

**AN ANALYTICAL RESEARCH INTO THE PRICE RISK MANAGEMENT OF THE SOFT
COMMODITIES FUTURES MARKETS**

by

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I hereby declare that "*An analytical research into the price risk management of the soft commodities futures markets*" is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

SIGNATURE

(W Rossouw)

DATE

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SUMMARY

Agriculture is of inestimable value to South Africa because it is a major source of job creation and plays a key role in earning foreign exchange. The most significant contribution of agriculture, and in particular maize, is its ability to provide food for the nation. For a number of decades government legislation determined prices, and as such the trade of grains on the futures exchange requires market participants to adapt to a volatile environment.

The research focuses on the ability of market participants to effectively mitigate price volatility on the futures exchange through the use of derivative instruments, and the possibility of developing risk management strategies that will outperform the return offered by the market.

The study shows that market participants are unable to use derivative instruments in such a way that price volatility is minimised. The findings of the study also indicate that the development of derivative risk management strategies could result in better returns than those offered by the market, mainly by exploiting trends on the futures market.

Key terms:

Average price; benchmark; contract valuation; derivatives; indexing; price risk management; processors; SAFEX; soft commodities; volatility

CHAPTER 1 INTRODUCTION

1.1 BACKGROUND

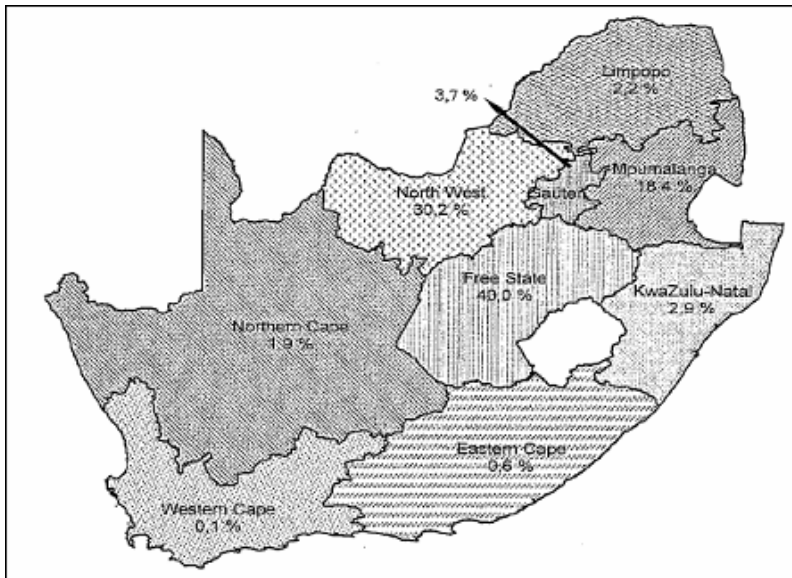
South Africa has a population of more than 47 million people, of whom 628 200 work either as farm employees or as domestic servants on the 45 818 commercial farming units. Agriculture provides employment to 1.34% of the total population (National Department of Agriculture 2007:1-4). Agriculture also plays a vital role in earning foreign exchange for the country, since the value of exported agricultural goods exceeds the value of agricultural products imported. South Africa is therefore a net exporter of agricultural products (Botha 2005:1). The projected amount of net farm income from agriculture in South Africa exceeded R18 514 million in 2007 (Directorate Agricultural Statistics 2007:3).

The most dominant staple food in South Africa is maize, and as such, agriculture is of inestimable value to all its residents (Traub & Jayne 2004:1). Since 2000, of the close to 17 million hectares of arable land, more than three million hectares, on average, have been allocated to maize plantings (National Department of Agriculture 2007:5-7). Although each of the nine provinces makes a contribution to the total maize crop, the Free State and North West provinces produce more than 70% of the maize harvested in South Africa (see fig 1.1).

From 2000, human consumption of maize made up more than 50% of total consumption (see fig 1.2), resulting in private expenditure on grain products of R54 584.1 million in 2006 (National Department of Agriculture 2007:107). The importance of this amount is highlighted by the estimate that ultra poor South African households spend up to 20% of their monthly income on maize alone, and as such, demand is price inelastic, that is, consumers have no choice but to absorb price increases (NIEP 1995). This figure is of even greater concern if

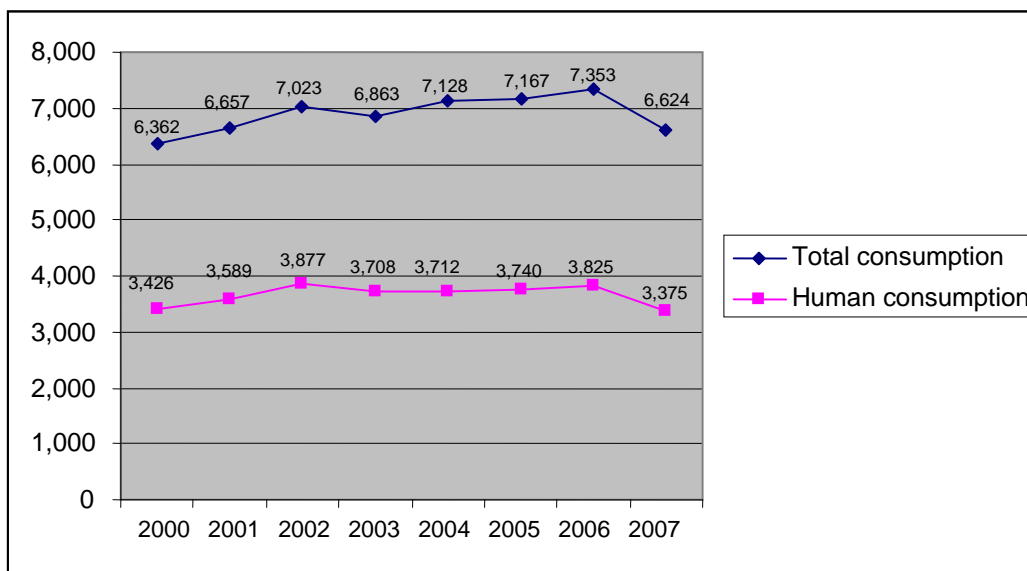
one considers the fact that 37% of South Africans are in the low-income group (Vink & Kirsten 2002:12).

Figure 1.1 Distribution of maize production among provinces



Source: Directorate Agricultural Statistics (2007:2)

Figure 1.2 Human consumption of maize vs total consumption (million metric tons)



Source: National Department of Agriculture (2007:8)

From the 1930s up to the mid-1990s, government controlling bodies largely dominated grain pricing in South Africa. As such, the estimated 4 000 large commercial farmers supplying the majority of grains for a population of more than 40 million people had to be content with a fixed price, notwithstanding the possibility of a smaller crop. Via the government-established Maize Board, the government appointed cooperatives to buy maize from producers and sell it to processors at a price fixed for the duration of the production season (Traub & Jayne 2004:1-3). This method of price determination resulted in the formation of oligopolies through a concentration of a limited number of maize processors (Bernstein 1996:120-145).

During this period of state intervention in the valuation of maize prices, no less than 22 marketing schemes were introduced, starting with the Marketing Act in 1937. According to Vink and Kirsten (2002:2), an increase in pressure from external forces in the 1980s resulted in the agricultural sector being deregulated in a process consisting of two distinctive phases, as highlighted below.

(1) The fundamental change incorporated in the first phase was the deregulation of state marketing schemes. This was done within the framework of the Marketing Act of 1968, and the change can be attributed to the amendment in fiscal and monetary policies during the latter stages of the 20th century. Ongoing isolation from the world market because of the apartheid regime meant that the deregulation steps taken were aimed at the domestic market only. Trade in foreign products consisted of managing imports and exports with the exclusive aim of manipulating domestic prices. The Marrakesh Agreement of GATT in 1993 was the first purposeful step towards opening the South African agricultural sector to world markets. This was achieved by replacing direct controls over agricultural imports with tariffs (Vink & Kirsten 2002:2).

(2) The second phase of deregulation proved to be more radical, and was brought about by the introduction of the Marketing of Agricultural Products Act 47 of 1996. This Act proposed important changes in the way in which prices of grain would be determined. It

was distinctly different from the autocratic method of price fixing to which producers and processors had become accustomed. This resulted in the agricultural sector being opened up to world market influences for the first time (Vink & Kirsten 2002:2).

The objectives of the Marketing of Agricultural Products Act 47 can be summarised as follows:

- an increase in market access for all participants in the market
- enhanced efficiency in the determination of prices for soft commodities
- the optimisation of earnings resulting from exports of soft commodities
- the overall enhancement of the viability of the agricultural sector.

(Vink & Kirsten 2000:17.)

As a direct result of the implementation of the above Act, the Agricultural Markets Division was introduced as a separate and independent division of the South African Futures Exchange (otherwise known as SAFEX). Henceforth, the value of commodities such as white and yellow maize, bread-milling wheat and sunflower seeds was to be derived from futures contracts on the underlying commodity (Gravelet-Blondin 2001:1-2). A change in the method of price determination whereby prices could fluctuate was not welcomed by all market participants, and many producers and processors held the view that a futures exchange for soft commodities was not viable in South Africa. This view was further enhanced by the fact that South Africa was the only exchange in the world trading futures and options contracts with white maize as the underlying commodity (FMD 2005). In particular, owing to the negative impact on earnings stability, processors did not enjoy the high levels of price variability brought about by a free market. More than a decade later, however, the free market is flourishing under the SAFEX mission statement whereby SAFEX “seeks to provide the secure and efficient market for trading derivatives in South Africa” (Gravelet-Blondin 2001:4).

The challenge and concern remain as to whether participants in the soft commodity futures market have acquired the necessary knowledge and skills over the past decade to effectively manage the price risks inherent in the futures market in such a way that earnings are not affected by price fluctuations.

1.2 PROBLEM STATEMENT

It is evident from the discussion in section 1.1 that over the past decade participants in the agricultural market, whether producers or processors, have had to adapt to a different and complicated method of price determination for grains. As such, it is necessary to determine the success of market participants in managing their price risk in a liberalised market.

Should the study indicate a lack of positive results from the market participants in the price risk management of agricultural commodities, it is necessary to determine whether risk management models can be developed to assist market participants in effectively mitigating price risk. The research problem can be formulated as follows:

What is the need and possibility for the development of futures market price risk management strategies that will constantly outperform the market?

As far as is known, no research has been conducted on the possibility of beating the market return of the South African Futures Exchange for soft commodities. A non-probability purposive sample will be used to refer to the procurement companies and the trading year over which the hedging results will be evaluated. The accurate and available historical price and volatility information are the main reasons why a secondary data analysis was chosen as the most appropriate data collection method. This historical information includes the daily trading range and closing prices, as well as the volatility for every commodity and contract month.

1.3 PURPOSE OF THE RESEARCH

This study will be conducted with the initial purpose of determining the success with which participants in the soft commodity futures market mitigate price risk through the use of derivative instruments. Thereafter, the aim will be to develop derivative price risk management strategies that will outperform the return offered by the market. In order to realise these aims

- derivative instruments available in the futures market and their benefits to market participants will be described
- the price risk management success of futures market participants will be explored
- returns from the proposed risk management models will be compared to those offered by the market

1.4 LIMITATIONS OF THE RESEARCH

In conducting the research, certain information from processors could not be obtained because it was regarded as confidential. This information includes:

- (1) the specific procurement strategy used for risk management purposes on SAFEX
- (2) the final realised procurement price

Since the financial results of the companies chosen in the research sample indicate the net effect of the procurement strategies, the specific procurement strategy applied and procurement price achieved does not prevent conclusions being drawn from the research.

1.5 RESEARCH STRUCTURE

This study can be divided into three distinct parts

- **Part 1.** The first part of the research involves an extensive literature review on trading in the futures market and the derivative instruments available to minimise the risk of price fluctuations. Participants in the futures market will be identified and their price risk management success evaluated against a chosen benchmark.
- **Part 2.** Empirical research will be conducted on the possibility of developing price risk management models, consisting of futures and/or options contracts, that will outperform the benchmark chosen in part 1. This will be achieved by applying these models to secondary (historical) data. The relevant models will ultimately be compared with one another in order to determine the most effective method of price risk management.
- **Part 3.** Results achieved from the literature study and empirical research will be interpreted in order to determine whether there is a need for price risk management models and whether a strategy can be developed in such a way that the return offered by the market is outperformed.

1.6 CHAPTER LAYOUT

The ensuing chapters can be summarised as follows:

Chapter 2: Theoretical background: soft commodity futures market

An extensive literature review is provided of the theoretical background of international and local futures markets. The chapter defines derivative instruments and their inherent margining system, and discusses relevant option pricing models. Market volatility, market variables and accounting standards pertaining to positions in the futures market are evaluated.

Chapter 3: Groups susceptible to volatility in the futures exchange

A distinction is made between the groups susceptible to price fluctuations on SAFEX and the effect of a volatile futures market on the relevant groups is highlighted. The chapter concludes by determining the need for alternative risk management strategies that will minimise price volatility.

Chapter 4: Performance measurement through benchmarking

Benchmarking is defined and the most appropriate market benchmark chosen. The return offered by the historical market benchmark is calculated as an introduction to the ensuing chapters.

Chapter 5: Research design

This chapter provides a literature study of the different research methodologies and research designs. It determines the most appropriate sampling method and research design that will enhance the accuracy and dependability of the results obtained from the research process.

Chapter 6: The momentum strategy

The momentum strategy is defined and applied to historical data. The results of this strategy are compared to the benchmark in order to determine its effectiveness.

Chapter 7: The maximum price strategy

The maximum price strategy is defined and applied to historical data. The results of this strategy are compared to the benchmark in order to evaluate its performance.

Chapter 8: The indexed strangle

The indexed strangle strategy is defined and applied to historical data. The results of this strategy are compared to the benchmark in order to derive conclusions on its viability.

Chapter 9: Evaluation and comparison of price risk management models

The results of the proposed risk management models are compared in order to determine the most effective strategy. The results versus the benchmark are compared to that of fund managers in alternative markets.

Chapter 10: Summary, conclusions and recommendations

The research is summarised and conclusions drawn on the price risk management success of participants in the futures market and the possibility of developing models that will mitigate price volatility and outperform market returns.

CHAPTER 2

THEORETICAL BACKGROUND: SOFT COMMODITY FUTURES MARKET

2.1 INTRODUCTION

Futures trading in a wide variety of commodities and financial instruments occur worldwide in numerous futures exchanges. Although futures trading has been in existence for a few centuries, it remains a highly specialised area and a trade in which a limited number of people possess sufficient knowledge to participate in.

In addition, few people realise the impact of the futures market on their daily existence. Without actively participating in the trade of futures contracts, price fluctuations in the futures market can have significant financial implications for the average South African as well as the economy as a whole.

The objective of this chapter is to provide the theoretical background to futures trading. This is necessary, because the ensuing chapters continuously refer to matters discussed in this chapter.

2.2 THE BIRTH OF THE FUTURES MARKET

2.2.1 Historical commodity markets

The futures market, as it is known today, and the underlying trading principles of commodity futures contracts evolved from practices that are centuries old. Formalised trading practices developed in the ancient Greek and Roman markets with the introduction of fixed trading locations and trading hours. Initially the Forum in Rome was used as the common marketplace, while the Agora served a similar purpose in Athens. Despite the fall of these

civilisations, the fundamental trading principle of a fixed marketplace survived (Teweles & Jones 1987:6; CBOT 1994:1).

A distinctive feature of the Dark Ages was the disruption of commerce. During this period, merchants had to rely on scattered local markets to trade their products. This proved highly ineffective and the principle of a common marketplace eventually re-emerged through the introduction of so-called “medieval fairs”. Merchants and craftsmen, with the support of political authorities, organised these regional fairs by traveling from town to town to promote them (CBOT 1994:1).

During the 12th century, the medieval fairs in England and France grew to large and complex markets, and by the 13th century, the principle of cash transactions with immediate delivery was well developed. It was during this time that the practice of contracting of merchandise for delivery in the future began. Samples were commonly used to establish standards of quality. Of all the contributions made by medieval fairs to modern commerce, the most important remains the principle of self-regulation and arbitration. The Law Merchant Code governed trading in England and set certain standards of conduct to be followed by local participants in the market. A violation of the Law Merchant Code prohibited a merchant from continuing trading activities. Commodity exchanges in the USA eventually adopted this principle of self-regulation (CBOT 1994:1-2).

The development of modern cities, better communication methods and improved transportation saw the importance of regional fairs declining and eventually being replaced by specialised market centers. The development of these market centers spread beyond Europe, with Japan’s commodity exchanges dating back to the 17th century. These Japanese commodity exchanges developed nearly one-and-a-half centuries earlier than their securities markets. In the USA, commodity markets came into existence during 1752, trading domestic produce, textiles, hides, lumber and metals. A feature of the early US commodity markets was

the fact that most of the trade was based upon transactions for immediate delivery (CBOT 1994:2-3).

2.2.2 Modern futures markets

The development of commerce in Chicago and grain trade in the US Midwest was the reason for the establishment of modern futures trading on the Midwestern frontier at the start of the 1800s. Chicago's proximity to the Great Lakes, close to the fertile farmlands of the well-known American Corn Belt, and its proximity to the major transport routes contributed to its development as a grain terminal (CBOT 1994:3; Teweles & Jones 1987:9).

Chaos in supply and demand was common in the early 1800s, with producers delivering produce to regional markets only to find the supply of grain outweighing the needs of processors. These processors would often bid at below-average prices because of the excessive supply of produce. Grains were regularly dumped in the streets for lack of buyers. Inevitably, the odd failure of crops and subsequent food shortages supported the prices of grains and forced businesses into bankruptcy because of a lack of raw materials for daily activities. The difficulty of transporting produce aggravated the problems for buyers and sellers. The dirt roads from farms surrounding the city of Chicago were impassable for long periods, especially during the rainy season. Snow was another factor contributing to the growing transportation problem. In an attempt to ease the transportation problems, roads made from wooden boards, otherwise known as "plank roads", were built. This proved moderately effective but had a negative impact on the already expensive transportation costs. During the 1840s, farmers transporting grains from their lands to Chicago over a distance of 60 miles were unable to break even since the transportation cost equaled the cost of producing the grains (CBOT 1994:3-4).

Upon reaching Chicago, the storage of the produce bought from farmers was another obstacle facing processors. In addition to inadequate storage space, underdeveloped facilities in local harbors handicapped the shipment of grains to the East and the return of procured

manufactured goods to the West. These intolerable market conditions caused farmers and merchants to start contracting produce for future delivery. This method of price determination was initially used by the so-called “Merchants of the River”, who received grains in early winter from farmers and had to store it until the rivers and canals were free of ice and navigable. In order to eliminate the price risk of the grain being stored, these river merchants would travel to Chicago and contract grains to be delivered in spring for a specific price. In doing so, they guaranteed themselves a buyer for the grains as well as an agreed-upon price on date of delivery (CBOT 1994:4).

On 13 March 1851, forward contracting was first recorded in the USA when 3 000 bushels of corn were contracted to be delivered in June at a price of one cent per bushel below the 13 March price of corn (Teweles & Jones 1987:9).

The Chicago Board of Trade (CBOT) was formed in 1848 by 82 merchants (Teweles & Jones 1987:9) with the objective of promoting the city of Chicago and providing a meeting place for buyers and sellers where commodities could be exchanged. A distinctive feature of the exchange’s early years was that only forward contracts were traded. In order to eliminate the potential drawbacks of forward contracts, the Chicago Board of Trade formalised commodity trading in 1865 by developing futures contracts that made provision for a standardised quality, quantity, place and time of delivery for the commodity being traded. During the same year, a margining system was introduced to reduce the risk of buyers and sellers not fulfilling their contracts. Speculators quickly became interested in futures contracts and found trading these contracts to be an exciting alternative to trading the grain itself (CBOT 1994:5).

After the introduction of the margining system, most of the underlying trading principles, as is evident today, were in place. Little did one know that the most successful contract in the futures market were yet to come, namely futures contracts on financial instruments (CBOT 1994:5-6). The CBOT developed into one of the largest futures trading markets in the USA, along with the Chicago Mercantile Exchange. In Europe, the two largest futures exchanges

are the London International Financial Futures and Options Exchange, and Eurex. Other futures exchanges worth noting are the Bolsa de Mercadorias y Futuros in Sao Paulo, the Sydney Futures Exchange and the Tokyo International Financial Futures Exchange (Hull 2002:1). This study will focus exclusively on the trade of derivative instruments on soft commodities.

2.3 TRADING IN SOFT COMMODITIES

2.3.1 What are commodities?

Tozer (2003:xiii) defines a commodity in economic terms as "... a portion of wealth that is demanded because it has the power to satisfy human needs and wants". He identifies the following three characteristics of commodities:

- (1) Commodities are homogeneous products.
- (2) A certain value is attached to commodities.
- (3) Commodities are limited in terms of supply.

Since commodities are natural substances, they can be owned and transformed through processing. The supply and demand condition of a commodity is the major underlying variable in the determination of the inherent value of the specific commodity (Chabane 2003: 3-4). In broad terms commodities are classified in three categories namely metals, energy and soft commodities (Tozer 2003:xiii).

2.3.2 Soft commodities

Soft commodities are agriculturally produced commodities. This is achieved via the well-known term of farming which entails the manipulation of biological processes and resources such as land and water in combination with technological inputs. The fact that many of the soft commodities produced by farmers are essential to sustain humankind in the form of food makes it unique. The production of soft commodities through agriculture is the most

geographically practised economic activity known to humankind. The evolution of human society from nomadic hunter-gatherer to a city-based civilisation had its origins some 12 000 years ago in the development of settled farming techniques. Through the years, the development of highly scientific technology underlying the production of soft commodities lowered the risk of crop failures. This economic activity remains subject to high levels of risk and uncertainty and shape the way in which commodity markets behave worldwide (Tozer 2003:xiii-xiv). The pricing behaviour of these commodity markets can be managed and minimised through the use of derivative instruments.

2.4 DERIVATIVE INSTRUMENTS

2.4.1 Definition and characteristics

According to Bodie, Kane and Marcus (2002:15), “Derivatives are financial arrangements between two parties whose payments are based on, or derived from, the performance of some agreed-upon benchmark”. This definition is similar to that of Brigham, Daves and Gapenski (1999:716) who define derivatives as instruments “... whose value is determined by the market price of some other asset”, as well as that of Valsamakis, Vivian and du Toit (2003:267) who state that a derivative instrument is a “...financial instrument of which the return is based on that of an underlying instrument”.

Derivative instruments can be based upon an underlying asset entailing one of the following:

- currencies
- commodities
- government or corporate debt
- stocks
- interest rates

(Wikipedia 2007:1)

Internationally, the derivatives market experienced a high level of growth in both liquidity and prominence in the previous decade. This can be attributed to the following factors:

- an enhanced globalization and liberalization of trade worldwide
- better technology and communication
- less rigorous control on capital flows
- the development of complex strategies in order to reduce risk

(Botha 2005:20.)

Derivatives can be classified in two broad groups, namely forward-type contracts and option-type contracts. These derivative instruments can be traded on a formal exchange (such as the Johannesburg Securities Exchange and the Chicago Board of Trade) or more privately on the over-the-counter (OTC) markets. Since exchange-traded derivative instruments consist mainly of futures and options contracts, it is a highly standardised market. In sharp contrast to this, an OTC derivative originates when a bank or securities firm enters into a private contract with another investor or dealer. This contract possesses features other than the derivatives traded on an exchange and is generally more flexible and innovative than standard futures and options contracts (Bodie et al 2002:15).

According to Skerritt (2002:10), it is important for both economic and legal purposes to classify derivative instruments, for the following reasons:

- **Tax treatment.** Derivative instruments have more favourable tax treatment in certain instances than non-derivative instruments.
- **Capital requirements.** Cash instruments entail higher capital requirements than derivative instruments.
- **Financial ratios.** Some derivative instruments are only published in the footnotes of financial statements. This is done when the derivative contracts are off-balance sheet transactions and can lead to the company experiencing improved financial ratios.

- **Legal requirements.** Legal requirements must be met when entering into certain derivative transactions.

2.4.2 Distinction between derivative instruments

2.4.2.1 *Forward contracts versus futures contracts*

Even though the form and terminology of forward contracts and futures contracts differ substantially, the fundamental mathematics and economics of these derivative instruments remain the same (Skerrit 2002:30).

a) *Forward contracts*

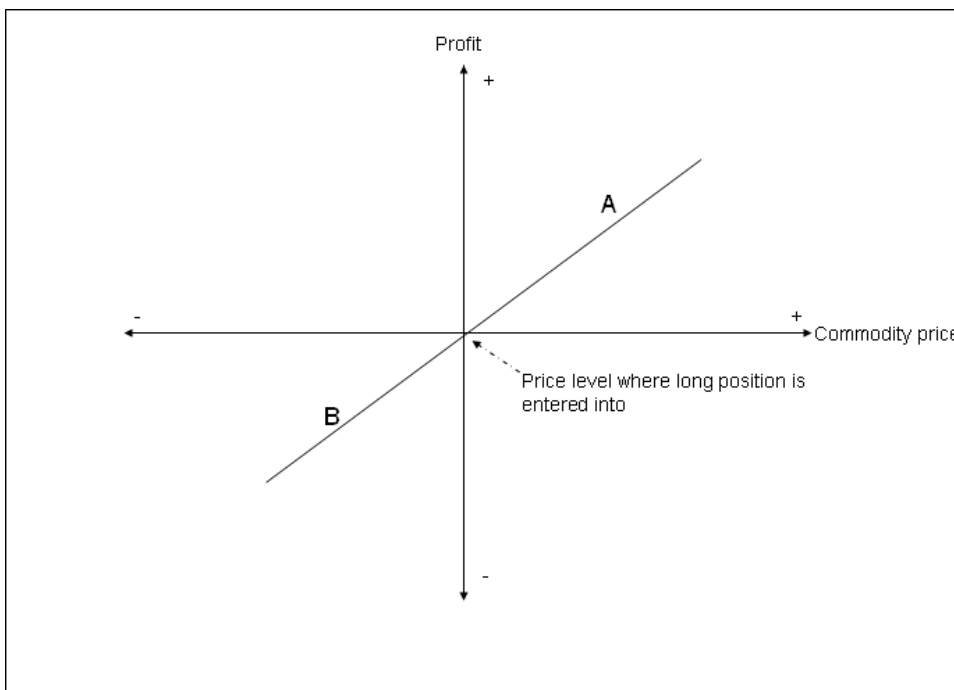
Hull (2002:462) defines a forward contract as “a contract that obligates the holder to buy or sell an asset for a predetermined delivery price at a predetermined future time”. Forward contracts are customised in order to meet the needs of both the contracting parties. Since forward contracts do not need to conform to the standards of a recognised futures exchange, it is traded in the OTC market.

A distinctive feature of forward contracts is the characteristic whereby no marking-to-market for the particular contract exists and the contracting parties agree on settlement of cash flows on the specified delivery date. Since this ruling enhances credit risk, parties are required to provide sufficient collateral as guarantee to the fulfillment of the forward contract or any other type of OTC contract (Ryan 2002:224). According to Hull (2002:34), the majority of forward contracts are not closed out prior to delivery of the underlying asset, but the contracts are mainly settled at maturity through delivery of the asset or a cash settlement.

As with futures contracts, two parties participate in the trading of a forward contract, namely long- and short-position holders (Bodie et al 2002:740). The long position holder will realise a profit if the asset price at maturity is higher than the delivery price of the asset. Similarly, a

loss will be realised if the asset price on maturity date is lower than the delivery price of the asset. This is graphically depicted in Figure 2.1. “A” indicates a profit realised owing to the asset price being higher than the delivery price (the price level where the long position is entered into), whilst “B” shows a loss, since the asset price is lower than the delivery price.

Figure 2.1 Payoff from a long position in a forward contract



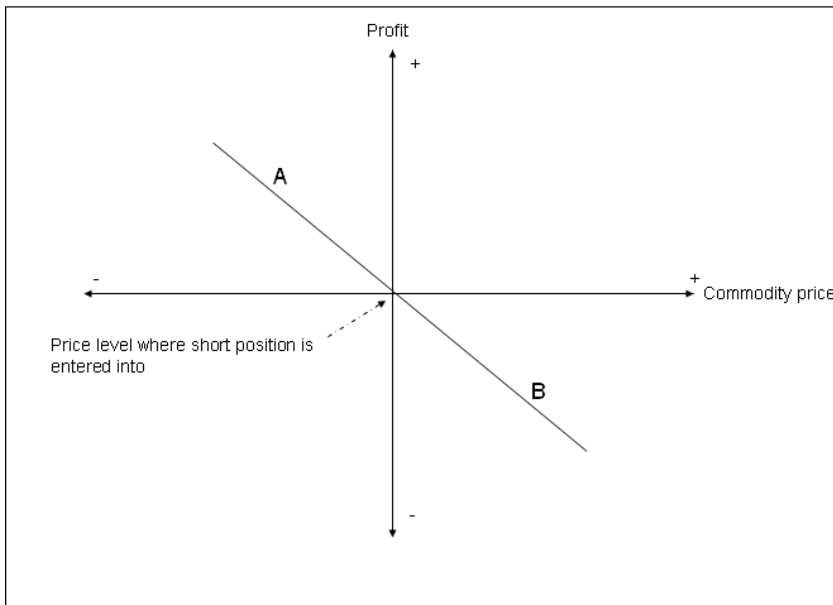
Source: Hull (2002:35)

Figure 2.1 indicates that an increase in the price of a commodity will result in higher profit margins realised by the long position holder.

A short position holder in a forward contract will realise a profit if the asset price on maturity date is lower than the delivery price, while a loss will occur if the asset price on delivery date is higher than the actual delivery price of the asset (see fig 2.2). A profit is realised at “A” because the asset price is lower than the delivery price (price level where the short position is

entered into), while a loss is incurred at “B” where the asset price is higher than the delivery price.

Figure 2.2 Payoff from a short position in a forward contract



Source: Hull (2002:35)

b) *Futures contracts*

According to Valsamakis et al (2003:267), “A futures contract is a notional commitment to take delivery (purchase) or to make delivery of (sell) a given quantity of a specific instrument on a specified future date at a price determined at the time of taking out the contract”. Since futures are exchange-traded contracts, the following characteristics are standardised:

- the asset-type
- the quantity of the asset
- the quality of the asset
- the future maturity date

The payoff for long and short position holders in futures contracts is similar to those of forward contracts (see figs 2.1 & 2.2). The fundamental differences between forward contracts and futures contracts are summarised in table 2.1.

Table 2.1 Comparison between forward contracts and futures contracts

Forward contracts	Futures contracts
No standardised contract terms	Standardised contract terms
Traded in OTC markets	Traded on formal exchanges
Single specified date of delivery	Range of possible delivery dates
Absence of daily margining	Daily settlement of margins
Delivery/cash settlement closes out positions	Positions closed out before maturity

Source: Hull (2002:37)

Futures contracts on soft commodities are quoted in a manner whereby the delivery month is in line with the physical crop cycle. As indicated in section 2.4.2, trading on the Agricultural Products Division (APD) of the JSE is limited to white and yellow maize, bread-milling wheat, sunflower seeds and soybeans. The tonnage per contract traded on the local exchange depends on the specific commodity (see tab 2.2).

Table 2.2 Tonnage per contract of the underlying commodity

Underlying commodity	Tonnage per single contract
Maize (white & yellow)	100 metric tons
Sunflower seeds	50 metric tons
Bread milling wheat	50 metric tons
Soybeans	25 metric tons

Source: SAFEX (2007)

2.4.2.2 Options contracts

The fundamental difference between an option contract and forward/futures contracts is the higher level of flexibility inherent in options contracts. This is because the holder of an option having the right, but not the obligation, to enter into the underlying futures contract (Madura

2000:66). In direct contrast to option contracts, forward/futures contracts entails a long position holder (short position holder) committing to the purchase (delivery) of a specified asset.

Two types of option contracts exist in the futures market: call options and put options. Since a participant in the market can enter into an option contract as either a buyer (long position) or seller (short position), four types of participants in the options market can be distinguished:

- (1) buyers of call options
- (2) sellers of call options
- (3) buyers of put options
- (4) sellers of put options

a) Call options

A call option provides the buyer (long position holder) with the right, but not an obligation, to buy an asset for a certain price by a specific date. The guaranteed price at which the asset can be bought is known as the strike price (Kohls & Uhl 2002:355). Since the buyer of the call option has the right to purchase an asset at a predetermined strike price, he or she foresees an increase in the price of the underlying asset and as such has a bullish outlook on the asset price.

The maximum profit to be achieved upon entering a long call option position can be summarised as follows:

$$\max (S_t - X, 0)$$

where X equals the strike price and S_t is the price of the underlying asset at option expiry. This indicates that the option will be exercised only if $S_t > X$, also known as an option that is “in the money”. In the instance where $S_t = X$ (“at the money”) or $S_t < X$ (“out of the money”), the option will not be exercised since the underlying asset can be bought at a price level lower

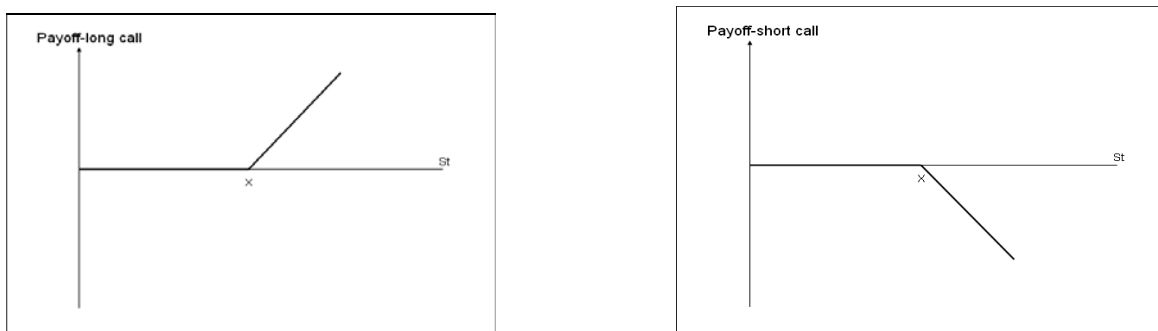
than the strike price (Hull 2002:164-165). When buying a call option, the maximum potential loss equals the amount of the call premium, while potential gains are unlimited. A short position in a call option gives the short position holder a maximum profit equal to the option premium with the risk of unlimited losses.

The payoff from a short position in a call option can be summarised as follows:

$$\text{Min}(X - S_t, 0)$$

These payoffs are depicted graphically in figure 2.3, which shows a long position holder in a call option realising a profit when prices rise, while the short position holder simultaneously incurs a loss in the call option.

Figure 2.3 Payoff from position in call options



Source: Hull (2002:165)

b) Put options

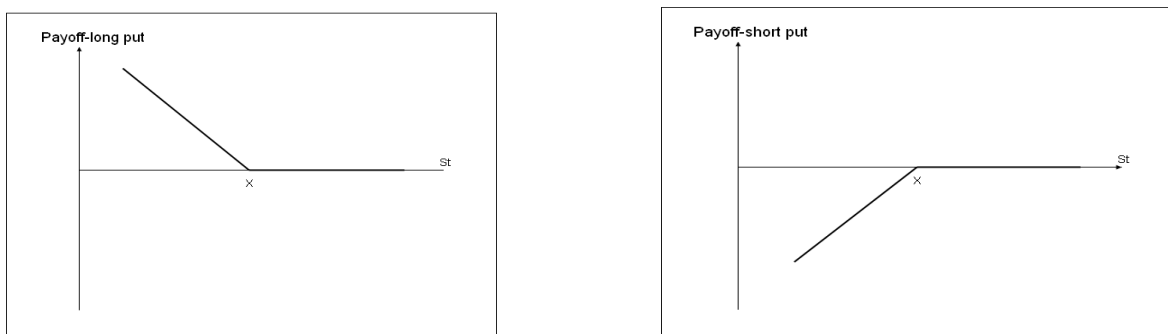
A put option provides the buyer (long position holder) with the right but not an obligation to deliver an asset for a certain price by a specific date. The guaranteed price against which the asset can be delivered is known as the strike price (Kohls & Uhl 2002:355). The buyer of the put option has the right to sell an asset at a predetermined strike price and enters into a put option contract because he or she foresees a decrease in the price of the underlying asset and as such has a bearish outlook on the asset price.

The maximum profit to be achieved upon entering a long put option position can be summarised as follows:

$$\text{Max}(X - St, 0)$$

where X equals the strike price and St the price of the underlying asset at option expiry. This indicates that the option will be exercised only if $X > St$, also known as an option that is “in the money”. In the instance where $X = St$ (“at the money”) or $X < St$ (“out of the money”), the option will not be exercised since the underlying asset can be bought at a price level lower than the strike price (Hull 2002:164-165). When entering a long put position the maximum potential loss is equal to the amount of the put premium, while potential gains are unlimited. A short position in a put option provides the short position holder with a maximum profit equal to the option premium, while potential losses are unlimited. The payoff from a short position in a put option can be summarised as follows: $\text{Min}(St - X, 0)$. These payoffs are represented graphically in figure 2.4, which shows that a profit is realised by a long position holder in a put option when prices drop, while the lower prices result in a loss for the short position holder in a put option.

Figure 2.4 Payoff from position in put options



Source: Hull (2002:165)

c) *American options versus European options*

It is important to note that option contracts are classified as either American or European options. Bodie, Kane & Marcus (2002:978) define an American option as an option that can be exercised any time before and up to its expiration date. In contrast to American options, European options can only be exercised upon expiry of the option contract (Hull 2002:461). Since option contracts on SAFEX can be exercised on any given trading day up to option expiry, they form part of American option contracts.

2.4.2.3 *Pricing of options*

The price being paid to obtain a long position in an option contract is known as the option premium. Various mathematical models are used to determine this option premium, such as the binomial model and models by Cox, Ross and Rubenstein (Botha 2005:53-54). The principal option pricing model, which is even programmed into the permanent memories of some calculators, is the Black-Scholes model.

During the early 1970s Fischer Black, Myron Scholes and Robert Merton developed a mathematical model upon which option pricing are still based today. This model, widely known as the Black-Scholes option pricing model, was pivotal in the rapid growth and success of financial engineering in the 1980s and 1990s. The importance of this model was highlighted when the Nobel Prize for economics was awarded to Scholes and Merton in 1997. The death of Black in 1995 prevented him from sharing this accolade. Some assumptions were made in the development of this model. These include the lack of arbitrage opportunities, returns on the underlying asset following a lognormal distribution and the continuous trading of the underlying asset (Brigham et al 1999:729; Hull 2002:232-239).

The Black-Scholes option pricing model can be summarised in the following three equations (Bodie et al 2002:709-710):

$$C_0 = S_0 N(d_1) - X e^{-rt} N(d_2)$$

where

$$d1 = [\ln(S_0/X) + (r + \sigma^2/2)T] / \sigma \sqrt{T}$$

$$d2 = d1 - \sigma \sqrt{T}$$

and where

C_0 = the current option value

S_0 = the current asset value

$N(d)$ = the probability that, from a standard normal distribution, a random draw will be less than d

X = the strike price or Exercise price

e = the base of the natural log function, namely 2.71828

r = the risk-free interest rate

T = the time to option expiration, expressed in annual terms

\ln = the natural logarithm function

σ = the standard deviation of the annualized continuously compounded rate of return of the underlying asset

Six factors that influence the premium of an option can be identified. These are as follows:

- (1) the asset price
- (2) the strike price (exercise price) of the option
- (3) the volatility of the underlying asset
- (4) the time until option expiration
- (5) the interest rate
- (6) the dividend rate of the asset

(Bodie *et al* 2002:698-699.)

The first four of these variables have the greatest impact on the premium payable for a long position in an option.

a) *Asset price and strike price (exercise price) of option*

Everything else being equal, a higher asset price will result in a larger premium payable for a long position in an option. This statement can be derived from the Black-Scholes option pricing model where $C_0 = S_0N(d_1) - Xe^{-rt}N(d_2)$, and S_0 = the current asset price. Similarly, a lower asset price will result in a smaller premium payable for a long position in an option.

Options are referred to as being “in the money, at the money or out of the money”. An at the money option is defined as “an option in which the strike price equals the price of the underlying asset” (Hull 2002:456). Hull (2002:462) defines an in the money option as “either a call option where the asset price is greater than the strike price or a put option where the asset price is less than the strike price”. This is the opposite of the definition of an out of the money option, which is a call option where the price on the underlying is less than the strike price or a put option with an underlying worth more in value than the strike price. This is summarised in table 2.3, with S being the asset value and X equal to the strike price of the option.

Table 2.3 Relationship between the asset price and strike price of options

	Call option	Put option
At the money option	$S = X$	$S = X$
In the money option	$S > X$	$S < X$
Out of the money option	$S < X$	$S > X$

Source: Hull (2002:168)

As shown in table 2.3, the long position holder in a call option will benefit from an increase in the price of the asset, with the maximum risk being equal to the option premium initially paid for the call option. A long position holder in a put option will benefit from a decrease in price and face a maximum potential loss equal to the price of the put option.

As such, in the money options are more expensive than at the money options which, in turn, trade for a larger premium than out of the money options.

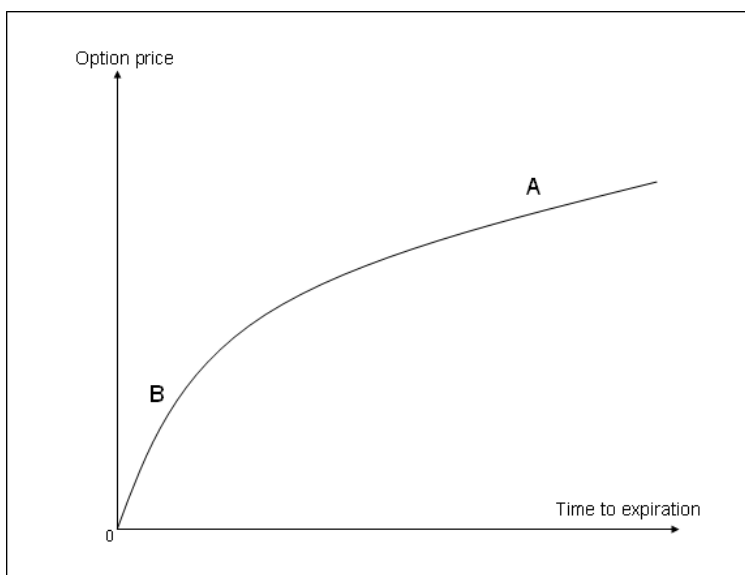
b) Volatility of the underlying asset

Volatility is a major determinant of option prices because it measures the uncertainty of returns on an asset. It can be defined as the change in the price of a futures contract over a given time period. Higher levels of volatility lead to higher option prices and vice versa.

c) Time until maturity

The longer the time until expiration of the option contract, the greater the influence will be on the eventual option price. Time value does not decrease in linear style, since the impact of time value on option prices falls sharply in the last few weeks until maturity. This is represented graphically in figure 2.5. An option with a longer period until expiration (A) is higher in price and decreases more slowly in value than an option with a shorter period until expiration (B).

Figure 2.5 Effect of time value on option prices



Source: Hull (2002:184)

2.5 SOUTH AFRICAN FUTURES EXCHANGE

Even though futures trading in South Africa have been in existence for two decades, the trade of contracts for future delivery with soft commodities as the underlying asset was only added to the futures exchange in the mid-1990s. As such, it is still a developing market.

2.5.1 Development of the South African Futures Exchange

The possibilities and potential of futures trading were recognised in South Africa during the 1980s, and in April 1987 Rand Merchant Bank established an informal futures market. In order to ensure widespread trust and to address the need for an independent exchange and clearing house, the South African Futures Exchange (hereafter known as SAFEX) came into existence. The SAFEX Clearing Company (Pty) Limited (SAFCOM) was formed, and on 10 August 1990 SAFEX was granted an official license from the Financial Services Board in terms of the Financial Markets Control Act (Gravelet-Blondin 2001:1).

Futures trading were initially confined to the financial markets with equity index products proving to be the most popular. Of these index products the All Share Index (ALSI) and Industrial Index (INDI) dominated trading volumes. Options contracts on financial futures were first introduced in October 1992, while the introduction of a fully automated trading system in 1996 signaled a significant milestone in the development of the exchange. Options contracts exploded into popularity and currently account for 65% of volumes traded and 80% of open interest (Gravelet-Blondin 2001:1).

2.5.2 Soft commodity futures contracts on SAFEX

Soft commodities in South Africa have been subject to a highly regulated market, and as such, prices for agricultural products were fixed for over 40 years by government-enabled legislation and governing bodies. The best-known governing body in the agricultural market was the South African Maize Board. Local and international pressure to deregulate this market brought about extensive research into the feasibility of these products being traded on

a futures exchange. In 1995 a separate, independent division of SAFEX was formed for trading agricultural commodities and R4.2 million was raised as start-up capital through the issue of 84 trading seats (Gravelet-Blondin 2001:1).

Contracts traded on the Agricultural Markets Division of SAFEX include white and yellow maize, bread-milling wheat, sunflower seeds and soybeans. March 1998 saw the successful introduction of options contracts on the underlying futures contract. As investor, speculator and hedger confidence in the futures market grew, so did the volumes traded. From a mediocre 1 800 contracts traded monthly in 1996, market liquidity blossomed in the following years to reach 33 000 contracts traded on a monthly basis in 2000 (Gravelet-Blondin 2001:2). Currently the exchange averages an astonishing 200 000 metric tons of maize traded daily, while the volume of options traded on the underlying futures contracts is increasing. The number of broking members on SAFEX exploded from the initial five active members to 52 members through which 12 000 clients manage their trading positions. South Africa remains the only country in the world with an exchange on which white maize futures contracts and white maize options contracts are traded (FMD 2005:1-3).

In May 2001, members of SAFEX and the Johannesburg Securities Exchange (JSE) agreed to a buyout of SAFEX by the JSE, although the SAFEX branding is still used in order to promote futures trading in South Africa (SAFEX 2006).

2.5.3 Clearinghouse and margins

In order to guarantee the fulfillment of contractual obligations obtained by parties through the trading of futures and options contracts, an exchange clearinghouse acts as an intermediary in all futures exchange transactions. A broker who is not a member of the clearinghouse itself is obliged to facilitate all transactions through a clearinghouse member. The clearinghouse keeps track of the daily trades in order to calculate the net rand value of market movement on a specific day. The clearinghouse member is required to keep funds in a margin account at

the clearinghouse against which the net effect of the daily market movement is offset (Hull 2002:23).

Similarly, an investor is required to maintain a margin account with its broking member. These margins act as a safeguard against the possibility of default by a client. Two types of margins can be distinguished, namely initial and variation margins. The initial margin is set by the governing body of the exchange on which trading occurs, while the flow of variation margin is dependent upon the fluctuation in the price of the futures or options contract on which a position is taken (Hull 2002:20-23).

2.5.3.1 The initial margin

Hull (2002:463) defines the initial margin as “the cash required from a futures trader at the time of the trade”. In other words, the initial margin is funds payable by a participant in the futures market when entering into a transaction as a deposit of good faith. Internationally, the initial margin may be in the form of cash, shares and even government bonds, but the JSE only allows for cash as the means of initial margin (Skerrit 2002:19). The initial margin should remain in the margin account of the client as long as an open position is present. The amount per ton payable as initial margin may vary according to the strategy entered into. Whereas an open position in a single futures contract requires the maximum initial margin, the amount of the initial margin is less if the futures contract is part of a spread strategy among commodities highly correlated in price movements since the loss from one position in the spread will at least be partially offset by the gain from the other position.

2.5.3.2 The variation margin

Hull (2002:463) defines the variation margin as “an extra margin required to bring the balance in a margin account up to the initial margin when there is a margin call”. As stated in 2.5.3.1, the initial margin is the amount payable upon entering into a contract on the futures exchange. After completion of every trading day, an adjustment is made to the value of the funds in the investor’s margin account in order to reflect the market movement for the

particular day. This practice is commonly known as marking to market. The principle of marking to market the margin account of a client is not an arrangement between the broking member and client, but rather a mechanism whereby the investor's losses are paid to the exchange in order to pass on the funds to the investor with a position similar in size but opposite in nature (Hull 2002:20-22).

To ensure that the amount of funds in an investor's margin account never becomes negative, a maintenance margin is set which is somewhat lower than the initial margin. In the event of a decline in the value of the margin account to a level lower than the maintenance margin, a margin call is placed upon the investor to deposit funds to the extent that the original initial margin level is restored. The funds payable to regain this initial margin level are known as the variation margin. Should the variation margin payment not be made, the broking member will liquidate the investor's positions to ensure that further market movement will not result in the net total of the margin account becoming negative (Hull 2002:20-22). A number of variables have an ongoing impact on futures prices and determine the direction and extent of market movement.

2.6 VARIABLES DETERMINING FUTURES PRICES

Market variables determine the level at which futures prices trade. These include the supply of and demand for the commodity, market sentiment and technical indicators. Research has found the supply of and demands for the underlying product as one of the most important fundamental variables in the South African market (Krugel 2003:3). Factors influencing supply and demand can be summarised as follows:

2.6.1 Import and export parity

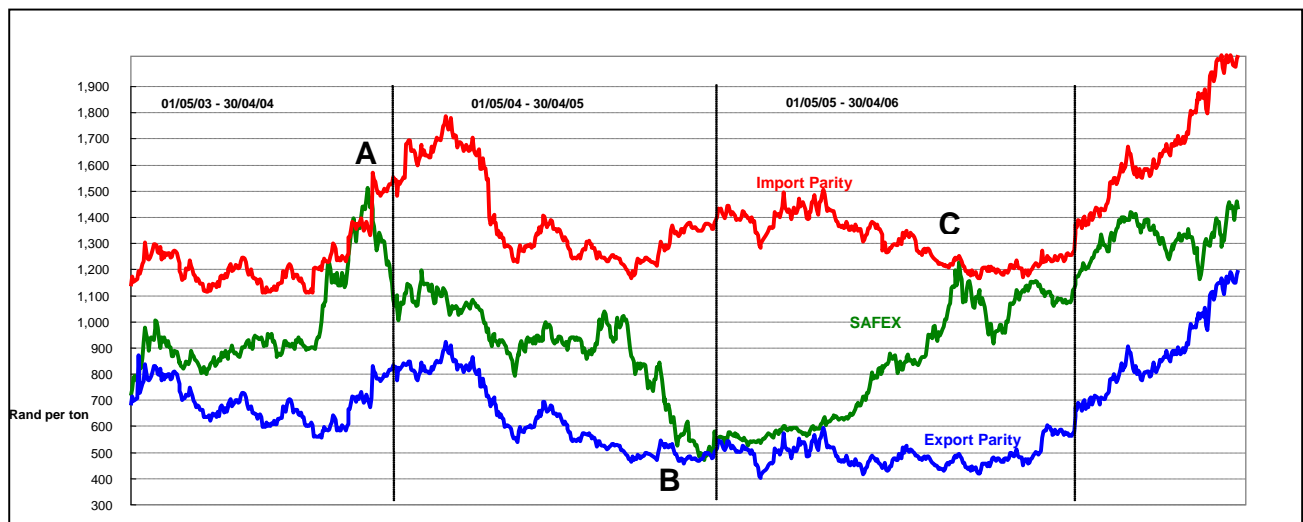
The soft commodity market in South Africa operates in a free-market environment. As such, changes in the world market of similar commodities have a direct impact on domestic prices.

Import and export parity prices act as ceiling and floor prices respectively for the underlying commodity.

Import parity is a calculable price level at which a specific commodity can be imported from foreign countries. Once the SAFEX price moves beyond this level, demand for the local product tends to decline as imports of the product increase. The flagging demand for the local product generally forces prices back to levels lower than import parity.

Export parity is a calculable price level at which a specific commodity can be exported to foreign countries. Once the SAFEX price moves lower than this level, demand for the local product tends to increase as exports of the product flourish. This higher demand for the local product generally forces prices back to levels higher than export parity (see figure 2.6).

Figure 2.6 Import and export parity versus SAFEX white maize



Source: GRAIN SA (2007)

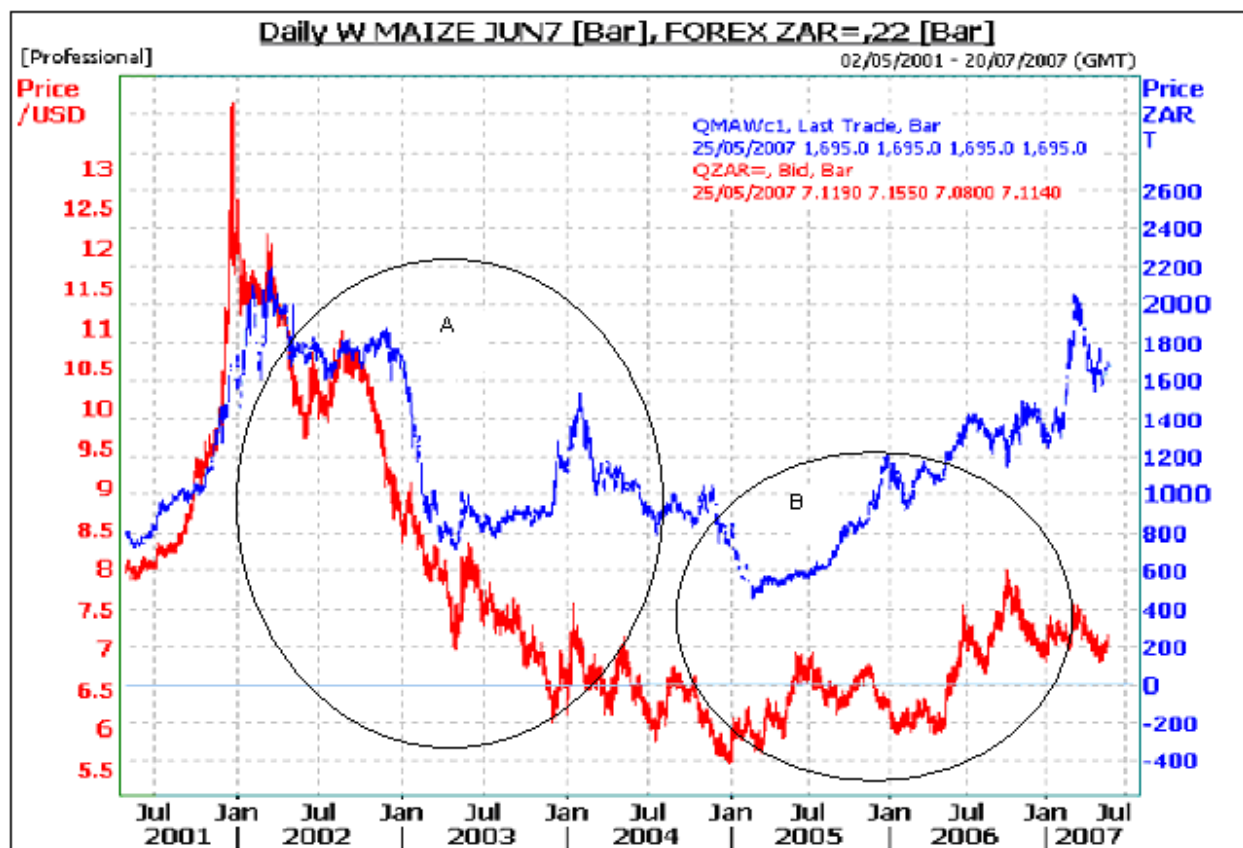
The impact of parity levels on SAFEX prices is clearly evident in figure 2.6, where the symbols A and C represent a period in which SAFEX prices are trading at levels similar to import parity. The lack of demand for local grain results in prices dropping after a brief period

at this level. Similarly, symbol B represents a brief period in which SAFEX prices traded around export parity levels. The resultant increase in demand for local grains leads to an immediate rise in SAFEX prices.

2.6.2 Strength of the local currency

The strength of the South African rand indirectly affects local supply and demand through its impact on import and export parity price levels. A stronger currency moves the parity price band lower, while a weaker currency drives the price band higher. The extent to which local SAFEX prices are influenced by a currency changing in value is illustrated in figure 2.7.

Figure 2.7 Correlation between SAFEX white maize prices and the currency



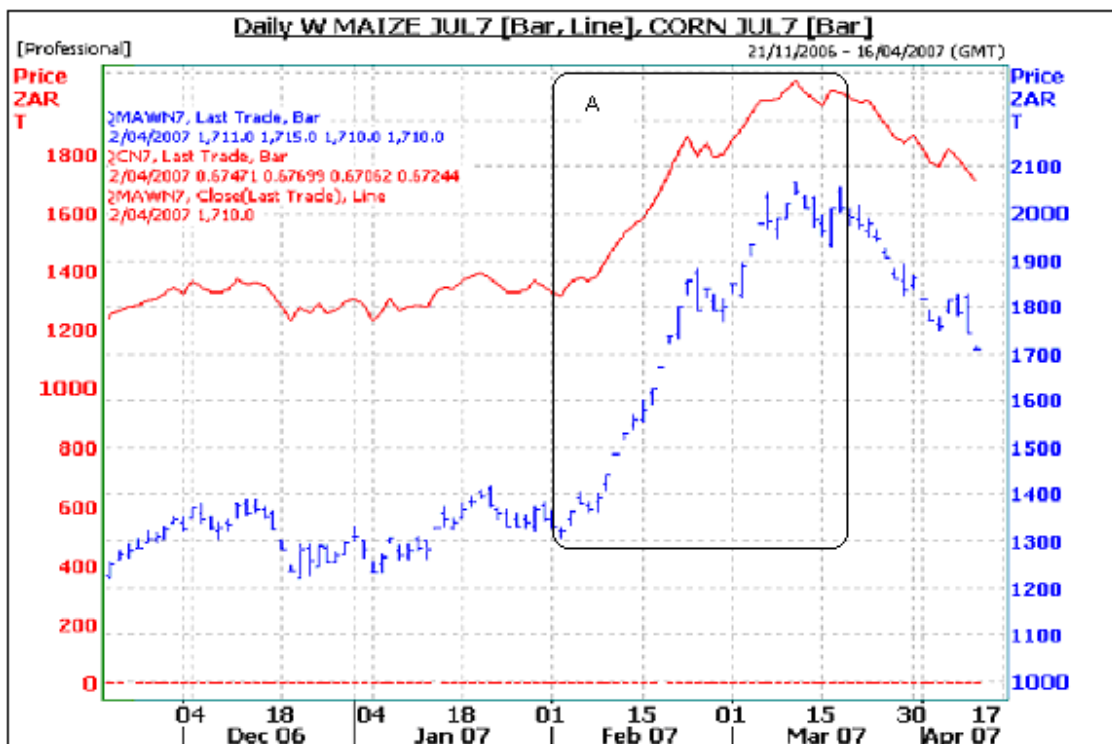
Source: Reuters (2007)

Figure 2.7 illustrates the impact of a volatile currency on the futures price of commodities. During period “A” the South African rand strengthened against the US dollar (R11/\$ vs R7/\$), resulting in SAFEX prices for white maize weakening by close to R1 000/mt. The weakening of the currency from the start of 2005 (R6/\$ vs R7/\$) resulted in SAFEX prices firming over the same period, indicated as “B”.

2.6.3 Strength of international commodity prices

The strength of international commodity prices indirectly affects local supply and demand through its impact on import and export parity price levels. Higher international commodity prices move the parity price band higher, while lower international commodity prices drive the price band lower. The effect of changing international commodity prices on local SAFEX prices is illustrated in figure 2.8.

Figure 2.8 Correlation between SAFEX white maize and CBOT corn prices



Source: Reuters (2007)

Figure 2.8 illustrates the impact of international commodity prices on the futures price of local commodities. From the start of 2007, US maize prices jumped dramatically, resulting in South African futures prices for maize following this price movement immediately, as shown in the rectangle marked “A”.

2.6.4 Weather conditions

Weather conditions affect supply and demand, and as such, the futures price level of commodities (Chabane 2003:7). Adverse weather conditions have a negative impact on the size and quality of the crop. This lower supply tends to move futures price levels higher. Ideal weather conditions, especially during planting and pollination, result in a larger crop and higher levels of supply which suppress futures prices.

The participants in the trading of derivative instruments on the futures exchange differ with respect to their goals and risk appetite. In broad terms, participants are categorised as either hedgers or speculators.

2.7 HEDGING VERSUS SPECULATION USING THE FUTURES EXCHANGE

2.7.1 Hedging

A great number of participants in the futures market are hedgers. The primary aim of hedging is to eliminate price risk through the use of derivative instruments provided by the futures market. Most companies are in the business of manufacturing, retailing or wholesaling. Since these companies do not possess superior expertise in predicting variables underlying commodity prices, it makes sense to hedge the risks associated with adverse price movements (Hull 2002:77). By hedging, participants avoid price surprises.

The price of a manufactured product in a specific industry may fluctuate to reflect the cost of raw materials, and as such, the company exercising the most effective hedging strategy will

earn market share through a lower and more stable product price. Typically, a grain processor will make use of futures and options contracts in order to reduce the risk of rising commodity prices. In its simplest form, either a long position in a futures contract or call option will be obtained.

2.7.2 Speculation

Traders attempting to anticipate and profit from price movements in the futures market are known as speculators. In general, speculators do not intend to fulfil the futures contract by taking or making delivery at maturity of the contract (Kohls & Uhl 2002:357). Speculators exploit short-term arbitrage opportunities in the commodity markets, thus restoring price equilibrium.

The characteristic distinguishing speculators from hedgers is risk. While speculators assume risk with the expectation of making a profit, hedgers are naturally risk averse. Speculators are a key component of the success of a futures exchange since their activity on the exchange provides the market with liquidity and ensures low transaction costs (Kurten 2002:5). Without speculators, short hedgers would only be able to trade with long hedgers. Finding a hedger with the exact opposite position is a frustrating and time-consuming exercise, and as such, speculators have a vital role to play in the futures market.

2.8 VOLATILITY OF FUTURES PRICES

As discussed in section 2.4.2.3, the change in the price of a futures contract over a given time period is known as the volatility of the contract. This measurement of price fluctuation is expressed as a percentage and computed as the annualised standard deviation of percentage changes in the daily price of a commodity. Volatility is one of the principal variables determining the price of an option.

SAFEX prices on white maize have been volatile since the inception of futures trading on soft commodities, with price fluctuations of up to 212% over a 16-month period (Chabane 2003:1). The average annual volatility of white maize contracts is in excess of 30%, although isolated cases of an annual volatility higher than 40% have been recorded (see tab 2.4).

Table 2.4 Annual July white maize contract high, low and average volatility 2001-2006

Season	Season high	Season low	Average volatility
2001	R957	R599	Not available
2002	R1893	R828	32.04%
2003	R1989	R743	32.67%
2004	R1578	R795	39.24%
2005	R1200	R522	41.55%
2006	R1419	R671	37.62%

Source: (SAFEX)

2.9 FINANCIAL REPORTING OF DERIVATIVE INSTRUMENTS: INTERNATIONAL FINANCIAL REPORTING STANDARDS (IFRS)

Historically, South African companies with an open position on SAFEX on financial year-end were subject to reporting of these positions through AC133 (Tiger Brands 2003; Tongaat Hulett 2003). In order to align South Africa to international standards of reporting in this field, AC133 was replaced by International Accounting Standard 39 (IAS39) as set by the International Accounting Standards Board. The aim of this section is to provide background on the working of the Board and the objectives of IAS39.

2.9.1 IFRS

The International Accounting Standards Board (IASB), which is based in London, started operations during 2001 and is committed to the development of a set of accounting standards

which is of the highest possible quality. In order to achieve the objective of convergence in accounting standards worldwide, the IASB cooperates with national accounting standard setters. The International Accounting Standards Committee (IASC) Foundation is responsible for the selection and funding of the IASB. Funds are obtained through major accounting firms, industrial companies, central and development banks, private financial institutions and other professional and international organisations (IASB 2006:3).

A formal process and broad international consultation are the foundation upon which International Financial Reporting Standards (IFRS) are developed. The full responsibility of all technical matters related to IFRS lies with the IASB, which includes the preparation and issuing of IFRS and the development of its technical agenda. The following steps are performed in the formal process involving new projects:

- IASB staff identifies and raises issues that warrant the attention of the Board, such as technical matters regarding the preparation and issuing of Reporting Standards.
- The issue is placed on the active agenda and the IASB decides whether the project should be conducted alone or if support is needed from alternative standard setters.
- After thorough consideration of the issue, the IASB may establish a working group.
- Even though it is not required, the IASB usually publishes a discussion paper on any new topics. This involves a comprehensive discussion of the issue as well as possible approaches whereby the issue can be addressed, and an invitation to comment on the discussion paper.
- A mandatory step in the process is the publication of an exposure draft, and this is carried out in public IASB meetings.
- A review is conducted by the IASB on both the comments received and the results of alternative consultations. The IASB may decide to explore issues further through public hearings and field visits.
- The final development of an IFRS is done during a public meeting by the IASB. Once all the issues arising from the exposure draft have been dealt with, the IASB decides

whether a revised proposal should be made available to the public for comment. In the instance where the IASB is satisfied that that a conclusion has been reached on all outstanding issues, an IFRS draft must be approved by no less than nine members of the IASB (IASB 2006:5-6).

2.9.2 Financial Instruments: Recognition and Measurement (IAS 39)

Futures and options contracts traded on SAFEX are recognised in the financial statements of relevant companies through International Accounting Standard 39 (IAS39) as the guideline. A detailed discussion of this is presented in section 3.5.1.

Objective of IAS 39 and financial instruments categories

“The objective of this Standard is to establish principles for recognizing and measuring financial assets, financial liabilities and some contracts to buy or sell non-financial items” (IASB 2006:1714).

IASB (2006:1717) defines a derivative for the purposes of IAS39 as follows:

“A derivative is a financial instrument or contract within the scope of this Standard with all three of the following characteristics:

- a) its value changes in response to the change in a specified interest rate, financial instrument price, commodity price, foreign exchange rate, index of prices or rates, credit rating or credit index, or other variable, provided in the case of a non-financial variable that the variable is not specific to a party to the contract (sometimes called the underlying);
- b) it requires no initial net investment or an initial net investment that is smaller than would be required for other types of contracts that would be expected to have a similar response to changes in market factors; and
- c) it is settled at a future date.”

IAS 39 specifies the following four categories of financial instruments: *financial assets or liabilities at fair value through profit or loss*; *held to maturity investments*; *loans and receivables* as well as *available for sale financial assets*. Since *held to maturity investments*, *loans and receivables* and *available for sale financial assets* are specified as non-derivative financial assets, futures and options contracts traded on SAFEX are categorised as *financial assets or liabilities at fair value through profit or loss*.

While the aim of this section is to provide background on the manner in which derivative margins are recorded in the financial statements of companies subject to market movement at year-end, the specific measurement of cash flow gains and losses attributable to hedging transactions will only be discussed in section 3.5.1.

2.10 SUMMARY AND CONCLUSIONS

Formalised trading practices developed as early as the ancient Greek and Roman markets, but it was only during the 1800s that commodity trading in the USA came into existence. SAFEX was formed in 1990, with trading initially limited to the financial markets. Futures trading in soft commodities were introduced in 1995.

Commodities are defined as portions of wealth that are demanded because they have the power to satisfy human needs and want, with soft commodities being agriculturally produced commodities. The development of highly scientific technology in the production of soft commodities lowers the risk of crop failures, but it remains an economic activity subject to high levels of uncertainty that shape the way in which commodity markets behave worldwide

Derivative trading is based on underlying assets such as currencies, commodities, government or corporate debt, home mortgages, stocks and interest rates. These derivative instruments can be classified as forward-type contracts or option-type contracts and are

traded on a formal exchange or more privately on the over-the-counter (OTC) markets. Futures contracts are distinguished from forward contracts through a standardised quality, quantity, place and time of delivery for the commodity being traded. Participants in the futures market are either long (buy) or short (sell) the market, while options on the underlying commodity are classified as put or call options.

