

**The assessment of the implementation of the requirements as
prescribed in the Record of Decision / Authorisation into
Sasol Solvents, Environmental Management System**

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ABSTRACT

Sasol Solvent, a division of Sasol Chemical Industries, is a global manufacturer and supplier of a diverse range of solvents, co-monomers and associated products. This division consist of twelve production facilities, of which eight are situated in Secunda and the remaining four in Sasolburg. These sites produce ketones, methanol, ethanol, C3 and C4 alcohols, esters, acids, blends and hydro carbons, aldehydes, glycol ethers acrylates and co monomers (including Hexene, Octene, pentene and Safol 45).

The products are supplied to customers in over 110 countries for use in several industries namely printing, packaging, plastics, pharmaceutical, fragrance, aerosol paint and adhesive sectors, as well as polish, cosmetics, agriculture and mining chemicals.

In 1992 Solvents Secunda implemented the ISO 9002 Quality Management System, which is now known as ISO 9001. In 1996 ISO 14001 Environmental Management System was implemented due to market pressure to export to Europe. Due to market pressure to obtain international certification for Health and Safety as well, Solvents replaced their existing Health and Safety System with OHSAS 18001 in 2001. A decision was made to integrate the Environmental Management System and Health and Safety Systems with Quality management System. Third part certification for an integrated SHEQ Management System was achieved in 2004 for the Secunda site and in 2005 for the Sasolburg site.

Since 1997, a number of EIA's were performed for various projects / new plants, such as Sasol Solvents. RoD's authorisations for these projects / new plants were obtained from the relevant authorities. The RoD's contained several conditions which had to be complied with.

In all Environmental Impact Assessments (EIA), if an activity has the potential to cause significant environmental damage, then all such impacts must be assessed to determine the degree of damage this action could cause and how this action can be modified to reduce the damage to within reasonable acceptable limits (South Africa, 1998).

The primary objective of this study is to assess all RoD's that were issued for new plants or operations of Sasol Solvents since 1997 and to determine whether the requirements, as specified in the RoD's, have successfully been implemented in the operational ISO14001 (2004) EMS.

In the evaluation all conditions specified in the RoD's issued for every new plant / operation which needed to be implemented and/or integrated into the Environmental Management System were evaluated. This was done to verify compliance or non-compliance to the conditions specified in the RoD's. The evaluation also considered consequences to potential legal non-compliances.

The literature review conducted indicated that objectives were reached in this study and it can be concluded that ISO 14001 EMS is ideally suited to be used as a management tool to ensure that the ROD requirements are implemented and complied with.

OPSOMMING

Sasol Solvents, 'n divisie van Sasol Chemiese Bedrywe is een van die wêreld se voorste verskaffers van koolwaterstowwe en geassosieerde produkte. Agt van die produksie aanlegte is in Secunda en vier in Sasolburg. Die aanlegte vervaardig ketones, methanol, ethanol, C3 en C4 alkohole, esters, sure, mengsels van koolwaterstowwe (Hexene, Oktene, Pentene en Safol 45) aldehydes en akrilate.

Bogenoemde produkte word aan 110 lande wêreldwyd verskaf. Die produkte wat vervaardig word kan onder andere aangewend word in drukwerk, verpakking, plastiek, farmasie, verf, kleefstof, sowel as die polerings bedryf, skoonheidsmiddels, landbou en mynbou chemikalië.

Sasol Solvents het in 1992 aan al die vereistes van ISO 9002 Kwaliteit Bestuur Stelsels, nou bekend as ISO 9001 voldoen. Om Sasol Solvents in staat te stel om hulle produkte na Europese lande uit te voer is die ISO 14001 Omgewing Bestuur Stelsels in 1996 vir Sasol Solvents geïmplimenteer. In 2001 het Sasol Solvents 'n Veiligheid Bestuur Stelsel OHSAS 18001 geïntegreer met huidige bestuur stelsels. 'n Derde party sertifisering is in 2004 vir Secunda aanlegte en 2005 vir Sasolburg aanlegte ontvang vir die geïntegreerde Veiligheid, Gesondheid, Omgewing en Kwaliteit Bestuur Stelsels.

Sedert 1997 is daar verskeie Omgewings impak ontledings gedoen op verskeie projekte en nuwe aanlegte. Rekord van Beslissings vir die projekte en nuwe aanlegte is verkry van die Regering Departemente.

Die doelwit van hierdie studie is om alle nuwe Rekord van Beslissings vir Sasol Solvents te evalueer ten opsigte van projekte en nuwe aanlegte sedert 1997. Die evaluasie is om vas te stel of alle voorwaardes in die Rekord van Beslissings suksesvol in die Sasol Solvents ISO 14001 (2004) Omgewing Bestuur Stelsels opgeneem / toegepas word.

Tydens die evaluering is alle voorwaardes van die Rekord van Beslissings vir projekte en nuwe aanlegte sedert 1997 wat in die Omgewing Bestuur Stelsels opgeneem moes word ge-evalueer. Hierdie evaluasie was gedoen ten opsigte van voldoening of nie voldoening aan die vereistes gestel soos aangedui / aanbeveel deur die Rekord van Beslissings. Die evaluasie was ook gedoen om die potensiële konsekwensies te identifiseer van wetlike nie voldoening en sodoende dit dan aan te spreek.

Die literatuur studie wat uitgevoer is het aangedui dat die doelwitte bereik is (Sasol Solvents het aan die vereistes / standarde voldoen). Die gevolgtrekking kan gemaak word dat ISO 14001 Omgewing Bestuur Stelsels aan alle voorwaardes / standarde van die Rekord Van Beslissings voldoen .

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Abbreviations and Definitions

ABBREVIATIONS

AEL:	Atmospheric Emission Licence
AIA:	Approved Inspection Authority
APPA:	Atmospheric Pollution Prevention Act 45 of 1965
AQA:	National Environmental Management: Air Quality Act 39 of 2004
AQMP:	Air Quality Management Plan
BD&I:	Business Design and Implementation
BSI:	British Standards
CAPCO:	Chief Air Pollution Control Officer
CEM:	Centre for environmental management
DACE:	Department of Agriculture, Conservation and Environment
DEAT:	Department of Environmental Affairs and Tourism
DQS:	Delhi Quality Services (ISO Certification Services)
DWAF:	Department of Water Affairs and Forestry
ECA:	Environmental Conservation Act 73 of 1989
EIA:	Environmental Impact Assessment
EIR:	Environmental Impact Report
EMP:	Environmental Management Plan
EMS:	Environmental Management System
HCS:	Hazardous Chemical Substances
ISO:	International Standards Organisation
IRCA :	Leading Risk Management solutions (ISO Certification Services)
LDAR :	Leak Detection and Repair
MDACE:	Mpumalanga Department of Agriculture, Conservation and Environment
MHI:	Major Hazard Installation
MOC:	Management of Change
MSDS:	Material Safety Data Sheet

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NEMA:	National Environmental Management Act 107 of 1998
NOSA:	National Occupational Safety Association
NWA:	National Water Act 36 of 1998
OHSA:	Occupational Health and Safety Act 85 of 1993
OH&S:	Occupational Health and Safety
PAEL:	Provisional Atmospheric Emission Licence
PSM:	Process Safety Management
RC:	Responsible Care
RoD:	Record of decision
SABS / SANS:	South African Bureau of Standards – now South African National Standards
SCI:	Sasol Chemical Industries
SD:	Sustainable Development

DEFINITIONS

Aspect Register

A checklist incorporated in the Environmental Database consisting of environmental aspects applicable to a certain type of project, and also as a potential environmental impact and the legal and other requirements (for normal, abnormal and emergency conditions).

Environmental Aspects

Those project activities, products or services that can interact with the environment and potentially result in an environmental impact.

Environment

The aggregate of surrounding objects, conditions and influences that influence the life and habits of man or any other organism or collection of organisms. (Environment Conservation Act, Act No 73 of 1989, definitions).

The surroundings within which humans exist and that are made up of:

the land, water and atmosphere of the earth; micro-organisms, plant and animal life; any part or combination of the above and the inter-relationships among and between

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them; and the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well being.

SANS 14001:2004 defines environment as the surroundings in which an organisation operates, including air, water, land, natural resources, flora, fauna, humans and their interrelations. Geographic surroundings extend from an organisation to global Encompasses people's culture, social, value and economic systems as well as eco-systems.

NEMA- environment means the surroundings within which humans exist and that are made up of-

- (i) the land, water and atmosphere of the earth;
- (ii) micro-organisms, plant and animal life;
- (iii) any part or combination of (i) and (ii) and the interrelationships among and between them; and
- (iv) the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being;

NEMA- environmental authorisation, when used in Chapter 5, means the authorisation by a competent authority of a listed activity or specified activity in terms of this Act, and includes a similar authorisation contemplated in specific environmental management Act;

NEMA- pollution means any change in the environment caused by—

- (i) substances;
- (ii) radioactive or other waves; or
- (iii) noise, odours, dust or heat,

emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or an organ of state, where that change has an adverse effect on human health or well-being or on the composition, resilience and pRoDuctivity of natural or managed ecosystems, or on materials useful to people, or will

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have such an effect in the future;

Environmental Impact Report

A report describing the process of examining the environmental effects of a development proposal, the expected impacts and the proposed mitigating measures.

