example includes costs related to the replacement of a stolen vehicle, the medical costs related to any injuries, and the costs incurred by the criminal justice system when responding to the crime. Justice system costs can include several items such as police personnel sent to the crime scene, the prosecutor presenting the trial or the prison hosting the criminal. Indirect costs would include factors such as a heightened fear of crime resulting in costs related to using a different route, and the loss of work time (and income) from attending court proceedings as an example.

3.10.1.2 Cost-benefit and cost-effectiveness studies

These studies are comparative in nature and differ therefore from other accounting type studies in the sense that they attempt to compare the costs of inputs and efforts to outputs and beneficial outcomes. These studies mainly try to measure the impact of the interventions, and whether the financial interventions, human resources and other inputs made, amounted to an effective use of resources. To be effective these studies are designed to take the details of inputs, delivery and outcomes into consideration. The consideration is viewed in terms of ‘return on investment’ principles. To be successful the impact of each intervention has to be clearly defined and the evaluation depends on the
availability of accurate data on the intervention’s impact. In the mining industry this method seems appropriate because it is a profit-driven industry. The resources expended on security have to be balanced with the value of the goods protected. This principle in itself is a challenge because in many profit driven industries security is seen as a grudge expense and not an investment in the future of the company. If the protection of the product was the only function of security this reasoning might have been valid but with the advent of increased non-ferrous metal theft, security’s function has changed to the protection of the lives of miners. However, cost-effective security is still a high priority for the mine and has to be pursued but the protection of lives will become more important in the future.

3.10.1.3 Costing new policy and legislation

This category of cost related studies warrants particular attention in South Africa. These studies involve projecting the costs of draft policies and legislation, for example the Child Justice Act, 2008 (Act 75 of 2008). This kind of costing is used in many countries as a standard part of the policy and law-making process, overall, however its value for policy-making and analysis has received much less attention than the accounting studies discussed earlier.

According to Frank (2005, p. 36) there is a gap in the information provided by cost studies, as it doesn’t cover the criminal economy and the ways in which this may relate to the issues of cost and investment. Other complicated issues that cost studies do not address relate to economic under-investment as a result of crime, the reduced productivity of individuals, businesses and government, lowering of labour force participation and costs associated with ‘victimless’ crimes such as gambling, drug crimes, and prostitution. Most importantly, ‘hidden crimes’ such as corruption, fraud and sexual offences cannot be quantified meticulously as there are no methodologies that produce reliable estimates. These cost studies also do not include information about the costs of the impact of the criminal justice system, for example the impact of imprisonment on the offenders, their families and society, or the costs of long periods awaiting trial.

3.10.1.4 Categories of cost

The tangible costs of property crime fall into three broad categories (Shapiro, 1999, p. 3):

- The first category is made up of direct costs associated with property or cash stolen. These costs are fairly easy to quantify because usually they are known at the time the crime is committed. These costs would include the cost of replacing the actual stolen property.
• Second, there may be costs relating to property damage. These costs are, similarly, relatively fixed and easily quantified. It would include the cost of repairing the damage done in the process of committing non-ferrous metal theft. In Cape Town, for example, non-ferrous metal thieves destroyed all equipment in a sub-station to get to the copper wiring. The damage to the structure and the sensitive equipment was more than the cost to replace the stolen copper wiring (Venter, 2008). The mining industry experiences the same phenomenon: expensive and irreparable equipment and machinery are destroyed to get to copper wiring on the inside. The electrical supply companies such as Eskom in South Africa are also at risk of high repair costs if relatively cheap components of the distribution network are stolen. Non-ferrous metal scavengers can cause structural damage to electrical pylons to such an extent that it would be unable to support the weight of the cable and could collapse, such as the case with pylons in Malaysia (Muguntan, 2008) and other parts of the world.

• Third, victims may suffer secondary losses such as loss of wages or productivity or legal costs due to either the physical or mental injuries they suffer or their participation in the criminal justice process. These costs are more complex to quantify because they may arise, in part, after the primary data of the crime was collected. Furthermore, property losses may be wholly or partially reimbursed by insurance or government assistance, which in turn transforms the crime cost from one borne by the victim to one borne by society in general. The mining industry in particular is faced with a challenge relating directly to secondary losses; if the non-ferrous metal thieves are not challenged and their activities restricted by effective security measures it can contribute to the closure of marginally profitable mines. Should the thieves be challenged, however, the mine would have to pay its own investigators and security to first catch the perpetrators and then to see the case through court. Both processes are a drain on the finances of the mine and neither will prevent theft from occurring in the future.

3.10.2 Costing study

In a costing study conducted by Mayhew (2003, p. 43) the cost of various types of crimes were divided into several sub-categories. For the purpose of this study shop theft was the comparative measure. In many ways the analysis of shop theft is similar to the scenario of non-ferrous metal theft.

3.10.2.1 Categories

The categories that were considered for closer investigation were estimating the number of non-ferrous metal thefts that took place over a period. The estimated property that was lost due to non-ferrous metal theft and the medical cost that might be involved in
the crime. This is followed by losses due to lack of output from the mine and other intangible losses, which are not easy to calculate. And finally the total cost is quantified through a process whereby estimations are used to indicate the total number if incidents that took place.

- **Estimating the number of non-ferrous metal thefts**

  This is extremely difficult to do with any accuracy. The fact is that the actual number of non-ferrous metal thefts is unknown. Certain large companies report their losses to a central forum but if these cases are considered against a backdrop of all metal infrastructure, whether State or privately owned, all fencing material in the country, all road signs and road work infrastructure, etc., it is clear that many cases will simply not be reported, neither to the insurance companies nor to SAPS. If the incident is life threatening or disrupts everyday life of people they would take note of the incident, but if the non-ferrous metal theft only impacts a small number of people the incident will pass unnoticed.

  The consequence of this situation is that the researcher had to extrapolate the findings of the case study to the general industry.

- **Estimated property loss**

  In the mining industry most of the costs relating to property loss are easily determined in the case on non-ferrous metal theft. In general the objects that are stolen are readily identifiable and a monetary value can be attached to the object.

- **Estimated medical costs**

  There are very few medical costs currently related to non-ferrous metal theft at the mine. The actual cost has to be considered against the potential cost should mineworkers be trapped underground because of non-ferrous metal theft (A003, 2006). In this category it would also be prudent to include the medical costs of the criminal. This can be justified by the case where a youth was found unconscious in an electrical sub-station in Cape Town; the boy was trying to steal electrical cable and was electrocuted. The youth was subsequently taken to the hospital and the cost of hospitalisation was borne by the tax-paying public. Another medical expense that has to be kept in mind is the expenses the security guards, protecting the non-ferrous metal might incur if they are attacked during the robbery. In some instances the guards are shot and killed. This cost is also passed onto the public through higher electricity tariffs and higher commodity prices.

- **Lost output**

  Losses relating to the inability to work, in the case of non-ferrous metal theft is directly related to the lack of electricity to perform the work that is required of the employee as
opposed to being absent from the workplace. In particular large industries are vulnerable to this category. In the mining industry mineworkers are severely hampered in the performance of their duties if there is an interruption in the electricity supply. In many cases the component affected by the power outage will have to wait until the power is restored before any further work can be completed. This is accounted for in ‘production losses’ by the mine.

- **Intangible losses**

The mine suffers some intangible losses in the form of lack of trust in the emergency evacuation system of the mine. This is relevant because the mineworkers are several kilometres underground in very hazardous circumstances and they need to know that rescue is possible if anything should go wrong (A003, 2006). If the trusting relationship the mineworker has with the safety officers is broken due to the lack of electricity to facilitate an evacuation it could perceivably lead to lower productivity and more absentees from the workplace.

- **Quantification of the costs of non-ferrous metal theft**

The total cost of a non-ferrous metal theft can be calculated to some extent, it is possible to put a value to the material and the time is would require to repair the damage. It is however not entirely possible to quantify an incident in totality, because several elements may manifest in other areas of the workplace and not be immediately detectable for inclusion in cost calculations. The participating mine is in a position to quantify the actual and potential losses as well as the recoveries made related to the loss. This has the effect that the mine can put a value to each incident and correlate it to the production losses, if any, suffered due to the incident.

**3.10.3 Cost of crime**

The full costs of crimes are multitudinous and not all of them are assessed in cost studies. According to Brand and Price (2001, p. 26) the costs fall into the three main categories discussed below.

**3.10.3.1 Costs in anticipation of crime**

These costs focus mainly on people as potential victims, for instance what they pay for security measures. There is also the element of ‘opportunity cost’, for example the time, costs and effort put into neighbourhood anti-crime activities. Potential victims will generally be more willing to take action to reduce the chance or risk of becoming a victim, in countries where crime levels are high and the perceived risk of becoming a victim is considered to be more likely. Where the perceived benefits of reducing the risk, outweigh the costs involved in the action (in terms of the financial and opportunity costs), these measures comprise defensive expenditure, which includes expenditure on security.
measures such as burglar alarms, fencing, lighting, security guards etc., and precautionary behaviour, such as avoiding public transport, or particular people, or specific places, or even staying at home after dark. These measures are also a cost of crime, as they are based on the perception of potential victims of the risk of becoming involved in crime, which (at least in the long run) is linked to the actual crime rate. The mine in question is affected in a similar way as what you would find a house owner is. The mine has put in place numerous defensive security measures ranging from armed patrols, alarm systems in boundary fences and in remote stations. The perimeter was strengthened by higher, better and stronger fences to reinforce the already numerous security guard contingent, infrared cameras, motion sensor cameras, biometric security devices, access control gates, and more. The mine is also following a precautionary behaviour pattern. It would consider carefully and deliberately where new security measures are located. The high-risk areas would be patrolled more regularly and personnel would spend more time patrolling the boundary to respond to signs of intrusion more effectively (A004, 2006). These measures are however costly and do not translate effectively into cost justification and tangible results, because it is impossible to measure the deterrent effect these measures have on planned criminal activity or crimes of opportunity.

3.10.3.2 Costs incurred as a consequence of crime

These costs focus mainly on actual victims, particularly in terms of property loss and/or damage. These costs can however also include time off work, costs for health services and so on. The replacement value of the stolen property and/or damaged property is a cost to victims. Stolen property not subsequently recovered by the victim is however a benefit to the criminal, either for personal use or for resale. Strictly speaking, the value has been transferred from the victim to the criminal. If stolen property was uninsured, the victim bears the replacement costs of the property in full, but if the victim had insurance, the only cost for the victim is the excess payable on the insurance claim and the insurers bear the remainder of the loss. This calculation does however not take into account the long-term effect of the claim on the client’s portfolio premium increase after the claim, the loss of any possible no-claim bonuses that might have been due to the insured or the possible industry wide premium increase due to the increased risk of a specific item being stolen. Property damaged involves the destruction, rather than the transfer, of value, and must also be counted as a cost of crime. The intention of a non-ferrous metal thief is clear; the perpetrator wants to benefit from material belonging to someone else, the mine, in this instance. The mine has to bear most of the cost of the theft, as it is, largely not insured against theft. In some instances the mine would be suffering production losses due to unscheduled power outages caused by non-ferrous metal thieves. The actual cable loss and repair cost will however be the responsibility of
Eskom or the municipality that is the owners of the infrastructure up to the point where it is tied into the user’s (the mine’s) own infrastructure. The cost relating to the repair of property that was destroyed during the non-ferrous metal theft has to be brought into account at this point to provide a holistic consideration of cost incurred as a consequence of crime.

### 3.10.3.3 Costs in response to crime

These costs focus mainly on the criminal justice system, which include a huge range of costs incurred as a response to crime. There are costs to the police, who respond, record, investigate and build evidence on those crimes that come to their attention, the prosecution, magistrates and criminal courts, legal aid and defence costs, as well as costs to the prison and probation services. The mine has to bear some cost in response to crime; it has to make sure that the case docket is properly completed and that the perpetrators are handed to the SAPS for processing. The investigative responsibilities became the work of the mine security division because the SAPS are overwhelmed by other crime combating duties and do not have the capacity to investigate the complaints about non-ferrous metal theft properly.

If offenders are incarcerated, the offenders and their families will also bear some financial cost due to defence cost, lost income and travel expenses. The cost of lost earnings for the offender is borne by society, since these earnings are a payment for productive input, which is lost to society when an offender capable of contributing to society is incarcerated. Considering the cost to the offender as a cost of crime may appear peculiar, but in a sense, the decision on whether to include costs to offenders and their families rests on the assumptions about the causes of criminality, is the offender independently at fault, or is society also to blame? In some instances non-ferrous metal thieves aren’t ‘hardened’ criminals but their unlawful actions are motivated by socio-economic need. ‘This factor should also be taken into account when each case is considered’ (A001, 2006).

### 3.10.4 Measurement of cost

Brand and Price (2001, p. 27) attempted to reduce the social and economic cost of crime into three categories to assist with the measurement of cost in general.

#### 3.10.4.1 Costs in anticipation of crime

Estimating the costs of some measures to reduce the risk of victimisation is fairly straightforward. Total defensive expenditure is estimated by taking annual expenditure on security measures that target the crime(s) in question. This is then averaged over the estimated number of crimes committed to find average expenditure per crime. The mine follows this methodology to some extent but has found that there are fundamental
challenges to the theoretical concept. Although the principle is sound there are seemingly
challenges in the execution of the practice. The amount spent on preventative measures
in ‘anticipation of the crime’ is readily available and poses no challenge to quantify the
difficulty is to determine the true number of incidents of crime. This is a challenge
because even though the mine captures all the reported incidents, there may still be
several incidents that go unreported and undetected. It can also provide the security
component of the mine with an opportunity to artificially increase the number of incidents
for statistical purposes, creating a false perception of the crime situation. This calculation
can however be very helpful if it is used in conjunction with other analytical measures
and not in isolation.

3.10.4.2 Costs as a consequence of crime
The value of property stolen or damaged can be measured using the replacement value
or repair costs of the property involved. The mine applies the principles suggested in the
methodology. Mine security determines the actual value of the product lost, establish the
amount recovered (if any) and calculates the loss to the mine. The methodology is
expanded to include factors such as the production losses the mine suffered as result of
the non-ferrous metal theft incident, which provides for a more holistic overview of the
situation in the mine.

3.10.4.2 Costs of response to crime
When developing the cost measurement model Brand and Price (2001) looked at the
application on a national policing level. The principles can however be applied, to a
certain extent, to security divisions of large companies mining industry. The information
on cost and recovery in each case is readily available and the expenditure of the
company on protecting its assets is obtainable. Having this information makes it
relatively easy to calculate the total cost of crime to the company.

3.11 SUMMARY
Considering the legislative tools that are available to the mining industry and the Justice
system, it would appear that the issue of non-ferrous metal theft might be well in hand.
This is however not the case, the mining industry employ civilian personnel and have
only the right and jurisdiction to investigate and arrest crimes that are perpetrated on
mining property. If the SAPS do not prioritise the non-ferrous metal theft related incident
at the same level as the mine security, any hope of prosecuting the suspect becomes
mute. The same is true for the prosecutor and the magistrate of the court.

One of the key intentions of this study is to highlight the threat posed by non-ferrous
metal thieves not only to the mine in question, but also to all of South Africa. Police and
Justice need to develop their understanding of the seriousness of the non-ferrous metal
threat, and act, before the threat becomes a reality resulting in significant loss of lives.
Chapter 4

A South African mine case study

4.1 INTRODUCTION

The case study examined in the study will be discussed in detail in an effort to not only bring across the seriousness of the threat of non-ferrous metal theft incidents, but also to provide the reader with a basic understanding of the environment the miners from the participating mine work in. Understanding the crime prevention actions the mine takes, as well as the criminal actions of the non-ferrous metal thieves, is a critical component of the study.

In this context the fact that the mine experienced 1 563 theft related attacks that can be divided into 791 non-ferrous metal theft cases and 772 thefts that were not non-ferrous metal related over a six-year period (1 January 2006 to 31 December 2011) is astounding if the possibility if threat to the lives of the mine workers is considered. The mine has managed the threat posed by the non-ferrous metal thieves over many years by ensuring effective perimeter fencing and patrols. This action by the mine reduced the threat to such an extent that the mine suffered production losses due to non-ferrous metal theft only in 2006 and 2007, in two unrelated incidents.

The main problem faced by the mining industry in general, however, is not solved this easily. Every time a copper cable is attacked and damaged, South African mines are in danger of their workforce being stranded thousands of metres underground. This is an untenable situation that can only result in disaster.

4.2 NON-FERROUS METAL THEFT THREAT

Mining and other industries will have to insist on the protection of the State against losses directly resulting from non-ferrous metal theft. It is the responsibility of Government to protect citizens and the industries providing work for thousands of people against crime. It is not the responsibility of the mining industry to protect parastatals’ assets such as electrical cabling and telecommunications networks. However, the State has grown accustomed to the mining sector providing its own security and asset protection services, much like as the banking sector is doing.

The threat to the mining industry is considerably more serious, however; one incident can cause the loss of many lives. The mining industry as a whole could suffer irreparable damage if a mine should suffer a fatality that is directly related to the theft of non-ferrous metal. The reasoning is simple: Would reasonable people willingly put their lives in danger by exposing themselves to a situation where they know there is an
unmanageable threat to their lives? This would lead to industrial action on a scale not experienced before in South Africa.

The working environment of South African miners is largely unknown to the general public. It is therefore necessary to explain some of the inherent risks faced by people in the mining industry as well as the terminology that is commonly used in the industry.

The threat posed by copper cable theft has to be weighed not only against the actual costs of the crime, be it the cost to repair damage to cables, the actual value of the cables that were stolen, or even the loss of production that might be suffered by the company affected.

The true threat to the mining industry reaches from above ground to the deepest recesses of the mine. The true threat is the threat to the lives of the people going down into the mine who could become trapped in a life-threatening situation if there were a sudden loss of electricity. The study will explore the threats from above ground to the area where the actual mining takes place in an effort to shed some light on the possible ramifications of non-ferrous metal theft.

4.2.1 Above ground

Mining operations are usually conducted in remote areas. ‘Buffer’ zones around mineshafts limit access to the actual mining site. These buffer zones are mine property and forms part of the security area of the mine. The purpose of a buffer zone is to create an area that can be easily monitored for trespassers and unauthorised entry (Coetzee & Horn, 2006, p. 92).