Variables that influence the premium of an option include the asset price, the strike price (exercise price) of the option, the volatility of the underlying asset, the time until option expiration, the interest rate and the dividend rate of the asset. The Black-Scholes option pricing model is widely recognized as the most important development in the options market.

Supply and demand, market sentiment and technical indicators are variables that determine the futures price of a commodity. Volatility measures the change in price of a futures contract over a given time period, and is a variable determining the price of options contracts. SAFEX prices on white maize are highly volatile, with extreme market movements since the inception of the contract. Hedgers participate in the futures market to eliminate the risk of adverse price movements, while speculators are risk-seekers whose goal is to realise profits from arbitrage opportunities.

The IASB is responsible for the development of a set of reporting standards of the highest possible quality and which standardise accounting standards worldwide. IAS39 is applicable on the manner in which positions in derivative instruments are measured in financial statements.

Chapter 3 identifies the groups susceptible to futures market volatility. The price risk management performance of these groups will be evaluated and the impact of volatile prices on their financial statements determined.

CHAPTER 3

GROUPS SUSCEPTIBLE TO VOLATILITY IN THE FUTURES EXCHANGE

3.1 INTRODUCTION

A number of different groups have an ongoing interest in the futures market. The extent to which these groups actively manage their exposure to price volatility differs significantly. The price risk management performance of the groups managing a position on SAFEX and the impact of volatile prices on individuals with no position on the exchange will determine the need for risk management strategies.

The objective of this chapter is to differentiate between groups with a concern in the futures exchange and evaluate the pricing performance of market advisory services and relevant participants in futures trading. The effect of price volatility on the financial statements of processors will be investigated and the need for indexing strategies explored.

Although some individuals do not make use of futures trading in their daily activities, this study will determine whether volatile prices do influence passive groups with a concern in the underlying commodity traded. This will serve as justification for the development of risk management models in the ensuing chapters.

3.2. CLASSIFICATION OF GROUPS INFLUENCED BY THE FUTURES MARKET

Groups concerned in SAFEX can be classified according to their level of participation on the exchange itself. According to Hull (2002:29), some groups make use of complex mathematical models on an intraday, daily or long-term basis in order to evaluate trading strategies and risk exposure, while, according to Chabane (2003:1), others are subject to

price fluctuations despite having no open position. In broad terms, parties with a concern in SAFEX can be defined as groups directly or indirectly susceptible to price movements.

3.2.1. Groups directly susceptible to price movements

Speculators and hedgers who actively manage a position on SAFEX are directly susceptible to a changing market environment and as such to volatile commodity prices (Kohls & Uhl 2002:350). Although similar price risk management tools are available to these market participants, their actual application and aim differ significantly.

3.2.1.1. Speculators

According to Kohls and Uhl (2002:357), speculators usually do not intend to participate in the delivery of physical grain but are directly susceptible to price movements since their financial success depends on the strategy used in the exploitation of arbitrage opportunities. The risk of being on the wrong side of the market is of such financial magnitude that risk managers of the future will need to deal with speculative risks, while activities such as market research and investments will resort within the scope of risk management departments (Valsamakis, Vivian & du Toit 2003:7).

3.2.1.2. Hedgers

Hedgers are naturally long stock (producers) or short stock (processors) and need to adopt an equal but offsetting position in the futures market in order to eliminate the risk of price fluctuations. Many underlying hedgers, attempting to achieve the optimum hedge, find it difficult to make effective decisions in volatile times (JSE 2006:1).

Producers aim to hedge their stock by going short (i.e. sell) the market at the highest possible price level. In addition to the uncertainty of predicting when prices will reach their peak, producers need to manage emotion in hedging decisions (Decision Commodities 2006). Typically, prices will trade at high levels during periods of crop uncertainty, but this should not prevent producers from utilising the opportunity of hedging at high price levels. The

producer's ultimate financial success depends on the efficiency of the applied hedging strategy.

The South African milling industry exhibits typical characteristics of an oligopolistic structure (Bernstein 1996:120-145; SA Grain 2004) and the high level of competition makes it impossible to pass on the results of ineffective procurement strategies to the consumer (National Chamber of Milling 2006). As such, the milling industry will be forced to cut profit margins and even close down if higher raw material prices are not reflected in the final product (*Doing little costs a lot* 2002). Financial success will only be realised once an effective hedging strategy with a predictable outcome is applied to futures prices.

3.2.2. Groups indirectly susceptible to price movement

Groups, influenced by futures price movements without actively participating in trading on the futures exchange, can be classified as being indirectly susceptible to price movements. White maize is used for human consumption in South Africa (Traub & Jayne 2004:1), and since consumers of maize meal do not participate in the trading of futures and options contracts on SAFEX, but are still susceptible to adverse price movements (Chabane 2003:1), they qualify as being indirectly influenced by price movements.

Huge numbers of poor people spend up to 50% of their income on food (*Doing little costs a lot* 2002). It has been estimated that ultra poor South African households spend up to 20% of their monthly income on maize alone (NIEP 1995). Because demand is price inelastic, that is, consumers have no choice but to absorb price increases or starve, rapid inflation in food prices has a devastating impact on the living standards of consumers (NALEDI 2002). This means that the food price index for low-income groups rises far more quickly than the overall consumer price index (CPI).

The importance of maize, a staple food for the low-income South African citizen, means that volatile futures prices have a major impact on food security. Cycles of high prices will lead to

malnutrition and hunger. Since expenditure is diverted to the purchase of more expensive food, other areas of household activities will ultimately suffer and the disproportionate effect of higher SAFEX prices for maize will exacerbate inequality (Chabane 2003:4).

3.3. PRICE-RISK MANAGEMENT PERFORMANCE OF MARKET ADVISORY SERVICES

The pioneering work in this field was done by Irwin, Good, Martines-Filho and Hagedorn (2005) for the AgMas project at the University of Illinois. Every price risk management recommendation from over 20 professional trading companies was recorded after 1994. A comparison was made between the net results of every recommendation from the individual companies and the benchmark average price constructed from the daily closing prices over the contract lifetime. The results indicate that only one professional trading company managed to outperform the simple average benchmark (by less than 7% on average). In other words, less than 5% of the professional trading companies managed to outperform the futures market.

Another finding of the research indicated that the net advisory prices vary substantially between companies, with differences of up to 70% on the realised futures price. The conclusion drawn is that markets are efficient and no additional profits can be made through risk management strategies (Irwin et al 2003).

3.4. PRICE RISK MANAGEMENT PERFORMANCE OF SPECULATORS AND HEDGERS

3.4.1. Speculators

Thorough research has been done on the forecasting ability of speculators in the soft commodity futures market. The earliest findings on the performance of speculators in the

grain futures market were published in 1934. Stewart (1934:415-433) made a detailed analysis of 9 000 accounts of a nationwide brokers' firm for the period 1925 to 1934. These accounts reflected exclusively speculative transactions in grain futures. The most striking finding of this research project was that nearly 75% of speculators lost money. Of greater concern, however, is the fact that the entire sample highlighted losses six times the value of total gains.

In 2001, 67 years after Stewart (1934) published his findings, Wang (2001:929-952) released the results of his study on the predictability of returns in the futures market. The results showed that large speculators in the futures market are still unable to accurately predict price movements.

Locally, the futures market was stunned when trustees of a pension fund stated their intention to sue WJ Morgan, a South African futures broker, for losses of R1.4 billion sustained as a result of overexposure on SAFEX. The decision to expose funds of R2.7 billion to the derivatives market was taken by WJ Morgan on the basis of expectations of a continued rise in maize prices (*Pension funds plan to sue WJ Morgan* 2003).

3.4.2 Producers

The inability of producers to effectively manage their exposure to adverse price movements is highlighted in the well-known fact that two-thirds of producers short the futures market in the bottom third of the price range (Decision Commodities 2006).

3.4.3 Processors

The inability of processors to effectively manage the risk of volatile prices has been well documented. The evaluation of the price risk management performance of processors will be done through an investigation into the procurement results of African Products and Tiger Brands. These two processing companies are used for the purposes of this study since they

are recognised as two of the main role players in the procurement market for the following reasons:

- African Products consumes close to 7% of the average annual maize crop (Tongaat Hullett 2003:4).
- Tiger Brands is recognised as one of the four biggest milling companies in South Africa (Chabane 2003:6-7).

In order to determine the ability of African Products and Tiger Brands to successfully eliminate volatile futures prices, the year with the greatest maize price movement should be identified. By identifying this particular year, the impact of large price movements on hedging strategies can be explored. The difference between the contract high and low of the July white maize contract for the period 2001 to 2006 is represented graphically in figure 3.1.

Figure 3.1 Price difference between July white maize contract high and low 2001-2006

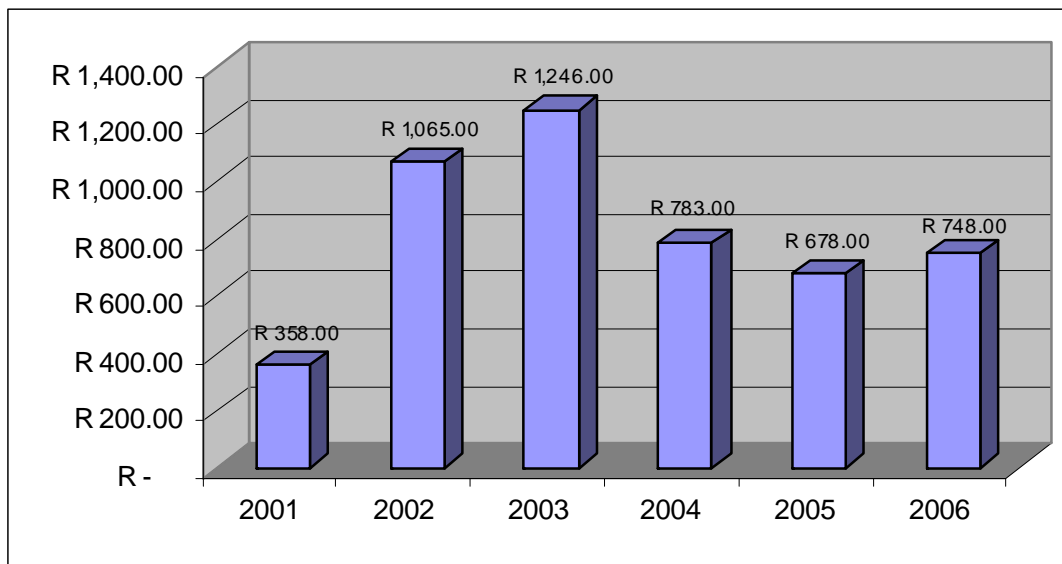


Figure 3.1 shows that 2003 experienced the greatest movement in white maize prices, and as such the annual results of Tongaat-Hulett and Tiger Brands for 2003 will be investigated in order to determine the effect of volatile prices.

3.4.3.1 *African Products*

Tongaat-Hulett is a group consisting of four closely linked and focused businesses. One of these businesses is African Products, Africa's largest manufacturer of starch and glucose. Its five mills consume in excess of 600 000 tons of maize annually, that is nearly 7% of the average South African maize crop.

In the chairman's statement for the 2003 financial year, Cedric Savage blamed expensive maize procurement costs as one of the main reasons contributing to a headline loss of R93 million, down from a 2002 headline profit of R380 million. During 2003, African Products followed its long-established strategy with a focus on price stability. A characteristic of this procurement strategy was that the impact of price increases was nullified. The strategy simply consisted of going long the futures market. As the market came down from levels of R2000/ton late in 2002 to below R800/ton in 2003, African Products incurred huge valuation losses on the procurement contracts. This forced Peter Staude, Chief Executive Officer, to comment in Tongaat Hulett's 2003 annual report that a new model of maize procurement was needed (Tongaat Hulett 2003).

3.4.3.2 *Tiger Brands*

In the group results for the year ended 30 September 2002, the following comment was made (Tiger Brands 2002): "The effects of sharply higher grain prices were mitigated by the benefits of an effective procurement programme, which resulted in the group being able to source its grain requirements at below market prices."

In subsequent months, the futures market was characterised by a sharp drop in white maize futures prices. This forced the Chief Executive Officer of Tiger Brands to make the following

contrasting comment in the 2003 annual report (Tiger Brands 2003): “High priced maize stocks carried over from last year, volatile maize prices and the stronger rand impacted on operating income which declined by 5% to R1.9 billion.”

After much praise for the hedging strategy in the previous year, a comment was made in the 2003 annual report that new hedging strategies would be introduced to provide for better hedging against volatile commodity prices. This clearly shows the absence of a hedging strategy with a predictable outcome that is able to beat the average market price.

Consistent with this, Dhuyvetter and Kastens (2004:1-25) presented the findings of their research project at the Risk and Profitability Conference in Kansas. They concluded by stating that “... spending management time trying to beat the market is probably not a good use of time”. The National Chamber of Milling released a statement in early 2006, expressing concern over the continued existence of the milling industry. This followed a year in which the processing sector suffered cumulative losses of R149.3 million due to the high level of maize prices.

As such, a price risk management strategy with effective results and a predictable outcome would be invaluable to all groups concerned in SAFEX. This is consistent with the findings of Erb and Harvey (2005:1-41) that tactical strategies provide higher average returns and lower risk than exclusively long-only commodity futures exposure.

3.5 THE IMPACT OF A VOLATILE MARKET ON THE FINANCIAL STATEMENTS OF PROCESSORS

Since volatility in the futures price of maize has a definite impact on the earnings of processors (see secs 3.4.3.1 & 3.4.3.2) it is necessary to investigate the standard of

measurement used in the recognition of financial instruments in the financial statements of processors.

3.5.1 IAS39

International Accounting Standard 39 (IAS 39) covers the recognition and measurement of financial instruments and as such is applicable to open positions in futures and options contracts (IASB 2006:1709). It is a particularly complex and complicated accounting standard whereby a cash flow valuation methodology is prescribed in calculating position values going into a new financial year. When a long futures position is held at a price level higher than the equivalent futures contract price level at financial year-end, a resultant charge against the income statement will be made to the extent that the long futures position is higher than the current futures price multiplied by the relevant tonnages.

Any entity can apply IAS39 to all types of financial instruments except the following:

- An interest in subsidiaries, associates or joint ventures that is accounted for under IAS27 or IAS31.
- A right or obligation under leases to which IAS17 is applicable.
- The rights and obligations of employers under employee benefit plans which are subject to IAS19.
- The issuance of financial instruments by an entity similar to the definition of equity instruments defined in IAS 32.
- Contracts for contingent consideration in business combinations.
- Contracts in a business combination between a vendor and acquirer to buy or sell at a future date.
- Financial instruments, obligations and contracts resorting under share-based payment transactions discussed in IFRS2. (IASB 2006:1714.)

The IASB (2006:1739-1742) identifies three types of hedging relationships, namely:

(1) *Fair value hedge*. “A hedge of the exposure to changes in fair value of a recognized asset or liability or an unrecognized firm commitment, or an identified portion of such an asset, liability or firm commitment, that is attributable to a particular risk and could affect profit or loss.”

(2) *Cash flow hedge*. “A hedge of the exposure to variability in cash flows that (i) is attributable to a particular risk associated with a recognized asset or liability or a highly probable forecast transaction and (ii) could affect profit or loss.”

(3) *Hedge of net investment in foreign operations*. When a long position in the futures market is entered into with the exclusive objective of nullifying the risk of a rise in futures prices, a cash flow hedge is incurred. A cash flow hedge is accounted for as follows:

- “The portion of the gain or loss on the hedging instrument that is determined to be an effective hedge shall be recognized directly in equity through the statement of changes in equity; and
- the ineffective portion of the gain or loss on the hedging instrument shall be recognized in profit or loss.”

In order to evaluate the effect of IAS39 on the financial statements of processors, 2003 will be used to determine the impact of large price movements on hedged positions and as such on the financial statements of Tongaat-Hulett and Tiger Brands (see figure 3.1).

3.5.2 Tongaat-Hulett

The 2003 financial results for the group proved to be most disappointing, predominantly because of expensive maize procurement costs. A headline loss of R93 million was reported, comparing poorly with a 2002 headline profit of R380 million. The underlying operating profit of the Group dropped from R262 million in 2002 to a mediocre R114 million in 2003. The group incurred a total net loss of R41 million for the year, versus a 2002 net earnings of R388

million. The mark-to-market valuation adjustment required on the 2003 African Products procurement contracts resulted in a charge against the income statement of R255 million (Tongaat-Hulett 2003).

The impact of high volatility in maize prices combined with customer expectations of a steady price has resulted in African Products changing its business model with respect to future procurement strategies (Tongaat-Hulett 2003).

3.5.3 Tiger Brands

Similar to the financial results of Tongaat-Hulett, the high levels of volatility in the futures market proved to be the main factor contributing to the poor results achieved by Tiger Brands in the financial year ending 30 September 2003 (Tiger Brands 2003).

Even though revenue from continuing operations of R23 billion increased by a staggering 15%, high-priced maize stocks carried over from the previous year are highlighted as the reason for a 5% drop in operating income to R1.9 billion. In addition, the operating margin declined from 10.1% in 2002 to 8.3% in 2003. A need was expressed in Tongaat Hulett's interim results for the half year ended 30 June 2003 to change its procurement strategy in such a way that IAS39 would not enhance earnings volatility.

3.6 THE IMPACT OF A VOLATILE MARKET ON GROUPS NOT ACTIVE ON SAFEX

The impact of market volatility on consumers is a vital consideration in the development of price risk management strategies for processors, given the fact that nearly 16.3 million South Africans earn an income of less than the minimum subsistence level (CDFNSSA 1990). Since food makes up such a high percentage of spending by the poor, an increase in food prices has a devastating effect on living standards in addition to the economy as a whole.

Research conducted by BFAP (2003) cited market power as one of the most obvious reasons for asymmetric price transmission. The research found that a 10% increase in the SAFEX price of white maize resulted in a R2.42 increase per 10 kg bag of maize meal. Once the variables determining SAFEX prices had returned to its earlier levels, the meal price would only return to normal after eight months. In sharp contrast to this, a 10% decrease in the SAFEX price of white maize resulted in a drop of only R0.95 per 10 kg bag of maize meal, with the retail prices returning to normality in five 5 months. Thus, SAFEX price increases are passed on to consumers to a greater extent than price decreases. Since 75% of the cost of producing maize meal is maize itself, the conclusion that should be drawn is that processing companies do not possess the necessary capabilities to beat the market.

An analysis of food price inflation for different income groups by SA Grain (2004) showed that poor households experienced higher inflation rates than wealthier households. At its peak in October 2002, poor households experienced a year-on-year food price inflation rate of 23.1%, while richer households were confronted with a 19% food price inflation rate.

When food prices in South Africa soared towards the end of 2001 and at the start of 2002, the food price index for December 2001 rose by 11.4% compared to a 3% increase for nonfood prices (NALEDI 2002). This was mainly the result of a 212% increase in the SAFEX price of white maize over the period October 2000 to January 2002 (Chabane 2003). If the milling industry does not develop a hedging product that will eliminate price fluctuations, the consumer will continue to absorb the impact of volatile maize prices.

3.7 THE NEED FOR INDEXING STRATEGIES

Price risk management is not about controlling price uncertainty, but rather a focus on managing it (Decision Commodities 2006). In more specific terms, price risk management focuses on managing the emotions that influence and shape decisions. The price risk

management strategy applied should remove emotion and automate the hedging process. In other words, an indexing strategy should be considered.

This need for indexing strategies was expressed by groups with a concern in SAFEX and resulted in the JSE publishing market notice A665 on 15 March 2006, entailing a proposal to trade a 30-day average pricing contract as an alternative hedging tool. This contract will be based on white maize contracts only and will represent a 30-day moving average for expiries based on the underlying futures contract. For example, should this alternative hedging tool trade on a willing buyer/willing seller principle at R1 000, but the 30-day moving average is R990 on a specific trading day, a R10 variation margin will be paid by the buyer to the seller (JSE 2006:1).

Although the proposal has not yet been approved, it does confirm the need for strategies to reduce price volatility.

3.8 SUMMARY AND CONCLUSIONS

Groups with a concern in SAFEX can broadly be defined as being directly or indirectly susceptible to price movements according to their level of active participation on the exchange itself. Speculators and hedgers (producers and processors) are directly influenced by market movement while consumers, exposed to fluctuations in retail prices of maize meal due to price volatility on SAFEX, are defined as being indirectly susceptible to volatile futures prices.

There is sufficient empirical and literature evidence to suggest that either market advisory services, speculators, producers or processors possess sufficient knowledge of price risk management models to outperform the market. In addition, price volatility has an adverse

impact on the financial statements of processors, especially since IAS39 implies that a long-term hedging position should be valued against short-term market levels.

Extreme levels of price volatility cause poor households to experience higher levels of food inflation than richer households. Consumers mainly absorb the impact of price volatility, with asymmetric price transmission being evident.

A need for indexing strategies led to the proposal of a 30-day moving average contract by SAFEX for expiries based on the underlying futures contract. These types of strategies will reduce price volatility and benefit participants in the futures market.

Chapter 4 investigates and calculates the extent of market volatility present on SAFEX and determines a benchmark for performance measurement. A discussion on the working of the proposed risk management models will serve as an introduction to the ensuing chapters.

CHAPTER 4

PERFORMANCE MEASUREMENT THROUGH BENCHMARKING

4.1 INTRODUCTION

The ineffectiveness of speculators and hedgers in the forecasting of price movements and procurement of grains on the futures market was highlighted in chapter 3. Volatile prices on SAFEX and their adverse impact on low-income groups in South Africa were evident from the literature examined in that chapter. The conclusion was drawn that a definite need exists among active participants on SAFEX for price risk management models that will lower the effect of price volatility. This will ultimately also benefit consumers of the underlying commodity to which the models will be applied.

The feasibility and success of price risk management models applied on futures prices can only be determined once their performance has been compared to the returns offered by the market or by alternative risk management models. The specific calculation of the market return or alternative risk management model against which the performance of the particular risk management model is measured is a significant consideration in the evaluation of a strategy.

The aim of this chapter is to define and explain the concept of performance comparisons. A suitable standard of measurement will be determined against which the eventual results of the proposed strategies will be measured. The historical returns on the chosen standard of measurement will be calculated and an explanation of the proposed risk management models provided as an introduction to the ensuing chapters. As such, the success of the proposed models will depend on the average price of the long positions obtained versus the price level of the standard of measurement.

4.2 WHAT IS BENCHMARKING?

In its simplest form, benchmarking involves comparisons (Brigham et al 1999:80). The concept underlying the evaluation of the performance of risk management strategies is the comparison of net prices achieved by these strategies versus the returns offered by similar active strategies or the passive market. These comparisons are widely known as benchmarking, because it serves as an objective standard of performance (similar to a scale providing an objective measurement of weight) (Irwin, Good, Martines-Filho & Batts 2006-03:2).

Benchmarking can be classified according to two broad groups of benchmarks: peer-group benchmarks and external benchmarks. Peer-group benchmarking is the comparison between the performances of a particular risk management strategy versus similar market-related strategies. External benchmarking focuses on the comparison between the performances of a particular risk management strategy and the return offered by the market, for example, a passive market index where the average price over a series of commodities or time periods is achieved without engaging in an actively managed strategy (Irwin et al 2006-02:29.)

Peer-group benchmarking provides interesting information on the ranking of alternative strategies, but is unable to determine whether a specific risk management model is superior or inferior in an absolute economic sense. Benchmarking, according to external benchmarks, is based upon the efficient market theory. This entails that markets are rational and all knowing and that competition between participants in the marketplace will immediately eliminate all possible arbitrage opportunities available through the exploitation thereof (Irwin et al 2006-02:29-30).

As such, the theory of efficient markets predicts that market prices will always reflect all the information available with reference to the variables determining the value of an underlying asset (Hull 2002:461; Madura 2000:263; Fama 1970:383-417). This implies that no trading

strategy can constantly outperform the return offered by the market and is the platform upon which the returns offered by the market are used as a benchmark.

4.3 USING THE INDEX (AVERAGE PRICE) AS BENCHMARK

For the purposes of this study, an index is defined as the average price of a single commodity or group of commodities, on a specific date or over a predetermined period. In this context the index used should measure the average SAFEX white maize price for July delivery over the contract lifetime for the processing company that follows no active hedging strategies. The average price is determined in order to reflect the returns of a naïve strategy, hedging equal amounts of the commodity every day over the duration of the contract. This is consistent with research already done on this subject (Irwin et al 2005:27-31).

Outside of the grain markets, the performance of fund managers in stock markets is also compared to an index, of which the SATRIX 40 and ALSI are two of the best-known South African indexes; international indexes often referred to as benchmarks include the Dow Jones Industrials Index, S&P 500 Index and Nasdaq 100 Index (Irwin et al 2006-02:29-30; Hull 2002:166).

Good, Irwin and Jackson (1998:3) identify desirable properties, from a practical perspective, that a benchmark should adhere to, namely:

- A benchmark should be easy to calculate and simple to understand.
The index, for the purposes of this study, is a simple average price over the contract lifetime of the commodity and can easily be calculated.
- It should represent the returns of a strategy that can be implemented by processors.
By going long an equal amount of grain on a daily basis over the lifetime of the contract, the index price will be achieved by processors.

- The benchmark price should be directly comparable to the price achieved by the strategy. *Since the benchmark index average price will be calculated on the same commodity and contract month as the strategy price, the benchmark price will be directly comparable to the price achieved by the risk management strategy.*

Since the simple average price index on grains has been used as a benchmark in previous research on this topic (Irwin et al 2005:27-31) and complies with the requirements of a benchmark (Good et al 1998:3), it will be used in the evaluation of the proposed price risk management models for the purposes of this study.

4.4 BENCHMARK INDEX FROM 2001 TO 2006

As discussed in section 4.3, the average price index can be calculated as follows:

$$API = (n1+n2+n3.....)/TD$$

where

API = average price index

n = daily July closing price of white maize

TD = number of July white maize trading days

(See appendix I for comprehensive details of the daily July white maize closing prices.)

By applying this formula to the July white maize contract from 2001 to 2006, the average price index for the individual marketing years is calculated and summarised in figure 4.1.

Figure 4.1 Average Price Index 2001 – 2006

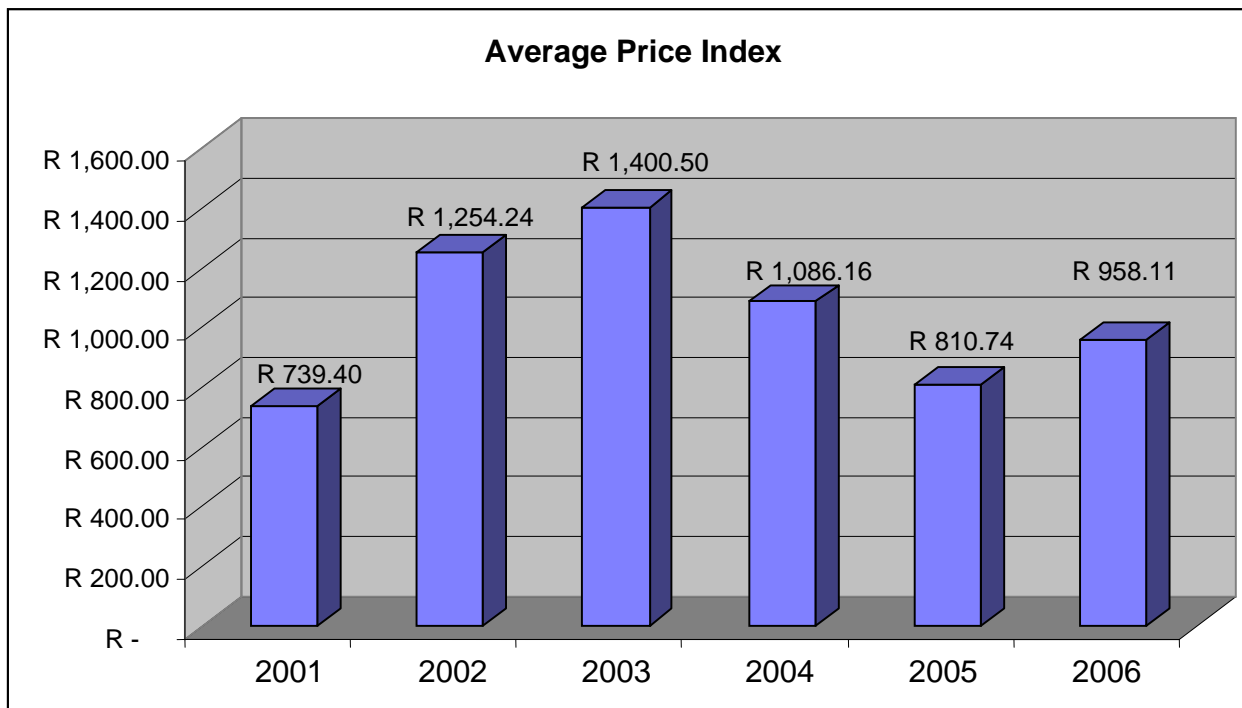


Figure 4.1 confirms the high levels of price volatility, with the highest Average Price Index (2003) nearly double the value of the lowest Average Price Index (2001).

4.5 CONTRACT HIGHS, CONTRACT LOWS AND VOLATILITY OF PRICES

(See appendix II for comprehensive details of the daily July white maize price volatility.)

Price volatility is evident in figure 4.2. In five of the six years under review the high of the July white maize contract is close to, and in some instances even more than, double the contract low. The average volatility of the July white maize contract for the last five years is presented graphically in figure 4.3. (Published volatility is only available from the 2002 season.)

Figure 4.2 Contract highs and lows 2001–2006

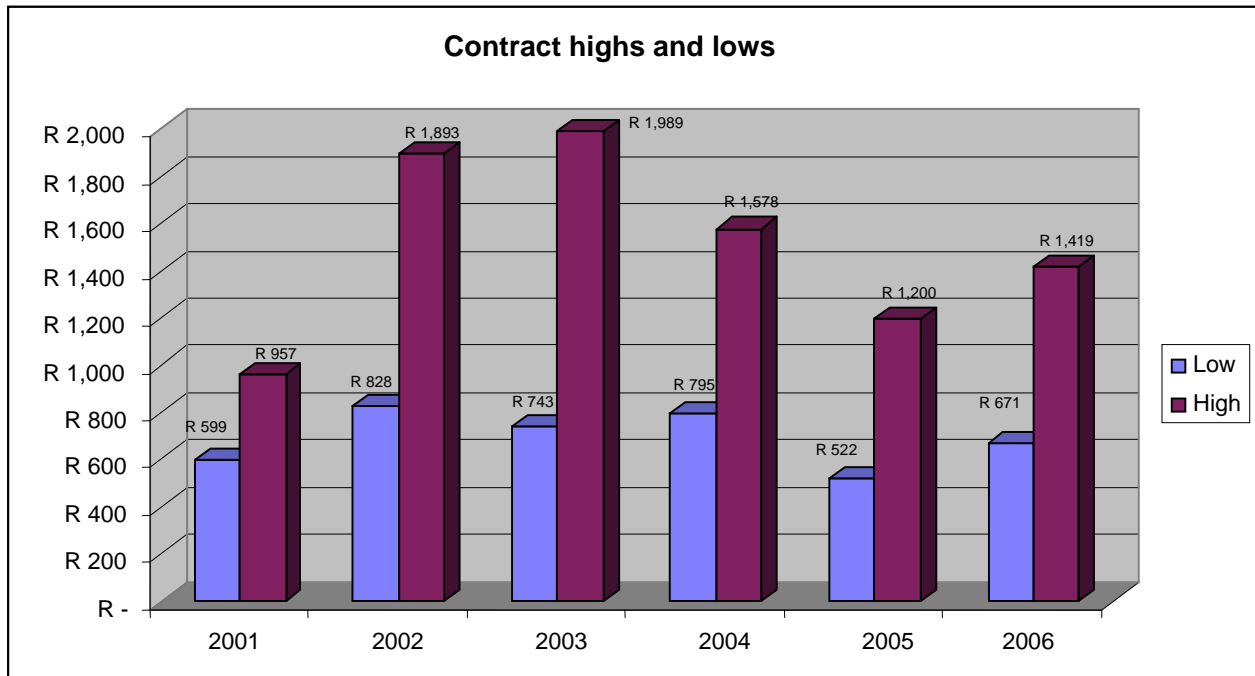
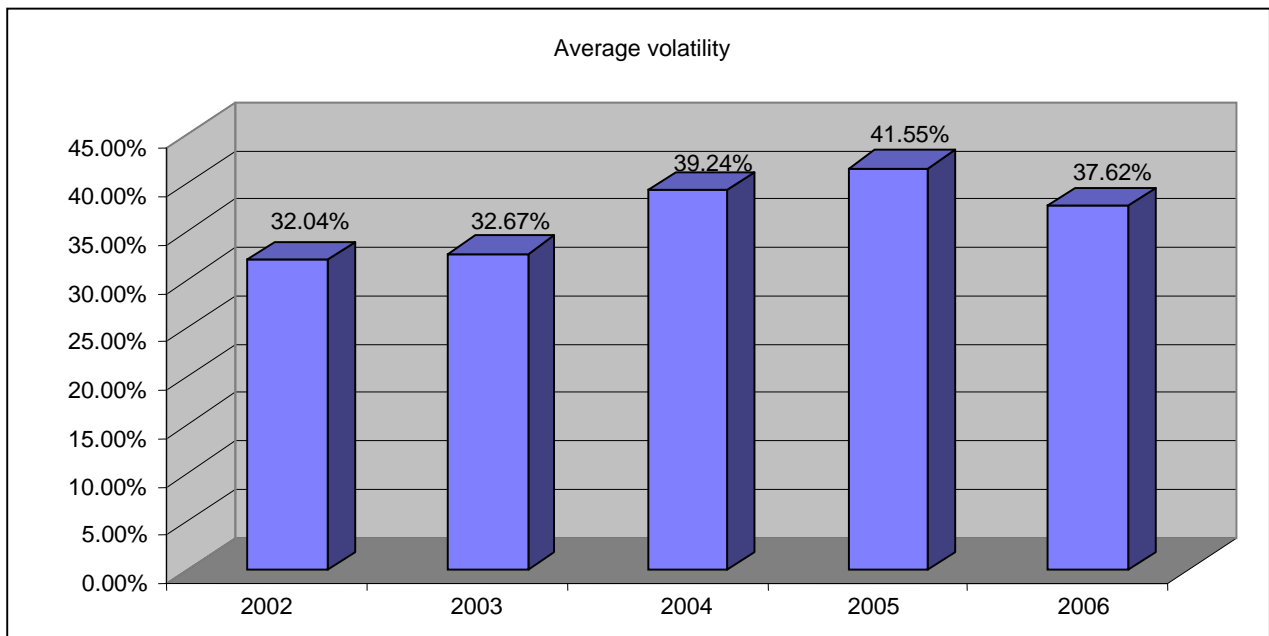


Figure 4.3 Average volatility 2002–2006



4.6 PROPOSED PRICE RISK MANAGEMENT STRATEGIES

The aim of the three price risk management strategies (to be presented in chapters 6, 7 & 8) is to beat the average July white maize price over the contract lifetime. This objective is in total contrast to the efficient market hypothesis which states that the market is a model of efficiency and cannot constantly be outguessed or outperformed (Hull 2002:461; Madura 2000:263; Fama 1970).

All three of the proposed strategies resort under core/satellite risk management models. This framework is used to develop a strategy with the potential to add additional value above a performance floor. In a typical core/satellite model, the main strategy is a risk-controlled core position, with an active satellite structure aiming to realise additional gains above the index price (Wicas 2005:27).

A successful core/satellite strategy is based on the predictability of passive indexing. In the words of Charles D Ellis (1995:95-100) "If you can't beat the market, you should certainly consider joining it." Hedging an open position according to this strategy will minimise the effect of volatility in the futures market. Much has been said about this type of risk management, with many diverse opinions.

In his 2001 presentation at the Superbowl of Indexing, John Bogle argued that no strategy can claim performance superior to market averages. According to Bogle, the concept of an average indexed price is being modified and misused by some in order to realise better than average returns. He concludes by stating that market players who undertake the folly of speculation in addition to indexing implement a flawed strategy and are bound to be disappointed.

In contrast to Bogle, Wicas (2005:27-30) claims that thoughtfully executed active management can potentially add value relative to a static average price index. He concedes

that active management should be incorporated in such a way that it does not sacrifice control of systematic risk factors, but states that active management and averaging of prices can complement each other. The core position should provide the strategy with a high degree of risk control, whereas active management provides the potential for enhanced performance.

Wicas (2005:27) further claims that the incorporation of research and academic results, in addition to extensive practical experience, will provide the stakeholder in the market with the ability to construct a risk-controlled strategy likely to constantly outperform the market.

4.7 SUMMARY AND CONCLUSIONS

The evaluation of the performance of risk management strategies by comparing their returns to those offered by similar active strategies or the passive market is known as benchmarking. Whilst peer-group benchmarking involves the comparison of returns between a particular strategy and those of alternative strategies available on the market, external benchmarking focuses on the comparison of the return of a particular strategy versus the return offered by the market.

The average price of the July white maize contract will be used as a benchmark for the purposes of this study. This use of an average price index is consistent with previous research on this topic, and complies with the requirements as identified by research.

A calculation of the average price index contract highs and contract lows for the July white maize contract over the last six years confirms the extraordinarily high levels of volatility present on SAFEX. This is confirmed by a five-year volatility average well in excess of 35%.

Chapter 5 provides background on alternative research methodologies and research designs and will determine the most appropriate sampling method and research design upon which the research will be conducted.

CHAPTER 5

RESEARCH DESIGN

5.1 INTRODUCTION

The importance of agriculture in South Africa and the radical changes brought about by the Marketing of Agricultural Products Act 47 of 1996 were discussed in chapter 1, while a theoretical background on the working of derivative instruments was presented in chapter 2. Chapters 3 and 4 focused on the different groups susceptible to market fluctuations and a market benchmark for measuring performance. The aim of this chapter is to provide theoretical background on the alternative methods of sampling and research designs. The most appropriate method of sampling for this particular study will be chosen in addition to the research design to be implemented in the following chapters. Research will be conducted by means of a case study approach based on historical data in order to determine the success of the proposed risk management strategies.

5.2 RESEARCH SAMPLE

The research process entails a collection of information in order to solve the underlying problem, namely: What is the need and possibility for the development of futures market price risk management strategies that will constantly outperform the market? The results obtained from the data derived from the particular objects will ultimately determine whether the credibility of the price risk management strategies is accepted or rejected. Crucial to this is the research design, defined as the method whereby objects are obtained and information gathered from the chosen sample (Welman & Kruger 2001:46).

A specific population usually underlies a research problem. The study object may be any one of the following: individuals, groups, organisations or the conditions to which they are exposed (Welman & Kruger 2001:46). The sheer size of a particular population may be of such magnitude that it would be impractical and uneconomical to involve all of the individual components within the population (Botha 2005:68). As such, the research will be based on data obtained from a sample of the population with characteristics similar to the population as a whole. According to Sekaran (2003:269), two broad types of samples can be distinguished, namely probability samples and non-probability samples.

5.2.1 Probability samples

In probability sampling, the probability of inclusion of an individual element from the larger population in the eventual research sample can be determined. Through probability samples, the probability with which the results from the sample differ from the corresponding population means can be indicated. Probability samples can be classified as follows:

- simple random samples
- stratified random samples
- systematic samples
- cluster samples

(Welman & Kruger 2001:46-47.)

5.2.1.1 Simple random samples

Simple random sampling is also known as unrestricted sampling (Botha 2005:68-69). Every individual member of the population has an equal chance of being included in the sample in addition to every sample possessing a similar probability of being chosen (Welman & Kruger 2001:53).

5.2.1.2 *Stratified random samples*

This method of sampling is applied where the specific population is composed of more than one subpopulation which is recognisable and non-overlapping and which differs from one another in terms of the variable (Welman & Kruger 2001:55). The representation of every subpopulation in the sample is determined, and elements within the sub-population are randomly chosen for presentation in the sample (Botha 2005:69).

5.2.1.3 *Systematic samples*

In the instance where a sample of n members is required from a population of N elements numbered from 1 to N , every N/n th element is included in the sample (Welman & Kruger 2001:58).

5.2.1.4 *Cluster samples*

Since it is impossible to obtain information on all members in large-scale surveys, a pre-existing list of heterogeneous groups, also known as clusters, is drawn and every member of the particular cluster is the sample (Welman & Kruger 2001:60).

5.2.2 **Non-probability samples**

In non-probability sampling, the probability of an element chosen in the sample cannot be specified. Certain members may not even have a chance of being included in the eventual sample. Non-probability samples are classified as follows:

- accidental sampling
- purposive sampling
- quota sampling
- snowball sampling

(Welman & Kruger 2001:61-63.)

5.2.2.1 *Accidental sampling*

This method of sampling members for research purposes is the most convenient since members who are near and available are included in the sample. Accidental sampling is an easy way to obtain relevant information efficiently and without a time delay (Sekaran 2003:276).

5.2.2.2 *Purposive sampling*

Purposive sampling is commonly regarded as the main type of non-probability sampling. This is because the user of this method relies purely on experience and ingenuity in order to obtain sample units in such a way that the units are recognised as being representative of the total population (Welman & Kruger 2001:63).

5.2.2.3 *Quota sampling*

Should the decision be made to follow the method of quota sampling, an effort is made to ensure that the sample consists of similar proportions of units in important areas. The units are obtained in the areas accidentally (Welman & Kruger 2001:63).

5.2.2.4 *Snowball sampling*

This entails individual members of the population being approached in order to identify additional members to be included in the sample (Welman & Kruger 2001:63).

5.2.3 Application of sampling methodology

For the purposes of this study, a non-probability purposive sample is used with reference to the procurement companies and the trading year on which the hedging results are evaluated. This sampling methodology is used for the following reasons:

- The milling industry (procurement sector) includes a number of small millers but is mainly concentrated in a limited number of large milling companies (Chabane 2003:6-7). The price risk management performance of processors is evaluated by means of an

investigation into the procurement results of African Products and Tiger Brands. These two processing companies are used for the purposes of this study since they are recognised as two of the main role players in the procurement market (see sec 3.4.3).

- In order to evaluate the price risk management success of procurement companies during periods of volatile market prices, the annual results of African Products and Tiger Brands are investigated for the year with the greatest maize price movement (see sec 3.4.3).

It is evident that this method of sampling represents a non-probability purposive sample, since it relies on the experience and ingenuity of the researcher to select a sample representative of the total population.

5.3 THE RESEARCH DESIGN

Mouton (2005:55) defines the research design as "... a plan or blueprint of how you intend conducting the research". This is similar to the definition of a research design by Welman and Kruger (2001:46), which states that "a research design is the plan according to which we obtain research participants and collect information from them". Botha (2005:73) distinguishes between the following four different research design techniques:

- (1) surveys
- (2) secondary data
- (3) experiments
- (4) observations

5.3.1 Surveys

Surveys are generally used in quantitative studies in order to provide an overview of a sample gathered from a large population (Mouton 2005:152). A survey is a research technique

whereby information is gathered from the chosen sample through verbal interviews or non-verbal questionnaires (Botha 2005:73).

5.3.2 Secondary data

Welman and Kruger (2001:142) define secondary data as information that is gathered by individuals or groups other than the researcher. This definition is similar to that of Mouton (2005:164) who states that secondary data are usually quantitative and historical (existing) and used by the researcher in order to reanalyse such data so as to validate models.

5.3.3 Experiments

Experiments are quantitative (Mouton 2005:155). The aim of experimental research is to provide a causal study of a limited number of subjects in an environment in which a high degree of control is evident (usually in laboratory conditions).

5.3.4 Observations

Three types of observation types exist, namely systematic field observations, participant observations and controlled recordings (Mouton 2005:105). Welman and Kruger (2001:186-187) note that the observer should refrain from summarising the findings of the observations since this can result in premature interpretations. To ensure that all relevant information is recorded, it is also of utmost importance that observations are recorded during the activity.

5.3.5 Application of the research design

The specific research design most suited to the purposes of this study is a secondary data analysis. This decision was made after considering the alternative research designs and the advantages and disadvantages offered by secondary data analysis, as stated by Mouton (2005:165).

Advantages

- By using secondary data, the researcher can access relevant information more quickly than through the use of primary data.
- Secondary data allow the researcher to obtain information at a lower cost than primary data.

Disadvantages

- Secondary data restrict the user in the original objective of the research.
- The researcher cannot control errors in the data obtained.

The main reasons why secondary data are most suitable for this study, can be summarised as follows:

- Relevant historical information can be accessed immediately since the historical SAFEX prices and volatility percentages are readily available.
- Secondary SAFEX data on grain prices and volatilities are available on the official SAFEX website (www.safex.co.za), and as such are made available to the general public at no cost.

Welman and Kruger (2001:35) express their concern about the presence of biases and inaccuracies in the use of secondary data. This will not be a limitation in this study, since the primary source of data is quoted directly in the secondary data. SAFEX prices as traded on the electronic futures market are quoted on its closing prices and inaccurate data on the official SAFEX website are therefore limited.

The historical SAFEX prices and volatilities are accessed by trading day per contract year and the application of the proposed price risk management strategies will be done on the information gathered.

5.4 SUMMARY

Two broad types of samples can be distinguished, namely probability samples and non-probability samples. Probability samples can be classified as simple random samples, stratified random samples, systematic samples and cluster samples. Non-probability samples are limited to accidental sampling, purposive sampling, quota sampling and snowball sampling. A research design is the method whereby objects are obtained and information gathered from the chosen sample. Four different research design techniques can be distinguished, namely surveys, secondary data, experiments and observations.

After due consideration and based upon a review of sampling techniques and research designs the researcher concluded that a non-probability purposive sample would be used with reference to the procurement companies and the trading year on which the hedging results would be evaluated. The accurate and available historical price and volatility information are the main reasons why a secondary data analysis was chosen as the most appropriate data collection method. This historical information includes the daily trading range and closing prices, as well as the volatility for every commodity and contract month.

In the next chapter the first of three core/satellite price risk management strategies will be presented. A successful core/satellite strategy captures the predictability of passive indexing with the possibilities of active management. The aim of these strategies is to beat the average price index.

CHAPTER 6

THE MOMENTUM STRATEGY

6.1 INTRODUCTION

It was concluded in previous chapters that neither hedgers nor speculators are able to outperform the returns offered by the market, in accordance with the efficient market hypothesis. The average price index was consequently chosen as benchmark against which the results from the proposed risk management strategies would be compared.

The proposed price risk management strategies are based on a core/satellite model. This framework is used to develop a strategy with the potential to add additional value above an average price, where the main strategy is a risk-controlled position, with an active structure aiming to add additional value.

This chapter will discuss and evaluate the momentum strategy. The success of the strategy depends on its performance relative to the benchmark, and the consistency with which the benchmark is outperformed.

6.2 DEFINITION

Erb and Harvey (2005:3) define the momentum strategy as a method of pursuing above-average returns by investing in commodity futures with positive past price movements. This is consistent with Spurgin's (1999:1) description, which states that the momentum strategy involves buying the underlying asset that rises in price and selling the asset when prices fall. For the purposes of this study, a drop in prices will not result in a short position being taken, since the underlying hedge position should result in delivery of the commodity being taken.

Hence the proposed momentum strategy will hold exclusively long positions, similar to the Goldman Sachs commodity index (Spurgin 1999:1).

The long-only momentum strategy for the purposes of this study is ultimately defined as buying the underlying commodity in the event of an increase in prices (or no change in prices), while a drop in the commodity price results in no action being taken.

6.3 DESCRIPTION OF THE MOMENTUM STRATEGY

The characteristic that defines a momentum strategy is its design whereby short-term price trends are captured with the added advantage of a minimisation of risk through indexing of prices over a period. Because this is a fixed strategy, it can easily be replicated by hedgers in the futures market.

While there is sufficient literature on momentum in equity markets (Carhart 1997:57-82; Johnson 2004:585-608) there does not seem to be general consensus on the reasons why this strategy is successful in its application. In terms of the proposed momentum strategy, Johnson's (2004:585-608) view seems to be the most likely reason for potential hedging success on SAFEX. He argues that the returns achieved by such a strategy are a payoff for taking more risk than merely buying the average price index.

The momentum strategy, to be applied on historical data, possesses the following distinctive features:

- Every trading day that July white maize prices increase (or remain unchanged), a long position will be taken.
- Every trading day that July white maize prices drop, no position will be taken on SAFEX.

- The first trading day on which July white maize prices increase after a drop in prices, long positions will be taken. The number of long positions entered into should equal the sum of the number of trading days since the last trading day on which prices closed higher.

The July contract is used in the evaluation of the proposed strategy, because it is the most liquid futures contract available on SAFEX. Although grain processors do not wish to take delivery of a year's stock all at once, the resultant long position can be rolled forward to the delivery month in which the grain is required. Rolling a position forward consists of going short the July contract against the long position obtained from the Momentum strategy, and immediately going long the desired contract month (Hull 2002:458).

For the purposes of the evaluation of the strategy, the assumption will be made that a single daily position taken on SAFEX entails one futures contract (100 metric tons) traded at its closing price. Since processors are naturally much shorter the market, the number of futures contracts taken as position on SAFEX can be adjusted according to individual needs.

6.4 APPLICATION OF THE MOMENTUM STRATEGY

A detailed analysis of the momentum strategy applied to the 2001 July white maize contract data (as given in Appendix I) is presented below in table 6.1, while an individual calculation for the years up to 2006 is presented in appendix III.

Table 6.1 The momentum strategy applied to 2001 July white maize daily closing prices

DATE	JULY WHITE MAIZE PRICE	CONTRACTS TRADED	TONNAGES TRADED	PRICE x TONNAGES
05 May 2000	R 670			
08 May 2000	R 670	1	100	R 67,000
09 May 2000	R 665	0	0	R 0
10 May 2000	R 665	2	200	R 133,000
11 May 2000	R 665	1	100	R 66,500
12 May 2000	R 670	1	100	R 67,000
15 May 2000	R 690	1	100	R 69,000
16 May 2000	R 690	1	100	R 69,000

17 May 2000	R 690	1	100	R 69,000
18 May 2000	R 690	1	100	R 69,000
19 May 2000	R 690	1	100	R 69,000
22 May 2000	R 690	1	100	R 69,000
23 May 2000	R 690	1	100	R 69,000
24 May 2000	R 690	1	100	R 69,000
25 May 2000	R 690	1	100	R 69,000
26 May 2000	R 690	1	100	R 69,000
29 May 2000	R 690	1	100	R 69,000
30 May 2000	R 685	0	0	R 0
31 May 2000	R 685	2	200	R 137,000
01 June 2000	R 686	1	100	R 68,600
02 June 2000	R 686	1	100	R 68,600
05 June 2000	R 686	1	100	R 68,600
06 June 2000	R 690	1	100	R 69,000
07 June 2000	R 690	1	100	R 69,000
08 June 2000	R 690	1	100	R 69,000
09 June 2000	R 700	1	100	R 70,000
12 June 2000	R 700	1	100	R 70,000
13 June 2000	R 685	0	0	R 0
14 June 2000	R 685	2	200	R 137,000
15 June 2000	R 682	0	0	R 0
19 June 2000	R 682	2	200	R 136,400
20 June 2000	R 682	1	100	R 68,200
21 June 2000	R 675	0	0	R 0
22 June 2000	R 675	2	200	R 135,000
23 June 2000	R 672	0	0	R 0
26 June 2000	R 655	0	0	R 0
27 June 2000	R 660	3	300	R 198,000
28 June 2000	R 657	0	0	R 0
29 June 2000	R 650	0	0	R 0
30 June 2000	R 648	0	0	R 0
03 July 2000	R 638	0	0	R 0
04 July 2000	R 636	0	0	R 0
05 July 2000	R 633	0	0	R 0
06 July 2000	R 630	0	0	R 0
07 July 2000	R 630	8	800	R 504,000
10 July 2000	R 624	0	0	R 0
11 July 2000	R 625	2	200	R 125,000
12 July 2000	R 617	0	0	R 0
13 July 2000	R 620	2	200	R 124,000
14 July 2000	R 624	1	100	R 62,400
17 July 2000	R 625	1	100	R 62,500
18 July 2000	R 630	1	100	R 63,000
19 July 2000	R 622	0	0	R 0
20 July 2000	R 619	0	0	R 0
21 July 2000	R 625	3	300	R 187,500
24 July 2000	R 625	1	100	R 62,500
25 July 2000	R 625	1	100	R 62,500
26 July 2000	R 625	1	100	R 62,500
27 July 2000	R 628	1	100	R 62,800
28 July 2000	R 630	1	100	R 63,000
31 July 2000	R 626	0	0	R 0
01 August 2000	R 627	2	200	R 125,400
02 August 2000	R 632	1	100	R 63,200
03 August 2000	R 629	0	0	R 0
04 August 2000	R 629	2	200	R 125,800
07 August 2000	R 624	0	0	R 0
08 August 2000	R 624	2	200	R 124,800
10 August 2000	R 612	0	0	R 0
11 August 2000	R 599	0	0	R 0
14 August 2000	R 599	3	300	R 179,700
15 August 2000	R 602	1	100	R 60,200
16 August 2000	R 608	1	100	R 60,800

17 August 2000	R 600	0	0	R 0
18 August 2000	R 604	2	200	R 120,800
21 August 2000	R 599	0	0	R 0
22 August 2000	R 604	2	200	R 120,800
23 August 2000	R 603	0	0	R 0
24 August 2000	R 603	2	200	R 120,600
25 August 2000	R 603	1	100	R 60,300
28 August 2000	R 601	0	0	R 0
29 August 2000	R 605	2	200	R 121,000
30 August 2000	R 618	1	100	R 61,800
31 August 2000	R 620	1	100	R 62,000
01 September 2000	R 619	0	0	R 0
04 September 2000	R 612	0	0	R 0
05 September 2000	R 617	3	300	R 185,100
06 September 2000	R 625	1	100	R 62,500
07 September 2000	R 626	1	100	R 62,600
08 September 2000	R 620	0	0	R 0
11 September 2000	R 625	2	200	R 125,000
12 September 2000	R 629	1	100	R 62,900
13 September 2000	R 626	0	0	R 0
14 September 2000	R 624	0	0	R 0
15 September 2000	R 622	0	0	R 0
18 September 2000	R 627	4	400	R 250,800
19 September 2000	R 632	1	100	R 63,200
20 September 2000	R 625	0	0	R 0
21 September 2000	R 629	2	200	R 125,800
22 September 2000	R 627	0	0	R 0
26 September 2000	R 626	0	0	R 0
27 September 2000	R 626	3	300	R 187,800
28 September 2000	R 628	1	100	R 62,800
29 September 2000	R 632	1	100	R 63,200
02 October 2000	R 635	1	100	R 63,500
03 October 2000	R 643	1	100	R 64,300
04 October 2000	R 665	1	100	R 66,500
05 October 2000	R 668	1	100	R 66,800
06 October 2000	R 659	0	0	R 0
09 October 2000	R 657	0	0	R 0
10 October 2000	R 655	0	0	R 0
11 October 2000	R 655	4	400	R 262,000
12 October 2000	R 662	1	100	R 66,200
13 October 2000	R 682	1	100	R 68,200
16 October 2000	R 679	0	0	R 0
17 October 2000	R 686	2	200	R 137,200
18 October 2000	R 694	1	100	R 69,400
19 October 2000	R 697	1	100	R 69,700
20 October 2000	R 688	0	0	R 0
23 October 2000	R 676	0	0	R 0
24 October 2000	R 672	0	0	R 0
25 October 2000	R 682	4	400	R 272,800
26 October 2000	R 690	1	100	R 69,000
27 October 2000	R 682	0	0	R 0
30 October 2000	R 693	2	200	R 138,600
31 October 2000	R 695	1	100	R 69,500
01 November 2000	R 694	0	0	R 0
02 November 2000	R 703	2	200	R 140,600
03 November 2000	R 712	1	100	R 71,200
06 November 2000	R 706	0	0	R 0
07 November 2000	R 710	2	200	R 142,000
08 November 2000	R 725	1	100	R 72,500
09 November 2000	R 732	1	100	R 73,200
10 November 2000	R 714	0	0	R 0
13 November 2000	R 695	0	0	R 0
14 November 2000	R 693	0	0	R 0
15 November 2000	R 705	4	400	R 282,000

16 November 2000	R 720	1	100	R 72,000
17 November 2000	R 722	1	100	R 72,200
20 November 2000	R 729	1	100	R 72,900
21 November 2000	R 738	1	100	R 73,800
22 November 2000	R 741	1	100	R 74,100
23 November 2000	R 739	0	0	R 0
24 November 2000	R 744	2	200	R 148,800
27 November 2000	R 744	1	100	R 74,400
28 November 2000	R 740	0	0	R 0
29 November 2000	R 736	0	0	R 0
30 November 2000	R 706	0	0	R 0
01 December 2000	R 709	4	400	R 283,600
04 December 2000	R 704	0	0	R 0
06 December 2000	R 699	0	0	R 0
07 December 2000	R 685	0	0	R 0
08 December 2000	R 699	4	400	R 279,600
11 December 2000	R 716	1	100	R 71,600
12 December 2000	R 712	0	0	R 0
13 December 2000	R 715	2	200	R 143,000
14 December 2000	R 705	0	0	R 0
15 December 2000	R 715	2	200	R 143,000
18 December 2000	R 720	1	100	R 72,000
19 December 2000	R 733	1	100	R 73,300
20 December 2000	R 732	0	0	R 0
21 December 2000	R 726	0	0	R 0
22 December 2000	R 732	3	300	R 219,600
27 December 2000	R 729	0	0	R 0
28 December 2000	R 736	2	200	R 147,240
29 December 2000	R 739	1	100	R 73,900
02 January 2001	R 757	1	100	R 75,680
03 January 2001	R 756	0	0	R 0
04 January 2001	R 779	2	200	R 155,800
05 January 2001	R 800	1	100	R 80,000
08 January 2001	R 830	1	100	R 83,000
09 January 2001	R 831	1	100	R 83,100
10 January 2001	R 851	1	100	R 85,100
11 January 2001	R 853	1	100	R 85,300
12 January 2001	R 839	0	0	R 0
15 January 2001	R 847	2	200	R 169,400
16 January 2001	R 862	1	100	R 86,200
17 January 2001	R 872	1	100	R 87,200
18 January 2001	R 861	0	0	R 0
19 January 2001	R 875	2	200	R 175,000
22 January 2001	R 879	1	100	R 87,900
23 January 2001	R 864	0	0	R 0
24 January 2001	R 877	2	200	R 175,400
25 January 2001	R 871	0	0	R 0
26 January 2001	R 841	0	0	R 0
29 January 2001	R 840	0	0	R 0
30 January 2001	R 810	0	0	R 0
31 January 2001	R 805	0	0	R 0
01 February 2001	R 835	6	600	R 501,000
02 February 2001	R 865	1	100	R 86,500
05 February 2001	R 910	1	100	R 91,000
06 February 2001	R 934	1	100	R 93,400
07 February 2001	R 904	0	0	R 0
08 February 2001	R 892	0	0	R 0
12 February 2001	R 855	0	0	R 0
13 February 2001	R 870	4	400	R 348,000
14 February 2001	R 900	1	100	R 90,000
15 February 2001	R 930	1	100	R 93,000
16 February 2001	R 923	0	0	R 0
19 February 2001	R 893	0	0	R 0
20 February 2001	R 894	3	300	R 268,200

21 February 2001	R 906	1	100	R 90,600
22 February 2001	R 887	0	0	R 0
23 February 2001	R 859	0	0	R 0
26 February 2001	R 834	0	0	R 0
27 February 2001	R 833	0	0	R 0
28 February 2001	R 829	0	0	R 0
01 March 2001	R 840	6	600	R 504,000
02 March 2001	R 864	1	100	R 86,400
05 March 2001	R 874	1	100	R 87,400
07 March 2001	R 873	0	0	R 0
08 March 2001	R 878	2	200	R 175,600
09 March 2001	R 883	1	100	R 88,300
12 March 2001	R 862	0	0	R 0
13 March 2001	R 848	0	0	R 0
14 March 2001	R 843	0	0	R 0
15 March 2001	R 840	0	0	R 0
16 March 2001	R 830	0	0	R 0
19 March 2001	R 846	6	600	R 507,600
20 March 2001	R 854	1	100	R 85,400
22 March 2001	R 850	0	0	R 0
23 March 2001	R 820	0	0	R 0
26 March 2001	R 820	3	300	R 246,000
27 March 2001	R 832	1	100	R 83,200
28 March 2001	R 813	0	0	R 0
29 March 2001	R 802	0	0	R 0
30 March 2001	R 797	0	0	R 0
02 April 2001	R 815	4	400	R 326,000
03 April 2001	R 817	1	100	R 81,700
04 April 2001	R 818	1	100	R 81,800
05 April 2001	R 827	1	100	R 82,700
06 April 2001	R 845	1	100	R 84,500
09 April 2001	R 846	1	100	R 84,600
10 April 2001	R 835	0	0	R 0
11 April 2001	R 830	0	0	R 0
12 April 2001	R 832	3	300	R 249,600
17 April 2001	R 840	1	100	R 84,000
18 April 2001	R 831	0	0	R 0
19 April 2001	R 826	0	0	R 0
20 April 2001	R 822	0	0	R 0
23 April 2001	R 823	4	400	R 329,200
24 April 2001	R 813	0	0	R 0
25 April 2001	R 804	0	0	R 0
26 April 2001	R 809	3	300	R 242,700
30 April 2001	R 807	0	0	R 0
02 May 2001	R 816	2	200	R 163,200
03 May 2001	R 812	0	0	R 0
04 May 2001	R 808	0	0	R 0
07 May 2001	R 788	0	0	R 0
08 May 2001	R 781	0	0	R 0
09 May 2001	R 771	0	0	R 0
10 May 2001	R 767	0	0	R 0
11 May 2001	R 754	0	0	R 0
14 May 2001	R 760	8	800	R 608,000
15 May 2001	R 764	1	100	R 76,400
16 May 2001	R 757	0	0	R 0
17 May 2001	R 750	0	0	R 0
18 May 2001	R 751	3	300	R 225,300
21 May 2001	R 737	0	0	R 0
22 May 2001	R 744	2	200	R 148,800
23 May 2001	R 758	1	100	R 75,800
24 May 2001	R 758	1	100	R 75,800
25 May 2001	R 756	0	0	R 0
28 May 2001	R 744	0	0	R 0
29 May 2001	R 743	0	0	R 0

30 May 2001	R 750	4	400	R 300,000
31 May 2001	R 756	1	100	R 75,600
01 June 2001	R 766	1	100	R 76,600
04 June 2001	R 766	1	100	R 76,600
05 June 2001	R 768	1	100	R 76,800
06 June 2001	R 761	0	0	R 0
07 June 2001	R 777	2	200	R 155,400
08 June 2001	R 782	1	100	R 78,200
11 June 2001	R 796	1	100	R 79,600
12 June 2001	R 794	0	0	R 0
13 June 2001	R 784	0	0	R 0
14 June 2001	R 794	3	300	R 238,200
15 June 2001	R 784	0	0	R 0
18 June 2001	R 777	0	0	R 0
19 June 2001	R 779	3	300	R 233,700
20 June 2001	R 775	0	0	R 0
21 June 2001	R 795	2	200	R 159,000
22 June 2001	R 796	1	100	R 79,600
25 June 2001	R 787	0	0	R 0
26 June 2001	R 807	2	200	R 161,400
27 June 2001	R 826	1	100	R 82,600
28 June 2001	R 830	1	100	R 83,000
29 June 2001	R 828	0	0	R 0
02 July 2001	R 828	2	200	R 165,600
03 July 2001	R 823	0	0	R 0
04 July 2001	R 837	2	200	R 167,400
05 July 2001	R 858	1	100	R 85,800
06 July 2001	R 859	1	100	R 85,900
09 July 2001	R 855	0	0	R 0
10 July 2001	R 867	2	200	R 173,400
11 July 2001	R 892	1	100	R 89,200
12 July 2001	R 900	1	100	R 90,000
13 July 2001	R 925	1	100	R 92,500
17 July 2001	R 943	1	100	R 94,300
18 July 2001	R 930	0	0	R 0
19 July 2001	R 957	2	200	R 191,400
20 July 2001	R 956	0	0	R 0
AVERAGE PRICE	R 739.40			
INDEX				
MOMENTUM	R 738.61			
STRATEGY				
TONNAGES	29,900			
HEDGED				

6.5 EVALUATION OF THE MOMENTUM STRATEGY VERSUS BENCHMARK: 2001-2006

The results of the momentum strategy applied to July white maize contract data over the period 2001-2006 is summarised in table 6.2 and graphically represented in figure 6.1.

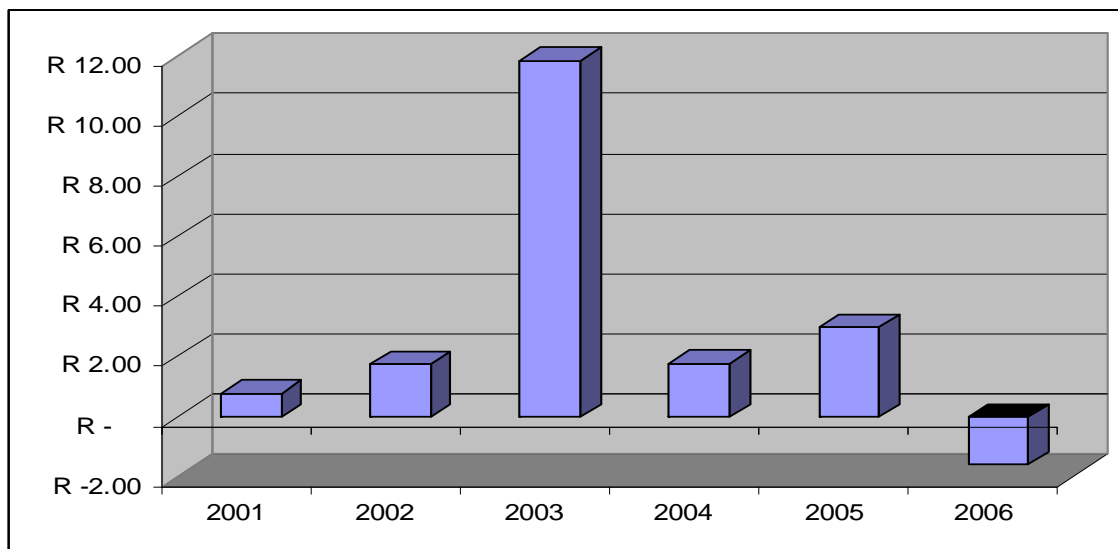
Table 6.2 Summary of the momentum strategy applied to July white maize data from 2001 to 2006

Year	Average price index	Momentum strategy	Value gained (R/ton)	Total value gained*
2001	R 739.40	R 738.61	R 0.79	R 473,597.26
2002	R 1,254.24	R 1,252.48	R 1.76	R 1,057,304.03
2003	R 1,400.50	R 1,388.64	R 11.86	R 7,113,240.42
2004	R 1,086.16	R 1,084.39	R 1.77	R 1,060,166.59
2005	R 810.74	R 807.77	R 2.97	R 1,779,472.85
2006	R 958.11	R 959.72	R -1.60	R -962,400.85

* Based upon a processor procuring 600 000 metric tons of maize annually

The results indicate that the benchmark index is outperformed by the momentum strategy in five of the six years under review, because the realised procurement price is lower than the average price index. The extent to which the momentum strategy beats the market varies substantially, from R0.79/metric ton in 2001 up to R11.86/metric ton in 2003. Based upon a processor purchasing 600 000 metric tons of maize annually, a R0.79/metric ton hedging gain in 2001 represented an overall gain of R473 597.26. The benefit of the strategy is clear once the R11.86/metric ton gain of 2003 is extrapolated over 600 000 metric tons, which leads to an overall hedging gain of R7 113 240.42.