Environmental Management Plan

A plan to address the management of environmental impacts related to the execution phases of the project. The document provides a basis for managing, mitigating and monitoring the environmental impacts associated with the project.

Environmental Objectives and Targets

These include those requirements that consider the legal and other requirements, environmental aspects, and views of interested and affected parties to mitigate the potential environmental impacts. These objectives are reviewed during project execution. Responsible persons and target gates are identified to meet the environmental objectives.

Internal Scoping

A procedure for determining the extent of, and approach to an Environmental Impact Assessment, carried out by the designated Project Team members.

This involves:

- Setting and reviewing of environmental objectives and targets;
- Capturing and evaluation of the alternatives to the project;
- Identifying the environmental aspects that might have an impact on the environment;
- Identifying the potential resulting environmental impacts and applicable legislation and other legal requirements;
- Identifying additional specialist studies required to be able to evaluate the environmental impacts; and
- Where possible, identify the actions to manage the identified environmental aspects and existing control measures

Interested and Affected Parties

Individuals or groups affected by, concerned with or interested in an activity and its consequences. These include the authorities, local communities, investors, work force, customers and consumers, environmental interest groups and the general public.

Plan of Study for Environmental Impact Assessment

Indication of procedure to be followed for an EIA, if the relevant authority decides that the information contained in the Scoping Report should be supplemented by an EIR. The Plan of Study for EIA should include the following:

- Description of the environmental issues identified during scoping, including explanation of elimination of insignificant impacts where necessary;
- A description of the feasible alternatives to be investigated further;
- Additional information required to determine potential impacts;
- Method to be used for identifying impacts; and
- Method to be used for assessing significance of impacts.

Plan of Study for Scoping

Plan for procedure to be covered during scoping including:

- Description of proposed activity;
- Description of tasks to be performed, including discussions with relevant authorities and key interested parties, identification of issues and alternatives, evaluation of concerns and prioritisation of issues, development of strategy for addressing and resolving key issues, providing feedback on incorporation of comments and preparation of a scoping report;
- Timetable of tasks;
- Stages of authority consultation; and
- Method of identifying issues and alternatives.

Record of Decision (RoD)

A written document issued by the relevant environmental authority to the applicant,

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detailing reasons for a decision to either issue an authorisation with or without conditions, or rejects the application. This record of decision will also be made available to interested parties on request. It will indicate to whom an appeal should be directed.

Scoping Report

A report compiled after the scoping exercise, containing the following:

- Brief project description;
- Brief description of how the environment may be affected;
- Description of environmental issues identified;
- Description of all alternatives identified; and
- Description of the public participation process.

Expansion:

Expansion means the modification, extension, alteration or upgrading of a facility, structure or infrastructure at which an activity takes place in such a manner that the capacity of the facility or the footprint of the activity is increased.

Air pollution:

Any change in the composition of the air caused by smoke, soot, dust (including fly ash), cinders, solid particles of any kind, gases, fumes, aerosols and odorous substances.

Industrial effluent

Effluent emanating from industrial use of water including, for purposes of these bylaws, any effluent other than domestic effluent or stormwater.

Pollution

The direct or indirect alteration of the physical, chemical or biological properties of a water resource so as to make it-

- (a) less fit for any beneficial purpose for which it may reasonably be expected to be used; or
- (b) harmful or potentially harmful-

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- (i) to the welfare, health or safety of human beings;
- (ii) to any aquatic or non-aquatic organisms;
- (III) to the resource quality; or
- (iv) to property.

Waste

Any substance, whether or not that substance can be reduced, reused, recycled and recovered –

- (a) that is surplus, unwanted, rejected, discarded, abandoned or disposed of;
- (b) which the generator has no further use of for the purposes of pRoDuction;
- (c) that must be treated or disposed of, or
- (d) that is identified as waste by the Minister by notice in the Gazette, and includes waste generated by the mining, medical or other sector, but –
 - (i) a by-pRoDuct is not considered waste, and
 - (ii) any portion of waste, once

Building and demolition waste

Waste, excluding hazardous waste, produced during the construction, alteration, repair or demolition of any structure, and includes rubble, earth, rock and wood displaced during that construction, alteration, repair or demolition.

By-product A substance that is produced as part of a process that is primarily intended to produce another substance or product and that has the characteristics of an equivalent virgin product or material.

Minimum Requirements

Minimum Requirements for the Handling, Classification and Disposal of Hazardous Waste (Second Edition 1998), published by DWAF (downloadable from www.dwaf.gov.za)

Recovery

The controlled extraction of a material or the retrieval of energy from waste to produce a product.

Recycling

A process where waste is reclaimed for further use, and includes the separation of waste from a waste stream for further use and the processing of that separated material as a products or raw material.

Re-use

To utilise articles from the waste stream again for a similar or different

Chapter 1: Introduction

1.1 Background

Sasol Solvent, a division of Sasol Chemical Industries, is a global manufacturer and supplier of a diverse range of solvents, co-monomers and associated products. This division consist of twelve production facilities, of which eight are situated in Secunda and the remaining four in Sasolburg. In 1992 Solvents Secunda implemented the ISO 9002 Quality Management System, which is now known as ISO 9001. In 1996 ISO 14001 Environmental Management System was implemented due to market pressure to export to Europe. Due to market pressure to obtain international certification for Health and Safety as well, Solvents replaced their existing Health and Safety system with OHSAS 18001 in 2001. A decision was made to integrate the Environmental Management System and Health and Safety systems with Quality management system. Third part certification for an integrated SHEQ management system was achieved in 2004 for the Secunda site and in 2005 for the Sasolburg site.

1.2 Problem Statement

Since 1997, a number of EIA's were performed for various projects / new plants, such as Sasol Solvents. RoD's authorisations for these projects / new plants where obtained from the relevant authorities. The RoD's contained several conditions which had to be complied with. These projects were managed by Sasol Technology on behalf of Sasol Solvent, according to the BD&I model. The BD&I model consist of seven gates, as listed below, while Sasol Solvent is responsible for the last three gates.

BD&I Gates:

Gate 1 – Pre-Feasibility

Gate 2 – Feasibility

Gate 3 – Basic Engineering

Gate 4 – Execution (Construction)

Gate 5 – Hand-Over to Solvents and Start-Up

Gate 6 – Evaluation

Gate 7 – Operation

Roles and responsibilities are clearly defined to manage the ROD requirements from feasibility to the construction phase of the project. The concern is however that the roles and responsibilities are not clearly defined with regards to integration of the RoD requirements into the Sasol Solvents EMS system.

The research question is whether Sasol Solvents complies / is compliant with the conditions set out in the RoD's which were obtained through the EIA process. See Table 1.1 below for list of all new projects / new plant for the two sites.

Sasol Solvents Secunda Site	Sasol Solvents Sasolburg Site
Acid Recovery Plant (Solvents West)	AAA Plant
Crotonealdehyde plant	Butanol
Crotonaldehyde loading area	Methyl Iso-Butyl Ketone plant (MiBK 1)
Detergent Alcohol Plant (Safol)	Sasolburg
Ethyl Acetate	Methyl Iso-Butyl Ketone plant (MiBK 2)
Ethylol 99	Sasolburg
Hexene Train 3	
Octene Train 1	
Octene Train 2	
OcteneTrain 3	
Rail Loading	

Table 1:1 Projects and new plants list

1.3 Research Objectives

The aim of this research is to assess all RoD's that were issued for new plants or operations of Sasol Solvents since 1997 and to determine whether the requirements, as specified in the RoD's, have successfully been implemented in the operational ISO14001 (2004) EMS.

The evaluation will:

- Identify compliance and/or non-compliances with possible patterns in terms of RoD-conditions.
- Identify where the EIA fits in to the EMS.
- Identify options for integration of the RoD / authorisation with the EMS.
- Identify possible challenges in integrating RoD / authorisation with the EMS.

The research question for the proposed dissertation is:

- Have all requirements, as identified in RoD's issued since 1997 for new plants or operations at Sasol Solvents, been incorporated into the existing operational ISO14001 (2004) EMS?