Unfortunately this has created a safe area for prospective copper cable thieves to hide in and which allows unrestricted access to electrical and communication cables traversing this zone. In one instance a security measure put in place to deter possible precious metal theft has been corrupted to serve the purpose of another type of criminal. The precious metal thief had to gain access to the primary product mined and produced at the site. In order to achieve this goal the criminals would enter the security buffer zone, cut through
perimeter fences up to the point where their intended target is located and try to escape as soon as possible after the break-in. Copper cable and non-ferrous metal thieves are not pressured by time constraints. They can infiltrate the security buffer zone and live there indefinitely, all the while gathering ‘scrap’ metal. These scavengers can be very organised (Bindeman, 2007); in some instances investigators have come across operations that had a distinctive military approach to both group discipline and the method in which it worked towards achieving its objective. These groups would meticulously spend time to unearth the electrical supply cable from sub-station to distribution panel, if allowed to do so, in an area that is not continuously monitored by surveillance and patrols. The group would then induce a power failure by ‘spiking’ the power cable. The general modus operandi is to hammer a six-inch nail through the cable causing an electrical short, which in turn activates the safety override in the sub-station.

The purpose of the process is to provide the criminal with a safe window of opportunity to cut the power cable with a saw during the period the electrical current is interrupted. The challenge faced by mining personnel is to identify the power failure as an attack on the electrical infrastructure of the mining operation and not a power failure as result of a ‘normal’ sub-station or cable failure. This is a time-consuming verification process and several people need to be contacted to confirm that the power failure is not the result of maintenance or equipment failure. In many instances the power supply company would have to dispatch a service team to the sub-station in question to investigate the cause of the power failure. This can take a significant amount of time.

When the report arrives at the control room of the mine that the power failure was not the result of equipment failure from the power supply company, the controller can assume that either there was internal equipment failure on the mine premises or that the cable was sabotaged. At this time security personnel can be tasked to investigate the cause of the power failure. This process is however not a simple one: security personnel have to drive to the sub-station and the distribution panel. From these two points they have to follow the cable towards the point of origin or termination respectively. Every metre of the cable trench has to be inspected for integrity to determine if any attempt was made to gain access to the buried cables. In some cases this visual inspection would have to be carried out over a distance of several kilometres, and to complicate matters many of the routes followed by the electrical cables are not clearly marked or are not accessible by vehicle. In these cases the security personnel will have to walk through the veld looking for signs that an underground cable that has been maintenance free for 10 to 15 years or longer has been tampered with. There are also no clearly marked maps that the security personnel can follow, resulting in a very inefficient verification process.
Security personnel have to be aware of the danger they are in when they are guarding copper cable installations. Non-ferrous metal thieves do not have any respect for life, as Isaac Nkadimeng would have been able to attest to if not killed by gunshot wounds. His death was the result of an attempted non-ferrous metal theft near Waltloo in Pretoria when Isaac was shot when thieves were surprised during their criminal activities (SAPA, 2003). This callous group of thieves left the body of one of their own in the open veld after the prospective criminal was accidentally shot by a fellow gang member during the confusion of the shootout.

If the perpetrators are discovered arrests can be made and the criminals prosecuted. However, this in itself is a challenge. It might be possible to prove that the suspects trespassed on mine property, but it is more challenging to prove that the suspects were involved in non-ferrous metal theft or attempted non-ferrous metal theft. Investigators and security personnel have to be alert and follow good investigative practice for a case of this nature to be proven in court.

4.2.2 Below ground

Below ground the situation can become dire very quickly. The miners in most South African mines rely on electrically powered life support systems while working underground. The conveyance up and down the shaft is also electrically powered because of the depth of South African mines.

![Figure 4.3 Rudimentary layout of a South African mine (Ben Coetzee)](image-url)
There is no other commercially viable method of delivering a large workforce quickly and efficiently to their individual work sites other than by using large electrical machinery, which consumes large amounts of electricity. The mine participating in the case study follows a mining model consisting of vertical shafts reaching down 20 levels. From the bottom of the shaft, miners have to walk to the head of the chair-lift system. The chair-lift system is similar to the ski lifts found in mountains and is used to transport the workers to the lower levels where the actual mining takes place.

![Figure 4.4 Chair-lift system (Wikipedia)](image)

The layout of the participating mine resulted in 2,8 kilometre long declines at angles of between 30 and 40 degrees. Transporting workers along these tunnels has become a safety concern because when workers and heavy machinery share a limited workspace it is inevitable that accidents would happen. The chair-lift worker transportation system was implemented to reduce the number of injuries and fatalities that resulted from the proximity of heavy machinery and the workers in confined spaces. This form of worker transportation however depends on a continuous electrical supply.

### 4.2.2.1 Safety hazards

Worker fatigue is reduced if the long process of getting to the actual site of rock breaking can be shortened and the physical effort of getting there could be reduced considering that the miners enter an environment where temperatures underground can reach approximately 50 °C accompanied by a high level of humidity (A003, 2006).

This combination of adverse conditions and physically demanding work escalates the risk of working in deep mines under normal conditions. Should an unforeseen situation develop during normal mining operations, working conditions can quickly turn lethal. In a scenario where copper cable thieves damage the power cable supplying electricity to the mineshaft, mineworkers will have to be evacuated as soon as possible. According to the safety manager at the participating mine (A003, 2006), mine workers can suffer heart attacks during normal mining operations. Add to that the stress and anxiety of being trapped underground and the possible scenario becomes clear. The safety manager believes there could be several casualties related to heart failure before the evacuation is completed.
4.2.2.2 Electrical failure: brief scenario

**Scenario 1: Ventilation failure**

If only the ventilation shuts down the normal electrical transportation system can still evacuate the workers in a relatively short period of time and few or no casualties can be expected.

**Scenario 2: Transportation failure**

Where the transportation power supply cable is damaged, the situation becomes much worse. Miners will have to be evacuated by means of an emergency cage or hoist, which is powered by emergency generators. This emergency cage can only accommodate 10-15 people at a time and have to cool down frequently between lifts to prevent overheating and complete shutdown due to mechanical failure. Miners would have to walk out from the deepest parts of the mine in 50 °C against a 30-40 degree incline for 2,8 kilometres and then several kilometres further to Level 20 to reach a point where the emergency cage can evacuate them. This is a physically demanding situation that may lead to some workers succumbing to the strain. In such a case some loss of life may be expected (A003, 2006). A factor that would save many lives is to continue ventilation in the mine, which would reduce the heat and provide fresh air to the workers while they are still underground.

**Scenario 3: Ventilation and transportation failure**

The worst-case scenario is where both the transport and ventilation systems are affected. In this instance the miners would have to walk out from the deepest parts of the mine in 50 °C against a 30-40 degree incline for 2,8 kilometres and then several kilometres further to Level 20 to reach the bottom of the extraction shaft. Emergency evacuation will commence and 10-15 workers at a time would be lifted to the surface. Underground personnel will experience increased heat and humidity due to the lack of ventilation. This combination of life-threatening factors will reduce the workers’ chance of survival.

The safety manager (A003, 2006) of the participating mine estimated that without a supply of electricity, it would have taken more than 22 hours to bring everyone to the surface. This scenario is based on the premise that the affected mine shaft had to rely solely on the emergency evacuation system and that the electricity supply had not been restored at any point during the evacuation process. On a previous occasion it took more than ten hours to restore electrical power after a similar type of cable was damaged. Fortunately the damage occurred in a non-critical part of the mine and it did not affect personnel (A003, 2006).

Cable repair time depends on the type of cable damaged, how much of the cable needs to be replaced, if cable is available on the mine premises or has to be sourced from
suppliers in Johannesburg or elsewhere, and if the specialist electrician and cable-joining
team are available to repair the damaged cable. If it takes ten hours to restore electrical
power to mining operations underground, a shift consisting of some 6 000 workers would
have experienced temperatures of 50 °C, coupled with extreme humidity and strenuous
physical activity for the duration of the emergency. Most people would be able to endure
this combination of environmental factors for 40 minutes before starting to succumb to
heat exposure. The emergency respirators carried as standard life-preserving equipment
by the miners would increase their chances for survival, but was not designed to support
life in a situation where rescue and life support systems are unable to reach such a large
number of trapped mine workers at such a depth underground.

One of the major factors that will contribute to the number of fatalities is panic as
workers try to reach the emergency hoist to be extracted to the surface. Such a situation
could result in numerous deaths. The safety manager (A003, 2006) of the participating
mine reflected on the possibility that mine workers would attempt to take ‘shortcuts’
through unused or mined out areas of the mine referred to as ‘madala’ sites. These areas
are not well lit or maintained and the sudden additional weight of several thousand mine
workers in these areas may cause the mine to cave in, trapping them underground under
tonnes of rock. In addition there are deep fissures in madala sites that workers may fall
into and it would be easy for mineworkers to get lost in the maze of disused unmarked
tunnels. The safety manager recalled an instance where a miner got lost in one of the
madala sites and the body was only discovered four years later.

4.2.3 The threat

From the above it is clear that non-ferrous metal theft in the mining industry may pose a
lethal threat to workers. The seriousness of the threat can be illustrated by looking at the
attacks suffered by the participating mine. In the period January 2006 to December 2011
the mine was attacked 791 times by suspected non-ferrous metal thieves. Thus there
were nearly 800 opportunities for the worst-case scenario to play itself out and possibly
leaving hundreds of people dead.

4.3 PREVENTING NON-FERROUS METAL THEFT

Crime prevention can be summed up as ‘anything that reduces delinquency, violence and
insecurity by successfully tackling the scientifically identified causal factors’ (Waller,
Welsh, & Sansfacon, 1997, p. 3) while Lab (2010, p. 26) theorises that crime prevention
is ‘any action designed to reduce the actual level of crime and/or perceived fear of crime’.

Crime can undoubtedly be linked to the place where it is committed according to the
findings of Landman and Lieberman (2005, p. 21). They concluded that many instances
of crime do not occur spontaneously or opportunistically, but that offenders select
specific areas because they lend themselves to criminal activity. Over time, the development of residential and business property has therefore changed to incorporate more security considerations (White, 1996, p. 106).

In most instances it is difficult and expensive to change the structural design of an existing structure in order to be more secure. However, several relatively inexpensive ‘target-hardening’ measures can be implemented to reduce the attractiveness of the target to criminals. For example, security cameras can be installed everywhere. In the case of mines, external measures such as burglar proofing, security gates, high fences and access control points can reduce the risk of being targeted by opportunistic criminals (United Nations Office on Drugs and Crime, 2009, p. 22).

Internationally, the first reaction to non-ferrous metal theft was target hardening. Security specialists soon realised that vulnerable non-ferrous metal infrastructure had to be protected against non-ferrous metal scavengers. Methods used for securing these assets include high-security fencing, additional lighting, and cameras with infrared and motion sensors (United Nations Office on Drugs and Crime, 2009, p. 21).

In recent times another group of criminals have been targeting the participating mine, however - criminals with a different approach and a different target. The objective of this new breed of criminal is to steal as much metal as possible from anywhere on the mining site. Any metal object that is not guarded by security personnel becomes a possible source of income, even though some of these objects may be buried underground, are fastened to blocks of concrete, or are kept behind security fences. In some instances the criminals even targeted the security fence itself.

This ‘new’ kind of thievery negates the use of heavy security gates and other, previously effective, security measures that rely on metal-based barriers, because the barrier itself may become the target. The use of concrete-encased metal palisade fences is also not enough to deter the metal thieves; concrete can be shattered to gain access to the steel inside the casing. Wire or mesh fencing on the other hand may not be a desirable target because of its low resale value in the scrap metal business. However, if enough of it can be ‘harvested’, the thieves can earn a few rands for their effort.

4.3.1 Crime prevention strategies

Generally crime prevention strategies can be divided into two distinct categories, namely situational crime prevention and crime prevention by means of social development (The John Howard Society of Alberta, 1995, p. 19).

In the case of situational crime prevention the aim is to reduce the total number of opportunities offenders are afforded to commit crime. This is usually achieved through effective law enforcement and institutionalisation and correction of offenders, combined
with an increase in personal and property security. The goal of the process is to reduce the attractiveness of a specific area or premises for the commissioning of a crime. The process of increasing physical security is also called ‘target hardening’.

The second crime prevention strategy, social development, does not preclude situational crime prevention or, in the case of the mine, target hardening. Social development strategies take into account that challenging social and economic conditions may contribute to a situation where an individual can become a habitual offender.

The participating mine acknowledged the need to fight crime on all these levels and consequently engaged in various community-policing, sector-policing and social upliftment programmes in the areas surrounding the mining operations in an effort to reduce crime levels. For the purpose of this study, only the situational crime prevention methods utilised to combat non-ferrous metal and property theft in particular at the participating mine will be explored.

4.3.1.1 Situational crime prevention

Situational crime prevention is not a difficult concept to understand or use in the fight against crime. In its most simplistic form it includes a wide range of practical measures intended to prevent crime from being committed. It combines everyday logical strategies regarding crime prevention into an executable range of measures that people can use to protect themselves and their property (National Crime Prevention Centre, 2006, p. 1).

The basic theory behind situational crime prevention is based upon three principles. Crime would be prevented if the opportunity for crime to be committed is reduced; if the risk of being detected is increased; and if the rewards of the crime are reduced (Crawford, 2002, p. 66). (See ‘Techniques’ below for a detailed discussion.)

The mining industry generally follows a crime management model that leans towards situational crime prevention. It is based on the methodology employed by private security and asset protection companies and supported by the. This model depends heavily on the principle of ‘target hardening’ for its success. Target hardening is the process through which barriers and obstacles are put in place to slow down the progress of an intruder when the intruder tries to enter a specific area (Coetzer, 2003, p. 16). Napier (1998, p. 43) sums up the concept of target hardening as ‘the physical strengthening of building facades or boundary walls to reduce the attractiveness or vulnerability of potential targets’.

In the mining industry - as in most instances where target hardening is considered - the aim of the process is to increase the technical difficulty the prospective criminal has to overcome between the point of entry and the target area. In some instances an enhanced barrier such as a well-lit parking area may deter the criminal from attempting
to enter the area; in other cases the intruder may be thwarted by an impenetrable barrier such as a walled-up window (Bannister, 1991, p. 57).

This model has worked for the industry for some time, but as criminals become more sophisticated the industry’s operations will have to adapt to counter improved criminal strategies. The industry will no longer be able to follow the outdated principle of making it more difficult to commit a crime at the location where the crime is committed, but will have to widen the scope of its activities to include focused preventive measures. The ingrained culture of escalation where the criminals would improve their techniques and the mine would respond by implementing more target-hardening measures will have to be re-evaluated.

Target hardening was adopted as the principal method of crime prevention in the mining industry because a need was identified to create a ‘safe space’ from which to conduct high-value and high-risk primary business. This led to the creation of a defensible space for the core business of the mine. Defensible space refers to ‘a residential or other environment for living whose physical attributes make it possible for residents to defend it, toward which its residents or workers take a protective territorial attitude, and in which an intruder perceives its residents are in control’ (LaVigne & Eck, 1993, p. 55). Although the term is mostly reserved for residential spaces, the concept works well in the mining industry. The success of the concept is based on the fact that mineworkers identify strongly with each other and with the mine that they work for. A defensible space is created through target hardening which would include the erection of more and higher barriers between the area that must be protected and the prospective criminal. It would also include measures such as getting employees actively involved in the protection of the area (Newman, 1996, p. 42) and the observation of the protected area as well as the reporting of suspicious activity (Jeffrey, 1977).

Another ‘bonding’ factor between the mine and its employees is the realisation that non-ferrous metal theft related crime is directed at the mining house as well as the mine employees. Employees realise that they will probably suffer the most if the mine continues to be victimised by non-ferrous metal thieves. The mineworkers are either direct victims or, through indirect victimisation, may lose their employment.

Three different techniques may be used in situational crime prevention. These techniques are, first, those that attempt to physically obstruct a criminal from criminal opportunity by making the target more difficult to reach. The second technique focuses on increasing the risk of the prospective perpetrator of being caught and in this way preventing criminal action from taking place. The third technique involves the crime preventer attempting to reduce the rewards of a crime. In this technique, items are marked in such a way that they would be identifiable by the intended markets if they were legitimately
acquired. Another method is to remove the items from the area where they are accessible to criminals, thus denying the criminals their reward (National Crime Prevention Centre, 2006, p. 4).

Three situational crime prevention techniques that may be used in the mining industry (Clarke, 1997, p.15) are discussed below.

**Technique 1: Reduce the opportunity**

Target hardening is the first logical step and includes measures such as fitting more and better locks, installing toughened glass, and using tamper proof seals. These could be complemented by introducing locked gates to control the movement of employees from one area to another; using ID badges to track authorised employee movement and identify unauthorised movement; and fencing in areas, thereby isolating high risk areas from each other.

Limiting access can deflect offenders, thus ensuring that committing a crime becomes more difficult. Examples are road closures and locating mass transport points in controlled areas. In addition, most mines are located in isolated areas and by acquiring surrounding land it becomes easier to monitor unauthorised movement.

A final step would be to control the factors that contribute to the ease with which the offence can be committed. For the mining industry this could mean actively opposing scrap metal dealers in close proximity to mining operations. It could also mean devoting resources and manpower to support the SAPS in their efforts to monitor and control the scrap metal recycling industry.

**Technique 2: Increase the risk**

The precious metal mining industry is increasingly implementing entry and exit screening procedures for mine employees. However, owing to the large number of people entering the operations at a specific time, this remains one of the most vulnerable security areas.

Formal surveillance is another technique used to increase the risk for prospective criminals. For example, in addition to guarding gates and monitoring product movement, the protection service of the mine would patrol mining operations and search employees. In this case the mining house that the participating mine belongs to have made significant inroads in involving mine employees in their efforts to fight corruption through a service called a ‘tip-line’. This practice can be expanded upon to include the use of surveillance by employees to combat non-ferrous metal theft. Incentive schemes can be promoted whereby employees can be rewarded for information that leads to arrests. One of the most important aspects is natural surveillance, which can be achieved through clearing brush from fences and improving lighting.
**Technique 3: Reduce the reward**

The target that has attracted the criminal in the first place can be removed by replacing non-ferrous metal infrastructure with alternative products. For example, high-value copper cabling can be replaced with lower-value derivatives and copper communication cables can be replaced with fibre-optic cables.

Property can be marked to make it identifiable even when removed from the control of the mine. There are several ways of marking non-ferrous metal but the cost prohibits the replacement of all non-ferrous metal or the marking of all non-ferrous metal at one time. Should it become necessary to replace a stolen component, it should therefore be replaced with one that is clearly marked and easily identifiable.

Property at risk of theft should be properly secured and kept under surveillance. Perimeter breaches should be repaired as soon as possible and the mine should appear alert and responsive to incidents. Personnel and vehicles should only be allowed to move under supervision in the controlled area. All movement must be monitored and suspicious behaviour reported.

The mining industry will do well to consider the standard theory for a situational project, which is a component of situational crime prevention. The methodology is a version of action research and involves a collaborative process whereby the researchers and practitioners work together to find solutions to problems through rigorous analysis of data. Solutions are found and implemented, and are then evaluated. If the intended results have not been achieved, the process is repeated.