Figure 6.1 R/metric ton by which the momentum strategy outperforms/underperforms the average price index



6.6 SUMMARY AND CONCLUSIONS

The common momentum strategy is a core/satellite price risk management strategy whereby the underlying asset is bought in the event of an increase in price and sold when its price moves lower. In the application of the proposed strategy, the definition is altered in order to make provision for an exclusively long position. This is achieved by staying neutral the market when prices drop, and going long the market on the first positive price movement (or sideways price movement) to the extent of the number of trading days since the previous upward movement in prices.

There is no mutual agreement as to why the momentum strategy works. The most obvious explanation is that the returns achieved by such a strategy are a payoff for taking more risk than merely trading the average price index. The July white maize contract is used in the analysis of the strategy, since it is the most liquid contract available on SAFEX, and as such, a single daily position entered into entails one futures contract (100 metric tons) on the July white maize contract. The realised long position can be rolled to the desired contract month by engaging into a calendar spread.

The momentum strategy applied to historical data shows that the average price index is outperformed in five of the six years under review. The extent to which the strategy outperforms the market varies considerably from year to year.

In the next two chapters an additional two core/satellite price risk management strategies will be evaluated. The ability of these strategies to outperform the market in all of the years under review will be explored, because the momentum strategy was only able to beat the average price in five out of the six years in which the strategy was tested.

CHAPTER 7

THE MAXIMUM PRICE STRATEGY

7.1 INTRODUCTION

The previous chapter discussed the momentum strategy and evaluated its returns against a passive buy and hold average price benchmark. Although the momentum strategy was able to outperform the simple average price benchmark during most years, it was not able to do so consistently. Another shortcoming of the momentum strategy is its inability to determine a maximum procurement price upon commencement of the strategy.

This chapter will discuss and evaluate the maximum price strategy which is also based upon a core/satellite method of risk management. Similar to the previous chapter, the success of the strategy depends on its performance relative to the benchmark as well as the consistency with which the benchmark is outperformed. The maximum price strategy will make use of both options and futures contracts, in contrast to the momentum strategy which applied exclusively futures contracts.

7.2 DEFINITION

Hull (2002:461) defines an exotic option simply as “a nonstandard option”. He states that the price and volatility of plain vanilla options are determined by an exchange, whereas financial engineers develop exotic options to be sold at a price not necessarily related to prices quoted by the market. He further argues that an exotic product comes about because of a number of factors. These include a specific need for a hedging product in the market and to reflect the user’s view on potential future price movements (Hull 2002:394). He identifies an Asian option

as “an option with a payoff dependent on the average price of the underlying asset during a specified period” (Hull 2002:456).

In their research on options available in the futures market for hedging purposes, Hagedorn, Irwin, Good, Martines-Filho, Sherrick and Schnitkey (2003:3-5) describe new generation contracts as products that use automated pricing rules, discretionary marketing, options strategies, or a combination of all three in order to achieve an average hedge price. They classify new generation contracts into three basic categories, namely automated pricing contracts, managed hedging contracts and combination contracts.

The maximum price strategy, to be presented in this chapter, is an exotic option strategy since it possesses no standard features and occurs as a result of a specific need expressed by risk-averse hedgers in the futures market. The strategy may be mistaken for an Asian option, but since its payoff does not depend on an average price, it should rather be classified as a managed hedging contract. It complies with the definition of a managed hedging contract (Hagedorn et al 2003:4) since a specific volume of the underlying commodity is hedged over a predetermined period with a fixed maximum price.

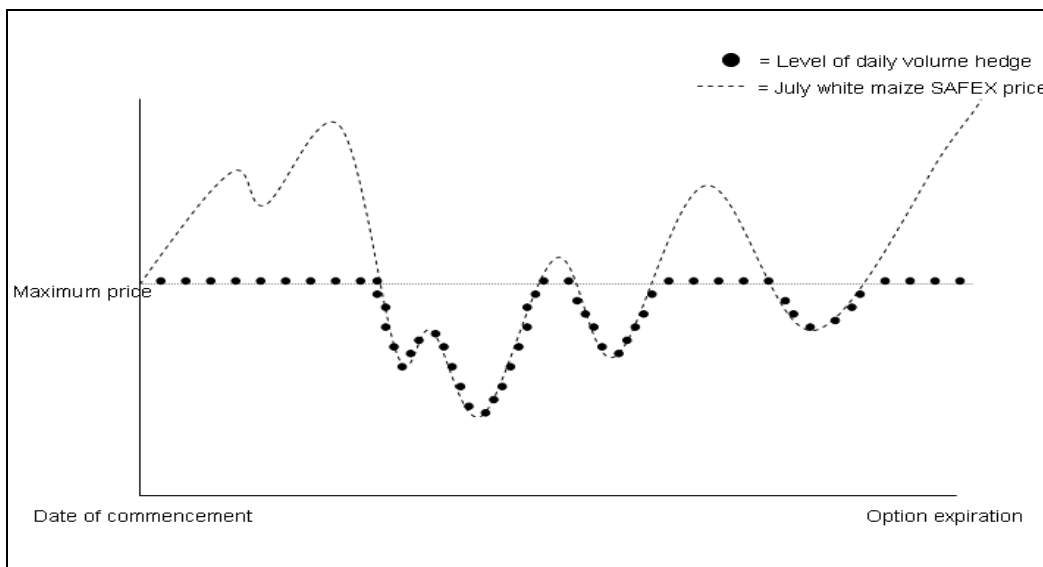
Taking all of the above into account, the maximum price strategy can be defined as an exotic and managed hedging strategy that guarantees a maximum procurement price. The benefit of daily price movements lower than the maximum price will lead to a reduction in the final procurement price of the commodity, while daily price movements higher than the maximum price will have no adverse impact on the price at which the underlying commodity is bought.

7.3 DESCRIPTION AND FEASIBILITY

The characteristics that distinguish the maximum price strategy from alternative exotic options can be summarised as follows:

- On the trading day on which the strategy is initiated, the buyer of the underlying commodity is guaranteed a maximum procurement price.
- The total volume of maize to be hedged is divided into the number of trading days over which the strategy will be applied to futures prices (i.e. the daily volume).
- Every trading day, on which the price of maize is higher than the maximum price, the daily volume of maize will be purchased at the maximum price. Should the price of maize be lower than the maximum price on option expiration, the long position holder will receive the benefit of the lower price, as on option expiration, for the total number of trading days on which the maize price traded higher than the maximum price.
- Every trading day, on which the price of maize is lower than the maximum price, the daily volume of maize will be purchased at the lower price.
- The average of the daily volume of long positions taken over a predetermined strategy period will result in the final procurement price. The working of the strategy is summarized in figure 7.1.

Figure 7.1 Graphical representation of maximum price contract



As is evident from figure 7.1, the long position holder will benefit from daily price movements lower than the guaranteed maximum price (as indicated in fig 7.1 by the daily pricing below the maximum price when SAFEX trades lower than the maximum price), while price movements higher than the maximum price will result in a daily long position being taken at the maximum price. The practical implementation of this strategy is structured as follows:

- On the date of commencement, at-the-money call options are bought for the total volume to be hedged. This results in a guaranteed maximum procurement price.
- The volume of grain to be hedged is divided into the number of trading days from the date of commencement to option expiration. This is known as the daily volume.
- Every trading day between the date of commencement and option expiry on which the daily price is lower than the maximum price, the daily volume of call options is sold and replaced by a daily volume long futures position. By going short the option (which is now an out-of-the money call option), the net cost of the strategy is reduced.
- Every trading day between the date of commencement and option expiry on which the daily price is higher than the maximum price, no action is taken. The daily volume of grain is hedged by the call option at the maximum price, which is the strike level of the call option. This call option is in the money.
- Should the daily price of the underlying commodity be higher than the maximum price (strike level of option) on date of option expiry, the call options will automatically become long futures positions. In the event of a daily price lower than the maximum price on the date of option expiry, long futures positions will be taken to the extent of the daily volume multiplied by the total number of trading days on which the daily price traded higher than the maximum price.
- The average price of the daily volume of grain hedged over the strategy period will result in the procurement price for the underlying commodity. By adding the premiums and broking fees of the call options to the realised procurement price, the net hedged price can be compared to the market benchmark.

- Since historical data on maize prices and volatility are available (appendixes I & II), the Black-Scholes model will be used to calculate the historical prices of options (see sec 2.4.2.3). The maximum price strategy will be initiated on the day on which volatility is first published, since this represents the first trading day on which options can be traded.

The July contract is used in the evaluation of the proposed strategy, because it is the most liquid futures contract available on SAFEX. Although grain processors do not wish to take delivery of a year's stock all at once, the resultant long position can be rolled forward to the delivery month in which the grain is required. Rolling a position forward consists of going short the July contract against the long position obtained from the maximum price strategy, and immediately going long the desired contract month (Hull 2002:458).

For the purposes of the evaluation of the strategy, the assumption will be made that the daily volume on SAFEX entails one futures contract (100 metric tons) traded at its closing price. Since processors are naturally much shorter the market, the volume of grain to be hedged can be adjusted according to individual needs. Once the value of the long call option is below R1/ton, no effort will be made to go short the option on days when the daily price is lower than the maximum price, since the broking cost will exceed the premium benefit of the option.

7.4 APPLICATION OF MAXIMUM PRICE STRATEGY

A detailed analysis of the maximum price strategy applied to the 2006 contract data (as given in appendixes I & II) is presented in table 7.1 below.

A at the money call constitutes a maximum price of R680/ton for 30 900 metric tons of maize, that is, one contract per day since inception of the strategy up to option expiration. An individual calculation for the years after 2001 is presented in appendix IV.

Table 7.I Maximum price strategy applied on 2006 July white maize daily closing prices

DATE	PRICE	VOLATILITY	CALL-STRIKE	DAILY HEDGE	VOLUME BELOW MAXIMUM PRICE	VOLUME @ MAXIMUM PRICE	OPTION PREMIUM	NET OPTION COST	ADDITIONAL BROKING FEES @ R1/TON	DAILY PROCUREMENT PRICE
2005/03/29	R 671	35.0%	R 680				-R 99.75	-R 3,082,275.00	-R 30,900.00	R 0.00
2005/03/30	R 671	35.0%	R 680	R 671	100	0	R 99.63	R 9,963.00	-R 100.00	-R 67,100.00
2005/03/31	R 674	35.0%	R 680	R 674	100	0	R 101.22	R 10,122.00	-R 100.00	-R 67,400.00
2005/04/01	R 674	35.0%	R 680	R 674	100	0	R 101.10	R 10,110.00	-R 100.00	-R 67,400.00
2005/04/04	R 674	35.0%	R 680	R 674	100	0	R 100.76	R 10,076.00	-R 100.00	-R 67,400.00
2005/04/05	R 674	35.0%	R 680	R 674	100	0	R 100.64	R 10,064.00	-R 100.00	-R 67,400.00
2005/04/06	R 698	35.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/04/07	R 698	35.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/04/08	R 698	35.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/04/11	R 692	35.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/04/12	R 693	35.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/04/13	R 689	35.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/04/14	R 685	35.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/04/15	R 695	35.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/04/18	R 687	35.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/04/19	R 683	35.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/04/20	R 675	38.0%	R 680	R 675	100	0	R 108.08	R 10,808.00	-R 100.00	-R 67,500.00
2005/04/21	R 675	38.0%	R 680	R 675	100	0	R 107.96	R 10,796.00	-R 100.00	-R 67,500.00
2005/04/22	R 678	38.0%	R 680	R 678	100	0	R 109.56	R 10,956.00	-R 100.00	-R 67,800.00
2005/04/25	R 677	38.0%	R 680	R 677	100	0	R 108.60	R 10,860.00	-R 100.00	-R 67,700.00
2005/04/26	R 683	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/04/28	R 683	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/04/29	R 683	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/05/03	R 683	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/05/04	R 683	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/05/05	R 682	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/05/06	R 682	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/05/09	R 683	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/05/10	R 690	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/05/11	R 690	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/05/12	R 675	38.0%	R 680	R 675	100	0	R 105.25	R 10,525.00	-R 100.00	-R 67,500.00
2005/05/13	R 690	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/05/16	R 695	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/05/17	R 695	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/05/18	R 695	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/05/19	R 695	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/05/20	R 680	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/05/23	R 695	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/05/24	R 695	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/05/25	R 694	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/05/26	R 694	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/05/27	R 705	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/05/30	R 705	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/05/31	R 719	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/06/01	R 719	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/06/02	R 717	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/06/03	R 704	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/06/06	R 704	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/06/07	R 700	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/06/08	R 700	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/06/09	R 715	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/06/10	R 715	37.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/06/13	R 715	37.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/06/14	R 715	37.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/06/15	R 707	37.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/06/17	R 707	37.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/06/20	R 707	37.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/06/21	R 715	37.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/06/22	R 714	37.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/06/23	R 705	37.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/06/24	R 705	37.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/06/27	R 710	37.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/06/28	R 699	37.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/06/29	R 700	37.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/06/30	R 703	37.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/07/01	R 703	37.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/07/04	R 707	37.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/07/05	R 720	37.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/07/06	R 728	35.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/07/07	R 718	35.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/07/08	R 718	35.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/07/11	R 718	35.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/07/12	R 717	35.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/07/13	R 716	35.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/07/14	R 732	33.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/07/15	R 725	33.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/07/18	R 733	33.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/07/19	R 750	33.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00

DATE	PRICE	VOLATILITY	CALL-STRIKE	DAILY HEDGE	VOLUME BELOW MAXIMUM PRICE	VOLUME @ MAXIMUM PRICE	OPTION PREMIUM	NET OPTION COST	ADDITIONAL BROKING FEES @ R1/TON	DAILY PROCUREMENT PRICE
2005/11/09	R 894	47.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/11/10	R 898	44.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/11/11	R 905	44.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/11/14	R 950	44.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/11/15	R 983	44.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/11/16	R 971	46.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/11/17	R 979	46.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/11/18	R 969	46.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/11/21	R 960	46.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/11/22	R 1,005	52.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/11/23	R 997	50.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/11/24	R 956	50.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/11/25	R 959	50.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/11/28	R 988	50.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/11/29	R 970	50.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/11/30	R 980	50.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/12/01	R 990	49.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/12/02	R 998	49.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/12/05	R 1,023	49.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/12/06	R 1,022	49.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/12/07	R 1,052	49.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/12/08	R 1,067	48.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/12/09	R 1,070	45.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/12/12	R 1,115	47.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/12/13	R 1,135	45.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/12/14	R 1,127	45.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/12/15	R 1,128	45.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/12/19	R 1,173	47.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/12/20	R 1,128	47.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/12/21	R 1,120	47.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/12/22	R 1,120	47.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/12/23	R 1,150	48.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/12/27	R 1,195	49.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/12/28	R 1,154	51.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/12/29	R 1,140	53.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/12/30	R 1,095	53.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/01/03	R 1,050	56.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/01/04	R 1,079	56.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/01/05	R 1,065	55.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/01/06	R 1,110	54.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/01/09	R 1,144	50.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/01/10	R 1,151	47.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/01/11	R 1,141	44.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/01/12	R 1,096	44.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/01/13	R 1,078	45.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/01/16	R 1,081	45.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/01/17	R 1,123	45.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/01/18	R 1,116	43.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/01/19	R 1,119	42.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/01/20	R 1,141	40.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/01/23	R 1,096	39.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/01/24	R 1,088	37.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/01/25	R 1,110	37.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/01/26	R 1,091	37.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/01/27	R 1,076	36.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/01/30	R 1,036	37.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/01/31	R 994	38.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/02/01	R 962	39.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/02/02	R 1,006	40.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/02/03	R 1,007	40.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/02/06	R 962	40.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/02/07	R 933	41.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/02/08	R 977	41.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/02/09	R 984	41.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/02/10	R 985	40.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/02/13	R 988	38.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/02/14	R 1,006	37.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/02/15	R 1,006	35.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/02/16	R 976	35.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/02/17	R 992	36.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/02/20	R 987	35.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/02/21	R 978	35.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/02/22	R 1,022	36.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/02/23	R 1,019	35.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/02/24	R 1,045	35.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/02/27	R 1,090	37.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/02/28	R 1,090	37.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/03/02	R 1,092	37.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00

DATE	PRICE	VOLATILITY	CALL-STRIKE	DAILY HEDGE	VOLUME BELOW MAXIMUM PRICE	VOLUME @ MAXIMUM PRICE	OPTION PREMIUM	NET OPTION COST	ADDITIONAL BROKING FEES @ R1/TON	DAILY PROCUREMENT PRICE
2006/03/03	R 1,109	36.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/03/06	R 1,132	36.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/03/07	R 1,124	35.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/03/08	R 1,096	35.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/03/09	R 1,117	34.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/03/10	R 1,127	33.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/03/13	R 1,132	33.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/03/14	R 1,126	33.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/03/15	R 1,141	32.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/03/16	R 1,132	30.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/03/17	R 1,114	30.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/03/20	R 1,129	29.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/03/22	R 1,166	30.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/03/23	R 1,159	31.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/03/24	R 1,161	30.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/03/27	R 1,163	28.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/03/28	R 1,171	27.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/03/29	R 1,164	28.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/03/30	R 1,147	29.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/03/31	R 1,146	29.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/04/03	R 1,134	29.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/04/04	R 1,113	28.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/04/05	R 1,120	26.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/04/06	R 1,105	26.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/04/07	R 1,117	24.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/04/10	R 1,122	24.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/04/11	R 1,120	24.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/04/12	R 1,119	24.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/04/13	R 1,106	24.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/04/18	R 1,077	25.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/04/19	R 1,068	25.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/04/20	R 1,080	26.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/04/21	R 1,098	26.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/04/24	R 1,093	26.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/04/25	R 1,087	26.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/04/26	R 1,099	25.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/04/28	R 1,090	25.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/02	R 1,094	24.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/03	R 1,088	24.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/04	R 1,089	24.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/05	R 1,089	24.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/08	R 1,088	24.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/09	R 1,100	23.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/10	R 1,140	23.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/11	R 1,143	23.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/12	R 1,169	24.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/15	R 1,197	27.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/16	R 1,187	25.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/17	R 1,189	24.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/18	R 1,206	24.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/19	R 1,218	25.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/22	R 1,216	25.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/23	R 1,226	25.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/24	R 1,216	24.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/25	R 1,201	25.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/26	R 1,209	25.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/29	R 1,207	23.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/30	R 1,221	22.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/31	R 1,233	22.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/06/01	R 1,244	21.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/06/02	R 1,244	21.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/06/05	R 1,266	22.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/06/06	R 1,272	24.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/06/07	R 1,270	23.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/06/08	R 1,290	22.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/06/09	R 1,285	20.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/06/12	R 1,302	24.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/06/13	R 1,335	25.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/06/14	R 1,314	26.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/06/15	R 1,295	23.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/06/19	R 1,287	25.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/06/20	R 1,270	27.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/06/21	R 1,288	28.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/06/22	R 1,320	28.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/06/23	R 1,340	29.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
								-R 2,977,995.00	-R 31,900.00	-R 21,006,700.00

Total procurement price	-R 21,006,700.00
Total option cost	-R 2,977,995.00
Additional broking fees	-R 31,900.00
Net procurement cost	-R 24,016,595.00
Average price index	R 958.11
Maximum price strategy	R 777.24
Tonnages hedged	30,900

The maximum price strategy applied to the 2006 contract data results in a net procurement cost of R24 016 595.00 for 30 900 metric tons of maize, with an average long position of R777.24 per metric ton. This is R180.87 lower than the average price index over the same period.

7.5 EVALUATION OF THE MAXIMUM PRICE STRATEGY VERSUS BENCHMARK: 2001-2006

The results of the maximum price strategy applied to July white maize contract data over the period 2001-2006 is summarised in table 7.2 and graphically represented in figure 7.2.

Table 7.2 Summary of the maximum price strategy applied to July white maize data from 2001 to 2006

Year	Average price index	Maximum price strategy	Value gained (R/ton)	Total value gained*
2001	R 739.40	R 713.29	R 26.11	R 15,663,209.30
2002	R 1,254.24	R 1,102.03	R 152.21	R 91,325,589.74
2003	R 1,400.50	R 1,291.70	R 108.80	R 65,280,000.00
2004	R 1,086.16	R 1,021.03	R 65.13	R 39,076,852.94
2005	R 810.74	R 787.55	R 23.19	R 13,913,010.75
2006	R 958.11	R 777.24	R 180.87	R 108,523,477.20

* Based upon a processor procuring 600 000 metric tons of maize annually.

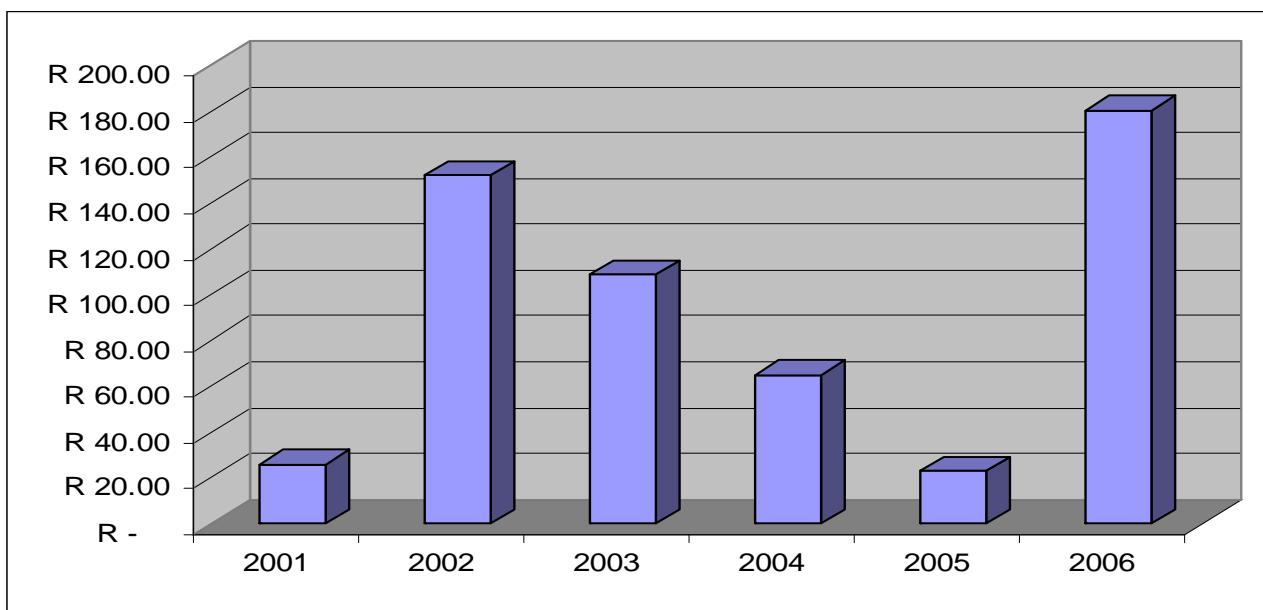
The results indicate that the benchmark index is outperformed by the maximum price strategy in all the years under review, because the realised procurement price is lower than the average price index.

The extent to which the maximum price strategy beats the market varies substantially, from R23.19/metric ton in 2005 up to R180.87/metric ton in 2006. There are two reasons for the inconsistency in the rand value by which the average price index is outperformed, namely:

- (1) A larger price movement over the duration of the contract results in a higher rand value by which the average price index is outperformed.
- (2) The second reason is the level at which a long position in call options is entered into.

Based upon a processor purchasing 600 000 metric tons of maize annually, a R180.87/metric ton hedging gain in 2006 represents an overall gain of R108 523 477.20.

Figure 7.2 R/metric ton by which the maximum price strategy outperforms the average price index



7.6 SUMMARY AND CONCLUSIONS

The maximum price strategy is an exotic and managed hedging strategy that guarantees the user a maximum procurement price on the date on which the strategy is initiated. The benefit of daily price movements lower than the maximum price will lead to a reduction in the final procurement price of the commodity, while daily price movements higher than the maximum price will have no adverse impact on the price at which the underlying commodity is bought.

In an economic sense, the maximum price strategy offers returns in excess of the average price offered by the futures market because of the additional risk taken in the management of the strategy. Since volatility tends to increase in the period immediately following the introduction of the underlying futures contract, the at-the-money call option is bought at a low premium. The July white maize contract is used in the analysis of the strategy, because it is the most liquid contract available on SAFEX, and as such, a position entered into entails one futures contract (100 metric tons) on the July white maize contract. The eventual long position can be rolled forward to the desired contract month.

The maximum price strategy applied to historical data shows that the average price index is outperformed in every year under review. The extent to which the strategy outperforms the market varies from 3 to 19%.

In the following chapter, the last of the proposed price risk management strategies will be evaluated. The ability of this strategy to outperform the market will be explored, and the results compared to those of the momentum and maximum price strategies.

CHAPTER 8

THE INDEXED STRANGLE

8.1 INTRODUCTION

In previous chapters, the adverse impact of a volatile market on groups with a concern in SAFEX was discussed and highlighted. It was concluded that there is a need for indexing strategies among stakeholders in order to reduce the extreme levels of price volatility evident in the futures market.

Chapters 6 and 7 discussed and evaluated two risk management strategies based on a core/satellite method of price risk management. Both the momentum strategy and the maximum price strategy were able to outperform the chosen benchmark, even though the consistency of and extent to which the benchmark was outperformed varied substantially. Although high levels of volatility negatively impact on procurement results, the possibility of exploiting volatile markets to the ultimate benefit of all groups concerned should be evaluated.

This chapter discusses and evaluates the indexed strangle strategy. The success of the strategy depends on its performance relative to the average price index and the consistency with which this benchmark is outperformed.

8.2 DESCRIPTION OF THE INDEXED STRANGLE STRATEGY

In their study on information flows in financial markets, Berchtold and Norden (2005:1147-1172) analysed two types of information flows, namely return information and volatility information. Whereas return information embodies the knowledge of informed investors on whether prices will increase or decrease, volatility information entails the lack of knowledge

on the direction of market movements. The indexed strangle strategy is consistent with volatility information flows, since the future direction of market movements cannot be predicted. As such, the indexed strangle will aim to provide additional value to an average price index on both upward and downward price movements.

Even though the future direction and extent of price movements cannot be accurately predicted, volatility movements are predictable in both its direction and extent, as is evident from figure 8.1.

Figure 8.1 Ten-day volatility average 2002-2007

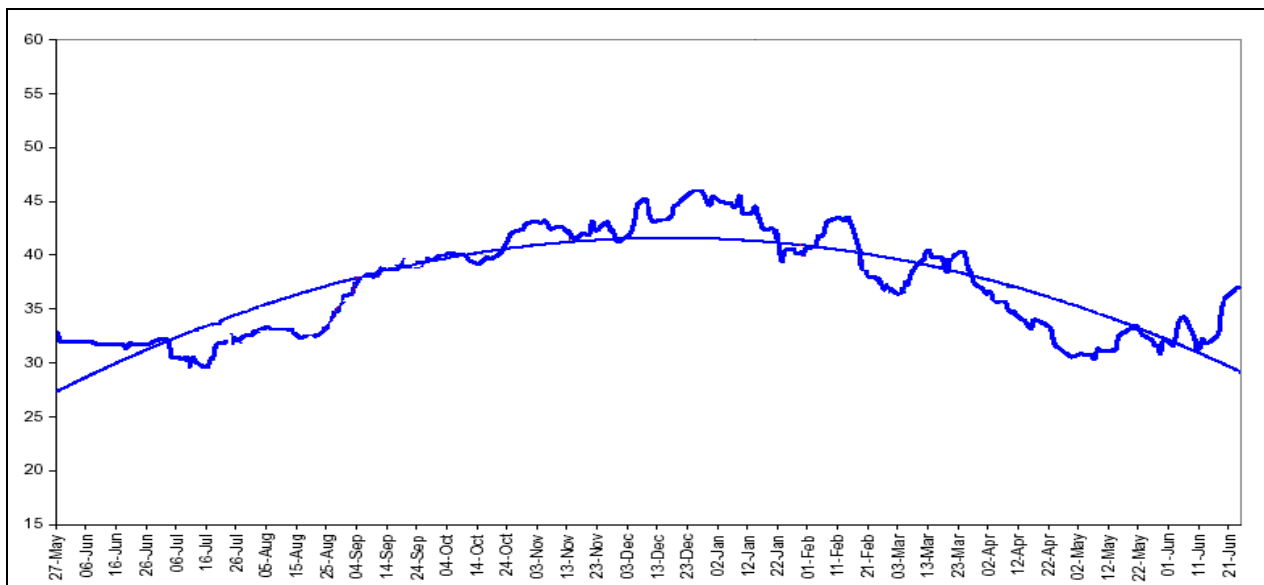


Figure 8.1 confirms a trend among historical volatility movements for the July white maize contract. The following important conclusions can be drawn from the graphical representation:

- Volatility is low at the commencement of the contract.
- Volatility increases over time from commencement and reaches a peak over December/January (see tab 8.1). This is because of the high levels of uncertainty in the maize market during planting time.

- From January until option expiration, volatility decreases. The lower volatility is brought about by higher levels of supply and demand certainty.

Table 8.1 Ten-day volatility 2002-2007

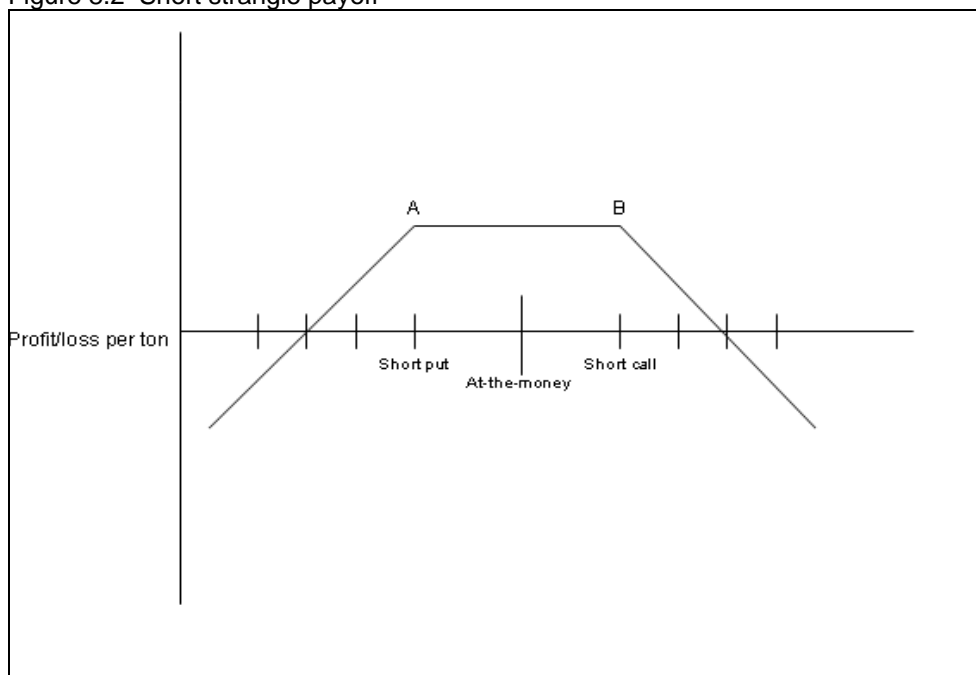
Period from:	Period to:	2002	2003	2004	2005	2006	Average
01-May	10-May					38.0	38.0
11-May	20-May					38.0	38.0
21-May	30-May		24.0			38.0	31.0
31-May	09-Jun		24.0			38.0	31.0
10-Jun	19-Jun		24.0			37.0	30.5
20-Jun	29-Jun		25.1	30.8		37.0	31.0
30-Jun	09-Jul		26.4	31.0	26.0	36.1	29.9
10-Jul	19-Jul		25.3	31.0	26.4	33.9	29.1
20-Jul	29-Jul		27.0	34.6	30.8	33.0	31.3
30-Jul	08-Aug		27.5	36.5	36.0	33.0	33.3
09-Aug	18-Aug		25.8	36.7	37.7	33.0	33.3
19-Aug	28-Aug		24.7	36.3	38.9	33.5	33.3
29-Aug	07-Sep		25.4	37.2	41.0	40.6	36.1
08-Sep	17-Sep		26.6	38.0	40.3	48.5	38.3
18-Sep	27-Sep		28.0	37.5	41.4	49.9	39.2
28-Sep	07-Oct		28.4	36.7	41.5	49.8	39.1
08-Oct	17-Oct		27.5	37.9	42.2	47.5	38.8
18-Oct	27-Oct		29.0	38.7	41.8	47.8	39.3
28-Oct	06-Nov		32.2	40.4	44.7	48.3	41.4
07-Nov	16-Nov		31.9	41.8	47.0	45.6	41.6
17-Nov	26-Nov		31.1	40.5	48.4	48.7	42.2
27-Nov	06-Dec		30.3	37.6	51.2	49.7	42.2
07-Dec	16-Dec		33.2	42.8	51.9	46.5	43.6
17-Dec	26-Dec		30.8	49.8	50.1	47.2	44.5
27-Dec	05-Jan	39.3	29.1	52.1	52.3	53.3	45.2
06-Jan	15-Jan	39.1	27.4	52.0	52.3	47.5	43.7
16-Jan	25-Jan	38.8	29.0	51.0	46.7	41.1	41.3
26-Jan	04-Feb	35.6	36.7	45.5	47.6	38.4	40.8
05-Feb	14-Feb	37.2	42.6	46.8	48.4	40.0	43.0
15-Feb	24-Feb	33.2	39.7	45.1	42.1	35.7	39.2
25-Feb	05-Mar	32.8	37.7	41.6	35.6	37.3	37.0
06-Mar	15-Mar	36.2	42.1	44.5	39.6	34.1	39.3
16-Mar	25-Mar	37.1	43.8	44.9	40.9	30.2	39.4
26-Mar	04-Apr	38.8	37.5	41.5	38.7	28.4	37.0
05-Apr	14-Apr	35.4	37.5	41.4	38.4	24.7	35.5
15-Apr	24-Apr	29.9	34.0	39.0	38.8	25.8	33.5
25-Apr	04-May	26.5	31.5	35.3	35.6	24.7	30.7
05-May	14-May	26.8	37.0	32.9	34.0	23.6	30.9
15-May	24-May	23.5	48.0	32.0	35.6	25.3	32.9
25-May	03-Jun	23.1	46.6	28.6	38.5	22.7	31.9
04-Jun	13-Jun	24.1	46.1	37.8	41.5	23.1	34.5
14-Jun	23-Jun	24.2	47.0	38.6	39.1	26.9	35.2

As discussed in chapter 2, one of the main variables determining the price of an option is volatility. Lower volatility leads to a lower premium being paid for an option, while high volatility levels will result in a higher premium being paid for an option on an underlying futures contract. The opportunity therefore is to go short volatility (sell options) over the 10-

day period in which volatility historically peaks. Since the direction of market movement cannot be accurately predicted, a short position in both put and call options should be taken. Although market movements tend to be less aggressive after the historical volatility peak, the strike level of the options, in which a short position is taken, should be out of the money. This is commonly known as a short option strangle.

Hull (2002:13) defines a strangle strategy as a position being taken in a put and call option with the same expiration date and different strike prices. He states that a short strangle position will be entered into if large price movements are possible. Maximum profit occurs when the underlying futures price on expiration date is trading between the strike prices of the options sold (indicated as the area between A and B in fig 8.2). At this price, both options expire worthless and the options trader profits the premiums of the options sold.

Figure 8.2 Short strangle payoff



The proposed indexed strangle strategy will therefore aim to profit from volatility trends, in addition to an average price. This will be implemented in the following way:

- An average long futures price will be realised by buying equal volumes of futures contracts on a daily basis over the whole of the contract lifetime.
- Since volatility tends to peak annually over the period 27 December to 5 January, short strangles will be implemented during this period for the total number of tonnages to be hedged via the average price strategy. This volume of grain divided by the number of trading days between 27 December and 5 January will determine the daily number of short strangles to be entered into. Should the mentioned formula not result in a round hundred number, it will be rounded off, and on the last trading day the resultant strangles will be entered into. The rule to be used is that an option will not be sold if the premium of the option is lower than R1/ton, since this is the breakeven value to offset broking fees.
- The strike of the call options to be sold will equal the SAFEX futures price for the July white maize contract as on 27 December (or the first trading day thereafter) plus 40%. The strike of the put options to be sold will equal the SAFEX futures price for the July white maize contract as on 27 December (or the first trading day thereafter) minus 40%. The resultant strike level will be rounded off to the nearest R20 interval.

It is necessary to consider the effect of the short options.

- If, on option expiry, the July white maize futures contract closes higher than the put option strike and lower than the call option strike the total amount of the option premiums will be realised as profit and deducted from the average long futures price. This is indicated as A in figure 8.3.
- If, on option expiry, the July white maize futures contract closes higher than the call option strike, short futures contracts will be assigned against the short call options. These short futures contracts will offset the long futures contracts entered into through the realisation of an average price. As such, no futures position will exist and the difference between the

long and short futures levels plus the option premiums will be the resultant cash flow per ton. This is indicated by B in figure 8.3.

- If, on option expiry, the July white maize futures contract closes lower than the put option strike, long futures contracts will be assigned against the short put options. As such a double-up of tonnages will arise as indicated by C in figure 8.3.

In this instance, the average long position price level can be calculated as follows:

$$AP = (LF + PS - OP)/2$$

where *AP* = average price of long futures position (per ton)

LF = average of daily long futures position (per ton)

PS = strike level of short put options

OP = sum of option premiums (per ton)

Example:

Average daily long futures position = R1 235/mt

Strike level of short put options = R1 000/mt

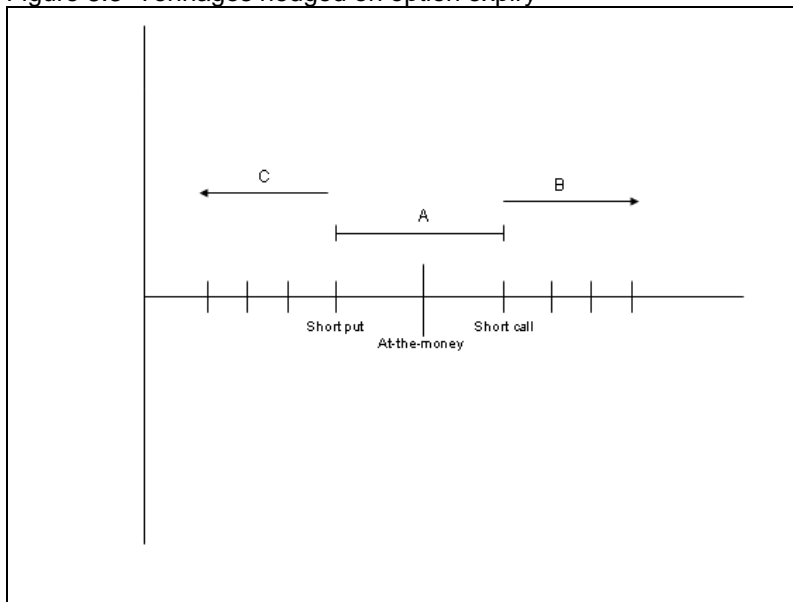
Call option premium = R50/mt

Put option premium = R40/mt

AP = (R1 235 + R1 000 – R90)/2

= R1 072.50/mt

Figure 8.3 Tonnages hedged on option expiry



8.3 APPLICATION OF INDEXED STRANGLE STRATEGY

Detailed analyses of the indexed strangle strategy applied to the 2006 contract data (as given in appendixes I & II) is presented in table 8.2 below. An individual calculation for the years since 2001 is presented in appendix V.

Table 8.2 The indexed strangle strategy applied to 2006 July white maize contract data

Date	July futures price	Volatility	Short put strike	Volume short puts	Put premium/ton	Short call strike	Volume short calls	Call premium/ton	Total option premium	Additional broking fees @ R/ton	Net option premium received
2005/12/27	R 1,195	49.0%	R 720	4,700	R 9.62	R 1,680	4700	R 40.37	R 234,953.00	-R 9,400.00	R 225,553.00
2005/12/28	R 1,154	51.0%	R 720	4,700	R 13.72	R 1,680	4700	R 36.51	R 236,081.00	-R 9,400.00	R 226,681.00
2005/12/29	R 1,140	53.0%	R 720	4,700	R 16.72	R 1,680	4700	R 37.86	R 256,526.00	-R 9,400.00	R 247,126.00
2005/12/30	R 1,095	53.0%	R 720	4,700	R 20.32	R 1,680	4700	R 29.57	R 234,463.00	-R 9,400.00	R 225,063.00
2006/01/03	R 1,050	56.0%	R 720	4,700	R 28.28	R 1,680	4700	R 26.72	R 258,500.00	-R 9,400.00	R 249,100.00
2006/01/04	R 1,079	56.0%	R 720	4,700	R 24.78	R 1,680	4700	R 31.03	R 262,307.00	-R 9,400.00	R 252,907.00
2006/01/05	R 1,065	55.0%	R 720	4,600	R 24.71	R 1,680	4600	R 26.75	R 236,716.00	-R 9,200.00	R 227,516.00
2006/06/23	R 1,340								R 1,719,566.00	-R 65,600.00	R 1,653,966.00
Tonnages hedged (1 contract/day)	32,800										
Average long position (index)	R 958.11										
Net option premium	R 1,653,966.00										
Option premium/ton	R 50.43										
Net procurement cost	R 907.68										

Since the July closing price on option expiration is between the short strangle strikes, the options expire worthless and the total option premium is gained.

8.4 EVALUATION OF INDEXED STRANGLE VS BENCHMARK 2001-2006

The results of the indexed strangle strategy applied to July white maize contract data over the period 2001-2006 is summarised in table 8.3 and graphically represented in figure 8.4.

Table 8.3 Summary of the indexed strangle strategy applied on July white maize data from 2001 to 2006

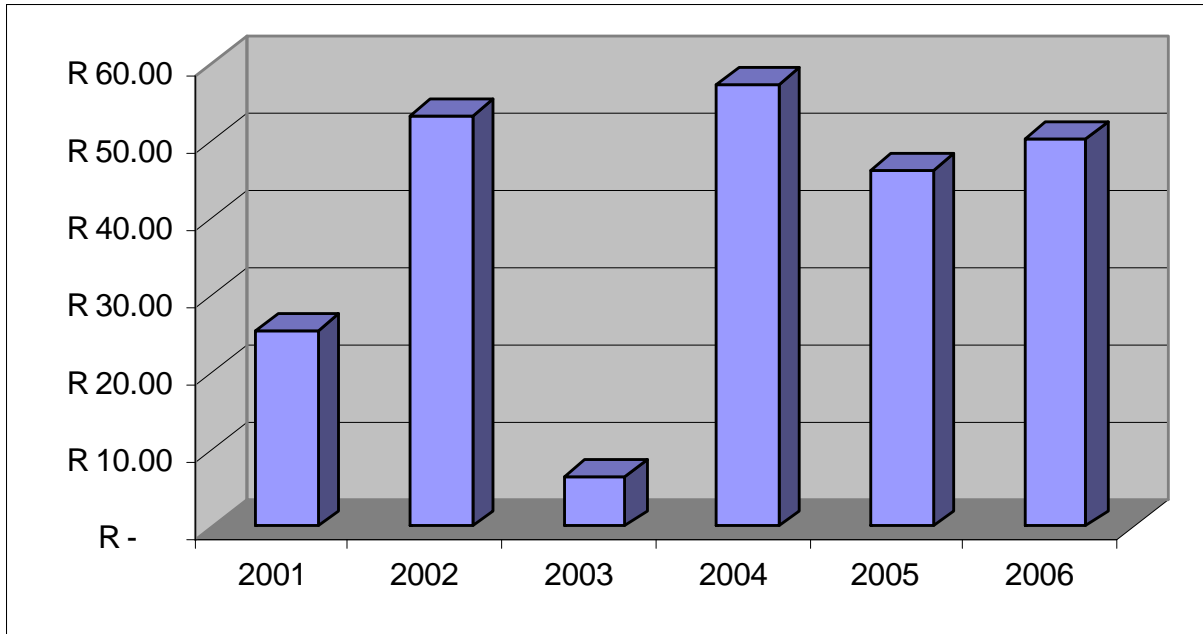
Year	Average price index	Indexed strangle strategy	Value gained (R/ton)	Total value gained*
2001	R 739.40	R 713.94	R 25.46	R 15,273,209.30
2002	R 1,254.24	R 1,200.85	R 53.39	R 32,033,589.74
2003	R 1,400.50	R 1,393.89	R 6.61	R 3,966,000.00
2004	R 1,086.16	R 1,028.64	R 57.52	R 34,510,852.94
2005	R 810.74	R 764.25	R 46.49	R 27,893,010.75
2006	R 958.11	R 907.68	R 50.43	R 30,259,477.20

- Based upon a processor procuring 600 000 metric tons of maize annually.

The results indicate that the benchmark index is outperformed in all the years under review because the realised procurement price is lower than the average price index.

The extent to which the indexed strangle strategy beats the market varies substantially, from R6.61/metric ton in 2003 up to R57.52/metric ton in 2004. Based upon a processor purchasing 600 000 metric tons of maize annually, a R57.52/metric ton hedging gain in 2004 represents an overall gain of R34 510 852.94.

Figure 8.4 R/metric ton by which the indexed strangle strategy outperforms the average price index



8.5 SUMMARY AND CONCLUSIONS

The indexed strangle strategy is a combination strategy that combines an average price with a short option structure. Whereas high volatility is traditionally experienced negatively by processors in the futures market, the short strangle actually exploits volatility to the benefit of the grain buyer. By selling options over the period on which volatility tends to reach its peak, high option premiums are secured.

In an economic sense, the indexed strangle strategy offers returns in excess of the average price offered by the futures market because of the additional risk taken by implementing a short strangle. Since volatility tends to decrease in the period following the introduction of the short strangle, the options are sold at high price levels. The July white maize contract is used in the analysis of the strategy, because it is the most liquid contract available on SAFEX, and

as such, a position entered into entails one futures contract (100 metric tons) on the July white maize contract. The eventual long position can be rolled forward to the desired contract month.

The indexed strangle strategy applied to historical data shows that the average price index is outperformed in every year under review. The extent to which the strategy outperforms the market varies from 0.47 to 5.73%.

In the following chapter, the results of the three proposed price risk management strategies will be compared, and a recommendation made about the optimal strategy or combination of strategies.

CHAPTER 9

EVALUATION AND COMPARISON OF PRICE RISK MANAGEMENT STRATEGIES

9.1 INTRODUCTION

In chapters 6, 7 and 8 three price risk management strategies were discussed and applied to historical market data. The resultant performance of each strategy was compared to the benchmark average July white maize SAFEX price. Even though all three strategies compared favorably with historical average SAFEX prices, the consistency and extent to which the benchmark average price was outperformed differed significantly.

By comparing the results of the three strategies, the optimum single or combination procurement strategy could be identified. This is achieved by comparing the consistency of performance and the extent to which the benchmark is outperformed.

This chapter will also focus on the benefits and disadvantages of each strategy. The objective will be to highlight the strategy that will provide the user with the most value and will successfully eliminate the high volatility levels inherent in the futures market. Results achieved by the price risk management strategies relative to the benchmark will be compared to those achieved by fund managers in alternative markets.

9.2 ANNUAL PERFORMANCE OF PRICE RISK MANAGEMENT STRATEGIES

Figure 9.1 graphically represents the six-year results of the proposed strategies against one another and the benchmark average price from 2001 to 2006. This is summarised in table 9.1 and then discussed on an annual basis.

Figure 9.1 Comparison of price risk management strategies versus benchmark average price

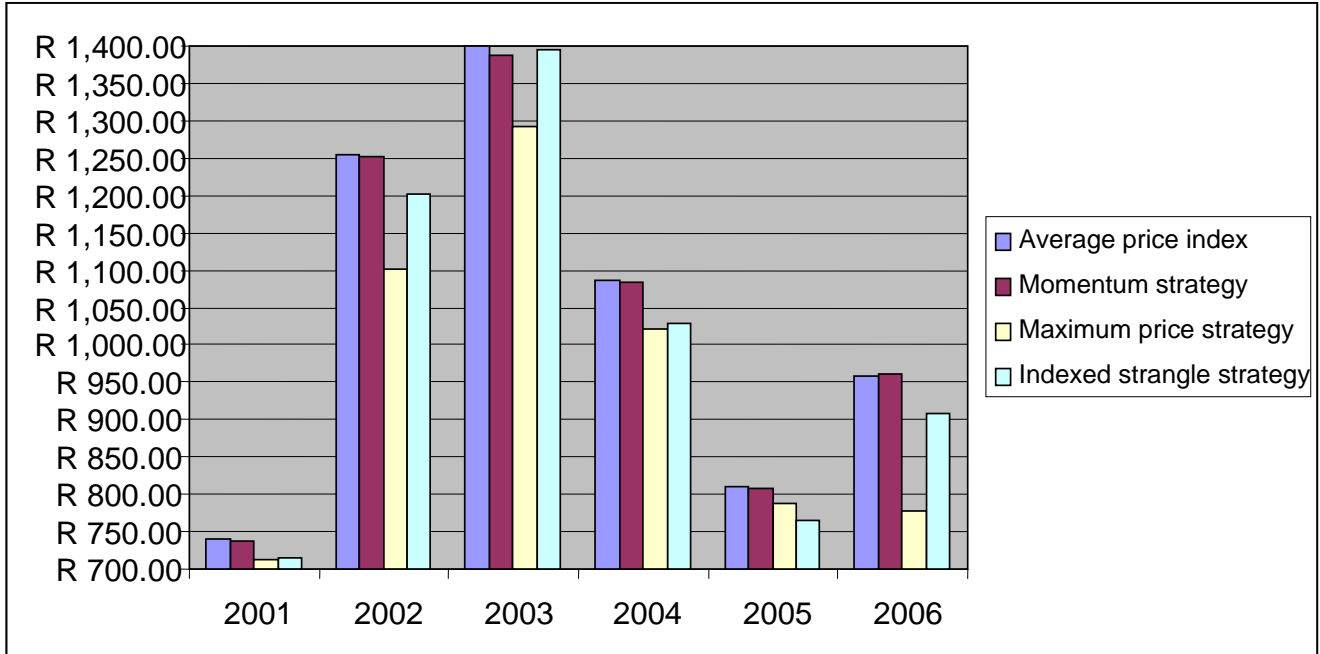


Table 9.1 Comparison between performances of price risk management strategies versus benchmark

Year	Average Price Index	Momentum strategy	% lower than average price	Maximum price strategy	% lower than average price	Indexed strangle strategy	% lower than average price
2001	R 739.40	R 738.61	0.11%	R 713.29	3.53%	R 713.94	3.44%
2002	R 1,254.24	R 1,252.48	0.14%	R 1,102.03	12.14%	R 1,200.85	4.26%
2003	R 1,400.50	R 1,388.64	0.85%	R 1,291.70	7.77%	R 1,393.89	0.47%
2004	R 1,086.16	R 1,084.39	0.16%	R 1,021.03	6.00%	R 1,028.64	5.30%
2005	R 810.74	R 807.77	0.37%	R 787.55	2.86%	R 764.25	5.73%
2006	R 958.11	R 959.72	-0.17%	R 777.24	18.88%	R 907.68	5.26%

- 2001.** The average price of the July 2001 white maize contract is R739.40, the lowest average of all the years under review. All the price risk management strategies outperform the average price. The maximum price strategy achieves the best procurement price of R713.29, followed closely by the indexed strangle strategy with a procurement price of R713.94. The momentum strategy outperforms the average price by a mere 0.11% or R0.79/metric ton.
- 2002.** The average price of the July 2002 white maize contract is R1 254.24.

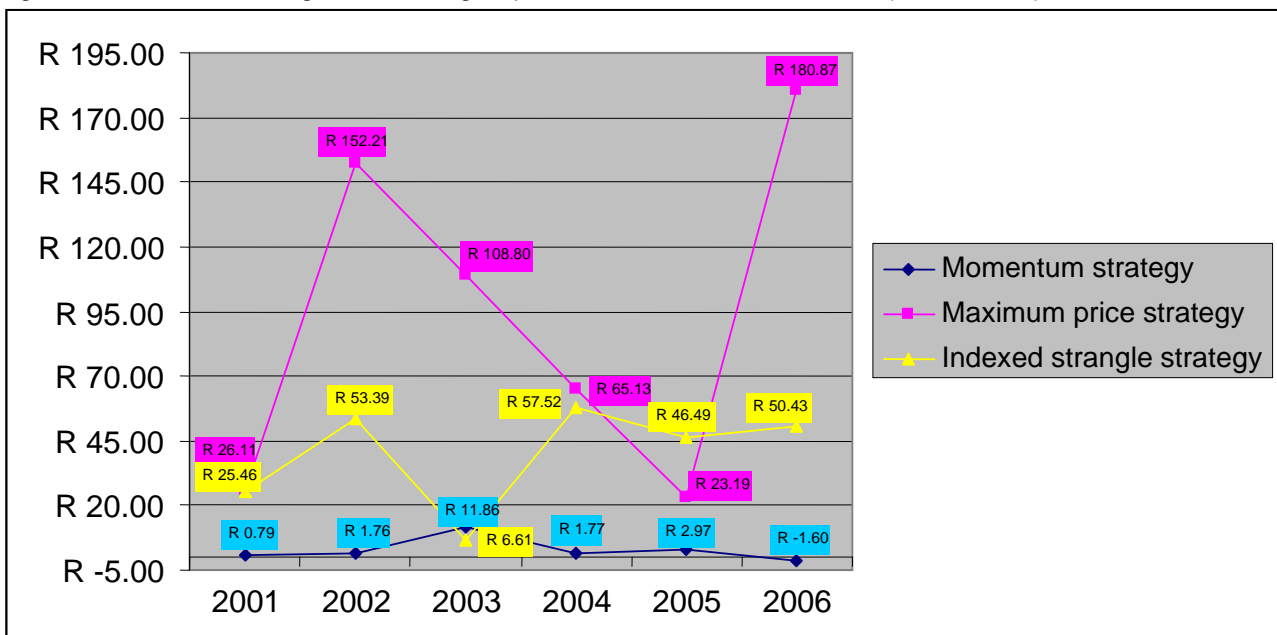
Once again all the price risk management strategies outperform this average price. The strategy rating is similar to 2001, with the maximum price strategy achieving the best procurement price of R1 102.03, followed by the indexed strangle strategy with a price of R1200.85. The momentum strategy outperforms the average price by realizing a long position of R1 252.48.

- **2003.** The R1 400.50 average price of the July 2003 white maize contract is the highest of all the years under review. Consistent with previous years, all the price risk management strategies outperform the average price. The maximum price strategy once again leads the way, achieving a procurement price of R1 291.70. The indexed strangle strategy realises a price of R1 393.89, while the momentum strategy outperforms the average price by R11.86/metric ton.
- **2004.** The R1 086.16 average price of the July 2004 white maize contract is outperformed by all the strategies evaluated. The performance ratings are consistent with previous years and the maximum price strategy achieves a procurement price of R1 021.03. This price is R7.61 better than the indexed strangle strategy and R63.36 superior to the momentum strategy.
- **2005.** The average price of the July 2005 white maize contract is R810.74. All the price risk management strategies outperform this average price. The maximum price strategy is outperformed for the first time because the indexed strangle realises a procurement price of R764.25, which is R23.30/metric ton lower than the maximum price strategy. The momentum strategy outperforms the average price by R2.97/metric ton, which equates to a 0.37% better performance than the average price.

- 2006.** The average price of the July 2006 white maize contract is R958.11. For the first time the average price is lower than one of the strategies, because the application of the momentum strategy on historical data results in a long position R1.61/metric ton higher than the average price. The maximum price strategy achieves a long position of R777.24 which is 18.88% lower than the average price and R130.44/metric ton lower than the indexed strangle procurement price.

The amount per metric ton by which the average price of the July contract is outperformed/underperformed from 2001 to 2006, is indicated in figure 9.2.

Figure 9.2 Price risk management strategies performance versus benchmark (R/metric ton)



From figure 9.2 it can be concluded that all three strategies are successful in reaching their objective. This is because 17 out of the 18 strategy applications were able to outperform the average price over the last six years on which the data were tested. It is especially true of the maximum price and indexed strangle strategies, because both these strategies constantly

achieved long futures positions at a price lower than the average price used as benchmark. These results are the direct opposite of the efficient market hypothesis and previous research done on this subject (Irwin et al 2005; Stewart 1934:415-433; Wang 2001:929-952).

9.3 DISCUSSION OF PRICE RISK MANAGEMENT STRATEGIES

The benefits and disadvantages of each individual risk management strategy are summarised in table 9.2.

Table 9.2 Benefits and disadvantages of individual price risk management strategies

Strategy	Benefits	Disadvantages
Momentum strategy	No cost (premium) payable Easy to implement	Inconsistency of results (versus benchmark) Small rand-value benefit versus benchmark average price No guaranteed maximum price
Maximum price strategy	Maximum price is known at inception of the strategy Consistency in performance versus benchmark High rand-value benefit versus benchmark average price Relatively easy to implement	Premium payable
Indexed strangle strategy	No cost (premium) payable Easy to implement High rand-value benefit versus benchmark average price	Price movement outside of short option strike levels results in double hedging/no hedging No guaranteed maximum price

Since the results achieved by these strategies are not consistent with the efficient market hypothesis, the question remains as to why these strategies are able to consistently outperform the market. The most obvious reasons for the superior performance of the individual strategies are as follows:

- **Momentum strategy.** No long positions are taken during bearish market movements, while futures are bought once prices move upwards. As such, short-term price trends are captured which results in a favorable net long position price.
- **Maximum price strategy.** Call options are bought on the day on which the strategy is implemented, resulting in a maximum price equal to the sum of the call-option strike and the option premium. Price movements lower than the call-option strike is exploited, while prices higher than the discussed strike level are nullified by the call option itself. Since volatility tends to start at low levels and increase over time, the call options are initially bought at a low premium and the subsequent rise in volatility will be exploited once long call options are liquidated in favor of long futures contracts.
- **Indexed strangle strategy.** Options are sold during the period over which volatility tends to peak, resulting in a high option premium to be subtracted from the average price realised by going long equal volumes of futures contracts every trading day over the contract lifetime. Since market movement is limited from the days on which the options are sold to option expiration, the net amount of the premiums will be realised.

9.4 THE IMPACT OF PRICE RISK MANAGEMENT STRATEGIES

The application of the proposed price risk management strategies results in a lower exposure to volatility and the realisation of a better than average futures contract price level. This will benefit groups directly and indirectly susceptible to volatile prices.

9.4.1 Speculators. Speculators' financial success depends on the strategy used in the exploitation of arbitrage opportunities. The principle of speculation in the futures market is to buy at low price levels and sell at high price levels, or vice versa (Kohls & Uhl 2002:350). By engaging in a risk management strategy, the speculator is not guaranteed a profit, since the lower than average long futures position in the market may still be higher than the futures price at the last trading day of the futures contract.

By applying components of these strategies for shorter periods of time, the speculator may still realise a profit. Since the momentum strategy exploits short-term price trends, a profit can be realised by going long the market on its first upward price movement and by going short the market on the first trading day thereafter on which prices move lower. The speculator can use the principle of buying options at low volatility levels (maximum price strategy), since a limited amount of funds are placed on risk with unlimited profit gains. Similarly, the indexed strangle can be used by ignoring the indexing strategy and simply engaging in a short strangle strategy over the designated time period. This would have resulted in speculative profits for the period 2001 to 2006.

9.4.2 Hedgers and consumers. Food price inflation has a major impact on a country's overall inflation rate. During the 2007 season white maize, a major part of the population's staple diet, soared by 75% in price. This caused economists to argue that higher grain prices in South Africa would result in food price inflation of close to 20%, which in turn would lift the overall inflation rate higher than the 6% upper target (Thomas 2007:34-35).

According to Thomas (2007:36-37), the complacent approach of industry players to market movement will ultimately be borne by consumers. This is illustrated in the price comparison of a 5 kg bag of maize meal over a one-year period. Although the price of the bag of meal increased from R14.87 to R21.84 because of higher grain prices, the component cost attributable to millers and retailers remained unchanged. The major price increase is the result of a higher cost of maize and as such a higher long position level obtained in the futures market. Since no effort is made to beat the market, the profit of processors thus remains unchanged.

Thomas (2007:36-37) make the following recommendations in order to eliminate the concerned state of food price inflation:

- **Tackle import parity pricing.** Import parity pricing only applies when South Africa is a net importer of grain. During this period, the landed cost of the imports sets the floor price. When there is a surplus production, prices will fall dramatically. Since import parity pricing is determined by the market, there is no obvious way to address this issue, except through government intervention to control prices.
- **Smooth the supply of grain.** Before the introduction of the futures market, the marketing boards would smooth the supply of grain by accumulating grain during good harvesting years and selling it in bad harvesting years. This is not the best solution because taxpayers end up paying storage costs as well as the cost of writing off accumulated stock after a succession of successful crops.
- **Fight retail prices.** South African retailers are competitive and their net margin of 2.8% to 3% compares favorably with the 6% net margin achieved by the UK's largest food retailer.

- **Allow the market to take care of itself.** When SAFEX prices for soft commodities trade at high levels, producers tend to expand production. The problem remains that the shortage of supply, and as such, prices of close to import parity, is usually only temporary.
- **Raise interest rates.** Interest rates remain the South African Reserve Bank's most popular inflation weapon. Higher interest rates could dampen food demand but how effective this would be in curbing rising prices is debatable. In fact, this could prove to be counterproductive since lower volumes would increase cost pressure on manufacturers.

Amazingly, no mention is made of better procurement strategies in order to eliminate price volatility and to obtain lower levels of procurement prices (long positions in the futures market). In fact, mention is made of the opportunity that existed in the 2007 season to go long the futures market at modest price levels. By entering into risk management strategies, long futures positions at levels lower than the discussed modest price levels could have been obtained.

For the purposes of this study, consumers will obtain the following benefits from a stable, below-average procurement price:

- Since demand is price inelastic, that is, consumers have no choice but to absorb price increases or starve, rapid inflation in food prices has a devastating impact on living standards of the consumer (NALEDI 2002). This means that the food price index for low-income groups rises far more quickly than the overall consumer price index (CPI). By applying the proposed price risk management strategies to grain procurement, food price inflation can be minimised and therefore have a smaller impact on consumer income.
- Since food price inflation has a definite impact on a country's overall inflation rate, the minimisation of food price inflation will lessen the upward pressure on overall inflation. In turn, this will ease the possibility of interest rate hikes due to high inflation levels.

The obvious benefits to hedgers of the price risk management strategies proposed in this study are as follows:

- **Increased profits.** By going long the market at below average prices, larger profit margins could be achieved while still remaining competitive with reference to other milling companies.
- **Increased market share.** Should a portion of the price benefits resulting from the successful procurement strategies be passed on to the consumer through lower retail prices, market share can be increased.
- **IAS39.** Accounting statement IAS39 relates to the recognition and valuation of the price levels of positions in futures contracts versus the price level of the relevant futures contract as on the end of the financial year. In the instance where the net long futures position price level is higher than the futures contract price at year-end, a charge will be made against the income statement (see sec 3.5). In turn, this will increase earnings volatility. By adopting the proposed price risk management strategies, the effect of IAS39 on the financial statements of the hedger can be minimised. This is because of a below-average long position price level which will be discounted against the price level at financial year-end.

9.5 COMPARISON OF PERFORMANCE TO FUND MANAGERS IN ALTERNATIVE MARKETS

The price risk management strategies discussed in this chapter was able to beat the average price (benchmark) fairly consistently. In turn, the same cannot be said about the performance of funds in alternative markets.

Thomas P McGuigan (2006) examined the performance of actively managed stock funds versus the returns offered by the market via a passive strategy over a 20-year period. His conclusion for the period 1983 to 2003 supports the theory that the market cannot be consistently outperformed by an actively managed strategy. The study found it nearly impossible for investors to predict winning strategies/funds. Even though some funds were able to generate returns superior to those offered by the market, they lacked consistency in doing so. Another significant finding of the study was the high cost of picking the wrong actively managed fund. Out of 170 funds, only six managed to outperform the market return by 1% or greater, whilst a staggering 113 funds underperformed the returns offered by the market by 1% or worse.

Wicas (2005:27-30) evaluated the results of 214 mutual funds from 1966 to 2003 and concluded that the market return outperformed actively managed funds on average by five basis points per month before costs. After subtracting the cost, the actively managed funds realised an average return of 22 cents per month lower than the market return (passive strategy). He states that these results are because of the fact that the market is a zero-sum playing field. Before costs, half of the funds invested in stocks and bonds will outperform the market and half will underperform. Once transaction costs and management fees have been subtracted, markets become a negative-sum playing field. The percentage of net winnings shrinks, the percentage of losses grows and the average return of all the funds trails the market by transaction costs.

The inability of investors to outperform the market is also evident in South Africa, where it is difficult, if not impossible, to beat the returns offered by a passive market index like the SATRIX 40 (De Klerk 2006). The practical implication is that no trading strategy can beat the return offered by the market on a constant basis (Brosen & Anderson 1994:85-94; Zulauf & Irwin 1998:308-331).

9.6 SUMMARY AND CONCLUSIONS

The application and evaluation of the three proposed price risk management strategies on historical data contradicts the efficient market hypothesis, since the average return offered by the market is outperformed in 17 out of the 18 applications on historical data. The consistency and extent to which the market return is outperformed varies according to strategy and the year in which the strategy is applied.

The maximum price strategy proves to be the most successful risk management strategy because it provides the best returns in five of the six years under review. It constantly outperforms the benchmark average and provides the fundamentally short position holder with a maximum long position price on the day on which the strategy is applied. A cost, the premium of an at-the-money call option, is payable in the use of the strategy.

The indexed strangle strategy achieves the second best returns, because it constantly outperforms the benchmark average price and realises the best return in one of the six years under review. Although no cost is payable in the application of the strategy, it does possess the feature that a price above the short call option strike level on option expiration will result in a hedging profit but zero hedged tonnages. A price below the short put option strike level on option expiration will result in double the volume tonnages hedged at an average of the market index (average price) and the short put option strike level minus the net option premium.

In terms of the average return offered by a particular price risk management strategy, the momentum strategy proves to be the least successful. It does outperform the benchmark in five of the six years investigated, but the amount by which the average price is beaten is minor in terms of the returns achieved by the maximum price and indexed strangle strategies.

Groups with either a direct or indirect concern in SAFEX will benefit from the application of the price risk management strategies. These groups include speculators, hedgers and consumers. The returns offered by these strategies compare favorably with those achieved by fund managers in alternative markets. This is evident in both local and international markets.

CHAPTER 10

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

10.1 INTRODUCTION

The aim of the preceding chapters was to discuss a specific component of the study, which can be summarised as follows:

- Chapter 1

Background and problem statement

- Chapter 2

The futures market, derivative instruments and literature review

- Chapter 3

Groups vulnerable to volatile futures prices and their performance on the futures market

- Chapter 4

The measurement of performance through benchmarking

- Chapter 5

Research sample and research design

- Chapters 6 to 9

Proposed risk management strategies and evaluation versus benchmark

This chapter summarises the relevant literature, empirical research and the results of the risk management strategies applied to historical data. A conclusion is drawn in order to answer the problem statement and recommendations put forward for further research on risk management strategies in the futures market.