1.4 Research Methodology

In order to achieve the abovementioned study objectives, the following methodology will be followed:

- A literature review (analysis) will be conducted on the processes / plants which have been established at Sasol Solvents since 1997. (Chapter 2)
- A literature review (analysis) will be conducted to identify which of the processes / plants have been authorised in terms of Environmental Conservation Act / National Environmental Management Act. (Chapter 3)
- A literature review (analysis) will be conducted to identify the

conditions specified in the RoD issued for every plant / operation. (Chapter 4)

- A literature review (analysis) will be conducted to identify if all conditions identified in Chapter 7 have been captured and formalised in the ISO14001 (2004). (Chapter 5)
- A literature review (analysis) will be conducted on the current status of the Sasol Solvents EMS. (Chapter 6)
- A literature review (analysis) will be conducted to evaluate the possible legal liabilities arising from the non-compliance with ROD conditions for each new plant or operation. (Chapter 7)
- Research results that will include how the EMS should be revised in order to mitigate any legal non-compliances arising from Chapter 7 shall be discussed. (Chapter 8)

Chapter 2: New Processes and Plants Established

This chapter will provide a broad overview of all the new processes and/or plants which have been established in Secunda and Sasolburg for Sasol Solvents since 1997. The new processes and/or plants are arranged in alphabetically order for Secunda and Sasolburg. The new Secunda and Sasolburg processes and/or plants are discussed in Paragraphs 2.1 – 2.11 and Paragraphs 2.12 – 2.15, respectively.

2.1 Acid Recovery Plant (Solvents West)

The construction of an off-spec acid tank at the Acid Recovery Area on the existing Solvents West plant. Ref: 17/2/28/EV1, dated 26 June 2002

2.2 Crotonaldehyde Plant

Unit 237 N was designed to convert acetaldehyde into crotonaldehyde. As part of the project to upgrade crotonaldehyde 99% purity. Two product run-down tanks have been installed as part of the project to upgrade crotonaldehyde 99%. Product is loaded from these tanks directly into shipping containers for export and local markets. It is planned to increase sales of crotonaldehyde 99% to the plant capacity of 8.5 kt/pa. The lack of buffer capacity leads to late deliveries. While the lack of storage space also means where there are no immediate orders the plant needs to be shut down due to full storage. It is therefore proposed to install a final product storage tank to act as a buffer between production and transport of the 99 % crotonaldehyde. Ref : 16/4/L/2001/16, dated 19 December 2001

2.3 Crotonaldehyde Loading Area

The new crotonaldehyde loading rack replaced the existing loading facility as the main loading point for the crotonaldehyde. The loading facility is a drive through facility meaning that the iso-container will enter from the east side and leave the loading bay on the west side of the facility. The dimensions of the loading area are 26 meters in length and 6 meters in width.

2.4 Detergent Alcohol Plant (Safol)

The establishment of Detergent Alcohol Plant is within the primary area of Sasol Secunda complex. The plant has a capacity to produce 120 thousand tones of Detergent alcohol per annum. The Project is established in Mpumalanga Province. This project is established in the Highveld Ridge district on portions 5,8,14 of the farm Goedehoop 290 and portions 1, 2, 5,6,9,10,11 of the farm Twistdraai 285 Secunda, Mpumalanga

2.5 Ethyl Acetate

Sasol produces approximately 50 000 tons of Ethyl Acetate per year from ethanol at the Sasol complex in Secunda. The production process consists of the following major steps:

- A Lights removal stop, where light components, mainly ethers present in the feed, are removed by distillation to prevent contamination of the product;
- Reaction section, where Ethanol is converted to Ethyl Acetate in a vapour phase dehydrogenation reactor. The crude product from the first reactor is hydrogenated in a polishing reactor to remove some impurities. The Hydrogen by-product is separated from the crude product and is then compressed and exported to another unit in the Sasol Secunda complex;
- Pressure Swing Distillation Section, where unreacted Ethanol is removed from the Ethyl Acetate product and lights ;
- Product Distillation Section, where heavies that formed in the reaction are removed and Ethyl Acetate with a minimum of 99.8% purity, is produced; and
- A process flare, which collects and incinerates gasses from Ethyl Acetate Plant.

2.6 Ethylol 99 (High Purity Ethanol Plant)

Sasol's High Purity Ethanol Plant substantially increases the value of its Ethanol.95 product by upgrading it to 99.99% purity. The plant has a 85000t/pa capacity, and will consists of three distillation columns.

Feed to the plant will contains light components such as water, methanol and ethers which must be removed in a lights column. The lights-free Ethanol products then go to the High Purity ethanol purification column where the pure ethanol product is taken overhead through top to the next operating unit.

The bottoms product from the High Purity Ethanol column is fed to the Solvents recovery unit. Alcohol free solvent is recovered at the bottom and recycled to the High Purity Ethanol column, and hence attaining 99.99% purity. (Ref: 14/3/L/SAS.HPE, dated 3 August 1999)

2.7 Hexene Train 3

Hexene Train 3 has been integrated into the existing Alpha Olefins Plant and is located within the battery limits of the existing Alpha Olefins Plant in Secunda. The expansion was supported in terms of the infrastructure and services by the existing Sasol Olefins as well as Sasol Synthetic Fuels Plant.

- Low value product (gum, which has been regarded as a waste product and has been upgraded to a higher value product (polymer). This action has resulted in a reduction of the volume of gum to be sold as burning fuels at Fuels Firing Systems (FFS);
- Installation of the Third 1-Hexene Train has resulted in an increased purity of the product;
- Foreign exchange has been earned due to the fact that additional product will be exported; and
- A thorough market analysis was done and the economics of the proposed project were attractive and has, resulted in a substantial fixed investment in the South African Economy

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2.8 Octene Train 1

The 1-Octene plant was an extension of the exiting Alpha Olefins Plant at the Sasol Synthetic Fuels Complex, Secunda. The plant is depended upon the infrastructure and utilities of the existing plant. The purpose of the plant is to upgrade C6 to C10 Stabilised Light Oil (SLO) to 1-Octene co monomer with a purity of 95%.

The feed is the SLO Naphtha stream from SSF East Refinery, This feed not only contains C6 and C10 aliphatic and olefinic components, but also contains oxygenates and organic acids.

2.9 Octene Train 2

Establishment of 1-Octene Train 2 at the Alpha Olefins, Sasol Chemical Industries (Pty) Ltd. The development is located south of Octene train 1 and consists of the following equipment/sections:

- Pre-fractionation section to produce C8 hydrocarbons;
- Oxygenate and Acid Removal section where Ethanol is used in an azeotropic distillation process to remove Oxygenates and Acids;
- Super fractionation section to remove components with boiling points close to 1-Octene;
- Guard beds for removal of any traces of oxygenates left;
- Tank Farm where two new run down and one new final product tank will be installed. The existing rail loading facilities will be utilised; and
- The second train will make use of new cooling tower on the eastern side of Sasol Alpha Olefins for cooling purposes.

2.10 Octene Train 3

Sasol Solvents Olefins and Surfactants extract heptene from the fuel streams present at the site and convert it to octene. The Modified Cobalt technology is used as a catalyst in the hydroformylation reaction process. The process consists of the following basic steps:

- Feed preparation to produce C7 olefin broad cut;
- Hydroformylation of heptene to octanal;

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- Hydrogenation of octanal to octanol
 - Distillation of alcohol to partially remove branched alcohol species;
 - Dehydration of a purified C8 alcohol stream to octane; and
 - Work-up of the product stream to produce co-monomer grade 1-octene.
- 1-Octene plant 3 consists of agitators, drums, heat exchangers, pumps, reactors, tanks, distillation columns, compressors, filters, fired heaters and a flare.

2.11 Rail Loading

The Rail Loading facilities consist of Hexene and Octene rail loading bays. The loading area is constructed in the Solvents Secunda area. All loading activities and maintenance activities are performed by Solvents personnel. The railway system is managed by the Sasol Synfuels.

2.12 Acrylic Acid and Acrylates (AAA Plant)

Sasol Chemical Industries (SCI) constructed an acrylates complex on the Sasolburg site. The complex consists of:

- Crude acrylic acid plant;
- Glacial acrylic acid plant;
- Normal butyl acrylate plant; and
- Ethyl acrylate plant.

The materials i.e. propylene, ethanol and normal-butanol which are obtainable from SCI. Enhance the global competitiveness of the products.

2.13 Butanol

The Butanol Complex consists of a Syngas Conditioning Unit, a Butanol Plat, a Cooling Tower and a Flare Stack.

- The Syngas Conditioning Unit
This consists of The Carbon Dioxide Removal Unit employing an amine wash and finally compressing the gas feed to desired pressures. The gas is then passed through a drying unit. This consists of a Gas Compression Unit

- Butanol Plant (Cryogenic Unit)

The Syngas from Rectisol Plant in Sasolburg, 95% w/w Propylene from Secunda and 99% w/w Hydrogen from the existing Hydrogen Purification Plant (PSA) within Sasol are reacted in the presence of a catalyst (Rhodium) in a chemical (OXO) reactor to produce the two butyl-aldehydes. This mixture is fed to a distillation column for separation.

- A Flare Stack

The unreacted propylene and polymerised butyl-aldehyde from the OXO reactor as well as any off-gas from the system will be routed to the flare stack.

- Effluent to Dams

As the reactions are exothermic in nature, cooling water will be utilised. Liquid effluent formed in this system as well as any effluent, which originates from the reaction section, will be routed to the appropriate waste dams.