This process cycle was first developed by Kurt Lewin (Lewin, 1947) and consists of four phases that are repeated until the desired result is achieved. The phases are: analysing the problem that needs to be addressed; implementing a solution to the challenge; evaluating the success and progress made to address the problem in the context of the solution implemented; and re-analysing the situation to determine if the solution is addressing all the relevant factors, thus determining whether the desired result has been achieved. The initial attempt to solve a problem seldom is the final solution; in most instances several solutions have to be combined to achieve success. For this reason the process cycle is a crucial component of the process to find a permanent and cost-effective solution, not least in the mining industry.

(Gladstone, 1980) proposed five stages in a situational crime prevention project. These were summarised by Clarke (1997, p. 15):

- **Stage 1:** Collect data about the specific crime problem, examining the nature and extent of the problem.
• **Stage 2:** Analyse the situational conditions, determining the factors that allow the crime to be committed.

• **Stage 3:** Identify possible means of preventing the crime from being committed through systematic evaluation of possible solutions, including the cost of the solution.

• **Stage 4:** Implement the most cost-effective and promising solution.

• **Stage 5:** Monitor the effectiveness of the implemented measure, evaluate the effect, and disseminate the results to relevant departments after implementation.

### 4.4 PRIMARY IMPACT OF NON-FERROUS METAL THEFT

The participating mine recorded all theft-related incidents for the period under review (1 January 2006 to 31 December 2011) including all non-ferrous metal theft related incidents. This co-operation was unprecedented in an industry largely closed to outsiders. An exception was made to accommodate external evaluation and analysis of a challenge that the mine acknowledges it cannot face on its own. This realisation in itself is an indication of the significance of the threat posed by non-ferrous metal theft to the economic viability of the South African mining industry and to the South African economy in general.

When looking at the threat of non-ferrous metal theft to the participating mine - and by extension to the mining industry as a whole - the first area under investigation would be the primary, monetary losses suffered by the mine.

Not all secondary costs are recorded by the participating mine, as it is complicated to calculate the exact costs per incident. For example, if 10 metres of copper cable is stolen, the entire line needs to be replaced, not only 10 metres. The replacement cost of 100 metres is not a true reflection either, as the 90 metres of cable that was removed for the line to be replaced has a scrap value the mine can recover. Other secondary costs such as the manpower used for the repair and the overtime paid need to be calculated as well to give a true reflection. This will vary, however, depending on whether the repairs are done by contractors already working in the area or whether a special contract team needs to be brought in. As the participating mine records all production downtime as result of crime, secondary costs due to asset theft was included in the dataset.

The actual loss of copper and production downtime losses is grouped into a category called ‘Primary impact’ and is the main concern of most production managers, safety managers and security managers. In principle these are all the identified threats that may jeopardise the continued existence of the mine from the viewpoint of financial viability.
4.4.1 All asset theft related incidents: January 2006 to December 2011

When the number of incidents at the mine is compared to the losses the mine suffered due to theft, it is interesting to note that non-ferrous metal (copper) related theft makes up 51% of incidents. However, if the non-ferrous metal (copper) related losses are combined (including the value of copper cable lost and production downtime as result of the copper related theft) it comprises 73% of the recorded primary impact losses (excluding secondary losses such as replacement costs and unplanned overtime) that the mine suffered during the six-year period.

This study takes into account that certain categories of goods are more attractive to thieves than others. This is based on the understanding that certain characteristics will cause some goods to be more CRAVED than others, meaning that these goods are easy to steal because they are Concealable, Removable, Available, Valuable, Enjoyable and Disposable (Clarke, 1999). The category referred to as 'Other property' includes all other assets (not copper cable) stolen during the six-year period under review. These assets mostly included items that are easily disposed off like laptops, computer parts, cameras, radios, cell phones (13%), or equipment and tools (42%), as well as items that can be used, such as cash, petrol, diesel, oil, consumables, clothing, batteries, tyres, appliances, furniture, safety equipment, medical supplies, building material and paint (33%). (See Annexure 1).

The participating mine stated that a further 436 incidents of trespassing were reported to the SAPS. (These are not included in this research dataset; see Annexure 2.) The rationale of highlighting trespassing at the participating mine is based on the premise that people found on mine property had to be there for some reason, and although the

Figure 4.5 Total incidents: comparison from January 2006 to December 2011

When the number of incidents at the mine is compared to the losses the mine suffered due to theft, it is interesting to note that non-ferrous metal (copper) related theft makes up 51% of incidents. However, if the non-ferrous metal (copper) related losses are combined (including the value of copper cable lost and production downtime as result of the copper related theft) it comprises 73% of the recorded primary impact losses (excluding secondary losses such as replacement costs and unplanned overtime) that the mine suffered during the six-year period.
reasons can be many, the simplest explanation would be that they were looking for scrap metal, or opportunities to acquire non-ferrous metal. Although the trespassers in most instances cannot be prosecuted for any offence other than trespassing, their presence has to be considered for security and asset protection purposes.

Table 4.1 Type of theft: January 2006 to December 2011

<table>
<thead>
<tr>
<th>Type of theft</th>
<th>Number of incidents</th>
<th>Value involve</th>
<th>Primary losses</th>
<th>Production losses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper related</td>
<td>791</td>
<td>R6 498 692</td>
<td>R4 955 261</td>
<td>R3 921 200</td>
</tr>
<tr>
<td>Property related</td>
<td>772</td>
<td>R6 465 043</td>
<td>R3 281 952</td>
<td>R0</td>
</tr>
</tbody>
</table>

The result of the non-ferrous metal theft activities is a primary loss of R4 955 261 and a further production loss of R3 921 200. This amounts to a total of R8 876 461 (excluding secondary losses such as costs related to infrastructure repair and replacement cost to the company). This also excludes the costs related to the research, development and implementation of additional as well as new security measures that would not have been necessary if the infrastructure had not been threatened, the loss due to manpower that has to be expended to patrol previously low-risk areas, and manpower expended in investigation of non-ferrous metal theft incidents. But the costs do not end there: the SAPS enter the cost cycle when the suspect is arrested and criminally charged, and then the judicial system is brought in to prosecute the offender. The cost cycle culminates with the correctional service having to house, feed, and rehabilitate the offender if the criminal is convicted, not to mention the medical costs incurred by the State during each of these steps.

The primary loss due to non-ferrous metal theft is however only 41% of the losses (total loss of R12 158 413) suffered by the mine as result of the 1 563 asset thefts during the period under investigation. The critical factor is two incidences where the essential cable was stolen, resulting in production losses amounting to R3 921 200. The questions can be posed: ‘What can the mine do to prevent these thefts from happening?’ and, more disconcertingly, ‘What will happen if more thefts result in production losses?’ considering the huge financial impact of only these two incidences.

Of even greater concern is that everyone is vulnerable to non-ferrous metal thievery: from the private homeowner being denied the use of electricity or telephone services to the mightiest echelons of government.

4.4.2 Copper related cases at the mine

This section contains all copper related incidents that took place at the participating mine in the six-year period 1 January 2006 to 31 December 2011. It should be kept in mind that the dataset reflects the situation at the participating mine during the period under investigation. The situation at the mine has changed as a result of further strategic and
operational interventions initiated by the security manager (A004, 2006) after the period in which the research study was conducted. The threat of non-ferrous metal theft remains a priority crime and continues to pose a risk to the participating mine.

Reflecting on the concept of the crime displacement from high-risk to low-risk targets it is conceivable that if the non-ferrous metal thieves’ new target responds in a way similar to that of the participating mine and has more security measures in place than the participating mine, there is a real possibility that said thieves will again turn their attention to operations at the participating mine. Although the displacement of crime is not guaranteed (Guerette 2009, p. 23), this is the more likely scenario in the case of the participating mine. It is therefore conceivable that, in the short term, crime would move from the participating mine to surrounding areas.

4.4.3 Number of incidents versus the methods used

Figure 4.6 illustrates the number of incidents the mine recorded for the period 1 January 2006 to 31 December 2011 in relation to the method that the thieves used and the subsequent detection of the theft or attempted theft. The dataset is complete with 791 incidents of non-ferrous metal theft being recorded during the period under investigation. As illustrated below, only 165 (21%) of the incidents were reported to the security division of the participating mine.

Figure 4.6 Number of copper thefts: methods involved

<table>
<thead>
<tr>
<th>Method</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarm/camera response</td>
<td>42</td>
</tr>
<tr>
<td>Area patrols-fence cut</td>
<td>33</td>
</tr>
<tr>
<td>Area patrols-housebreak</td>
<td>14</td>
</tr>
<tr>
<td>Off-site/residence/SAPS search</td>
<td>29</td>
</tr>
<tr>
<td>Recovered by security</td>
<td>227</td>
</tr>
<tr>
<td>Reported to security</td>
<td>165</td>
</tr>
<tr>
<td>Security searches</td>
<td>281</td>
</tr>
</tbody>
</table>

4.4.4 Security searches

The most successful method of detection is conducting physical searches of suspects and vehicles searches; this method comprised 281 (36%) of the total non-ferrous metal theft related incidences at the mine. In these cases the security personnel discovered the non-ferrous metals during random person and vehicle searches at access points or during
random searches conducted on persons and vehicles moving within the mining operations security area. It should be taken into consideration that not all people and vehicles entering and exiting the mine’s premises are searched. If the vehicle is not bringing goods onto the mine’s property or transporting goods from the mine, only random searches are carried out. This is largely due to the number of vehicles that use the entry points every day. As thousands of employees and contractors enter the premises, it is not practicable to search everybody entering the mining operations. The successes achieved through vehicle searches may be indicative of a much larger systemic problem involving the removal of large quantities of stolen non-ferrous metal from the control of the mine in an organised manner as opposed to being limited to numerous opportunistic small incidents.

The above implies that 281 (36%) of the suspects caught at the mine tried to conceal stolen non-ferrous metal on their person or in their vehicle in an attempt to remove the metal from the control of the mine. This detection rate is commendable, if seen in isolation. However, if it were taken into account that any employee of the mine caught when attempting to steal mine property could be dismissed and yet so many would-be thieves are still caught through physical searches, the question begs, how many do not get caught? It stands to reason that enough non-ferrous metal thieves get away with the stolen product to make it worthwhile for prospective thieves to attempt to steal from mine premises.

### 4.4.5 Searches at residence of suspects

Physical searches of the suspects’ residences are directly related to physical searches of the suspects. This type of searches can only be executed with the co-operation and support of the SAPS and the searches are based on information from and sworn statements by the investigating officers at the mine, as well as sworn statements from informers or witnesses. This detection method accounts for 29 (4%) of the total number of incidences recorded by the mine. In these cases the mine property (non-ferrous metal) had already been removed from the mine area. This implies that all security measures put in place by the mine to protect its assets had failed and although the mine found the suspect through investigation it had already suffered irrecoverable losses due to the theft.

Losses in the case of non-ferrous metal theft cannot be quantified only in actual financial terms. For example, the thief may attempt to steal an underground power supply cable by first digging it out of the ground. He would then induce a power cut by causing an electrical short-circuit in the cable by hammering a six-inch nail through the core of the electrical cable. If the suspect is apprehended at this point, one could argue that the mine has not lost anything but has gained the use of one six-inch nail.
The actual losses suffered by the mine have to be based not on the isolated act but on the consequences of the action. Most consequences cannot be calculated immediately and would include a range of things such as the repair cost of the cable, which might have to be replaced completely, as well as a long list of financial losses resulting from the lack of electricity while the cable was being repaired.

4.4.6 Copper abandoned by suspects

Copper that was found abandoned on mine property makes up another 227 (29%) of the total recorded cases at the participating mine. There are several possibilities for thieves abandoning copper. The copper could have been hidden for later collection or dropped during an escape. In general this is regarded as a success for the mine. However, it has to be acknowledged that even though the recovery was made before the stolen non-ferrous metal was removed from the premises of the mine, the mine has failed to protect its assets from being targeted by thieves in the first place.

For non-ferrous dependent industries such as the mining industry, preventing non-ferrous metal theft is the only option; detecting already destroyed infrastructure after the fact will result in production losses even if the perpetrators are caught. In addition to the financial threat the more important threat to the lives of underground workers would persist even if new evacuation procedures and emergency evacuation systems are devised and deployed.

4.4.7 Other detection methods

The remaining 89 (11%) incidents were detected during area patrols 47 (6%) or responses to alarms triggered or camera surveillance 42 (5%) identified irregularities.

4.4.8 Loss to the mine versus the area

The mine under scrutiny suffered production losses of more than R 3,9 million due to non-ferrous metal theft in the period January 2006 to December 2011. The evaluation of the losses in relation to the areas where the loss happened excludes the secondary production losses suffered by the mine and focuses on the direct cost of the specific incident.
Figure 4.7 Number of copper theft incidents: area involved

An alarming 117 (15%) of the incidents occurred at the high-risk pump stations, ventilation stations and sub-stations. The term 'ventilation station' is used to describe large ventilation fans that pump fresh cooled air from the surface into the mine and extract foul hot air from underground. These points are usually not within the inner security perimeter of the mine and were until recently not under any threat of being damaged or stolen. These structures are easy targets, however, because they are designed to operate autonomously with little human intervention unless there is a breakdown or routine maintenance.

Subsequently these points can be surveyed and attacked at leisure by the organised non-ferrous metal thief. Electrical supply cables can be dug out of trenches and the sub-station cabling prepared for the eventual theft over a matter of days. If the preparation has been done properly, the theft can be concluded in a matter of minutes and the enterprising thief would be able to disappear before the police or security had time to respond to the theft.

Of the recorded incidents 240 (30%) occurred at shaft areas (including decline access points to the underground mining operations) and a further 154 (19%) underground.

In layman’s terms a ‘decline’ is understood to be a ‘ramp’ allowing access from the surface to the underground operational levels of the mine (see Figure 4.8 below). This type of access allows heavy machinery to travel down the decline to lower levels without
the need for excessively large shafts; it also provides an additional access or escape route for personnel. The decline is equipped with large quantities of electrical cable and other metal-based infrastructure, making it an attractive target for non-ferrous metal thieves. It would appear a simple task to guard an access tunnel from non-ferrous metal thieves, but since these mines have now reached a depth of more than 2 000 metres, guarding the infrastructure has become a mammoth task.

![Bar chart showing copper theft losses by area of incident excluding production losses.](image)

**Figure 4.8 Copper theft losses: area of incident (excluding production losses)**

In some mining operation designs declines are used to connect different levels of a mine. In Figure 4.9, for example, the decline is a tunnel access ramp spiralling downwards in an area of the mine that does not contain viable amounts of the sought-after metal to justify mining at that point. This makes it easier to understand the extent of the problem faced by mining infrastructure protectors. The assets that have to be protected are out in the open where perpetrators have access to it and reacting to every disruption in the electrical supply is not feasible due to the time it takes the reaction team to reach the site of the possible theft. In addition to the hazardous environment, responders to possible incidents of theft need to take into account that the perpetrators may be armed and that they may have used explosives such as IEDs (improvised explosive devices) to protect themselves from unexpected discovery and to deter responders from giving the chase.
4.4.9 Thefts from cable yards

Of the non-ferrous metal theft losses suffered by the participating mine, 41 (5%) was from cable yards where cable are stored before it is installed on the site. This amounted to a loss of R238 654 (excluding production losses) over the above period. The figure is placed into perspective if we take into account that only 41 incidents were recorded at the cable yard.

To put it another way: in 41 attacks against the cable yards the criminals managed to inflict almost a quarter million rands of damage. Considering that cable yards are well-secured areas that are patrolled by guards and patrol vehicles on a random basis and are secured by fence alarms, this does not bode well for the mine’s less protected infrastructure. This is also a prized target for criminals with many high-value items amassed in close proximity, resulting in attacks being more coordinated with a possible...
higher return on investment for the enterprising criminal willing and able to neutralise the mine’s defences.

4.4.10 Theft from cable racks, pump stations, ventilation stations and sub-stations

Pump stations, ventilation stations and sub-stations are also targets of choice for the criminal. This accounts for 5% of total losses excluding production loss. A further 10% of the losses were due to the theft of installed cable from cable racks feeding the mining operations. The main driving force behind these attacks may be the fact that the targets are located in remote areas and although they are critical to the continued safe working of the mine, they are not considered of high monetary value. These types of infrastructure do not rank as a top protection priority for the mine and are therefore not rigorously protected. However pump, ventilation and sub-stations were attacked 117 times resulting in losses of R256 064. If these stations were better protected the number of incidents would probably be much lower – perhaps similar to those at cable storage yards. Of greater concern is that the mine lost R483 986 in only 66 attacks on installed cable on cable racks. The conclusion is that non-ferrous metal thieves regard these types of infrastructure as easy targets and are more likely to attack at these points.

This trend is unfortunate; non-ferrous metal stored in a cable yard have a high monetary value but because it has not yet been installed it has little threat value. The threat to the mine is significantly higher if installed cable at one or more of the critical pump, ventilation and sub-stations goes off-line, at which point the potential risk becomes a possible life-threatening disaster.

4.4.11 Thefts from shafts and underground

Shafts and tunnels are the arteries that the lifeblood of the mine flows through. Lack of a

Figure 4.10 Infrastructure before and after being stripped away by thieves
functioning arterial infrastructure would threaten the continued existence of the mine. Old shafts and tunnels that are not actively used form an important part of the arterial system of the mine. However, non-ferrous metal thieves are targeting old shafts that do not form part of the mine’s current operational area and are therefore not inspected regularly (see Figure 4.10 above).

These criminals are ignorant of the possible results of their actions and they have a blatant disregard for their own lives and the lives of legitimate miners. From January 2006 to December 2011 the mine was targeted by 394 attacks at shafts and underground mining operations and suffered a loss of R3 723 512, which in monetary terms is considered significant. The real danger is what will happen if these unused shafts and tunnels have to be used to evacuate injured miners, or if the main shaft becomes inoperable for some reason and miners have to make their way back to the surface through the unused tunnels to the access ramp.

None of the infrastructure the mine installed during previous operations in the (currently) disused shafts and tunnels are safe from the attentions of non-ferrous metal thieves. After the high-value copper has been stripped from the tunnels and shafts other non-ferrous metal components are dismantled or broken into manageable pieces to be moved to the surface. There is no discernible trend or pattern in the attacks other than the fact that the mine is threatened by scavenging subsistence criminals as well as more organised criminal groups that are well informed and well resourced. The variety of areas targeted also indicated that the criminals would scout the mining premises for weak points and attack them without mercy. These random attacks pose a significant challenge to current security models used by the mining industry.