10.2 SUMMARY OF RESEARCH

The futures market evolved from practices that are centuries old. These trading practices developed in the ancient Greek and Roman markets with the introduction of fixed trading locations and trading hours. During the 1800s, chaos in supply and demand in the USA was fairly common. This, together with the difficulty of transporting grains via dirt roads and the lack of sufficient storage space, resulted in producers and merchants contracting grains for future delivery. The first recorded trade of a contract for future delivery was on 13 March 1851 in the USA.

More than a century later, in April 1987, an informal futures market was formed in South Africa. This market was formalised in 1990 with the establishment of the South African Futures Exchange (SAFEX). Futures trading were initially confined to the financial markets. The prices of soft commodities, and grains in particular, were subject to a highly regulated market in which legislation and governing bodies had the authority to determine price levels. Local and international pressure to deregulate this market resulted in governing bodies being abolished through the Marketing of Agricultural Products Act 47 of 1996. As such, futures and options contracts are available with grain as the underlying asset.

A futures contract is a commitment to purchase or sell a given quantity of a specific instrument on a specified future date. Variables affecting the price of a futures contract include supply and demand, import and export parity price levels, the strength of the local currency, international grain prices and weather conditions. The following characteristics are standard features of futures contracts:

- the underlying asset
- the quantity of the asset
- the quality of the asset
- the future delivery date

The difference between an option contract and a futures contract is the higher level of flexibility inherent in options contracts since the holder of an option contract has the right, but not the obligation, to enter into the underlying futures contract. Two types of option contracts can be distinguished, namely call options and put options. A call option (put option) provides the holder thereof with the right, but not the obligation, to buy (sell) an asset for a certain price by a specific date. The variables with the greatest impact on the price of an option are volatility, time to maturity and intrinsic value. Black, Merton and Scholes were responsible for the development of the Black-Scholes option pricing model in the 1970s upon which option valuation is still done today.

Volatility is known as the change in the price of a futures contract over a given time period and is expressed as a percentage. This is computed as the annualised standard deviation of percentage changes in the daily price of a commodity. SAFEX white maize prices are known to be extraordinarily volatile with annual volatility levels as high as 40%. This can have a negative impact on financial statements of role players in the market, since IAS39 determines that the valuation of futures contracts at year-end should be reflected in financial statements.

A distinction is made between groups who are susceptible to volatility in the futures market, namely:

- groups directly susceptible to market movement
- groups indirectly susceptible to market movement

This distinction is based on the groups' level of activity on SAFEX. Hedgers and speculators are defined as being directly susceptible to market movements, while consumers of the commodity are indirectly influenced by changing market prices. Various sources of literature confirm the negative impact of fluctuating prices on consumers. South Africans spend up to 50% of their income on food, while the poor spend 20% on maize alone. Ineffective procurement strategies therefore lead to malnutrition and hunger, since the food price index for low-income groups rises far more quickly than the overall consumer price index.

Ineffective procurement strategies and higher grain prices also contribute to the overall inflation rate.

A non-probability purposive sample was used in this study with reference to the procurement companies and the trading year on which the hedging results of these companies were evaluated. The procurement sector includes a number of small millers but is mainly concentrated in a limited number of large milling companies. The evaluation of the price risk management performance of processors was done by means of an investigation into the procurement results of African Products and Tiger Brands. These two processing companies were used for the purposes of this study since they are recognised as two of the main role players in the procurement market.

- African Products consume close to 7% of the average annual maize crop.
- Tiger Brands is recognised as being among the four largest milling companies in South Africa.

The year with the greatest price fluctuation (2003) was used to determine the effectiveness of existing price risk management strategies. A secondary data analysis was used to evaluate the proposed risk management strategies and to determine the benchmark, namely the average price index.

From the analysis on the chosen sample, it was concluded that procurement companies do not possess the necessary knowledge and capabilities to beat the market. This finding is similar to previous research on this subject which found that less than 5% of grain trading companies were able to beat the simple average price over a predetermined period, while 75% of speculators were not able to outperform the grain market. In addition, hedgers are known to enter futures contracts in the wrong third of the price range. This correlates with research on the performance of actively managed stock funds which found it near impossible to accurately predict winning stocks.

Three price risk management strategies, based on a core/satellite strategy, were developed and applied to historical SAFEX white maize prices.

(1) The momentum strategy. The momentum strategy outperformed the market in five of the six years under review. The extent to which the average price was outperformed varied from R-1.60/ton to R11.86/ton.

(2) The maximum price strategy. By applying the Maximum price strategy to historical data, the average white maize price was outperformed in all of the years under review. The maximum price strategy results varied from R23.19/ton to R180.87/ton better than the benchmark.

(3) The indexed strangle strategy. The indexed strangle strategy, like the maximum price strategy, outperformed the market in all of the years under review, from R6.61/ton to R57.62/ton.

10.3 CONCLUSIONS

Speculators, and for the purposes of this study, more specifically hedgers, are currently unable to enter into contracts on the futures exchange in a manner that will minimise the impact of price volatility on their earnings. Indirectly, this has a negative impact on consumers of the commodity underlying the futures/options contract.

Even though derivative instruments are available to use as a counter against market fluctuations, the price risk management success of groups with a concern on SAFEX suggests that this has not yet been achieved, ultimately to the detriment of consumers. The view exists that markets are efficient and the return offered by the futures exchange cannot consistently be outperformed.

This study shows the exact opposite, since the use of futures/options strategies results in returns superior to those of the market. Two of the proposed price risk management strategies outperform the market in every year under review, which is exactly the opposite of the popular belief of efficient markets. This is achieved by minimising price volatility and gaining from short-term market trends. By applying these strategies to their procurement models, processors will benefit from below-average prices. In turn, this could have a favorable impact on food inflation.

After considering the results of this study, the following recommendations are made to assist users of the futures market, particularly processors, in lowering the impact of market movement:

- (1) Personnel concerned with SAFEX should be educated in the use of derivative instruments in order to increase their knowledge.
- (2) Greater emphasis should be placed on the development of core/satellite risk management strategies, which will ultimately result in procurement models based on an indexing strategy.
- (3) The procurement function should in part be outsourced to companies specialising in exotic options based on the expectation of achieving average prices.

10.4 RECOMMENDATIONS FOR FURTHER RESEARCH

This study provides statistically sound information on the use of derivative instruments in order to outperform market returns. Further components of this topic that should be investigated in order to elaborate on the findings of this study include the following:

- the development of index derivatives to be introduced on SAFEX to minimise the risk of price fluctuations

- development of a model whereby the price of consumable goods obtained from the commodity underlying the derivative instrument is adjusted in order to reflect price fluctuations in both bullish and bearish markets
- research into the possibility of developing strategies whereby producers can obtain above average short positions on the futures market

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APPENDIX I
JULY WHITE MAIZE CLOSING PRICES 2001 – 2006

Year	2001		2002		2003		2004		2005		2006
	DATE	CLOSE	DATE	CLOSE	DATE	CLOSE	DATE	CLOSE	DATE	CLOSE	DATE
	2000/05/05	670	2001/02/21	1030	2002/05/27	1730	2003/06/23	1034	2004/06/10	1200	2005/03/29
	2000/05/08	670	2001/02/22	1015	2002/05/28	1715	2003/06/24	1018	2004/06/11	1185	2005/03/30
	2000/05/09	665	2001/02/23	950	2002/05/29	1710	2003/06/25	993	2004/06/14	1184	2005/03/31
	2000/05/10	665	2001/02/26	880	2002/05/30	1710	2003/06/26	995	2004/06/15	1161	2005/04/01
	2000/05/11	665	2001/02/27	870	2002/05/31	1710	2003/06/27	975	2004/06/17	1132	2005/04/04
	2000/05/12	670	2001/02/28	870	2002/06/03	1700	2003/06/30	975	2004/06/18	1132	2005/04/05
	2000/05/15	690	2001/03/01	870	2002/06/04	1698	2003/07/01	970	2004/06/21	1101	2005/04/06
	2000/05/16	690	2001/03/02	870	2002/06/05	1680	2003/07/02	970	2004/06/22	1095	2005/04/07
	2000/05/17	690	2001/03/05	870	2002/06/06	1690	2003/07/03	988	2004/06/23	1070	2005/04/08
	2000/05/18	690	2001/03/07	880	2002/06/07	1690	2003/07/04	990	2004/06/24	1070	2005/04/11
	2000/05/19	690	2001/03/08	880	2002/06/10	1690	2003/07/07	982	2004/06/25	1070	2005/04/12
	2000/05/22	690	2001/03/09	880	2002/06/11	1705	2003/07/08	988	2004/06/28	1070	2005/04/13
	2000/05/23	690	2001/03/12	880	2002/06/12	1680	2003/07/09	1006	2004/06/29	1070	2005/04/14
	2000/05/24	690	2001/03/13	865	2002/06/13	1680	2003/07/10	994	2004/06/30	1070	2005/04/15
	2000/05/25	690	2001/03/14	865	2002/06/14	1690	2003/07/11	990	2004/07/01	1070	2005/04/18
	2000/05/26	690	2001/03/15	865	2002/06/18	1725	2003/07/14	975	2004/07/02	1084	2005/04/19
	2000/05/29	690	2001/03/16	858	2002/06/19	1690	2003/07/15	985	2004/07/05	1065	2005/04/20
	2000/05/30	685	2001/03/19	858	2002/06/20	1685	2003/07/16	982	2004/07/06	1065	2005/04/21
	2000/05/31	685	2001/03/20	860	2002/06/21	1685	2003/07/17	968	2004/07/07	1065	2005/04/22
	2000/06/01	686	2001/03/22	840	2002/06/24	1700	2003/07/18	957	2004/07/08	1045	2005/04/25
	2000/06/02	686	2001/03/23	835	2002/06/25	1700	2003/07/21	942	2004/07/09	1032	2005/04/26
	2000/06/05	686	2001/03/26	830	2002/06/26	1655	2003/07/22	952	2004/07/12	1019	2005/04/28
	2000/06/06	690	2001/03/27	840	2002/06/27	1661	2003/07/23	961	2004/07/13	1022	2005/04/29
	2000/06/07	690	2001/03/28	840	2002/06/28	1680	2003/07/24	940	2004/07/14	1016	2005/05/03
	2000/06/08	690	2001/03/29	840	2002/07/01	1681	2003/07/25	940	2004/07/15	999	2005/05/04
	2000/06/09	700	2001/03/30	835	2002/07/02	1695	2003/07/28	935	2004/07/16	989	2005/05/05
	2000/06/12	700	2001/04/02	841	2002/07/03	1700	2003/07/29	949	2004/07/19	946	2005/05/06
	2000/06/13	685	2001/04/03	841	2002/07/04	1710	2003/07/30	960	2004/07/20	930	2005/05/09
	2000/06/14	685	2001/04/04	841	2002/07/05	1690	2003/07/31	976	2004/07/21	964	2005/05/10
	2000/06/15	682	2001/04/05	841	2002/07/08	1700	2003/08/01	983	2004/07/22	965	2005/05/11
	2000/06/19	682	2001/04/06	845	2002/07/09	1695	2003/08/04	986	2004/07/23	995	2005/05/12
	2000/06/20	682	2001/04/09	840	2002/07/10	1650	2003/08/05	1000	2004/07/26	987	2005/05/13
	2000/06/21	675	2001/04/10	840	2002/07/11	1605	2003/08/06	966	2004/07/27	1032	2005/05/16
	2000/06/22	675	2001/04/11	840	2002/07/12	1560	2003/08/07	970	2004/07/28	1044	2005/05/17
	2000/06/23	672	2001/04/12	840	2002/07/15	1515	2003/08/08	981	2004/07/29	1036	2005/05/18
	2000/06/26	655	2001/04/17	847	2002/07/16	1505	2003/08/11	990	2004/07/30	1023	2005/05/19
	2000/06/27	660	2001/04/18	841	2002/07/17	1505	2003/08/12	981	2004/08/02	1013	2005/05/20
	2000/06/28	657	2001/04/19	842	2002/07/18	1509	2003/08/13	1010	2004/08/03	1058	2005/05/23
	2000/06/29	650	2001/04/20	842	2002/07/19	1518	2003/08/14	985	2004/08/04	1059	2005/05/24
	2000/06/30	648	2001/04/23	845	2002/07/22	1529	2003/08/15	995	2004/08/05	1049	2005/05/25
	2000/07/03	638	2001/04/24	845	2002/07/23	1573	2003/08/18	1000	2004/08/06	1069	2005/05/26
	2000/07/04	636	2001/04/25	845	2002/07/24	1584	2003/08/19	990	2004/08/10	1048	2005/05/27
	2000/07/05	633	2001/04/26	845	2002/07/25	1590	2003/08/20	993	2004/08/11	1070	2005/05/30
	2000/07/06	630	2001/04/30	845	2002/07/26	1595	2003/08/21	1018	2004/08/12	1042	2005/05/31
	2000/07/07	630	2001/05/02	845	2002/07/29	1600	2003/08/22	1026	2004/08/13	1075	2005/06/01
	2000/07/10	624	2001/05/03	847	2002/07/30	1601	2003/08/25	1031	2004/08/16	1053	2005/06/02

Year	2001		2002		2003		2004		2005		2006	
	DATE	CLOSE	DATE	CLOSE	DATE	CLOSE	DATE	CLOSE	DATE	CLOSE	DATE	CLOSE
	2000/07/11	625	2001/05/04	847	2002/07/31	1600	2003/08/26	1046	2004/08/17	1060	2005/06/03	704
	2000/07/12	617	2001/05/07	850	2002/08/01	1621	2003/08/27	1033	2004/08/18	1060	2005/06/06	704
	2000/07/13	620	2001/05/08	850	2002/08/02	1609	2003/08/28	1022	2004/08/19	1045	2005/06/07	700
	2000/07/14	624	2001/05/09	830	2002/08/05	1621	2003/08/29	1030	2004/08/20	1055	2005/06/08	700
	2000/07/17	625	2001/05/10	830	2002/08/06	1647	01/09/200	1020	2004/08/23	1081	2005/06/09	715
	2000/07/18	630	2001/05/11	830	2002/08/07	1642	2003/09/02	1014	2004/08/24	1110	2005/06/10	715
	2000/07/19	622	2001/05/14	830	2002/08/08	1650	2003/09/03	1012	2004/08/25	1100	2005/06/13	715
	2000/07/20	619	2001/05/15	830	2002/08/12	1650	2003/09/04	1029	2004/08/26	1093	2005/06/14	715
	2000/07/21	625	2001/05/16	830	2002/08/13	1691	2003/09/05	1048	2004/08/27	1095	2005/06/15	707
	2000/07/24	625	2001/05/17	830	2002/08/14	1690	2003/09/08	1044	2004/08/30	1095	2005/06/17	707
	2000/07/25	625	2001/05/18	830	2002/08/15	1685	2003/09/09	1043	2004/08/31	1078	2005/06/20	707
	2000/07/26	625	2001/05/21	830	2002/08/16	1687	2003/09/10	1056	2004/09/01	1033	2005/06/21	715
	2000/07/27	628	2001/05/22	830	2002/08/19	1671	2003/09/11	1060	2004/09/02	1025	2005/06/22	714
	2000/07/28	630	2001/05/23	828	2002/08/20	1680	2003/09/12	1058	2004/09/03	1024	2005/06/23	705
	2000/07/31	626	2001/05/24	828	2002/08/21	1700	2003/09/15	1033	2004/09/06	1038	2005/06/24	705
	2000/08/01	627	2001/05/25	830	2002/08/22	1712	2003/09/16	1050	2004/09/07	1031	2005/06/27	710
	2000/08/02	632	2001/05/28	830	2002/08/23	1740	2003/09/17	1044	2004/09/08	1050	2005/06/28	699
	2000/08/03	629	2001/05/29	835	2002/08/26	1745	2003/09/18	1026	2004/09/09	1052	2005/06/29	700
	2000/08/04	629	2001/05/30	835	2002/08/27	1728	2003/09/19	1028	2004/09/10	1057	2005/06/30	703
	2000/08/07	624	2001/05/31	835	2002/08/28	1743	2003/09/22	1039	2004/09/13	1034	2005/07/01	703
	2000/08/08	624	2001/06/01	835	2002/08/29	1751	2003/09/23	1035	2004/09/14	1022	2005/07/04	707
	2000/08/10	612	2001/06/04	835	2002/08/30	1763	2003/09/25	1029	2004/09/15	1020	2005/07/05	720
	2000/08/11	599	2001/06/05	835	2002/09/02	1782	2003/09/26	1029	2004/09/16	1035	2005/07/06	728
	2000/08/14	599	2001/06/06	830	2002/09/03	1814	2003/09/29	1038	2004/09/17	1023	2005/07/07	718
	2000/08/15	602	2001/06/07	840	2002/09/04	1811	2003/09/30	1025	2004/09/20	1011	2005/07/08	718
	2000/08/16	608	2001/06/08	850	2002/09/05	1810	2003/10/01	1000	2004/09/21	1003	2005/07/11	718
	2000/08/17	600	2001/06/11	850	2002/09/06	1780	2003/10/02	1009	2004/09/22	1023	2005/07/12	717
	2000/08/18	604	2001/06/12	850	2002/09/09	1785	2003/10/03	994	2004/09/23	1030	2005/07/13	716
	2000/08/21	599	2001/06/13	850	2002/09/10	1799	2003/10/06	1039	2004/09/27	1030	2005/07/14	732
	2000/08/22	604	2001/06/14	850	2002/09/11	1789	2003/10/07	1017	2004/09/28	1025	2005/07/15	725
	2000/08/23	603	2001/06/15	845	2002/09/12	1765	2003/10/08	1014	2004/09/29	1030	2005/07/18	733
	2000/08/24	603	2001/06/18	845	2002/09/13	1760	2003/10/09	1027	2004/09/30	1020	2005/07/19	750
	2000/08/25	603	2001/06/19	835	2002/09/16	1770	2003/10/10	999	2004/10/01	1022	2005/07/20	733
	2000/08/28	601	2001/06/20	835	2002/09/17	1766	2003/10/13	1006	2004/10/04	1023	2005/07/21	733
	2000/08/29	605	2001/06/21	840	2002/09/18	1770	2003/10/14	986	2004/10/05	1010	2005/07/22	733
	2000/08/30	618	2001/06/22	845	2002/09/19	1780	2003/10/15	959	2004/10/06	965	2005/07/25	733
	2000/08/31	620	2001/06/25	845	2002/09/20	1815	2003/10/16	948	2004/10/07	978	2005/07/26	741
	2000/09/01	619	2001/06/26	855	2002/09/23	1820	2003/10/17	961	2004/10/08	967	2005/07/27	745
	2000/09/04	612	2001/06/27	860	2002/09/25	1841	2003/10/20	967	2004/10/11	938	2005/07/28	745
	2000/09/05	617	2001/06/28	845	2002/09/26	1835	2003/10/21	961	2004/10/12	953	2005/07/29	759
	2000/09/06	625	2001/06/29	843	2002/09/27	1823	2003/10/22	962	2004/10/13	967	2005/08/01	759
	2000/09/07	626	2001/07/02	843	2002/09/30	1810	2003/10/23	976	2004/10/14	956	2005/08/02	759
	2000/09/08	620	2001/07/03	837	2002/10/01	1793	2003/10/24	997	2004/10/15	945	2005/08/03	757
	2000/09/11	625	2001/07/04	842	2002/10/02	1805	2003/10/27	999	2004/10/18	965	2005/08/04	752
	2000/09/12	629	2001/07/05	845	2002/10/03	1812	2003/10/28	984	2004/10/19	957	2005/08/05	749
	2000/09/13	626	2001/07/06	850	2002/10/04	1803	2003/10/29	993	2004/10/20	965	2005/08/08	749

Year	2001		2002		2003		2004		2005		2006	
	DATE	CLOSE	DATE	CLOSE	DATE	CLOSE	DATE	CLOSE	DATE	CLOSE	DATE	CLOSE
	2000/09/14	624	2001/07/09	850	2002/10/07	1809	2003/10/30	983	2004/10/21	983	2005/08/10	749
	2000/09/15	622	2001/07/10	865	2002/10/08	1825	2003/10/31	980	2004/10/22	982	2005/08/11	749
	2000/09/18	627	2001/07/11	877	2002/10/09	1835	2003/11/03	992	2004/10/25	1027	2005/08/12	750
	2000/09/19	632	2001/07/12	880	2002/10/10	1840	2003/11/04	979	2004/10/26	1065	2005/08/15	750
	2000/09/20	625	2001/07/13	893	2002/10/11	1845	2003/11/05	970	2004/10/27	1042	2005/08/16	752
	2000/09/21	629	2001/07/17	900	2002/10/14	1846	2003/11/06	994	2004/10/28	1048	2005/08/17	764
	2000/09/22	627	2001/07/18	876	2002/10/15	1856	2003/11/07	987	2004/10/29	1093	2005/08/18	762
	2000/09/26	626	2001/07/19	870	2002/10/16	1861	2003/11/10	1003	2004/11/01	1100	2005/08/19	762
	2000/09/27	626	2001/07/20	860	2002/10/17	1866	2003/11/11	988	2004/11/02	1088	2005/08/22	775
	2000/09/28	628	2001/07/23	850	2002/10/18	1854	2003/11/12	988	2004/11/03	1059	2005/08/23	780
	2000/09/29	632	2001/07/24	859	2002/10/21	1833	2003/11/13	1004	2004/11/04	1050	2005/08/24	796
	2000/10/02	635	2001/07/25	867	2002/10/22	1799	2003/11/14	991	2004/11/05	1040	2005/08/25	790
	2000/10/03	643	2001/07/26	881	2002/10/23	1774	2003/11/17	984	2004/11/08	995	2005/08/26	797
	2000/10/04	665	2001/07/27	888	2002/10/24	1761	2003/11/18	986	2004/11/09	998	2005/08/29	792
	2000/10/05	668	2001/07/30	884	2002/10/25	1790	2003/11/19	978	2004/11/10	983	2005/08/30	797
	2000/10/06	659	2001/07/31	880	2002/10/28	1769	2003/11/20	976	2004/11/11	1007	2005/08/31	803
	2000/10/09	657	2001/08/01	880	2002/10/29	1782	2003/11/21	972	2004/11/12	997	2005/09/01	815
	2000/10/10	655	2001/08/02	877	2002/10/30	1783	2003/11/24	978	2004/11/15	1042	2005/09/02	805
	2000/10/11	655	2001/08/03	885	2002/10/31	1794	2003/11/25	980	2004/11/16	1081	2005/09/05	797
	2000/10/12	662	2001/08/06	880	2002/11/01	1786	2003/11/26	977	2004/11/17	1050	2005/09/06	822
	2000/10/13	682	2001/08/07	884	2002/11/04	1741	2003/11/27	976	2004/11/18	1050	2005/09/07	825
	2000/10/16	679	2001/08/08	879	2002/11/05	1752	2003/11/28	968	2004/11/19	1062	2005/09/08	839
	2000/10/17	686	2001/08/10	892	2002/11/06	1765	2003/12/01	996	2004/11/22	1090	2005/09/09	860
	2000/10/18	694	2001/08/13	895	2002/11/07	1774	2003/12/02	1015	2004/11/23	1087	2005/09/12	882
	2000/10/19	697	2001/08/14	903	2002/11/08	1753	2003/12/03	1020	2004/11/24	1072	2005/09/13	839
	2000/10/20	688	2001/08/15	899	2002/11/11	1740	2003/12/04	1045	2004/11/25	1075	2005/09/14	860
	2000/10/23	676	2001/08/16	895	2002/11/12	1760	2003/12/05	1080	2004/11/26	1054	2005/09/15	842
	2000/10/24	672	2001/08/17	885	2002/11/13	1773	2003/12/08	1125	2004/11/29	1009	2005/09/16	849
	2000/10/25	682	2001/08/20	873	2002/11/14	1787	2003/12/09	1138	2004/11/30	964	2005/09/19	877
	2000/10/26	690	2001/08/21	882	2002/11/15	1810	2003/12/10	1139	2004/12/01	944	2005/09/20	875
	2000/10/27	682	2001/08/22	903	2002/11/18	1855	2003/12/11	1147	2004/12/02	940	2005/09/21	864
	2000/10/30	693	2001/08/23	900	2002/11/19	1854	2003/12/12	1192	2004/12/03	927	2005/09/22	852
	2000/10/31	695	2001/08/24	905	2002/11/20	1866	2003/12/15	1237	2004/12/06	882	2005/09/23	866
	2000/11/01	694	2001/08/27	908	2002/11/21	1889	2003/12/17	1245	2004/12/07	902	2005/09/26	858
	2000/11/02	703	2001/08/28	920	2002/11/22	1865	18/12/2003	1206	2004/12/08	929	2005/09/27	866
	2000/11/03	712	2001/08/29	920	2002/11/25	1890	2003/12/19	1212	2004/12/09	904	2005/09/28	869
	2000/11/06	706	2001/08/30	935	2002/11/26	1893	2003/12/22	1247	2004/12/10	901	2005/09/29	867
	2000/11/07	710	2001/08/31	939	2002/11/27	1893	2003/12/23	1209	2004/12/13	917	2005/09/30	877
	2000/11/08	725	2001/09/03	940	2002/11/28	1905	2003/12/24	1254	2004/12/14	900	2005/10/03	904
	2000/11/09	732	2001/09/04	935	2002/11/29	1950	2003/12/29	1209	2004/12/15	906	2005/10/04	893
	2000/11/10	714	2001/09/05	930	2002/12/02	1989	2003/12/30	1192	2004/12/17	897	2005/10/05	893
	2000/11/13	695	2001/09/06	912	2002/12/03	1958	2003/12/31	1225	2004/12/20	852	2005/10/06	896
	2000/11/14	693	2001/09/07	925	2002/12/04	1955	2004/01/02	1246	2004/12/21	807	2005/10/07	897
	2000/11/15	705	2001/09/10	918	2002/12/05	1910	2004/01/05	1205	2004/12/22	804	2005/10/10	870
	2000/11/16	720	2001/09/11	909	2002/12/06	1865	2004/01/06	1172	2004/12/23	795	2005/10/11	851
	2000/11/17	722	2001/09/12	923	2002/12/09	1800	2004/01/07	1185	2004/12/24	798	2005/10/12	856

Year	2001		2002		2003		2004		2005		2006	
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	2000/11/20	729	2001/09/13	917	2002/12/10	1735	2004/01/08	1230	2004/12/28	784	2005/10/13	875
	2000/11/21	738	2001/09/14	920	2002/12/11	1689	2004/01/09	1275	2004/12/29	767	2005/10/14	839
	2000/11/22	741	2001/09/17	920	2002/12/12	1727	2004/01/12	1283	2004/12/30	812	2005/10/17	846
	2000/11/23	739	2001/09/18	927	2002/12/13	1720	2004/01/13	1328	2004/12/31	816	2005/10/18	868
	2000/11/24	744	2001/09/19	925	2002/12/17	1675	2004/01/14	1373	2005/01/03	861	2005/10/19	874
	2000/11/27	744	2001/09/20	934	2002/12/18	1645	2004/01/15	1380	2005/01/04	855	2005/10/20	880
	2000/11/28	740	2001/09/21	950	2002/12/19	1640	2004/01/16	1425	2005/01/05	880	2005/10/21	890
	2000/11/29	736	2001/09/25	969	2002/12/20	1682	2004/01/19	1380	2005/01/06	845	2005/10/24	900
	2000/11/30	706	2001/09/26	998	2002/12/23	1724	2004/01/20	1335	2005/01/07	814	2005/10/25	880
	2000/12/01	709	2001/09/27	1009	2002/12/24	1713	2004/01/21	1400	2005/01/10	769	2005/10/26	880
	2000/12/04	704	2001/09/28	1000	2002/12/27	1668	2004/01/22	1396	2005/01/11	725	2005/10/27	875
	2000/12/06	699	2001/10/01	1028	2002/12/30	1640	2004/01/23	1408	2005/01/12	742	2005/10/28	860
	2000/12/07	685	2001/10/02	1058	2002/12/31	1672	2004/01/26	1453	2005/01/13	698	2005/10/31	880
	2000/12/08	699	2001/10/03	1068	2003/01/02	1681	2004/01/27	1494	2005/01/14	709	2005/11/01	862
	2000/12/11	716	2001/10/04	1054	2003/01/03	1663	2004/01/28	1500	2005/01/17	724	2005/11/02	862
	2000/12/12	712	2001/10/05	1044	2003/01/06	1620	2004/01/29	1492	2005/01/18	697	2005/11/03	856
	2000/12/13	715	2001/10/08	1027	2003/01/07	1599	2004/01/30	1533	2005/01/19	659	2005/11/04	867
	2000/12/14	705	2001/10/09	1024	2003/01/08	1580	2004/02/02	1578	2005/01/20	678	2005/11/07	886
	2000/12/15	715	2001/10/10	1022	2003/01/09	1550	2004/02/03	1543	2005/01/21	687	2005/11/08	890
	2000/12/18	720	2001/10/11	1019	2003/01/10	1572	2004/02/04	1500	2005/01/24	648	2005/11/09	894
	2000/12/19	733	2001/10/12	1043	2003/01/13	1527	2004/02/05	1536	2005/01/25	603	2005/11/10	898
	2000/12/20	732	2001/10/15	1025	2003/01/14	1515	2004/02/06	1491	2005/01/26	580	2005/11/11	905
	2000/12/21	726	2001/10/16	1021	2003/01/15	1562	2004/02/09	1446	2005/01/27	614	2005/11/14	950
	2000/12/22	732	2001/10/17	1018	2003/01/16	1594	2004/02/10	1423	2005/01/28	615	2005/11/15	983
	2000/12/27	729	2001/10/18	1018	2003/01/20	1536	2004/02/11	1378	2005/01/31	625	2005/11/16	971
	2000/12/28	736.2	2001/10/19	1012	2003/01/21	1549	2004/02/12	1333	2005/02/01	621	2005/11/17	979
	2000/12/29	739	2001/10/22	1013	2003/01/22	1566	2004/02/13	1342	2005/02/02	624	2005/11/18	969
	2001/01/02	756.8	2001/10/23	1037	2003/01/23	1561	2004/02/16	1387	2005/02/03	638	2005/11/21	960
	2001/01/03	756	2001/10/24	1035	2003/01/24	1516	2004/02/17	1380	2005/02/04	662	2005/11/22	1005
	2001/01/04	779	2001/10/25	1041	2003/01/27	1471	2004/02/18	1364	2005/02/07	672	2005/11/23	997
	2001/01/05	800	2001/10/26	1067	2003/01/28	1406	2004/02/19	1372	2005/02/08	627	2005/11/24	956
	2001/01/08	830	2001/10/29	1055	2003/01/29	1434	2004/02/20	1368	2005/02/09	601	2005/11/25	959
	2001/01/09	831	2001/10/30	1036	2003/01/30	1432	2004/02/23	1323	2005/02/10	598	2005/11/28	988
	2001/01/10	851	2001/10/31	1043	2003/01/31	1424	2004/02/24	1278	2005/02/11	605	2005/11/29	970
	2001/01/11	853	2001/11/01	1034	2003/02/03	1379	2004/02/25	1287	2005/02/14	601	2005/11/30	980
	2001/01/12	839	2001/11/02	1042	2003/02/04	1334	2004/02/26	1270	2005/02/15	595	2005/12/01	990
	2001/01/15	847	2001/11/05	1057	2003/02/05	1320	2004/02/27	1225	2005/02/16	580	2005/12/02	998
	2001/01/16	862	2001/11/06	1077	2003/02/06	1360	2004/03/01	1212	2005/02/17	579	2005/12/05	1023
	2001/01/17	872	2001/11/07	1088	2003/02/07	1382	2004/03/02	1167	2005/02/18	555	2005/12/06	1022
	2001/01/18	861	2001/11/08	1098	2003/02/10	1337	2004/03/03	1125	2005/02/21	536	2005/12/07	1052
	2001/01/19	875	2001/11/09	1080	2003/02/11	1292	2004/03/04	1160	2005/02/22	548	2005/12/08	1067
	2001/01/22	879	2001/11/12	1110	2003/02/12	1285	2004/03/05	1166	2005/02/23	542	2005/12/09	1070
	2001/01/23	864	2001/11/13	1140	2003/02/13	1240	2004/03/08	1121	2005/02/24	531	2005/12/12	1115
	2001/01/24	877	2001/11/14	1185	2003/02/14	1195	2004/03/09	1076	2005/02/25	522	2005/12/13	1135
	2001/01/25	871	2001/11/15	1185	2003/02/17	1130	2004/03/10	1100	2005/02/28	548	2005/12/14	1127
	2001/01/26	841	2001/11/16	1163	2003/02/18	1133	2004/03/11	1145	2005/03/01	538	2005/12/15	1128

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	2001/01/30	810	2001/11/20	1208	2003/02/20	1021	2004/03/15	1135	2005/03/03	561	2005/12/20	1128
	2001/01/31	805	2001/11/21	1238	2003/02/21	1007	2004/03/16	1207	2005/03/04	554	2005/12/21	1120
	2001/02/01	835	2001/11/22	1283	2003/02/24	1008	2004/03/17	1176	2005/03/07	544	2005/12/22	1120
	2001/02/02	865	2001/11/23	1328	2003/02/25	1016	2004/03/18	1206	2005/03/08	532	2005/12/23	1150
	2001/02/05	910	2001/11/26	1336	2003/02/26	1039	2004/03/19	1203	2005/03/09	537	2005/12/27	1195
	2001/02/06	934	2001/11/27	1291	2003/02/27	1007	2004/03/23	1158	2005/03/10	553	2005/12/28	1154
	2001/02/07	904	2001/11/28	1246	2003/02/28	969	2004/03/24	1113	2005/03/11	581	2005/12/29	1140
	2001/02/08	892	2001/11/29	1255	2003/03/03	964	2004/03/25	1100	2005/03/14	586	2005/12/30	1095
	2001/02/12	855	2001/11/30	1285	2003/03/04	950	2004/03/26	1103	2005/03/15	594	2006/01/03	1050
	2001/02/13	870	2001/12/03	1315	2003/03/05	989	2004/03/29	1086	2005/03/16	597	2006/01/04	1079
	2001/02/14	900	2001/12/04	1340	2003/03/06	969	2004/03/30	1091	2005/03/17	587	2006/01/05	1065
	2001/02/15	930	2001/12/05	1385	2003/03/07	992	2004/03/31	1136	2005/03/18	577	2006/01/06	1110
	2001/02/16	923	2001/12/06	1419	2003/03/10	1037	2004/04/01	1164	2005/03/22	559	2006/01/09	1144
	2001/02/19	893	2001/12/07	1383	2003/03/11	1055	2004/04/02	1187	2005/03/23	576	2006/01/10	1151
	2001/02/20	894	2001/12/10	1428	2003/03/12	1063	2004/04/05	1223	2005/03/24	570	2006/01/11	1141
	2001/02/21	906	2001/12/11	1454	2003/03/13	1022	2004/04/06	1178	2005/03/29	594	2006/01/12	1096
	2001/02/22	887	2001/12/12	1499	2003/03/14	1018	2004/04/07	1165	2005/03/30	592	2006/01/13	1078
	2001/02/23	859	2001/12/13	1544	2003/03/17	992	2004/04/08	1171	2005/03/31	585	2006/01/16	1081
	2001/02/26	834	2001/12/14	1589	2003/03/18	1002	2004/04/13	1142	2005/04/01	580	2006/01/17	1123
	2001/02/27	833	2001/12/18	1634	2003/03/19	958	2004/04/15	1167	2005/04/04	578	2006/01/18	1116
	2001/02/28	829	2001/12/19	1679	2003/03/20	913	2004/04/16	1122	2005/04/05	587	2006/01/19	1119
	2001/03/01	840	2001/12/20	1724	2003/03/24	848	2004/04/19	1097	2005/04/06	573	2006/01/20	1141
	2001/03/02	864	2001/12/21	1689	2003/03/25	867	2004/04/20	1100	2005/04/07	583	2006/01/23	1096
	2001/03/05	874	2001/12/24	1644	2003/03/26	886	2004/04/21	1134	2005/04/08	580	2006/01/24	1088
	2001/03/07	873	2001/12/27	1599	2003/03/27	875	2004/04/22	1151	2005/04/11	570	2006/01/25	1110
	2001/03/08	878	2001/12/28	1554	2003/03/28	866	2004/04/23	1129	2005/04/12	567	2006/01/26	1091
	2001/03/09	883	2001/12/31	1599	2003/03/31	821	2004/04/26	1119	2005/04/13	563	2006/01/27	1076
	2001/03/12	862	2002/01/02	1644	2003/04/01	826	2004/04/28	1150	2005/04/14	560	2006/01/30	1036
	2001/03/13	848	2002/01/03	1689	2003/04/02	865	2004/04/29	1150	2005/04/15	570	2006/01/31	994
	2001/03/14	843	2002/01/04	1680	2003/04/03	855	2004/04/30	1140	2005/04/18	561	2006/02/01	962
	2001/03/15	840	2002/01/07	1635	2003/04/04	841	2004/05/03	1139	2005/04/19	556	2006/02/02	1006
	2001/03/16	830	2002/01/08	1590	2003/04/07	886	2004/05/04	1116	2005/04/20	544	2006/02/03	1007
	2001/03/19	846	2002/01/09	1525	2003/04/08	891	2004/05/05	1088	2005/04/21	543	2006/02/06	962
	2001/03/20	854	2002/01/10	1495	2003/04/09	876	2004/05/06	1057	2005/04/22	550	2006/02/07	933
	2001/03/22	850	2002/01/11	1518	2003/04/10	847	2004/05/07	1064	2005/04/25	550	2006/02/08	977
	2001/03/23	820	2002/01/14	1550	2003/04/11	859	2004/05/10	1090	2005/04/26	555	2006/02/09	984
	2001/03/26	820	2002/01/15	1570	2003/04/14	867	2004/05/11	1069	2005/04/28	558	2006/02/10	985
	2001/03/27	832	2002/01/16	1615	2003/04/15	864	2004/05/12	1074	2005/04/29	558	2006/02/13	988
	2001/03/28	813	2002/01/17	1628	2003/04/16	851	2004/05/13	1081	2005/05/03	564	2006/02/14	1006
	2001/03/29	802	2002/01/18	1652	2003/04/17	842	2004/05/14	1079	2005/05/04	560	2006/02/15	1006
	2001/03/30	797	2002/01/21	1661	2003/04/22	824	2004/05/17	1048	2005/05/05	551	2006/02/16	976
	2001/04/02	815	2002/01/22	1630	2003/04/23	806	2004/05/18	1063	2005/05/06	552	2006/02/17	992
	2001/04/03	817	2002/01/23	1665	2003/04/24	782	2004/05/19	1054	2005/05/09	561	2006/02/20	987
	2001/04/04	818	2002/01/24	1657	2003/04/25	780	2004/05/20	1062	2005/05/10	568	2006/02/21	978
	2001/04/05	827	2002/01/25	1639	2003/04/29	763	2004/05/21	1055	2005/05/11	567	2006/02/22	1022

Year	2001		2002		2003		2004		2005		2006	
	DATE	CLOSE	DATE	CLOSE	DATE	CLOSE	DATE	CLOSE	DATE	CLOSE	DATE	CLOSE
	2001/04/06	845	2002/01/28	1594	2003/04/30	743	2004/05/24	1064	2005/05/12	575	2006/02/23	1019
	2001/04/09	846	2002/01/29	1558	2003/05/02	763	2004/05/25	1076	2005/05/13	579	2006/02/24	1045
	2001/04/10	835	2002/01/30	1595	2003/05/05	808	2004/05/26	1069	2005/05/16	587	2006/02/27	1090
	2001/04/11	830	2002/01/31	1640	2003/05/06	813	2004/05/27	1057	2005/05/17	586	2006/02/28	1090
	2001/04/12	832	2002/02/01	1605	2003/05/07	801	2004/05/28	1052	2005/05/18	578	2006/03/02	1092
	2001/04/17	840	2002/02/04	1646	2003/05/08	794	2004/05/31	1055	2005/05/19	564	2006/03/03	1109
	2001/04/18	831	2002/02/05	1636	2003/05/09	800	2004/06/01	1073	2005/05/20	556	2006/03/06	1132
	2001/04/19	826	2002/02/06	1591	2003/05/12	841	2004/06/02	1086	2005/05/23	577	2006/03/07	1124
	2001/04/20	822	2002/02/07	1626	2003/05/13	839	2004/06/03	1073	2005/05/24	585	2006/03/08	1096
	2001/04/23	823	2002/02/08	1614	2003/05/14	872	2004/06/04	1071	2005/05/25	579	2006/03/09	1117
	2001/04/24	813	2002/02/11	1628	2003/05/15	917	2004/06/07	1056	2005/05/26	571	2006/03/10	1127
	2001/04/25	804	2002/02/12	1631	2003/05/16	962	2004/06/08	1059	2005/05/27	588	2006/03/13	1132
	2001/04/26	809	2002/02/13	1586	2003/05/19	954	2004/06/09	1051	2005/05/30	581	2006/03/14	1126
	2001/04/30	807	2002/02/14	1565	2003/05/20	951	2004/06/10	1044	2005/05/31	593	2006/03/15	1141
	2001/05/02	816	2002/02/15	1571	2003/05/21	907	2004/06/11	1016	2005/06/01	602	2006/03/16	1132
	2001/05/03	812	2002/02/18	1526	2003/05/22	938	2004/06/14	1017	2005/06/02	603	2006/03/17	1114
	2001/05/04	808	2002/02/19	1481	2003/05/23	940	2004/06/15	997	2005/06/03	592	2006/03/20	1129
	2001/05/07	788	2002/02/20	1416	2003/05/26	933	2004/06/17	962	2005/06/06	591	2006/03/22	1166
	2001/05/08	781	2002/02/21	1430	2003/05/27	930	2004/06/18	975	2005/06/07	585	2006/03/23	1159
	2001/05/09	771	2002/02/22	1472	2003/05/28	975	2004/06/21	930	2005/06/08	591	2006/03/24	1161
	2001/05/10	767	2002/02/25	1492	2003/05/29	1005	2004/06/22	927	2005/06/09	594	2006/03/27	1163
	2001/05/11	754	2002/02/26	1473	2003/05/30	1001	2004/06/23	906	2005/06/10	588	2006/03/28	1171
	2001/05/14	760	2002/02/27	1481	2003/06/02	980	2004/06/24	951	2005/06/13	595	2006/03/29	1164
	2001/05/15	764	2002/02/28	1514	2003/06/03	935	2004/06/25	953	2005/06/14	594	2006/03/30	1147
	2001/05/16	757	2002/03/01	1489	2003/06/04	901	2004/06/28	930	2005/06/15	594	2006/03/31	1146
	2001/05/17	750	2002/03/04	1457	2003/06/05	939	2004/06/29	927	2005/06/17	588	2006/04/03	1134
	2001/05/18	751	2002/03/05	1412	2003/06/06	924	2004/06/30	925	2005/06/20	581	2006/04/04	1113
	2001/05/21	737	2002/03/06	1445	2003/06/09	940	2004/07/01	910	2005/06/21	582	2006/04/05	1120
	2001/05/22	744	2002/03/07	1490	2003/06/10	923	2004/07/02	931	2005/06/22	579	2006/04/06	1105
	2001/05/23	758	2002/03/08	1522	2003/06/11	906	2004/07/05	923	2005/06/23	569	2006/04/07	1117
	2001/05/24	758	2002/03/11	1477	2003/06/12	927	2004/07/06	929	2005/06/24	574	2006/04/10	1122
	2001/05/25	756	2002/03/12	1451	2003/06/13	904	2004/07/07	924	2005/06/27	574	2006/04/11	1120
	2001/05/28	744	2002/03/13	1450	2003/06/17	869	2004/07/08	912	2005/06/28	565	2006/04/12	1119
	2001/05/29	743	2002/03/14	1490	2003/06/18	870	2004/07/09	906	2005/06/29	569	2006/04/13	1106
	2001/05/30	750	2002/03/15	1492	2003/06/19	889	2004/07/12	879	2005/06/30	572	2006/04/18	1077
	2001/05/31	756	2002/03/18	1517	2003/06/20	885	2004/07/13	881	2005/07/01	577	2006/04/19	1068
	2001/06/01	766	2002/03/19	1555	2003/06/23	885	2004/07/14	878	2005/07/04	589	2006/04/20	1080
	2001/06/04	766	2002/03/20	1600	2003/06/24	866	2004/07/15	863	2005/07/05	598	2006/04/21	1098
	2001/06/05	768	2002/03/22	1645	2003/06/25	840	2004/07/16	851	2005/07/06	602	2006/04/24	1093
	2001/06/06	761	2002/03/25	1639	2003/06/26	848	2004/07/19	810	2005/07/07	587	2006/04/25	1087
	2001/06/07	777	2002/03/26	1672	2003/06/27	830	2004/07/20	795	2005/07/08	596	2006/04/26	1099
	2001/06/08	782	2002/03/27	1668	2003/06/30	829	2004/07/21	827	2005/07/11	592	2006/04/28	1090
	2001/06/11	796	2002/03/28	1713	2003/07/01	822			2005/07/12	592	2006/05/02	1094
	2001/06/12	794	2002/04/02	1758	2003/07/02	831			2005/07/13	590	2006/05/03	1088
	2001/06/13	784	2002/04/03	1803	2003/07/03	847			2005/07/14	608	2006/05/04	1089
	2001/06/14	794	2002/04/04	1756	2003/07/04	845			2005/07/15	612	2006/05/05	1089

Year	2001		2002		2003		2004		2005		2006	
	DATE	CLOSE	DATE	CLOSE	DATE	CLOSE	DATE	CLOSE	DATE	CLOSE	DATE	CLOSE
	2001/06/15	784	2002/04/05	1775	2003/07/07	838			2005/07/18	624	2006/05/08	1088
	2001/06/18	777	2002/04/08	1799	2003/07/08	852			2005/07/19	636	2006/05/09	1100
	2001/06/19	779	2002/04/09	1785	2003/07/09	888			2005/07/20	604	2006/05/10	1140
	2001/06/20	775	2002/04/10	1775	2003/07/10	874					2006/05/11	1143
	2001/06/21	795	2002/04/11	1820	2003/07/11	869					2006/05/12	1169
	2001/06/22	796	2002/04/12	1850	2003/07/14	856					2006/05/15	1197
	2001/06/25	787	2002/04/15	1870	2003/07/15	852					2006/05/16	1187
	2001/06/26	807	2002/04/16	1873	2003/07/16	845					2006/05/17	1189
	2001/06/27	826	2002/04/17	1878	2003/07/17	835					2006/05/18	1206
	2001/06/28	830	2002/04/18	1893	2003/07/18	823					2006/05/19	1218
	2001/06/29	828	2002/04/19	1885	2003/07/21	805					2006/05/22	1216
	2001/07/02	828	2002/04/22	1853	2003/07/22	812					2006/05/23	1226
	2001/07/03	823	2002/04/23	1808							2006/05/24	1216
	2001/07/04	837	2002/04/24	1786							2006/05/25	1201
	2001/07/05	858	2002/04/25	1770							2006/05/26	1209
	2001/07/06	859	2002/04/26	1751							2006/05/29	1207
	2001/07/09	855	2002/04/29	1706							2006/05/30	1221
	2001/07/10	867	2002/04/30	1725							2006/05/31	1233
	2001/07/11	892	2002/05/02	1752							2006/06/01	1244
	2001/07/12	900	2002/05/03	1763							2006/06/02	1244
	2001/07/13	925	2002/05/06	1774							2006/06/05	1266
	2001/07/17	943	2002/05/07	1737							2006/06/06	1272
	2001/07/18	930	2002/05/08	1692							2006/06/07	1270
	2001/07/19	957	2002/05/09	1727							2006/06/08	1290
	2001/07/20	956	2002/05/10	1718							2006/06/09	1285
			2002/05/13	1722							2006/06/12	1302
			2002/05/14	1745							2006/06/13	1335
			2002/05/15	1765							2006/06/14	1314
			2002/05/16	1764							2006/06/15	1295
			2002/05/17	1772							2006/06/19	1287
			2002/05/20	1773							2006/06/20	1270
			2002/05/21	1771							2006/06/21	1288
			2002/05/22	1766							2006/06/22	1320
			2002/05/23	1766							2006/06/23	1340
			2002/05/24	1781							2006/06/26	1333
			2002/05/27	1777							2006/06/27	1312
			2002/05/28	1791							2006/06/28	1337
			2002/05/29	1799							2006/06/29	1355
			2002/05/30	1793							2006/06/30	1361
			2002/05/31	1802							2006/07/03	1391
			2002/06/03	1787							2006/07/04	1380
			2002/06/04	1742							2006/07/05	1401
			2002/06/05	1738							2006/07/06	1400
			2002/06/06	1734							2006/07/07	1401
			2002/06/07	1719							2006/07/10	1384
			2002/06/10	1737							2006/07/11	1398

Year	2001		2002		2003		2004		2005		2006	
	DATE	CLOSE	DATE	CLOSE	DATE	CLOSE	DATE	CLOSE	DATE	CLOSE	DATE	CLOSE
			2002/06/11	1743							2006/07/12	1390
			2002/06/12	1734							2006/07/13	1391
			2002/06/13	1754							2006/07/14	1390
			2002/06/14	1786							2006/07/17	1419
			2002/06/18	1831							2006/07/18	1416
			2002/06/19	1794							2006/07/19	1400
			2002/06/20	1778							2006/07/20	1403
			2002/06/21	1786								
			2002/06/24	1802								
			2002/06/25	1794								
			2002/06/26	1749								
			2002/06/27	1756								
			2002/06/28	1767								
			2002/07/01	1769								
			2002/07/02	1777								
			2002/07/03	1760								
			2002/07/04	1761								
			2002/07/05	1746								
			2002/07/08	1745								
			2002/07/09	1749								
			2002/07/10	1747								
			2002/07/11	1740								
			2002/07/12	1694								
			2002/07/15	1676								
			2002/07/16	1705								
			2002/07/17	1660								
			2002/07/18	1643								
			2002/07/19	1628								
			2002/07/22	1630								

APPENDIX II

JULY WHITE MAIZE VOLATILITY 2001 – 2006

DATE	2002 Volatility	DATE	2003 Volatility	DATE	2004 Volatility	DATE	2005 Volatility	DATE	2006 Volatility
02-Jan-02	39.0	27-May-02	24	23-Jun-03	30	08-Jul-04	26	29-Mar-05	35
03-Jan-02	40.0	28-May-02	24	24-Jun-03	31	09-Jul-04	26	30-Mar-05	35
04-Jan-02	39.0	29-May-02	24	25-Jun-03	31	12-Jul-04	26	31-Mar-05	35
07-Jan-02	38.5	30-May-02	24	26-Jun-03	31	13-Jul-04	26.5	01-Apr-05	35
08-Jan-02	38.5	31-May-02	24	27-Jun-03	31	14-Jul-04	26.5	04-Apr-05	35
09-Jan-02	40.0	03-Jun-02	24	30-Jun-03	31	15-Jul-04	26.5	05-Apr-05	35
10-Jan-02	39.0	04-Jun-02	24	01-Jul-03	31	16-Jul-04	26.5	06-Apr-05	35
11-Jan-02	39.0	05-Jun-02	24	02-Jul-03	31	19-Jul-04	26.5	07-Apr-05	35
14-Jan-02	39.0	06-Jun-02	24	03-Jul-03	31	20-Jul-04	26.5	08-Apr-05	35
15-Jan-02	40.0	07-Jun-02	24	04-Jul-03	31	21-Jul-04	29	11-Apr-05	35
16-Jan-02	41.0	10-Jun-02	24	07-Jul-03	31	22-Jul-04	30	12-Apr-05	35
17-Jan-02	40.0	11-Jun-02	24	08-Jul-03	31	23-Jul-04	31	13-Apr-05	35
18-Jan-02	40.0	12-Jun-02	24	09-Jul-03	31	26-Jul-04	32	14-Apr-05	35
21-Jan-02	40.0	13-Jun-02	24	10-Jul-03	31	27-Jul-04	32	15-Apr-05	35
22-Jan-02	39.0	14-Jun-02	24	11-Jul-03	31	28-Jul-04	32	18-Apr-05	35
23-Jan-02	38.0	18-Jun-02	24	14-Jul-03	31	29-Jul-04	34	19-Apr-05	35
24-Jan-02	36.0	19-Jun-02	24	15-Jul-03	31	30-Jul-04	34	20-Apr-05	38
25-Jan-02	36.0	20-Jun-02	25	16-Jul-03	31	02-Aug-04	36	21-Apr-05	38
28-Jan-02	34.0	21-Jun-02	25	17-Jul-03	31	03-Aug-04	36	22-Apr-05	38
29-Jan-02	33.0	24-Jun-02	25	18-Jul-03	31	04-Aug-04	36	25-Apr-05	38
30-Jan-02	35.0	25-Jun-02	25	21-Jul-03	31	05-Aug-04	37	26-Apr-05	38
31-Jan-02	36.5	26-Jun-02	25	22-Jul-03	31	06-Aug-04	37	28-Apr-05	38
01-Feb-02	37.0	27-Jun-02	25	23-Jul-03	36	10-Aug-04	38	29-Apr-05	38
04-Feb-02	38.0	28-Jun-02	26	24-Jul-03	36	11-Aug-04	37	03-May-05	38
05-Feb-02	37.0	01-Jul-02	27	25-Jul-03	36	12-Aug-04	37	04-May-05	38
06-Feb-02	36.0	02-Jul-02	26.5	28-Jul-03	36	13-Aug-04	38	05-May-05	38
07-Feb-02	37.0	03-Jul-02	26.5	29-Jul-03	36	16-Aug-04	38	06-May-05	38
08-Feb-02	38.0	04-Jul-02	26.5	30-Jul-03	36	17-Aug-04	38	09-May-05	38
11-Feb-02	38.0	05-Jul-02	26.5	31-Jul-03	36	18-Aug-04	38	10-May-05	38
12-Feb-02	37.5	08-Jul-02	26	01-Aug-03	36	19-Aug-04	38	11-May-05	38
13-Feb-02	37.0	09-Jul-02	26	04-Aug-03	36	20-Aug-04	38	12-May-05	38
14-Feb-02	37.0	10-Jul-02	22	05-Aug-03	37	23-Aug-04	39	13-May-05	38
15-Feb-02	35.0	11-Jul-02	26	06-Aug-03	37	24-Aug-04	39	16-May-05	38
18-Feb-02	34.0	12-Jul-02	26	07-Aug-03	37	25-Aug-04	39	17-May-05	38
19-Feb-02	33.0	15-Jul-02	25	08-Aug-03	37	26-Aug-04	39	18-May-05	38
20-Feb-02	32.0	16-Jul-02	25	11-Aug-03	37	27-Aug-04	40	19-May-05	38
21-Feb-02	32.5	17-Jul-02	26	12-Aug-03	37	30-Aug-04	40	20-May-05	38
22-Feb-02	32.5	18-Jul-02	26.5	13-Aug-03	37	31-Aug-04	42	23-May-05	38
25-Feb-02	32.8	19-Jul-02	26	14-Aug-03	37	01-Sep-04	41	24-May-05	38
26-Feb-02	32.0	22-Jul-02	26	15-Aug-03	36	02-Sep-04	41	25-May-05	38
27-Feb-02	31.5	23-Jul-02	26.5	18-Aug-03	36	03-Sep-04	41	26-May-05	38
28-Feb-02	33.5	24-Jul-02	27	19-Aug-03	36	06-Sep-04	41	27-May-05	38
01-Mar-02	32.0	25-Jul-02	27.5	20-Aug-03	36	07-Sep-04	41	30-May-05	38
04-Mar-02	33.0	26-Jul-02	27.5	21-Aug-03	36	08-Sep-04	41	31-May-05	38
05-Mar-02	34.5	29-Jul-02	27.5	22-Aug-03	36	09-Sep-04	41	01-Jun-05	38
06-Mar-02	35.5	30-Jul-02	27.5	25-Aug-03	36	10-Sep-04	40	02-Jun-05	38
07-Mar-02	36.0	31-Jul-02	27.5	26-Aug-03	36	13-Sep-04	39	03-Jun-05	38
08-Mar-02	36.0	01-Aug-02	27.5	27-Aug-03	37	14-Sep-04	39	06-Jun-05	38
11-Mar-02	36.5	02-Aug-02	27.5	28-Aug-03	37	15-Sep-04	40	07-Jun-05	38
12-Mar-02	35.5	05-Aug-02	28	29-Aug-03	37	16-Sep-04	41	08-Jun-05	38
13-Mar-02	36.0	06-Aug-02	28	01-Sep-03	37	17-Sep-04	41	09-Jun-05	38
14-Mar-02	37.0	07-Aug-02	27	02-Sep-03	37	20-Sep-04	41	10-Jun-05	37
15-Mar-02	37.0	08-Aug-02	27	03-Sep-03	37	21-Sep-04	41	13-Jun-05	37
18-Mar-02	37.0	12-Aug-02	27	04-Sep-03	37	22-Sep-04	41	14-Jun-05	37
19-Mar-02	37.0	13-Aug-02	27	05-Sep-03	38	23-Sep-04	42	15-Jun-05	37
20-Mar-02	37.0	14-Aug-02	26	08-Sep-03	38	27-Sep-04	42	17-Jun-05	37
22-Mar-02	37.0	15-Aug-02	25	09-Sep-03	38	28-Sep-04	42	20-Jun-05	37
25-Mar-02	37.5	16-Aug-02	24	10-Sep-03	38	29-Sep-04	42	21-Jun-05	37

DATE	2002 Volatility	DATE	2003 Volatility	DATE	2004 Volatility	DATE	2005 Volatility	DATE	2006 Volatility
26-Mar-02	38.0	19-Aug-02	25	11-Sep-03	38	30-Sep-04	42	22-Jun-05	37
27-Mar-02	38.5	20-Aug-02	25	12-Sep-03	38	01-Oct-04	42	23-Jun-05	37
28-Mar-02	39.0	21-Aug-02	24	15-Sep-03	38	04-Oct-04	41	24-Jun-05	37
02-Apr-02	39.0	22-Aug-02	24.5	16-Sep-03	38	05-Oct-04	41	27-Jun-05	37
03-Apr-02	39.0	23-Aug-02	24.5	17-Sep-03	38	06-Oct-04	41	28-Jun-05	37
04-Apr-02	39.0	26-Aug-02	24.5	18-Sep-03	38	07-Oct-04	41	29-Jun-05	37
05-Apr-02	38.0	27-Aug-02	25	19-Sep-03	38	08-Oct-04	41	30-Jun-05	37
08-Apr-02	37.0	28-Aug-02	25	22-Sep-03	38	11-Oct-04	42	01-Jul-05	37
09-Apr-02	36.0	29-Aug-02	25	23-Sep-03	38	12-Oct-04	43	04-Jul-05	37
10-Apr-02	35.0	30-Aug-02	25	25-Sep-03	37	13-Oct-04	42	05-Jul-05	37
11-Apr-02	33.5	02-Sep-02	25	26-Sep-03	36	14-Oct-04	43	06-Jul-05	35
12-Apr-02	33.0	03-Sep-02	26.5	29-Sep-03	36	15-Oct-04	42	07-Jul-05	35
15-Apr-02	33.0	04-Sep-02	25.5	30-Sep-03	36	18-Oct-04	42	08-Jul-05	35
16-Apr-02	31.0	05-Sep-02	25	01-Oct-03	36	19-Oct-04	41	11-Jul-05	35
17-Apr-02	29.0	06-Sep-02	25.5	02-Oct-03	37	20-Oct-04	41	12-Jul-05	35
18-Apr-02	29.0	09-Sep-02	25.5	03-Oct-03	37	21-Oct-04	41	13-Jul-05	35
19-Apr-02	30.0	10-Sep-02	25.5	06-Oct-03	37	22-Oct-04	41	14-Jul-05	33
22-Apr-02	30.5	11-Sep-02	26.5	07-Oct-03	38	25-Oct-04	42.5	15-Jul-05	33
23-Apr-02	29.0	12-Sep-02	26.5	08-Oct-03	38	26-Oct-04	43	18-Jul-05	33
24-Apr-02	28.0	13-Sep-02	27	09-Oct-03	38	27-Oct-04	43	19-Jul-05	33
25-Apr-02	27.0	16-Sep-02	27.5	10-Oct-03	39	28-Oct-04	43	20-Jul-05	33
26-Apr-02	26.0	17-Sep-02	27.5	13-Oct-03	39	29-Oct-04	44.5	21-Jul-05	33
29-Apr-02	26.0	18-Sep-02	27.5	14-Oct-03	38	01-Nov-04	44.5	22-Jul-05	33
30-Apr-02	27.0	19-Sep-02	28	15-Oct-03	36	02-Nov-04	44	25-Jul-05	33
02-May-02	27	20-Sep-02	28.5	16-Oct-03	37	03-Nov-04	45	26-Jul-05	33
03-May-02	26	23-Sep-02	28	17-Oct-03	38	04-Nov-04	46	27-Jul-05	33
06-May-02	26.5	25-Sep-02	28	20-Oct-03	39	05-Nov-04	46	28-Jul-05	33
07-May-02	26.5	26-Sep-02	28	21-Oct-03	38	08-Nov-04	46	29-Jul-05	33
08-May-02	28.5	27-Sep-02	28	22-Oct-03	38	09-Nov-04	47	01-Aug-05	33
09-May-02	27.5	30-Sep-02	28	23-Oct-03	38	10-Nov-04	47	02-Aug-05	33
10-May-02	27.5	01-Oct-02	28.5	24-Oct-03	39	11-Nov-04	46	03-Aug-05	33
13-May-02	26	02-Oct-02	28.5	27-Oct-03	40	12-Nov-04	46	04-Aug-05	33
14-May-02	25	03-Oct-02	28.5	28-Oct-03	40	15-Nov-04	49	05-Aug-05	33
15-May-02	23.5	04-Oct-02	28.5	29-Oct-03	40	16-Nov-04	48	08-Aug-05	33
16-May-02	23.5	07-Oct-02	28.5	30-Oct-03	39	17-Nov-04	47	10-Aug-05	33
17-May-02	24.5	08-Oct-02	28	31-Oct-03	40	18-Nov-04	47.5	11-Aug-05	33
20-May-02	24.5	09-Oct-02	27.5	03-Nov-03	40	19-Nov-04	48	12-Aug-05	33
21-May-02	25	10-Oct-02	26	04-Nov-03	41	22-Nov-04	49	15-Aug-05	33
22-May-02	22.5	11-Oct-02	27	05-Nov-03	41	23-Nov-04	49	16-Aug-05	33
23-May-02	22.5	14-Oct-02	27.5	06-Nov-03	42	24-Nov-04	49	17-Aug-05	33
24-May-02	22	15-Oct-02	28	07-Nov-03	42	25-Nov-04	49	18-Aug-05	33
27-May-02	23	16-Oct-02	28	10-Nov-03	42	26-Nov-04	49	19-Aug-05	33
28-May-02	23	17-Oct-02	28	11-Nov-03	42	29-Nov-04	51	22-Aug-05	33
29-May-02	22	18-Oct-02	28	12-Nov-03	42	30-Nov-04	54	23-Aug-05	33
30-May-02	23	21-Oct-02	28	13-Nov-03	41	01-Dec-04	52	24-Aug-05	33
31-May-02	23.5	22-Oct-02	28.5	14-Nov-03	42	02-Dec-04	51	25-Aug-05	33
03-Jun-02	24	23-Oct-02	28.5	17-Nov-03	41	03-Dec-04	49	26-Aug-05	36
04-Jun-02	28	24-Oct-02	30	18-Nov-03	41	06-Dec-04	50	29-Aug-05	36
05-Jun-02	27.5	25-Oct-02	31	19-Nov-03	41	07-Dec-04	50	30-Aug-05	36
06-Jun-02	26	28-Oct-02	32	20-Nov-03	41	08-Dec-04	51	31-Aug-05	38
07-Jun-02	23	29-Oct-02	32.5	21-Nov-03	41	09-Dec-04	52	01-Sep-05	40
10-Jun-02	23	30-Oct-02	33	24-Nov-03	41	10-Dec-04	53	02-Sep-05	41
11-Jun-02	22	31-Oct-02	32.25	25-Nov-03	39	13-Dec-04	54	05-Sep-05	43
12-Jun-02	22.5	01-Nov-02	32	26-Nov-03	39	14-Dec-04	53	06-Sep-05	44
13-Jun-02	20.5	04-Nov-02	31.5	27-Nov-03	37	15-Dec-04	50.5	07-Sep-05	47
14-Jun-02	19.5	05-Nov-02	32	28-Nov-03	36	17-Dec-04	48.5	08-Sep-05	48
18-Jun-02	24	06-Nov-02	32	01-Dec-03	37	20-Dec-04	49	09-Sep-05	48
19-Jun-02	25.5	07-Nov-02	32	02-Dec-03	38	21-Dec-04	50	12-Sep-05	49
20-Jun-02	26	08-Nov-02	32.5	03-Dec-03	38	22-Dec-04	50	13-Sep-05	47.5
21-Jun-02	26	11-Nov-02	32	04-Dec-03	38	23-Dec-04	51.5	14-Sep-05	49
24-Jun-02	26	12-Nov-02	32	05-Dec-03	39	24-Dec-04	51.5	15-Sep-05	49
25-Jun-02		13-Nov-02	32	08-Dec-03	41	28-Dec-04	51	16-Sep-05	49
26-Jun-02		14-Nov-02	31.5	09-Dec-03	42	29-Dec-04	50	19-Sep-05	49