2.14 Methyl Iso-Butyl Ketone Plant (MiBK 1) Sasolburg

The Methyl Iso-Butyl Ketone plant (MiBK 1) was constructed in 1995. The MiBK 1 plant was constructed with a capacity of 85 tons per day. The MiBK 1 plant consists of two tubular reactors and a series of three columns. The palladium-based resin catalyst is located on the tube side of the reactors. The feed streams, namely acetone and hydrogen, are fed into the tubes, where they react to form BiBK and small amounts of by-products. The product formed in the reactors is sent into a three column work-up section, where MiBK is removed as a side draw to the last column.

2.15 Methyl Iso-Butyl Ketone Plant (MiBK 2) Sasolburg

The MiBK 2 plant was constructed with a capacity of 35 000 tons per year. The MiBK 2 plant consists of two tubular reactors and a series of three columns. The palladium-based resin catalyst is located on the tube side of the reactors. The feed streams, namely acetone and hydrogen, are fed into the tubes, where they react to BiBK and small amounts of by-products. The product formed in the reactors is sent into a three column work-up section, where MiBK is removed as a side draw to the last column.

Chapter 3 –Environmental Impact Assessment Authorisation

This chapter will provide the results from the review to determine if all new processes and/or plants established at Sasol Solvents since 1997 have been authorised in terms of Environment Conservation Act (Act 73 of 1989).

3.1 Acid Recovery Plant (Solvents West)

Record of Decision was issued by the Mpumalanga Province MEC for Agriculture, Conservation and Environment on the 26 June 2002. The authorisation was issued in terms of Section 22 of the Environment Conservation Act (Act 73 of 1989) The RoD number to undertake a Listed Activity for the construction and operation of the Acid Recovery Plant is Ref: 17/2/28/EV1, dated 26 June 2002.

3.2 Crotonaldehyde Plant

Record of Decision was issued by the Mpumalanga Province MEC for Agriculture, Conservation and Environment on the 19 December 2001. 16/4/L/2001/16, dated 19 December 2001.

3.3 Crotonaldehyde Loading Area

Record of Decision was issued by the Mpumalanga Province MEC for Agriculture, Conservation and Environment on the 7 February 2002. The authorisation was issued in terms of Section 22 of the Environment Conservation Act (Act 73 of 1989) The RoD number to undertake a Listed Activity for the construction and operation of the Crotonaldehyde loading area is Ref: 16/4/L/2001/15, dated 7 February 2002.

3.4 Detergent Alcohol Plant (Safol)

Record of Decision was issued by the Mpumalanga Province MEC for Agriculture, Conservation and Environment on the 29 March 2000. The authorisation was issued in terms of Section 22 of the Environment Conservation Act (Act 73 of 1989) The RoD number to undertake a Listed Activity for the construction and operation of the Detergent Alcohol Plant is

Ref: 16.25 (Sasol Dert), dated 29 March 2000.

3.5 Ethyl Acetate Plant

Record of Decision was issued by the Mpumalanga Province MEC for Agriculture, Conservation and Environment on the 14 January 2000. The authorisation was issued in terms of Section 22 of the Environment Conservation Act (Act 73 of 1989) The RoD number to undertake a Listed Activity for the construction and operation of the Ethyl Acetate is Ref: 14/3/L/A/SAS.E.A, dated 14 January 2000.

3.6 Ethylol 99 (High Purity Ethanol plant)

Record of Decision was issued by the Mpumalanga Province MEC for Agriculture, Conservation and Environment on the 3 August 1999. The authorisation was issued in terms of Section 22 of the Environment Conservation Act (Act 73 of 1989) The RoD number to undertake a Listed Activity for the construction and operation of the High Purity Ethanol Plant is Ref: 14/3/L/SAS.HPE, dated 3 August 1999.

3.7 Hexene Train 3

Record of Decision was issued by the Mpumalanga Province MEC for Agriculture, Conservation and Environment on the 10 August 1999. The authorisation was issued in terms of Section 22 of the Environment Conservation Act (Act 73 of 1989) The RoD number to undertake a Listed Activity for the construction and operation of the Third 1-Hexene Plant is Ref: 14.3(EV), dated 13 August 1999.

3.8 Octene Train 1

Record of Decision was issued by the Mpumalanga Province MEC for Agriculture, Conservation and Environment on the 9 February 2000. The authorisation was issued in terms of Section 22 of the Environment Conservation Act (Act 73 of 1989) The RoD number to undertake a Listed Activity for the construction and operation of the 1-Octene Plant Train 1 is Ref 14.25(EV).1A(W), dated 9 February 2000.

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3.9 Octene Train 2

Record of Decision was issued by the Mpumalanga Province MEC for Agriculture, Conservation and Environment on the 14 July 2000. The authorisation was issued in terms of Section 22 of the Environment Conservation Act (Act 73 of 1989) The RoD number to undertake a Listed Activity for the construction and operation of the 1-Octene Plant Train 2 is Ref 164.28.L2, dated 14 July 2000.

3.10 Octene Train 3

Record of Decision was issued by the Mpumalanga Province MEC for Agriculture, Conservation and Environment. The authorisation was issued in terms of Section 22 of the Environment Conservation Act (Act 73 of 1989) The RoD number to undertake a Listed Activity for the construction and operation of the 1-Octene Plant Train 3 is Ref 17.2.4 GS9, dated 14 July 2007.

3.11 Rail Loading

No Record of Decision exists for the Rail Loading facility. The Rail Loading facility was constructed in 1993 preceding the introduction of the Environmental Impact Assessments Regulations under the Environmental Conservation Act.

3.12 Acrylic Acid and Acrylates (AAA Plant)

Record of Decision was issued by the Free State Province MEC for Tourism, Environmental and Economic Affairs on the 30 January 2002. The authorisation was issued in terms of Schedule 1 of Government Gazette no R1182; Activity 1(c): Construction or upgrading of transportation routes and structure, and manufacturing, storage, handling or processing facilities for any substance which is considered as dangerous or hazardous and is controlled by National legislation. The RoD number to undertake a Listed Activity for the construction and operation of the Acrlates Plant is Ref

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EM1/1(c)/00/132 dated 30 January 2002.

3.13 Butanol

Record of Decision was issued by the Free State Province MEC for Environmental Affairs and Tourism, on the 20 April 2001. The authorisation was issued in terms of Schedule 1 of Government Gazette no R1182; Activity 1(c): Construction or upgrading of transportation routes and structure, and manufacturing, storage, handling or processing facilities for any substance which is considered as dangerous or hazardous and is controlled by the national legislation. The RoD is to undertake a Listed Activity for the construction and operation of the n-Butanol and iso-Butanol Plant is Ref EM1/1(c)/00/82 dated 20 April 2001.

3.14 Methyl Iso-Butyl Ketone (MiBK 1) Sasolburg

No Record of Decision exists for the MiBK 1 plant. The MiBK 1 plant was constructed in 1995 preceding to the introduction of the Environmental Impact Assessments Regulations under the Environmental Conservation Act.

3.15 Methyl Iso-Butyl Ketone plant (MiBK 2) Sasolburg

Record of Decision was issued by the Free State Province MEC for Tourism, Environmental and Economic Affairs, on the 20 April 2001. The authorisation was issued in terms of Schedule 1 of Government Gazette no R1182; Activity 1(c): Construction or upgrading of transportation routes and structure, and manufacturing, storage, handling or processing facilities for any substance which is considered as dangerous or hazardous and is controlled by the national legislation. The RoD is to undertake a Listed Activity for the construction and operation of the MiBK Plant is Ref EM1/1(c)/06/77 dated 27 April 2007.

Chapter 4 - RoD Conditions

It must be noted that only operational requirements of the RoD have been reproduced and audited in the following section. Some of the provisions of the RoD relate only to the construction phase of the plant, and was excluded

4.1 Significant conditions specified in the Acid Recovery Plant (Solvents West) RoD

General Conditions

Clause 1.1: An Environmental Management Plan for the mentioned activity should be developed before the installation commences

Clause 1.2: All waste generated during the construction and operational phase should be disposed off in a licensed landfill site.

Clause 1.3: All employees who will be working at the acid recovery area should be aware of emergency procedures in case of any accident

Clause 1.4: Air pollution and other emissions should be handled as indicated by relevant authorities

Clause 1.5: Any complaints regarding the said development must be thoroughly investigated and addressed to the satisfaction of all parties concerned.

4.2 Significant conditions specified in the Crotonaldehyde plant RoD

General Conditions

Clause 1.5: A copy of this Authorisation shall be available at Sasol Solvents, Secunda, at all times and all staff, contractors and sub-contractors of the specific plant shall be acquainted with the contents of this Authorisation

Clause 1.7: All mitigation measures and recommendations as laid down in the motivational letter and recommendations made by other institutions are binding and must be adhered to as part of the Environmental Plan.

Establishment of the Enterprise

Clause 2.2: If a decision is taken to close down the facility, sell and /or transfer ownership of the infrastructure, this Department must be notified of such a decision at least 12 months prior to the date closure or transfer of ownership.