At the participating mine there are two main operational mining sites. At one of these sites (referred to as Site 2), vast areas are no longer part of active mining operations. Figure 4.11 illustrates the number of incidents and losses recorded at the two sites.
Figure 4.11 Site comparison: January 2006 to December 2011

It is clear from the number of incidents versus the losses suffered that Site 2 has a much larger financial implication despite the fact that more incidents occurred at Site 1.

Table 4.2 illustrates the area where these losses occurred. Since Site 2 has vast areas that are no longer operational (called underground madala sites), the criminals attacked these areas in groups of between 12 and 16, gaining entry by digging up redundant holings (ventilation access points) and remaining underground for weeks in order to steal enormous amounts of copper cable. The 101 underground thefts at the madala sites of Site 2 comprised 66% (R3 254 877) of all non-ferrous theft primary losses at the participating mine (R4 955 261 excluding production losses). This posed the greatest financial risk as well as the greatest security risk to the participating mine.

Table 4.2 Copper losses at areas on mine site (excluding production losses)

<table>
<thead>
<tr>
<th>Copper theft area involved</th>
<th>Number of incidents</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Site 1</td>
<td>Site 2</td>
<td>Site 1</td>
</tr>
<tr>
<td>Access control gate</td>
<td>17</td>
<td>16</td>
<td>R0</td>
</tr>
<tr>
<td>Business premises or offices</td>
<td>7</td>
<td>2</td>
<td>R18 154</td>
</tr>
<tr>
<td>Cable racks</td>
<td>11</td>
<td>55</td>
<td>R65 900</td>
</tr>
<tr>
<td>Cable yards</td>
<td>23</td>
<td>18</td>
<td>R90 825</td>
</tr>
<tr>
<td>Concentrators</td>
<td>11</td>
<td>3</td>
<td>R50 235</td>
</tr>
<tr>
<td>Hostel or residential village</td>
<td>18</td>
<td>13</td>
<td>R5 175</td>
</tr>
<tr>
<td>Pump, ventilation or substations</td>
<td>69</td>
<td>48</td>
<td>R108 313</td>
</tr>
<tr>
<td>Salvage yard</td>
<td>2</td>
<td>3</td>
<td>R537</td>
</tr>
<tr>
<td>Shaft area</td>
<td>151</td>
<td>89</td>
<td>R28 274</td>
</tr>
<tr>
<td>Surface area</td>
<td>20</td>
<td>18</td>
<td>R10 289</td>
</tr>
<tr>
<td>Underground</td>
<td>53</td>
<td>101</td>
<td>R9 526</td>
</tr>
<tr>
<td>Waste dump</td>
<td>11</td>
<td>5</td>
<td>R179</td>
</tr>
<tr>
<td>Off-site</td>
<td>23</td>
<td>4</td>
<td>R0</td>
</tr>
<tr>
<td>Total</td>
<td>416</td>
<td>375</td>
<td>R387 506</td>
</tr>
</tbody>
</table>
Asset protection should therefore include the protection of infrastructure and personnel; it should be developed in collaboration with the safety officer at the mine to prevent duplication of effort and to prevent departments from working against one another. The loss of infrastructure may prove to be more important than the protection of the main product the mine produces, because mining cannot continue if the mines’ infrastructure is under attack. The danger resulting from scavenged infrastructure and structural components leads to an increased risk to the safety of workers as well as an increased risk that the mine would have to close if it cannot be operated profitably and safely.

At some point the risks outweigh the profit, and at such time the mine will close and thousands of people will become unemployed. The threat does not stop there; one mine worker indirectly equates several other people employed by related industries that rely on the operation of the mine for their employment (Chamber of Mines of South Africa, 2005, p. 1) those associated industries would not be able to sustain themselves without the work provided by the mine and would have to lay off workers, they may even be faced with bankruptcy.

### 4.4.12 Non-ferrous metal theft trends

Trend analysis is a useful indicator to determine at which point the subject is most at risk when compared to other points of measurement on the same scale. It is based on the concept of using historical data (Peterson, 1994, p. 276), that which have already occurred in the past, along with current data, that which is happening in the present. This process is complemented by the possibility of forecasting (Peterson, 1994, p. 272) to predict what would possibly happen in the future. The purpose of trend analysis is to identify a trend (Peterson, 1994, p. 277) from the data by drawing conclusions from the patterns revealed by the data. Statistical analysis; the analysis of data in numeric form to determine what it means (Peterson, 1994, p. 275); is followed by trend analysis to investigate patterns that were identified in the preliminary examination of the data. For the mining industry threatened by non-ferrous metal thievery, strategic analysis is a crucial component of their situational crime prevention strategies (Peterson, 1994, p. 275). The victims of non-ferrous metal theft have to use all their resources and assets to contribute to a strategic analysis of the threat they face. The strategic analysis will address general thematic areas such as the overall crime activity in the area of the mining operations, reports on the criminal groups that might be active in the area.

#### 4.4.12.1 Trends in relation to the month of the year

In the following series of charts the number of non-ferrous metal theft related incidents that were recorded by the mine is compared to the months when these incidents were recorded. This has led to several observations that are discussed.
Peak from January to March

Interestingly there are two peak seasons for non-ferrous metal theft as experienced by the participating mine. The first ‘season’ starts in January of each year and peaks over February and March before it subsides in April. This first trend contributes 28% (220 incidents) to the total number of incidents recorded by the mine and is fairly consistent on a year-to-year comparison.

Figure 4.12 Copper theft incidents from January 2006 to December 2011

Peak from August to November

The second peak period begins its upward turn during August each year and continues climbing until it reaches its peak in November of each year. After reaching the highest point each year the trend sharply drops to 6.4% in December before resuming a similar trend pattern in January of the following year. This trend contributes to 41% (327) of the mine’s total number of non-ferrous metal theft incidents each year.

Other five months of year

The other five months of the year is the low season with regard to non-ferrous metal theft incidents for the participating mine, totalling 31% of total yearly incidents. May, June and July consistently reflect the lowest non-ferrous metal theft activity, each comprising 6% per month during the period with December and April varying between 6.4% and 6.9% respectively.
There may be several reasons for these trends, ranging from weather conditions during the winter months in South Africa to the closure of businesses, including metal recyclers, over the Easter and Christmas holiday periods. None of these theories could however be substantiated with validated facts during this particular study.

Interestingly, in comparison to other property related thefts, a fairly similar pattern was found, as illustrated in Figure 4.13.

![Figure 4.13 Copper theft incidents per month: January 2006 to December 2011](image)

Other property related thefts differed only in May, when copper thefts remained low, but other property thefts showed a slight increase and again in October, when copper remained high, but other property thefts showed a decrease. Other than these two deviations, all thefts seem to follow the same timeline trends.

According to the participating mine, during an internal analysis conducted, the only correlation found in terms of timeline trends were an increase in copper related thefts when the international copper price increased and a corresponding decrease in copper related thefts when the international copper price decreased. The participating mine holds the opinion that the black market for stolen copper is influenced by the international copper price and therefore the demand is higher when the trading price is higher and lower when the trading price decreases. It can be argued that although the criminals may access the mining sites to obtain copper cable, if unsuccessful any other property accessible will be targeted.

**4.4.12.2 Non-ferrous metal theft related losses**

Year on year losses relating to non-ferrous metal are relatively minor, considering the turnover of the participating mine. The concern is not the actual losses the mine experienced; the concern is what would happen if one essential part of the infrastructure were damaged during a non-ferrous metal theft attack. What would the impact be on the
safety and health of thousands of mineworkers that are underground? Actual losses in this instance do not reflect the magnitude of the concern, it is only an indicator that there is something to be concerned about. The mine is thus left in a position where it must take measures to mitigate a possible disaster; steps that would have been unnecessary if non-ferrous metal theft received proper attention from the State.

**Figure 4.14 Copper related theft: losses per year**

Figure 4.14 graphically illustrates the threat to mining operations if one crucial component of its infrastructure is damaged to such an extent that the damage causes production losses. This illustrates the vulnerability of the mine to cope with non-ferrous metal theft, and indeed it illustrates the vulnerability of all large industries to react to non-ferrous metal theft when it affects their core business.

In 2006 the mine suffered production losses of more than R3,1 million as a result of one incident that resulted in production downtime. The value involved of all the copper that was targeted by the non-ferrous metal thieves in 2006 was R364 420 of which the security division of the mine recovered R185 279 resulting in a primary loss of R179 140 to the mine if calculated on the actual crime for the entire year. During 2007 another copper theft resulted in a production loss of R800 000. The value involved of the copper was R103 000 of which the security division recovered R63 000 resulting in a primary loss of R40 000 for that particular incident. It is noteworthy that during the six-year period in merely two instances did the attack cause production downtime, which resulted in losses of more than R 3,9 million. If more attacks resulted in production downtime, the mine could have faced considerable losses. For example, if 5% of all attacks resulted in similar production downtime, the losses would have amounted to more than R 77 million.
(791 x 5% = 40 x average of R 1,9 million production losses). This is the very reason why the mine considers non-ferrous metal theft to be a priority risk, not only because of the significant safety risk, but also of the ‘potential’ financial risk associated with this threat.

Table 4.3 Copper related theft: losses per incident

<table>
<thead>
<tr>
<th>Loss per incident</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>R0 - 500</td>
<td>538</td>
<td>114</td>
<td>141</td>
<td>114</td>
<td>69</td>
<td>49</td>
<td>51</td>
</tr>
<tr>
<td>R501 - 1 000</td>
<td>29</td>
<td>10</td>
<td>5</td>
<td>8</td>
<td>0</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>R1 001 - 2 500</td>
<td>41</td>
<td>11</td>
<td>17</td>
<td>5</td>
<td>1</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>R2 501 - 5 000</td>
<td>44</td>
<td>6</td>
<td>7</td>
<td>5</td>
<td>10</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>R5 001 - 10 000</td>
<td>41</td>
<td>2</td>
<td>8</td>
<td>3</td>
<td>12</td>
<td>11</td>
<td>5</td>
</tr>
<tr>
<td>R10 001 - 25 000</td>
<td>48</td>
<td>3</td>
<td>6</td>
<td>7</td>
<td>12</td>
<td>14</td>
<td>6</td>
</tr>
<tr>
<td>R25 001 - 50 000</td>
<td>24</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>R50 001 - 100 000</td>
<td>17</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>7</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>R100 001 - 250 000</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>0.5%</td>
</tr>
<tr>
<td>R250 001 - 500 000</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0.3%</td>
</tr>
<tr>
<td>R400 000 (including production)</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.1%</td>
</tr>
<tr>
<td>R3 121 200 (including production)</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.1%</td>
</tr>
<tr>
<td>Total</td>
<td>791</td>
<td>148</td>
<td>192</td>
<td>147</td>
<td>117</td>
<td>100</td>
<td>87</td>
</tr>
</tbody>
</table>

Of the 791 non-ferrous metal thefts related incidents recorded over the period 2006 to 2011, 68% of the incidents had a primary loss of R500 or less per incident. In 82% of the non-ferrous metal theft related incidents, the loss per incident was R5 000 or less. Only nine incidents showed a loss of more than R100 000 per incident (including the two incidents with production downtime).

Securing non-ferrous metal infrastructure that are widely dispersed and relatively isolated is a challenge for the mine as this infrastructure has become increasingly vulnerable due to the rise in the price of scrap metal and therefore more important to protect. The worrisome factor is that if this theft trend continues, the mine would be incurring costs pertaining to security that is not, at face value, justifiable expenses. For example how would the security division of the mine justify deploying a patrol officer to protect an electrical sub-station that is the property of Eskom outside of the property that belongs to the mine? If the mine however does not take initiative to protect a vulnerable component of the infrastructure that is crucial to the mining operation, the operation might suffer millions of rands in losses.

4.4.12.3 Outcome of finalised cases

In the period under investigation, January 2006 to December 2011, the security division of the participating mine investigated 1 563 theft related cases, which includes 791 non-ferrous metal theft cases and 772 thefts that were not non-ferrous metal related. At the time the information was supplied, 8% (121 cases) were pending investigation. These incidents have therefore been excluded from the discussions below.
Outcome of finalised non-ferrous metal theft related cases

The security division of the participating mine investigated 791 non-ferrous metal theft incidents that were reported to them or that were detected by them during the period under investigation and finalised 91% (772) by the time the information was supplied.

Figure 4.15 Case outcome: finalised copper theft incidents

Of the closed cases, a noteworthy 168 cases were closed as 'resolved'. This means that in 23% of the incidents the criminals were convicted in a court of law based on the investigation by the mine’s security division or that the employee of the mine suspected of criminal behaviour was found guilty during the departmental procedure. Add to this total another 6% for those suspects for which warrants of arrest were issued because they did not appear in court as required by their bail conditions and the positive outcome for the mine security division is phenomenal from an investigation and prosecution point with only 8(1%) of cases withdrawn or found not guilty.

A further 316 (44%) of cases were closed as ‘recovery only’, which included the instances where the security division was able to detect the stolen property before it was removed from the mine premises. Only 190 (26%) of the cases were classified as undetected, which implies that the incident took place and that the security division only discovered the incident after it was perpetrated and that there was no suspect to apprehend or to prosecute and they could not recover the stolen copper cable. Although this is a significant percentage of the cases that were dealt with by the security division, it is understandable that it is unlikely that any security component would have been able to protect all the non-ferrous metal that forms part of the mine’s infrastructure, over the
vast area the mine encompasses. The only way of mitigating some of the risks is to invest more capital in personnel and tamper monitoring equipment, which would enhance the early detection capability of the mine.

**Outcome of finalised other property theft cases**

For the sake of comparison and objectivity the total number of thefts that occurred in the area of responsibility of the participating mine was considered. A total of 772 other property related theft cases were reported and detected by the security division over the period under examination, of which 7% (52 cases) were still pending investigations and thus excluded from Figure 4.16.

![Figure 4.16 Case outcome: other theft incidents](image)

Of the closed cases (720), a noteworthy 29% were closed as ‘resolved’ (guilty finding in court of law and/or departmental disciplinary hearing) and 39% of the cases closed as ‘recovery only’. Only 30% of the incidents were undetected, meaning that by the time the security division was informed of the incident there were no suspects to arrest and that the investigation into the incident did not produce a viable suspect for prosecution. Overall the two charts compare favourably with each other but the same concern about the elevated ‘undetected’ percentage could also be raised in this instance.

**4.4.13 Offender profiling**

In this research project the term ‘offender profiling’; is used in the context of historical data based on actual convictions and actual investigations conducted at the participating mine similar to the methodology used by Zinn (2002, p. 42). The main purpose of
offender profiling in this project is to establish which group of people are currently producing the largest group of offenders. The security manager of the participating mine would then have to work out proportionally how many of the high-risk group are working for the mine and whether the resulting proportion still reflects a high-risk offender profile. This is only used as one indicator in the larger context of offender profiling.

4.4.13.1 Offender profile: based on employment status

In the period January 2006 to December 2011, 299 offenders were identified committing crimes relating to non-ferrous metal theft at the participating mine. Of these offenders the mine employed 151 and 148 were trespassers.

![Pie chart showing offender status](chart.png)

**Figure 4.17 Identified offenders: status of employment**

For practical purposes the 41 permanent employees of the mine were added to the 110 contractors employed by the mine. This was done to simplify the analysis and does not impact on the process because there is no distinction between the level of access granted to contractors and permanent employees. The offender profile is one of the most interesting findings of the study. The perception is that the mine faces an external threat; the data however proves that the mine employs more than half (51%) of the offenders.

The mine employee group is subdivided into two distinct categories, one for permanent employees of the mine and another for contractors employed by the mine to provide specialist services. From a threat perspective the security manager has to consider the fact that the identified offender dataset indicated that the contractors, who had legitimate access to the mine, comprised a disconcerting 37% of offenders committing a non-ferrous metal theft related offence.

Another interesting and worrying phenomenon is the number of attacks executed by offenders that were unemployed (49%). The data do not offer sufficient detail to determine whether the ‘unemployed’ criminals had previously been employed by the
mine or if they had close ties with other mine employees that might have assisted them with knowledge on procedures or information on weak points in security measures that would allow them to gain access to non-ferrous metal sites. From this dataset it is clear that even though there is a significant threat from people that are not employed by the mine, it was necessary to look closely at the contractors employed by the mine. Contractors have access to the mining operation and have the legitimate means to move stolen non-ferrous metal from the area controlled by the mine’s security teams.

4.4.13.2 Offender profile: based on race and gender

During the period under examination, 299 non-ferrous metal theft related offenders were apprehended by the mine’s security division. These offenders were classified by race and gender.

![Figure 4.18 Identified offenders: race and gender](image)

Although race and gender activists might frown upon the use of these terms in offender profiling it remains an essential component of security planning. The simple facts cannot be ignored that, in the mining industry and this mine in particular, 93% of the perpetrators were African males. This of course does not imply that African males are more prone to crime; it only reflects the reality of the employment situation within the context of the mine. In fact a disproportionate numbers of African males are employed in the mining industry in general. In principle all male suspects in non-ferrous metal theft should be handled the same.

The challenge for the mine security division is how to handle female offenders of which 6% were identified in the period under examination. During the search and apprehension of female suspects special procedures have to be followed to preserve their rights and dignity, which means that the whole process becomes complicated and cumbersome. This might lead to a situation where security personnel would rather avoid confronting female employees than hazard the possibility of being accused of inappropriate behaviour.
4.4.14 Identified offenders: result of cases

The results of the cases against the identified offenders for the period January 2006 to December 2011 at the time when the research project was undertaken indicated only 3% of the cases had no outcome, where neither the disciplinary nor the criminal cases had been finalised and the cases were still being processed.

![Pie chart showing the outcomes of cases against identified offenders.]

**Figure 4.19 Identified offenders: outcome of cases**

Of the cases against the 299 identified offenders, 57% were resolved with a guilty finding in either a departmental process or through the justice system. This is a positive result for the participating mine and reflects well on their investigative process. The crime investigators of the mine and the security division as a whole can be commended for their continuous efforts to fight against non-ferrous metal theft. Of the 299 offenders that were identified for non-ferrous metal theft related crimes only 10 (3%) of the cases against the suspects were withdrawn or the suspects were found not guilty. These are impressive figures because it reflects the effectiveness and quality of the investigation performed by the asset protection division at the mine.

**Table 4.4 Identified offenders: outcome of departmental cases**

<table>
<thead>
<tr>
<th>Disciplinary case outcome</th>
<th>Number of offenders</th>
<th>Contractor</th>
<th>Mine</th>
<th>Unemployed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non mine (criminal action only)</td>
<td>148</td>
<td>0</td>
<td>0</td>
<td>148</td>
</tr>
<tr>
<td>Pending</td>
<td>9</td>
<td>4</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Terminated</td>
<td>131</td>
<td>104</td>
<td>27</td>
<td>0</td>
</tr>
<tr>
<td>Warning</td>
<td>9</td>
<td>2</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>Withdrawn/not guilty</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

During the period, the mine employed 151 of the identified offenders, either as permanent employees or contractors. A significant 87% of the departmental cases were
resolved by termination of either employment (permanent employees) or termination of access to the mine (contractors).