DATE	2002 Volatility	DATE	2003 Volatility	DATE	2004 Volatility	DATE	2005 Volatility	DATE	2006 Volatility
27-Jun-02		15-Nov-02	31	10-Dec-03	42	30-Dec-04	52	20-Sep-05	50
28-Jun-02		18-Nov-02	32	11-Dec-03	42	31-Dec-04	52	21-Sep-05	50
01-Jul-02		19-Nov-02	31	12-Dec-03	43	03-Jan-05	54	22-Sep-05	50
02-Jul-02		20-Nov-02	31	15-Dec-03	47	04-Jan-05	54	23-Sep-05	50
03-Jul-02		21-Nov-02	30.5	17-Dec-03	47	05-Jan-05	53	26-Sep-05	50
04-Jul-02		22-Nov-02	31	18-Dec-03	48	06-Jan-05	53	27-Sep-05	50
05-Jul-02		25-Nov-02	31.5	19-Dec-03	50	07-Jan-05	53	28-Sep-05	50
08-Jul-02		26-Nov-02	31	22-Dec-03	50	10-Jan-05	55	29-Sep-05	50
09-Jul-02		27-Nov-02	31	23-Dec-03	50	11-Jan-05	53	30-Sep-05	50
10-Jul-02		28-Nov-02	31	24-Dec-03	54	12-Jan-05	51	03-Oct-05	50
11-Jul-02		29-Nov-02	28	29-Dec-03	54.5	13-Jan-05	50	04-Oct-05	50
12-Jul-02		02-Dec-02	29	30-Dec-03	53	14-Jan-05	51	05-Oct-05	50
15-Jul-02		03-Dec-02	29.5	31-Dec-03	52	17-Jan-05	49	06-Oct-05	49
16-Jul-02		04-Dec-02	29.5	02-Jan-04	51	18-Jan-05	48	07-Oct-05	49
17-Jul-02		05-Dec-02	30.5	05-Jan-04	50	19-Jan-05	47	10-Oct-05	49
18-Jul-02		06-Dec-02	34	06-Jan-04	47	20-Jan-05	47.5	11-Oct-05	48
19-Jul-02		09-Dec-02	36	07-Jan-04	47	21-Jan-05	46.5	12-Oct-05	47
22-Jul-02		10-Dec-02	34	08-Jan-04	49	24-Jan-05	45	13-Oct-05	47
23-Jul-02		11-Dec-02	32	09-Jan-04	53	25-Jan-05	44	14-Oct-05	47
24-Jul-02		12-Dec-02	32	12-Jan-04	51	26-Jan-05	45	17-Oct-05	47
25-Jul-02		13-Dec-02	32	13-Jan-04	54	27-Jan-05	47	18-Oct-05	47
26-Jul-02		17-Dec-02	31	14-Jan-04	60	28-Jan-05	48.5	19-Oct-05	47
29-Jul-02		18-Dec-02	31	15-Jan-04	55	31-Jan-05	48	20-Oct-05	48
30-Jul-02		19-Dec-02	30	16-Jan-04	54	01-Feb-05	48.5	21-Oct-05	48
31-Jul-02		20-Dec-02	31	19-Jan-04	52	02-Feb-05	48.5	24-Oct-05	48
01-Aug-02		23-Dec-02	30.5	20-Jan-04	53	03-Feb-05	47.5	25-Oct-05	48
02-Aug-02		24-Dec-02	31	21-Jan-04	51	04-Feb-05	47.5	26-Oct-05	48
05-Aug-02		27-Dec-02	30	22-Jan-04	49	07-Feb-05	46.5	27-Oct-05	48
06-Aug-02		30-Dec-02	29	23-Jan-04	47	08-Feb-05	49	28-Oct-05	48
07-Aug-02		31-Dec-02	29	26-Jan-04	48	09-Feb-05	50	31-Oct-05	48
08-Aug-02		03-Jan-03	28.5	27-Jan-04	46	10-Feb-05	50	01-Nov-05	48
12-Aug-02		06-Jan-03	29.5	28-Jan-04	44	11-Feb-05	48	02-Nov-05	48.5
13-Aug-02		07-Jan-03	27.5	29-Jan-04	45	14-Feb-05	47	03-Nov-05	48.5
14-Aug-02		08-Jan-03	26	30-Jan-04	45	15-Feb-05	45	04-Nov-05	48.5
15-Aug-02		09-Jan-03	26.5	02-Feb-04	46	16-Feb-05	44	07-Nov-05	48.5
16-Aug-02		10-Jan-03	26.5	03-Feb-04	44	17-Feb-05	44	08-Nov-05	47
19-Aug-02		13-Jan-03	28	04-Feb-04	46	18-Feb-05	44	09-Nov-05	47
20-Aug-02		14-Jan-03	28	05-Feb-04	46	21-Feb-05	43	10-Nov-05	44
21-Aug-02		15-Jan-03	27.5	06-Feb-04	47	22-Feb-05	41	11-Nov-05	44
22-Aug-02		16-Jan-03	27	09-Feb-04	48.5	23-Feb-05	39	14-Nov-05	44
23-Aug-02		17-Jan-03	27	10-Feb-04	46	24-Feb-05	37	15-Nov-05	44.5
26-Aug-02		20-Jan-03	27	11-Feb-04	45.5	25-Feb-05	35	16-Nov-05	46
27-Aug-02		21-Jan-03	28.5	12-Feb-04	47	28-Feb-05	36	17-Nov-05	46
28-Aug-02		22-Jan-03	29.75	13-Feb-04	47.5	01-Mar-05	35	18-Nov-05	46.5
29-Aug-02		23-Jan-03	28.75	16-Feb-04	48	02-Mar-05	34	21-Nov-05	46.5
30-Aug-02		24-Jan-03	35	17-Feb-04	46	03-Mar-05	36	22-Nov-05	52
02-Sep-02		27-Jan-03	40	18-Feb-04	46	04-Mar-05	37.5	23-Nov-05	50
03-Sep-02		28-Jan-03	39.5	19-Feb-04	45	07-Mar-05	36.5	24-Nov-05	50
04-Sep-02		29-Jan-03	35.5	20-Feb-04	43	08-Mar-05	36.5	25-Nov-05	50
05-Sep-02		30-Jan-03	34	23-Feb-04	43	09-Mar-05	37.5	28-Nov-05	50
06-Sep-02		31-Jan-03	34	24-Feb-04	45	10-Mar-05	39.5	29-Nov-05	50
09-Sep-02		03-Feb-03	35	25-Feb-04	45	11-Mar-05	41.5	30-Nov-05	50
10-Sep-02		04-Feb-03	39	26-Feb-04	43	14-Mar-05	43	01-Dec-05	49.5
11-Sep-02		05-Feb-03	39	27-Feb-04	42	15-Mar-05	43	02-Dec-05	49.5
12-Sep-02		06-Feb-03	39	01-Mar-04	41	16-Mar-05	43	05-Dec-05	49.5
13-Sep-02		07-Feb-03	39	02-Mar-04	39	17-Mar-05	42	06-Dec-05	49.5
16-Sep-02		10-Feb-03	42	03-Mar-04	40	18-Mar-05	40	07-Dec-05	49.5
17-Sep-02		11-Feb-03	43.5	04-Mar-04	41	22-Mar-05	40	08-Dec-05	48.5
18-Sep-02		12-Feb-03	43	05-Mar-04	42	23-Mar-05	41	09-Dec-05	45.5
19-Sep-02		13-Feb-03	44	08-Mar-04	45	24-Mar-05	39.5	12-Dec-05	47
20-Sep-02		14-Feb-03	51	09-Mar-04	45	29-Mar-05	38.5	13-Dec-05	45
23-Sep-02		17-Feb-03	45	10-Mar-04	44	30-Mar-05	38	14-Dec-05	45
25-Sep-02		18-Feb-03	42	11-Mar-04	45	31-Mar-05	39	15-Dec-05	45

DATE	2002 Volatility	DATE	2003 Volatility	DATE	2004 Volatility	DATE	2005 Volatility	DATE	2006 Volatility
26-Sep-02		19-Feb-03	37	12-Mar-04	45	01-Apr-05	39	19-Dec-05	47
27-Sep-02		20-Feb-03	39	15-Mar-04	43	04-Apr-05	39	20-Dec-05	47
30-Sep-02		21-Feb-03	38	16-Mar-04	44	05-Apr-05	40	21-Dec-05	47
01-Oct-02		24-Feb-03	37	17-Mar-04	44	06-Apr-05	39	22-Dec-05	47
02-Oct-02		25-Feb-03	36	18-Mar-04	44	07-Apr-05	39	23-Dec-05	48
03-Oct-02		26-Feb-03	39	19-Mar-04	44	08-Apr-05	38	27-Dec-05	49
04-Oct-02		27-Feb-03	39	23-Mar-04	48	11-Apr-05	37	28-Dec-05	51
07-Oct-02		28-Feb-03	39	24-Mar-04	46	12-Apr-05	37	29-Dec-05	53
08-Oct-02		03-Mar-03	38	25-Mar-04	44	13-Apr-05	38	30-Dec-05	53
09-Oct-02		04-Mar-03	36	26-Mar-04	43	14-Apr-05	39	03-Jan-06	56
10-Oct-02		05-Mar-03	37	29-Mar-04	42	15-Apr-05	39	04-Jan-06	56
11-Oct-02		06-Mar-03	36	30-Mar-04	41	18-Apr-05	39	05-Jan-06	55
14-Oct-02		07-Mar-03	39	31-Mar-04	40	19-Apr-05	38	06-Jan-06	54
15-Oct-02		10-Mar-03	43	01-Apr-04	41	20-Apr-05	40	09-Jan-06	50
16-Oct-02		11-Mar-03	44	02-Apr-04	42	21-Apr-05	39	10-Jan-06	47.5
17-Oct-02		12-Mar-03	46	05-Apr-04	42	22-Apr-05	38	11-Jan-06	44.5
18-Oct-02		13-Mar-03	44	06-Apr-04	42	25-Apr-05	37	12-Jan-06	44
21-Oct-02		14-Mar-03	43	07-Apr-04	41	26-Apr-05	36	13-Jan-06	45
22-Oct-02		17-Mar-03	43	08-Apr-04	41	28-Apr-05	35	16-Jan-06	45
23-Oct-02		18-Mar-03	42	13-Apr-04	41	29-Apr-05	35	17-Jan-06	45
24-Oct-02		19-Mar-03	41	15-Apr-04	41	03-May-05	35	18-Jan-06	43
25-Oct-02		20-Mar-03	47	16-Apr-04	40	04-May-05	35.5	19-Jan-06	42
28-Oct-02		24-Mar-03	45	19-Apr-04	39	05-May-05	34	20-Jan-06	40
29-Oct-02		25-Mar-03	45	20-Apr-04	38	06-May-05	33	23-Jan-06	39
30-Oct-02		26-Mar-03	43	21-Apr-04	39	09-May-05	33	24-Jan-06	37.5
31-Oct-02		27-Mar-03	43	22-Apr-04	39	10-May-05	34	25-Jan-06	37
01-Nov-02		28-Mar-03	40	23-Apr-04	37	11-May-05	34	26-Jan-06	37
04-Nov-02		31-Mar-03	37	26-Apr-04	36	12-May-05	35	27-Jan-06	36.5
05-Nov-02		01-Apr-03	35	28-Apr-04	38	13-May-05	35	30-Jan-06	37.5
06-Nov-02		02-Apr-03	35	29-Apr-04	36	16-May-05	35	31-Jan-06	38.5
07-Nov-02		03-Apr-03	34	30-Apr-04	35	17-May-05	35	01-Feb-06	39
08-Nov-02		04-Apr-03	33	03-May-04	34	18-May-05	35	02-Feb-06	40
11-Nov-02		07-Apr-03	37	04-May-04	33	19-May-05	36	03-Feb-06	40.5
12-Nov-02		08-Apr-03	38	05-May-04	33	20-May-05	36	06-Feb-06	40.5
13-Nov-02		09-Apr-03	38	06-May-04	32	23-May-05	36	07-Feb-06	41
14-Nov-02		10-Apr-03	38	07-May-04	34	24-May-05	36	08-Feb-06	41
15-Nov-02		11-Apr-03	37	10-May-04	34	25-May-05	36	09-Feb-06	41.5
18-Nov-02		14-Apr-03	37	11-May-04	33	26-May-05	36	10-Feb-06	40.5
19-Nov-02		15-Apr-03	36	12-May-04	33	27-May-05	37	13-Feb-06	38.5
20-Nov-02		16-Apr-03	35	13-May-04	32	30-May-05	38	14-Feb-06	37
21-Nov-02		17-Apr-03	35	14-May-04	32	31-May-05	39	15-Feb-06	35.5
22-Nov-02		22-Apr-03	33	17-May-04	33	01-Jun-05	39	16-Feb-06	35.5
25-Nov-02		23-Apr-03	33	18-May-04	33	02-Jun-05	41	17-Feb-06	36
26-Nov-02		24-Apr-03	32	19-May-04	32	03-Jun-05	42	20-Feb-06	35.5
27-Nov-02		25-Apr-03	31	20-May-04	32	06-Jun-05	42	21-Feb-06	35.5
28-Nov-02		29-Apr-03	31	21-May-04	32	07-Jun-05	42	22-Feb-06	36.5
29-Nov-02		30-Apr-03	31	24-May-04	30	08-Jun-05	42	23-Feb-06	35.5
02-Dec-02		02-May-03	33	25-May-04	30	09-Jun-05	42	24-Feb-06	35.5
03-Dec-02		05-May-03	35	26-May-04	28	10-Jun-05	41	27-Feb-06	37.5
04-Dec-02		06-May-03	36	27-May-04	26	13-Jun-05	40	28-Feb-06	37.5
05-Dec-02		07-May-03	36	28-May-04	26	14-Jun-05	39	02-Mar-06	37.5
06-Dec-02		08-May-03	37	31-May-04	28	15-Jun-05	40	03-Mar-06	36.5
09-Dec-02		09-May-03	36	01-Jun-04	29.5	17-Jun-05	39	06-Mar-06	36
10-Dec-02		12-May-03	38	02-Jun-04	31	20-Jun-05	39	07-Mar-06	35
11-Dec-02		13-May-03	38	03-Jun-04	30	21-Jun-05	39	08-Mar-06	35
12-Dec-02		14-May-03	40	04-Jun-04	30	22-Jun-05	39	09-Mar-06	34.5
13-Dec-02		15-May-03	44	07-Jun-04	30	23-Jun-05	39	10-Mar-06	33.5
17-Dec-02		16-May-03	47	08-Jun-04	28			13-Mar-06	33.5
18-Dec-02		19-May-03	49	09-Jun-04	26			14-Mar-06	33
19-Dec-02		20-May-03	49	10-Jun-04	25			15-Mar-06	32
20-Dec-02		21-May-03	49	11-Jun-04	28			16-Mar-06	30
23-Dec-02		22-May-03	49	14-Jun-04	30			17-Mar-06	30
24-Dec-02		23-May-03	49	15-Jun-04	33			20-Mar-06	29.5

DATE	2002 Volatility	DATE	2003 Volatility	DATE	2004 Volatility	DATE	2005 Volatility	DATE	2006 Volatility
27-Dec-02		26-May-03	48	17-Jun-04	37			22-Mar-06	30.5
30-Dec-02		27-May-03	46	18-Jun-04	39			23-Mar-06	31
31-Dec-02		28-May-03	47	21-Jun-04	41			24-Mar-06	30
03-Jan-03		29-May-03	46	22-Jun-04	45			27-Mar-06	28
06-Jan-03		30-May-03	49	23-Jun-04	45			28-Mar-06	27
07-Jan-03		02-Jun-03	45					29-Mar-06	28
08-Jan-03		03-Jun-03	45					30-Mar-06	29
09-Jan-03		04-Jun-03	47					31-Mar-06	29
10-Jan-03		05-Jun-03	47					03-Apr-06	29
13-Jan-03		06-Jun-03	50					04-Apr-06	28.5
14-Jan-03		09-Jun-03	47					05-Apr-06	26.5
15-Jan-03		10-Jun-03	45					06-Apr-06	26
16-Jan-03		11-Jun-03	45					07-Apr-06	24.5
17-Jan-03		12-Jun-03	45					10-Apr-06	24
20-Jan-03		13-Jun-03	43					11-Apr-06	24
21-Jan-03		17-Jun-03	47					12-Apr-06	24
22-Jan-03		18-Jun-03	47					13-Apr-06	24
23-Jan-03		19-Jun-03	49					18-Apr-06	25
24-Jan-03		20-Jun-03	46					19-Apr-06	25.5
27-Jan-03		23-Jun-03	46					20-Apr-06	26.5
28-Jan-03		24-Jun-03	46					21-Apr-06	26
29-Jan-03								24-Apr-06	26
30-Jan-03								25-Apr-06	26
31-Jan-03								26-Apr-06	25
03-Feb-03								28-Apr-06	25
04-Feb-03								02-May-06	24
05-Feb-03								03-May-06	24
06-Feb-03								04-May-06	24
07-Feb-03								05-May-06	24
10-Feb-03								08-May-06	24
11-Feb-03								09-May-06	23
12-Feb-03								10-May-06	23.5
13-Feb-03								11-May-06	23
14-Feb-03								12-May-06	24
17-Feb-03								15-May-06	27.5
18-Feb-03								16-May-06	25
19-Feb-03								17-May-06	24.5
20-Feb-03								18-May-06	24.5
21-Feb-03								19-May-06	25
24-Feb-03								22-May-06	25.5
25-Feb-03								23-May-06	25.5
26-Feb-03								24-May-06	24.5
27-Feb-03								25-May-06	25
28-Feb-03								26-May-06	25
03-Mar-03								29-May-06	23
04-Mar-03								30-May-06	22
05-Mar-03								31-May-06	22
06-Mar-03								01-Jun-06	21
07-Mar-03								02-Jun-06	21
10-Mar-03								05-Jun-06	22
11-Mar-03								06-Jun-06	24.5
12-Mar-03								07-Jun-06	23
13-Mar-03								08-Jun-06	22.5
14-Mar-03								09-Jun-06	20.5
17-Mar-03								12-Jun-06	24
18-Mar-03								13-Jun-06	25.5
19-Mar-03								14-Jun-06	26.5
20-Mar-03								15-Jun-06	23.5
24-Mar-03								19-Jun-06	25.5
25-Mar-03								20-Jun-06	27
26-Mar-03								21-Jun-06	28.5
27-Mar-03								22-Jun-06	28.5
28-Mar-03								23-Jun-06	29

APPENDIX III
MOMENTUM STRATEGY 2001 – 2006
2001

DATE	JULY WHITE MAIZE PRICE	CONTRACTS TRADED	TONNAGES TRADED	PRICE x TONNAGES
05 May 2000	R 670			
08 May 2000	R 670	1	100	R 670
09 May 2000	R 665	0	0	R 0
10 May 2000	R 665	2	200	R 1,330
11 May 2000	R 665	1	100	R 665
12 May 2000	R 670	1	100	R 670
15 May 2000	R 690	1	100	R 690
16 May 2000	R 690	1	100	R 690
17 May 2000	R 690	1	100	R 690
18 May 2000	R 690	1	100	R 690
19 May 2000	R 690	1	100	R 690
22 May 2000	R 690	1	100	R 690
23 May 2000	R 690	1	100	R 690
24 May 2000	R 690	1	100	R 690
25 May 2000	R 690	1	100	R 690
26 May 2000	R 690	1	100	R 690
29 May 2000	R 690	1	100	R 690
30 May 2000	R 685	0	0	R 0
31 May 2000	R 685	2	200	R 1,370
01 June 2000	R 686	1	100	R 686
02 June 2000	R 686	1	100	R 686
05 June 2000	R 686	1	100	R 686
06 June 2000	R 690	1	100	R 690
07 June 2000	R 690	1	100	R 690
08 June 2000	R 690	1	100	R 690
09 June 2000	R 700	1	100	R 700
12 June 2000	R 700	1	100	R 700
13 June 2000	R 685	0	0	R 0
14 June 2000	R 685	2	200	R 1,370
15 June 2000	R 682	0	0	R 0
19 June 2000	R 682	2	200	R 1,364
20 June 2000	R 682	1	100	R 682
21 June 2000	R 675	0	0	R 0
22 June 2000	R 675	2	200	R 1,350
23 June 2000	R 672	0	0	R 0
26 June 2000	R 655	0	0	R 0
27 June 2000	R 660	3	300	R 1,980
28 June 2000	R 657	0	0	R 0
29 June 2000	R 650	0	0	R 0
30 June 2000	R 648	0	0	R 0
03 July 2000	R 638	0	0	R 0
04 July 2000	R 636	0	0	R 0
05 July 2000	R 633	0	0	R 0
06 July 2000	R 630	0	0	R 0

DATE	JULY WHITE MAIZE PRICE	CONTRACTS TRADED	TONNAGES TRADED	PRICE x TONNAGES
07 July 2000	R 630	8	800	R 5,040
10 July 2000	R 624	0	0	R 0
11 July 2000	R 625	2	200	R 1,250
12 July 2000	R 617	0	0	R 0
13 July 2000	R 620	2	200	R 1,240
14 July 2000	R 624	1	100	R 624
17 July 2000	R 625	1	100	R 625
18 July 2000	R 630	1	100	R 630
19 July 2000	R 622	0	0	R 0
20 July 2000	R 619	0	0	R 0
21 July 2000	R 625	3	300	R 1,875
24 July 2000	R 625	1	100	R 625
25 July 2000	R 625	1	100	R 625
26 July 2000	R 625	1	100	R 625
27 July 2000	R 628	1	100	R 628
28 July 2000	R 630	1	100	R 630
31 July 2000	R 626	0	0	R 0
01 August 2000	R 627	2	200	R 1,254
02 August 2000	R 632	1	100	R 632
03 August 2000	R 629	0	0	R 0
04 August 2000	R 629	2	200	R 1,258
07 August 2000	R 624	0	0	R 0
08 August 2000	R 624	2	200	R 1,248
10 August 2000	R 612	0	0	R 0
11 August 2000	R 599	0	0	R 0
14 August 2000	R 599	3	300	R 1,797
15 August 2000	R 602	1	100	R 602
16 August 2000	R 608	1	100	R 608
17 August 2000	R 600	0	0	R 0
18 August 2000	R 604	2	200	R 1,208
21 August 2000	R 599	0	0	R 0
22 August 2000	R 604	2	200	R 1,208
23 August 2000	R 603	0	0	R 0
24 August 2000	R 603	2	200	R 1,206
25 August 2000	R 603	1	100	R 603
28 August 2000	R 601	0	0	R 0
29 August 2000	R 605	2	200	R 1,210
30 August 2000	R 618	1	100	R 618
31 August 2000	R 620	1	100	R 620
01 September 2000	R 619	0	0	R 0
04 September 2000	R 612	0	0	R 0
05 September 2000	R 617	3	300	R 1,851
06 September 2000	R 625	1	100	R 625
07 September 2000	R 626	1	100	R 626
08 September 2000	R 620	0	0	R 0
11 September 2000	R 625	2	200	R 1,250
12 September 2000	R 629	1	100	R 629
13 September 2000	R 626	0	0	R 0
14 September 2000	R 624	0	0	R 0

DATE	JULY WHITE MAIZE PRICE	CONTRACTS TRADED	TONNAGES TRADED	PRICE x TONNAGES
15 September 2000	R 622	0	0	R 0
18 September 2000	R 627	4	400	R 2,508
19 September 2000	R 632	1	100	R 632
20 September 2000	R 625	0	0	R 0
21 September 2000	R 629	2	200	R 1,258
22 September 2000	R 627	0	0	R 0
26 September 2000	R 626	0	0	R 0
27 September 2000	R 626	3	300	R 1,878
28 September 2000	R 628	1	100	R 628
29 September 2000	R 632	1	100	R 632
02 October 2000	R 635	1	100	R 635
03 October 2000	R 643	1	100	R 643
04 October 2000	R 665	1	100	R 665
05 October 2000	R 668	1	100	R 668
06 October 2000	R 659	0	0	R 0
09 October 2000	R 657	0	0	R 0
10 October 2000	R 655	0	0	R 0
11 October 2000	R 655	4	400	R 2,620
12 October 2000	R 662	1	100	R 662
13 October 2000	R 682	1	100	R 682
16 October 2000	R 679	0	0	R 0
17 October 2000	R 686	2	200	R 1,372
18 October 2000	R 694	1	100	R 694
19 October 2000	R 697	1	100	R 697
20 October 2000	R 688	0	0	R 0
23 October 2000	R 676	0	0	R 0
24 October 2000	R 672	0	0	R 0
25 October 2000	R 682	4	400	R 2,728
26 October 2000	R 690	1	100	R 690
27 October 2000	R 682	0	0	R 0
30 October 2000	R 693	2	200	R 1,386
31 October 2000	R 695	1	100	R 695
01 November 2000	R 694	0	0	R 0
02 November 2000	R 703	2	200	R 1,406
03 November 2000	R 712	1	100	R 712
06 November 2000	R 706	0	0	R 0
07 November 2000	R 710	2	200	R 1,420
08 November 2000	R 725	1	100	R 725
09 November 2000	R 732	1	100	R 732
10 November 2000	R 714	0	0	R 0
13 November 2000	R 695	0	0	R 0
14 November 2000	R 693	0	0	R 0
15 November 2000	R 705	4	400	R 2,820
16 November 2000	R 720	1	100	R 720
17 November 2000	R 722	1	100	R 722
20 November 2000	R 729	1	100	R 729
21 November 2000	R 738	1	100	R 738
22 November 2000	R 741	1	100	R 741
23 November 2000	R 739	0	0	R 0

DATE	JULY WHITE MAIZE PRICE	CONTRACTS TRADED	TOHHAGES TRADED	PRICE x TOHHAGES
24 November 2000	R 744	2	200	R 1,488
27 November 2000	R 744	1	100	R 744
28 November 2000	R 740	0	0	R 0
29 November 2000	R 736	0	0	R 0
30 November 2000	R 706	0	0	R 0
01 December 2000	R 709	4	400	R 2,836
04 December 2000	R 704	0	0	R 0
06 December 2000	R 699	0	0	R 0
07 December 2000	R 685	0	0	R 0
08 December 2000	R 699	4	400	R 2,796
11 December 2000	R 716	1	100	R 716
12 December 2000	R 712	0	0	R 0
13 December 2000	R 715	2	200	R 1,430
14 December 2000	R 705	0	0	R 0
15 December 2000	R 715	2	200	R 1,430
18 December 2000	R 720	1	100	R 720
19 December 2000	R 733	1	100	R 733
20 December 2000	R 732	0	0	R 0
21 December 2000	R 726	0	0	R 0
22 December 2000	R 732	3	300	R 2,196
27 December 2000	R 729	0	0	R 0
28 December 2000	R 736	2	200	R 1,472
29 December 2000	R 739	1	100	R 739
02 January 2001	R 757	1	100	R 757
03 January 2001	R 756	0	0	R 0
04 January 2001	R 779	2	200	R 1,558
05 January 2001	R 800	1	100	R 800
08 January 2001	R 830	1	100	R 830
09 January 2001	R 831	1	100	R 831
10 January 2001	R 851	1	100	R 851
11 January 2001	R 853	1	100	R 853
12 January 2001	R 839	0	0	R 0
15 January 2001	R 847	2	200	R 1,694
16 January 2001	R 862	1	100	R 862
17 January 2001	R 872	1	100	R 872
18 January 2001	R 861	0	0	R 0
19 January 2001	R 875	2	200	R 1,750
22 January 2001	R 879	1	100	R 879
23 January 2001	R 864	0	0	R 0
24 January 2001	R 877	2	200	R 1,754
25 January 2001	R 871	0	0	R 0
26 January 2001	R 841	0	0	R 0
29 January 2001	R 840	0	0	R 0
30 January 2001	R 810	0	0	R 0
31 January 2001	R 805	0	0	R 0
01 February 2001	R 835	6	600	R 5,010
02 February 2001	R 865	1	100	R 865
05 February 2001	R 910	1	100	R 910
06 February 2001	R 934	1	100	R 934

DATE	JULY WHITE MAIZE PRICE	CONTRACTS TRADED	TOHHAGES TRADED	PRICE x TOHHAGES
07 February 2001	R 904	0	0	R 0
08 February 2001	R 892	0	0	R 0
12 February 2001	R 855	0	0	R 0
13 February 2001	R 870	4	400	R 3,480
14 February 2001	R 900	1	100	R 900
15 February 2001	R 930	1	100	R 930
16 February 2001	R 923	0	0	R 0
19 February 2001	R 893	0	0	R 0
20 February 2001	R 894	3	300	R 2,682
21 February 2001	R 906	1	100	R 906
22 February 2001	R 887	0	0	R 0
23 February 2001	R 859	0	0	R 0
26 February 2001	R 834	0	0	R 0
27 February 2001	R 833	0	0	R 0
28 February 2001	R 829	0	0	R 0
01 March 2001	R 840	6	600	R 5,040
02 March 2001	R 864	1	100	R 864
05 March 2001	R 874	1	100	R 874
07 March 2001	R 873	0	0	R 0
08 March 2001	R 878	2	200	R 1,756
09 March 2001	R 883	1	100	R 883
12 March 2001	R 862	0	0	R 0
13 March 2001	R 848	0	0	R 0
14 March 2001	R 843	0	0	R 0
15 March 2001	R 840	0	0	R 0
16 March 2001	R 830	0	0	R 0
19 March 2001	R 846	6	600	R 5,076
20 March 2001	R 854	1	100	R 854
22 March 2001	R 850	0	0	R 0
23 March 2001	R 820	0	0	R 0
26 March 2001	R 820	3	300	R 2,460
27 March 2001	R 832	1	100	R 832
28 March 2001	R 813	0	0	R 0
29 March 2001	R 802	0	0	R 0
30 March 2001	R 797	0	0	R 0
02 April 2001	R 815	4	400	R 3,260
03 April 2001	R 817	1	100	R 817
04 April 2001	R 818	1	100	R 818
05 April 2001	R 827	1	100	R 827
06 April 2001	R 845	1	100	R 845
09 April 2001	R 846	1	100	R 846
10 April 2001	R 835	0	0	R 0
11 April 2001	R 830	0	0	R 0
12 April 2001	R 832	3	300	R 2,496
17 April 2001	R 840	1	100	R 840
18 April 2001	R 831	0	0	R 0
19 April 2001	R 826	0	0	R 0
20 April 2001	R 822	0	0	R 0
23 April 2001	R 823	4	400	R 3,292

DATE	JULY WHITE MAIZE PRICE	CONTRACTS TRADED	TOHHAGES TRADED	PRICE x TOHHAGES
24 April 2001	R 813	0	0	R 0
25 April 2001	R 804	0	0	R 0
26 April 2001	R 809	3	300	R 2,427
30 April 2001	R 807	0	0	R 0
02 May 2001	R 816	2	200	R 1,632
03 May 2001	R 812	0	0	R 0
04 May 2001	R 808	0	0	R 0
07 May 2001	R 788	0	0	R 0
08 May 2001	R 781	0	0	R 0
09 May 2001	R 771	0	0	R 0
10 May 2001	R 767	0	0	R 0
11 May 2001	R 754	0	0	R 0
14 May 2001	R 760	8	800	R 6,080
15 May 2001	R 764	1	100	R 764
16 May 2001	R 757	0	0	R 0
17 May 2001	R 750	0	0	R 0
18 May 2001	R 751	3	300	R 2,253
21 May 2001	R 737	0	0	R 0
22 May 2001	R 744	2	200	R 1,488
23 May 2001	R 758	1	100	R 758
24 May 2001	R 758	1	100	R 758
25 May 2001	R 756	0	0	R 0
28 May 2001	R 744	0	0	R 0
29 May 2001	R 743	0	0	R 0
30 May 2001	R 750	4	400	R 3,000
31 May 2001	R 756	1	100	R 756
01 June 2001	R 766	1	100	R 766
04 June 2001	R 766	1	100	R 766
05 June 2001	R 768	1	100	R 768
06 June 2001	R 761	0	0	R 0
07 June 2001	R 777	2	200	R 1,554
08 June 2001	R 782	1	100	R 782
11 June 2001	R 796	1	100	R 796
12 June 2001	R 794	0	0	R 0
13 June 2001	R 784	0	0	R 0
14 June 2001	R 794	3	300	R 2,382
15 June 2001	R 784	0	0	R 0
18 June 2001	R 777	0	0	R 0
19 June 2001	R 779	3	300	R 2,337
20 June 2001	R 775	0	0	R 0
21 June 2001	R 795	2	200	R 1,590
22 June 2001	R 796	1	100	R 796
25 June 2001	R 787	0	0	R 0
26 June 2001	R 807	2	200	R 1,614
27 June 2001	R 826	1	100	R 826
28 June 2001	R 830	1	100	R 830
29 June 2001	R 828	0	0	R 0
02 July 2001	R 828	2	200	R 1,656
03 July 2001	R 823	0	0	R 0

DATE	JULY WHITE MAIZE PRICE	CONTRACTS TRADED	TONNAGES TRADED	PRICE x TONNAGES
04 July 2001	R 837	2	200	R 1,674
05 July 2001	R 858	1	100	R 858
06 July 2001	R 859	1	100	R 859
09 July 2001	R 855	0	0	R 0
10 July 2001	R 867	2	200	R 1,734
11 July 2001	R 892	1	100	R 892
12 July 2001	R 900	1	100	R 900
13 July 2001	R 925	1	100	R 925
17 July 2001	R 943	1	100	R 943
18 July 2001	R 930	0	0	R 0
19 July 2001	R 957	2	200	R 1,914
20 July 2001	R 956	0	0	R 0
AVERAGE PRICE INDEX	R 739.40			
MOMENTUM STRATEGY	R 738.61			
TONNAGES HEDGED	29,900			

2002

DATE	JULY WHITE MAIZE PRICE	CONTRACTS TRADED	TONNAGES TRADED	PRICE x TONNAGES
21 February 2001	R 1,030.00			
22 February 2001	R 1,015.00	0	0	R 0.00
23 February 2001	R 950.00	0	0	R 0.00
26 February 2001	R 880.00	0	0	R 0.00
27 February 2001	R 870.00	0	0	R 0.00
28 February 2001	R 870.00	5	500	R 435,000.00
01 March 2001	R 870.00	1	100	R 87,000.00
02 March 2001	R 870.00	1	100	R 87,000.00
05 March 2001	R 870.00	1	100	R 87,000.00
07 March 2001	R 880.00	1	100	R 88,000.00
08 March 2001	R 880.00	1	100	R 88,000.00
09 March 2001	R 880.00	1	100	R 88,000.00
12 March 2001	R 880.00	1	100	R 88,000.00
13 March 2001	R 865.00	0	0	R 0.00
14 March 2001	R 865.00	2	200	R 173,000.00
15 March 2001	R 865.00	1	100	R 86,500.00
16 March 2001	R 858.00	0	0	R 0.00
19 March 2001	R 858.00	2	200	R 171,600.00
20 March 2001	R 860.00	1	100	R 86,000.00
22 March 2001	R 840.00	0	0	R 0.00
23 March 2001	R 835.00	0	0	R 0.00
26 March 2001	R 830.00	0	0	R 0.00
27 March 2001	R 840.00	4	400	R 336,000.00
28 March 2001	R 840.00	1	100	R 84,000.00
29 March 2001	R 840.00	1	100	R 84,000.00
30 March 2001	R 835.00	0	0	R 0.00
02 April 2001	R 841.00	2	200	R 168,200.00
03 April 2001	R 841.00	1	100	R 84,100.00
04 April 2001	R 841.00	1	100	R 84,100.00
05 April 2001	R 841.00	1	100	R 84,100.00
06 April 2001	R 845.00	1	100	R 84,500.00
09 April 2001	R 840.00	0	0	R 0.00
10 April 2001	R 840.00	2	200	R 168,000.00
11 April 2001	R 840.00	1	100	R 84,000.00
12 April 2001	R 840.00	1	100	R 84,000.00
17 April 2001	R 847.00	1	100	R 84,700.00
18 April 2001	R 841.00	0	0	R 0.00
19 April 2001	R 842.00	2	200	R 168,400.00
20 April 2001	R 842.00	1	100	R 84,200.00
23 April 2001	R 845.00	1	100	R 84,500.00
24 April 2001	R 845.00	1	100	R 84,500.00
25 April 2001	R 845.00	1	100	R 84,500.00
26 April 2001	R 845.00	1	100	R 84,500.00
30 April 2001	R 845.00	1	100	R 84,500.00
02 May 2001	R 845.00	1	100	R 84,500.00
03 May 2001	R 847.00	1	100	R 84,700.00
04 May 2001	R 847.00	1	100	R 84,700.00
07 May 2001	R 850.00	1	100	R 85,000.00
08 May 2001	R 850.00	1	100	R 85,000.00

DATE	JULY WHITE MAIZE PRICE	CONTRACTS TRADED	TONNAGES TRADED	PRICE x TONNAGES
09 May 2001	R 830.00	0	0	R 0.00
10 May 2001	R 830.00	2	200	R 166,000.00
11 May 2001	R 830.00	1	100	R 83,000.00
14 May 2001	R 830.00	1	100	R 83,000.00
15 May 2001	R 830.00	1	100	R 83,000.00
16 May 2001	R 830.00	1	100	R 83,000.00
17 May 2001	R 830.00	1	100	R 83,000.00
18 May 2001	R 830.00	1	100	R 83,000.00
21 May 2001	R 830.00	1	100	R 83,000.00
22 May 2001	R 830.00	1	100	R 83,000.00
23 May 2001	R 828.00	0	0	R 0.00
24 May 2001	R 828.00	2	200	R 165,600.00
25 May 2001	R 830.00	1	100	R 83,000.00
28 May 2001	R 830.00	1	100	R 83,000.00
29 May 2001	R 835.00	1	100	R 83,500.00
30 May 2001	R 835.00	1	100	R 83,500.00
31 May 2001	R 835.00	1	100	R 83,500.00
01 June 2001	R 835.00	1	100	R 83,500.00
04 June 2001	R 835.00	1	100	R 83,500.00
05 June 2001	R 835.00	1	100	R 83,500.00
06 June 2001	R 830.00	0	0	R 0.00
07 June 2001	R 840.00	2	200	R 168,000.00
08 June 2001	R 850.00	1	100	R 85,000.00
11 June 2001	R 850.00	1	100	R 85,000.00
12 June 2001	R 850.00	1	100	R 85,000.00
13 June 2001	R 850.00	1	100	R 85,000.00
14 June 2001	R 850.00	1	100	R 85,000.00
15 June 2001	R 845.00	0	0	R 0.00
18 June 2001	R 845.00	2	200	R 169,000.00
19 June 2001	R 835.00	0	0	R 0.00
20 June 2001	R 835.00	2	200	R 167,000.00
21 June 2001	R 840.00	1	100	R 84,000.00
22 June 2001	R 845.00	1	100	R 84,500.00
25 June 2001	R 845.00	1	100	R 84,500.00
26 June 2001	R 855.00	1	100	R 85,500.00
27 June 2001	R 860.00	1	100	R 86,000.00
28 June 2001	R 845.00	0	0	R 0.00
29 June 2001	R 843.00	0	0	R 0.00
02 July 2001	R 843.00	3	300	R 252,900.00
03 July 2001	R 837.00	0	0	R 0.00
04 July 2001	R 842.00	2	200	R 168,400.00
05 July 2001	R 845.00	1	100	R 84,500.00
06 July 2001	R 850.00	1	100	R 85,000.00
09 July 2001	R 850.00	1	100	R 85,000.00
10 July 2001	R 865.00	1	100	R 86,500.00
11 July 2001	R 877.00	1	100	R 87,700.00
12 July 2001	R 880.00	1	100	R 88,000.00
13 July 2001	R 893.00	1	100	R 89,300.00
17 July 2001	R 900.00	1	100	R 90,000.00

DATE	JULY WHITE MAIZE PRICE	CONTRACTS TRADED	TONNAGES TRADED	PRICE x TONNAGES
18 July 2001	R 876.00	0	0	R 0.00
19 July 2001	R 870.00	0	0	R 0.00
20 July 2001	R 860.00	0	0	R 0.00
23 July 2001	R 850.00	0	0	R 0.00
24 July 2001	R 859.00	5	500	R 429,500.00
25 July 2001	R 867.00	1	100	R 86,700.00
26 July 2001	R 881.00	1	100	R 88,100.00
27 July 2001	R 888.00	1	100	R 88,800.00
30 July 2001	R 884.00	0	0	R 0.00
31 July 2001	R 880.00	0	0	R 0.00
01 August 2001	R 880.00	3	300	R 264,000.00
02 August 2001	R 877.00	0	0	R 0.00
03 August 2001	R 885.00	2	200	R 177,000.00
06 August 2001	R 880.00	0	0	R 0.00
07 August 2001	R 884.00	2	200	R 176,800.00
08 August 2001	R 879.00	0	0	R 0.00
10 August 2001	R 892.00	2	200	R 178,400.00
13 August 2001	R 895.00	1	100	R 89,500.00
14 August 2001	R 903.00	1	100	R 90,300.00
15 August 2001	R 899.00	0	0	R 0.00
16 August 2001	R 895.00	0	0	R 0.00
17 August 2001	R 885.00	0	0	R 0.00
20 August 2001	R 873.00	0	0	R 0.00
21 August 2001	R 882.00	5	500	R 441,000.00
22 August 2001	R 903.00	1	100	R 90,300.00
23 August 2001	R 900.00	0	0	R 0.00
24 August 2001	R 905.00	2	200	R 181,000.00
27 August 2001	R 908.00	1	100	R 90,800.00
28 August 2001	R 920.00	1	100	R 92,000.00
29 August 2001	R 920.00	1	100	R 92,000.00
30 August 2001	R 935.00	1	100	R 93,500.00
31 August 2001	R 939.00	1	100	R 93,900.00
03 September 2001	R 940.00	1	100	R 94,000.00
04 September 2001	R 935.00	0	0	R 0.00
05 September 2001	R 930.00	0	0	R 0.00
06 September 2001	R 912.00	0	0	R 0.00
07 September 2001	R 925.00	4	400	R 370,000.00
10 September 2001	R 918.00	0	0	R 0.00
11 September 2001	R 909.00	0	0	R 0.00
12 September 2001	R 923.00	3	300	R 276,900.00
13 September 2001	R 917.00	0	0	R 0.00
14 September 2001	R 920.00	2	200	R 184,000.00
17 September 2001	R 920.00	1	100	R 92,000.00
18 September 2001	R 927.00	1	100	R 92,700.00
19 September 2001	R 925.00	0	0	R 0.00
20 September 2001	R 934.00	2	200	R 186,800.00
21 September 2001	R 950.00	1	100	R 95,000.00
25 September 2001	R 969.00	1	100	R 96,900.00
26 September 2001	R 998.00	1	100	R 99,800.00

DATE	JULY WHITE MAIZE PRICE	CONTRACTS TRADED	TONNAGES TRADED	PRICE x TONNAGES
27 September 2001	R 1,009.00	1	100	R 100,900.00
28 September 2001	R 1,000.00	0	0	R 0.00
01 October 2001	R 1,028.00	2	200	R 205,600.00
02 October 2001	R 1,058.00	1	100	R 105,800.00
03 October 2001	R 1,068.00	1	100	R 106,800.00
04 October 2001	R 1,054.00	0	0	R 0.00
05 October 2001	R 1,044.00	0	0	R 0.00
08 October 2001	R 1,027.00	0	0	R 0.00
09 October 2001	R 1,024.00	0	0	R 0.00
10 October 2001	R 1,022.00	0	0	R 0.00
11 October 2001	R 1,019.00	0	0	R 0.00
12 October 2001	R 1,043.00	7	700	R 730,100.00
15 October 2001	R 1,025.00	0	0	R 0.00
16 October 2001	R 1,021.00	0	0	R 0.00
17 October 2001	R 1,018.00	0	0	R 0.00
18 October 2001	R 1,018.00	4	400	R 407,200.00
19 October 2001	R 1,012.00	0	0	R 0.00
22 October 2001	R 1,013.00	2	200	R 202,600.00
23 October 2001	R 1,037.00	1	100	R 103,700.00
24 October 2001	R 1,035.00	0	0	R 0.00
25 October 2001	R 1,041.00	2	200	R 208,200.00
26 October 2001	R 1,067.00	1	100	R 106,700.00
29 October 2001	R 1,055.00	0	0	R 0.00
30 October 2001	R 1,036.00	0	0	R 0.00
31 October 2001	R 1,043.00	3	300	R 312,900.00
01 November 2001	R 1,034.00	0	0	R 0.00
02 November 2001	R 1,042.00	2	200	R 208,400.00
05 November 2001	R 1,057.00	1	100	R 105,700.00
06 November 2001	R 1,077.00	1	100	R 107,700.00
07 November 2001	R 1,088.00	1	100	R 108,800.00
08 November 2001	R 1,098.00	1	100	R 109,800.00
09 November 2001	R 1,080.00	0	0	R 0.00
12 November 2001	R 1,110.00	2	200	R 222,000.00
13 November 2001	R 1,140.00	1	100	R 114,000.00
14 November 2001	R 1,185.00	1	100	R 118,500.00
15 November 2001	R 1,185.00	1	100	R 118,500.00
16 November 2001	R 1,163.00	0	0	R 0.00
19 November 2001	R 1,178.00	2	200	R 235,600.00
20 November 2001	R 1,208.00	1	100	R 120,800.00
21 November 2001	R 1,238.00	1	100	R 123,800.00
22 November 2001	R 1,283.00	1	100	R 128,300.00
23 November 2001	R 1,328.00	1	100	R 132,800.00
26 November 2001	R 1,336.00	1	100	R 133,600.00
27 November 2001	R 1,291.00	0	0	R 0.00
28 November 2001	R 1,246.00	0	0	R 0.00
29 November 2001	R 1,255.00	3	300	R 376,500.00
30 November 2001	R 1,285.00	1	100	R 128,500.00
03 December 2001	R 1,315.00	1	100	R 131,500.00
04 December 2001	R 1,340.00	1	100	R 134,000.00

DATE	JULY WHITE MAIZE PRICE	CONTRACTS TRADED	TOHHAGES TRADED	PRICE x TOHHAGES
05 December 2001	R 1,385.00	1	100	R 138,500.00
06 December 2001	R 1,419.00	1	100	R 141,900.00
07 December 2001	R 1,383.00	0	0	R 0.00
10 December 2001	R 1,428.00	2	200	R 285,600.00
11 December 2001	R 1,454.00	1	100	R 145,400.00
12 December 2001	R 1,499.00	1	100	R 149,900.00
13 December 2001	R 1,544.00	1	100	R 154,400.00
14 December 2001	R 1,589.00	1	100	R 158,900.00
18 December 2001	R 1,634.00	1	100	R 163,400.00
19 December 2001	R 1,679.00	1	100	R 167,900.00
20 December 2001	R 1,724.00	1	100	R 172,400.00
21 December 2001	R 1,689.00	0	0	R 0.00
24 December 2001	R 1,644.00	0	0	R 0.00
27 December 2001	R 1,599.00	0	0	R 0.00
28 December 2001	R 1,554.00	0	0	R 0.00
31 December 2001	R 1,599.00	5	500	R 799,500.00
02 January 2002	R 1,644.00	1	100	R 164,400.00
03 January 2002	R 1,689.00	1	100	R 168,900.00
04 January 2002	R 1,680.00	0	0	R 0.00
07 January 2002	R 1,635.00	0	0	R 0.00
08 January 2002	R 1,590.00	0	0	R 0.00
09 January 2002	R 1,525.00	0	0	R 0.00
10 January 2002	R 1,495.00	0	0	R 0.00
11 January 2002	R 1,518.00	6	600	R 910,800.00
14 January 2002	R 1,550.00	1	100	R 155,000.00
15 January 2002	R 1,570.00	1	100	R 157,000.00
16 January 2002	R 1,615.00	1	100	R 161,500.00
17 January 2002	R 1,628.00	1	100	R 162,800.00
18 January 2002	R 1,652.00	1	100	R 165,200.00
21 January 2002	R 1,661.00	1	100	R 166,100.00
22 January 2002	R 1,630.00	0	0	R 0.00
23 January 2002	R 1,665.00	2	200	R 333,000.00
24 January 2002	R 1,657.00	0	0	R 0.00
25 January 2002	R 1,639.00	0	0	R 0.00
28 January 2002	R 1,594.00	0	0	R 0.00
29 January 2002	R 1,558.00	0	0	R 0.00
30 January 2002	R 1,595.00	5	500	R 797,500.00
31 January 2002	R 1,640.00	1	100	R 164,000.00
01 February 2002	R 1,605.00	0	0	R 0.00
04 February 2002	R 1,646.00	2	200	R 329,200.00
05 February 2002	R 1,636.00	0	0	R 0.00
06 February 2002	R 1,591.00	0	0	R 0.00
07 February 2002	R 1,626.00	3	300	R 487,800.00
08 February 2002	R 1,614.00	0	0	R 0.00
11 February 2002	R 1,628.00	2	200	R 325,600.00
12 February 2002	R 1,631.00	1	100	R 163,100.00
13 February 2002	R 1,586.00	0	0	R 0.00
14 February 2002	R 1,565.00	0	0	R 0.00
15 February 2002	R 1,571.00	3	300	R 471,300.00

DATE	JULY WHITE MAIZE PRICE	CONTRACTS TRADED	TOHHAGES TRADED	PRICE x TOHHAGES
18 February 2002	R 1,526.00	0	0	R 0.00
19 February 2002	R 1,481.00	0	0	R 0.00
20 February 2002	R 1,416.00	0	0	R 0.00
21 February 2002	R 1,430.00	4	400	R 572,000.00
22 February 2002	R 1,472.00	1	100	R 147,200.00
25 February 2002	R 1,492.00	1	100	R 149,200.00
26 February 2002	R 1,473.00	0	0	R 0.00
27 February 2002	R 1,481.00	2	200	R 296,200.00
28 February 2002	R 1,514.00	1	100	R 151,400.00
01 March 2002	R 1,489.00	0	0	R 0.00
04 March 2002	R 1,457.00	0	0	R 0.00
05 March 2002	R 1,412.00	0	0	R 0.00
06 March 2002	R 1,445.00	4	400	R 578,000.00
07 March 2002	R 1,490.00	1	100	R 149,000.00
08 March 2002	R 1,522.00	1	100	R 152,200.00
11 March 2002	R 1,477.00	0	0	R 0.00
12 March 2002	R 1,451.00	0	0	R 0.00
13 March 2002	R 1,450.00	0	0	R 0.00
14 March 2002	R 1,490.00	4	400	R 596,000.00
15 March 2002	R 1,492.00	1	100	R 149,200.00
18 March 2002	R 1,517.00	1	100	R 151,700.00
19 March 2002	R 1,555.00	1	100	R 155,500.00
20 March 2002	R 1,600.00	1	100	R 160,000.00
22 March 2002	R 1,645.00	1	100	R 164,500.00
25 March 2002	R 1,639.00	0	0	R 0.00
26 March 2002	R 1,672.00	2	200	R 334,400.00
27 March 2002	R 1,668.00	0	0	R 0.00
28 March 2002	R 1,713.00	2	200	R 342,600.00
02 April 2002	R 1,758.00	1	100	R 175,800.00
03 April 2002	R 1,803.00	1	100	R 180,300.00
04 April 2002	R 1,756.00	0	0	R 0.00
05 April 2002	R 1,775.00	2	200	R 355,000.00
08 April 2002	R 1,799.00	1	100	R 179,900.00
09 April 2002	R 1,785.00	0	0	R 0.00
10 April 2002	R 1,775.00	0	0	R 0.00
11 April 2002	R 1,820.00	3	300	R 546,000.00
12 April 2002	R 1,850.00	1	100	R 185,000.00
15 April 2002	R 1,870.00	1	100	R 187,000.00
16 April 2002	R 1,873.00	1	100	R 187,300.00
17 April 2002	R 1,878.00	1	100	R 187,800.00
18 April 2002	R 1,893.00	1	100	R 189,300.00
19 April 2002	R 1,885.00	0	0	R 0.00
22 April 2002	R 1,853.00	0	0	R 0.00
23 April 2002	R 1,808.00	0	0	R 0.00
24 April 2002	R 1,786.00	0	0	R 0.00
25 April 2002	R 1,770.00	0	0	R 0.00
26 April 2002	R 1,751.00	0	0	R 0.00
29 April 2002	R 1,706.00	0	0	R 0.00
30 April 2002	R 1,725.00	8	800	R 1,380,000.00

DATE	JULY WHITE MAIZE PRICE	CONTRACTS TRADED	TOHHAGES TRADED	PRICE x TOHHAGES
02 May 2002	R 1,752.00	1	100	R 175,200.00
03 May 2002	R 1,763.00	1	100	R 176,300.00
06 May 2002	R 1,774.00	1	100	R 177,400.00
07 May 2002	R 1,737.00	0	0	R 0.00
08 May 2002	R 1,692.00	0	0	R 0.00
09 May 2002	R 1,727.00	3	300	R 518,100.00
10 May 2002	R 1,718.00	0	0	R 0.00
13 May 2002	R 1,722.00	2	200	R 344,400.00
14 May 2002	R 1,745.00	1	100	R 174,500.00
15 May 2002	R 1,765.00	1	100	R 176,500.00
16 May 2002	R 1,764.00	0	0	R 0.00
17 May 2002	R 1,772.00	2	200	R 354,400.00
20 May 2002	R 1,773.00	1	100	R 177,300.00
21 May 2002	R 1,771.00	0	0	R 0.00
22 May 2002	R 1,766.00	0	0	R 0.00
23 May 2002	R 1,766.00	3	300	R 529,800.00
24 May 2002	R 1,781.00	1	100	R 178,100.00
27 May 2002	R 1,777.00	0	0	R 0.00
28 May 2002	R 1,791.00	2	200	R 358,200.00
29 May 2002	R 1,799.00	1	100	R 179,900.00
30 May 2002	R 1,793.00	0	0	R 0.00
31 May 2002	R 1,802.00	2	200	R 360,400.00
03 June 2002	R 1,787.00	0	0	R 0.00
04 June 2002	R 1,742.00	0	0	R 0.00
05 June 2002	R 1,738.00	0	0	R 0.00
06 June 2002	R 1,734.00	0	0	R 0.00
07 June 2002	R 1,719.00	0	0	R 0.00
10 June 2002	R 1,737.00	6	600	R 1,042,200.00
11 June 2002	R 1,743.00	1	100	R 174,300.00
12 June 2002	R 1,734.00	0	0	R 0.00
13 June 2002	R 1,754.00	2	200	R 350,800.00
14 June 2002	R 1,786.00	1	100	R 178,600.00
18 June 2002	R 1,831.00	1	100	R 183,100.00
19 June 2002	R 1,794.00	0	0	R 0.00
20 June 2002	R 1,778.00	0	0	R 0.00
21 June 2002	R 1,786.00	3	300	R 535,800.00
24 June 2002	R 1,802.00	1	100	R 180,200.00
25 June 2002	R 1,794.00	0	0	R 0.00
26 June 2002	R 1,749.00	0	0	R 0.00
27 June 2002	R 1,756.00	3	300	R 526,800.00
28 June 2002	R 1,767.00	1	100	R 176,700.00
01 July 2002	R 1,769.00	1	100	R 176,900.00
02 July 2002	R 1,777.00	1	100	R 177,700.00
03 July 2002	R 1,760.00	0	0	R 0.00
04 July 2002	R 1,761.00	2	200	R 352,200.00
05 July 2002	R 1,746.00	0	0	R 0.00
08 July 2002	R 1,745.00	0	0	R 0.00
09 July 2002	R 1,749.00	3	300	R 524,700.00
10 July 2002	R 1,747.00	0	0	R 0.00

DATE	JULY WHITE MAIZE PRICE	CONTRACTS TRADED	TONNAGES TRADED	PRICE x TONNAGES
11 July 2002	R 1,740.00	0	0	R 0.00
12 July 2002	R 1,694.00	0	0	R 0.00
15 July 2002	R 1,676.00	0	0	R 0.00
16 July 2002	R 1,705.00	5	500	R 852,500.00
17 July 2002	R 1,660.00	0	0	R 0.00
18 July 2002	R 1,643.00	0	0	R 0.00
19 July 2002	R 1,628.00	0	0	R 0.00
22 July 2002	R 1,630.00	4	400	R 652,000.00
AVERAGE PRICE INDEX	R 1,254.24			
MOMENTUM STRATEGY	R 1,252.48			
TONNAGES HEDGED	35,000			

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DATE	JULY WHITE MAIZE PRICE	CONTRACTS TRADED	TOHHAGES TRADED	PRICE x TOHHAGES
27 May 2002	R 1,730			
28 May 2002	R 1,715	0	0	R 0
29 May 2002	R 1,710	0	0	R 0
30 May 2002	R 1,710	3	300	R 513,000
31 May 2002	R 1,710	1	100	R 171,000
03 June 2002	R 1,700	0	0	R 0
04 June 2002	R 1,698	0	0	R 0
05 June 2002	R 1,680	0	0	R 0
06 June 2002	R 1,690	4	400	R 676,000
07 June 2002	R 1,690	1	100	R 169,000
10 June 2002	R 1,690	1	100	R 169,000
11 June 2002	R 1,705	1	100	R 170,500
12 June 2002	R 1,680	0	0	R 0
13 June 2002	R 1,680	2	200	R 336,000
14 June 2002	R 1,690	1	100	R 169,000
18 June 2002	R 1,725	1	100	R 172,500
19 June 2002	R 1,690	0	0	R 0
20 June 2002	R 1,685	0	0	R 0
21 June 2002	R 1,685	3	300	R 505,500
24 June 2002	R 1,700	1	100	R 170,000
25 June 2002	R 1,700	1	100	R 170,000
26 June 2002	R 1,655	0	0	R 0
27 June 2002	R 1,661	2	200	R 332,200
28 June 2002	R 1,680	1	100	R 168,000
01 July 2002	R 1,681	1	100	R 168,100
02 July 2002	R 1,695	1	100	R 169,500
03 July 2002	R 1,700	1	100	R 170,000
04 July 2002	R 1,710	1	100	R 171,000
05 July 2002	R 1,690	0	0	R 0
08 July 2002	R 1,700	2	200	R 340,000
09 July 2002	R 1,695	0	0	R 0
10 July 2002	R 1,650	0	0	R 0
11 July 2002	R 1,605	0	0	R 0
12 July 2002	R 1,560	0	0	R 0
15 July 2002	R 1,515	0	0	R 0
16 July 2002	R 1,505	0	0	R 0
17 July 2002	R 1,505	7	700	R 1,053,500
18 July 2002	R 1,509	1	100	R 150,900
19 July 2002	R 1,518	1	100	R 151,800
22 July 2002	R 1,529	1	100	R 152,900
23 July 2002	R 1,573	1	100	R 157,300
24 July 2002	R 1,584	1	100	R 158,400
25 July 2002	R 1,590	1	100	R 159,000
26 July 2002	R 1,595	1	100	R 159,500
29 July 2002	R 1,600	1	100	R 160,000
30 July 2002	R 1,601	1	100	R 160,100
31 July 2002	R 1,600	0	0	R 0
01 August 2002	R 1,621	2	200	R 324,200
02 August 2002	R 1,609	0	0	R 0

DATE	JULY WHITE MAIZE PRICE	CONTRACTS TRADED	TONNAGES TRADED	PRICE x TONNAGES
05 August 2002	R 1,621	2	200	R 324,200
06 August 2002	R 1,647	1	100	R 164,700
07 August 2002	R 1,642	0	0	R 0
08 August 2002	R 1,650	2	200	R 330,000
12 August 2002	R 1,650	1	100	R 165,000
13 August 2002	R 1,691	1	100	R 169,100
14 August 2002	R 1,690	0	0	R 0
15 August 2002	R 1,685	0	0	R 0
16 August 2002	R 1,687	3	300	R 506,100
19 August 2002	R 1,671	0	0	R 0
20 August 2002	R 1,680	2	200	R 336,000
21 August 2002	R 1,700	1	100	R 170,000
22 August 2002	R 1,712	1	100	R 171,200
23 August 2002	R 1,740	1	100	R 174,000
26 August 2002	R 1,745	1	100	R 174,500
27 August 2002	R 1,728	0	0	R 0
28 August 2002	R 1,743	2	200	R 348,600
29 August 2002	R 1,751	1	100	R 175,100
30 August 2002	R 1,763	1	100	R 176,300
02 September 2002	R 1,782	1	100	R 178,200
03 September 2002	R 1,814	1	100	R 181,400
04 September 2002	R 1,811	0	0	R 0
05 September 2002	R 1,810	0	0	R 0
06 September 2002	R 1,780	0	0	R 0
09 September 2002	R 1,785	4	400	R 714,000
10 September 2002	R 1,799	1	100	R 179,900
11 September 2002	R 1,789	0	0	R 0
12 September 2002	R 1,765	0	0	R 0
13 September 2002	R 1,760	0	0	R 0
16 September 2002	R 1,770	4	400	R 708,000
17 September 2002	R 1,766	0	0	R 0
18 September 2002	R 1,770	2	200	R 354,000
19 September 2002	R 1,780	1	100	R 178,000
20 September 2002	R 1,815	1	100	R 181,500
23 September 2002	R 1,820	1	100	R 182,000
25 September 2002	R 1,841	1	100	R 184,100
26 September 2002	R 1,835	0	0	R 0
27 September 2002	R 1,823	0	0	R 0
30 September 2002	R 1,810	0	0	R 0
01 October 2002	R 1,793	0	0	R 0
02 October 2002	R 1,805	5	500	R 902,500
03 October 2002	R 1,812	1	100	R 181,200
04 October 2002	R 1,803	0	0	R 0
07 October 2002	R 1,809	2	200	R 361,800
08 October 2002	R 1,825	1	100	R 182,500
09 October 2002	R 1,835	1	100	R 183,500
10 October 2002	R 1,840	1	100	R 184,000
11 October 2002	R 1,845	1	100	R 184,500
14 October 2002	R 1,846	1	100	R 184,600

DATE	JULY WHITE MAIZE PRICE	CONTRACTS TRADED	TONNAGES TRADED	PRICE x TONNAGES
15 October 2002	R 1,856	1	100	R 185,600
16 October 2002	R 1,861	1	100	R 186,100
17 October 2002	R 1,866	1	100	R 186,600
18 October 2002	R 1,854	0	0	R 0
21 October 2002	R 1,833	0	0	R 0
22 October 2002	R 1,799	0	0	R 0
23 October 2002	R 1,774	0	0	R 0
24 October 2002	R 1,761	0	0	R 0
25 October 2002	R 1,790	6	600	R 1,074,000
28 October 2002	R 1,769	0	0	R 0
29 October 2002	R 1,782	2	200	R 356,400
30 October 2002	R 1,783	1	100	R 178,300
31 October 2002	R 1,794	1	100	R 179,400
01 November 2002	R 1,786	0	0	R 0
04 November 2002	R 1,741	0	0	R 0
05 November 2002	R 1,752	3	300	R 525,600
06 November 2002	R 1,765	1	100	R 176,500
07 November 2002	R 1,774	1	100	R 177,400
08 November 2002	R 1,753	0	0	R 0
11 November 2002	R 1,740	0	0	R 0
12 November 2002	R 1,760	3	300	R 528,000
13 November 2002	R 1,773	1	100	R 177,300
14 November 2002	R 1,787	1	100	R 178,700
15 November 2002	R 1,810	1	100	R 181,000
18 November 2002	R 1,855	1	100	R 185,500
19 November 2002	R 1,854	0	0	R 0
20 November 2002	R 1,866	2	200	R 373,200
21 November 2002	R 1,889	1	100	R 188,900
22 November 2002	R 1,865	0	0	R 0
25 November 2002	R 1,890	2	200	R 378,000
26 November 2002	R 1,893	1	100	R 189,300
27 November 2002	R 1,893	1	100	R 189,300
28 November 2002	R 1,905	1	100	R 190,500
29 November 2002	R 1,950	1	100	R 195,000
02 December 2002	R 1,989	1	100	R 198,900
03 December 2002	R 1,958	0	0	R 0
04 December 2002	R 1,955	0	0	R 0
05 December 2002	R 1,910	0	0	R 0
06 December 2002	R 1,865	0	0	R 0
09 December 2002	R 1,800	0	0	R 0
10 December 2002	R 1,735	0	0	R 0
11 December 2002	R 1,689	0	0	R 0
12 December 2002	R 1,727	8	800	R 1,381,600
13 December 2002	R 1,720	0	0	R 0
17 December 2002	R 1,675	0	0	R 0
18 December 2002	R 1,645	0	0	R 0
19 December 2002	R 1,640	0	0	R 0
20 December 2002	R 1,682	5	500	R 841,000
23 December 2002	R 1,724	1	100	R 172,400

DATE	JULY WHITE MAIZE PRICE	CONTRACTS TRADED	TONNAGES TRADED	PRICE x TONNAGES
24 December 2002	R 1,713	0	0	R 0
27 December 2002	R 1,668	0	0	R 0
30 December 2002	R 1,640	0	0	R 0
31 December 2002	R 1,672	4	400	R 668,800
02 January 2003	R 1,681	1	100	R 168,100
03 January 2003	R 1,663	0	0	R 0
06 January 2003	R 1,620	0	0	R 0
07 January 2003	R 1,599	0	0	R 0
08 January 2003	R 1,580	0	0	R 0
09 January 2003	R 1,550	0	0	R 0
10 January 2003	R 1,572	6	600	R 943,200
13 January 2003	R 1,527	0	0	R 0
14 January 2003	R 1,515	0	0	R 0
15 January 2003	R 1,562	3	300	R 468,600
16 January 2003	R 1,594	1	100	R 159,400
20 January 2003	R 1,536	0	0	R 0
21 January 2003	R 1,549	2	200	R 309,800
22 January 2003	R 1,566	1	100	R 156,600
23 January 2003	R 1,561	0	0	R 0
24 January 2003	R 1,516	0	0	R 0
27 January 2003	R 1,471	0	0	R 0
28 January 2003	R 1,406	0	0	R 0
29 January 2003	R 1,434	5	500	R 717,000
30 January 2003	R 1,432	0	0	R 0
31 January 2003	R 1,424	0	0	R 0
03 February 2003	R 1,379	0	0	R 0
04 February 2003	R 1,334	0	0	R 0
05 February 2003	R 1,320	0	0	R 0
06 February 2003	R 1,360	6	600	R 816,000
07 February 2003	R 1,382	1	100	R 138,200
10 February 2003	R 1,337	0	0	R 0
11 February 2003	R 1,292	0	0	R 0
12 February 2003	R 1,285	0	0	R 0
13 February 2003	R 1,240	0	0	R 0
14 February 2003	R 1,195	0	0	R 0
17 February 2003	R 1,130	0	0	R 0
18 February 2003	R 1,133	7	700	R 793,100
19 February 2003	R 1,086	0	0	R 0
20 February 2003	R 1,021	0	0	R 0
21 February 2003	R 1,007	0	0	R 0
24 February 2003	R 1,008	4	400	R 403,200
25 February 2003	R 1,016	1	100	R 101,600
26 February 2003	R 1,039	1	100	R 103,900
27 February 2003	R 1,007	0	0	R 0
28 February 2003	R 969	0	0	R 0
03 March 2003	R 964	0	0	R 0
04 March 2003	R 950	0	0	R 0
05 March 2003	R 989	5	500	R 494,500
06 March 2003	R 969	0	0	R 0

DATE	JULY WHITE MAIZE PRICE	CONTRACTS TRADED	TONNAGES TRADED	PRICE x TONNAGES
07 March 2003	R 992	2	200	R 198,400
10 March 2003	R 1,037	1	100	R 103,700
11 March 2003	R 1,055	1	100	R 105,500
12 March 2003	R 1,063	1	100	R 106,300
13 March 2003	R 1,022	0	0	R 0
14 March 2003	R 1,018	0	0	R 0
17 March 2003	R 992	0	0	R 0
18 March 2003	R 1,002	4	400	R 400,800
19 March 2003	R 958	0	0	R 0
20 March 2003	R 913	0	0	R 0
24 March 2003	R 848	0	0	R 0
25 March 2003	R 867	4	400	R 346,800
26 March 2003	R 886	1	100	R 88,600
27 March 2003	R 875	0	0	R 0
28 March 2003	R 866	0	0	R 0
31 March 2003	R 821	0	0	R 0
01 April 2003	R 826	4	400	R 330,400
02 April 2003	R 865	1	100	R 86,500
03 April 2003	R 855	0	0	R 0
04 April 2003	R 841	0	0	R 0
07 April 2003	R 886	3	300	R 265,800
08 April 2003	R 891	1	100	R 89,100
09 April 2003	R 876	0	0	R 0
10 April 2003	R 847	0	0	R 0
11 April 2003	R 859	3	300	R 257,700
14 April 2003	R 867	1	100	R 86,700
15 April 2003	R 864	0	0	R 0
16 April 2003	R 851	0	0	R 0
17 April 2003	R 842	0	0	R 0
22 April 2003	R 824	0	0	R 0
23 April 2003	R 806	0	0	R 0
24 April 2003	R 782	0	0	R 0
25 April 2003	R 780	0	0	R 0
29 April 2003	R 763	0	0	R 0
30 April 2003	R 743	0	0	R 0
02 May 2003	R 763	10	1000	R 763,000
05 May 2003	R 808	1	100	R 80,800
06 May 2003	R 813	1	100	R 81,300
07 May 2003	R 801	0	0	R 0
08 May 2003	R 794	0	0	R 0
09 May 2003	R 800	3	300	R 240,000
12 May 2003	R 841	1	100	R 84,100
13 May 2003	R 839	0	0	R 0
14 May 2003	R 872	2	200	R 174,400
15 May 2003	R 917	1	100	R 91,700
16 May 2003	R 962	1	100	R 96,200
19 May 2003	R 954	0	0	R 0
20 May 2003	R 951	0	0	R 0
21 May 2003	R 907	0	0	R 0