Clause 2.3: in case of closure of the site, this Department shall evaluate, monitor and approve the clearing and rehabilitation of the site.

Construction & Operation

Clause 3.1: If changes need to be made to the development and/or associated infrastructure, this Department must be informed at least thirty (30) days in advance to be able to decide whether the changes need authorisation or not.

Sufficient provision must be made in the annual budget for mitigation of environmental impacts during operation and rehabilitation of this site in the event of closure of the site.

Air Pollution

Clause 4.1: Air pollution shall be handled as indicated by the relevant authorities.

Clause 4.2: Any emissions must be permitted by CAPCO.

Water Pollution

Clause 5.2: In case of any non-compliance with Section 19 of the National Water Act. 1998 (Act 36 of 1998), the applicant will be held responsible to remedy the effects of pollution.

Waste

Clause 6.1: All waste generated during the construction and/or operation of the development should be stored, handled and disposed of in an environmentally acceptable way.

Risk Management

Clause 7.1: Fire extinguishing equipment should be available at all times.

Monitoring

Clause 8.1: Records of monitoring must be available for inspection of any relevant authorities inspecting the development.

Reporting

Clause 9.1: Records related to compliance and non-compliance with the conditions of this exemption must be kept in good order. Such records must be available on request by the Department.

Clause 9.3: Any complaints regarding the said development must be brought to the attention of the office within 24 hours after receiving the complaint.

Clause 9.4: A complaints register must be kept up-to-date for inspection by members of the Department.

4.3 Significant conditions specified in the Crotonaldehyde loading area

RoD

General Conditions

Clause 1.5: A copy of this Authorisation shall be available at Sasol Solvents, Secunda, at all times and all staff, contractors and sub-contractors of the specific plant shall be acquainted with the contents of this Authorisation

Clause 1.7: All mitigation measures and recommendations as laid down in the Motivational letter and recommendations made by other institution are binding and must be adhered to as part of the Environmental Plan.

Establishment of the Enterprise

Clause 2.2: If a decision is taken to close down the facility, sell and /or transfer ownership of the infrastructure, this Department must be notified of such a decision at least 12 months prior to the date closure or transfer of ownership.

Clause 2.3: in case of closure of the site, this Department shall evaluate, monitor and approve the clearing and rehabilitation of the site.

Construction & Operation

Clause 3.1: If changes need to be made to the development and/or associated infrastructure, this Department must be informed at least thirty (30) days in advance to be able to decide whether the changes need authorisation or not.

Clause 3.2: Sufficient provision must be made in the annual budget for mitigation of environmental impacts during operation and rehabilitation of this site in the event of closure of the site.

Air Pollution

Clause 4.1: Air pollution should be handled as indicated by the relevant authorities. Any emissions must be permitted by CAPCO.

Water Pollution

Clause 5.2: In case of any non-compliance with Section 19 of the National Water Act. 1998 (Act 36 of 1998), the applicant will be held responsible to remedy the effects of pollution.

Waste

Clause 6.1: All waste generated during the construction and/or operation of the development should be stored, handled and deposited in an environmentally acceptable way.

Risk Management

Clause 7.1: Fire extinguishing equipment should be available at all times.

Monitoring

Clause 8.1: Records of monitoring must be available for inspection of any relevant authorities inspecting the development.

Reporting

Clause 9.1: Records related to compliance and non-compliance with the conditions of this exemption must be kept in good order. Such records must be available on request by the Department.

Clause 9.3: Any complaints regarding the said development must be brought to the attention of the office within 24 hours after receiving the complaint.

Clause 9.4: A complaints register must be kept up-to-date for inspection by members of the Department

4.4 Significant conditions specified in the Detergent Alcohol Plant (Safol) ROD

General Conditions

Clause 1.3: No development may take place on the area of concern without the necessary permits/ approvals and/or service agreement from relevant authorities.

Clause 1.4: Copies of relevant documents mentioned in 1.3 above, must be in possession of this Department before any construction may commence on the relevant sites involved.

Clause 1.6: A copy of this Authorisation shall be available at site offices at all times and all staff, contractors; sub-contractors shall be conversant with its content.

Clause 1.7: The proposed mitigation measures, as set out in the Scoping Report shall be strictly adhere to.

Clause 1.8: The records of public participation (e.g. with local people/ structures) should be set to this Department

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Establishment of the development

Clause 2.1: This authorisation is repealed if development has not started within three (3) years from the date of issue.

Construction and operation

Clause 3.2: If changes need to be made to the plant and/or associated structures other than which have been agreed upon, the Department must be informed at least thirty (30) days in advance to be able to decide whether the changes need authorisation.

Risk Assessment

Clause 6.2: The owner of the property must ensure that issues and concerns from affected parties are addressed as stated in the Scoping Report.

Air Pollution

Clause 7.1: Will be according to emission certificate by the CAPCO (sic).

Monitoring

Clause 8.1: It is the responsibility of the operator of the development to install monitoring systems to detect any form of surface as well as ground water pollution, and to ensure water quality maintenance.

Reporting

Clause 9.1: Records related to compliance/non-compliance with the conditions of this authorisation must be kept in good order. Such records should be made available to this Department within seven (7) working days from the date of written request for such records from this Department.

Clause 9.3: Any complaints regarding the said development will be thoroughly investigated and addressed to the satisfaction of all parties concerned. Copies of such a complaint must be forwarded to the Department within 24 hours.

4.5 Significant conditions specified in the Ethyl Acetate ROD

General Conditions

Clause 1.4: A copy of this Authorisation shall be available at Sasol Chemical Industries (Pty) Ltd, Secunda, at all times and all staff, contractors and sub-contractors of the specific plant shall be acquainted with the contents of this Authorisation.

Establishment of the Ethyl Acetate

Clause 2.1: If changes need to be made to the plant and/or associated structures other than which have been agreed upon, the Department must be informed at least (thirty) 30 days in advance to be able to decide whether the changes need authorisation.

Clause 2.2: The Ethyl Acetate Plant must operate according to recognised environmental management standards. The Department must receive a proposal towards the EMS which management of the specific plant proposes to implement in order for the Department to approve or disapprove such a system.

Clause 2.3 This Authorisation is repealed if the project is not commenced within two (2) years from the date of Authorisation.

Construction and Operation

Clause 3.1: Standards laid down by the SANS and National Fire Prevention Association (NFPA) regarding (i) lightning protection and (ii) fire detection, protection and fighting systems, must be adhered to.

Clause 3.2: The Ethyl Acetate plant must be incorporated into Sasol's existing Hearing Conservation Programme in order to comply with the minimum requirements of Environmental Regulations for Workplaces in terms of the OHSA.

Clause 3.3: Illumination of the plant must comply with salutatory requirements of Environmental Regulations of Workplaces in terms of the Occupational Health and Safety Act, 1993 (Act 85 of 1993)

Clause 3.4: Care must be taken to comply with any other relevant section of the OHSA. This must be accompanied by accomplished by incorporating the Ethyl Acetate plant into Sasol's NOSA 5 Star System.

Clause 3.5: The design capacity of the Ethyl Acetate produced at the plant may not be surpassed.

Clause 3.6: No firewater apart from firewater to be utilised for fire fighting / commissioning purposes may be utilised during normal operation of the Ethyl Acetate plant.

Clause 3.7: No raw water / potable water may be utilised during normal operation of the Ethyl Acetate plant.

Clause 3.9: All waste, off-spec products or spent catalysts, should be recycled or re-routed into the process, treated or disposed off on a permitted waste disposal site according to the classification of the waste.

Clause 3.11 A plant specific Emergency Procedure must be developed as part of the operation manuals of the Ethyl Acetate Plant.

Clause 3.12: Commissioning of the new site may not take place before receipt of and approval of the final design criteria for the Polishing reactor and Ethyl Acetate column reflux system.

Clause 3.13: Commissioning of the site may not commence with the MDACE receiving and approving the considerations given in determining the final site location with regard to a potential explosive buffer zone.

Clause 3.14: Sasol must conduct a quantitative risk assessment as soon as more detailed process information becomes available.

Clause 3.15: Emissions limits and operating conditions issued in terms of the Atmosphere Pollution Prevention Act, 1965 (Act 45 of 1965), must be adhere to.

Clause 3.16: Detailed plans for the water removal unit must be forwarded to this Department and the Department of Water Affairs and Forestry before construction of the Plant may commence.

Clause 3.17: Sasol must develop contingency plans regarding storm water quality and quantity. These plans must be approved by the Department of Water Affairs and Forestry. Proof of approval must be forwarded to this Department.

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Air Pollution

Clause 4: Emission limits and operating conditions as stated in the provisional registration certificates issued in terms of the Atmospheric Pollution Prevention Act. 1965 (Act 45 of 1965) must be adhere to.

Risk Management

Clause 5: All employees, contractors and sub-contractors employed by, or delivering a service to Sasol with regard to the EA plant, must be acquainted with the characteristics and dangers associated with such a plant. They must also be familiarised with emergency procedures associated with the plant and for any other integrated structures.