**Table 4.5 Identified offenders: outcome of criminal cases**

<table>
<thead>
<tr>
<th>Criminal case outcome</th>
<th>Number of offenders</th>
<th>Contractor</th>
<th>Mine</th>
<th>Unemployed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Departmental action only</td>
<td>28</td>
<td>24</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Guilty</td>
<td>78</td>
<td>34</td>
<td>16</td>
<td>28</td>
</tr>
<tr>
<td>Pending (recovery made)</td>
<td>57</td>
<td>2</td>
<td>5</td>
<td>50</td>
</tr>
<tr>
<td>Withdrawn/not guilty</td>
<td>66</td>
<td>16</td>
<td>10</td>
<td>40</td>
</tr>
<tr>
<td>Warrant of arrest</td>
<td>70</td>
<td>34</td>
<td>6</td>
<td>30</td>
</tr>
</tbody>
</table>

During the period, in 9% of the cases only disciplinary action was taken against the employees. Criminal action was taken against 271 of the identified offenders, which will be discussed further.

In 21% of the criminal cases, the mine recovered the stolen copper and handed the offenders over to the SAPS for further future criminal action. A significant 29% of the criminal cases finalised resulted in a guilty finding (78 offenders convicted). The cases were withdrawn in court against 24% of the offenders.

In addition to the high resolve rate there were outstanding warrants against 70 of the identified offenders (26% of the criminal cases). This high number of outstanding warrants of arrest does not reflect well on the SAPS or the justice system in general. From the data it seems obvious that suspects that are in custody for non-ferrous metal theft are a flight risk. Most of these suspects do not have a fixed address or fixed employers, but they do have cash to pay for bail. Why doesn’t this trend raise warning flags throughout the justice system? Why has there not been an enquiry from the Justice Department into this trend? The Justice Department should instruct the SAPS to keep suspected non-ferrous metal thieves in custody and that suspects have to appear before a magistrate to apply for bail. Magistrates should also be instructed to be very strict and careful when granting bail to suspected non-ferrous metal thieves, for they can be considered a flight risk based on data from previous cases.

A matter of concern however is the large percentage of offenders that were released from custody pending their court appearance and who subsequently did not make themselves available for court. Warrants for arrest were issued for these suspects but as many of them cannot be identified beyond reasonable doubt, the chances of arresting them again are exceedingly slim. This indicates the flagrant disregard of the law by the offenders and the knowledge that the police are busy with more important issues and would not pursue outstanding warrants for ‘petty’ offences. These criminals realise that the justice system is already unable to cope with the serious offences and they are hiding their activities within the immense caseload the justice system is struggling to cope with.
It is estimated that for every active SAPS detective there are an average of 70 dockets that have to be investigated (Minnaar, 2008, p. 25). This has led to a situation where detectives are tempted to take ‘shortcuts’ in an effort to reduce their caseload. Some detectives would mark dockets as ‘undetected’ or in some cases that ‘witnesses could not be located’. The workload of the detectives might be one explanation for the numerous outstanding warrants of arrest for non-ferrous metal thieves.

Another aspect that has to be pointed out is that at this phase of the investigation the suspects are handed over to the SAPS for processing through the judicial system. It is these same officers that have to pursue suspects that were released on bail and who failed to appear in court as per their bail agreements. Under these circumstances one might sympathise with police detectives for being somewhat despondent in the execution of their investigation. This attitude can be ascribed to the large caseload most of the detectives have to carry and the limited time they have to spend on each case. To illustrate the point: if a detective has 70 open dockets on hand and spends 10 minutes on a docket every day that would amount to 700 minutes per day. That would mean the detective spends 11 hours and 40 minutes working through the dockets. This would go a long way towards explaining the lack of interest from the detective to follow up on non-ferrous metal cases; they would rather spend their limited time on trying to find murderers and rapists.

The investigators and security personnel employed by the mine are essentially private citizens and they can only investigate offences that occur on mine property, after the investigation is concluded the complete case is handed over to the South African Police Service which then has to complete the official proceedings. In contrast to the resources devoted by the State, the private sector is devoting millions of rands to the protection of their non-ferrous infrastructure. The State would have to realise that these cases of non-ferrous metal theft is not ‘petty’ crimes; it is the manifestation of a large-scale pandemic.

**4.4.15 Sentencing of convicted offenders**

In this section the focus is on the 78 offenders that were actually convicted in light of their criminal actions. It examines the types of sentences that are handed down for all non-ferrous metal theft.

According to South African law a suspect has the right to bail after arrest and processing, and for a ‘petty’ crime such as possession of suspected stolen goods, a police officer of the rank of non-commissioned officer or above can grant the applicant bail (South Africa, 1995, p. 2). In most cases the suspect may even be granted the option of paying an admission of guilt fine, upon which the suspect would be released.
In the case of non-ferrous metal theft the charge does not reflect the seriousness of the crime, however. The challenge is that there is no way to differentiate between ‘normal’ trespassing and trespassing with the intent to commit non-ferrous metal theft. The trespasser will have to be arrested with the evidence of their crime in their possession or with the tools and equipment that can only be used for non-ferrous metal theft in their possession for them to be charged with anything more serious than trespassing.

Holding the suspect for an appearance before the court becomes challenging for the police officer in charge of the police office where the suspect is held. However, in the case of the magistrate’s court in the district the participating mine is situated, the magistrate instructed the police that no suspect that was arrested for non-ferrous metal theft related offences might be granted bail unless the suspect appears before the magistrate himself. This has had the effect that the total number of convictions for non-ferrous metal theft incidents increased in this particular magisterial district.

The 78 convicted offenders can be classified into three main groups based on the type of sentence that was imposed on the offender. The first group 8 (10%) received effective prison sentences, the second group 37 (47%) received fines and the last group 25 (32%) were given suspended sentences. One offender was sentenced to correctional service and seven offenders were deported (see Figure 4.20 below).

**Figure 4.20 Convicted offenders: sentences**

Analysis of the composition of the convicted offenders brings to light an interesting phenomenon: 64% (50) of the convicted offenders were employed by the mine and 36% (28) of the offenders were trespassing on the mine when they were arrested for the
copper related thefts based on the total sample of 78 convicted offenders. For clarification ‘mine employees’ include permanent employees of the mine as well as contractors that work with the mine’s permission on the mine premises. In the dataset, 35% of the convicted offenders were employed by the mine and received a fine; a further 26% of the convicted offenders were employed by the mine and received suspended sentences.

Table 4.6 Convicted offenders: sentence by employment type

<table>
<thead>
<tr>
<th>Sentence</th>
<th>Contractor</th>
<th>Mine</th>
<th>Unemployed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nine years’ prison</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Four years’ prison</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Eighteen months’ prison</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Six months’ prison</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Fine - R500 or less</td>
<td>8</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Fine - R501 - 1 000</td>
<td>4</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Fine - R1 001 - 2 500</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Fine - R2 501 - 5 000</td>
<td>2</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Fine - R5 001 or more</td>
<td>0</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Eighteen months’ correctional service</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Deported</td>
<td>0</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Suspended sentence</td>
<td>14</td>
<td>6</td>
<td>28</td>
</tr>
<tr>
<td>Total</td>
<td>34</td>
<td>16</td>
<td>28</td>
</tr>
</tbody>
</table>

When the penalties of convicted mine employees are compared to the convicted unemployed ‘trespassers’, the following becomes clear: If you are an employee of the mine and you engage in any criminal activities that constitute theft and are convicted, you only have a 4% chance of receiving a prison sentence. If it is a first-time offence the chances of going to prison are even less.

Should the suspect stand to be sentenced for non-ferrous metal theft related crime it is a matter of record that the mine employee will receive more leniency in sentencing than a trespasser. Of the 78 offenders that were sentenced by the court for various non-ferrous metal theft related crimes, the mine employed 50 of the offenders. Of these employed convicted offenders, 54% received a fine and 40% received a suspended sentence.

Of the offenders that were convicted, 28 were unemployed. Of these unemployed convicted offenders, 21% received prison sentences, 25% were deported and 36% received a fine. The remaining 18% received a suspended sentence.

4.4.16 Convicted offender profile: non-ferrous metal thieves

Convicted offenders were grouped into categories of employment, race, gender and age to enable the use of cross tabulation to understand the profile of a non-ferrous metal thief. This analysis includes the dataset of all 78 convicted offenders.
NOTE: This profile does not in any way profess that all people falling into the profile groupings have a criminal tendency. This is a breakdown of factual information and is a representation of what actually constitute the offender profile at the participating mine during the period under investigation.

Table 4.7 Convicted offenders: offender profile

<table>
<thead>
<tr>
<th>Race</th>
<th>Gender</th>
<th>Age</th>
<th>Contractor</th>
<th>Mine</th>
<th>Unemployed</th>
</tr>
</thead>
<tbody>
<tr>
<td>African</td>
<td>Female</td>
<td>21 - 30</td>
<td>0.0%</td>
<td>0.0%</td>
<td>1.3%</td>
</tr>
<tr>
<td>African</td>
<td>Male</td>
<td>21 - 30</td>
<td>7.7%</td>
<td>5.1%</td>
<td>2.6%</td>
</tr>
<tr>
<td>African</td>
<td>Male</td>
<td>31 - 40</td>
<td>20.5%</td>
<td>7.7%</td>
<td>15.4%</td>
</tr>
<tr>
<td>African</td>
<td>Male</td>
<td>41 - 50</td>
<td>12.8%</td>
<td>3.8%</td>
<td>9.0%</td>
</tr>
<tr>
<td>African</td>
<td>Male</td>
<td>51 or older</td>
<td>1.3%</td>
<td>3.8%</td>
<td>3.8%</td>
</tr>
<tr>
<td>African</td>
<td>Male</td>
<td>Not specified</td>
<td>1.3%</td>
<td>0.0%</td>
<td>3.8%</td>
</tr>
</tbody>
</table>

The actual numbers of the mineworkers employed by the participating mine were not available for comparison to the numbers of convicted offenders. The analysis is therefore biased and reflects only the profiles of the convicted offenders and not the general criminal tendency of one group over another. To be of use as a security risk profiling tool the number of employees for each age group employed by the participating mine should be determined. This data can then be used to supplement the original dataset and valid conclusions can be drawn from it with relation to the risk individual categories of employees pose to the company. This however did not fall within the scope of the current study.

The lowest number of convictions for crimes relating to non-ferrous metal theft was in the group African Female between the ages of 21 and 30 (1%). The group with the highest number of convictions for non-ferrous metal theft related crime is African Male Contractors between the age of 31 and 40 (21%), followed by the group African Male Unemployed between the age of 31 and 40 (15%). The group with the highest number of convicted offenders of non-ferrous metal theft related crime is African Males between the age of 31 to 40 (44%) followed by the group African Males between the age of 41 to 50 (26%).

The demographic group that are most at risk of becoming involved with non-ferrous metal theft is African Males between the ages of 31 and 40. From a threat analysis perspective this is a significant indicator during offender profiling. Preventative measures must be aimed at this demographic group in an effort to create awareness and reduce the risk of the employee becoming involved in crime.

4.5 SUMMARY

The mining industry in South Africa is particularly vulnerable to any disruption in the electrical supply to underground operations. The main reason for this is the depth of the mines in South Africa, where mineworkers are required to work thousands of meters
underground in extremely hazardous circumstances. Traditionally, non-ferrous metal, and in particular the theft of copper cabling, was not an issue the mine had to concern itself with, but since 1990 the incidents have increased dramatically.

The continuous and well-planned attacks on vulnerable infrastructure exposed the vulnerability in the design of the mining operations and led to the strengthening of security measures to counteract the threat on the mines’ premises. However, the threat continues outside of the perimeter fence of the mine where other entities own the land crossed by high voltage power lines and where substations are located. The mine cannot protect all these points of vulnerability and, at some point, the security division will not be quick enough to respond or the intelligence and informer network of the mine would not obtain the necessary information timeously and this will result in the tragic demise of tens if not hundreds of hardworking mineworkers earning a living deep under ground.
Chapter 5

Preventing non-ferrous metal theft

5.1 INTRODUCTION

The prevention of non-ferrous metal theft is a key priority to the participating mine as well as other mines in the area in which the participating mine is situated. The participating mine modelled its crime prevention strategy on the strategy document made public by the South African Government (Department of Safety and Security, 1996) but it expanded the concepts to be applicable in situations where civilian intervention is a more appropriate strategy. The private sector, as is the case in many instances, had to take matters into its own hands, whilst remaining within the confines of the law, to protect its assets and the lives of its people.

The protection of assets before they become targets of criminal activity is the main responsibility of the security managers of the mine. This approach would require a complete mind-set change from a reactive approach to a proactive threat identification principle. It would also become more important for mine security to ‘borrow’ methodologies and initiatives from other sectors not traditionally considered part of the security or the mining sector. This could include research areas such as CPTED (Crime Prevention Through Environmental Design), international situational crime prevention strategies, and studies that may shed light on future crimes and how they might be combated.

Crime prevention strategies are not new to the security industry. In the last century the study field has become more prominent as traditional burglar bars and locks became ever more redundant. The new understanding of crime prevention strategies relies not only on the ways and means of preventing criminals from committing crime by placing physical barriers between them and their targets, it also takes into consideration the criminal mind-set in reflecting on the way in which they would approach the target. Advocates of this approach design programmes and interventions that are intended to intercede in lives of prospective criminals and through such interventions attempt to reduce contributing factors that might lead to criminality. In principle this is a more holistic approach, which increases the scope of the prevention programme to include not only the effects of the crime, but also the root causes.

5.2 CRIME PREVENTION MEASURES

The participating mine closely follows the guidelines and principles of the South African National Crime Prevention Strategy (NCPS) (Department of Safety and Security, 1996) in an attempt to complement the efforts of the South African Government to curb crime.
The mine’s crime prevention strategy is based on three of the four pillars of the NCPS, namely reducing opportunities to commit crime through smart environmental design; the introduction of social upliftment programmes in the mining communities surrounding the mine; and support of the criminal justice process. These are discussed below.

• *Reducing opportunities to commit crime:* The first responsibility of the participating mine was to secure their mining operations through target hardening by erecting improved boundaries and reducing the attractiveness of its property to criminals according to Net et al. (2000, p. 79). In practice the participating mine deployed security measures such as access control systems and procedures as well as crime prevention through environmental design (CPTED) principles. CPTED is a combination of factors that are built into the initial site development process as explained by Crowe (2000, p. 1) and Napier (1998, p. 40), in this instance, the mine. For example, old access shafts into the current mine were sealed with concrete to prevent non-ferrous metal thieves from gaining easy access to the mining operations. The physical hole is also put under observation and the grass surrounding it is cut, thus preventing prospective non-ferrous metal thieves from gaining access to the area unnoticed. In addition to these largely reactive measures, the mine engineers and architects consulted the safety and security departments of the mine during the design and development of new areas in an effort to prevent crime before it occurs.

• *Introducing social upliftment programmes:* The second pillar the mine uses is the development and rollout of social upliftment programmes in the communities where the mines are situated. The mine assists communities with the development and construction of schools, hospitals, clinics, and other infrastructural development. In addition the mine continuously presents skills development projects and training workshops where miners and community members can improve their skills, which would contribute to them securing jobs either within the mining sector or other areas of employment.

• *Supporting the criminal justice system:* The third pillar of the crime prevention strategy followed by the mine is the active involvement in the criminal justice process through participation in community-based law enforcement committees and by supporting law enforcement in their efforts to disrupt the trade in stolen non-ferrous metals. The participating mine is also a supporter and committee member of the Non-Ferrous Theft Combating Committee (NFTCC).

These crime prevention methods complement one other. They serve to highlight that crime prevention strategies need not be limited to specific activities, but that any action may be construed to form part of an integrated crime prevention strategy. The intended action must however be evaluated against the background of effectiveness and the
chance to determine whether the action is achieving its intended goal, to be considered as part of the crime prevention strategy.

In this section crime prevention methods and approaches currently employed in South Africa by roleplayers among such as the SAPS and the security industry in general will be examined. The methods were evaluated to determine their successes and failures in the context of national non-ferrous metal theft prevention and the situation at the participating mine in particular.

5.2.1 Overview of the South African National Crime Prevention Strategy

In 1995 the former President Nelson Mandela raised concerns about the criminal onslaught on South African society at the opening of Parliament (Mandela, 1995). The President strongly criticised the situation in which South Africans are continuously subjected to, among other crimes, theft. He called on Government and citizens alike to ‘take the war [on crime] to the criminals [and to cease to be] sitting ducks’ (Mandela, 1995, p 1).

Since 1995, and in response to this speech, various ‘crime prevention plans’ were developed, partially implemented, implemented, and finally abandoned. One of the ‘new’ crime prevention strategies required the redeployment of police personnel and the restructuring of specialist units. The motivation for the change - offered by the SAPS management - was that it detectives with specialised investigative skills and experience would be deployed at station level and that the restructuring was an effort to reinforce the struggling detectives at station level. This plan, as most of the others, did not have the desired effect – there was no significant reduction in crime and in particular violent crime. In some instances, such as precious metal theft, the sudden vacuum created by the departure of experienced detectives had an adverse effect on the effectiveness of the police.

Clearly, therefore, South Africa needs another kind of crime prevention strategy. Donziger’s (1997, p. 198) comments on American criminal justice practices are mirrored by the situation in South Africa. He made the point that as crime prevention and crime reduction plans fail, more, similar policies are developed which in turn also fail. This process culminates in higher prison populations, more expenditure on the justice system, longer sentences, and mandatory minimum penalties, which in turn leads to a greater burden to society that has to fund the prison population. And when everything is said and done, the crime rate, if considered in the context of increased expenditure, does not reflect a significant reduction. This begs the question: Why is there no evidence of a significant reduction in crime since 1995 after almost two decades of crime prevention policy implementation? This should be a clear indicator that current policies do not
address crime effectively and that a completely new and possibly radically different strategy has to be designed.

5.2.2 Crime prevention and non-ferrous metal theft

Drafting of the South African National Crime Prevention Strategy (NCPS) started in May 1995. The drafting committee was an inter-departmental strategy team consisting almost entirely of civilian officials (Rauch, 2001, p. 1). This committee was tasked with drafting a long-term crime prevention strategy. The intention was to address the root causes of crime and did not limit itself to addressing the outcome of criminal behaviour. The drafting committee’s intention was for the NCPS to function in parallel with the SAPS’s Community Safety Plan, addressing both the long and short-term requirements of crime prevention, while complementing each other.