DATE	JULY WHITE MAIZE PRICE	CONTRACTS TRADED	TONNAGES TRADED	PRICE x TONNAGES
22 May 2003	R 938	4	400	R 375,200
23 May 2003	R 940	1	100	R 94,000
26 May 2003	R 933	0	0	R 0
27 May 2003	R 930	0	0	R 0
28 May 2003	R 975	3	300	R 292,500
29 May 2003	R 1,005	1	100	R 100,500
30 May 2003	R 1,001	0	0	R 0
02 June 2003	R 980	0	0	R 0
03 June 2003	R 935	0	0	R 0
04 June 2003	R 901	0	0	R 0
05 June 2003	R 939	5	500	R 469,500
06 June 2003	R 924	0	0	R 0
09 June 2003	R 940	2	200	R 188,000
10 June 2003	R 923	0	0	R 0
11 June 2003	R 906	0	0	R 0
12 June 2003	R 927	3	300	R 278,100
13 June 2003	R 904	0	0	R 0
17 June 2003	R 869	0	0	R 0
18 June 2003	R 870	3	300	R 261,000
19 June 2003	R 889	1	100	R 88,900
20 June 2003	R 885	0	0	R 0
23 June 2003	R 885	2	200	R 177,000
24 June 2003	R 866	0	0	R 0
25 June 2003	R 840	0	0	R 0
26 June 2003	R 848	3	300	R 254,400
27 June 2003	R 830	0	0	R 0
30 June 2003	R 829	0	0	R 0
01 July 2003	R 822	0	0	R 0
02 July 2003	R 831	4	400	R 332,400
03 July 2003	R 847	1	100	R 84,700
04 July 2003	R 845	0	0	R 0
07 July 2003	R 838	0	0	R 0
08 July 2003	R 852	3	300	R 255,600
09 July 2003	R 888	1	100	R 88,800
10 July 2003	R 874	0	0	R 0
11 July 2003	R 869	0	0	R 0
14 July 2003	R 856	0	0	R 0
15 July 2003	R 852	0	0	R 0
16 July 2003	R 845	0	0	R 0
17 July 2003	R 835	0	0	R 0
18 July 2003	R 823	0	0	R 0
21 July 2003	R 805	0	0	R 0
22 July 2003	R 812	9	900	R 730,800
AVERAGE PRICE INDEX	R 1,400.50			
MOMENTUM STRATEGY	R 1,388.64			
TONNAGES HEDGED	28,700			

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DATE	JULY WHITE MAIZE PRICE	CONTRACTS TRADED	TONNAGES TRADED	PRICE x TONNAGES
23 June 2003	R 1,034			
24 June 2003	R 1,018	0	0	R 0
25 June 2003	R 993	0	0	R 0
26 June 2003	R 995	3	300	R 298,500
27 June 2003	R 975	0	0	R 0
30 June 2003	R 975	2	200	R 195,000
01 July 2003	R 970	0	0	R 0
02 July 2003	R 970	2	200	R 194,000
03 July 2003	R 988	1	100	R 98,800
04 July 2003	R 990	1	100	R 99,000
07 July 2003	R 982	0	0	R 0
08 July 2003	R 988	2	200	R 197,600
09 July 2003	R 1,006	1	100	R 100,600
10 July 2003	R 994	0	0	R 0
11 July 2003	R 990	0	0	R 0
14 July 2003	R 975	0	0	R 0
15 July 2003	R 985	4	400	R 394,000
16 July 2003	R 982	0	0	R 0
17 July 2003	R 968	0	0	R 0
18 July 2003	R 957	0	0	R 0
21 July 2003	R 942	0	0	R 0
22 July 2003	R 952	5	500	R 476,000
23 July 2003	R 961	1	100	R 96,100
24 July 2003	R 940	0	0	R 0
25 July 2003	R 940	2	200	R 188,000
28 July 2003	R 935	0	0	R 0
29 July 2003	R 949	2	200	R 189,800
30 July 2003	R 960	1	100	R 96,000
31 July 2003	R 976	1	100	R 97,600
01 August 2003	R 983	1	100	R 98,300
04 August 2003	R 986	1	100	R 98,600
05 August 2003	R 1,000	1	100	R 100,000
06 August 2003	R 966	0	0	R 0
07 August 2003	R 970	2	200	R 194,000
08 August 2003	R 981	1	100	R 98,100
11 August 2003	R 990	1	100	R 99,000
12 August 2003	R 981	0	0	R 0
13 August 2003	R 1,010	2	200	R 202,000
14 August 2003	R 985	0	0	R 0
15 August 2003	R 995	2	200	R 199,000
18 August 2003	R 1,000	1	100	R 100,000
19 August 2003	R 990	0	0	R 0
20 August 2003	R 993	2	200	R 198,600
21 August 2003	R 1,018	1	100	R 101,800
22 August 2003	R 1,026	1	100	R 102,600
25 August 2003	R 1,031	1	100	R 103,100
26 August 2003	R 1,046	1	100	R 104,600
27 August 2003	R 1,033	0	0	R 0
28 August 2003	R 1,022	0	0	R 0

DATE	JULY WHITE MAIZE PRICE	CONTRACTS TRADED	TONNAGES TRADED	PRICE x TONNAGES
29 August 2003	R 1,030	3	300	R 309,000
01 September 2003	R 1,020	0	0	R 0
02 September 2003	R 1,014	0	0	R 0
03 September 2003	R 1,012	0	0	R 0
04 September 2003	R 1,029	4	400	R 411,600
05 September 2003	R 1,048	1	100	R 104,800
08 September 2003	R 1,044	0	0	R 0
09 September 2003	R 1,043	0	0	R 0
10 September 2003	R 1,056	3	300	R 316,800
11 September 2003	R 1,060	1	100	R 106,000
12 September 2003	R 1,058	0	0	R 0
15 September 2003	R 1,033	0	0	R 0
16 September 2003	R 1,050	3	300	R 315,000
17 September 2003	R 1,044	0	0	R 0
18 September 2003	R 1,026	0	0	R 0
19 September 2003	R 1,028	3	300	R 308,400
22 September 2003	R 1,039	1	100	R 103,900
23 September 2003	R 1,035	0	0	R 0
25 September 2003	R 1,029	0	0	R 0
26 September 2003	R 1,029	3	300	R 308,700
29 September 2003	R 1,038	1	100	R 103,800
30 September 2003	R 1,025	0	0	R 0
01 October 2003	R 1,000	0	0	R 0
02 October 2003	R 1,009	3	300	R 302,700
03 October 2003	R 994	0	0	R 0
06 October 2003	R 1,039	2	200	R 207,800
07 October 2003	R 1,017	0	0	R 0
08 October 2003	R 1,014	0	0	R 0
09 October 2003	R 1,027	3	300	R 308,100
10 October 2003	R 999	0	0	R 0
13 October 2003	R 1,006	2	200	R 201,200
14 October 2003	R 986	0	0	R 0
15 October 2003	R 959	0	0	R 0
16 October 2003	R 948	0	0	R 0
17 October 2003	R 961	4	400	R 384,400
20 October 2003	R 967	1	100	R 96,700
21 October 2003	R 961	0	0	R 0
22 October 2003	R 962	2	200	R 192,400
23 October 2003	R 976	1	100	R 97,600
24 October 2003	R 997	1	100	R 99,700
27 October 2003	R 999	1	100	R 99,900
28 October 2003	R 984	0	0	R 0
29 October 2003	R 993	2	200	R 198,600
30 October 2003	R 983	0	0	R 0
31 October 2003	R 980	0	0	R 0
03 November 2003	R 992	3	300	R 297,600
04 November 2003	R 979	0	0	R 0
05 November 2003	R 970	0	0	R 0
06 November 2003	R 994	3	300	R 298,200

DATE	JULY WHITE MAIZE PRICE	CONTRACTS TRADED	TONNAGES TRADED	PRICE x TONNAGES
07 November 2003	R 987	0	0	R 0
10 November 2003	R 1,003	2	200	R 200,600
11 November 2003	R 988	0	0	R 0
12 November 2003	R 988	2	200	R 197,600
13 November 2003	R 1,004	1	100	R 100,400
14 November 2003	R 991	0	0	R 0
17 November 2003	R 984	0	0	R 0
18 November 2003	R 986	3	300	R 295,800
19 November 2003	R 978	0	0	R 0
20 November 2003	R 976	0	0	R 0
21 November 2003	R 972	0	0	R 0
24 November 2003	R 978	4	400	R 391,200
25 November 2003	R 980	1	100	R 98,000
26 November 2003	R 977	0	0	R 0
27 November 2003	R 976	0	0	R 0
28 November 2003	R 968	0	0	R 0
01 December 2003	R 996	4	400	R 398,400
02 December 2003	R 1,015	1	100	R 101,500
03 December 2003	R 1,020	1	100	R 102,000
04 December 2003	R 1,045	1	100	R 104,500
05 December 2003	R 1,080	1	100	R 108,000
08 December 2003	R 1,125	1	100	R 112,500
09 December 2003	R 1,138	1	100	R 113,800
10 December 2003	R 1,139	1	100	R 113,900
11 December 2003	R 1,147	1	100	R 114,700
12 December 2003	R 1,192	1	100	R 119,200
15 December 2003	R 1,237	1	100	R 123,700
17 December 2003	R 1,245	1	100	R 124,500
18 December 2003	R 1,206	0	0	R 0
19 December 2003	R 1,212	2	200	R 242,400
22 December 2003	R 1,247	1	100	R 124,700
23 December 2003	R 1,209	0	0	R 0
24 December 2003	R 1,254	2	200	R 250,800
29 December 2003	R 1,209	0	0	R 0
30 December 2003	R 1,192	0	0	R 0
31 December 2003	R 1,225	3	300	R 367,500
02 January 2004	R 1,246	1	100	R 124,600
05 January 2004	R 1,205	0	0	R 0
06 January 2004	R 1,172	0	0	R 0
07 January 2004	R 1,185	3	300	R 355,500
08 January 2004	R 1,230	1	100	R 123,000
09 January 2004	R 1,275	1	100	R 127,500
12 January 2004	R 1,283	1	100	R 128,300
13 January 2004	R 1,328	1	100	R 132,800
14 January 2004	R 1,373	1	100	R 137,300
15 January 2004	R 1,380	1	100	R 138,000
16 January 2004	R 1,425	1	100	R 142,500
19 January 2004	R 1,380	0	0	R 0
20 January 2004	R 1,335	0	0	R 0

DATE	JULY WHITE MAIZE PRICE	CONTRACTS TRADED	TONNAGES TRADED	PRICE x TONNAGES
21 January 2004	R 1,400	3	300	R 420,000
22 January 2004	R 1,396	0	0	R 0
23 January 2004	R 1,408	2	200	R 281,600
26 January 2004	R 1,453	1	100	R 145,300
27 January 2004	R 1,494	1	100	R 149,400
28 January 2004	R 1,500	1	100	R 150,000
29 January 2004	R 1,492	0	0	R 0
30 January 2004	R 1,533	2	200	R 306,600
02 February 2004	R 1,578	1	100	R 157,800
03 February 2004	R 1,543	0	0	R 0
04 February 2004	R 1,500	0	0	R 0
05 February 2004	R 1,536	3	300	R 460,800
06 February 2004	R 1,491	0	0	R 0
09 February 2004	R 1,446	0	0	R 0
10 February 2004	R 1,423	0	0	R 0
11 February 2004	R 1,378	0	0	R 0
12 February 2004	R 1,333	0	0	R 0
13 February 2004	R 1,342	6	600	R 805,200
16 February 2004	R 1,387	1	100	R 138,700
17 February 2004	R 1,380	0	0	R 0
18 February 2004	R 1,364	0	0	R 0
19 February 2004	R 1,372	3	300	R 411,600
20 February 2004	R 1,368	0	0	R 0
23 February 2004	R 1,323	0	0	R 0
24 February 2004	R 1,278	0	0	R 0
25 February 2004	R 1,287	4	400	R 514,800
26 February 2004	R 1,270	0	0	R 0
27 February 2004	R 1,225	0	0	R 0
01 March 2004	R 1,212	0	0	R 0
02 March 2004	R 1,167	0	0	R 0
03 March 2004	R 1,125	0	0	R 0
04 March 2004	R 1,160	6	600	R 696,000
05 March 2004	R 1,166	1	100	R 116,600
08 March 2004	R 1,121	0	0	R 0
09 March 2004	R 1,076	0	0	R 0
10 March 2004	R 1,100	3	300	R 330,000
11 March 2004	R 1,145	1	100	R 114,500
12 March 2004	R 1,132	0	0	R 0
15 March 2004	R 1,135	2	200	R 227,000
16 March 2004	R 1,207	1	100	R 120,700
17 March 2004	R 1,176	0	0	R 0
18 March 2004	R 1,206	2	200	R 241,200
19 March 2004	R 1,203	0	0	R 0
23 March 2004	R 1,158	0	0	R 0
24 March 2004	R 1,113	0	0	R 0
25 March 2004	R 1,100	0	0	R 0
26 March 2004	R 1,103	5	500	R 551,500
29 March 2004	R 1,086	0	0	R 0
30 March 2004	R 1,091	2	200	R 218,200

DATE	JULY WHITE MAIZE PRICE	CONTRACTS TRADED	TONNAGES TRADED	PRICE x TONNAGES
31 March 2004	R 1,136	1	100	R 113,600
01 April 2004	R 1,164	1	100	R 116,400
02 April 2004	R 1,187	1	100	R 118,700
05 April 2004	R 1,223	1	100	R 122,300
06 April 2004	R 1,178	0	0	R 0
07 April 2004	R 1,165	0	0	R 0
08 April 2004	R 1,171	3	300	R 351,300
13 April 2004	R 1,142	0	0	R 0
15 April 2004	R 1,167	2	200	R 233,400
16 April 2004	R 1,122	0	0	R 0
19 April 2004	R 1,097	0	0	R 0
20 April 2004	R 1,100	3	300	R 330,000
21 April 2004	R 1,134	1	100	R 113,400
22 April 2004	R 1,151	1	100	R 115,100
23 April 2004	R 1,129	0	0	R 0
26 April 2004	R 1,119	0	0	R 0
28 April 2004	R 1,150	3	300	R 345,000
29 April 2004	R 1,150	1	100	R 115,000
30 April 2004	R 1,140	0	0	R 0
03 May 2004	R 1,139	0	0	R 0
04 May 2004	R 1,116	0	0	R 0
05 May 2004	R 1,088	0	0	R 0
06 May 2004	R 1,057	0	0	R 0
07 May 2004	R 1,064	6	600	R 638,400
10 May 2004	R 1,090	1	100	R 109,000
11 May 2004	R 1,069	0	0	R 0
12 May 2004	R 1,074	2	200	R 214,800
13 May 2004	R 1,081	1	100	R 108,100
14 May 2004	R 1,079	0	0	R 0
17 May 2004	R 1,048	0	0	R 0
18 May 2004	R 1,063	3	300	R 318,900
19 May 2004	R 1,054	0	0	R 0
20 May 2004	R 1,062	2	200	R 212,400
21 May 2004	R 1,055	0	0	R 0
24 May 2004	R 1,064	2	200	R 212,800
25 May 2004	R 1,076	1	100	R 107,600
26 May 2004	R 1,069	0	0	R 0
27 May 2004	R 1,057	0	0	R 0
28 May 2004	R 1,052	0	0	R 0
31 May 2004	R 1,055	4	400	R 422,000
01 June 2004	R 1,073	1	100	R 107,300
02 June 2004	R 1,086	1	100	R 108,600
03 June 2004	R 1,073	0	0	R 0
04 June 2004	R 1,071	0	0	R 0
07 June 2004	R 1,056	0	0	R 0
08 June 2004	R 1,059	4	400	R 423,600
09 June 2004	R 1,051	0	0	R 0
10 June 2004	R 1,044	0	0	R 0
11 June 2004	R 1,016	0	0	R 0

DATE	JULY WHITE MAIZE PRICE	CONTRACTS TRADED	TONNAGES TRADED	PRICE x TONNAGES
14 June 2004	R 1,017	4	400	R 406,800
15 June 2004	R 997	0	0	R 0
17 June 2004	R 962	0	0	R 0
18 June 2004	R 975	3	300	R 292,500
21 June 2004	R 930	0	0	R 0
22 June 2004	R 927	0	0	R 0
23 June 2004	R 906	0	0	R 0
24 June 2004	R 951	4	400	R 380,400
25 June 2004	R 953	1	100	R 95,300
28 June 2004	R 930	0	0	R 0
29 June 2004	R 927	0	0	R 0
30 June 2004	R 925	0	0	R 0
01 July 2004	R 910	0	0	R 0
02 July 2004	R 931	5	500	R 465,500
05 July 2004	R 923	0	0	R 0
06 July 2004	R 929	2	200	R 185,800
07 July 2004	R 924	0	0	R 0
08 July 2004	R 912	0	0	R 0
09 July 2004	R 906	0	0	R 0
12 July 2004	R 879	0	0	R 0
13 July 2004	R 881	5	500	R 440,500
14 July 2004	R 878	0	0	R 0
15 July 2004	R 863	0	0	R 0
16 July 2004	R 851	0	0	R 0
19 July 2004	R 810	0	0	R 0
20 July 2004	R 795	0	0	R 0
21 July 2004	R 827	6	600	R 496,200
AVERAGE PRICE INDEX	R 1,086.16			
MOMENTUM STRATEGY	R 1,084.39			
TONNAGES HEDGED	27,100			

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DATE	JULY WHITE MAIZE PRICE	CONTRACTS TRADED	TOHHAGES TRADED	PRICE x TOHHAGES
10 June 2004	R 1,200			
11 June 2004	R 1,185	0	0	R 0
14 June 2004	R 1,184	0	0	R 0
15 June 2004	R 1,161	0	0	R 0
17 June 2004	R 1,132	0	0	R 0
18 June 2004	R 1,132	5	500	R 566,000
21 June 2004	R 1,101	0	0	R 0
22 June 2004	R 1,095	0	0	R 0
23 June 2004	R 1,070	0	0	R 0
24 June 2004	R 1,070	4	400	R 428,000
25 June 2004	R 1,070	1	100	R 107,000
28 June 2004	R 1,070	1	100	R 107,000
29 June 2004	R 1,070	1	100	R 107,000
30 June 2004	R 1,070	1	100	R 107,000
01 July 2004	R 1,070	1	100	R 107,000
02 July 2004	R 1,084	1	100	R 108,400
05 July 2004	R 1,065	0	0	R 0
06 July 2004	R 1,065	2	200	R 213,000
07 July 2004	R 1,065	1	100	R 106,500
08 July 2004	R 1,045	0	0	R 0
09 July 2004	R 1,032	0	0	R 0
12 July 2004	R 1,019	0	0	R 0
13 July 2004	R 1,022	4	400	R 408,800
14 July 2004	R 1,016	0	0	R 0
15 July 2004	R 999	0	0	R 0
16 July 2004	R 989	0	0	R 0
19 July 2004	R 946	0	0	R 0
20 July 2004	R 930	0	0	R 0
21 July 2004	R 964	6	600	R 578,400
22 July 2004	R 965	1	100	R 96,500
23 July 2004	R 995	1	100	R 99,500
26 July 2004	R 987	0	0	R 0
27 July 2004	R 1,032	2	200	R 206,400
28 July 2004	R 1,044	1	100	R 104,400
29 July 2004	R 1,036	0	0	R 0
30 July 2004	R 1,023	0	0	R 0
02 August 2004	R 1,013	0	0	R 0
03 August 2004	R 1,058	4	400	R 423,200
04 August 2004	R 1,059	1	100	R 105,900
05 August 2004	R 1,049	0	0	R 0
06 August 2004	R 1,069	2	200	R 213,800
10 August 2004	R 1,048	0	0	R 0
11 August 2004	R 1,070	2	200	R 214,000
12 August 2004	R 1,042	0	0	R 0
13 August 2004	R 1,075	2	200	R 215,000
16 August 2004	R 1,053	0	0	R 0
17 August 2004	R 1,060	2	200	R 212,000
18 August 2004	R 1,060	1	100	R 106,000
19 August 2004	R 1,045	0	0	R 0

DATE	JULY WHITE MAIZE PRICE	CONTRACTS TRADED	TONNAGES TRADED	PRICE x TONNAGES
20 August 2004	R 1,055	2	200	R 211,000
23 August 2004	R 1,081	1	100	R 108,100
24 August 2004	R 1,110	1	100	R 111,000
25 August 2004	R 1,100	0	0	R 0
26 August 2004	R 1,093	0	0	R 0
27 August 2004	R 1,095	3	300	R 328,500
30 August 2004	R 1,095	1	100	R 109,500
31 August 2004	R 1,078	0	0	R 0
01 September 2004	R 1,033	0	0	R 0
02 September 2004	R 1,025	0	0	R 0
03 September 2004	R 1,024	0	0	R 0
06 September 2004	R 1,038	5	500	R 519,000
07 September 2004	R 1,031	0	0	R 0
08 September 2004	R 1,050	2	200	R 210,000
09 September 2004	R 1,052	1	100	R 105,200
10 September 2004	R 1,057	1	100	R 105,700
13 September 2004	R 1,034	0	0	R 0
14 September 2004	R 1,022	0	0	R 0
15 September 2004	R 1,020	0	0	R 0
16 September 2004	R 1,035	4	400	R 414,000
17 September 2004	R 1,023	0	0	R 0
20 September 2004	R 1,011	0	0	R 0
21 September 2004	R 1,003	0	0	R 0
22 September 2004	R 1,023	4	400	R 409,200
23 September 2004	R 1,030	1	100	R 103,000
27 September 2004	R 1,030	1	100	R 103,000
28 September 2004	R 1,025	0	0	R 0
29 September 2004	R 1,030	2	200	R 206,000
30 September 2004	R 1,020	0	0	R 0
01 October 2004	R 1,022	2	200	R 204,400
04 October 2004	R 1,023	1	100	R 102,300
05 October 2004	R 1,010	0	0	R 0
06 October 2004	R 965	0	0	R 0
07 October 2004	R 978	3	300	R 293,400
08 October 2004	R 967	0	0	R 0
11 October 2004	R 938	0	0	R 0
12 October 2004	R 953	3	300	R 285,900
13 October 2004	R 967	1	100	R 96,700
14 October 2004	R 956	0	0	R 0
15 October 2004	R 945	0	0	R 0
18 October 2004	R 965	3	300	R 289,500
19 October 2004	R 957	0	0	R 0
20 October 2004	R 965	2	200	R 193,000
21 October 2004	R 983	1	100	R 98,300
22 October 2004	R 982	0	0	R 0
25 October 2004	R 1,027	2	200	R 205,400
26 October 2004	R 1,065	1	100	R 106,500
27 October 2004	R 1,042	0	0	R 0
28 October 2004	R 1,048	2	200	R 209,600

DATE	JULY WHITE MAIZE PRICE	CONTRACTS TRADED	TONNAGES TRADED	PRICE x TONNAGES
29 October 2004	R 1,093	1	100	R 109,300
01 November 2004	R 1,100	1	100	R 110,000
02 November 2004	R 1,088	0	0	R 0
03 November 2004	R 1,059	0	0	R 0
04 November 2004	R 1,050	0	0	R 0
05 November 2004	R 1,040	0	0	R 0
08 November 2004	R 995	0	0	R 0
09 November 2004	R 998	6	600	R 598,800
10 November 2004	R 983	0	0	R 0
11 November 2004	R 1,007	2	200	R 201,400
12 November 2004	R 997	0	0	R 0
15 November 2004	R 1,042	2	200	R 208,400
16 November 2004	R 1,081	1	100	R 108,100
17 November 2004	R 1,050	0	0	R 0
18 November 2004	R 1,050	2	200	R 210,000
19 November 2004	R 1,062	1	100	R 106,200
22 November 2004	R 1,090	1	100	R 109,000
23 November 2004	R 1,087	0	0	R 0
24 November 2004	R 1,072	0	0	R 0
25 November 2004	R 1,075	3	300	R 322,500
26 November 2004	R 1,054	0	0	R 0
29 November 2004	R 1,009	0	0	R 0
30 November 2004	R 964	0	0	R 0
01 December 2004	R 944	0	0	R 0
02 December 2004	R 940	0	0	R 0
03 December 2004	R 927	0	0	R 0
06 December 2004	R 882	0	0	R 0
07 December 2004	R 902	8	800	R 721,600
08 December 2004	R 929	1	100	R 92,900
09 December 2004	R 904	0	0	R 0
10 December 2004	R 901	0	0	R 0
13 December 2004	R 917	3	300	R 275,100
14 December 2004	R 900	0	0	R 0
15 December 2004	R 906	2	200	R 181,200
17 December 2004	R 897	0	0	R 0
20 December 2004	R 852	0	0	R 0
21 December 2004	R 807	0	0	R 0
22 December 2004	R 804	0	0	R 0
23 December 2004	R 795	0	0	R 0
24 December 2004	R 798	6	600	R 478,800
28 December 2004	R 784	0	0	R 0
29 December 2004	R 767	0	0	R 0
30 December 2004	R 812	3	300	R 243,600
31 December 2004	R 816	1	100	R 81,600
03 January 2005	R 861	1	100	R 86,100
04 January 2005	R 855	0	0	R 0
05 January 2005	R 880	2	200	R 176,000
06 January 2005	R 845	0	0	R 0
07 January 2005	R 814	0	0	R 0

DATE	JULY WHITE MAIZE PRICE	CONTRACTS TRADED	TONNAGES TRADED	PRICE x TONNAGES
10 January 2005	R 769	0	0	R 0
11 January 2005	R 725	0	0	R 0
12 January 2005	R 742	5	500	R 371,000
13 January 2005	R 698	0	0	R 0
14 January 2005	R 709	2	200	R 141,800
17 January 2005	R 724	1	100	R 72,400
18 January 2005	R 697	0	0	R 0
19 January 2005	R 659	0	0	R 0
20 January 2005	R 678	3	300	R 203,400
21 January 2005	R 687	1	100	R 68,700
24 January 2005	R 648	0	0	R 0
25 January 2005	R 603	0	0	R 0
26 January 2005	R 580	0	0	R 0
27 January 2005	R 614	4	400	R 245,600
28 January 2005	R 615	1	100	R 61,500
31 January 2005	R 625	1	100	R 62,500
01 February 2005	R 621	0	0	R 0
02 February 2005	R 624	2	200	R 124,800
03 February 2005	R 638	1	100	R 63,800
04 February 2005	R 662	1	100	R 66,200
07 February 2005	R 672	1	100	R 67,200
08 February 2005	R 627	0	0	R 0
09 February 2005	R 601	0	0	R 0
10 February 2005	R 598	0	0	R 0
11 February 2005	R 605	4	400	R 242,000
14 February 2005	R 601	0	0	R 0
15 February 2005	R 595	0	0	R 0
16 February 2005	R 580	0	0	R 0
17 February 2005	R 579	0	0	R 0
18 February 2005	R 555	0	0	R 0
21 February 2005	R 536	0	0	R 0
22 February 2005	R 548	7	700	R 383,600
23 February 2005	R 542	0	0	R 0
24 February 2005	R 531	0	0	R 0
25 February 2005	R 522	0	0	R 0
28 February 2005	R 548	4	400	R 219,200
01 March 2005	R 538	0	0	R 0
02 March 2005	R 554	2	200	R 110,800
03 March 2005	R 561	1	100	R 56,100
04 March 2005	R 554	0	0	R 0
07 March 2005	R 544	0	0	R 0
08 March 2005	R 532	0	0	R 0
09 March 2005	R 537	4	400	R 214,800
10 March 2005	R 553	1	100	R 55,300
11 March 2005	R 581	1	100	R 58,100
14 March 2005	R 586	1	100	R 58,600
15 March 2005	R 594	1	100	R 59,400
16 March 2005	R 597	1	100	R 59,700
17 March 2005	R 587	0	0	R 0

DATE	JULY WHITE MAIZE PRICE	CONTRACTS TRADED	TONNAGES TRADED	PRICE x TONNAGES
18 March 2005	R 577	0	0	R 0
22 March 2005	R 559	0	0	R 0
23 March 2005	R 576	4	400	R 230,400
24 March 2005	R 570	0	0	R 0
29 March 2005	R 594	2	200	R 118,800
30 March 2005	R 592	0	0	R 0
31 March 2005	R 585	0	0	R 0
01 April 2005	R 580	0	0	R 0
04 April 2005	R 578	0	0	R 0
05 April 2005	R 587	5	500	R 293,500
06 April 2005	R 573	0	0	R 0
07 April 2005	R 583	2	200	R 116,600
08 April 2005	R 580	0	0	R 0
11 April 2005	R 570	0	0	R 0
12 April 2005	R 567	0	0	R 0
13 April 2005	R 563	0	0	R 0
14 April 2005	R 560	0	0	R 0
15 April 2005	R 570	6	600	R 342,000
18 April 2005	R 561	0	0	R 0
19 April 2005	R 556	0	0	R 0
20 April 2005	R 544	0	0	R 0
21 April 2005	R 543	0	0	R 0
22 April 2005	R 550	5	500	R 275,000
25 April 2005	R 550	1	100	R 55,000
26 April 2005	R 555	1	100	R 55,500
28 April 2005	R 558	1	100	R 55,800
29 April 2005	R 558	1	100	R 55,800
03 May 2005	R 564	1	100	R 56,400
04 May 2005	R 560	0	0	R 0
05 May 2005	R 551	0	0	R 0
06 May 2005	R 552	3	300	R 165,600
09 May 2005	R 561	1	100	R 56,100
10 May 2005	R 568	1	100	R 56,800
11 May 2005	R 567	0	0	R 0
12 May 2005	R 575	2	200	R 115,000
13 May 2005	R 579	1	100	R 57,900
16 May 2005	R 587	1	100	R 58,700
17 May 2005	R 586	0	0	R 0
18 May 2005	R 578	0	0	R 0
19 May 2005	R 564	0	0	R 0
20 May 2005	R 556	0	0	R 0
23 May 2005	R 577	5	500	R 288,500
24 May 2005	R 585	1	100	R 58,500
25 May 2005	R 579	0	0	R 0
26 May 2005	R 571	0	0	R 0
27 May 2005	R 588	3	300	R 176,400
30 May 2005	R 581	0	0	R 0
31 May 2005	R 593	2	200	R 118,600
01 June 2005	R 602	1	100	R 60,200

DATE	JULY WHITE MAIZE PRICE	CONTRACTS TRADED	TONNAGES TRADED	PRICE x TONNAGES
02 June 2005	R 603	1	100	R 60,300
03 June 2005	R 592	0	0	R 0
06 June 2005	R 591	0	0	R 0
07 June 2005	R 585	0	0	R 0
08 June 2005	R 591	4	400	R 236,400
09 June 2005	R 594	1	100	R 59,400
10 June 2005	R 588	0	0	R 0
13 June 2005	R 595	2	200	R 119,000
14 June 2005	R 594	0	0	R 0
15 June 2005	R 594	2	200	R 118,800
17 June 2005	R 588	0	0	R 0
20 June 2005	R 581	0	0	R 0
21 June 2005	R 582	3	300	R 174,600
22 June 2005	R 579	0	0	R 0
23 June 2005	R 569	0	0	R 0
24 June 2005	R 574	3	300	R 172,200
27 June 2005	R 574	1	100	R 57,400
28 June 2005	R 565	0	0	R 0
29 June 2005	R 569	2	200	R 113,800
30 June 2005	R 572	1	100	R 57,200
01 July 2005	R 577	1	100	R 57,700
04 July 2005	R 589	1	100	R 58,900
05 July 2005	R 598	1	100	R 59,800
06 July 2005	R 602	1	100	R 60,200
07 July 2005	R 587	0	0	R 0
08 July 2005	R 596	2	200	R 119,200
11 July 2005	R 592	0	0	R 0
12 July 2005	R 592	2	200	R 118,400
13 July 2005	R 590	0	0	R 0
14 July 2005	R 608	2	200	R 121,600
15 July 2005	R 612	1	100	R 61,200
18 July 2005	R 624	1	100	R 62,400
19 July 2005	R 636	1	100	R 63,600
20 July 2005	R 604	0	0	R 0
AVERAGE PRICE INDEX	R 810.74			
MOMENTUM STRATEGY	R 807.77			
TONNAGES HEDGED	27,700			

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DATE	JULY WHITE MAIZE PRICE	CONTRACTS TRADED	TOHHAGES TRADED	PRICE x TOHHAGES
29 March 2005	R 671			
30 March 2005	R 671	1	100	R 67,100
31 March 2005	R 674	1	100	R 67,400
01 April 2005	R 674	1	100	R 67,400
04 April 2005	R 674	1	100	R 67,400
05 April 2005	R 674	1	100	R 67,400
06 April 2005	R 698	1	100	R 69,800
07 April 2005	R 698	1	100	R 69,800
08 April 2005	R 698	1	100	R 69,800
11 April 2005	R 692	0	0	R 0
12 April 2005	R 693	2	200	R 138,600
13 April 2005	R 689	0	0	R 0
14 April 2005	R 685	0	0	R 0
15 April 2005	R 695	3	300	R 208,500
18 April 2005	R 687	0	0	R 0
19 April 2005	R 683	0	0	R 0
20 April 2005	R 675	0	0	R 0
21 April 2005	R 675	4	400	R 270,000
22 April 2005	R 678	1	100	R 67,800
25 April 2005	R 677	0	0	R 0
26 April 2005	R 683	2	200	R 136,600
28 April 2005	R 683	1	100	R 68,300
29 April 2005	R 683	1	100	R 68,300
03 May 2005	R 683	1	100	R 68,300
04 May 2005	R 683	1	100	R 68,300
05 May 2005	R 682	0	0	R 0
06 May 2005	R 682	2	200	R 136,400
09 May 2005	R 683	1	100	R 68,300
10 May 2005	R 690	1	100	R 69,000
11 May 2005	R 690	1	100	R 69,000
12 May 2005	R 675	0	0	R 0
13 May 2005	R 690	2	200	R 138,000
16 May 2005	R 695	1	100	R 69,500
17 May 2005	R 695	1	100	R 69,500
18 May 2005	R 695	1	100	R 69,500
19 May 2005	R 695	1	100	R 69,500
20 May 2005	R 680	0	0	R 0
23 May 2005	R 695	2	200	R 139,000
24 May 2005	R 695	1	100	R 69,500
25 May 2005	R 694	0	0	R 0
26 May 2005	R 694	2	200	R 138,800
27 May 2005	R 705	1	100	R 70,500
30 May 2005	R 705	1	100	R 70,500
31 May 2005	R 719	1	100	R 71,900
01 June 2005	R 719	1	100	R 71,900
02 June 2005	R 717	0	0	R 0
03 June 2005	R 704	0	0	R 0
06 June 2005	R 704	3	300	R 211,200
07 June 2005	R 700	0	0	R 0

DATE	JULY WHITE MAIZE PRICE	CONTRACTS TRADED	TONNAGES TRADED	PRICE x TONNAGES
08 June 2005	R 700	2	200	R 140,000
09 June 2005	R 715	1	100	R 71,500
10 June 2005	R 715	1	100	R 71,500
13 June 2005	R 715	1	100	R 71,500
14 June 2005	R 715	1	100	R 71,500
15 June 2005	R 707	0	0	R 0
17 June 2005	R 707	2	200	R 141,400
20 June 2005	R 707	1	100	R 70,700
21 June 2005	R 715	1	100	R 71,500
22 June 2005	R 714	0	0	R 0
23 June 2005	R 705	0	0	R 0
24 June 2005	R 705	3	300	R 211,500
27 June 2005	R 710	1	100	R 71,000
28 June 2005	R 699	0	0	R 0
29 June 2005	R 700	2	200	R 140,000
30 June 2005	R 703	1	100	R 70,300
01 July 2005	R 703	1	100	R 70,300
04 July 2005	R 707	1	100	R 70,700
05 July 2005	R 720	1	100	R 72,000
06 July 2005	R 728	1	100	R 72,800
07 July 2005	R 718	0	0	R 0
08 July 2005	R 718	2	200	R 143,600
11 July 2005	R 718	1	100	R 71,800
12 July 2005	R 717	0	0	R 0
13 July 2005	R 716	0	0	R 0
14 July 2005	R 732	3	300	R 219,600
15 July 2005	R 725	0	0	R 0
18 July 2005	R 733	2	200	R 146,600
19 July 2005	R 750	1	100	R 75,000
20 July 2005	R 733	0	0	R 0
21 July 2005	R 733	2	200	R 146,600
22 July 2005	R 733	1	100	R 73,300
25 July 2005	R 733	1	100	R 73,300
26 July 2005	R 741	1	100	R 74,100
27 July 2005	R 745	1	100	R 74,500
28 July 2005	R 745	1	100	R 74,500
29 July 2005	R 759	1	100	R 75,900
01 August 2005	R 759	1	100	R 75,900
02 August 2005	R 759	1	100	R 75,900
03 August 2005	R 757	0	0	R 0
04 August 2005	R 752	0	0	R 0
05 August 2005	R 749	0	0	R 0
08 August 2005	R 749	4	400	R 299,600
10 August 2005	R 749	1	100	R 74,900
11 August 2005	R 749	1	100	R 74,900
12 August 2005	R 750	1	100	R 75,000
15 August 2005	R 750	1	100	R 75,000
16 August 2005	R 752	1	100	R 75,200
17 August 2005	R 764	1	100	R 76,400

DATE	JULY WHITE MAIZE PRICE	CONTRACTS TRADED	TONNAGES TRADED	PRICE x TONNAGES
18 August 2005	R 762	0	0	R 0
19 August 2005	R 762	2	200	R 152,400
22 August 2005	R 775	1	100	R 77,500
23 August 2005	R 780	1	100	R 78,000
24 August 2005	R 796	1	100	R 79,600
25 August 2005	R 790	0	0	R 0
26 August 2005	R 797	2	200	R 159,400
29 August 2005	R 792	0	0	R 0
30 August 2005	R 797	2	200	R 159,400
31 August 2005	R 803	1	100	R 80,300
01 September 2005	R 815	1	100	R 81,500
02 September 2005	R 805	0	0	R 0
05 September 2005	R 797	0	0	R 0
06 September 2005	R 822	3	300	R 246,600
07 September 2005	R 825	1	100	R 82,500
08 September 2005	R 839	1	100	R 83,900
09 September 2005	R 860	1	100	R 86,000
12 September 2005	R 882	1	100	R 88,200
13 September 2005	R 839	0	0	R 0
14 September 2005	R 860	2	200	R 172,000
15 September 2005	R 842	0	0	R 0
16 September 2005	R 849	2	200	R 169,800
19 September 2005	R 877	1	100	R 87,700
20 September 2005	R 875	0	0	R 0
21 September 2005	R 864	0	0	R 0
22 September 2005	R 852	0	0	R 0
23 September 2005	R 866	4	400	R 346,400
26 September 2005	R 858	0	0	R 0
27 September 2005	R 866	2	200	R 173,200
28 September 2005	R 869	1	100	R 86,900
29 September 2005	R 867	0	0	R 0
30 September 2005	R 877	2	200	R 175,400
03 October 2005	R 904	1	100	R 90,400
04 October 2005	R 893	0	0	R 0
05 October 2005	R 893	2	200	R 178,600
06 October 2005	R 896	1	100	R 89,600
07 October 2005	R 897	1	100	R 89,700
10 October 2005	R 870	0	0	R 0
11 October 2005	R 851	0	0	R 0
12 October 2005	R 856	3	300	R 256,800
13 October 2005	R 875	1	100	R 87,500
14 October 2005	R 839	0	0	R 0
17 October 2005	R 846	2	200	R 169,200
18 October 2005	R 868	1	100	R 86,800
19 October 2005	R 874	1	100	R 87,400
20 October 2005	R 880	1	100	R 88,000
21 October 2005	R 890	1	100	R 89,000
24 October 2005	R 900	1	100	R 90,000
25 October 2005	R 880	0	0	R 0

DATE	JULY WHITE MAIZE PRICE	CONTRACTS TRADED	TONNAGES TRADED	PRICE x TONNAGES
26 October 2005	R 880	2	200	R 176,000
27 October 2005	R 875	0	0	R 0
28 October 2005	R 860	0	0	R 0
31 October 2005	R 880	3	300	R 264,000
01 November 2005	R 862	0	0	R 0
02 November 2005	R 862	2	200	R 172,400
03 November 2005	R 856	0	0	R 0
04 November 2005	R 867	2	200	R 173,400
07 November 2005	R 886	1	100	R 88,600
08 November 2005	R 890	1	100	R 89,000
09 November 2005	R 894	1	100	R 89,400
10 November 2005	R 898	1	100	R 89,800
11 November 2005	R 905	1	100	R 90,500
14 November 2005	R 950	1	100	R 95,000
15 November 2005	R 983	1	100	R 98,300
16 November 2005	R 971	0	0	R 0
17 November 2005	R 979	2	200	R 195,800
18 November 2005	R 969	0	0	R 0
21 November 2005	R 960	0	0	R 0
22 November 2005	R 1,005	3	300	R 301,500
23 November 2005	R 997	0	0	R 0
24 November 2005	R 956	0	0	R 0
25 November 2005	R 959	3	300	R 287,700
28 November 2005	R 988	1	100	R 98,800
29 November 2005	R 970	0	0	R 0
30 November 2005	R 980	2	200	R 196,000
01 December 2005	R 990	1	100	R 99,000
02 December 2005	R 998	1	100	R 99,800
05 December 2005	R 1,023	1	100	R 102,300
06 December 2005	R 1,022	0	0	R 0
07 December 2005	R 1,052	2	200	R 210,400
08 December 2005	R 1,067	1	100	R 106,700
09 December 2005	R 1,070	1	100	R 107,000
12 December 2005	R 1,115	1	100	R 111,500
13 December 2005	R 1,135	1	100	R 113,500
14 December 2005	R 1,127	0	0	R 0
15 December 2005	R 1,128	2	200	R 225,600
19 December 2005	R 1,173	1	100	R 117,300
20 December 2005	R 1,128	0	0	R 0
21 December 2005	R 1,120	0	0	R 0
22 December 2005	R 1,120	3	300	R 336,000
23 December 2005	R 1,150	1	100	R 115,000
27 December 2005	R 1,195	1	100	R 119,500
28 December 2005	R 1,154	0	0	R 0
29 December 2005	R 1,140	0	0	R 0
30 December 2005	R 1,095	0	0	R 0
03 January 2006	R 1,050	0	0	R 0
04 January 2006	R 1,079	5	500	R 539,500
05 January 2006	R 1,065	0	0	R 0

DATE	JULY WHITE MAIZE PRICE	CONTRACTS TRADED	TONNAGES TRADED	PRICE x TONNAGES
06 January 2006	R 1,110	2	200	R 222,000
09 January 2006	R 1,144	1	100	R 114,400
10 January 2006	R 1,151	1	100	R 115,100
11 January 2006	R 1,141	0	0	R 0
12 January 2006	R 1,096	0	0	R 0
13 January 2006	R 1,078	0	0	R 0
16 January 2006	R 1,081	4	400	R 432,400
17 January 2006	R 1,123	1	100	R 112,300
18 January 2006	R 1,116	0	0	R 0
19 January 2006	R 1,119	2	200	R 223,800
20 January 2006	R 1,141	1	100	R 114,100
23 January 2006	R 1,096	0	0	R 0
24 January 2006	R 1,088	0	0	R 0
25 January 2006	R 1,110	3	300	R 333,000
26 January 2006	R 1,091	0	0	R 0
27 January 2006	R 1,076	0	0	R 0
30 January 2006	R 1,036	0	0	R 0
31 January 2006	R 994	0	0	R 0
01 February 2006	R 962	0	0	R 0
02 February 2006	R 1,006	6	600	R 603,600
03 February 2006	R 1,007	1	100	R 100,700
06 February 2006	R 962	0	0	R 0
07 February 2006	R 933	0	0	R 0
08 February 2006	R 977	3	300	R 293,100
09 February 2006	R 984	1	100	R 98,400
10 February 2006	R 985	1	100	R 98,500
13 February 2006	R 988	1	100	R 98,800
14 February 2006	R 1,006	1	100	R 100,600
15 February 2006	R 1,006	1	100	R 100,600
16 February 2006	R 976	0	0	R 0
17 February 2006	R 992	2	200	R 198,400
20 February 2006	R 987	0	0	R 0
21 February 2006	R 978	0	0	R 0
22 February 2006	R 1,022	3	300	R 306,600
23 February 2006	R 1,019	0	0	R 0
24 February 2006	R 1,045	2	200	R 209,000
27 February 2006	R 1,090	1	100	R 109,000
28 February 2006	R 1,090	1	100	R 109,000
02 March 2006	R 1,092	1	100	R 109,200
03 March 2006	R 1,109	1	100	R 110,900
06 March 2006	R 1,132	1	100	R 113,200
07 March 2006	R 1,124	0	0	R 0
08 March 2006	R 1,096	0	0	R 0
09 March 2006	R 1,117	3	300	R 335,100
10 March 2006	R 1,127	1	100	R 112,700
13 March 2006	R 1,132	1	100	R 113,200
14 March 2006	R 1,126	0	0	R 0
15 March 2006	R 1,141	2	200	R 228,200
16 March 2006	R 1,132	0	0	R 0

DATE	JULY WHITE MAIZE PRICE	CONTRACTS TRADED	TONNAGES TRADED	PRICE x TONNAGES
17 March 2006	R 1,114	0	0	R 0
20 March 2006	R 1,129	3	300	R 338,700
22 March 2006	R 1,166	1	100	R 116,600
23 March 2006	R 1,159	0	0	R 0
24 March 2006	R 1,161	2	200	R 232,200
27 March 2006	R 1,163	1	100	R 116,300
28 March 2006	R 1,171	1	100	R 117,100
29 March 2006	R 1,164	0	0	R 0
30 March 2006	R 1,147	0	0	R 0
31 March 2006	R 1,146	0	0	R 0
03 April 2006	R 1,134	0	0	R 0
04 April 2006	R 1,113	0	0	R 0
05 April 2006	R 1,120	6	600	R 672,000
06 April 2006	R 1,105	0	0	R 0
07 April 2006	R 1,117	2	200	R 223,400
10 April 2006	R 1,122	1	100	R 112,200
11 April 2006	R 1,120	0	0	R 0
12 April 2006	R 1,119	0	0	R 0
13 April 2006	R 1,106	0	0	R 0
18 April 2006	R 1,077	0	0	R 0
19 April 2006	R 1,068	0	0	R 0
20 April 2006	R 1,080	6	600	R 648,000
21 April 2006	R 1,098	1	100	R 109,800
24 April 2006	R 1,093	0	0	R 0
25 April 2006	R 1,087	0	0	R 0
26 April 2006	R 1,099	3	300	R 329,700
28 April 2006	R 1,090	0	0	R 0
02 May 2006	R 1,094	2	200	R 218,800
03 May 2006	R 1,088	0	0	R 0
04 May 2006	R 1,089	2	200	R 217,800
05 May 2006	R 1,089	1	100	R 108,900
08 May 2006	R 1,088	0	0	R 0
09 May 2006	R 1,100	2	200	R 220,000
10 May 2006	R 1,140	1	100	R 114,000
11 May 2006	R 1,143	1	100	R 114,300
12 May 2006	R 1,169	1	100	R 116,900
15 May 2006	R 1,197	1	100	R 119,700
16 May 2006	R 1,187	0	0	R 0
17 May 2006	R 1,189	2	200	R 237,800
18 May 2006	R 1,206	1	100	R 120,600
19 May 2006	R 1,218	1	100	R 121,800
22 May 2006	R 1,216	0	0	R 0
23 May 2006	R 1,226	2	200	R 245,200
24 May 2006	R 1,216	0	0	R 0
25 May 2006	R 1,201	0	0	R 0
26 May 2006	R 1,209	3	300	R 362,700
29 May 2006	R 1,207	0	0	R 0
30 May 2006	R 1,221	2	200	R 244,200
31 May 2006	R 1,233	1	100	R 123,300

DATE	JULY WHITE MAIZE PRICE	CONTRACTS TRADED	TONNAGES TRADED	PRICE x TONNAGES
01 June 2006	R 1,244	1	100	R 124,400
02 June 2006	R 1,244	1	100	R 124,400
05 June 2006	R 1,266	1	100	R 126,600
06 June 2006	R 1,272	1	100	R 127,200
07 June 2006	R 1,270	0	0	R 0
08 June 2006	R 1,290	2	200	R 258,000
09 June 2006	R 1,285	0	0	R 0
12 June 2006	R 1,302	2	200	R 260,400
13 June 2006	R 1,335	1	100	R 133,500
14 June 2006	R 1,314	0	0	R 0
15 June 2006	R 1,295	0	0	R 0
19 June 2006	R 1,287	0	0	R 0
20 June 2006	R 1,270	0	0	R 0
21 June 2006	R 1,288	5	500	R 644,000
22 June 2006	R 1,320	1	100	R 132,000
23 June 2006	R 1,340	1	100	R 134,000
26 June 2006	R 1,333	0	0	R 0
27 June 2006	R 1,312	0	0	R 0
28 June 2006	R 1,337	3	300	R 401,100
29 June 2006	R 1,355	1	100	R 135,500
30 June 2006	R 1,361	1	100	R 136,100
03 July 2006	R 1,391	1	100	R 139,100
04 July 2006	R 1,380	0	0	R 0
05 July 2006	R 1,401	2	200	R 280,200
06 July 2006	R 1,400	0	0	R 0
07 July 2006	R 1,401	2	200	R 280,200
10 July 2006	R 1,384	0	0	R 0
11 July 2006	R 1,398	2	200	R 279,600
12 July 2006	R 1,390	0	0	R 0
13 July 2006	R 1,391	2	200	R 278,200
14 July 2006	R 1,390	0	0	R 0
17 July 2006	R 1,419	2	200	R 283,800
18 July 2006	R 1,416	0	0	R 0
19 July 2006	R 1,400	0	0	R 0
20 July 2006	R 1,403	3	300	R 420,900
AVERAGE PRICE INDEX	R 958.11			
MOMENTUM STRATEGY	R 959.72			
TONNAGES HEDGED	32,800			

APPENDIX IV
MAXIMUM PRICE STRATEGY 2001 – 2006
2001

(*A fixed level of volatility is used since no 2001 volatility data exists)

DATE	PRICE	VOLATILITY*	CALL-STRIKE	DAILY HEDGE	VOLUME BELOW MAXIMUM PRICE	VOLUME @ MAXIMUM PRICE	OPTION PREMIUM	NET OPTION COST	ADDITIONAL BROKING FEES @ R1/TON	DAILY PROCUREMENT PRICE
2000/05/05	R 670	30.0%	R 660				-R 71.50	-R 2,016,300.00	-R 28,200.00	
2000/05/08	R 670	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/05/09	R 665	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/05/10	R 665	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/05/11	R 665	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/05/12	R 670	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/05/15	R 690	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/05/16	R 690	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/05/17	R 690	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/05/18	R 690	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/05/19	R 690	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/05/22	R 690	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/05/23	R 690	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/05/24	R 690	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/05/25	R 690	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/05/26	R 690	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/05/29	R 690	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/05/30	R 685	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/05/31	R 685	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/06/01	R 686	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/06/02	R 686	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/06/05	R 686	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/06/06	R 690	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/06/07	R 690	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/06/08	R 690	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/06/09	R 700	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/06/12	R 700	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/06/13	R 685	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/06/14	R 685	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/06/15	R 682	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/06/19	R 682	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/06/20	R 682	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/06/21	R 675	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/06/22	R 675	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/06/23	R 672	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/06/26	R 655	30.0%	R 660	R 655	100	0	R 58.60	R 5,860.00	-R 100.00	-R 65,500.00
2000/06/27	R 660	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/06/28	R 657	30.0%	R 660	R 657	100	0	R 59.32	R 5,932.00	-R 100.00	-R 65,700.00
2000/06/29	R 650	30.0%	R 660	R 650	100	0	R 55.95	R 5,595.00	-R 100.00	-R 65,000.00
2000/06/30	R 648	30.0%	R 660	R 648	100	0	R 54.93	R 5,493.00	-R 100.00	-R 64,800.00
2000/07/03	R 638	30.0%	R 660	R 638	100	0	R 50.18	R 5,018.00	-R 100.00	-R 63,800.00
2000/07/04	R 636	30.0%	R 660	R 636	100	0	R 49.21	R 4,921.00	-R 100.00	-R 63,600.00
2000/07/05	R 633	30.0%	R 660	R 633	100	0	R 47.83	R 4,783.00	-R 100.00	-R 63,300.00
2000/07/06	R 630	30.0%	R 660	R 630	100	0	R 46.47	R 4,647.00	-R 100.00	-R 63,000.00
2000/07/07	R 630	30.0%	R 660	R 630	100	0	R 46.37	R 4,637.00	-R 100.00	-R 63,000.00
2000/07/10	R 624	30.0%	R 660	R 624	100	0	R 43.61	R 4,361.00	-R 100.00	-R 62,400.00
2000/07/11	R 625	30.0%	R 660	R 625	100	0	R 43.91	R 4,391.00	-R 100.00	-R 62,500.00
2000/07/12	R 617	30.0%	R 660	R 617	100	0	R 40.66	R 4,066.00	-R 100.00	-R 61,700.00
2000/07/13	R 620	30.0%	R 660	R 620	100	0	R 41.72	R 4,172.00	-R 100.00	-R 62,000.00
2000/07/14	R 624	30.0%	R 660	R 624	100	0	R 43.20	R 4,320.00	-R 100.00	-R 62,400.00
2000/07/17	R 625	30.0%	R 660	R 625	100	0	R 43.29	R 4,329.00	-R 100.00	-R 62,500.00
2000/07/18	R 630	30.0%	R 660	R 630	100	0	R 45.21	R 4,521.00	-R 100.00	-R 63,000.00
2000/07/19	R 622	30.0%	R 660	R 622	100	0	R 41.89	R 4,189.00	-R 100.00	-R 62,200.00
2000/07/20	R 619	30.0%	R 660	R 619	100	0	R 40.61	R 4,061.00	-R 100.00	-R 61,900.00
2000/07/21	R 625	30.0%	R 660	R 625	100	0	R 42.87	R 4,287.00	-R 100.00	-R 62,500.00
2000/07/24	R 625	30.0%	R 660	R 625	100	0	R 42.55	R 4,255.00	-R 100.00	-R 62,500.00
2000/07/25	R 625	30.0%	R 660	R 625	100	0	R 42.44	R 4,244.00	-R 100.00	-R 62,500.00
2000/07/26	R 625	30.0%	R 660	R 625	100	0	R 42.34	R 4,234.00	-R 100.00	-R 62,500.00
2000/07/27	R 628	30.0%	R 660	R 628	100	0	R 43.43	R 4,343.00	-R 100.00	-R 62,800.00
2000/07/28	R 630	30.0%	R 660	R 630	100	0	R 44.14	R 4,414.00	-R 100.00	-R 63,000.00
2000/07/31	R 626	30.0%	R 660	R 626	100	0	R 42.20	R 4,220.00	-R 100.00	-R 62,600.00
2000/08/01	R 627	30.0%	R 660	R 627	100	0	R 42.49	R 4,249.00	-R 100.00	-R 62,700.00
2000/08/02	R 632	30.0%	R 660	R 632	100	0	R 44.41	R 4,441.00	-R 100.00	-R 63,200.00
2000/08/03	R 629	30.0%	R 660	R 629	100	0	R 43.08	R 4,308.00	-R 100.00	-R 62,900.00
2000/08/04	R 629	30.0%	R 660	R 629	100	0	R 42.97	R 4,297.00	-R 100.00	-R 62,900.00
2000/08/07	R 624	30.0%	R 660	R 624	100	0	R 40.66	R 4,066.00	-R 100.00	-R 62,400.00
2000/08/08	R 624	30.0%	R 660	R 624	100	0	R 40.56	R 4,056.00	-R 100.00	-R 62,400.00
2000/08/10	R 612	30.0%	R 660	R 612	100	0	R 35.82	R 3,582.00	-R 100.00	-R 61,200.00

DATE	PRICE	VOLATILITY	CALL-STRIKE	DAILY HEDGE	VOLUME BELOW MAXIMUM PRICE	VOLUME @ MAXIMUM PRICE	OPTION PREMIUM	NET OPTION COST	ADDITIONAL BROKING FEES @ R1/TON	DAILY PROCUREMENT PRICE
2000/08/11	R 599	30.0%	R 660	R 599	100	0	R 31.19	R 3,119.00	-R 100.00	-R 59,900.00
2000/08/14	R 599	30.0%	R 660	R 599	100	0	R 30.89	R 3,089.00	-R 100.00	-R 59,900.00
2000/08/15	R 602	30.0%	R 660	R 602	100	0	R 31.80	R 3,180.00	-R 100.00	-R 60,200.00
2000/08/16	R 608	30.0%	R 660	R 608	100	0	R 33.77	R 3,377.00	-R 100.00	-R 60,800.00
2000/08/17	R 600	30.0%	R 660	R 600	100	0	R 30.93	R 3,093.00	-R 100.00	-R 60,000.00
2000/08/18	R 604	30.0%	R 660	R 604	100	0	R 32.18	R 3,218.00	-R 100.00	-R 60,400.00
2000/08/21	R 599	30.0%	R 660	R 599	100	0	R 30.20	R 3,020.00	-R 100.00	-R 59,900.00
2000/08/22	R 604	30.0%	R 660	R 604	100	0	R 31.77	R 3,177.00	-R 100.00	-R 60,400.00
2000/08/23	R 603	30.0%	R 660	R 603	100	0	R 31.33	R 3,133.00	-R 100.00	-R 60,300.00
2000/08/24	R 603	30.0%	R 660	R 603	100	0	R 31.23	R 3,123.00	-R 100.00	-R 60,300.00
2000/08/25	R 603	30.0%	R 660	R 603	100	0	R 31.13	R 3,113.00	-R 100.00	-R 60,300.00
2000/08/28	R 601	30.0%	R 660	R 601	100	0	R 30.16	R 3,016.00	-R 100.00	-R 60,100.00
2000/08/29	R 605	30.0%	R 660	R 605	100	0	R 31.40	R 3,140.00	-R 100.00	-R 60,500.00
2000/08/30	R 618	30.0%	R 660	R 618	100	0	R 35.90	R 3,590.00	-R 100.00	-R 61,800.00
2000/08/31	R 620	30.0%	R 660	R 620	100	0	R 36.53	R 3,653.00	-R 100.00	-R 62,000.00
2000/09/01	R 619	30.0%	R 660	R 619	100	0	R 36.05	R 3,605.00	-R 100.00	-R 61,900.00
2000/09/04	R 612	30.0%	R 660	R 612	100	0	R 33.19	R 3,319.00	-R 100.00	-R 61,200.00
2000/09/05	R 617	30.0%	R 660	R 617	100	0	R 34.88	R 3,488.00	-R 100.00	-R 61,700.00
2000/09/06	R 625	30.0%	R 660	R 625	100	0	R 37.75	R 3,775.00	-R 100.00	-R 62,500.00
2000/09/07	R 626	30.0%	R 660	R 626	100	0	R 38.02	R 3,802.00	-R 100.00	-R 62,600.00
2000/09/08	R 620	30.0%	R 660	R 620	100	0	R 35.65	R 3,565.00	-R 100.00	-R 62,000.00
2000/09/11	R 625	30.0%	R 660	R 625	100	0	R 37.19	R 3,719.00	-R 100.00	-R 62,500.00
2000/09/12	R 629	30.0%	R 660	R 629	100	0	R 38.62	R 3,862.00	-R 100.00	-R 62,900.00
2000/09/13	R 626	30.0%	R 660	R 626	100	0	R 37.34	R 3,734.00	-R 100.00	-R 62,600.00
2000/09/14	R 624	30.0%	R 660	R 624	100	0	R 36.47	R 3,647.00	-R 100.00	-R 62,400.00
2000/09/15	R 622	30.0%	R 660	R 622	100	0	R 35.61	R 3,561.00	-R 100.00	-R 62,200.00
2000/09/18	R 627	30.0%	R 660	R 627	100	0	R 37.15	R 3,715.00	-R 100.00	-R 62,700.00
2000/09/19	R 632	30.0%	R 660	R 632	100	0	R 38.98	R 3,898.00	-R 100.00	-R 63,200.00
2000/09/20	R 625	30.0%	R 660	R 625	100	0	R 36.16	R 3,616.00	-R 100.00	-R 62,500.00
2000/09/21	R 629	30.0%	R 660	R 629	100	0	R 37.57	R 3,757.00	-R 100.00	-R 62,900.00
2000/09/22	R 627	30.0%	R 660	R 627	100	0	R 36.69	R 3,669.00	-R 100.00	-R 62,700.00
2000/09/26	R 626	30.0%	R 660	R 626	100	0	R 35.84	R 3,584.00	-R 100.00	-R 62,600.00
2000/09/27	R 626	30.0%	R 660	R 626	100	0	R 35.73	R 3,573.00	-R 100.00	-R 62,600.00
2000/09/28	R 628	30.0%	R 660	R 628	100	0	R 36.37	R 3,637.00	-R 100.00	-R 62,800.00
2000/09/29	R 632	30.0%	R 660	R 632	100	0	R 37.79	R 3,779.00	-R 100.00	-R 63,200.00
2000/10/02	R 635	30.0%	R 660	R 635	100	0	R 38.61	R 3,861.00	-R 100.00	-R 63,500.00
2000/10/03	R 643	30.0%	R 660	R 643	100	0	R 41.74	R 4,174.00	-R 100.00	-R 64,300.00
2000/10/04	R 665	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/10/05	R 668	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/10/06	R 659	30.0%	R 660	R 659	100	0	R 48.31	R 4,831.00	-R 100.00	-R 65,900.00
2000/10/09	R 657	30.0%	R 660	R 657	100	0	R 47.02	R 4,702.00	-R 100.00	-R 65,700.00
2000/10/10	R 655	30.0%	R 660	R 655	100	0	R 46.00	R 4,600.00	-R 100.00	-R 65,500.00
2000/10/11	R 655	30.0%	R 660	R 655	100	0	R 45.87	R 4,587.00	-R 100.00	-R 65,500.00
2000/10/12	R 662	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/10/13	R 682	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/10/16	R 679	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/10/17	R 686	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/10/18	R 694	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/10/19	R 697	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/10/20	R 688	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/10/23	R 676	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/10/24	R 672	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/10/25	R 682	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/10/26	R 690	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/10/27	R 682	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/10/30	R 693	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/10/31	R 695	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/11/01	R 694	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/11/02	R 703	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/11/03	R 712	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/11/06	R 706	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/11/07	R 710	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/11/08	R 725	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/11/09	R 732	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/11/10	R 714	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/11/13	R 695	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/11/14	R 693	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/11/15	R 705	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/11/16	R 720	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/11/17	R 722	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/11/20	R 729	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/11/21	R 738	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/11/22	R 741	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/11/23	R 739	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/11/24	R 744	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/11/27	R 744	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/11/28	R 740	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/11/29	R 736	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2000/11/30	R 706	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00

DATE	PRICE	VOLATILITY	CALL-STRIKE	DAILY HEDGE	VOLUME BELOW MAXIMUM PRICE	VOLUME @ MAXIMUM PRICE	OPTION PREMIUM	NET OPTION COST	ADDITIONAL BROKING FEES @ R1/TON	DAILY PROCUREMENT PRICE
2001/04/02	R 815	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/04/03	R 817	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/04/04	R 818	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/04/05	R 827	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/04/06	R 845	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/04/09	R 846	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/04/10	R 835	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/04/11	R 830	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/04/12	R 832	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/04/17	R 840	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/04/18	R 831	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/04/19	R 826	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/04/20	R 822	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/04/23	R 823	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/04/24	R 813	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/04/25	R 804	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/04/26	R 809	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/04/30	R 807	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/05/02	R 816	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/05/03	R 812	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/05/04	R 808	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/05/07	R 788	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/05/08	R 781	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/05/09	R 771	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/05/10	R 767	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/05/11	R 754	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/05/14	R 760	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/05/15	R 764	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/05/16	R 757	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/05/17	R 750	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/05/18	R 751	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/05/21	R 737	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/05/22	R 744	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/05/23	R 758	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/05/24	R 758	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/05/25	R 756	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/05/28	R 744	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/05/29	R 743	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/05/30	R 750	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/05/31	R 756	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/06/01	R 766	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/06/04	R 766	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/06/05	R 768	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/06/06	R 761	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/06/07	R 777	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/06/08	R 782	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/06/11	R 796	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/06/12	R 794	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/06/13	R 784	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/06/14	R 794	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/06/15	R 784	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/06/18	R 777	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/06/19	R 779	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/06/20	R 775	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/06/21	R 795	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/06/22	R 796	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
2001/06/25	R 787	30.0%	R 660	R 660	0	100		R 0.00	R 0.00	-R 66,000.00
								-R 1,723,907.00	-R 35,500.00	-R 18,355,300.00
Total procurement price	-R 18,355,300.00									
Total option cost	-R 1,723,907.00									
Additional broking fees	-R 35,500.00									
Net procurement cost	-R 20,114,707.00									
Average Price Index	R 739.40									
Maximum price strategy	R 713.29									
Tonnages hedged	28,200									

2002

(*A fixed level of volatility is used up until 2 January 2002 due to non-existence of data)