Inspection and Monitoring

Clause 6: The EA plant and its associated infrastructure should be regularly checked to prevent incidents from occurring. Inspection timeframes must be reviewed at predetermined time intervals.

Environmental Auditing

Clause 8.1: Six months after commissioning of the Plant, MDACE must be supplied with an external Environmental Audit Report. The report must cover all environmental as well as operations aspects associated with the plant.

Clause 8.2: Sasol must conduct internal environmental audits on a yearly basis. The results of these internal audits must be forwarded to MDACE for monitoring purposes.

Reporting

Clause 9.1: The MDACE must be notified within 24 hours in the event of non-compliance with any of the conditions of this Authorisation.

Clause 9.2: Records relating to the compliance / non-compliance with the conditions must be kept in good order. Such records must be made available to this Department within seven workdays of the date of written requisite for such records.

Clause 9.4: Any complaints regarding the said development will be thoroughly investigated and addressed to the satisfaction of all parties concerned. Copies of such a complaint must be forwarded to the Department within 24 hours.

4.6 Significant conditions specified in the Ethylol 99 Plant RoD

General Conditions

Clause 1.4 :A copy of this Authorisation shall be available at Sasol Chemical Industries (Pty) Ltd, Secunda, at all times and all staff, contractors and sub-contractors of the specific plant shall be acquainted with the contents of this Authorisation.

Establishment of Plant

Clause 2.1: If changes need to be made to the plant and/or associated structures other than which have been agreed upon, the Department must be informed at least thirty (30) days in advance to be able to decide whether the changes need authorisation.

Clause 2.2: The High Purity Ethanol Plant must operate in accordance to ISO 14001 standards as well as requirements set by Sasol's Quality Management Standards (QMS 918).

Construction and Operation

Clause 3.1: Standards prescribed by the SABS and National Fire Prevention Association (NFPA) regarding (i) lightning protection and (ii) fire detection, protection and fighting systems, must be followed and adhered to.

Clause 3.2: The High Purity Ethanol Plant must be incorporated into Sasol's existing Hearing Conservation Programme in order to comply with the minimum requirements of Environmental Regulations for Workplaces in terms of the Occupational Health and Safety Act (Act 85 of 1993).

Clause 3.3: Illumination of the plant must comply with statutory requirements of Environmental Regulations for Workplaces in terms of the Occupational Health and Safety Act, 1993 (Act 85 of 1993)

Clause 3.4: Care must be taken to comply with any other relevant section 8 of the Occupational Health and Safety Act, 1993 (Act 85 of 1993). This must be accompanied by accomplished by incorporating the High Purity Ethanol Plant into Sasol's NOSA 5 Star System.

Clause 3.5: The design capacity of 85000t/ya may not be exceeded.

Clause 3.6: No firewater apart from the designated firewater, may be utilised for fire fighting / commissioning purposes may be utilised during normal operation of the High Purity Ethanol Plant.

Clause 3.7: No raw water / potable water may be utilised during normal operation of the High Purity Ethanol Plant.

Clause 3.9: All effluent, and off-spec products should be recycled or re-routed into the process, or be disposed off on a class H:H waste disposal site. This Department must be notified of any other Province, in order to legalise the transportation and dumping of such waste.

Clause 3.10: the contractual agreement regarding transport of product should include guidelines on official truck stops and routes.

Air Pollution

Clause 4: Emission limits and operating conditions must be adhere to, as stated in the registration certificates issued in terms of the Atmospheric Pollution Prevention Act. 1965 (Act 45 of 1965).

Risk Management

Clause 5: All employees, contractors and sub-contractors employed by, or delivering a service to Sasol with regard to the High Purity Ethanol Plant, must be acquainted with the characteristics and dangers associated with such a plant. They must also be familiarised with emergency procedures associated with the High Purity Ethanol Plant and for any other integrated structures that is relevant to this project.

Inspection and Monitoring

Clause 6: The High Purity Ethanol Plant and its associated infrastructure should be regularly checked to prevent incidents. Inspection timeframes must be reviewed at predetermined time intervals.

Decommissioning

Clause 7.1: Decommissioning of the new High Purity Ethanol Plant may not commence without the Department receiving, and approving a formal rehabilitation plan for the plant six (6) months in advance of the proposed decommissioning date.

Environmental Auditing

Clause 8.1: External environmental Audit: Six months after commissioning of the plant, the Department must be supplied with an external Environmental Audit Report. The report must cover all environmental as well as operations issues surrounding the plant to ensure that all mitigating measures identified in the Environmental Scoping phase have been addressed.

Clause 8.2: Internal Environmental Auditing: Sasol must conduct internal environmental audits on a yearly basis. The results of these internal audits must be forwarded to the Department for monitoring purposes.

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Reporting

Clause 9.1: The Department must be notified within 24 hours in the event of non-compliance with any of the conditions of this Authorisation and/or in the case of an event which results in people being injured.

Clause 9.2: Records relating to the compliance / non-compliance with the conditions must be kept in good order. Such records must be made available to this Department within seven (7) workdays of the date of written requisite for such records.

Clause 9.4: Any complaints regarding the said activity must be brought to the attention of the Department within 24 hours after receiving the complaint. A complaints register must be kept. This register must contain up to date information and must be made available for inspection by members of this Department within seven (7) days, after requesting such information.

4.7 Significant conditions specified in Hexene Train 3 RoD

General Conditions

Clause 1.3: No development may take place on the area of concern without the necessary permits/ approvals and/or service and/ or lease agreements, where it is relevant:

1.3.1 Department of Water Affairs & Forestry

1.3.2 Department of Health & Welfare

1.3.3 National Department of Environmental Affairs & Tourism

Clause 1.4: Copies of relevant documents mentioned in Clause 1.3 above, must be in possession of this Department before any construction may commence on the relevant sites involved.

Clause 1.6: A copy of this Authorisation shall be available at site offices at all times and all staff, contractors; sub-contractors shall be conversant with its content.

Clause 1.8: The records of public participation (e.g with local people/ structures) should be set to this Department.

Establishment of the Development

Clause 2.1 This Authorisation is repealed if construction has not started within three (3) years from the date of this Authorisation.

Construction and Operation

Clause 3.2: If any change needs to be made in the plan for the proposed development, the MDACE must be informed (thirty) 30 days prior to the commencement of such changes to decide whether the changes will require an authorisation or not.

Clause 3.3: All mitigation measures as proposed in the Scoping Report are binding and must be adhered to as part of the Authorisation.

Clause 3.4: The developer must notify the MDACE within 24 hours in the event of non-compliance with any of the conditions of the Authorisation and/or emergency that will have a negative impact on the environment.

Water Pollution

Clause 4.1: Rain water will be managed by using the philosophy being approved for the 1-Octene Train One Project.

Clause 4.2: Water will be tested for purity and compliance with requirements for Water Affairs, and if polluted it will be let out of the oily water sewer.

Clause 4.3: Chemical cleaning will be done in the distillation columns by using TeePol.

Clause 4.4: Storm water catchments drains will harvest surface water that may result from heavy rains.

Waste

Clause 5.1: All waste generated during construction and operation of the plant and associated activities should be handled and disposed of in a registered landfill, and must be to the satisfaction of this Department and/ or any other relevant authority.

Clause 5.2: Any hazardous waste resulting from construction operation including the polymers and other associated wastes should be disposed of according to requirements of this Department and any other relevant authorities.

Air Pollution

Clause 6.1 Emission shall be within the permissible standard as required according to the Atmospheric Pollution Prevention Act, 1965 (Act No 45 of 1965).

Risk Management

Clause 7.2: The owner of the development must ensure that all concerns from I&APs are addressed as stated in the Scoping Report.

Monitoring

Clause 8.1 The owner of the development must put in place the monitoring system to ensure that the water quality is of correct standards as per the Department of Water Affairs.

Reporting

Clause 9.3: Any complaint regarding the mentioned development must be thoroughly investigated and addressed to the satisfaction of all parties concerned.

4.8 Significant conditions specified in the 1-Octene Train 1 ROD

General conditions

Clause 1.4: A copy of this Authorisation shall be available at the plant at all times and all staff, contractors and sub-contractors shall be acquainted with the contents of the Authorisation.

Establishment of the Octene Plant

Clause 2.1: This Authorisation is repealed if the project has not commenced within five (5) years from the date of the Authorisation

Clause 2.2: If any changes need to be made to the Plant and/or associated structures other than that which has been agreed upon, this Department must be informed thirty (30) days in advance, to be able to decide whether the changes need authorisation.

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Clause 2.3: The 1-Octene Plant must be operated as part of the certified ISO 14001 Environmental Management System of the Alpha Olefins Plant and must be under the control of the management team of the existing Sasol Alpha Olefins plant.