5.2.3 Key NCPS non-ferrous metal theft combating concepts

The first is the acknowledgement that crime cannot be reduced through law enforcement and criminal justice responses alone. The drafters of the NCPS acknowledged the futility of increased expenditure on criminal justice if the root causes were not addressed. They reiterated the need for a concerted effort by the State to introduce other methods of crime prevention in addition to the usual criminal justice responses. This is a key concept that has not been pursued to its full effect by the State and the result of this neglect may be beginning to manifest itself in the form of non-ferrous metal theft.

This deduction is supported by the revised theory on social control put forward by Miethe and Meier (1994, p. 2) and supported by Sampson and Wilson (1995, p. 54). The revised theory proposes that economic hopelessness; land-use transition, residential mobility, cultural discord, low local ownership, family instability, institutional unsteadiness, and similar concepts are contributing to a dysfunctional societal network. Factors that promote crime, according to Rice (2003, p. 5), are the lack of primary relationships, high levels of anonymity, low organisational participation, weak social bonds, lack of supervision, absence of social cohesion, and lack of consensus in the community. The mitigating factor in the struggle against institutionalised criminality is a strong social structure that nurtures a sense of belonging and entrenches the concept of social responsibility.

The second factor is the acknowledgement that the criminal justice system will not be able to function effectively unless departments make a principled and continues effort to guarantee co-operation between the different components of the criminal justice system. An analysis of crime and sentencing patterns in this study leaves no doubt that the criminal justice system and all the departments forming part of the system are not co-operating in an effort to address non-ferrous metal theft. Departments are unwittingly
working against one another and are consequently undermining one another’s efforts to address non-ferrous metal related crime.

The third factor is the realisation that Government cannot deal with crime on its own. The three tiers of Government have to work with each other and - crucially - with civil society to combat crime. The NCPS conceptualised the fact that there cannot be 'social crime prevention' if there is no co-operation between society and Government. The bane of non-ferrous metal theft is affecting everybody, rich and poor alike.

Several other factors were named in the NCPS that can, if applied properly, have a positive impact on crime in general and non-ferrous metal theft in particular. But as Standing (2006, p. 188) concluded: crime represents a sore on the body that is society. The sore may become infected to the point where it would represent a serious threat to the wellbeing of the body. However, if the physician only focuses on the sore and ignores the underlying disease, the patient will not heal and the condition will become dire.

To date, efforts to implement the NCPS have not yielded any significant results and there is no clear indication that it would be implemented in the near future. The victims on non-ferrous metal theft should look at this failed process and understand that the current strategy followed by them is bound to achieve similar results if the scope is not broadened to include wider crime prevention and a collaborative crime combating strategy.

5.2.4 The South African Police Service’s strategic plan (2005–2010)

The purpose of the SAPS’s strategic plan for the period 2005-2010 (the period under investigation in this study) was to attain the goals determined by the Justice, Crime Prevention and Security (JCPS) Cluster (South African Police Service, 2005, pp. 25-26). The strategic plan was in line with the Government’s Medium Term Strategic Framework for the next decade with the caveat that the plan would be reviewed annually in line with the Government’s policy and direction. According to the 2005-1010 plan the JCPS Cluster would have focused on reinforcing the rule of law and enhancing national security. These two broad terms were subdivided into several elements.

The concept of the rule of law in relation to non-ferrous metal theft was looked at. The spirit of the strategic plan and the original 1995 commitment to ‘take the war [on crime] to the criminals’ (Mandela, 1995) were examined in the context of the effects of non-ferrous metal theft on South Africa.

5.2.5 Improving the integrated justice system

Considering the discrepancies found in sentencing during this study there is definitely a need for better co-ordination in the criminal justice cluster with regard to the handling of non-ferrous metal theft cases. The discrepancies start with the initial arrest and in many
cases the subsequent option of the payment of an admission of guilt fine, which is provided by the police official at the police office. This is in direct opposition to the police office close to the participating mine where the instruction was issued that no admission of guilt would be entertained by the presiding magistrate for any non-ferrous metal theft case. All these cases will need to be place on the court roll and the defendant must appear in court (A001, 2006).

5.2.6 Reducing contact crime levels

Reducing the levels of crime is a key component of the process of making South Africa safer for all. Regarding non-ferrous metal theft it would seem that Government is able to pre-empt the inevitable violent criminal activity it is becoming. By acting decisively and quickly non-ferrous metal related crime could be managed and to a large extent eradicated. Taking into account the violent death of an SANDF captain who ‘was part of a group patrolling the area around the base in an effort to curb incidents of cable theft’ action is needed urgently (News24, 2008). Non-ferrous metal thieves are arming themselves and they are not afraid to shoot at well-armed military patrols to protect their loot. Should the violence become a trend, the most vulnerable defenders of national infrastructure would be private security guards.

The Johannesburg Metro Police is not much better off. In June 2007 they had to shoot a suspected non-ferrous metal thief after being shot at (Cape Times, 2007). Fortunately the criminal was only wounded in the hand and no police officer was injured. SAPS members are also threatened by the escalation in violence related to non-ferrous metal theft. Superintendent Khoabane (SAPA, 2008) said that the police members were shot at from a suspect vehicle. They returned fire killing one occupant and arresting seven others. In the vehicle the police discovered copper to the value of almost R40 000.

5.2.7 Addressing organised crime

Organised crime is recognised as one of the most urgent crimes to be addressed by all levels of government and by the SAPS in particular. This is commendable but difficult to accomplish in an open market system. Non-ferrous metal related crime is however one of the areas that can be easily controlled and monitored. It is relatively easy to determine losses to criminals and because of the bulk of the product, it is difficult to hide which the potential for detection and recovery. In fact, non-ferrous metal theft has graduated from subsistence crime to organised crime (Schuitmaker in Morris 2007; Pillay-Van Graan in Venter, 2008).

In 2007 National Police Commissioner General Jackie Selebi supported this conclusion in a statement to Parliament that a syndicate was behind the thefts of non-ferrous metal
and that those thieves were deliberately trying to slow down the country’s economic growth (Ndzenze, 2007).

Organised crime in itself poses a threat to the economic stability of South Africa and crime syndicates have raised the stakes. Never has the need for concerted effort to eradicate non-ferrous metal related crime been so great as in the City of Cape Town where an ‘alarming trend is emerging in which children as young as 11 are being recruited by crime syndicates to steal cable and vandalise municipal facilities. This juvenile should be protected from himself and urgently be put in a place of safety for juveniles’ (City of Cape Town, 2007). Unscrupulous organised crime syndicates have discovered an unending supply of willing accomplices that would risk life and limb for an insignificant amount of money – and they are exploiting the situation.

5.2.8 Prioritising drugs and substance abuse

One of the main concerns for South Africa of the future is drug and substance abuse among children. It is imperative that the SAPS focus on the reduction of this crime. One area that has to be prioritised is the addicts’ source of funds to sustain drug addiction. For example, children in Cape Town source for funding for their drug addiction from stealing and selling electrical cable, according to Mayor Helen Zille (Mail and Guardian, 2007).

5.2.9 Reducing the incidence of illegal firearms

The security services and private security companies are at the mercy of armed criminals. Criminals are in the position to shoot at security personnel should they decide to do so, but security personnel can only react once shot at. Security personnel are therefore always vulnerable and at a tactical disadvantage. Cable thieves are becoming more violent and there have been more incidents of unlicensed firearms being found in possession of suspected cable thieves. In Limpopo, for example, the police arrested five suspects for the theft and possession of copper cables and electrical wires (Ramatseba, 2007). The group also had an unlicensed 9 mm pistol in their possession.

5.2.10 Reducing overcrowding in prisons

The reduction of overcrowding in prisons must be a priority in any society. The longer people stay incarcerated the longer they are a burden on the rest of society. What Not more prisons or more staff are needed, but better rehabilitation programmes to keep offenders out of prison after they have paid their debt to society. Altbeker (2005, p. 27) made the point that if the number of prisoners continued to rise at the 1998-2005 rate, the Department of Correctional Services would barely be able to maintain control over the prison population. Overcrowding would leave incarcerated juveniles vulnerable to
recruitment by gangs in prisons and outside, which would in turn lead to more imprisonments.

With regard to non-ferrous metal theft better social cohesion is the key and the possibility of building a future, not more prisons. In this regard the criminal justice sector will have to work with other government departments to increase societal awareness about the effects of non-ferrous metal theft.

5.3 COMMUNITY CRIME PREVENTION

The concept of community crime prevention in South Africa is in line with the National Crime Prevention Strategy (NCPS) developed and led by the Department of Safety and Security. Community crime prevention is difficult to define because it is more of a strategy than a definable word. As a working definition the following will have to suffice:

Community crime prevention is any action that prevents crime and violence and reduces the public fear of crime; it is a tool that brings together roleplayers from different backgrounds to contribute to the crime prevention process. It serves the community by developing local partnerships in the fight against crime and serves as a method to coordinate local crime prevention initiatives. The process followed by community crime prevention also serves an analysis purpose to identify high-priority areas and to distribute resources to combat crime (Nel et al., 2000, p. 1). The mining industry, and in particular the participating mine, has to consider the possibility that their current situational crime prevention approach is not effective in preventing non-ferrous metal theft. The measures taken, do not deliver the results that would be expected from the application of a target-hardening philosophy.

Situational crime prevention strategies should not be discarded; community crime prevention approaches should be developed to complement the policies already in place. This process can be relatively uncomplicated. The strategic team should approach the crime that is a problem for the mine logically and systematically to understand it as well as possible. The needs that are identified can be addressed through focused programmes and the effectiveness of the programmes should be evaluated after implementation to determine if all the problems were addressed. This process is circular in nature and does not have an endpoint.

However, no standard crime prevention programme will work under all circumstances and in all communities. Every community will have to develop a programme that addresses its own needs and requirements (Nel et al., 2000, p. 3). Strategists developing community crime prevention programmes have to consider three factors contributing to the causes of crime. The victim, the offender and the location of the crime all contribute crime, in this instance non-ferrous metal theft. For the community crime prevention
programme to be successful, these three factors and their impact on one another have to be addressed by the strategy. In addition, it should be kept in mind that very few crimes are committed at random or on the spur of the moment. In many cases the offender carefully considers the place and time before the act is committed (Landman & Liebermann, 2005, p. 21).

In the discussions below several components of community crime prevention are discussed independently from one another. This silo type of approach is followed deliberately because it reflects what is happening ‘on the ground’ where several community-based groups and even some government departments work independently in trying to address non-ferrous metal theft. This theme is carried through to provinces. The only co-ordinating body, to some extent, was Business Against Crime (BAC), but they followed a more research like approach where their partners’ data were collated into reports to show how big the problem was. BAC also played a role in the development of the ‘new’ Second-Hand Goods Act, 2009 (Act No 6 of 2009) along with industry roleplayers such as the Metal Recyclers Association (MRA) and the Non-Ferrous Theft Combating Committee (NFTCC).

5.3.1 Non-Ferrous Theft Combating Committee

The NFTCC was formed in 1993 to address non-ferrous metal theft. Its membership has fluctuated through the years with notable organisations such as BAC, the SAPS, Eskom, Telkom, and Transnet at the core of the committee. Other members from the metal recycling industry, the mining industry and corporations such as City Power from time to time worked with the committee.

The NFTCC formulated the following strategic position: ‘The NFTCC is an integrated body of key role-players that provides strategic guidance and direction for the process of prevention and eradication of theft of non-ferrous metal so that quality of supply of strategic services can be ensured to the benefit of all the people in South Africa’ (Telkom SA, 2011).

Through its work the NFTCC identified several key factors that contribute to the growing number of non-ferrous metal theft incidents each year. These factors are the increasing number of illegal immigrants that are desperate to earn any type of income, whether through legitimate means or through crime, as well as the ever-increasing number of unemployed men and women that have to make a living in some way and the increasing involvement of organised crime in the large-scale non-ferrous metal theft ‘business’. Organised crime is fuelled by the increasing demand for non-ferrous metal from the international markets and their involvement is facilitated by the lack of proper legislation to control and regulate their activity. A final factor is the ineffective sentencing criteria for
second-hand goods theft under which non-ferrous metal theft has to be prosecuted (Telkom SA, 2011).

The NFTCC is a voluntary forum and has to compete with the business priorities of industry. This creates an environment in which members are not fully committed and without the dedicated support of the SAPS cannot act in a concerted effective manner. There is also the challenge of funding the committee and to obtain funds for collaborative crime prevention efforts. This state of affairs is disappointing, because from a community crime prevention perspective the NFTCC has the opportunity to contribute significantly to the efforts against non-ferrous metal theft on a national and regional basis.

5.3.2 Action plans against the illicit market

Asset protection - especially the protection of high-value non-ferrous metals - is becoming a growing concern for the mining industry in South Africa. Historically, precious metal thieves targeted mines, but recently the focus has shifted to scavenging of metal. This changed the profile of the perpetrator from a person that needed to have access to the precious metal product at any stage during the mining process to a perpetrator that only needed an access point to the mine’s property. Consequently asset protection measures and the target hardening called for by traditional security approaches became redundant or just too expensive to implement on the scale required to combat the non-ferrous metal theft threat.

This change in the profile of the perpetrators calls for a change in the approach to asset protection. Mine security divisions will have to adapt the traditional approach followed in the protection of mine assets to one designed for the protection of fast-moving consumer goods (FMCG). This represents a radical change in the way security approached their task and will require a rethink of the methodologies deployed by the security divisions.

FMCG are defined as products that can be sold quickly and at low cost. The profit made from FMCG lies in the volume of goods sold and not in the sale of a single item. If this concept is applied to the non-ferrous metal theft ‘business’, it is clear that thieves focus on the volume of ‘goods’ they sell to the scrap metal industry. In a few cases large amounts of non-ferrous metal are stolen. This, however, is the exception and not the rule. Theft mostly takes place on small scale and the thieves are indiscriminate of what is taken and how it is obtained.

The non-ferrous metal scavengers are at the bottom of the organised crime pyramid and are able to subsist on the cumulative income from multiple small transactions. Categorising non-ferrous metal theft as FMCG theft is a break in tradition, but the way in which the non-ferrous metal theft ‘industry’ is structured lends itself to the application of the preventive and reactive strategies already existing in the FMCG industries.
FMCG amount to a large portion of end-users’ expenses worldwide (Çelen, Erdogan and Taymaz, 2005). The study did however not take into account the pressure on manufacturers of FMCG to develop and produce more and better goods for consumption by consumers. The manufacturers of FMCG have to acquire raw materials to produce the consumables demanded by growing societies. These growing societies also need raw materials to continue their development. All these pressures contribute to the worldwide demand for inexpensive non-ferrous metals. Demand has seen unprecedented growth in the metal recycling industry worldwide, which in turn contributed to the continued existence and expansion of the illicit market for stolen non-ferrous metal. The interesting fact about illicit non-ferrous metal is that it is both an FMCG in the initial stages before it is incorporated in the legal non-ferrous metal market, and is also used to manufacture FMCG.

5.3.3 Action plans to combat the non-ferrous metal theft threat

Mining security can, with relative ease, incorporate the principles applied to counteract FMCG theft into programmes designed to combat non-ferrous metal theft. Gill (2004, p. 5) completed an impact study on the illicit marketing of stolen consumer goods and found that the responses to the theft of FMCG rely on a few basic principles. The first is that there must be an investigation of each incident and the investigation should not stop at the crime scene. In the case of the mine the investigation must be followed through to the buyers and resellers of the stolen non-ferrous metal. The public, the Ministry of Safety and Security as well as the Justice Department must be educated, and training provided as to the extent of the threat. This should include the identification of stolen non-ferrous metals by police and customs officials. Industries threatened by non-ferrous metal theft have to work tirelessly to influence industries such as the second-hand goods industry, the metal recycling industry and retailers that sell high-value non-ferrous metals to implement stricter control mechanisms to prevent the unlawful acquisition of stolen non-ferrous metals. The co-operation and participation of the retail industry when purchasing products made from non-ferrous metals must be obtained. Consumers must be sensitised to the threat and scale of non-ferrous metal theft and they must insist on only purchasing goods that were manufactured from materials that were acquired from accredited sources. This process would contribute significantly to the continued effort to eradicate the illicit trade in non-ferrous metals.

5.3.4 Self-regulation of the metal recyclers industry

Considering that the materials are in different stages of manufacturing and destruction, ranging from raw metal to disused goods, the industries relying on non-ferrous metals can investigate the possibility of broadening the self-regulatory framework relating to the recycling of non-ferrous metal to include a certification scheme similar to the Kimberley
Process Certification Scheme (Kimberley Process, 2013) that regulates the diamond trade. Fifty-four participants representing 80 countries are party to the agreement, with the European Union and its member states counting as a single participant. The main purpose of the agreement is to allow the participants to certify that diamonds are ‘conflict-free’.

Non-ferrous metal users and suppliers can establish a similar process whereby the supplier is required to certify that the materials that are delivered to the manufacturers are ‘illicit trade free’. Agreeing to sanction the supplier if it is proven that the certification was false or that the supplier did not follow the proper verification procedures before certifying the material can strengthen the agreement. This approach will contribute to the eradication of non-ferrous metal theft if all the parties in the non-ferrous metals chain participate in the process, from the first scrap metal dealer who buys the recyclable metal from the initial seller to the manufacturer that produces a product for commercial consumption.

5.3.5 Restrict the supply of non-ferrous metal

The mines, in this instance, have to reduce the volume of non-ferrous metal available to scavengers. Large-scale clean-up operations have to be conducted that would limit the volume of metal attracting scavengers to the mine’s property. This process would contribute to reducing the attractiveness of the target. Scavengers would then have to escalate the planning and execution of their operations to a level where more time and preparation is required to achieve an adequate return on investment. This process would probably be the most effective starting point in the fight against non-ferrous metal scavenging in the case of the participating mine and companies with similar locations and circumstances.

In addition, this would also have the effect that most of the opportunistic scavengers would be eliminated and the security divisions would be able to focus on larger-scale organised crime groups. In this escalation process the mine will have to accept that criminals would also escalate the degree of violence that would accompany an attempted theft. Security will have to plan for armed resistance during raids on the thieves. Asset protection analysts continuously assess the vulnerability of non-ferrous metal on the mine’s property. The task is relatively easy because an indicator of the non-ferrous metal most at risk is the number of attacks on assets in a specific area.