DATE	PRICE	VOLATILITY*	CALL-STRIKE	DAILY HEDGE	VOLUME BELOW MAXIMUM PRICE	VOLUME @ MAXIMUM PRICE	OPTION PREMIUM	NET OPTION COST	ADDITIONAL BROKING FEES @ R1/TON	DAILY PROCUREMENT PRICE
2001/02/21	R 1,030	39.0%	R 1,020				-R 187.89	-R 6,200,370.00	-R 33,000.00	R 0.00
2001/02/22	R 1,015	39.0%	R 1,020	R 1,015	100	0	R 178.84	R 17,884.00	-R 100.00	-R 101,500.00
2001/02/23	R 950	39.0%	R 1,020	R 950	100	0	R 142.51	R 14,251.00	-R 100.00	-R 95,000.00
2001/02/26	R 880	39.0%	R 1,020	R 880	100	0	R 107.49	R 10,749.00	-R 100.00	-R 88,000.00
2001/02/27	R 870	39.0%	R 1,020	R 870	100	0	R 102.80	R 10,280.00	-R 100.00	-R 87,000.00
2001/02/28	R 870	39.0%	R 1,020	R 870	100	0	R 102.64	R 10,264.00	-R 100.00	-R 87,000.00
2001/03/01	R 870	39.0%	R 1,020	R 870	100	0	R 102.48	R 10,248.00	-R 100.00	-R 87,000.00
2001/03/02	R 870	39.0%	R 1,020	R 870	100	0	R 102.32	R 10,232.00	-R 100.00	-R 87,000.00
2001/03/05	R 870	39.0%	R 1,020	R 870	100	0	R 101.84	R 10,184.00	-R 100.00	-R 87,000.00
2001/03/07	R 880	39.0%	R 1,020	R 880	100	0	R 106.03	R 10,603.00	-R 100.00	-R 88,000.00
2001/03/08	R 880	39.0%	R 1,020	R 880	100	0	R 105.86	R 10,586.00	-R 100.00	-R 88,000.00
2001/03/09	R 880	39.0%	R 1,020	R 880	100	0	R 105.70	R 10,570.00	-R 100.00	-R 88,000.00
2001/03/12	R 880	39.0%	R 1,020	R 880	100	0	R 105.21	R 10,521.00	-R 100.00	-R 88,000.00
2001/03/13	R 865	39.0%	R 1,020	R 865	100	0	R 98.33	R 9,833.00	-R 100.00	-R 86,500.00
2001/03/14	R 865	39.0%	R 1,020	R 865	100	0	R 98.17	R 9,817.00	-R 100.00	-R 86,500.00
2001/03/15	R 865	39.0%	R 1,020	R 865	100	0	R 98.01	R 9,801.00	-R 100.00	-R 86,500.00
2001/03/16	R 858	39.0%	R 1,020	R 858	100	0	R 94.81	R 9,481.00	-R 100.00	-R 85,800.00
2001/03/19	R 858	39.0%	R 1,020	R 858	100	0	R 94.33	R 9,433.00	-R 100.00	-R 85,800.00
2001/03/20	R 860	39.0%	R 1,020	R 860	100	0	R 95.03	R 9,503.00	-R 100.00	-R 86,000.00
2001/03/22	R 840	39.0%	R 1,020	R 840	100	0	R 86.28	R 8,628.00	-R 100.00	-R 84,000.00
2001/03/23	R 835	39.0%	R 1,020	R 835	100	0	R 84.08	R 8,408.00	-R 100.00	-R 83,500.00
2001/03/26	R 830	39.0%	R 1,020	R 830	100	0	R 81.61	R 8,161.00	-R 100.00	-R 83,000.00
2001/03/27	R 840	39.0%	R 1,020	R 840	100	0	R 85.50	R 8,550.00	-R 100.00	-R 84,000.00
2001/03/28	R 840	39.0%	R 1,020	R 840	100	0	R 85.34	R 8,534.00	-R 100.00	-R 84,000.00
2001/03/29	R 840	39.0%	R 1,020	R 840	100	0	R 85.19	R 8,519.00	-R 100.00	-R 84,000.00
2001/03/30	R 835	39.0%	R 1,020	R 835	100	0	R 83.00	R 8,300.00	-R 100.00	-R 83,500.00
2001/04/02	R 841	39.0%	R 1,020	R 841	100	0	R 84.97	R 8,497.00	-R 100.00	-R 84,100.00
2001/04/03	R 841	39.0%	R 1,020	R 841	100	0	R 84.81	R 8,481.00	-R 100.00	-R 84,100.00
2001/04/04	R 841	39.0%	R 1,020	R 841	100	0	R 84.65	R 8,465.00	-R 100.00	-R 84,100.00
2001/04/05	R 841	39.0%	R 1,020	R 841	100	0	R 84.49	R 8,449.00	-R 100.00	-R 84,100.00
2001/04/06	R 845	39.0%	R 1,020	R 845	100	0	R 85.97	R 8,597.00	-R 100.00	-R 84,500.00
2001/04/09	R 840	39.0%	R 1,020	R 840	100	0	R 83.45	R 8,345.00	-R 100.00	-R 84,000.00
2001/04/10	R 840	39.0%	R 1,020	R 840	100	0	R 83.30	R 8,330.00	-R 100.00	-R 84,000.00
2001/04/11	R 840	39.0%	R 1,020	R 840	100	0	R 83.14	R 8,314.00	-R 100.00	-R 84,000.00
2001/04/12	R 840	39.0%	R 1,020	R 840	100	0	R 82.98	R 8,298.00	-R 100.00	-R 84,000.00
2001/04/17	R 847	39.0%	R 1,020	R 847	100	0	R 85.03	R 8,503.00	-R 100.00	-R 84,700.00
2001/04/18	R 841	39.0%	R 1,020	R 841	100	0	R 82.43	R 8,243.00	-R 100.00	-R 84,100.00
2001/04/19	R 842	39.0%	R 1,020	R 842	100	0	R 82.67	R 8,267.00	-R 100.00	-R 84,200.00
2001/04/20	R 842	39.0%	R 1,020	R 842	100	0	R 82.51	R 8,251.00	-R 100.00	-R 84,200.00
2001/04/23	R 845	39.0%	R 1,020	R 845	100	0	R 83.24	R 8,324.00	-R 100.00	-R 84,500.00
2001/04/24	R 845	39.0%	R 1,020	R 845	100	0	R 83.08	R 8,308.00	-R 100.00	-R 84,500.00
2001/04/25	R 845	39.0%	R 1,020	R 845	100	0	R 82.92	R 8,292.00	-R 100.00	-R 84,500.00
2001/04/26	R 845	39.0%	R 1,020	R 845	100	0	R 82.76	R 8,276.00	-R 100.00	-R 84,500.00
2001/04/30	R 845	39.0%	R 1,020	R 845	100	0	R 82.11	R 8,211.00	-R 100.00	-R 84,500.00
2001/05/02	R 845	39.0%	R 1,020	R 845	100	0	R 81.78	R 8,178.00	-R 100.00	-R 84,500.00
2001/05/03	R 847	39.0%	R 1,020	R 847	100	0	R 82.43	R 8,243.00	-R 100.00	-R 84,700.00
2001/05/04	R 847	39.0%	R 1,020	R 847	100	0	R 82.26	R 8,226.00	-R 100.00	-R 84,700.00
2001/05/07	R 850	39.0%	R 1,020	R 850	100	0	R 82.99	R 8,299.00	-R 100.00	-R 85,000.00
2001/05/08	R 850	39.0%	R 1,020	R 850	100	0	R 82.82	R 8,282.00	-R 100.00	-R 85,000.00
2001/05/09	R 830	39.0%	R 1,020	R 830	100	0	R 74.72	R 7,472.00	-R 100.00	-R 83,000.00
2001/05/10	R 830	39.0%	R 1,020	R 830	100	0	R 74.56	R 7,456.00	-R 100.00	-R 83,000.00
2001/05/11	R 830	39.0%	R 1,020	R 830	100	0	R 74.40	R 7,440.00	-R 100.00	-R 83,000.00
2001/05/14	R 830	39.0%	R 1,020	R 830	100	0	R 73.92	R 7,392.00	-R 100.00	-R 83,000.00
2001/05/15	R 830	39.0%	R 1,020	R 830	100	0	R 73.76	R 7,376.00	-R 100.00	-R 83,000.00
2001/05/16	R 830	39.0%	R 1,020	R 830	100	0	R 73.60	R 7,360.00	-R 100.00	-R 83,000.00
2001/05/17	R 830	39.0%	R 1,020	R 830	100	0	R 73.44	R 7,344.00	-R 100.00	-R 83,000.00
2001/05/18	R 830	39.0%	R 1,020	R 830	100	0	R 73.28	R 7,328.00	-R 100.00	-R 83,000.00
2001/05/21	R 830	39.0%	R 1,020	R 830	100	0	R 72.80	R 7,280.00	-R 100.00	-R 83,000.00
2001/05/22	R 830	39.0%	R 1,020	R 830	100	0	R 72.63	R 7,263.00	-R 100.00	-R 83,000.00
2001/05/23	R 828	39.0%	R 1,020	R 828	100	0	R 71.71	R 7,171.00	-R 100.00	-R 82,800.00
2001/05/24	R 828	39.0%	R 1,020	R 828	100	0	R 71.55	R 7,155.00	-R 100.00	-R 82,800.00
2001/05/25	R 830	39.0%	R 1,020	R 830	100	0	R 72.15	R 7,215.00	-R 100.00	-R 83,000.00
2001/05/28	R 830	39.0%	R 1,020	R 830	100	0	R 71.66	R 7,166.00	-R 100.00	-R 83,000.00
2001/05/29	R 835	39.0%	R 1,020	R 835	100	0	R 73.41	R 7,341.00	-R 100.00	-R 83,500.00
2001/05/30	R 835	39.0%	R 1,020	R 835	100	0	R 73.24	R 7,324.00	-R 100.00	-R 83,500.00
2001/05/31	R 835	39.0%	R 1,020	R 835	100	0	R 73.08	R 7,308.00	-R 100.00	-R 83,500.00
2001/06/01	R 835	39.0%	R 1,020	R 835	100	0	R 72.91	R 7,291.00	-R 100.00	-R 83,500.00
2001/06/04	R 835	39.0%	R 1,020	R 835	100	0	R 72.41	R 7,241.00	-R 100.00	-R 83,500.00
2001/06/05	R 835	39.0%	R 1,020	R 835	100	0	R 72.25	R 7,225.00	-R 100.00	-R 83,500.00
2001/06/06	R 830	39.0%	R 1,020	R 830	100	0	R 70.19	R 7,019.00	-R 100.00	-R 83,000.00
2001/06/07	R 840	39.0%	R 1,020	R 840	100	0	R 73.84	R 7,384.00	-R 100.00	-R 84,000.00
2001/06/08	R 850	39.0%	R 1,020	R 850	100	0	R 77.59	R 7,759.00	-R 100.00	-R 85,000.00
2001/06/11	R 850	39.0%	R 1,020	R 850	100	0	R 77.08	R 7,708.00	-R 100.00	-R 85,000.00

DATE	PRICE	VOLATILITY*	CALL-STRIKE	DAILY HEDGE	VOLUME BELOW MAXIMUM PRICE	VOLUME @ MAXIMUM PRICE	OPTION PREMIUM	NET OPTION COST	ADDITIONAL BROKING FEES @ R1/TON	DAILY PROCUREMENT PRICE
2001/06/12	R 850	39.0%	R 1,020	R 850	100	0	R 76.91	R 7,691.00	-R 100.00	-R 85,000.00
2001/06/13	R 850	39.0%	R 1,020	R 850	100	0	R 76.73	R 7,673.00	-R 100.00	-R 85,000.00
2001/06/14	R 850	39.0%	R 1,020	R 850	100	0	R 76.56	R 7,656.00	-R 100.00	-R 85,000.00
2001/06/15	R 845	39.0%	R 1,020	R 845	100	0	R 74.42	R 7,442.00	-R 100.00	-R 84,500.00
2001/06/18	R 845	39.0%	R 1,020	R 845	100	0	R 73.91	R 7,391.00	-R 100.00	-R 84,500.00
2001/06/19	R 835	39.0%	R 1,020	R 835	100	0	R 69.91	R 6,991.00	-R 100.00	-R 83,500.00
2001/06/20	R 835	39.0%	R 1,020	R 835	100	0	R 69.74	R 6,974.00	-R 100.00	-R 83,500.00
2001/06/21	R 840	39.0%	R 1,020	R 840	100	0	R 71.47	R 7,147.00	-R 100.00	-R 84,000.00
2001/06/22	R 845	39.0%	R 1,020	R 845	100	0	R 73.22	R 7,322.00	-R 100.00	-R 84,500.00
2001/06/25	R 845	39.0%	R 1,020	R 845	100	0	R 72.70	R 7,270.00	-R 100.00	-R 84,500.00
2001/06/26	R 855	39.0%	R 1,020	R 855	100	0	R 76.45	R 7,645.00	-R 100.00	-R 85,500.00
2001/06/27	R 860	39.0%	R 1,020	R 860	100	0	R 78.27	R 7,827.00	-R 100.00	-R 86,000.00
2001/06/28	R 845	39.0%	R 1,020	R 845	100	0	R 72.18	R 7,218.00	-R 100.00	-R 84,500.00
2001/06/29	R 843	39.0%	R 1,020	R 843	100	0	R 71.24	R 7,124.00	-R 100.00	-R 84,300.00
2001/07/02	R 843	39.0%	R 1,020	R 843	100	0	R 70.72	R 7,072.00	-R 100.00	-R 84,300.00
2001/07/03	R 837	39.0%	R 1,020	R 837	100	0	R 68.28	R 6,828.00	-R 100.00	-R 83,700.00
2001/07/04	R 842	39.0%	R 1,020	R 842	100	0	R 69.99	R 6,999.00	-R 100.00	-R 84,200.00
2001/07/05	R 845	39.0%	R 1,020	R 845	100	0	R 70.96	R 7,096.00	-R 100.00	-R 84,500.00
2001/07/06	R 850	39.0%	R 1,020	R 850	100	0	R 72.72	R 7,272.00	-R 100.00	-R 85,000.00
2001/07/09	R 850	39.0%	R 1,020	R 850	100	0	R 72.18	R 7,218.00	-R 100.00	-R 85,000.00
2001/07/10	R 865	39.0%	R 1,020	R 865	100	0	R 77.94	R 7,794.00	-R 100.00	-R 86,500.00
2001/07/11	R 877	39.0%	R 1,020	R 877	100	0	R 82.69	R 8,269.00	-R 100.00	-R 87,700.00
2001/07/12	R 880	39.0%	R 1,020	R 880	100	0	R 83.77	R 8,377.00	-R 100.00	-R 88,000.00
2001/07/13	R 893	39.0%	R 1,020	R 893	100	0	R 89.15	R 8,915.00	-R 100.00	-R 89,300.00
2001/07/17	R 900	39.0%	R 1,020	R 900	100	0	R 91.45	R 9,145.00	-R 100.00	-R 90,000.00
2001/07/18	R 876	39.0%	R 1,020	R 876	100	0	R 80.96	R 8,096.00	-R 100.00	-R 87,600.00
2001/07/19	R 870	39.0%	R 1,020	R 870	100	0	R 78.31	R 7,831.00	-R 100.00	-R 87,000.00
2001/07/20	R 860	39.0%	R 1,020	R 860	100	0	R 74.11	R 7,411.00	-R 100.00	-R 86,000.00
2001/07/23	R 850	39.0%	R 1,020	R 850	100	0	R 69.68	R 6,968.00	-R 100.00	-R 85,000.00
2001/07/24	R 859	39.0%	R 1,020	R 859	100	0	R 72.98	R 7,298.00	-R 100.00	-R 85,900.00
2001/07/25	R 867	39.0%	R 1,020	R 867	100	0	R 75.97	R 7,597.00	-R 100.00	-R 86,700.00
2001/07/26	R 881	39.0%	R 1,020	R 881	100	0	R 81.52	R 8,152.00	-R 100.00	-R 88,100.00
2001/07/27	R 888	39.0%	R 1,020	R 888	100	0	R 84.28	R 8,428.00	-R 100.00	-R 88,800.00
2001/07/30	R 884	39.0%	R 1,020	R 884	100	0	R 82.00	R 8,200.00	-R 100.00	-R 88,400.00
2001/07/31	R 880	39.0%	R 1,020	R 880	100	0	R 80.14	R 8,014.00	-R 100.00	-R 88,000.00
2001/08/01	R 880	39.0%	R 1,020	R 880	100	0	R 79.94	R 7,994.00	-R 100.00	-R 88,000.00
2001/08/02	R 877	39.0%	R 1,020	R 877	100	0	R 78.51	R 7,851.00	-R 100.00	-R 87,700.00
2001/08/03	R 885	39.0%	R 1,020	R 885	100	0	R 81.64	R 8,164.00	-R 100.00	-R 88,500.00
2001/08/06	R 880	39.0%	R 1,020	R 880	100	0	R 78.97	R 7,897.00	-R 100.00	-R 88,000.00
2001/08/07	R 884	39.0%	R 1,020	R 884	100	0	R 80.44	R 8,044.00	-R 100.00	-R 88,400.00
2001/08/08	R 879	39.0%	R 1,020	R 879	100	0	R 78.17	R 7,817.00	-R 100.00	-R 87,900.00
2001/08/10	R 892	39.0%	R 1,020	R 892	100	0	R 83.22	R 8,322.00	-R 100.00	-R 89,200.00
2001/08/13	R 895	39.0%	R 1,020	R 895	100	0	R 83.90	R 8,390.00	-R 100.00	-R 89,500.00
2001/08/14	R 903	39.0%	R 1,020	R 903	100	0	R 87.16	R 8,716.00	-R 100.00	-R 90,300.00
2001/08/15	R 899	39.0%	R 1,020	R 899	100	0	R 85.21	R 8,521.00	-R 100.00	-R 89,900.00
2001/08/16	R 895	39.0%	R 1,020	R 895	100	0	R 83.29	R 8,329.00	-R 100.00	-R 89,500.00
2001/08/17	R 885	39.0%	R 1,020	R 885	100	0	R 78.87	R 7,887.00	-R 100.00	-R 88,500.00
2001/08/20	R 873	39.0%	R 1,020	R 873	100	0	R 73.39	R 7,339.00	-R 100.00	-R 87,300.00
2001/08/21	R 882	39.0%	R 1,020	R 882	100	0	R 76.84	R 7,684.00	-R 100.00	-R 88,200.00
2001/08/22	R 903	39.0%	R 1,020	R 903	100	0	R 85.51	R 8,551.00	-R 100.00	-R 90,300.00
2001/08/23	R 900	39.0%	R 1,020	R 900	100	0	R 84.00	R 8,400.00	-R 100.00	-R 90,000.00
2001/08/24	R 905	39.0%	R 1,020	R 905	100	0	R 85.97	R 8,597.00	-R 100.00	-R 90,500.00
2001/08/27	R 908	39.0%	R 1,020	R 908	100	0	R 86.65	R 8,665.00	-R 100.00	-R 90,800.00
2001/08/28	R 920	39.0%	R 1,020	R 920	100	0	R 91.80	R 9,180.00	-R 100.00	-R 92,000.00
2001/08/29	R 920	39.0%	R 1,020	R 920	100	0	R 91.59	R 9,159.00	-R 100.00	-R 92,000.00
2001/08/30	R 935	39.0%	R 1,020	R 935	100	0	R 98.31	R 9,831.00	-R 100.00	-R 93,500.00
2001/08/31	R 939	39.0%	R 1,020	R 939	100	0	R 99.99	R 9,999.00	-R 100.00	-R 93,900.00
2001/09/03	R 940	39.0%	R 1,020	R 940	100	0	R 99.80	R 9,980.00	-R 100.00	-R 94,000.00
2001/09/04	R 935	39.0%	R 1,020	R 935	100	0	R 97.21	R 9,721.00	-R 100.00	-R 93,500.00
2001/09/05	R 930	39.0%	R 1,020	R 930	100	0	R 94.65	R 9,465.00	-R 100.00	-R 93,000.00
2001/09/06	R 912	39.0%	R 1,020	R 912	100	0	R 86.28	R 8,628.00	-R 100.00	-R 91,200.00
2001/09/07	R 925	39.0%	R 1,020	R 925	100	0	R 91.91	R 9,191.00	-R 100.00	-R 92,500.00
2001/09/10	R 918	39.0%	R 1,020	R 918	100	0	R 88.08	R 8,808.00	-R 100.00	-R 91,800.00
2001/09/11	R 909	39.0%	R 1,020	R 909	100	0	R 83.89	R 8,389.00	-R 100.00	-R 90,900.00
2001/09/12	R 923	39.0%	R 1,020	R 923	100	0	R 89.90	R 8,990.00	-R 100.00	-R 92,300.00
2001/09/13	R 917	39.0%	R 1,020	R 917	100	0	R 86.98	R 8,698.00	-R 100.00	-R 91,700.00
2001/09/14	R 920	39.0%	R 1,020	R 920	100	0	R 88.10	R 8,810.00	-R 100.00	-R 92,000.00
2001/09/17	R 920	39.0%	R 1,020	R 920	100	0	R 87.44	R 8,744.00	-R 100.00	-R 92,000.00
2001/09/18	R 927	39.0%	R 1,020	R 927	100	0	R 90.38	R 9,038.00	-R 100.00	-R 92,700.00
2001/09/19	R 925	39.0%	R 1,020	R 925	100	0	R 89.24	R 8,924.00	-R 100.00	-R 92,500.00
2001/09/20	R 934	39.0%	R 1,020	R 934	100	0	R 93.15	R 9,315.00	-R 100.00	-R 93,400.00
2001/09/21	R 950	39.0%	R 1,020	R 950	100	0	R 100.50	R 10,050.00	-R 100.00	-R 95,000.00
2001/09/25	R 969	39.0%	R 1,020	R 969	100	0	R 108.97	R 10,897.00	-R 100.00	-R 96,900.00
2001/09/26	R 998	39.0%	R 1,020	R 998	100	0	R 123.92	R 12,392.00	-R 100.00	-R 99,800.00
2001/09/27	R 1,009	39.0%	R 1,020	R 1,009	100	0	R 129.69	R 12,969.00	-R 100.00	-R 100,900.00
2001/09/28	R 1,000	39.0%	R 1,020	R 1,000	100	0	R 124.51	R 12,451.00	-R 100.00	-R 100,000.00
2001/10/01	R 1,028	39.0%	R 1,020	R 1,020	0	100	R 0.00	R 0.00	R 0.00	-R 102,000.00
2001/10/02	R 1,058	39.0%	R 1,020	R 1,020	0	100	R 0.00	R 0.00	R 0.00	-R 102,000.00
2001/10/03	R 1,068	39.0%	R 1,020	R 1,020	0	100	R 0.00	R 0.00	R 0.00	-R 102,000.00

DATE	PRICE	VOLATILITY*	CALL-STRIKE	DAILY HEDGE	VOLUME BELOW MAXIMUM PRICE	VOLUME @ MAXIMUM PRICE	OPTION PREMIUM	NET OPTION COST	ADDITIONAL BROKING FEES @ R1/TON	DAILY PROCUREMENT PRICE
2001/10/04	R 1,054	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/10/05	R 1,044	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/10/08	R 1,027	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/10/09	R 1,024	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/10/10	R 1,022	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/10/11	R 1,019	39.0%	R 1,020	R 1,019	100	0	R 131.75	R 13,175.00	-R 100.00	-R 101,900.00
2001/10/12	R 1,043	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/10/15	R 1,025	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/10/16	R 1,021	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/10/17	R 1,018	39.0%	R 1,020	R 1,018	100	0	R 129.65	R 12,965.00	-R 100.00	-R 101,800.00
2001/10/18	R 1,018	39.0%	R 1,020	R 1,018	100	0	R 129.39	R 12,939.00	-R 100.00	-R 101,800.00
2001/10/19	R 1,012	39.0%	R 1,020	R 1,012	100	0	R 125.78	R 12,578.00	-R 100.00	-R 101,200.00
2001/10/22	R 1,013	39.0%	R 1,020	R 1,013	100	0	R 125.55	R 12,555.00	-R 100.00	-R 101,300.00
2001/10/23	R 1,037	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/10/24	R 1,035	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/10/25	R 1,041	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/10/26	R 1,067	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/10/29	R 1,055	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/10/30	R 1,036	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/10/31	R 1,043	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/11/01	R 1,034	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/11/02	R 1,042	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/11/05	R 1,057	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/11/06	R 1,077	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/11/07	R 1,088	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/11/08	R 1,098	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/11/09	R 1,080	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/11/12	R 1,110	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/11/13	R 1,140	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/11/14	R 1,185	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/11/15	R 1,185	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/11/16	R 1,163	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/11/19	R 1,178	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/11/20	R 1,208	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/11/21	R 1,238	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/11/22	R 1,283	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/11/23	R 1,328	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/11/26	R 1,336	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/11/27	R 1,291	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/11/28	R 1,246	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/11/29	R 1,255	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/11/30	R 1,285	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/12/03	R 1,315	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/12/04	R 1,340	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/12/05	R 1,385	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/12/06	R 1,419	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/12/07	R 1,383	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/12/10	R 1,428	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/12/11	R 1,454	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/12/12	R 1,499	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/12/13	R 1,544	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/12/14	R 1,589	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/12/18	R 1,634	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/12/19	R 1,679	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/12/20	R 1,724	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/12/21	R 1,689	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/12/24	R 1,644	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/12/27	R 1,599	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/12/28	R 1,554	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2001/12/31	R 1,599	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/01/02	R 1,644	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/01/03	R 1,689	40.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/01/04	R 1,680	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/01/07	R 1,635	38.5%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/01/08	R 1,590	38.5%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/01/09	R 1,525	40.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/01/10	R 1,495	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/01/11	R 1,518	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/01/14	R 1,550	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/01/15	R 1,570	40.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/01/16	R 1,615	41.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/01/17	R 1,628	40.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/01/18	R 1,652	40.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/01/21	R 1,661	40.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/01/22	R 1,630	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/01/23	R 1,665	38.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/01/24	R 1,657	36.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/01/25	R 1,639	36.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/01/28	R 1,594	34.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00

DATE	PRICE	VOLATILITY*	CALL-STRIKE	DAILY HEDGE	VOLUME BELOW MAXIMUM PRICE	VOLUME @ MAXIMUM PRICE	OPTION PREMIUM	NET OPTION COST	ADDITIONAL BROKING FEES @ R1/TON	DAILY PROCUREMENT PRICE
2002/01/29	R 1,558	33.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/01/30	R 1,595	35.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/01/31	R 1,640	36.5%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/02/01	R 1,605	37.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/02/04	R 1,646	38.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/02/05	R 1,636	37.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/02/06	R 1,591	36.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/02/07	R 1,626	37.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/02/08	R 1,614	38.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/02/11	R 1,628	38.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/02/12	R 1,631	37.5%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/02/13	R 1,586	37.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/02/14	R 1,565	37.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/02/15	R 1,571	35.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/02/18	R 1,526	34.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/02/19	R 1,481	33.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/02/20	R 1,416	32.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/02/21	R 1,430	32.5%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/02/22	R 1,472	32.5%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/02/25	R 1,492	32.8%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/02/26	R 1,473	32.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/02/27	R 1,481	31.5%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/02/28	R 1,514	33.5%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/03/01	R 1,489	32.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/03/04	R 1,457	33.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/03/05	R 1,412	34.5%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/03/06	R 1,445	35.5%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/03/07	R 1,490	36.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/03/08	R 1,522	36.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/03/11	R 1,477	36.5%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/03/12	R 1,451	35.5%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/03/13	R 1,450	36.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/03/14	R 1,490	37.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/03/15	R 1,492	37.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/03/18	R 1,517	37.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/03/19	R 1,555	37.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/03/20	R 1,600	37.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/03/22	R 1,645	37.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/03/25	R 1,639	37.5%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/03/26	R 1,672	38.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/03/27	R 1,668	38.5%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/03/28	R 1,713	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/04/02	R 1,758	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/04/03	R 1,803	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/04/04	R 1,756	39.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/04/05	R 1,775	38.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/04/08	R 1,799	37.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/04/09	R 1,785	36.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/04/10	R 1,775	35.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/04/11	R 1,820	33.5%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/04/12	R 1,850	33.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/04/15	R 1,870	33.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/04/16	R 1,873	31.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/04/17	R 1,878	29.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/04/18	R 1,893	29.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/04/19	R 1,885	30.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/04/22	R 1,853	30.5%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/04/23	R 1,808	29.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/04/24	R 1,786	28.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/04/25	R 1,770	27.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/04/26	R 1,751	26.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/04/29	R 1,706	26.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/04/30	R 1,725	27.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/05/02	R 1,752	27.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/05/03	R 1,763	26.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/05/06	R 1,774	26.5%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/05/07	R 1,737	26.5%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/05/08	R 1,692	28.5%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/05/09	R 1,727	27.5%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/05/10	R 1,718	27.5%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/05/13	R 1,722	26.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/05/14	R 1,745	25.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/05/15	R 1,765	23.5%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/05/16	R 1,764	23.5%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/05/17	R 1,772	24.5%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/05/20	R 1,773	24.5%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/05/21	R 1,771	25.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/05/22	R 1,766	22.5%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/05/23	R 1,766	22.5%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00

DATE	PRICE	VOLATILITY*	CALL-STRIKE	DAILY HEDGE	VOLUME BELOW MAXIMUM PRICE	VOLUME @ MAXIMUM PRICE	OPTION PREMIUM	NET OPTION COST	ADDITIONAL BROKING FEES @ R1/TON	DAILY PROCUREMENT PRICE
2002/05/24	R 1,781	22.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/05/27	R 1,777	23.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/05/28	R 1,791	23.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/05/29	R 1,799	22.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/05/30	R 1,793	23.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/05/31	R 1,802	23.5%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/06/03	R 1,787	24.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/06/04	R 1,742	28.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/06/05	R 1,738	27.5%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/06/06	R 1,734	26.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/06/07	R 1,719	23.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/06/10	R 1,737	23.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/06/11	R 1,743	22.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/06/12	R 1,734	22.5%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/06/13	R 1,754	20.5%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/06/14	R 1,786	19.5%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/06/18	R 1,831	24.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/06/19	R 1,794	25.5%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/06/20	R 1,778	26.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/06/21	R 1,786	26.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
2002/06/24	R 1,802	26.0%	R 1,020	R 1,020	0	100		R 0.00	R 0.00	-R 102,000.00
								-R 4,877,973.00	-R 48,300.00	-R 31,440,700.00
Total procurement price	-R 31,440,700.00									
Total option cost	-R 4,877,973.00									
Additional broking fees	-R 48,300.00									
Net procurement cost	-R 36,366,973.00									
Average Price Index	R 1,254.24									
Maximum price strategy	R 1,102.03									
Tonnages hedged	33,000									

2003

DATE	PRICE	VOLATILITY	CALL-STRIKE	DAILY HEDGE	VOLUME BELOW MAXIMUM PRICE	VOLUME @ MAXIMUM PRICE	OPTION PREMIUM	NET OPTION COST	ADDITIONAL BROKING FEES @ R1/TON	DAILY PROCUREMENT PRICE
2002/05/27	R 1,730	24.0%	R 1,720				-R 175.98	-R 4,698,666.00	-R 26,700.00	R 0.00
2002/05/28	R 1,715	24.0%	R 1,720	R 1,715	100	0	R 167.49	R 16,749.00	-R 100.00	-R 171,500.00
2002/05/29	R 1,710	24.0%	R 1,720	R 1,710	100	0	R 164.56	R 16,456.00	-R 100.00	-R 171,000.00
2002/05/30	R 1,710	24.0%	R 1,720	R 1,710	100	0	R 164.35	R 16,435.00	-R 100.00	-R 171,000.00
2002/05/31	R 1,710	24.0%	R 1,720	R 1,710	100	0	R 164.13	R 16,413.00	-R 100.00	-R 171,000.00
2002/06/03	R 1,700	24.0%	R 1,720	R 1,700	100	0	R 158.13	R 15,813.00	-R 100.00	-R 170,000.00
2002/06/04	R 1,698	24.0%	R 1,720	R 1,698	100	0	R 156.86	R 15,686.00	-R 100.00	-R 169,800.00
2002/06/05	R 1,680	24.0%	R 1,720	R 1,680	100	0	R 147.29	R 14,729.00	-R 100.00	-R 168,000.00
2002/06/06	R 1,690	24.0%	R 1,720	R 1,690	100	0	R 152.23	R 15,223.00	-R 100.00	-R 169,000.00
2002/06/07	R 1,690	24.0%	R 1,720	R 1,690	100	0	R 152.01	R 15,201.00	-R 100.00	-R 169,000.00
2002/06/10	R 1,690	24.0%	R 1,720	R 1,690	100	0	R 151.36	R 15,136.00	-R 100.00	-R 169,000.00
2002/06/11	R 1,705	24.0%	R 1,720	R 1,705	100	0	R 159.05	R 15,905.00	-R 100.00	-R 170,500.00
2002/06/12	R 1,680	24.0%	R 1,720	R 1,680	100	0	R 145.78	R 14,578.00	-R 100.00	-R 168,000.00
2002/06/13	R 1,680	24.0%	R 1,720	R 1,680	100	0	R 145.56	R 14,556.00	-R 100.00	-R 168,000.00
2002/06/14	R 1,690	24.0%	R 1,720	R 1,690	100	0	R 150.49	R 15,049.00	-R 100.00	-R 169,000.00
2002/06/18	R 1,725	24.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/06/19	R 1,690	24.0%	R 1,720	R 1,690	100	0	R 149.39	R 14,939.00	-R 100.00	-R 169,000.00
2002/06/20	R 1,685	25.0%	R 1,720	R 1,685	100	0	R 153.35	R 15,335.00	-R 100.00	-R 168,500.00
2002/06/21	R 1,685	25.0%	R 1,720	R 1,685	100	0	R 153.12	R 15,312.00	-R 100.00	-R 168,500.00
2002/06/24	R 1,700	25.0%	R 1,720	R 1,700	100	0	R 160.29	R 16,029.00	-R 100.00	-R 170,000.00
2002/06/25	R 1,700	25.0%	R 1,720	R 1,700	100	0	R 160.06	R 16,006.00	-R 100.00	-R 170,000.00
2002/06/26	R 1,655	25.0%	R 1,720	R 1,655	100	0	R 136.89	R 13,689.00	-R 100.00	-R 165,500.00
2002/06/27	R 1,661	25.0%	R 1,720	R 1,661	100	0	R 139.61	R 13,961.00	-R 100.00	-R 166,100.00
2002/06/28	R 1,680	26.0%	R 1,720	R 1,680	100	0	R 155.60	R 15,560.00	-R 100.00	-R 168,000.00
2002/07/01	R 1,681	27.0%	R 1,720	R 1,681	100	0	R 162.03	R 16,203.00	-R 100.00	-R 168,100.00
2002/07/02	R 1,695	26.5%	R 1,720	R 1,695	100	0	R 165.79	R 16,579.00	-R 100.00	-R 169,500.00
2002/07/03	R 1,700	26.5%	R 1,720	R 1,700	100	0	R 168.21	R 16,821.00	-R 100.00	-R 170,000.00
2002/07/04	R 1,710	26.5%	R 1,720	R 1,710	100	0	R 173.35	R 17,335.00	-R 100.00	-R 171,000.00
2002/07/05	R 1,690	26.5%	R 1,720	R 1,690	100	0	R 162.41	R 16,241.00	-R 100.00	-R 169,000.00
2002/07/08	R 1,700	26.0%	R 1,720	R 1,700	100	0	R 163.65	R 16,365.00	-R 100.00	-R 170,000.00
2002/07/09	R 1,695	26.0%	R 1,720	R 1,695	100	0	R 160.75	R 16,075.00	-R 100.00	-R 169,500.00
2002/07/10	R 1,650	22.0%	R 1,720	R 1,650	100	0	R 112.00	R 11,200.00	-R 100.00	-R 165,000.00
2002/07/11	R 1,605	26.0%	R 1,720	R 1,605	100	0	R 116.59	R 11,659.00	-R 100.00	-R 160,500.00
2002/07/12	R 1,560	26.0%	R 1,720	R 1,560	100	0	R 97.46	R 9,746.00	-R 100.00	-R 156,000.00
2002/07/15	R 1,515	25.0%	R 1,720	R 1,515	100	0	R 74.48	R 7,448.00	-R 100.00	-R 151,500.00
2002/07/16	R 1,505	25.0%	R 1,720	R 1,505	100	0	R 70.89	R 7,089.00	-R 100.00	-R 150,500.00
2002/07/17	R 1,505	26.0%	R 1,720	R 1,505	100	0	R 76.03	R 7,603.00	-R 100.00	-R 150,500.00
2002/07/18	R 1,509	26.5%	R 1,720	R 1,509	100	0	R 79.90	R 7,990.00	-R 100.00	-R 150,900.00
2002/07/19	R 1,518	26.0%	R 1,720	R 1,518	100	0	R 80.15	R 8,015.00	-R 100.00	-R 151,800.00
2002/07/22	R 1,529	26.0%	R 1,720	R 1,529	100	0	R 83.47	R 8,347.00	-R 100.00	-R 152,900.00
2002/07/23	R 1,573	26.5%	R 1,720	R 1,573	100	0	R 103.18	R 10,318.00	-R 100.00	-R 157,300.00
2002/07/24	R 1,584	27.0%	R 1,720	R 1,584	100	0	R 110.49	R 11,049.00	-R 100.00	-R 158,400.00
2002/07/25	R 1,590	27.5%	R 1,720	R 1,590	100	0	R 115.81	R 11,581.00	-R 100.00	-R 159,000.00
2002/07/26	R 1,595	27.5%	R 1,720	R 1,595	100	0	R 117.74	R 11,774.00	-R 100.00	-R 159,500.00
2002/07/29	R 1,600	27.5%	R 1,720	R 1,600	100	0	R 119.20	R 11,920.00	-R 100.00	-R 160,000.00
2002/07/30	R 1,601	27.5%	R 1,720	R 1,601	100	0	R 119.39	R 11,939.00	-R 100.00	-R 160,100.00
2002/07/31	R 1,600	27.5%	R 1,720	R 1,600	100	0	R 118.69	R 11,869.00	-R 100.00	-R 160,000.00
2002/08/01	R 1,621	27.5%	R 1,720	R 1,621	100	0	R 127.92	R 12,792.00	-R 100.00	-R 162,100.00
2002/08/02	R 1,609	27.5%	R 1,720	R 1,609	100	0	R 122.20	R 12,220.00	-R 100.00	-R 160,900.00
2002/08/05	R 1,621	28.0%	R 1,720	R 1,621	100	0	R 129.92	R 12,992.00	-R 100.00	-R 162,100.00
2002/08/06	R 1,647	28.0%	R 1,720	R 1,647	100	0	R 142.00	R 14,200.00	-R 100.00	-R 164,700.00
2002/08/07	R 1,642	27.0%	R 1,720	R 1,642	100	0	R 133.17	R 13,317.00	-R 100.00	-R 164,200.00
2002/08/08	R 1,650	27.0%	R 1,720	R 1,650	100	0	R 136.76	R 13,676.00	-R 100.00	-R 165,000.00
2002/08/12	R 1,650	27.0%	R 1,720	R 1,650	100	0	R 135.72	R 13,572.00	-R 100.00	-R 165,000.00
2002/08/13	R 1,691	27.0%	R 1,720	R 1,691	100	0	R 156.10	R 15,610.00	-R 100.00	-R 169,100.00
2002/08/14	R 1,690	26.0%	R 1,720	R 1,690	100	0	R 149.07	R 14,907.00	-R 100.00	-R 169,000.00
2002/08/15	R 1,685	25.0%	R 1,720	R 1,685	100	0	R 140.01	R 14,001.00	-R 100.00	-R 168,500.00
2002/08/16	R 1,687	24.0%	R 1,720	R 1,687	100	0	R 134.56	R 13,456.00	-R 100.00	-R 168,700.00
2002/08/19	R 1,671	25.0%	R 1,720	R 1,671	100	0	R 131.97	R 13,197.00	-R 100.00	-R 167,100.00
2002/08/20	R 1,680	25.0%	R 1,720	R 1,680	100	0	R 136.22	R 13,622.00	-R 100.00	-R 168,000.00
2002/08/21	R 1,700	24.0%	R 1,720	R 1,700	100	0	R 140.06	R 14,006.00	-R 100.00	-R 170,000.00
2002/08/22	R 1,712	24.5%	R 1,720	R 1,712	100	0	R 149.28	R 14,928.00	-R 100.00	-R 171,200.00
2002/08/23	R 1,740	24.5%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/08/26	R 1,745	24.5%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/08/27	R 1,728	25.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/08/28	R 1,743	25.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/08/29	R 1,751	25.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/08/30	R 1,763	25.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	

DATE	PRICE	VOLATILITY	CALL-STRIKE	DAILY HEDGE	VOLUME BELOW MAXIMUM PRICE	VOLUME @ MAXIMUM PRICE	OPTION PREMIUM	NET OPTION COST	ADDITIONAL BROKING FEES @ R1/TON	DAILY PROCUREMENT PRICE
2002/09/02	R 1,782	25.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/09/03	R 1,814	26.5%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/09/04	R 1,811	25.5%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/09/05	R 1,810	25.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/09/06	R 1,780	25.5%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/09/09	R 1,785	25.5%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/09/10	R 1,799	25.5%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/09/11	R 1,789	26.5%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/09/12	R 1,765	26.5%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/09/13	R 1,760	27.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/09/16	R 1,770	27.5%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/09/17	R 1,766	27.5%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/09/18	R 1,770	27.5%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/09/19	R 1,780	28.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/09/20	R 1,815	28.5%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/09/23	R 1,820	28.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/09/25	R 1,841	28.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/09/26	R 1,835	28.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/09/27	R 1,823	28.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/09/30	R 1,810	28.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/10/01	R 1,793	28.5%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/10/02	R 1,805	28.5%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/10/03	R 1,812	28.5%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/10/04	R 1,803	28.5%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/10/07	R 1,809	28.5%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/10/08	R 1,825	28.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/10/09	R 1,835	27.5%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/10/10	R 1,840	26.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/10/11	R 1,845	27.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/10/14	R 1,846	27.5%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/10/15	R 1,856	28.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/10/16	R 1,861	28.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/10/17	R 1,866	28.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/10/18	R 1,854	28.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/10/21	R 1,833	28.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/10/22	R 1,799	28.5%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/10/23	R 1,774	28.5%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/10/24	R 1,761	30.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/10/25	R 1,790	31.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/10/28	R 1,769	32.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/10/29	R 1,782	32.5%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/10/30	R 1,783	33.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/10/31	R 1,794	32.3%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/11/01	R 1,786	32.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/11/04	R 1,741	31.5%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/11/05	R 1,752	32.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/11/06	R 1,765	32.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/11/07	R 1,774	32.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/11/08	R 1,753	32.5%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/11/11	R 1,740	32.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/11/12	R 1,760	32.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/11/13	R 1,773	32.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/11/14	R 1,787	31.5%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/11/15	R 1,810	31.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/11/18	R 1,855	32.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/11/19	R 1,854	31.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/11/20	R 1,866	31.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/11/21	R 1,889	30.5%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/11/22	R 1,865	31.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/11/25	R 1,890	31.5%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/11/26	R 1,893	31.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/11/27	R 1,893	31.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/11/28	R 1,905	31.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/11/29	R 1,950	28.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/12/02	R 1,989	29.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/12/03	R 1,958	29.5%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/12/04	R 1,955	29.5%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/12/05	R 1,910	30.5%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/12/06	R 1,865	34.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/12/09	R 1,800	36.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/12/10	R 1,735	34.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/12/11	R 1,689	32.0%	R 1,720	R 1,689	100	0	R 143.66	R 14,366.00	-R 100.00	-R 168,900.00
2002/12/12	R 1,727	32.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/12/13	R 1,720	32.0%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	

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2002/12/17	R 1,675	31.0%	R 1,720	R 1,675	100	0	R 129.31	R 12,931.00	-R 100.00	-R 167,500.00
2002/12/18	R 1,645	31.0%	R 1,720	R 1,645	100	0	R 114.50	R 11,450.00	-R 100.00	-R 164,500.00
2002/12/19	R 1,640	30.0%	R 1,720	R 1,640	100	0	R 106.77	R 10,677.00	-R 100.00	-R 164,000.00
2002/12/20	R 1,682	31.0%	R 1,720	R 1,682	100	0	R 131.23	R 13,123.00	-R 100.00	-R 168,200.00
2002/12/23	R 1,724	30.5%	R 1,720	R 1,720	0	100		R 0.00	R 0.00	
2002/12/24	R 1,713	31.0%	R 1,720	R 1,713	100	0	R 145.72	R 14,572.00	-R 100.00	-R 171,300.00
2002/12/27	R 1,668	30.0%	R 1,720	R 1,668	100	0	R 116.83	R 11,683.00	-R 100.00	-R 166,800.00
2002/12/30	R 1,640	29.0%	R 1,720	R 1,640	100	0	R 98.11	R 9,811.00	-R 100.00	-R 164,000.00
2002/12/31	R 1,672	29.0%	R 1,720	R 1,672	100	0	R 112.59	R 11,259.00	-R 100.00	-R 167,200.00
2003/01/02	R 1,681	28.5%	R 1,720	R 1,681	100	0	R 113.92	R 11,392.00	-R 100.00	-R 168,100.00
2003/01/03	R 1,663	29.5%	R 1,720	R 1,663	100	0	R 109.41	R 10,941.00	-R 100.00	-R 166,300.00
2003/01/06	R 1,620	27.5%	R 1,720	R 1,620	100	0	R 80.44	R 8,044.00	-R 100.00	-R 162,000.00
2003/01/07	R 1,599	26.0%	R 1,720	R 1,599	100	0	R 65.61	R 6,561.00	-R 100.00	-R 159,900.00
2003/01/08	R 1,580	26.5%	R 1,720	R 1,580	100	0	R 60.45	R 6,045.00	-R 100.00	-R 158,000.00
2003/01/09	R 1,550	26.5%	R 1,720	R 1,550	100	0	R 50.25	R 5,025.00	-R 100.00	-R 155,000.00
2003/01/10	R 1,572	28.0%	R 1,720	R 1,572	100	0	R 62.89	R 6,289.00	-R 100.00	-R 157,200.00
2003/01/13	R 1,527	28.0%	R 1,720	R 1,527	100	0	R 47.49	R 4,749.00	-R 100.00	-R 152,700.00
2003/01/14	R 1,515	27.5%	R 1,720	R 1,515	100	0	R 42.11	R 4,211.00	-R 100.00	-R 151,500.00
2003/01/15	R 1,562	27.0%	R 1,720	R 1,562	100	0	R 54.08	R 5,408.00	-R 100.00	-R 156,200.00
2003/01/16	R 1,594	27.0%	R 1,720	R 1,594	100	0	R 64.83	R 6,483.00	-R 100.00	-R 159,400.00
2003/01/20	R 1,536	27.0%	R 1,720	R 1,536	100	0	R 44.56	R 4,456.00	-R 100.00	-R 153,600.00
2003/01/21	R 1,549	28.5%	R 1,720	R 1,549	100	0	R 53.42	R 5,342.00	-R 100.00	-R 154,900.00
2003/01/22	R 1,566	29.5%	R 1,720	R 1,566	100	0	R 62.36	R 6,236.00	-R 100.00	-R 156,600.00
2003/01/23	R 1,561	28.5%	R 1,720	R 1,561	100	0	R 56.63	R 5,663.00	-R 100.00	-R 156,100.00
2003/01/24	R 1,516	35.0%	R 1,720	R 1,516	100	0	R 64.69	R 6,469.00	-R 100.00	-R 151,600.00
2003/01/27	R 1,471	40.0%	R 1,720	R 1,471	100	0	R 66.06	R 6,606.00	-R 100.00	-R 147,100.00
2003/01/28	R 1,406	39.5%	R 1,720	R 1,406	100	0	R 45.92	R 4,592.00	-R 100.00	-R 140,600.00
2003/01/29	R 1,434	35.5%	R 1,720	R 1,434	100	0	R 41.15	R 4,115.00	-R 100.00	-R 143,400.00
2003/01/30	R 1,432	34.0%	R 1,720	R 1,432	100	0	R 36.20	R 3,620.00	-R 100.00	-R 143,200.00
2003/01/31	R 1,424	34.0%	R 1,720	R 1,424	100	0	R 34.11	R 3,411.00	-R 100.00	-R 142,400.00
2003/02/03	R 1,379	35.0%	R 1,720	R 1,379	100	0	R 26.70	R 2,670.00	-R 100.00	-R 137,900.00
2003/02/04	R 1,334	39.0%	R 1,720	R 1,334	100	0	R 27.14	R 2,714.00	-R 100.00	-R 133,400.00
2003/02/05	R 1,320	39.0%	R 1,720	R 1,320	100	0	R 24.49	R 2,449.00	-R 100.00	-R 132,000.00
2003/02/06	R 1,360	39.0%	R 1,720	R 1,360	100	0	R 31.31	R 3,131.00	-R 100.00	-R 136,000.00
2003/02/07	R 1,382	39.0%	R 1,720	R 1,382	100	0	R 35.44	R 3,544.00	-R 100.00	-R 138,200.00
2003/02/10	R 1,337	42.0%	R 1,720	R 1,337	100	0	R 32.26	R 3,226.00	-R 100.00	-R 133,700.00
2003/02/11	R 1,292	43.5%	R 1,720	R 1,292	100	0	R 26.94	R 2,694.00	-R 100.00	-R 129,200.00
2003/02/12	R 1,285	43.0%	R 1,720	R 1,285	100	0	R 24.53	R 2,453.00	-R 100.00	-R 128,500.00
2003/02/13	R 1,240	44.0%	R 1,720	R 1,240	100	0	R 19.44	R 1,944.00	-R 100.00	-R 124,000.00
2003/02/14	R 1,195	51.0%	R 1,720	R 1,195	100	0	R 24.14	R 2,414.00	-R 100.00	-R 119,500.00
2003/02/17	R 1,130	45.0%	R 1,720	R 1,130	100	0	R 8.74	R 874.00	-R 100.00	-R 113,000.00
2003/02/18	R 1,133	42.0%	R 1,720	R 1,133	100	0	R 6.26	R 626.00	-R 100.00	-R 113,300.00
2003/02/19	R 1,086	37.0%	R 1,720	R 1,086	100	0	R 1.74	R 174.00	-R 100.00	-R 108,600.00
2003/02/20	R 1,021	39.0%	R 1,720	R 1,021	100	0	R 1.08	R 108.00	-R 100.00	-R 102,100.00
2003/02/21	R 1,007	38.0%	R 1,720	R 1,007	100	0		R 0.00	R 0.00	-R 100,700.00
2003/02/24	R 1,008	37.0%	R 1,720	R 1,008	100	0		R 0.00	R 0.00	-R 100,800.00
2003/02/25	R 1,016	36.0%	R 1,720	R 1,016	100	0		R 0.00	R 0.00	-R 101,600.00
2003/02/26	R 1,039	39.0%	R 1,720	R 1,039	100	0	R 1.13	R 113.00	-R 100.00	-R 103,900.00
2003/02/27	R 1,007	39.0%	R 1,720	R 1,007	100	0		R 0.00	R 0.00	-R 100,700.00
2003/02/28	R 969	39.0%	R 1,720	R 969	100	0		R 0.00	R 0.00	-R 96,900.00
2003/03/03	R 964	38.0%	R 1,720	R 964	100	0		R 0.00	R 0.00	-R 96,400.00
2003/03/04	R 950	36.0%	R 1,720	R 950	100	0		R 0.00	R 0.00	-R 95,000.00
2003/03/05	R 989	37.0%	R 1,720	R 989	100	0		R 0.00	R 0.00	-R 98,900.00
2003/03/06	R 969	36.0%	R 1,720	R 969	100	0		R 0.00	R 0.00	-R 96,900.00
2003/03/07	R 992	39.0%	R 1,720	R 992	100	0		R 0.00	R 0.00	-R 99,200.00
2003/03/10	R 1,037	43.0%	R 1,720	R 1,037	100	0	R 1.52	R 152.00	-R 100.00	-R 103,700.00
2003/03/11	R 1,055	44.0%	R 1,720	R 1,055	100	0	R 2.14	R 214.00	-R 100.00	-R 105,500.00
2003/03/12	R 1,063	46.0%	R 1,720	R 1,063	100	0	R 3.03	R 303.00	-R 100.00	-R 106,300.00
2003/03/13	R 1,022	44.0%	R 1,720	R 1,022	100	0	R 1.34	R 134.00	-R 100.00	-R 102,200.00
2003/03/14	R 1,018	43.0%	R 1,720	R 1,018	100	0	R 1.03	R 103.00	-R 100.00	-R 101,800.00
2003/03/17	R 992	43.0%	R 1,720	R 992	100	0		R 0.00	R 0.00	-R 99,200.00
2003/03/18	R 1,002	42.0%	R 1,720	R 1,002	100	0		R 0.00	R 0.00	-R 100,200.00
2003/03/19	R 958	41.0%	R 1,720	R 958	100	0		R 0.00	R 0.00	-R 95,800.00
2003/03/20	R 913	47.0%	R 1,720	R 913	100	0		R 0.00	R 0.00	-R 91,300.00
2003/03/24	R 848	45.0%	R 1,720	R 848	100	0		R 0.00	R 0.00	-R 84,800.00
2003/03/25	R 867	45.0%	R 1,720	R 867	100	0		R 0.00	R 0.00	-R 86,700.00
2003/03/26	R 886	43.0%	R 1,720	R 886	100	0		R 0.00	R 0.00	-R 88,600.00
2003/03/27	R 875	43.0%	R 1,720	R 875	100	0		R 0.00	R 0.00	-R 87,500.00
2003/03/28	R 866	40.0%	R 1,720	R 866	100	0		R 0.00	R 0.00	-R 86,600.00
2003/03/31	R 821	37.0%	R 1,720	R 821	100	0		R 0.00	R 0.00	-R 82,100.00
2003/04/01	R 826	35.0%	R 1,720	R 826	100	0		R 0.00	R 0.00	-R 82,600.00
2003/04/02	R 865	35.0%	R 1,720	R 865	100	0		R 0.00	R 0.00	-R 86,500.00
2003/04/03	R 855	34.0%	R 1,720	R 855	100	0		R 0.00	R 0.00	-R 85,500.00
2003/04/04	R 841	33.0%	R 1,720	R 841	100	0		R 0.00	R 0.00	-R 84,100.00

DATE	PRICE	VOLATILITY	CALL-STRIKE	DAILY HEDGE	VOLUME BELOW MAXIMUM PRICE	VOLUME @ MAXIMUM PRICE	OPTION PREMIUM	NET OPTION COST	ADDITIONAL BROKING FEES @ R1/TON	DAILY PROCUREMENT PRICE
2003/04/07	R 886	37.0%	R 1,720	R 886	100	0		R 0.00	R 0.00	-R 88,600.00
2003/04/08	R 891	38.0%	R 1,720	R 891	100	0		R 0.00	R 0.00	-R 89,100.00
2003/04/09	R 876	38.0%	R 1,720	R 876	100	0		R 0.00	R 0.00	-R 87,600.00
2003/04/10	R 847	38.0%	R 1,720	R 847	100	0		R 0.00	R 0.00	-R 84,700.00
2003/04/11	R 859	37.0%	R 1,720	R 859	100	0		R 0.00	R 0.00	-R 85,900.00
2003/04/14	R 867	37.0%	R 1,720	R 867	100	0		R 0.00	R 0.00	-R 86,700.00
2003/04/15	R 864	36.0%	R 1,720	R 864	100	0		R 0.00	R 0.00	-R 86,400.00
2003/04/16	R 851	35.0%	R 1,720	R 851	100	0		R 0.00	R 0.00	-R 85,100.00
2003/04/17	R 842	35.0%	R 1,720	R 842	100	0		R 0.00	R 0.00	-R 84,200.00
2003/04/22	R 824	33.0%	R 1,720	R 824	100	0		R 0.00	R 0.00	-R 82,400.00
2003/04/23	R 806	33.0%	R 1,720	R 806	100	0		R 0.00	R 0.00	-R 80,600.00
2003/04/24	R 782	32.0%	R 1,720	R 782	100	0		R 0.00	R 0.00	-R 78,200.00
2003/04/25	R 780	31.0%	R 1,720	R 780	100	0		R 0.00	R 0.00	-R 78,000.00
2003/04/29	R 763	31.0%	R 1,720	R 763	100	0		R 0.00	R 0.00	-R 76,300.00
2003/04/30	R 743	31.0%	R 1,720	R 743	100	0		R 0.00	R 0.00	-R 74,300.00
2003/05/02	R 763	33.0%	R 1,720	R 763	100	0		R 0.00	R 0.00	-R 76,300.00
2003/05/05	R 808	35.0%	R 1,720	R 808	100	0		R 0.00	R 0.00	-R 80,800.00
2003/05/06	R 813	36.0%	R 1,720	R 813	100	0		R 0.00	R 0.00	-R 81,300.00
2003/05/07	R 801	36.0%	R 1,720	R 801	100	0		R 0.00	R 0.00	-R 80,100.00
2003/05/08	R 794	37.0%	R 1,720	R 794	100	0		R 0.00	R 0.00	-R 79,400.00
2003/05/09	R 800	36.0%	R 1,720	R 800	100	0		R 0.00	R 0.00	-R 80,000.00
2003/05/12	R 841	38.0%	R 1,720	R 841	100	0		R 0.00	R 0.00	-R 84,100.00
2003/05/13	R 839	38.0%	R 1,720	R 839	100	0		R 0.00	R 0.00	-R 83,900.00
2003/05/14	R 872	40.0%	R 1,720	R 872	100	0		R 0.00	R 0.00	-R 87,200.00
2003/05/15	R 917	44.0%	R 1,720	R 917	100	0		R 0.00	R 0.00	-R 91,700.00
2003/05/16	R 962	47.0%	R 1,720	R 962	100	0		R 0.00	R 0.00	-R 96,200.00
2003/05/19	R 954	49.0%	R 1,720	R 954	100	0		R 0.00	R 0.00	-R 95,400.00
2003/05/20	R 951	49.0%	R 1,720	R 951	100	0		R 0.00	R 0.00	-R 95,100.00
2003/05/21	R 907	49.0%	R 1,720	R 907	100	0		R 0.00	R 0.00	-R 90,700.00
2003/05/22	R 938	49.0%	R 1,720	R 938	100	0		R 0.00	R 0.00	-R 93,800.00
2003/05/23	R 940	49.0%	R 1,720	R 940	100	0		R 0.00	R 0.00	-R 94,000.00
2003/05/26	R 933	48.0%	R 1,720	R 933	100	0		R 0.00	R 0.00	-R 93,300.00
2003/05/27	R 930	46.0%	R 1,720	R 930	100	0		R 0.00	R 0.00	-R 93,000.00
2003/05/28	R 975	47.0%	R 1,720	R 975	100	0		R 0.00	R 0.00	-R 97,500.00
2003/05/29	R 1,005	46.0%	R 1,720	R 1,005	100	0		R 0.00	R 0.00	-R 100,500.00
2003/05/30	R 1,001	49.0%	R 1,720	R 1,001	100	0		R 0.00	R 0.00	-R 100,100.00
2003/06/02	R 980	45.0%	R 1,720	R 980	100	0		R 0.00	R 0.00	-R 98,000.00
2003/06/03	R 935	45.0%	R 1,720	R 935	100	0		R 0.00	R 0.00	-R 93,500.00
2003/06/04	R 901	47.0%	R 1,720	R 901	100	0		R 0.00	R 0.00	-R 90,100.00
2003/06/05	R 939	47.0%	R 1,720	R 939	100	0		R 0.00	R 0.00	-R 93,900.00
2003/06/06	R 924	50.0%	R 1,720	R 924	100	0		R 0.00	R 0.00	-R 92,400.00
2003/06/09	R 940	47.0%	R 1,720	R 940	100	0		R 0.00	R 0.00	-R 94,000.00
2003/06/10	R 923	45.0%	R 1,720	R 923	100	0		R 0.00	R 0.00	-R 92,300.00
2003/06/11	R 906	45.0%	R 1,720	R 906	100	0		R 0.00	R 0.00	-R 90,600.00
2003/06/12	R 927	45.0%	R 1,720	R 927	100	0		R 0.00	R 0.00	-R 92,700.00
2003/06/13	R 904	43.0%	R 1,720	R 904	100	0		R 0.00	R 0.00	-R 90,400.00
2003/06/17	R 869	47.0%	R 1,720	R 869	100	0		R 0.00	R 0.00	-R 86,900.00
2003/06/18	R 870	47.0%	R 1,720	R 870	100	0		R 0.00	R 0.00	-R 87,000.00
2003/06/19	R 889	49.0%	R 1,720	R 889	100	0		R 0.00	R 0.00	-R 88,900.00
2003/06/20	R 885	46.0%	R 1,720	R 885	100	0		R 0.00	R 0.00	-R 88,500.00
2003/06/23	R 885	46.0%	R 1,720	R 885	100	0		R 0.00	R 0.00	-R 88,500.00
2003/06/24	R 866	46.0%	R 1,720	R 866	8200	0		R 0.00	R 0.00	-R 7,101,200.00
								-R 3,612,674.00	-R 37,700.00	-R 30,838,000.00
Total procurement price	-R 30,838,000.00									
Total option cost	-R 3,612,674.00									
Additional broking fees	-R 37,700.00									
Net procurement cost	-R 34,488,374.00									
Average Price Index	R 1,400.50									
Maximum price strategy	R 1,291.70									
Tonnages hedged	26,700									

2004

DATE	PRICE	VOLATILITY	CALL-STRIKE	DAILY HEDGE	VOLUME BELOW MAXIMUM PRICE	VOLUME @ MAXIMUM PRICE	OPTION PREMIUM	NET OPTION COST	ADDITIONAL BROKING FEES @ R1/TON	DAILY PROCUREMENT PRICE
2003/06/23	R 1,034	30.0%	R 1,040				-R 120.84	-R 3,033,084.00	-R 25,100.00	R 0.00
2003/06/24	R 1,018	31.0%	R 1,040	R 1,018	100	0	R 116.05	R 11,605.00	-R 100.00	-R 101,800.00
2003/06/25	R 993	31.0%	R 1,040	R 993	100	0	R 102.92	R 10,292.00	-R 100.00	-R 99,300.00
2003/06/26	R 995	31.0%	R 1,040	R 995	100	0	R 103.76	R 10,376.00	-R 100.00	-R 99,500.00
2003/06/27	R 975	31.0%	R 1,040	R 975	100	0	R 93.76	R 9,376.00	-R 100.00	-R 97,500.00
2003/06/30	R 975	31.0%	R 1,040	R 975	100	0	R 93.27	R 9,327.00	-R 100.00	-R 97,500.00
2003/07/01	R 970	31.0%	R 1,040	R 970	100	0	R 90.73	R 9,073.00	-R 100.00	-R 97,000.00
2003/07/02	R 970	31.0%	R 1,040	R 970	100	0	R 90.56	R 9,056.00	-R 100.00	-R 97,000.00
2003/07/03	R 988	31.0%	R 1,040	R 988	100	0	R 99.08	R 9,908.00	-R 100.00	-R 98,800.00
2003/07/04	R 990	31.0%	R 1,040	R 990	100	0	R 99.90	R 9,990.00	-R 100.00	-R 99,000.00
2003/07/07	R 982	31.0%	R 1,040	R 982	100	0	R 95.46	R 9,546.00	-R 100.00	-R 98,200.00
2003/07/08	R 988	31.0%	R 1,040	R 988	100	0	R 98.23	R 9,823.00	-R 100.00	-R 98,800.00
2003/07/09	R 1,006	31.0%	R 1,040	R 1,006	100	0	R 107.15	R 10,715.00	-R 100.00	-R 100,600.00
2003/07/10	R 994	31.0%	R 1,040	R 994	100	0	R 100.87	R 10,087.00	-R 100.00	-R 99,400.00
2003/07/11	R 990	31.0%	R 1,040	R 990	100	0	R 98.70	R 9,870.00	-R 100.00	-R 99,000.00
2003/07/14	R 975	31.0%	R 1,040	R 975	100	0	R 90.92	R 9,092.00	-R 100.00	-R 97,500.00
2003/07/15	R 985	31.0%	R 1,040	R 985	100	0	R 95.56	R 9,556.00	-R 100.00	-R 98,500.00
2003/07/16	R 982	31.0%	R 1,040	R 982	100	0	R 93.93	R 9,393.00	-R 100.00	-R 98,200.00
2003/07/17	R 968	31.0%	R 1,040	R 968	100	0	R 87.12	R 8,712.00	-R 100.00	-R 96,800.00
2003/07/18	R 957	31.0%	R 1,040	R 957	100	0	R 81.93	R 8,193.00	-R 100.00	-R 95,700.00
2003/07/21	R 942	31.0%	R 1,040	R 942	100	0	R 74.86	R 7,486.00	-R 100.00	-R 94,200.00
2003/07/22	R 952	31.0%	R 1,040	R 952	100	0	R 79.04	R 7,904.00	-R 100.00	-R 95,200.00
2003/07/23	R 961	36.0%	R 1,040	R 961	100	0	R 101.22	R 10,122.00	-R 100.00	-R 96,100.00
2003/07/24	R 940	36.0%	R 1,040	R 940	100	0	R 91.26	R 9,126.00	-R 100.00	-R 94,000.00
2003/07/25	R 940	36.0%	R 1,040	R 940	100	0	R 91.07	R 9,107.00	-R 100.00	-R 94,000.00
2003/07/28	R 935	36.0%	R 1,040	R 935	100	0	R 88.25	R 8,825.00	-R 100.00	-R 93,500.00
2003/07/29	R 949	36.0%	R 1,040	R 949	100	0	R 94.40	R 9,440.00	-R 100.00	-R 94,900.00
2003/07/30	R 960	36.0%	R 1,040	R 960	100	0	R 99.36	R 9,936.00	-R 100.00	-R 96,000.00
2003/07/31	R 976	36.0%	R 1,040	R 976	100	0	R 106.91	R 10,691.00	-R 100.00	-R 97,600.00
2003/08/01	R 983	36.0%	R 1,040	R 983	100	0	R 110.19	R 11,019.00	-R 100.00	-R 98,300.00
2003/08/04	R 986	36.0%	R 1,040	R 986	100	0	R 111.08	R 11,108.00	-R 100.00	-R 98,600.00
2003/08/05	R 1,000	37.0%	R 1,040	R 1,000	100	0	R 121.81	R 12,181.00	-R 100.00	-R 100,000.00
2003/08/06	R 966	37.0%	R 1,040	R 966	100	0	R 104.44	R 10,444.00	-R 100.00	-R 96,600.00
2003/08/07	R 970	37.0%	R 1,040	R 970	100	0	R 106.18	R 10,618.00	-R 100.00	-R 97,000.00
2003/08/08	R 981	37.0%	R 1,040	R 981	100	0	R 111.42	R 11,142.00	-R 100.00	-R 98,100.00
2003/08/11	R 990	37.0%	R 1,040	R 990	100	0	R 115.34	R 11,534.00	-R 100.00	-R 99,000.00
2003/08/12	R 981	37.0%	R 1,040	R 981	100	0	R 110.57	R 11,057.00	-R 100.00	-R 98,100.00
2003/08/13	R 1,010	37.0%	R 1,040	R 1,010	100	0	R 125.37	R 12,537.00	-R 100.00	-R 101,000.00
2003/08/14	R 985	37.0%	R 1,040	R 985	100	0	R 112.15	R 11,215.00	-R 100.00	-R 98,500.00
2003/08/15	R 995	36.0%	R 1,040	R 995	100	0	R 113.37	R 11,337.00	-R 100.00	-R 99,500.00
2003/08/18	R 1,000	36.0%	R 1,040	R 1,000	100	0	R 115.32	R 11,532.00	-R 100.00	-R 100,000.00
2003/08/19	R 990	36.0%	R 1,040	R 990	100	0	R 109.98	R 10,998.00	-R 100.00	-R 99,000.00
2003/08/20	R 993	36.0%	R 1,040	R 993	100	0	R 111.29	R 11,129.00	-R 100.00	-R 99,300.00
2003/08/21	R 1,018	36.0%	R 1,040	R 1,018	100	0	R 124.20	R 12,420.00	-R 100.00	-R 101,800.00
2003/08/22	R 1,026	36.0%	R 1,040	R 1,026	100	0	R 128.34	R 12,834.00	-R 100.00	-R 102,600.00
2003/08/25	R 1,031	36.0%	R 1,040	R 1,031	100	0	R 130.44	R 13,044.00	-R 100.00	-R 103,100.00
2003/08/26	R 1,046	36.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2003/08/27	R 1,033	37.0%	R 1,040	R 1,033	100	0	R 134.81	R 13,481.00	-R 100.00	-R 103,300.00
2003/08/28	R 1,022	37.0%	R 1,040	R 1,022	100	0	R 128.51	R 12,851.00	-R 100.00	-R 102,200.00
2003/08/29	R 1,030	37.0%	R 1,040	R 1,030	100	0	R 132.69	R 13,269.00	-R 100.00	-R 103,000.00
01/09/200	R 1,020	37.0%	R 1,040	R 1,020	100	0	R 126.51	R 12,651.00	-R 100.00	-R 102,000.00
2003/09/02	R 1,014	37.0%	R 1,040	R 1,014	100	0	R 123.05	R 12,305.00	-R 100.00	-R 101,400.00
2003/09/03	R 1,012	37.0%	R 1,040	R 1,012	100	0	R 121.75	R 12,175.00	-R 100.00	-R 101,200.00
2003/09/04	R 1,029	37.0%	R 1,040	R 1,029	100	0	R 130.76	R 13,076.00	-R 100.00	-R 102,900.00
2003/09/05	R 1,048	38.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2003/09/08	R 1,044	38.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2003/09/09	R 1,043	38.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2003/09/10	R 1,056	38.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2003/09/11	R 1,060	38.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2003/09/12	R 1,058	38.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2003/09/15	R 1,033	38.0%	R 1,040	R 1,033	100	0	R 134.00	R 13,400.00	-R 100.00	-R 103,300.00
2003/09/16	R 1,050	38.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2003/09/17	R 1,044	38.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2003/09/18	R 1,026	38.0%	R 1,040	R 1,026	100	0	R 129.40	R 12,940.00	-R 100.00	-R 102,600.00
2003/09/19	R 1,028	38.0%	R 1,040	R 1,028	100	0	R 130.26	R 13,026.00	-R 100.00	-R 102,800.00
2003/09/22	R 1,039	38.0%	R 1,040	R 1,039	100	0	R 135.67	R 13,567.00	-R 100.00	-R 103,900.00
2003/09/23	R 1,035	38.0%	R 1,040	R 1,035	100	0	R 133.17	R 13,317.00	-R 100.00	-R 103,500.00
2003/09/25	R 1,029	37.0%	R 1,040	R 1,029	100	0	R 125.83	R 12,583.00	-R 100.00	-R 102,900.00