Construction and Operation

Clause 3.5: Lightning protection, fire detection, protection and fighting systems must be in accordance with SABS & NFPA standards

Clause 3.6: Illumination must comply with the statutory requirements of the Environmental Regulation for Workplaces in terms of the Occupational Health and Safety Act, 1993 (Act 85 of 1993)

Clause 3.7: The 1-Octene Plant must be incorporated into the existing Hearing Conservation Programme of the Alpha Olefins Plant, and must comply with the minimum requirements of the Environmental Regulations for Workplaces in terms of OHSA.

Clause 3.8: All mitigation measures as proposed in the Environmental Impact Assessment for the 1-Octene Plant (dated: 11 March 1998) and the addendums (dated: 10 December 1998 and 28 July 1998) hereafter referred to as the EIA) must be implemented and adhere to.

Clause 3.10 The loading facility for the railroad cars must be built and operated as specified in the EIA.

Air Pollution

Clause 4.1 The emission limits and operating conditions as stated in the provisional registration certificates issued in terms of the Atmospheric Pollution Prevention Act, 1965 (Act 45 of 1965), must be adhere to.

Clause 4.2 The emissions from the Carbonate Regenerator (released into the atmosphere) must comply with the requirements of Schedule Process 39: Waste Incineration of the Atmospheric Pollution Prevention Act, 1965 (Act 45 of 1965).

Clause 4.3: The Carbonate Regenerator must comply with the Internal Sasol company standard of not emitting more than 200mg/Nm³ of NOX.

Clause 4.4: The volume of NMP (N-methylpyrrolidone) containing waste in the Kettle Reboiler Column must be reduced (as indicated in the EIA) before plant shutdown in order to reduce the mass of pollutants to be released from the flare.

Water Pollution

Clause 5.1: Water is to be re-used for hydro-testing as indicated in the EIA

Clause 5.2: Water used to flush the plant must be contained and analysed to prove that it complies with the general water quality standards before it is released to the storm water sewer.

Clause 5.3: The total plant must be bunded. The bunded area must be divided into clean and potentially polluted areas. All bunded areas must be designed to contain the largest of 110% of the total volume of liquids on plant and any stage or the volume of water associated with a rain incident of 117mm.

Clause 5.4: Storm water from 'clean areas' is only to be released to the storm water drainage system after testing to ensure compliance with standards.

Clause 5.5: Polluted water is to be contained and tested to assess compliance with Oily Water Sewage system requirements. Only if requirements are adhered to (i.e. no Potassium salts in the run-off), may the polluted water be released to the Oily water Sewage System.

Clause 5.6: Polluted water that does not comply with the Oily water Sewage system requirements must be disposed at a class HH landfill site (i.e. Holfontein).

Clause 5.7 Contingency or alternative plans must be investigated and implemented in the event that capacity problems are experienced in the API system. A progress report regarding these investigations must be presented to the Department within six (6) years of the authorisation. The practice of controlled release does not coincide with the policies of the Department of Water Affairs and Forestry and is considered to be a violation of the Water Act 1956 (Act 54 of 1956) and the additional Water Act, 1998 (Act 36 of 1998).

Clause 5.8: the management of water at the Sasol Alpha Olefins Plant must form part of the integrated Water Management Plan of the Sasol Secunda Industrial Complex.

Waste

Clause 6.1: All waste must be stored, handled and disposed of in an environmentally acceptable manner and as stipulated in the EIA.

Clause 6.2: A Waste Management Programme must be developed and implemented and must include the IWM principles.

Clause 6.3: Empty containers must be sent back to suppliers for disposal. This requirement must be included in purchase agreements with suppliers.

Clause 6.4: Any off-specification product generated on the plant during start-up or following a shutdown must be contained in run down tanks. From the run down tanks, the off-specification products are to be released to the Refinery East Naphtha Hydrotreater tank via the common return line.

Clause 6.5: The sewer system of the 1-Octene plant is to be designed and operated according to the philosophy stipulated in the addendum to the EIA for the 1-Octene Plant (dated:10 December 1998).

Clause 6.6: Disposal contracts must clearly indicate requirements with regards to transport of waste, disposal methods, disposal sites, documentation, environmental obligations placed on contractor, and clean-up contingency measures in the event of a spill.

Risk Management

Clause 7.1: All employees, contractors and sub-contractors employed by, or delivering a service to the Alpha Olefins Plant, shall be acquainted with the characteristics and dangers associated with the processes used by Sasol Alpha Olefins.

Monitoring

Clause 8.1: For the purpose of taking effluent samples and measuring the flow, the necessary facilities shall be provided in the wastewater outlet. The details shall be agreed with the Department of Water Affairs and Forestry.

Clause 8.2: Monitoring of water and air pollution must be carried out according to the accepted monitoring programme for the Sasol Alpha Olefins Plant.

Reporting

Clause 9.1: The Department must be notified within 24 hours in the event of non-compliance with any of the conditions of the Authorisation and/ or in the case of any event which results in emissions or discharges of pollutants.

Clause 9.2: Records relating to the compliance/non-compliance with the conditions of the Authorisation must be kept in good order. Such records must be made available to this Department within seven (7) workdays of the date on a written request by the Department for such records.

Clause 9.4: Any complaints regarding the mentioned development must be brought to the attention of the Department within 24 hours after receiving the complaint. A complaints register must be kept for inspection by members of this Department.

4.9 Significant conditions specified in the 1-Octene Train 2 RoD

General Conditions

Clause 1.6: A copy of this authorisation shall be available at the site office at all times and the staff and contractors shall be conversant with its content.

Clause 1.7: The proposed mitigation measures, as set out in the Scoping Report shall strictly adhere to.

Clause 1.8: The record of public participation should be sent to this Department for record keeping.

Establishment of the development

Clause 2.1: This authorisation is repealed if construction has not started within three (3) years from the date of issue.

Construction and Operation

Clause 3.2: If any change need to be made in the plant of the mentioned development, or replacement of any of its structures, this department must be informed thirty (30) days in advance in order to decide whether such

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changes require authorisation or not.

Monitoring

Clause 8.1: It is the responsibility of the operator of the development to install monitoring systems to detect any form of surface or ground water pollution, and to ensure good water quality maintenance.

Reporting

Clause 9.1: Records related to compliance / non-compliance with the conditions of this authorisation must be kept in good order. Such records should be made available to this Department within seven (7) days from the date of written request for such records from this Department.

Clause 9.3: Any complaints regarding the mentioned development will be thoroughly investigated and addressed to the satisfaction of all parties concerned. Copies of such complaint must be forwarded to this Department within twenty-four (24) hours.

4.10 Significant conditions specified in the 1-Octene Train 3 Plant ROD

General Conditions

Clause 1.3: Ensure that the necessary permits, approval and/or service agreements where it is relevant, from or between the following institutions are in place:

- 1.3.1 Chief Air Pollution Control Officer
- 1.3.2 DWAF
- 1.3.3 Provincial Department of Health
- 1.3.4 Department of Labour

Clause 1.5: A copy of this authorisation must be available at the premises of the applicant at all times and all staff, contractors and sub-contractors must be acquainted with the contents of this authorisation.

Establishment of the Development

Clause 2.1: This authorisation is repealed if the proposed 1-Octene 3 plant has not been constructed within two (2) years from the date of this authorisation.

Construction and Operation

Clause 3.1: Any emissions levels of the pollutants (NO_x, SO₂, H₂S, VOC, PM_{2.5} and PM₁₀) must be approved by CAPCO before construction and operation commences.

Clause 3.2: Monitoring of ambient air quality and characterisation of pollutant concentrations for the entire Sasol Complex must be carried out in order to assess the cumulative pollutant concentrations and its impact on the receptors areas (Sasol Complex, Secunda, eMbalenhle, etc.).

Clause 3.3: The dispersion potential of the pollutants must be measured and characterised in various receptor areas (Sasol Complex, Secunda, eMbalenhle, etc.).

Clause 3.4: The adverse human health effects that may be caused by the proposed development including emissions of pollutants must be documented and be made available to this Department when needed.

Clause 3.5: Workers must be aware of the harmful effects of emissions and must be trained on the dangers and safety measures that must be taken should such a situation arise.

Clause 3.6: All waste material must be placed in suitable containers and disposed of in a suitable site.

Clause 3.8: Bunded areas and a fast drainage system must be put in place to recover feed, chemicals, solvents, products and by-products during loading and off loading.

Clause 3.9: Fire fighting equipment must be installed according of the relevant legislation on the proposed site.

Clause 3.11: If any changes need to be made to the site and/or associated infrastructure, this Department must be informed thirty (30) days in advance, to be able to decide whether the changes need authorisation.

Air Pollution

Clause 4.1: The necessary air permits must be obtained and forwarded to this Department before the plant is commissioned.

Water pollution

Clause 5.1: Any pollution of surface as well as ground water must be prevented at all cost.

Reporting

Clause 7.1: Records relating to the compliance and non-compliance to the conditions of this authorisation must be kept in good order. Such records must be made available to this Department within five (5) working days from the date of a written request by the Department.