The products can be measured against the CRAVED principle developed for the FMCG sector. The CRAVED acronym sums up the attractiveness of products to the illicit trade industry. If products are easy to steal because they are Concealable, Removable as well as Available to the thief and the products also happen to be Valuable, Enjoyable and Disposable, they will attract significant risk.
Continuous research to assess the relative risks affecting different products is needed and should focus specifically on the threat to non-ferrous metals that cannot be moved to more secure locations. Once the items that attract the attention of non-ferrous metal thieves are identified, these products can be secured more effectively. Staff from the asset protection divisions as well as operational personnel can be trained to be more proactive in asset protection. Mining staff as a unit has to realise that the protection of non-ferrous metal has become the responsibility of all mine employees, if the mine is to stay in production. Awareness raising is a critical factor in the reduction of non-ferrous metal losses. Employees need to know which non-ferrous metals are most at risk and what techniques are used to steal them. Continuous evaluation and research into the effectiveness of security measures and the vulnerability of non-ferrous metal products will lead to improved asset protection procedures.

5.3.6 Commercial non-ferrous metal buyers

International pressure to deliver base metals such as non-ferrous metals at low cost to countries with growing economies such as China is resulting in a situation where large-scale commercial scrap metal buyers and recyclers are tempted to turn a blind eye to the origin of the non-ferrous metals they purchase. The scrap metal industry is well aware of the fact that stolen goods taint much of the purchased metals. The challenge is how to regulate the practice of non-accountability for purchasing goods of stolen origin. Large commercial recyclers point out that the recycling industry is a multi-billion dollar industry that employs hundreds of people and delivers a service to the community by removing scrap metal. This is an admirable claim and it is not contested that the overwhelming number of scrap metal recyclers are trying to reduce the volume of non-verified material they are buying. These recyclers can however not provide the community with adequate control measures and assurances that they would be protected from being exploited by thieves stealing unsecured metal objects.

5.3.7 Metal Recyclers Association

The South African Metal Recyclers Association (MRA) (Metal Recyclers Association of SA, 2013) claims a membership of more than 100 metal recyclers and dealers. The association states that its members are responsible for the recycling of more than 80% of all the scrap metal in South Africa.

5.3.7.1 Code of conduct

The MRA states that it holds its members to a strict code of conduct, which is:

• To strive to promote and improve the image and standards of the Metal Recyclers Association of South Africa.

• To provide the highest level of service to customers.
• To trade in an ethical manner according to accepted business practice.
• To provide safe and pleasant working conditions for employees.
• To uphold the concept of free enterprise and service to the community.
• To act in accordance with current legislation relating to the trading of scrap metal and to promote the protection of the environment.
• To avoid purchasing or handling materials suspected of having been stolen.
• To co-operate with and support all persons in an endeavour to stop unlawful practices.
• To supply all material in accordance with accepted international standards.
• To gain respect for the industry at all levels - local and international.

The members of the MRA have to join victims’ efforts to eradicate non-ferrous metal theft (Metal Recyclers Association of SA, 2013). They should not only pay lip service to the cause but should also take a stand against illicitly acquired non-ferrous metals of all kinds. Scrap metal dealers have to be made aware that in buying illicit non-ferrous metals they are directly contributing to the existence and growth of the illicit network of non-ferrous metal thieves. All metal merchants should realise that their businesses will become the next targets of non-ferrous metal thieves as soon as other sources of non-ferrous metal become too difficult to attempt to steal from. This would impact directly on the profitability of their businesses. The industry must investigate the actions of commercial non-ferrous metal recyclers and buyers suspected of purchasing illicit goods and co-operate to prosecute these individuals.

5.3.8 Illicit traders and thieves

The drivers of the illicit network are far too strong to be tackled by moral exhortation alone - there will always be unscrupulous individuals that are motivated by greed and the possibility of getting rich quickly. Illicit networks exist throughout the world, but the nature of relationships within the illegal market system is likely to vary widely and according to cultural context and national laws. Despite this, there are techniques that can be universally applied. Some illicit non-ferrous metal retailers operate openly in the (often justified) belief that the illicit origins of their stock cannot be proven. One way of countering to this is to apply technology to track and trace the movement of goods into and through the illicit network. This would facilitate ‘sting’ operations to recover stolen stock and undermine trust between illicit traders. Following major instances of theft, the industry needs to investigate the routes through which the stolen stock is dispersed. Such investigation will also inform sting operations and further alarm illicit traders. This will encourage some to desist.
5.3.9 Physical sites

Illicit traders need to meet with each other and with prospective purchasers to buy and sell goods. Traditional venues are physical markets which may be entirely illicit or, more often, semi-licit or with the appearance of complete legitimacy. Action is required to raise awareness of illicit activity in legitimate sites, thereby motivating concerned proprietors to ban illicit traders. Owners can be influenced by the FMCG industry, perhaps through intermediaries such as regulatory bodies, to adopt and enforce codes of practice to disrupt and drive out illicit trade, and publicity can be given to such action. Legitimate markets should be encouraged and the public needs to be educated about where they can be sure of buying licit goods and where they are risk of being sold counterfeit or stolen products.

5.3.10 Internet sites

The extent to which operators of Internet metal auction houses are willing or able to prevent the sale of illicit goods online is unknown. Therefore an audit of what powers and obligations exist is urgently required. Metal auction houses could be influenced by the industry to impose controls or to make use of any powers that already exist, and any precedents created by such action should be collated. The industry could also work to develop protocols to govern the acceptance by Internet sites of goods for sale and influence sites to adopt them.

5.3.11 Consumers

Offered a bargain, many consumers are unable to resist the temptation to purchase illicit stolen goods. The problem for the industry is that it is not obvious to consumers that buying stolen goods causes real harm. Addressing this challenge requires industry to educate consumers perhaps through the publication of appropriate media reports and articles. The articles should focus on the scale of the illicit non-ferrous metal theft network and its links with terrorism and drugs. At the same time legitimate traders should be supported by assistance with advertising and measures to improve customer loyalty. The benefits of buying from reputable sources, such as the availability of warranties and other consumer rights, have to be stressed.

5.3.12 Politicians and law enforcement

Governments, their agents (such as trading standards enforcers) and regulatory bodies may have the power to disrupt illicit trading, but they need to be persuaded that such action is a priority. The same publicity used to influence consumers not to buy illicit goods is useful in persuading the authorities to use their existing powers or to create new ones. Governments are particularly responsive to threats at the macro-level, such as
terrorism, and the links between the illicit market and such threats need to be emphasised.

5.4 CRIME PREVENTION THROUGH ENVIRONMENTAL DESIGN

Crime Prevention Through Environmental Design (CPTED) has been explained by Crowe (2000, p. 1) and Napier (1998, p. 40). They concluded that the incidences of crime can be reduced and the quality of life improved if the design of structures and use of appropriate building materials were considered in project design. Napier further theorised that the implementation of appropriate measures aimed at the reduction of the factors that lead to crime and the opportunities to commit crime will lead to a reduction in the fear of crime which in turn will improve the quality of life.

In the case of the mining sector the security division would have to become more involved in the initial layout and design of mining operations. Security specialists have to consider the crime situation that can be anticipated at the mining operation currently and in the future. By not only focusing on the process flow from an efficient production point of view but also taking asset protection into consideration, safety and security can become a cost-saving component of new mining operations. In the initial development of new mining sites as well as the redevelopment and upgrading of established sites, security experts can assist by making suggestions that would mitigate some of the inherent threats the mine will have to cope with in future. This approach will contribute to the process of crime prevention even before the criminals have an opportunity to observe the mining operations and plan future attacks on the mine.

5.5 EFFECTIVENESS OF CURRENT PREVENTION STRATEGIES

Evaluation of current crime prevention strategies is a crucial component of the development of new and better strategies for the future. Evaluation is however also the most overlooked and underrated component of most crime prevention strategies currently and historically.

5.5.1 Evaluating prevention strategies

The first step in the evaluation process is to determine what is meant by the term evaluation and how evaluation was implemented in the field of crime research. There are many texts and significant bodies of research on evaluation research and one of these suggests the following working definition: the evaluation of crime prevention programmes should be designed and developed based on the 'planned, organised or systematic collection, collation and analysis of data at every stage of its development' (Dixon, 2002, p. 90). Not only should the focus be broadened from the impact of the programme, but an evaluation should include the thought or conceptualisation process that led to the programme as well as how those thoughts and ideas were operationalised.
and developed into a plan of action and implementation. The last component should be an evaluation of the plan to determine how and if the plan were implemented and if the implementers followed the plan. The importance of strategy and action evaluation cannot be over-emphasised in the context of the mining industry. The security division in support of and in collaboration with the safety division must look at the protocols and procedures that are in place to protect mineworkers from crime and more specifically from non-ferrous metal crime. The main concern that needs to be addressed by the mining community is how a mayor safety concern and possible disaster can be prevented by a concerted effort of both the safety and security departments.

Several questions need to be asked by the mine, starting with: Is the non-ferrous metal theft prevention project well conceptualised? This is a crucial question and it must be answered openly and honestly. If the crime prevention strategy is based on an incorrect assumption, not much can be changed and the implementers will not be able to achieve the results envisaged by developers of the strategy. This is also one of the areas that has to be revisited continuously throughout the process for the first indication that the concept - although sound at the time of conceptualisation and development - may have become unsound as a result of new developments or a significant change in the environment. This would be the case where the mine designed its security procedures and protocols to prevent precious metal theft. The initial focus was on the protection of small quantities of high-value product that might be removed from high-security areas within the most secure areas of the mine. Not much consideration was given to the protection of relatively low-value infrastructure. This perception and potential lethal oversight has only surfaced in recent times and the mine realised that previous unprotected infrastructure is crucial for the continued smooth running of operations. The mine also realised that the infrastructure is located in areas that are difficult to secure and protect.

The next question relates to the design of the prevention strategy, or project. It requires the team to consider whether the design of the crime prevention strategy is sound and whether the concept was broken down into an executable set of activities and measures. When the above two points have been established the question becomes whether the crime prevention project is being implemented according to the design that was decided upon and whether the activities planned are being executed to schedule. The fourth topic to question is whether the programme has achieved the desired impact.

This process of evaluation can contribute to the mine’s overall crime prevention strategy and would force the strategists to consider the long-term effects of crime prevention. When addressing crime such as theft in a hazardous working environment, no action should be taken without the collaboration of the health and safety department of the
mine. For instance a security manager may have a problem with an unsecured door, making it difficult to control access. For the safety manager the solution may be to chain and padlock the door, thereby solving the access control problem. The safety officer may have determined, however, that that particular access point is a crucial exit point in case of an emergency evacuation. This conflict should have been resolved when the security plan was designed before actions were planned and executed.

The point being made is that evaluation of crime prevention work is an indispensable part of crime prevention programmes. The evaluation process must be based on extensive information gathering and assessment procedures from the start of the crime prevention programme.

5.6 SUMMARY

The mining industry is investing millions of rands in the protection of its assets. The worrying factor is however that expenditure on asset protection is not focused on the primary product mined at the site but to protect infrastructure that a mere 15 years ago would not have merited a second thought from either the security personnel or the thieves.

This means that the motivation behind the crime has changed and that it has become a lucrative business to harvest non-ferrous metal from every possible source. These factors should be taken into account by the mining industry and, even more so, the SAPS during their investigations. The metal recyclers industry should also be approached to mitigate the risk of stolen product being moved through their networks.
Chapter 6

Conclusions

6.1 FACTUAL CONCLUSIONS

Because so little is known about the mining industry and the way it operates, the possible consequence of non-ferrous metal theft at South African mines is largely unknown to the general public. To the man in the street, mines merely represent a limitless source of riches allowing access to only a few well-heeled and well-connected individuals.

The study examines the threat posed by non-ferrous metal theft and does not focus on the loss of the mine’s product. The main area of concern was the threat posed by non-ferrous metal theft in its various forms, ranging from theft of electrical copper cable to theft involving infrastructure such as buildings, fences and bridges. In addition, the areas where the mine was most vulnerable were identified and investigated to identify the threats facing the mine and to determine whether the threats can be managed in such a way that fatal accidents can be avoided.

The results of the study indicated that theft is indeed one of the most prevalent crimes on the mining site. It also indicated that the threat posed by the theft of the mine’s product is less important than the threat posed by the loss that may be suffered if a critical cable or sub-station is damaged. When the mine’s product is stolen it directly impacts the profit margins of the mine and it may impact the sustainability of the mining operation, but it seldom endangers the lives of mine employees. Should non-ferrous metal scavengers target infrastructure, the result can be catastrophic: supporting structures may collapse and ultimately life-supporting systems may fail.

The above realisation underscored the importance of identifying appropriate crime prevention techniques that could be implemented by the mine and which would complement the National Crime Prevention Strategies of Government. Owing to various reasons, the research process took much longer than anticipated - not least of which was the complexity of the problem, which only became apparent once the research process had begun. One of the first obstacles was the lack of concise records of non-ferrous metal theft losses suffered by the mining industry. The information had been captured to some degree but it was not of any significant value for risk analysis or for basing managerial decisions on. Since the study began, the participating mine has changed its strategy and the method it uses for capturing and using its crime information data.

The affected industries generally did record losses due to non-ferrous metal theft, but failed to analyse the losses in order to identify trends and patterns that could be used to
develop a long-term crime prevention strategy. In most instances short-term counter-measures were implemented as incidents happened and little was done to anticipate other vulnerable areas. This way of thinking is widespread in the business sector. Industries that fall victim to non-ferrous metal theft do not consider the possibility that the crime may represent more than merely a crime of opportunity by an opportunistic criminal.

In then course of the study the Second-Hand Goods Act, 1955 (Act 23 of 1955) was repealed and replace with the Second–Hand Goods Act, 2009 (Act 6 of 2009). Both Acts were examined to determine their significance from a crime deterrent perspective. Other pieces of legislation that go hand in glove with the Second–Hand Goods Act of 2009 were also examined and ways were suggested to apply not only one Act to a crime, but to look for additional transgressions that are covered by other legislation. A strong message must be sent – if a crime is committed that endangers mineworkers and other people, the justice system will be used to prosecute the criminal(s) to the full extent of the law.

Billions of rands are lost every year to some or other form of non-ferrous metal theft. Losses at the participating mine are three fold - first through actual loss of the stolen article or component, then through the need to repair or replace the article or component, and finally through the loss of production as a result of interruptions caused by the initial crime. Over and above these losses, South Africans are experiencing the large-scale criminalisation of the scrap metal recycling industry by unscrupulous metal recyclers that transgress the law and its supporting regulations. These individuals are fuelling the metal scavengers’ greed, which in turn leads to more risks being taken and more violence used.

The research was aimed at contributing to the understanding of the non-ferrous metal theft phenomenon. In doing this, both the transcontinental and cross-border nature of the crime was discussed. These factors were viewed in the context of the safety risks the mining industry is exposed to. Transferability of the study was also considered to ensure that the threat could be evaluated in the context of other mines and other industries such as telecommunications (where life-saving communication can be disrupted) and transportation (where the theft of copper cable can disrupt train signals and cause trains to crash).

This perspective logically led to the question of punishment related to non-ferrous metal theft. It was discovered that in most instances payment of an admission of guilt fine was sufficient to secure the release of the perpetrator from police custody. It was also discovered that in certain districts in South Africa non-ferrous metal theft was viewed much more seriously than in others. The conclusion was that magistrates in these areas were better informed about the seriousness and prevalence of the crime. They met with
the police, prosecutors and affected industries with the specific purpose of informing all the roleplayers of the burden of proof that is required to obtain a proper conviction for non-ferrous metal thieves. Non-ferrous metal theft related cases in these areas are dealt with in magistrates’ courts. This process led to more consistent sentencing of offenders as well as a reduction of non-ferrous metal theft related incidents in these areas. This was experienced by all the industries in these areas, and not only the participating mine.

The value of this research is that it allows for a better understanding of the problem as well as the industry affected by it. It also allows for more comprehensive crime-combating measures to be developed based on the understanding gained from investigating the phenomenon of non-ferrous metal theft.

It became clear from the study that target-hardening and preventive measures are costing industries millions of rands and that the judicial system is currently failing to adequately support the crime prevention efforts of the industry. Society in general should be made aware of the threat posed by non-ferrous metal theft and should realise that the concealment of illegally obtained non-ferrous metal in legal shipments does not constitute a victimless crime. All South Africans suffer the consequences of this type of theft - whether directly through electrical cable theft causing smelters to shut down, or indirectly through job losses as a result of industries filing for bankruptcy as a result of inflated operating costs because of non-ferrous metal theft and the need for continuous repairs flowing from it.

Non-ferrous metal theft is prevalent all over the world. It also became clear from the study that there is a general lack of agreement on the seriousness of the offence. Whether a roof disappears from a church in the UK or a complete bridge be stolen in Prague, plaques disappear from headstones in Australia, undersea communications cable from Vietnam, or electrical cable from Cape Town, there is a general disregard for the effect that allowing this crime to multiply can have on countries. As easily obtainable sources of non-ferrous metal are cleaned out or become better protected, thieves are forced to take greater risks.

Since 2000 there has been an increase in the world demand for non-ferrous metals such as copper owing to the development of countries such as China. This resulted in an exponential increase in the price offered for non-ferrous metal resources. This opportunity was identified quickly by metal recyclers and subsequently by scrap metal scavengers. A perfect environment was created for organised crime to step in and take control of the illegal trade in non-ferrous metals.

In South Africa there are several laws that can be used in the fight against the illegal recycling of non-ferrous metals. The main Act is the Second-Hand Goods Act (Act 6 of 2009), which replaced the Second-Hand Goods Act (Act 23 of 1955). Although Act 23 of
1955 has been repealed, it is still worthwhile taking note of the cases handled and regulations developed under the Act. The prevalence and nature of the crime have not changed, thus it would be valuable to consider preventive actions under the previous Act as a basis for future actions.

In addition to these Acts the Criminal Procedure Act (Act 51 of 1977); the Criminal Procedure Second Amendment Act (Act 85 of 1996); the Fencing Act (Act 31 of 1963); and the Prevention of Organised Crime Act (Act 121 of 1998) can be used during the investigation and prosecution. Although non-ferrous metal theft is often considered to be a petty crime and a mere misdemeanour, it has been likened to terrorism with the aim of destabilising the country. Even though it is unlikely that attacks on non-ferrous metal targets are orchestrated with the intention of destabilising the country, it does have the same cumulative effect. If, for example, commuters are terrified of boarding a train because it may crash due to stolen copper cables and industries grind to a halt, this may well point to acts of terrorism. The same will be true if mineworkers refuse to go underground due to safety concerns. This may very well happen if it would ever transpire that miners were trapped below ground due to a theft related power failure and the mine was unable to bring the trapped miners to the surface in time.

Although the argument can be made that to impose severe penalties for misdemeanour crimes such as non-ferrous metal theft constitutes an over-reaction, the problem in its totality and the cumulative effect of rampant non-ferrous metal theft should be examined.