DATE	PRICE	VOLATILITY	CALL-STRIKE	DAILY HEDGE	VOLUME BELOW MAXIMUM PRICE	VOLUME @ MAXIMUM PRICE	OPTION PREMIUM	NET OPTION COST	ADDITIONAL BROKING FEES @ R1/TON	DAILY PROCUREMENT PRICE
2003/09/26	R 1,029	36.0%	R 1,040	R 1,029	100	0	R 122.08	R 12,208.00	-R 100.00	-R 102,900.00
2003/09/29	R 1,038	36.0%	R 1,040	R 1,038	100	0	R 126.36	R 12,636.00	-R 100.00	-R 103,800.00
2003/09/30	R 1,025	36.0%	R 1,040	R 1,025	100	0	R 118.97	R 11,897.00	-R 100.00	-R 102,500.00
2003/10/01	R 1,000	36.0%	R 1,040	R 1,000	100	0	R 105.57	R 10,557.00	-R 100.00	-R 100,000.00
2003/10/02	R 1,009	37.0%	R 1,040	R 1,009	100	0	R 113.41	R 11,341.00	-R 100.00	-R 100,900.00
2003/10/03	R 994	37.0%	R 1,040	R 994	100	0	R 105.45	R 10,545.00	-R 100.00	-R 99,400.00
2003/10/06	R 1,039	37.0%	R 1,040	R 1,039	100	0	R 128.72	R 12,872.00	-R 100.00	-R 103,900.00
2003/10/07	R 1,017	38.0%	R 1,040	R 1,017	100	0	R 119.85	R 11,985.00	-R 100.00	-R 101,700.00
2003/10/08	R 1,014	38.0%	R 1,040	R 1,014	100	0	R 118.00	R 11,800.00	-R 100.00	-R 101,400.00
2003/10/09	R 1,027	38.0%	R 1,040	R 1,027	100	0	R 124.77	R 12,477.00	-R 100.00	-R 102,700.00
2003/10/10	R 999	39.0%	R 1,040	R 999	100	0	R 113.00	R 11,300.00	-R 100.00	-R 99,900.00
2003/10/13	R 1,006	39.0%	R 1,040	R 1,006	100	0	R 115.88	R 11,588.00	-R 100.00	-R 100,600.00
2003/10/14	R 986	38.0%	R 1,040	R 986	100	0	R 102.11	R 10,211.00	-R 100.00	-R 98,600.00
2003/10/15	R 959	36.0%	R 1,040	R 959	100	0	R 82.64	R 8,264.00	-R 100.00	-R 95,900.00
2003/10/16	R 948	37.0%	R 1,040	R 948	100	0	R 80.63	R 8,063.00	-R 100.00	-R 94,800.00
2003/10/17	R 961	38.0%	R 1,040	R 961	100	0	R 89.40	R 8,940.00	-R 100.00	-R 96,100.00
2003/10/20	R 967	39.0%	R 1,040	R 967	100	0	R 94.64	R 9,464.00	-R 100.00	-R 96,700.00
2003/10/21	R 961	38.0%	R 1,040	R 961	100	0	R 88.44	R 8,844.00	-R 100.00	-R 96,100.00
2003/10/22	R 962	38.0%	R 1,040	R 962	100	0	R 88.66	R 8,866.00	-R 100.00	-R 96,200.00
2003/10/23	R 976	38.0%	R 1,040	R 976	100	0	R 95.01	R 9,501.00	-R 100.00	-R 97,600.00
2003/10/24	R 997	39.0%	R 1,040	R 997	100	0	R 108.38	R 10,838.00	-R 100.00	-R 99,700.00
2003/10/27	R 999	40.0%	R 1,040	R 999	100	0	R 111.85	R 11,185.00	-R 100.00	-R 99,900.00
2003/10/28	R 984	40.0%	R 1,040	R 984	100	0	R 103.99	R 10,399.00	-R 100.00	-R 98,400.00
2003/10/29	R 993	40.0%	R 1,040	R 993	100	0	R 108.24	R 10,824.00	-R 100.00	-R 99,300.00
2003/10/30	R 983	39.0%	R 1,040	R 983	100	0	R 99.80	R 9,980.00	-R 100.00	-R 98,300.00
2003/10/31	R 980	40.0%	R 1,040	R 980	100	0	R 101.22	R 10,122.00	-R 100.00	-R 98,000.00
2003/11/03	R 992	40.0%	R 1,040	R 992	100	0	R 106.38	R 10,638.00	-R 100.00	-R 99,200.00
2003/11/04	R 979	41.0%	R 1,040	R 979	100	0	R 102.77	R 10,277.00	-R 100.00	-R 97,900.00
2003/11/05	R 970	41.0%	R 1,040	R 970	100	0	R 98.13	R 9,813.00	-R 100.00	-R 97,000.00
2003/11/06	R 994	42.0%	R 1,040	R 994	100	0	R 112.87	R 11,287.00	-R 100.00	-R 99,400.00
2003/11/07	R 987	42.0%	R 1,040	R 987	100	0	R 109.03	R 10,903.00	-R 100.00	-R 98,700.00
2003/11/10	R 1,003	42.0%	R 1,040	R 1,003	100	0	R 116.37	R 11,637.00	-R 100.00	-R 100,300.00
2003/11/11	R 988	42.0%	R 1,040	R 988	100	0	R 108.38	R 10,838.00	-R 100.00	-R 98,800.00
2003/11/12	R 988	42.0%	R 1,040	R 988	100	0	R 108.09	R 10,809.00	-R 100.00	-R 98,800.00
2003/11/13	R 1,004	41.0%	R 1,040	R 1,004	100	0	R 112.88	R 11,288.00	-R 100.00	-R 100,400.00
2003/11/14	R 991	42.0%	R 1,040	R 991	100	0	R 109.03	R 10,903.00	-R 100.00	-R 99,100.00
2003/11/17	R 984	41.0%	R 1,040	R 984	100	0	R 101.60	R 10,160.00	-R 100.00	-R 98,400.00
2003/11/18	R 986	41.0%	R 1,040	R 986	100	0	R 102.30	R 10,230.00	-R 100.00	-R 98,600.00
2003/11/19	R 978	41.0%	R 1,040	R 978	100	0	R 98.09	R 9,809.00	-R 100.00	-R 97,800.00
2003/11/20	R 976	41.0%	R 1,040	R 976	100	0	R 96.84	R 9,684.00	-R 100.00	-R 97,600.00
2003/11/21	R 972	41.0%	R 1,040	R 972	100	0	R 94.64	R 9,464.00	-R 100.00	-R 97,200.00
2003/11/24	R 978	41.0%	R 1,040	R 978	100	0	R 96.66	R 9,666.00	-R 100.00	-R 97,800.00
2003/11/25	R 980	39.0%	R 1,040	R 980	100	0	R 91.41	R 9,141.00	-R 100.00	-R 98,000.00
2003/11/26	R 977	39.0%	R 1,040	R 977	100	0	R 89.70	R 8,970.00	-R 100.00	-R 97,700.00
2003/11/27	R 976	37.0%	R 1,040	R 976	100	0	R 83.08	R 8,308.00	-R 100.00	-R 97,600.00
2003/11/28	R 968	36.0%	R 1,040	R 968	100	0	R 76.25	R 7,625.00	-R 100.00	-R 96,800.00
2003/12/01	R 996	37.0%	R 1,040	R 996	100	0	R 91.61	R 9,161.00	-R 100.00	-R 99,600.00
2003/12/02	R 1,015	38.0%	R 1,040	R 1,015	100	0	R 103.98	R 10,398.00	-R 100.00	-R 101,500.00
2003/12/03	R 1,020	38.0%	R 1,040	R 1,020	100	0	R 106.33	R 10,633.00	-R 100.00	-R 102,000.00
2003/12/04	R 1,045	38.0%	R 1,040	R 1,040	0	100	R 0.00	R 0.00	R 0.00	
2003/12/05	R 1,080	39.0%	R 1,040	R 1,040	0	100	R 0.00	R 0.00	R 0.00	
2003/12/08	R 1,125	41.0%	R 1,040	R 1,040	0	100	R 0.00	R 0.00	R 0.00	
2003/12/09	R 1,138	42.0%	R 1,040	R 1,040	0	100	R 0.00	R 0.00	R 0.00	
2003/12/10	R 1,139	42.0%	R 1,040	R 1,040	0	100	R 0.00	R 0.00	R 0.00	
2003/12/11	R 1,147	42.0%	R 1,040	R 1,040	0	100	R 0.00	R 0.00	R 0.00	
2003/12/12	R 1,192	43.0%	R 1,040	R 1,040	0	100	R 0.00	R 0.00	R 0.00	
2003/12/15	R 1,237	47.0%	R 1,040	R 1,040	0	100	R 0.00	R 0.00	R 0.00	
2003/12/17	R 1,245	47.0%	R 1,040	R 1,040	0	100	R 0.00	R 0.00	R 0.00	
18/12/2003	R 1,206	48.0%	R 1,040	R 1,040	0	100	R 0.00	R 0.00	R 0.00	
2003/12/19	R 1,212	50.0%	R 1,040	R 1,040	0	100	R 0.00	R 0.00	R 0.00	
2003/12/22	R 1,247	50.0%	R 1,040	R 1,040	0	100	R 0.00	R 0.00	R 0.00	
2003/12/23	R 1,209	50.0%	R 1,040	R 1,040	0	100	R 0.00	R 0.00	R 0.00	
2003/12/24	R 1,254	54.0%	R 1,040	R 1,040	0	100	R 0.00	R 0.00	R 0.00	
2003/12/29	R 1,209	54.5%	R 1,040	R 1,040	0	100	R 0.00	R 0.00	R 0.00	
2003/12/30	R 1,192	53.0%	R 1,040	R 1,040	0	100	R 0.00	R 0.00	R 0.00	
2003/12/31	R 1,225	52.0%	R 1,040	R 1,040	0	100	R 0.00	R 0.00	R 0.00	
2004/01/02	R 1,246	51.0%	R 1,040	R 1,040	0	100	R 0.00	R 0.00	R 0.00	
2004/01/05	R 1,205	50.0%	R 1,040	R 1,040	0	100	R 0.00	R 0.00	R 0.00	
2004/01/06	R 1,172	47.0%	R 1,040	R 1,040	0	100	R 0.00	R 0.00	R 0.00	
2004/01/07	R 1,185	47.0%	R 1,040	R 1,040	0	100	R 0.00	R 0.00	R 0.00	
2004/01/08	R 1,230	49.0%	R 1,040	R 1,040	0	100	R 0.00	R 0.00	R 0.00	
2004/01/09	R 1,275	53.0%	R 1,040	R 1,040	0	100	R 0.00	R 0.00	R 0.00	
2004/01/12	R 1,283	51.0%	R 1,040	R 1,040	0	100	R 0.00	R 0.00	R 0.00	
2004/01/13	R 1,328	54.0%	R 1,040	R 1,040	0	100	R 0.00	R 0.00	R 0.00	

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2004/01/14	R 1,373	60.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/01/15	R 1,380	55.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/01/16	R 1,425	54.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/01/19	R 1,380	52.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/01/20	R 1,335	53.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/01/21	R 1,400	51.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/01/22	R 1,396	49.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/01/23	R 1,408	47.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/01/26	R 1,453	48.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/01/27	R 1,494	46.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/01/28	R 1,500	44.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/01/29	R 1,492	45.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/01/30	R 1,533	45.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/02/02	R 1,578	46.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/02/03	R 1,543	44.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/02/04	R 1,500	46.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/02/05	R 1,536	46.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/02/06	R 1,491	47.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/02/09	R 1,446	48.5%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/02/10	R 1,423	46.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/02/11	R 1,378	45.5%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/02/12	R 1,333	47.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/02/13	R 1,342	47.5%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/02/16	R 1,387	48.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/02/17	R 1,380	46.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/02/18	R 1,364	46.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/02/19	R 1,372	45.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/02/20	R 1,368	43.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/02/23	R 1,323	43.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/02/24	R 1,278	45.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/02/25	R 1,287	45.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/02/26	R 1,270	43.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/02/27	R 1,225	42.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/03/01	R 1,212	41.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/03/02	R 1,167	39.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/03/03	R 1,125	40.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/03/04	R 1,160	41.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/03/05	R 1,166	42.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/03/08	R 1,121	45.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/03/09	R 1,076	45.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/03/10	R 1,100	44.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/03/11	R 1,145	45.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/03/12	R 1,132	45.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/03/15	R 1,135	43.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/03/16	R 1,207	44.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/03/17	R 1,176	44.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/03/18	R 1,206	44.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/03/19	R 1,203	44.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/03/23	R 1,158	48.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/03/24	R 1,113	46.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/03/25	R 1,100	44.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/03/26	R 1,103	43.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/03/29	R 1,086	42.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/03/30	R 1,091	41.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/03/31	R 1,136	40.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/04/01	R 1,164	41.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/04/02	R 1,187	42.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/04/05	R 1,223	42.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/04/06	R 1,178	42.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/04/07	R 1,165	41.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/04/08	R 1,171	41.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/04/13	R 1,142	41.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/04/15	R 1,167	41.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/04/16	R 1,122	40.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/04/19	R 1,097	39.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/04/20	R 1,100	38.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/04/21	R 1,134	39.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/04/22	R 1,151	39.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/04/23	R 1,129	37.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/04/26	R 1,119	36.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/04/28	R 1,150	38.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/04/29	R 1,150	36.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/04/30	R 1,140	35.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/05/03	R 1,139	34.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	

DATE	PRICE	VOLATILITY	CALL-STRIKE	DAILY HEDGE	VOLUME BELOW MAXIMUM PRICE	VOLUME @ MAXIMUM PRICE	OPTION PREMIUM	NET OPTION COST	ADDITIONAL BROKING FEES @ R1/TON	DAILY PROCUREMENT PRICE
2004/05/04	R 1,116	33.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/05/05	R 1,088	33.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/05/06	R 1,057	32.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/05/07	R 1,064	34.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/05/10	R 1,090	34.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/05/11	R 1,069	33.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/05/12	R 1,074	33.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/05/13	R 1,081	32.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/05/14	R 1,079	32.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/05/17	R 1,048	33.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/05/18	R 1,063	33.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/05/19	R 1,054	32.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/05/20	R 1,062	32.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/05/21	R 1,055	32.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/05/24	R 1,064	30.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/05/25	R 1,076	30.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/05/26	R 1,069	28.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/05/27	R 1,057	26.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/05/28	R 1,052	26.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/05/31	R 1,055	28.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/06/01	R 1,073	29.5%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/06/02	R 1,086	31.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/06/03	R 1,073	30.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/06/04	R 1,071	30.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/06/07	R 1,056	30.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/06/08	R 1,059	28.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/06/09	R 1,051	26.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/06/10	R 1,044	25.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/06/11	R 1,016	28.0%	R 1,040	R 1,016	100	0	R 10.98	R 1,098.00	-R 100.00	-R 101,600.00
2004/06/14	R 1,017	30.0%	R 1,040	R 1,017	100	0	R 9.96	R 996.00	-R 100.00	-R 101,700.00
2004/06/15	R 997	33.0%	R 1,040	R 997	100	0	R 5.33	R 533.00	-R 100.00	-R 99,700.00
2004/06/17	R 962	37.0%	R 1,040	R 962	100	0		R 0.00	R 0.00	-R 96,200.00
2004/06/18	R 975	39.0%	R 1,040	R 975	100	0	R 1.63	R 163.00	-R 100.00	-R 97,500.00
2004/06/21	R 930	41.0%	R 1,040	R 930	100	0		R 0.00	R 0.00	-R 93,000.00
2004/06/22	R 927	45.0%	R 1,040	R 927	100	0		R 0.00	R 0.00	-R 92,700.00
2004/06/23	R 906	45.0%	R 1,040	R 906	13700	0		R 0.00	R 0.00	-R 12,412,200.00
								-R 1,890,528.00	-R 36,200.00	-R 23,701,200.00
Total procurement price	-R 23,701,200.00									
Total option cost	-R 1,890,528.00									
Additional broking fees	-R 36,200.00									
Net procurement cost	-R 25,627,928.00									
Average Price Index	R 1,086.16									
Maximum price strategy	R 1,021.03									
Tonnages hedged	25100									

2005

DATE	PRICE	VOLATILITY	CALL-STRIKE	DAILY HEDGE	VOLUME BELOW MAXIMUM PRICE	VOLUME @ MAXIMUM PRICE	OPTION PREMIUM	NET OPTION COST	ADDITIONAL BROKING FEES @ R1/TON	DAILY PROCUREMENT PRICE
2004/07/08	R 1,045	26.0%	R 1,040				-R 108.12	-R 2,594,880.00	-R 24,000.00	
2004/07/09	R 1,032	26.0%	R 1,040	R 1,032	100	0	R 100.84	R 10,084.00	-R 100.00	-R 103,200.00
2004/07/12	R 1,019	26.0%	R 1,040	R 1,019	100	0	R 93.53	R 9,353.00	-R 100.00	-R 101,900.00
2004/07/13	R 1,022	26.5%	R 1,040	R 1,022	100	0	R 96.91	R 9,691.00	-R 100.00	-R 102,200.00
2004/07/14	R 1,016	26.5%	R 1,040	R 1,016	100	0	R 93.65	R 9,365.00	-R 100.00	-R 101,600.00
2004/07/15	R 999	26.5%	R 1,040	R 999	100	0	R 84.96	R 8,496.00	-R 100.00	-R 99,900.00
2004/07/16	R 989	26.5%	R 1,040	R 989	100	0	R 80.01	R 8,001.00	-R 100.00	-R 98,900.00
2004/07/19	R 946	26.5%	R 1,040	R 946	100	0	R 60.72	R 6,072.00	-R 100.00	-R 94,600.00
2004/07/20	R 930	26.5%	R 1,040	R 930	100	0	R 54.33	R 5,433.00	-R 100.00	-R 93,000.00
2004/07/21	R 964	29.0%	R 1,040	R 964	100	0	R 77.09	R 7,709.00	-R 100.00	-R 96,400.00
2004/07/22	R 965	30.0%	R 1,040	R 965	100	0	R 81.05	R 8,105.00	-R 100.00	-R 96,500.00
2004/07/23	R 995	31.0%	R 1,040	R 995	100	0	R 98.93	R 9,893.00	-R 100.00	-R 99,500.00
2004/07/26	R 987	32.0%	R 1,040	R 987	100	0	R 98.21	R 9,821.00	-R 100.00	-R 98,700.00
2004/07/27	R 1,032	32.0%	R 1,040	R 1,032	100	0	R 121.50	R 12,150.00	-R 100.00	-R 103,200.00
2004/07/28	R 1,044	32.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/07/29	R 1,036	34.0%	R 1,040	R 1,036	100	0	R 131.10	R 13,110.00	-R 100.00	-R 103,600.00
2004/07/30	R 1,023	34.0%	R 1,040	R 1,023	100	0	R 123.73	R 12,373.00	-R 100.00	-R 102,300.00
2004/08/02	R 1,013	36.0%	R 1,040	R 1,013	100	0	R 125.36	R 12,536.00	-R 100.00	-R 101,300.00
2004/08/03	R 1,058	36.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/08/04	R 1,059	36.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/08/05	R 1,049	37.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/08/06	R 1,069	37.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/08/10	R 1,048	38.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/08/11	R 1,070	37.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/08/12	R 1,042	37.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/08/13	R 1,075	38.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/08/16	R 1,053	38.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/08/17	R 1,060	38.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/08/18	R 1,060	38.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/08/19	R 1,045	38.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/08/20	R 1,055	38.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/08/23	R 1,081	39.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/08/24	R 1,110	39.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/08/25	R 1,100	39.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/08/26	R 1,093	39.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/08/27	R 1,095	40.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/08/30	R 1,095	40.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/08/31	R 1,078	42.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/09/01	R 1,033	41.0%	R 1,040	R 1,033	100	0	R 148.08	R 14,808.00	-R 100.00	-R 103,300.00
2004/09/02	R 1,025	41.0%	R 1,040	R 1,025	100	0	R 143.33	R 14,333.00	-R 100.00	-R 102,500.00
2004/09/03	R 1,024	41.0%	R 1,040	R 1,024	100	0	R 142.52	R 14,252.00	-R 100.00	-R 102,400.00
2004/09/06	R 1,038	41.0%	R 1,040	R 1,038	100	0	R 149.65	R 14,965.00	-R 100.00	-R 103,800.00
2004/09/07	R 1,031	41.0%	R 1,040	R 1,031	100	0	R 145.52	R 14,552.00	-R 100.00	-R 103,100.00
2004/09/08	R 1,050	41.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/09/09	R 1,052	41.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/09/10	R 1,057	40.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/09/13	R 1,034	39.0%	R 1,040	R 1,034	100	0	R 138.39	R 13,839.00	-R 100.00	-R 103,400.00
2004/09/14	R 1,022	39.0%	R 1,040	R 1,022	100	0	R 131.49	R 13,149.00	-R 100.00	-R 102,200.00
2004/09/15	R 1,020	40.0%	R 1,040	R 1,020	100	0	R 133.70	R 13,370.00	-R 100.00	-R 102,000.00
2004/09/16	R 1,035	41.0%	R 1,040	R 1,035	100	0	R 145.35	R 14,535.00	-R 100.00	-R 103,500.00
2004/09/17	R 1,023	41.0%	R 1,040	R 1,023	100	0	R 138.38	R 13,838.00	-R 100.00	-R 102,300.00
2004/09/20	R 1,011	41.0%	R 1,040	R 1,011	100	0	R 131.04	R 13,104.00	-R 100.00	-R 101,100.00
2004/09/21	R 1,003	41.0%	R 1,040	R 1,003	100	0	R 126.51	R 12,651.00	-R 100.00	-R 100,300.00
2004/09/22	R 1,023	41.0%	R 1,040	R 1,023	100	0	R 137.07	R 13,707.00	-R 100.00	-R 102,300.00
2004/09/23	R 1,030	42.0%	R 1,040	R 1,030	100	0	R 144.21	R 14,421.00	-R 100.00	-R 103,000.00
2004/09/27	R 1,030	42.0%	R 1,040	R 1,030	100	0	R 143.13	R 14,313.00	-R 100.00	-R 103,000.00
2004/09/28	R 1,025	42.0%	R 1,040	R 1,025	100	0	R 140.06	R 14,006.00	-R 100.00	-R 102,500.00
2004/09/29	R 1,030	42.0%	R 1,040	R 1,030	100	0	R 142.58	R 14,258.00	-R 100.00	-R 103,000.00
2004/09/30	R 1,020	42.0%	R 1,040	R 1,020	100	0	R 136.76	R 13,676.00	-R 100.00	-R 102,000.00
2004/10/01	R 1,022	42.0%	R 1,040	R 1,022	100	0	R 137.59	R 13,759.00	-R 100.00	-R 102,200.00
2004/10/04	R 1,023	41.0%	R 1,040	R 1,023	100	0	R 133.89	R 13,389.00	-R 100.00	-R 102,300.00
2004/10/05	R 1,010	41.0%	R 1,040	R 1,010	100	0	R 126.56	R 12,656.00	-R 100.00	-R 101,000.00
2004/10/06	R 965	41.0%	R 1,040	R 965	100	0	R 103.38	R 10,338.00	-R 100.00	-R 96,500.00
2004/10/07	R 978	41.0%	R 1,040	R 978	100	0	R 109.50	R 10,950.00	-R 100.00	-R 97,800.00
2004/10/08	R 967	41.0%	R 1,040	R 967	100	0	R 103.84	R 10,384.00	-R 100.00	-R 96,700.00
2004/10/11	R 938	42.0%	R 1,040	R 938	100	0	R 92.65	R 9,265.00	-R 100.00	-R 93,800.00
2004/10/12	R 953	43.0%	R 1,040	R 953	100	0	R 102.48	R 10,248.00	-R 100.00	-R 95,300.00
2004/10/13	R 967	42.0%	R 1,040	R 967	100	0	R 105.75	R 10,575.00	-R 100.00	-R 96,700.00
2004/10/14	R 956	43.0%	R 1,040	R 956	100	0	R 103.37	R 10,337.00	-R 100.00	-R 95,600.00
2004/10/15	R 945	42.0%	R 1,040	R 945	100	0	R 94.81	R 9,481.00	-R 100.00	-R 94,500.00
2004/10/18	R 965	42.0%	R 1,040	R 965	100	0	R 103.44	R 10,344.00	-R 100.00	-R 96,500.00
2004/10/19	R 957	41.0%	R 1,040	R 957	100	0	R 96.22	R 9,622.00	-R 100.00	-R 95,700.00
2004/10/20	R 965	41.0%	R 1,040	R 965	100	0	R 99.75	R 9,975.00	-R 100.00	-R 96,500.00
2004/10/21	R 983	41.0%	R 1,040	R 983	100	0	R 108.29	R 10,829.00	-R 100.00	-R 98,300.00
2004/10/22	R 982	41.0%	R 1,040	R 982	100	0	R 107.52	R 10,752.00	-R 100.00	-R 98,200.00
2004/10/25	R 1,027	42.5%	R 1,040	R 1,027	100	0	R 135.28	R 13,528.00	-R 100.00	-R 102,700.00
2004/10/26	R 1,065	43.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/10/27	R 1,042	43.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	

DATE	PRICE	VOLATILITY	CALL-STRIKE	DAILY HEDGE	VOLUME BELOW MAXIMUM PRICE	VOLUME @ MAXIMUM PRICE	OPTION PREMIUM	NET OPTION COST	ADDITIONAL BROKING FEES @ R1/TON	DAILY PROCUREMENT PRICE
2004/10/28	R 1,048	43.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/10/29	R 1,093	44.5%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/11/01	R 1,100	44.5%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/11/02	R 1,088	44.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/11/03	R 1,059	45.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/11/04	R 1,050	46.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/11/05	R 1,040	46.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/11/08	R 995	46.0%	R 1,040	R 995	100	0	R 125.03	R 12,503.00	-R 100.00	-R 99,500.00
2004/11/09	R 998	47.0%	R 1,040	R 998	100	0	R 129.41	R 12,941.00	-R 100.00	-R 99,800.00
2004/11/10	R 983	47.0%	R 1,040	R 983	100	0	R 121.27	R 12,127.00	-R 100.00	-R 98,300.00
2004/11/11	R 1,007	46.0%	R 1,040	R 1,007	100	0	R 130.43	R 13,043.00	-R 100.00	-R 100,700.00
2004/11/12	R 997	46.0%	R 1,040	R 997	100	0	R 124.80	R 12,480.00	-R 100.00	-R 99,700.00
2004/11/15	R 1,042	49.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/11/16	R 1,081	48.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/11/17	R 1,050	47.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/11/18	R 1,050	47.5%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/11/19	R 1,062	48.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/11/22	R 1,090	49.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/11/23	R 1,087	49.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/11/24	R 1,072	49.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/11/25	R 1,075	49.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/11/26	R 1,054	49.0%	R 1,040	R 1,040	0	100		R 0.00	R 0.00	
2004/11/29	R 1,009	51.0%	R 1,040	R 1,009	100	0	R 140.62	R 14,062.00	-R 100.00	-R 100,900.00
2004/11/30	R 964	54.0%	R 1,040	R 964	100	0	R 125.45	R 12,545.00	-R 100.00	-R 96,400.00
2004/12/01	R 944	52.0%	R 1,040	R 944	100	0	R 109.54	R 10,954.00	-R 100.00	-R 94,400.00
2004/12/02	R 940	51.0%	R 1,040	R 940	100	0	R 104.49	R 10,449.00	-R 100.00	-R 94,000.00
2004/12/03	R 927	49.0%	R 1,040	R 927	100	0	R 92.67	R 9,267.00	-R 100.00	-R 92,700.00
2004/12/06	R 882	50.0%	R 1,040	R 882	100	0	R 75.34	R 7,534.00	-R 100.00	-R 88,200.00
2004/12/07	R 902	50.0%	R 1,040	R 902	100	0	R 83.18	R 8,318.00	-R 100.00	-R 90,200.00
2004/12/08	R 929	51.0%	R 1,040	R 929	100	0	R 97.30	R 9,730.00	-R 100.00	-R 92,900.00
2004/12/09	R 904	52.0%	R 1,040	R 904	100	0	R 88.56	R 8,856.00	-R 100.00	-R 90,400.00
2004/12/10	R 901	53.0%	R 1,040	R 901	100	0	R 89.51	R 8,951.00	-R 100.00	-R 90,100.00
2004/12/13	R 917	54.0%	R 1,040	R 917	100	0	R 98.08	R 9,808.00	-R 100.00	-R 91,700.00
2004/12/14	R 900	53.0%	R 1,040	R 900	100	0	R 87.67	R 8,767.00	-R 100.00	-R 90,000.00
2004/12/15	R 906	50.5%	R 1,040	R 906	100	0	R 83.48	R 8,348.00	-R 100.00	-R 90,600.00
2004/12/17	R 897	48.5%	R 1,040	R 897	100	0	R 74.07	R 7,407.00	-R 100.00	-R 89,700.00
2004/12/20	R 852	49.0%	R 1,040	R 852	100	0	R 57.53	R 5,753.00	-R 100.00	-R 85,200.00
2004/12/21	R 807	50.0%	R 1,040	R 807	100	0	R 44.93	R 4,493.00	-R 100.00	-R 80,700.00
2004/12/22	R 804	50.0%	R 1,040	R 804	100	0	R 43.79	R 4,379.00	-R 100.00	-R 80,400.00
2004/12/23	R 795	51.5%	R 1,040	R 795	100	0	R 43.81	R 4,381.00	-R 100.00	-R 79,500.00
2004/12/24	R 798	51.5%	R 1,040	R 798	100	0	R 44.41	R 4,441.00	-R 100.00	-R 79,800.00
2004/12/28	R 784	51.0%	R 1,040	R 784	100	0	R 38.49	R 3,849.00	-R 100.00	-R 78,400.00
2004/12/29	R 767	50.0%	R 1,040	R 767	100	0	R 32.18	R 3,218.00	-R 100.00	-R 76,700.00
2004/12/30	R 812	52.0%	R 1,040	R 812	100	0	R 47.86	R 4,786.00	-R 100.00	-R 81,200.00
2004/12/31	R 816	52.0%	R 1,040	R 816	100	0	R 48.80	R 4,880.00	-R 100.00	-R 81,600.00
2005/01/03	R 861	54.0%	R 1,040	R 861	100	0	R 67.41	R 6,741.00	-R 100.00	-R 86,100.00
2005/01/04	R 855	54.0%	R 1,040	R 855	100	0	R 64.85	R 6,485.00	-R 100.00	-R 85,500.00
2005/01/05	R 880	53.0%	R 1,040	R 880	100	0	R 71.66	R 7,166.00	-R 100.00	-R 88,000.00
2005/01/06	R 845	53.0%	R 1,040	R 845	100	0	R 58.46	R 5,846.00	-R 100.00	-R 84,500.00
2005/01/07	R 814	53.0%	R 1,040	R 814	100	0	R 48.03	R 4,803.00	-R 100.00	-R 81,400.00
2005/01/10	R 769	55.0%	R 1,040	R 769	100	0	R 37.95	R 3,795.00	-R 100.00	-R 76,900.00
2005/01/11	R 725	53.0%	R 1,040	R 725	100	0	R 24.48	R 2,448.00	-R 100.00	-R 72,500.00
2005/01/12	R 742	51.0%	R 1,040	R 742	100	0	R 24.94	R 2,494.00	-R 100.00	-R 74,200.00
2005/01/13	R 698	50.0%	R 1,040	R 698	100	0	R 15.70	R 1,570.00	-R 100.00	-R 69,800.00
2005/01/14	R 709	51.0%	R 1,040	R 709	100	0	R 18.40	R 1,840.00	-R 100.00	-R 70,900.00
2005/01/17	R 724	49.0%	R 1,040	R 724	100	0	R 17.98	R 1,798.00	-R 100.00	-R 72,400.00
2005/01/18	R 697	48.0%	R 1,040	R 697	100	0	R 12.71	R 1,271.00	-R 100.00	-R 69,700.00
2005/01/19	R 659	47.0%	R 1,040	R 659	100	0	R 7.54	R 754.00	-R 100.00	-R 65,900.00
2005/01/20	R 678	47.5%	R 1,040	R 678	100	0	R 9.70	R 970.00	-R 100.00	-R 67,800.00
2005/01/21	R 687	46.5%	R 1,040	R 687	100	0	R 9.73	R 973.00	-R 100.00	-R 68,700.00
2005/01/24	R 648	45.0%	R 1,040	R 648	100	0	R 4.93	R 493.00	-R 100.00	-R 64,800.00
2005/01/25	R 603	44.0%	R 1,040	R 603	100	0	R 2.21	R 221.00	-R 100.00	-R 60,300.00
2005/01/26	R 580	45.0%	R 1,040	R 580	100	0	R 1.69	R 169.00	-R 100.00	-R 58,000.00
2005/01/27	R 614	47.0%	R 1,040	R 614	100	0	R 3.67	R 367.00	-R 100.00	-R 61,400.00
2005/01/28	R 615	48.5%	R 1,040	R 615	100	0	R 4.31	R 431.00	-R 100.00	-R 61,500.00
2005/01/31	R 625	48.0%	R 1,040	R 625	100	0	R 4.45	R 445.00	-R 100.00	-R 62,500.00
2005/02/01	R 621	48.5%	R 1,040	R 621	100	0	R 4.36	R 436.00	-R 100.00	-R 62,100.00
2005/02/02	R 624	48.5%	R 1,040	R 624	100	0	R 4.46	R 446.00	-R 100.00	-R 62,400.00
2005/02/03	R 638	47.5%	R 1,040	R 638	100	0	R 4.78	R 478.00	-R 100.00	-R 63,800.00
2005/02/04	R 662	47.5%	R 1,040	R 662	100	0	R 6.44	R 644.00	-R 100.00	-R 66,200.00
2005/02/07	R 672	46.5%	R 1,040	R 672	100	0	R 6.32	R 632.00	-R 100.00	-R 67,200.00
2005/02/08	R 627	49.0%	R 1,040	R 627	100	0	R 4.38	R 438.00	-R 100.00	-R 62,700.00
2005/02/09	R 601	50.0%	R 1,040	R 601	100	0	R 3.30	R 330.00	-R 100.00	-R 60,100.00
2005/02/10	R 598	50.0%	R 1,040	R 598	100	0	R 3.09	R 309.00	-R 100.00	-R 59,800.00
2005/02/11	R 605	48.0%	R 1,040	R 605	100	0	R 2.67	R 267.00	-R 100.00	-R 60,500.00
2005/02/14	R 601	47.0%	R 1,040	R 601	100	0	R 2.06	R 206.00	-R 100.00	-R 60,100.00
2005/02/15	R 595	45.0%	R 1,040	R 595	100	0	R 1.36	R 136.00	-R 100.00	-R 59,500.00
2005/02/16	R 580	44.0%	R 1,040	R 580	100	0		R 0.00	R 0.00	-R 58,000.00
2005/02/17	R 579	44.0%	R 1,040	R 579	100	0		R 0.00	R 0.00	-R 57,900.00
2005/02/18	R 555	44.0%	R 1,040	R 555	100	0		R 0.00	R 0.00	-R 55,500.00
2005/02/21	R 536	43.0%	R 1,040	R 536	100	0		R 0.00	R 0.00	-R 53,600.00
2005/02/22	R 548	41.0%	R 1,040	R 548	100	0		R 0.00	R 0.00	-R 54,800.00
2005/02/23	R 542	39.0%	R 1,040	R 542	100	0		R 0.00	R 0.00	-R 54,200.00
2005/02/24	R 531	37.0%	R 1,040	R 531	100	0		R 0.00	R 0.00	-R 53,100.00

DATE	PRICE	VOLATILITY	CALL-STRIKE	DAILY HEDGE	VOLUME BELOW MAXIMUM PRICE	VOLUME @ MAXIMUM PRICE	OPTION PREMIUM	NET OPTION COST	ADDITIONAL BROKING FEES @ RI/TON	DAILY PROCUREMENT PRICE
2005/02/25	R 522	35.0%	R 1,040	R 522	100	0		R 0.00	R 0.00	-R 52,200.00
2005/02/28	R 548	36.0%	R 1,040	R 548	100	0		R 0.00	R 0.00	-R 54,800.00
2005/03/01	R 538	35.0%	R 1,040	R 538	100	0		R 0.00	R 0.00	-R 53,800.00
2005/03/02	R 554	34.0%	R 1,040	R 554	100	0		R 0.00	R 0.00	-R 55,400.00
2005/03/03	R 561	36.0%	R 1,040	R 561	100	0		R 0.00	R 0.00	-R 56,100.00
2005/03/04	R 554	37.5%	R 1,040	R 554	100	0		R 0.00	R 0.00	-R 55,400.00
2005/03/07	R 544	36.5%	R 1,040	R 544	100	0		R 0.00	R 0.00	-R 54,400.00
2005/03/08	R 532	36.5%	R 1,040	R 532	100	0		R 0.00	R 0.00	-R 53,200.00
2005/03/09	R 537	37.5%	R 1,040	R 537	100	0		R 0.00	R 0.00	-R 53,700.00
2005/03/10	R 553	39.5%	R 1,040	R 553	100	0		R 0.00	R 0.00	-R 55,300.00
2005/03/11	R 581	41.5%	R 1,040	R 581	100	0		R 0.00	R 0.00	-R 58,100.00
2005/03/14	R 586	43.0%	R 1,040	R 586	100	0		R 0.00	R 0.00	-R 58,600.00
2005/03/15	R 594	43.0%	R 1,040	R 594	100	0		R 0.00	R 0.00	-R 59,400.00
2005/03/16	R 597	43.0%	R 1,040	R 597	100	0		R 0.00	R 0.00	-R 59,700.00
2005/03/17	R 587	42.0%	R 1,040	R 587	100	0		R 0.00	R 0.00	-R 58,700.00
2005/03/18	R 577	40.0%	R 1,040	R 577	100	0		R 0.00	R 0.00	-R 57,700.00
2005/03/22	R 559	40.0%	R 1,040	R 559	100	0		R 0.00	R 0.00	-R 55,900.00
2005/03/23	R 576	41.0%	R 1,040	R 576	100	0		R 0.00	R 0.00	-R 57,600.00
2005/03/24	R 570	39.5%	R 1,040	R 570	100	0		R 0.00	R 0.00	-R 57,000.00
2005/03/29	R 594	38.5%	R 1,040	R 594	100	0		R 0.00	R 0.00	-R 59,400.00
2005/03/30	R 592	38.0%	R 1,040	R 592	100	0		R 0.00	R 0.00	-R 59,200.00
2005/03/31	R 585	39.0%	R 1,040	R 585	100	0		R 0.00	R 0.00	-R 58,500.00
2005/04/01	R 580	39.0%	R 1,040	R 580	100	0		R 0.00	R 0.00	-R 58,000.00
2005/04/04	R 578	39.0%	R 1,040	R 578	100	0		R 0.00	R 0.00	-R 57,800.00
2005/04/05	R 587	40.0%	R 1,040	R 587	100	0		R 0.00	R 0.00	-R 58,700.00
2005/04/06	R 573	39.0%	R 1,040	R 573	100	0		R 0.00	R 0.00	-R 57,300.00
2005/04/07	R 583	39.0%	R 1,040	R 583	100	0		R 0.00	R 0.00	-R 58,300.00
2005/04/08	R 580	38.0%	R 1,040	R 580	100	0		R 0.00	R 0.00	-R 58,000.00
2005/04/11	R 570	37.0%	R 1,040	R 570	100	0		R 0.00	R 0.00	-R 57,000.00
2005/04/12	R 567	37.0%	R 1,040	R 567	100	0		R 0.00	R 0.00	-R 56,700.00
2005/04/13	R 563	38.0%	R 1,040	R 563	100	0		R 0.00	R 0.00	-R 56,300.00
2005/04/14	R 560	39.0%	R 1,040	R 560	100	0		R 0.00	R 0.00	-R 56,000.00
2005/04/15	R 570	39.0%	R 1,040	R 570	100	0		R 0.00	R 0.00	-R 57,000.00
2005/04/18	R 561	39.0%	R 1,040	R 561	100	0		R 0.00	R 0.00	-R 56,100.00
2005/04/19	R 556	38.0%	R 1,040	R 556	100	0		R 0.00	R 0.00	-R 55,600.00
2005/04/20	R 544	40.0%	R 1,040	R 544	100	0		R 0.00	R 0.00	-R 54,400.00
2005/04/21	R 543	39.0%	R 1,040	R 543	100	0		R 0.00	R 0.00	-R 54,300.00
2005/04/22	R 550	38.0%	R 1,040	R 550	100	0		R 0.00	R 0.00	-R 55,000.00
2005/04/25	R 550	37.0%	R 1,040	R 550	100	0		R 0.00	R 0.00	-R 55,000.00
2005/04/26	R 555	36.0%	R 1,040	R 555	100	0		R 0.00	R 0.00	-R 55,500.00
2005/04/28	R 558	35.0%	R 1,040	R 558	100	0		R 0.00	R 0.00	-R 55,800.00
2005/04/29	R 558	35.0%	R 1,040	R 558	100	0		R 0.00	R 0.00	-R 55,800.00
2005/05/03	R 564	35.0%	R 1,040	R 564	100	0		R 0.00	R 0.00	-R 56,400.00
2005/05/04	R 560	35.5%	R 1,040	R 560	100	0		R 0.00	R 0.00	-R 56,000.00
2005/05/05	R 551	34.0%	R 1,040	R 551	100	0		R 0.00	R 0.00	-R 55,100.00
2005/05/06	R 552	33.0%	R 1,040	R 552	100	0		R 0.00	R 0.00	-R 55,200.00
2005/05/09	R 561	33.0%	R 1,040	R 561	100	0		R 0.00	R 0.00	-R 56,100.00
2005/05/10	R 568	34.0%	R 1,040	R 568	100	0		R 0.00	R 0.00	-R 56,800.00
2005/05/11	R 567	34.0%	R 1,040	R 567	100	0		R 0.00	R 0.00	-R 56,700.00
2005/05/12	R 575	35.0%	R 1,040	R 575	100	0		R 0.00	R 0.00	-R 57,500.00
2005/05/13	R 579	35.0%	R 1,040	R 579	100	0		R 0.00	R 0.00	-R 57,900.00
2005/05/16	R 587	35.0%	R 1,040	R 587	100	0		R 0.00	R 0.00	-R 58,700.00
2005/05/17	R 586	35.0%	R 1,040	R 586	100	0		R 0.00	R 0.00	-R 58,600.00
2005/05/18	R 578	35.0%	R 1,040	R 578	100	0		R 0.00	R 0.00	-R 57,800.00
2005/05/19	R 564	36.0%	R 1,040	R 564	100	0		R 0.00	R 0.00	-R 56,400.00
2005/05/20	R 556	36.0%	R 1,040	R 556	100	0		R 0.00	R 0.00	-R 55,600.00
2005/05/23	R 577	36.0%	R 1,040	R 577	100	0		R 0.00	R 0.00	-R 57,700.00
2005/05/24	R 585	36.0%	R 1,040	R 585	100	0		R 0.00	R 0.00	-R 58,500.00
2005/05/25	R 579	36.0%	R 1,040	R 579	100	0		R 0.00	R 0.00	-R 57,900.00
2005/05/26	R 571	36.0%	R 1,040	R 571	100	0		R 0.00	R 0.00	-R 57,100.00
2005/05/27	R 588	37.0%	R 1,040	R 588	100	0		R 0.00	R 0.00	-R 58,800.00
2005/05/30	R 581	38.0%	R 1,040	R 581	100	0		R 0.00	R 0.00	-R 58,100.00
2005/05/31	R 593	39.0%	R 1,040	R 593	100	0		R 0.00	R 0.00	-R 59,300.00
2005/06/01	R 602	39.0%	R 1,040	R 602	100	0		R 0.00	R 0.00	-R 60,200.00
2005/06/02	R 603	41.0%	R 1,040	R 603	100	0		R 0.00	R 0.00	-R 60,300.00
2005/06/03	R 592	42.0%	R 1,040	R 592	100	0		R 0.00	R 0.00	-R 59,200.00
2005/06/06	R 591	42.0%	R 1,040	R 591	100	0		R 0.00	R 0.00	-R 59,100.00
2005/06/07	R 585	42.0%	R 1,040	R 585	100	0		R 0.00	R 0.00	-R 58,500.00
2005/06/08	R 591	42.0%	R 1,040	R 591	100	0		R 0.00	R 0.00	-R 59,100.00
2005/06/09	R 594	42.0%	R 1,040	R 594	100	0		R 0.00	R 0.00	-R 59,400.00
2005/06/10	R 588	41.0%	R 1,040	R 588	100	0		R 0.00	R 0.00	-R 58,800.00
2005/06/13	R 595	40.0%	R 1,040	R 595	100	0		R 0.00	R 0.00	-R 59,500.00
2005/06/14	R 594	39.0%	R 1,040	R 594	100	0		R 0.00	R 0.00	-R 59,400.00
2005/06/15	R 594	40.0%	R 1,040	R 594	100	0		R 0.00	R 0.00	-R 59,400.00
2005/06/17	R 588	39.0%	R 1,040	R 588	100	0		R 0.00	R 0.00	-R 58,800.00
2005/06/20	R 581	39.0%	R 1,040	R 581	100	0		R 0.00	R 0.00	-R 58,100.00
2005/06/21	R 582	39.0%	R 1,040	R 582	100	0		R 0.00	R 0.00	-R 58,200.00
2005/06/22	R 579	39.0%	R 1,040	R 579	100	0		R 0.00	R 0.00	-R 57,900.00
2005/06/23	R 569	39.0%	R 1,040	R 569	4400	0		R 0.00	R 0.00	-R 2,503,600.00
								-R 1,710,807.00	-R 35,100.00	-R 17,155,200.00

Total procurement price	-R 17,155,200.00
Total option cost	-R 1,710,807.00
Additional broking fees	-R 35,100.00
Net procurement cost	-R 18,901,107.00
Average Price Index	R 810.74
Maximum price strategy	R 787.55
Tonnages hedged	24,000

2006

DATE	PRICE	VOLATILITY	CALL-STRIKE	DAILY HEDGE	VOLUME BELOW MAXIMUM PRICE	VOLUME @ MAXIMUM PRICE	OPTION PREMIUM	NET OPTION COST	ADDITIONAL BROKING FEES @ R1/TON	DAILY PROCUREMENT PRICE
2005/03/29	R 671	35.0%	R 680				-R 99.75	-R 3,082,275.00	-R 30,900.00	R 0.00
2005/03/30	R 671	35.0%	R 680	R 671	100	0	R 99.63	R 9,963.00	-R 100.00	-R 67,100.00
2005/03/31	R 674	35.0%	R 680	R 674	100	0	R 101.22	R 10,122.00	-R 100.00	-R 67,400.00
2005/04/01	R 674	35.0%	R 680	R 674	100	0	R 101.10	R 10,110.00	-R 100.00	-R 67,400.00
2005/04/04	R 674	35.0%	R 680	R 674	100	0	R 100.76	R 10,076.00	-R 100.00	-R 67,400.00
2005/04/05	R 674	35.0%	R 680	R 674	100	0	R 100.64	R 10,064.00	-R 100.00	-R 67,400.00
2005/04/06	R 698	35.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/04/07	R 698	35.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/04/08	R 698	35.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/04/11	R 692	35.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/04/12	R 693	35.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/04/13	R 689	35.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/04/14	R 685	35.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/04/15	R 695	35.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/04/18	R 687	35.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/04/19	R 683	35.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/04/20	R 675	38.0%	R 680	R 675	100	0	R 108.08	R 10,808.00	-R 100.00	-R 67,500.00
2005/04/21	R 675	38.0%	R 680	R 675	100	0	R 107.96	R 10,796.00	-R 100.00	-R 67,500.00
2005/04/22	R 678	38.0%	R 680	R 678	100	0	R 109.56	R 10,956.00	-R 100.00	-R 67,800.00
2005/04/25	R 677	38.0%	R 680	R 677	100	0	R 108.60	R 10,860.00	-R 100.00	-R 67,700.00
2005/04/26	R 683	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/04/28	R 683	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/04/29	R 683	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/05/03	R 683	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/05/04	R 683	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/05/05	R 682	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/05/06	R 682	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/05/09	R 683	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/05/10	R 690	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/05/11	R 690	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/05/12	R 675	38.0%	R 680	R 675	100	0	R 105.25	R 10,525.00	-R 100.00	-R 67,500.00
2005/05/13	R 690	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/05/16	R 695	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/05/17	R 695	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/05/18	R 695	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/05/19	R 695	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/05/20	R 680	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/05/23	R 695	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/05/24	R 695	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/05/25	R 694	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/05/26	R 694	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/05/27	R 705	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/05/30	R 705	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/05/31	R 719	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/06/01	R 719	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/06/02	R 717	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/06/03	R 704	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/06/06	R 704	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/06/07	R 700	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/06/08	R 700	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/06/09	R 715	38.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/06/10	R 715	37.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/06/13	R 715	37.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/06/14	R 715	37.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/06/15	R 707	37.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/06/17	R 707	37.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/06/20	R 707	37.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/06/21	R 715	37.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/06/22	R 714	37.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/06/23	R 705	37.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/06/24	R 705	37.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/06/27	R 710	37.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/06/28	R 699	37.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/06/29	R 700	37.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/06/30	R 703	37.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/07/01	R 703	37.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/07/04	R 707	37.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/07/05	R 720	37.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/07/06	R 728	35.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/07/07	R 718	35.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/07/08	R 718	35.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/07/11	R 718	35.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/07/12	R 717	35.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00

DATE	PRICE	VOLATILITY	CALL-STRIKE	DAILY HEDGE	VOLUME BELOW MAXIMUM PRICE	VOLUME @ MAXIMUM PRICE	OPTION PREMIUM	NET OPTION COST	ADDITIONAL BROKING FEES @ R1/TON	DAILY PROCUREMENT PRICE
2005/11/04	R 867	48.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/11/07	R 886	48.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/11/08	R 890	47.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/11/09	R 894	47.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/11/10	R 898	44.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/11/11	R 905	44.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/11/14	R 950	44.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/11/15	R 983	44.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/11/16	R 971	46.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/11/17	R 979	46.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/11/18	R 969	46.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/11/21	R 960	46.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/11/22	R 1,005	52.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/11/23	R 997	50.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/11/24	R 956	50.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/11/25	R 959	50.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/11/28	R 988	50.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/11/29	R 970	50.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/11/30	R 980	50.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/12/01	R 990	49.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/12/02	R 998	49.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/12/05	R 1,023	49.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/12/06	R 1,022	49.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/12/07	R 1,052	49.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/12/08	R 1,067	48.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/12/09	R 1,070	45.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/12/12	R 1,115	47.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/12/13	R 1,135	45.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/12/14	R 1,127	45.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/12/15	R 1,128	45.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/12/19	R 1,173	47.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/12/20	R 1,128	47.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/12/21	R 1,120	47.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/12/22	R 1,120	47.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/12/23	R 1,150	48.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/12/27	R 1,195	49.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/12/28	R 1,154	51.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/12/29	R 1,140	53.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2005/12/30	R 1,095	53.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/01/03	R 1,050	56.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/01/04	R 1,079	56.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/01/05	R 1,065	55.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/01/06	R 1,110	54.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/01/09	R 1,144	50.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/01/10	R 1,151	47.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/01/11	R 1,141	44.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/01/12	R 1,096	44.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/01/13	R 1,078	45.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/01/16	R 1,081	45.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/01/17	R 1,123	45.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/01/18	R 1,116	43.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/01/19	R 1,119	42.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/01/20	R 1,141	40.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/01/23	R 1,096	39.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/01/24	R 1,088	37.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/01/25	R 1,110	37.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/01/26	R 1,091	37.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/01/27	R 1,076	36.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/01/30	R 1,036	37.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/01/31	R 994	38.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/02/01	R 962	39.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/02/02	R 1,006	40.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/02/03	R 1,007	40.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/02/06	R 962	40.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/02/07	R 933	41.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/02/08	R 977	41.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/02/09	R 984	41.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/02/10	R 985	40.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/02/13	R 988	38.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/02/14	R 1,006	37.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/02/15	R 1,006	35.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/02/16	R 976	35.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/02/17	R 992	36.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/02/20	R 987	35.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/02/21	R 978	35.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/02/22	R 1,022	36.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/02/23	R 1,019	35.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/02/24	R 1,045	35.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/02/27	R 1,090	37.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/02/28	R 1,090	37.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/03/02	R 1,092	37.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00

DATE	PRICE	VOLATILITY	CALL-STRIKE	DAILY HEDGE	VOLUME BELOW MAXIMUM PRICE	VOLUME @ MAXIMUM PRICE	OPTION PREMIUM	NET OPTION COST	ADDITIONAL BROKING FEES @ R1/TON	DAILY PROCUREMENT PRICE
2006/03/03	R 1,109	36.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/03/06	R 1,132	36.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/03/07	R 1,124	35.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/03/08	R 1,096	35.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/03/09	R 1,117	34.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/03/10	R 1,127	33.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/03/13	R 1,132	33.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/03/14	R 1,126	33.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/03/15	R 1,141	32.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/03/16	R 1,132	30.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/03/17	R 1,114	30.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/03/20	R 1,129	29.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/03/22	R 1,166	30.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/03/23	R 1,159	31.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/03/24	R 1,161	30.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/03/27	R 1,163	28.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/03/28	R 1,171	27.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/03/29	R 1,164	28.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/03/30	R 1,147	29.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/03/31	R 1,146	29.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/04/03	R 1,134	29.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/04/04	R 1,113	28.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/04/05	R 1,120	26.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/04/06	R 1,105	26.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/04/07	R 1,117	24.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/04/10	R 1,122	24.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/04/11	R 1,120	24.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/04/12	R 1,119	24.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/04/13	R 1,106	24.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/04/18	R 1,077	25.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/04/19	R 1,068	25.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/04/20	R 1,080	26.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/04/21	R 1,098	26.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/04/24	R 1,093	26.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/04/25	R 1,087	26.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/04/26	R 1,099	25.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/04/28	R 1,090	25.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/02	R 1,094	24.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/03	R 1,088	24.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/04	R 1,089	24.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/05	R 1,089	24.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/08	R 1,088	24.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/09	R 1,100	23.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/10	R 1,140	23.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/11	R 1,143	23.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/12	R 1,169	24.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/15	R 1,197	27.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/16	R 1,187	25.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/17	R 1,189	24.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/18	R 1,206	24.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/19	R 1,218	25.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/22	R 1,216	25.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/23	R 1,226	25.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/24	R 1,216	24.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/25	R 1,201	25.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/26	R 1,209	25.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/29	R 1,207	23.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/30	R 1,221	22.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/05/31	R 1,233	22.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/06/01	R 1,244	21.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/06/02	R 1,244	21.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/06/05	R 1,266	22.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/06/06	R 1,272	24.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/06/07	R 1,270	23.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/06/08	R 1,290	22.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/06/09	R 1,285	20.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/06/12	R 1,302	24.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/06/13	R 1,335	25.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/06/14	R 1,314	26.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/06/15	R 1,295	23.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/06/19	R 1,287	25.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/06/20	R 1,270	27.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/06/21	R 1,288	28.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/06/22	R 1,320	28.5%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
2006/06/23	R 1,340	29.0%	R 680	R 680	0	100		R 0.00	R 0.00	-R 68,000.00
								-R 2,977,995.00	-R 31,900.00	-R 21,006,700.00
Total procurement price	-R 21,006,700.00									
Total option cost	-R 2,977,995.00									
Additional broking fees	-R 31,900.00									
Net procurement cost	-R 24,016,595.00									
Average Price Index	R 958.11									
Maximum price strategy	R 777.24									
Tonnages hedged	30,900									

APPENDIX V

INDEXED STRANGLE STRATEGY 2001 – 2006

2001

(*The 5-year volatility average is used since no 2001 volatility data exists)

DATE	JULY FUTURES PRICE	VOLATILITY*	SHORT PUT STRIKE	VOLUME PUTS	PUT PREMIUM/TON	SHORT CALL STRIKE	VOLUME CALLS	CALL PREMIUM/TON	TOTAL OPTION PREMIUM	BROKING FEES @ R1/TON	NET PREMIUM RECEIVED
2000/12/27	R 729	45.20%	R 440	4,300	R 4.07	R 1,020	4300	R 19.71	R 102,254.00	-R 8,600.00	R 93,654.00
2000/12/28	R 736	45.20%	R 440	4,300	R 3.75	R 1,020	4300	R 20.83	R 105,694.00	-R 8,600.00	R 97,094.00
2000/12/29	R 739	45.20%	R 440	4,300	R 3.59	R 1,020	4300	R 21.22	R 106,683.00	-R 8,600.00	R 98,083.00
2001/01/02	R 757	45.20%	R 440	4,300	R 2.84	R 1,020	4300	R 24.07	R 115,713.00	-R 8,600.00	R 107,113.00
2001/01/03	R 756	45.20%	R 440	4,300	R 2.82	R 1,020	4300	R 23.67	R 113,907.00	-R 8,600.00	R 105,307.00
2001/01/04	R 779	45.20%	R 440	4,300	R 2.20	R 1,020	4300	R 28.54	R 132,182.00	-R 8,600.00	R 123,582.00
2001/01/05	R 800	45.20%	R 440	4,100	R 1.75	R 1,020	4100	R 33.52	R 144,607.00	-R 8,200.00	R 136,407.00
2001/06/22	R 796										R 761,240.00
Tonnages hedged (1 contract/day)	29,900										
Average long position (index)	R 739.40										
Net option premium	R 761,240.00										
Option premium/ton	R 25.46										
Net procurement cost	R 713.94										

2002

(*The 5-year volatility average is used since 2002 volatility is only available from 2 January 2002)

DATE	JULY FUTURES PRICE	VOLATILITY*	SHORT PUT STRIKE	VOLUME PUTS	PUT PREMIUM/TON	SHORT CALL STRIKE	VOLUME CALLS	CALL PREMIUM/TON	TOTAL OPTION PREMIUM	BROKING FEES @ R1/TON	NET PREMIUM RECEIVED
2001/12/27	R 1,599	45.20%	R 960	5,800	R 8.78	R 2,240	5800	R 43.68	R 304,268.00	-R 11,600.00	R 292,668.00
2001/12/28	R 1,554	45.20%	R 960	5,800	R 10.55	R 2,240	5800	R 35.66	R 268,018.00	-R 11,600.00	R 256,418.00
2001/12/31	R 1,599	45.20%	R 960	5,800	R 8.32	R 2,240	5800	R 42.18	R 292,900.00	-R 11,600.00	R 281,300.00
2002/01/02	R 1,644	45.20%	R 960	5,800	R 6.60	R 2,240	5800	R 49.93	R 327,874.00	-R 11,600.00	R 316,274.00
2002/01/03	R 1,689	45.20%	R 960	5,800	R 5.30	R 2,240	5800	R 59.08	R 373,404.00	-R 11,600.00	R 361,804.00
2002/01/04	R 1,680	45.20%	R 960	6,000	R 5.44	R 2,240	6000	R 56.62	R 372,360.00	-R 12,000.00	R 360,360.00
2002/06/24	R 1,802										R 1,868,824.00
Tonnages hedged (1 contract/day)	35,000										
Average long position (index)	R 1,254.24										
Net option premium	R 1,868,824.00										
Option premium/ton	R 53.39										
Net procurement cost	R 1,200.85										

2003

DATE	JULY FUTURES PRICE	VOLATILITY	SHORT PUT STRIKE	VOLUME PUTS	PUT PREMIUM/TON	SHORT CALL STRIKE	VOLUME CALLS	CALL PREMIUM/TON	TOTAL OPTION PREMIUM	BROKING FEES @ R1/TON	NET PREMIUM RECEIVED
2002/12/27	R 1,668	30.00%	R 1,000	0	R 0.66	R 2,340	5700	R 9.35	R 53,295.00	-R 5,700.00	R 47,595.00
2002/12/30	R 1,640	29.00%	R 1,000	0	R 0.59	R 2,340	5700	R 6.12	R 34,884.00	-R 5,700.00	R 29,184.00
2002/12/31	R 1,672	29.00%	R 1,000	0	R 0.80	R 2,340	5700	R 7.71	R 43,947.00	-R 5,700.00	R 38,247.00
2003/01/02	R 1,681	28.50%	R 1,000	0	R 0.32	R 2,340	5700	R 7.34	R 41,838.00	-R 5,700.00	R 36,138.00
2003/01/03	R 1,663	29.50%	R 1,000	0	R 0.50	R 2,340	5900	R 7.52	R 44,368.00	-R 5,900.00	R 38,468.00
2003/06/24	R 866								R 218,332.00	-R 28,700.00	R 189,632.00
Tonnages hedged (1 contract/day)	28,700										
Average long position (index)	R 1,400.50										
Net option premium	R 189,632.00										
Option premium/ton	R 6.61										
Net procurement cost	R 1,393.89										

2004

DATE	JULY FUTURES PRICE	VOLATILITY	SHORT PUT STRIKE	VOLUME PUTS	PUT PREMIUM/TON	SHORT CALL STRIKE	VOLUME CALLS	CALL PREMIUM/TON	TOTAL OPTION PREMIUM	BROKING FEES @ R1/TON	NET PREMIUM RECEIVED
2003/12/29	R 1,209.00	54.50%	R 720	5,400	R 13.82	R 1,700	5400	R 54.24	R 367,524.00	-R 10,800.00	R 356,724.00
2003/12/30	R 1,192.00	53.00%	R 720	5,400	R 13.20	R 1,700	5400	R 46.18	R 320,852.00	-R 10,800.00	R 309,852.00
2003/12/31	R 1,225.00	52.00%	R 720	5,400	R 10.34	R 1,700	5400	R 50.72	R 329,724.00	-R 10,800.00	R 318,924.00
2004/01/02	R 1,246.00	51.00%	R 720	5,400	R 8.35	R 1,700	5400	R 52.27	R 327,348.00	-R 10,800.00	R 316,548.00
2004/01/05	R 1,205.00	50.00%	R 720	5,500	R 9.03	R 1,700	5500	R 39.66	R 267,795.00	-R 11,000.00	R 256,795.00
2004/06/23	R 906.00								R 1,613,043.00	-R 54,200.00	R 1,558,843.00
Tonnages hedged (1 contract/day)	27,100										
Average long position (index)	R 1,086.16										
Net option premium	R 1,558,843.00										
Option premium/ton	R 57.52										
Net procurement cost	R 1,028.64										

2005

DATE	JULY FUTURES PRICE	VOLATILITY	SHORT PUT STRIKE	VOLUME PUTS	PUT PREMIUM/TON	SHORT CALL STRIKE	VOLUME CALLS	CALL PREMIUM/TON	TOTAL OPTION PREMIUM	BROKING FEES @ R1/TON	NET PREMIUM RECEIVED
2004/12/28	R 784	51.0%	R 480	4,000	R 8.23	R 1,100	4000	R 29.78	R 152,040.00	-R 8,000.00	R 144,040.00
2004/12/29	R 767	50.0%	R 480	4,000	R 8.53	R 1,100	4000	R 24.44	R 131,880.00	-R 8,000.00	R 123,880.00
2004/12/30	R 812	52.0%	R 480	4,000	R 7.13	R 1,100	4000	R 37.52	R 178,600.00	-R 8,000.00	R 170,600.00
2004/12/31	R 816	52.0%	R 480	4,000	R 6.84	R 1,100	4000	R 38.27	R 180,440.00	-R 8,000.00	R 172,440.00
2005/01/03	R 861	54.0%	R 480	4,000	R 5.70	R 1,100	4000	R 54.20	R 239,600.00	-R 8,000.00	R 231,600.00
2005/01/04	R 855	54.0%	R 480	4,000	R 5.86	R 1,100	4000	R 51.99	R 231,400.00	-R 8,000.00	R 223,400.00
2005/01/05	R 880	53.0%	R 480	3,700	R 4.44	R 1,100	3700	R 57.54	R 229,326.00	-R 7,400.00	R 221,926.00
2005/06/23	R 569								R 1,343,286.00	-R 55,400.00	R 1,287,886.00
Tonnages hedged (1 contract/day)	27,700										
Average long position (index)	R 810.74										
Net option premium	R 1,287,886.00										
Option premium/ton	R 46.49										
Net procurement cost	R 764.25										

2006

DATE	JULY FUTURES PRICE	VOLATILITY	SHORT PUT STRIKE	VOLUME PUTS	PUT PREMIUM/TON	SHORT CALL STRIKE	VOLUME CALLS	CALL PREMIUM/TON	TOTAL OPTION PREMIUM	BROKING FEES @ R1/TON	NET PREMIUM RECEIVED
2005/12/27	R 1,195	49.0%	R 720	4,700	R 9.62	R 1,680	4700	R 40.37	R 234,953.00	-R 9,400.00	R 225,553.00
2005/12/28	R 1,154	51.0%	R 720	4,700	R 13.72	R 1,680	4700	R 36.51	R 236,081.00	-R 9,400.00	R 226,681.00
2005/12/29	R 1,140	53.0%	R 720	4,700	R 16.72	R 1,680	4700	R 37.86	R 256,526.00	-R 9,400.00	R 247,126.00
2005/12/30	R 1,095	53.0%	R 720	4,700	R 20.32	R 1,680	4700	R 29.57	R 234,483.00	-R 9,400.00	R 225,083.00
2006/01/03	R 1,050	56.0%	R 720	4,700	R 28.28	R 1,680	4700	R 26.72	R 258,500.00	-R 9,400.00	R 249,100.00
2006/01/04	R 1,079	56.0%	R 720	4,700	R 24.78	R 1,680	4700	R 31.03	R 262,307.00	-R 9,400.00	R 252,907.00
2006/01/05	R 1,065	55.0%	R 720	4,600	R 24.71	R 1,680	4600	R 26.75	R 236,716.00	-R 9,200.00	R 227,516.00
2006/06/23	R 1,340										
									R 1,719,566.00	-R 65,600.00	R 1,653,966.00
Tonnages hedged (1 contract/day)	32,800										
Average long position (index)	R 958.11										
Net option premium	R 1,653,966.00										
Option premium/ton	R 50.43										
Net procurement cost	R 907.68										