Each case in isolation does not reflect the seriousness of the situation. However, if the context is taken into account as well as the amount of damage that may be caused and is caused by the rampant trade in non-ferrous metal theft, it becomes clear that every act of vandalism, trespassing and attempted non-ferrous metal theft is serious. If the law fails to act as a deterrent, the consequences will increase in severity until loss of life due to non-ferrous metal theft will become a regular occurrence. The legal system must be made aware of the extent and seriousness of the problem and it must prevent these incidents before they escalate out of control and cause incalculable direct and indirect losses to South Africa and its neighbours. Costs related to non-ferrous metal theft can be divided into several categories such as property loss, medical costs, lost in output, intangible losses, and total costs (quantified based on estimates of the total number of incidents). These aspects provide a rudimentary framework for analysts to determine the true cost of non-ferrous metal theft within their respective industries. A lot of the expenses related to non-ferrous metal theft that industries are exposed to are costs that are incurred in anticipation of a crime. Industries spend huge amounts of money to protect their premises and infrastructure against theft. More costs are incurred when
preventive measures fail and the non-ferrous metal is removed from its rightful owner. To this can be added the cost in response to a crime, when more measures are put in place to prevent a recurrence of the crime.

The research in this study is based on the case study at a particular mine that agreed to make statistics available on the number of attacks they were exposed to every day over a six-year period. This proved to be an effective method of investigating the closed world of the mining industry. The co-operation from the participating mine was unprecedented and is indicative of the seriousness of the threat to the mining industry. To put the time and access allowed by the mine to the best possible use, a sequential mixed method research approach was developed and executed. The approach required the use of both qualitative and quantitative data to interrogate the non-ferrous metal theft phenomenon. The combination of methodologies provided for a broad overview of the problem while highlighting detailed information, which served to ground the findings of the study.

The seriousness of the non-ferrous metal theft threat to the mining industry cannot be overstated. This is an already hazardous working environment where human ingenuity made it possible to mine for precious resources, but should the life-sustaining support systems be interrupted, tragedy is bound to follow. The mine was the victim of non-ferrous metal theft attacks 791 times over the period 2006 to 2011 and any one of these attacks could have resulted in the death and injury of several thousand underground workers.

The State is not contributing enough to the effort to combat non-ferrous metal theft and by shirking this responsibility it is putting at risk large sectors of the manufacturing and mining industries. These industries form the backbone of the South African job market and if they should fail due to infrastructural damage and rising operating costs, more of the unemployed may turn to non-ferrous metal theft to sustain their livelihood. This will contribute to the cyclic nature of non-ferrous metal theft.

The case study made it clear that the mine is at greatest risk when the non-ferrous scavengers are able to penetrate the outer perimeter - the so-called buffer zone - undetected. This allows them to work undisturbed to uncover copper cable or other non-ferrous metals. It also allows them to penetrate old mine entrances in an effort to gain access to the mining infrastructure that remained underground after work in the older, less profitable areas has been shut down temporarily.

It is also clear that the risk is not limited to actual theft of non-ferrous metals. The mine is at risk from the moment the scavenger gain access to the cable, because the modus operandi is to ‘spike’ the cable with a nail and hammer thereby inducing a short circuit and causing the failsafe at the sub-station to switch off the supply. This creates an opportunity for the criminal to cut through the cable and get away with the prize.
In addition, the response time of the mine is too long, mostly because of the great distances that have to be covered to identify a possible criminal attack on power cables and infrastructure in remote areas. The isolation of the areas where the attacks take place also poses a threat to security personnel because criminals have no respect for other people’s lives: increasingly, approaching security personnel are violently repelled by armed criminals.

The greatest concern is for the wellbeing of the mineworkers that may find themselves stranded below ground if it should happen that criminals accidentally cut the main power supply cable to the mining operations, or striking mine workers do so deliberately. The mineworkers may be thousands of metres underground and returning to the surface is not like descending a skyscraper in an evacuation drill. It is impossible to take the stairs to safety - there are no stairs and even though the vertical shaft takes mineworkers underground, devices such as chair-lifts provide transport over long distances in tunnels to the actual mining site.

Chair-lifts were introduced to reduce the amount of stress mineworkers experience underground where they had to walk long distances from the entry point to the mining operation down an incline of 30 to 40 degrees in temperatures that may reach 50 °C.

In these circumstances heat exhaustion and the possibility of a heart attack are real dangers. And if the evacuation system that relies on electricity fails, thousands of mineworkers would be in serious trouble. The evacuation journey back to the surface would be significantly more strenuous because the miners would have to walk all the way to the entry shaft along an incline that was not designed to traverse on foot.

**6.2 CONCEPTUAL CONCLUSIONS**

The best way for the participating mine to combat and prevent non-ferrous metal theft is a pragmatic approach in by borrowing components of different crime prevention models and applying them to the specific mine. The same can be said of other industries affected by non-ferrous metal theft and where large-scale operations that cover big areas. Anything that may reduce the possibility of attacks on the mine has to be considered.

Fortunately, the participating mine does not follow only one crime prevention model. It uses a practical and pragmatic approach when dealing with non-ferrous metal related attacks. It learns from each incident and makes concerted efforts to prevent similar attacks from happening in the future. The various crime prevention measures make it very difficult for prospective criminals to identify patterns or weak points in the security shield that protects the mining operations.

The mine focuses most of its resources on situational crime prevention where target hardening is used to make the possible target less attractive to thieves. Access control is
used to increase the risk to the criminal of being caught if he or she should attempt to commit a crime.

Another pillar of situational crime prevention, as the mine uses it, is to reduce the reward criminals may receive when they steal from the mine. The participating mine may increase the effectiveness of the reward reduction effort by making a policy decision to replace high-value copper and other non-ferrous metals with alternative products such as fibre optics, where appropriate.

It would however be to the mine’s benefit to increase the use of action research where researchers and the practitioners work together to find solutions to problems through rigorous data analysis. This process would allow for the identification of possible weak points in the mine’s strategy and would allow for the protection of possible future targets that may be of interest to criminals.

One of the key findings of the study is that offenders belong to specific groups and that profiling may save not only money but may also reduce the risk of falling prey to the criminal element. The profile led to an interesting discovery, namely that there is almost a 50/50 split between unemployed offenders and those employed by the mine.

Closed cases are one of the measuring tools that can be used to determine how effective the mine collaborates with the justice department and the SAPS in prosecuting non-ferrous metal thieves. Over the six years covered by the study 29% of the cases were closed as ‘resolved’ (guilty finding in court of law and/or departmental disciplinary hearing) and 39% of the cases closed as ‘recovery only’. A third of the incidents were undetected, meaning that by the time the security division was informed of the incident there were no suspects left to arrest and the investigation into the incident did not produce a viable suspect for prosecution.

The mine is following the best possible approach by investigating criminal conduct internally and only handing over the investigation to the SAPS once most if not all the work has been completed. This increases the possibility that the case would receive the necessary attention from SAPS and that the investigation would be done correctly from the start.

However, the best investigation and the best prosecution cannot mitigate the fact that there are huge discrepancies in the way perpetrators are sentenced.

Of the 78 offenders sentenced by the court for non-ferrous metal theft related crimes, the mine employed 50. More than half (54%) of them were only fined while 40% received a suspended sentence. Unemployed offenders that were sentenced totalled 28. Twenty-one per cent of the unemployed perpetrators received prison sentences, 25% were deported and 36% received a fine. The remaining 18% received a suspended
sentence. From this it follows that although the threat to the mine is almost equally split between employed and unemployed perpetrators, the court sees unemployed offenders in a much more serious light.

This result is one of the aspects requiring action by the mine: the threat posed by mine employees should be regarded in a more serious light than the threat posed by unemployed offenders. Offending mineworkers can breach the trust of the employer and have access to restricted areas that are denied to non-employees. However, they still receive lighter sentences than their unemployed counterparts.

Although the participating mine spends millions of rands on asset protection every year, it is impossible for one mine or even one industry to combat an international phenomenon. As long as the Government does not actively get involved in large-scale non-ferrous metal crime prevention strategies and operations, the flow of illicit non-ferrous metals to unscrupulous international buyers will continue. A holistic and collaborative approach is the only way this battle can be won, and everyone needs to be part of the fight.

The non-ferrous metal theft problem does not only affect large industry - Government is hard hit as well. National infrastructure made from non-ferrous metal has become an attractive proposition for unemployed metal scavengers and involves the loss, for example, of statues from parks and plaques from buildings and electrical cabling from railway lines. Everyone is a target and the management of the possible consequences of non-ferrous metal theft at a South African mine is only the tip of the iceberg.

Since 1995 various crime prevention strategies have been proposed and numerous plans developed in an effort to stem the tide of crime. These plans met with limited success and in most cases were not implemented long enough to have any effect before they were replaced with other plans.

One of the most serious crime prevention strategy failures was the decision by the SAPS to close specialised investigation units. The premise was that knowledge gathered over years of specialisation and with experience would filter into general crime investigation divisions at station level. The opposite happened: redeployed detectives lost access to crime information gathering networks built up over decades. In addition, the SAPS lost the possibility of acting on information before a crime was actually committed as well as using informer networks that enabled specialised detectives to effectively follow up on crimes. The damage done by this decision will take decades to repair.

The collapse of the specialised networks should be used as an opportunity to develop a new and integrated approach to crime prevention that is not based on the reactive work of the police but on principles such as poverty reduction and an increase in the basic
level of education. All government departments should play a role and understand how they fit into the National Crime Prevention Strategy.

The current South African National Crime Prevention Strategy (NCPS) is an ambitious undertaking and follows an integrated approach. This procedure was difficult to understand for the other departments involved in the execution of the strategy. Every department has a narrow vision of what it is supposed to do and is reluctant to adapt their limited vision to include areas where they may have a secondary impact. Thus the Ministry of Social Welfare interprets their mandate as ensuring that social upliftment takes place and citizens in need of assistance are provided with subsidies, food, and so forth. The ministry dedicated no time to developing a strategy that fits into the larger crime prevention and violence reduction commitment of the South African Government, because they regard crime as a matter for the police, not a social issue. This way of thinking extends to other ministries as well. Crime cannot be reduced thorough law enforcement efforts alone. All departments must contribute to one long-term, co-ordinated strategic plan in an effort to reduce crime. This will prevent departments from working against one another in well-intentioned but poorly conceptualised projects.

This lack of interdepartmental collaboration and the increasing disillusionment of the public with the police’s inability to reduce crime levels significantly is a clear indication that the time has come to all crime prevention strategies.

The mining industry and the participating mine in particular took the NCPS and the police’s strategic plan and developed its own operational plan to combat crime on the mine premises. Some of the pillars of the police’s strategy that are used by the mine are:

- A holistic approach was implemented that includes several areas that would not traditionally be the responsibility of the mine. The first step was to ensure that the asset protection and investigative divisions at the mine engage with their counterparts in the justice system. The police as well as the magistrate and prosecutors were educated on the threat and prevalence of non-ferrous metal theft. This led to a situation where all roleplayers can work together and each understands their own role in the process of apprehending, processing, prosecuting, and sentencing alleged non-ferrous metal thieves.
- The mine is employing unmanned aerial vehicles (UAVs) to reduce the time it takes to respond to attacks against mine property. This reduces the risk of armed non-ferrous metal thieves ambushing mine security. The mine security personnel undergo rigorous training and are equipped with the latest in protective gear to reduce the possibility of getting injured or killed due to their involvement in trying to stop a contact crime in a remote area.
• The mine also prioritised the identification and eradication of organised crime syndicates that may be involved in non-ferrous metal theft and precious metal theft.

Although selected components of the NCPS can be very useful when it comes to crime prevention in general, it is the concept of community crime prevention that promises to deliver the best results in the long run.

By focusing on getting the community to become involved with crime prevention, the communities’ fear of crime may be reduced. Community participation in crime prevention also creates a platform where different people from different backgrounds and sectors are brought together to share information and ideas on crime prevention. The participating mine should consider enhancing their current strategy, which follows the principles of target hardening, with more community participation crime prevention programmes.

The victim, the offender and the location of the crime should be analysed to determine how these factors relate to one another and where best to make an intervention that would have a lasting effect on mining operations. To achieve a state of continuous non-ferrous metal theft reduction the affected industries have put in place several strategies and procedures. The first was the development of a co-ordinating body - the NFTCC - where information about the prevalence of non-ferrous metal theft could be shared and a national approach to combat non-ferrous metal theft could be developed. However, over time this body has become little more than a talk shop where little practical, crime-combating information is shared. Nationally co-ordinated non-ferrous metal crime-combating strategies were unheard of. It is recommended that the NFTCC be re-tasked as an operational body with a mandate from member industries and organisations to become more operational and a more prevention-oriented organisation where trends could be identified and the illegality of non-ferrous metal theft transactions could be reported and followed up on.

In addition to action plans to combat the non-ferrous metal theft threat, the re-envisioned NFTCC can lead the industry to develop action plans against the illicit market. This operationalisation can be completed in conjunction with legitimate metal recyclers to achieve an effective state of self-regulation of the metal recycling industry. The amount of scrap metal that is available to scrap metal scavengers must be reduced. Managers should remember the theory that the thieves CRAVE non-ferrous metal because the product is Concealable, Removable, Available, Valuable, Enjoyable and Disposable. Recycling can be managed through the regulation of non-ferrous metal buyers that must follow strict guidelines and through self-regulation of the recycling industry by bodies such as the Metal Recyclers Association. Even though this would be a step in the right
direction, it would still be necessary to mark the non-ferrous metal in such a way that it can be identified even if the form of the metal is changed through milling or melting.

For investigative purposes the communication between identified suspects can be monitored and the physical sites where the illegal trade in non-ferrous metals takes place can be shut down. In addition, Internet-based transactions should be monitored and stopped, and the perpetrators should be identified and prosecuted.

These recommendations will however not be sufficient or even possible if the consumers of non-ferrous metals are not educated and if the political will does not exist. The police also need to re-engage in the process to identify non-ferrous metal theft syndicates.

In the meantime, while the rest of the components of a holistic situational crime prevention strategy are being put in place, the mine can employ basic crime prevention through environmental design principles, whereby the location and construction of mining operations are adapted or developed to include crime prevention components.

The management of the plausible consequence of non-ferrous metal theft at a South African mine is a complex problem that would need a complex, multi-dimensional solution.
List of references


# Appendices

## Annexure A

### Interview Schedule

- Reference method:

- Date of Interview:

- Place interview took place:

### Biographical Data

- Respondent Reference Number:

- Respondent Position:

- Respondent Years experience in position:

### Interview Questions

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>What do you think is the estimated cost (financially, potentially and in terms of risk to life) of non-ferrous metal theft on the South African mining industry?</td>
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<tr>
<td>How do you think non-ferrous metal theft can be best addressed?</td>
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<td>Type of property</td>
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Annexure C

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</tr>
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</tr>
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</tr>
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<td>LPM</td>
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<td>C3</td>
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<td>Values involved</td>
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<td>Method used</td>
</tr>
<tr>
<td>Cable - burned</td>
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<tr>
<td>Cable - cut</td>
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<tr>
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<tr>
<td>Cable - short</td>
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<td>Concealed in container</td>
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<td>Concealed inside equipment</td>
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<td>Concealed on person</td>
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<td>Fence - cut</td>
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<td>Fence - over</td>
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<td>Fence - through existing hole</td>
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<td>Property involved</td>
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171
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<th>Weapon / violence used</th>
<th>Description</th>
<th>Weapon / violence used</th>
<th>Description</th>
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<td>Knife</td>
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<td>Glass bottle/broken bottle</td>
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<td>Open hand</td>
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<td>Slap someone with hand</td>
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<td>Pushed</td>
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<tr>
<td>Fist</td>
<td>Hit someone with fist</td>
<td>w5</td>
<td>Pushed someone</td>
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<td>Foot</td>
<td>Kicked someone</td>
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<td>Stick</td>
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<td>Forehead</td>
<td>Hit someone with forehead (head butt)</td>
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<td>Including any type of stick, pole, kerie, sjambok, etc</td>
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<td>Grabbed someone</td>
<td>w8</td>
<td>Verbal threats</td>
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<td>Threats of violence made</td>
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**Area/place where crime was committed or detected**

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<th>Concentrators</th>
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<th>Hostels</th>
<th>Offices</th>
<th>Plants</th>
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**Number of suspects arrested**

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<tr>
<th>Race</th>
<th>African</th>
<th>Coloured</th>
<th>Foreign</th>
<th>Indian</th>
<th>White</th>
<th>Unknown</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>r1</td>
<td>r2</td>
<td>r3</td>
<td>r4</td>
<td>r5</td>
<td>r6</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th>16 and under</th>
<th>17 to 20</th>
<th>21 to 30</th>
<th>31 to 40</th>
<th>41 to 50</th>
<th>51 and over</th>
<th>Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a1</td>
<td>a2</td>
<td>a3</td>
<td>a4</td>
<td>a5</td>
<td>a6</td>
<td>a7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Employee type</th>
<th>Contractor</th>
<th>Mine</th>
<th>Non-mine</th>
<th>Security</th>
<th>Unemployed</th>
<th>Unemployed</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>e1</td>
<td>e2</td>
<td>e3</td>
<td>e4</td>
<td>e5</td>
<td>e6</td>
<td></td>
</tr>
</tbody>
</table>

**Suspect No 1: Details**

<table>
<thead>
<tr>
<th>Deported</th>
<th>o1</th>
<th>Guilty</th>
<th>o2</th>
<th>Not guilty</th>
<th>o3</th>
<th>Undetected</th>
<th>o4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warm and released</td>
<td>o5</td>
<td>Warrant of arrest</td>
<td>o6</td>
<td>Withdrawn</td>
<td>o7</td>
<td>Pending hearing</td>
<td>o8</td>
</tr>
</tbody>
</table>

**Suspect No 1: Sentence (if guilty)**

| Fine of R500 or less | s1 | Imprisonment of less than 3 months | s8 | Deported | s16 |
| Fine of R501 to R1,000 | s2 | Imprisonment of 3 to less than 6 months | s9 | Correctional services | s17 |
| Fine of R1,001 to R2,000 | s3 | Imprisonment of 6 months to less than 12 months | s10 | Suspended fine | s18 |
| Fine of R2,001 to R3,000 | s4 | Imprisonment of 1 to less than 2 years | s11 | Suspended imprisonment | s19 |
| Fine of R3,001 to R4,000 | s5 | Imprisonment of 2 to less than 3 years | s12 | Warned and released | s20 |
| Fine of R4,001 to R5,000 | s6 | Imprisonment of 3 to less than 4 years | s13 | Warrant of arrest | s21 |
| Fine of more than R5,000 | s7 | Imprisonment of 4 to 5 years | s14 | Pending sentence | s22 |

| Imprisonment of more than 5 years | s15 |