Clause 7.3: Any complaints regarding the mentioned development must be brought to the attention of this office within 24 hours after receiving the complaint.

Clause 7.4: A complaint's register must be kept-up to date for inspection by members of this Department.

4.11 Significant conditions specified in the Acrylic Acid and Acrylates (AAA Plant) RoD

Special Conditions

1. Air Pollution

- a. All storage tank vents must be fitted with vapour recovery lines.
- b. All sample points must be enclosed and routed to drip tanks.
- c. All exhaust gases must be properly treated and vented as stated in the Scoping Report

2. Storm Water and Effluent Disposal

All effluents must be properly separated and appropriately disposed of as stated in the Scoping Report.

3. Noise Pollution

While noise generation equipment must be fitted with silencers, Sasol will comply with Health and Safety legislation that an overall noise rating level in areas where more than one noise source is placed is less than 85dB.

4. Safety

Safety standards will not be compromised to below current levels. The Health and Safety Act shall be observed.

Standard Conditions

1. The applicant must advertise the authorisation of this specific activity in terms of Section 22 of the Environmental Conservation Act, 1989 (Act 73 of 1989): Schedule 1 of the Government Gazette No R1182. Proof of this advertisement must be submitted to this Department within 14 days from the date of this authorisation.
2. This record of decision does not exempt any person from the requirements of any other controlling authority or from any provision of any other laws. The RoD also does not purport to interfere with the rights of any person who may have an interest in the property.
3. A copy of this authorisation and a copy of the relevant Scoping Report shall be available at the site office at all times. Staff members and contractors shall be conversant with its content.
4. The Department must be granted access to the property at any time to investigate any possible environmental impacts that may be caused by this development.
5. The records of compliance/non-compliance with conditions of this authorisation must be kept in good order. Such records should be available to this Department within seven (7) days from the date of written request from this Department.
6. Non-compliance with, or any deviation from the conditions of this authorisation as set out in the Record of Decision, is regarded as an offence and will be dealt with in terms of Section 29, 30 and/ or 31A of the Environmental Conservation Act.
7. The Department may change, add or amend any of the condition mentioned in this authorisation, if in the opinion of the Department, it is environmentally justifiable.

4.12 Significant conditions specified in the Butanol RoD

Special Conditions

1. Air pollution
 - a. The cumulative effects of particulate and organic emissions must be monitored and will be reported as part of Sasol's permit conditions
 - b. Once the plant is operational, monitoring of the amines will be done to ensure that the absolute perception limit (APL) is not exceeded. On exceeding the APL, the appropriate action (as may be convincing to permitting authorities) will be taken by SCI.
 - c. No uncontrolled venting of butanol will be allowed. If it is necessary to do so, this will be limited to conditions of good dispersion potential during shutdowns, such as windy daytime atmospheres.
2. Storm water and effluent disposal
 - a. All storm water that may be contaminated with chemicals (due to leakages), must be directed to bio-works.
 - b. The fire-fighting run off will be sampled and analysed before the appropriate disposal site.
 - c. Cooling tower blow-down and other sour process water must be disposed off in the appropriate waste dams.
3. Other effluents and solid wastes
 - a. All tanks containing chemicals must be properly bunded and their run-off appropriately diverted.
 - b. Spent catalyst must be disposed off by a specialist waste contractor at a licensed waste site.
 - c. Guard-beds might be replaced biannually and must be disposed of by a specialist waste contractor at a licensed waste site.
 - d. The horizontal flare knock out drum must be emptied annually. Solid contents of the knock out drum will be disposed of by a specialist waste contractor in a licensed hazardous waste site.

4. Noise Pollution

- a. While noise generation equipment must be fitted with silencers, Sasol will comply with Health and Safety legislation that an overall noise rating level in areas, with more than one noise source is placed is less than 85dB.

5. Transportation of Hazardous Material

- a. Sasol will ensure that its contractors adhere to the requirements of
 - o The Hazardous Substances Act (Act 15 of 1973)
 - o The Occupational Health and Safety Act (Act 85 of 1993),
 - o The National Road Traffic Act (Act 93 of 1996).

6. Safety

- a. It is normal industrial practise that CO₂ removal (Benfield) units employ a Potassium Carbonate (K₂CO₃) wash before the amine wash. Inclusion of a K₂CO₃ system requires in most instances the use of hazardous substances such as vanadium pentoxide (V₂O₅) for rejuvenating the carbonate.
- b. Oxidising agents such as V₂O₅, will not be utilised as they shall not have been subjected to a scoping exercise.
- c. Proper protective clothing may not be enough if operators are not informed about hazards of the dusts.
- d. Di-ethanol amine exists under ambient temperatures as a hard solid. This requires heating to fluid-form before introduction into wash systems. Normal industrial practise is to heat the container with a steam hose.
- e. State of the art engineering designs are recommended for DEA dosing facility where if possible, a fully automated dosing system is recommended.
- f. In the event a conventional, manual system is in place, sound safety procedures compliant to the Safety Act (when handling substances at high temperatures) must at all times be observed.

7. Socio-economic issues

- a. During construction, contractors will largely draw from local labour. (The Zamdela Unemployment Forum, the Greater Sasolburg Contractors Association, etc.) while it is acknowledged that limitations due to skill available may exist.
- b. A few new permanent jobs that will be created during operation phase, should be communicated in parallel with conditions for authorisation, as an attempt to improve SCI-community relationship and trust.

Standard Conditions

- a. The applicant must advertise this record of decision.
- b. This record of decision does not exempt any person from the requirements of any other controlling authority or from any provision of any other law and does not purport to interfere with the rights of any person who may have an interest in the property.

4.13 Significant conditions specified in the MiBK 2 Sasolburg RoD

Specific Conditions

- a. This authorisation has been granted solely for the purpose of undertaking the specified activities referred to above.
- b. The following mitigation measures and recommendations contained in the scoping report (Final Scoping Report, Methyl Iso-Butyl Ketone MiBK2, dated July 2006) compiled by Nermal Consulting must be adopted and complied with:

Environmental Management Plan

- a. Construction contractors must comply with the measures contained in the Environmental Management Plan (Final Scoping Report, Methyl Iso-Butyl Ketone MiBK2, dated July 2008).

Operational Phase

- a. All off-loading areas of acetone must be bunded and provided with a sump'

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- b. All other process, loading and storage areas must be bunded
- c. It must be ensured that all polluted run-off are collected and re-processed in the plant;
- d. Ensure that all surfaces are concreted with watertight joints to reduce the possibility of groundwater pollution.
- e. Sasol Solvents (the applicant) must maintain a transparent relationship with the public, and all relevant information must be made available to the public on request.

**The following conditions from Department of Tourism,
Environmental and Economic Affairs must be adhered to:**

- a. Storm water management:
 - o Ponding of water on the site, due to poor drainage, must be prevented and where it does occur, it must be drained immediately.
- b. Ensure that all applicable regulations as included in the Occupational Health and Safety Act (Act 85 of 1993), SABS codes and other statutory requirements are complies with.
- c. The holder of the authorisation must submit an environmental audit report to the Department once after the construction phase of the facility (MiBK 2 Plant) The environmental audit report must contain the following-
 - o Activity;
 - o Targets;
 - o Conformance/Non conformance;
 - o Performance indicator; and
 - o Comments.
- d. In case of non-compliance with regulations the burden of proof rests with the applicant and/or the relevant contractor.
- e. The Department hereby confirms that an audit compliance with procedures mentions can be conducted at any time. Records of monitoring and/or auditing must be made available for the inspections to any relevant authority inspecting the development.
- f. This Authorisation is granted in terms of Section 22 of the

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Environmental Conservation Act 1989 (Act No 73 of 1989) and does not exempt the holder from compliance with other relevant legislation.

- g. The holder of the authorisation must notify all registered interested and affected parties within seven (7) calendar days, of the Department decision to authorise the activity.
- h. Include in such information the explicit provisions of Regulation 11 of the Environmental Impact Assessment Regulations, (Government Notices No. R1182 and 1183 of 5 September 1997) which reads as follows.
- i. An appeal to the minister or provincial authority under Section 35(3) of the Act must be done in writing within thirty (30) days from the date on which the record of decision was issued to the applicant in terms of regulation 10(1).
- j. An appeal must set out all the facts as well as the grounds of appeal, and must, be accompanied by all relevant documents or copies of them, which are certified.
- k. Include the date on which the record of decision was issued to the applicant in terms of regulation 10(1) and the date by which appeals must reach the MEC.
- l. This authorisation refers only to the project specified and described in this Record of Decision.
- m. Changes in the proposal resulting in significant environmental impacts are only permissible if approved in writing by the Department.
- n. The Department reserves the right to amend and review the conditions of authorisation every five (5) years.
- o. The Department must be notified, of any change of ownership and/or project developer within thirty (30) days. Conditions imposed in this Record of Decision must be made known to the new owner and/or developer and are binding on the new owner and /or developer
- p. The Department must be notified of any change of address of the owner and/or developer.
- q. The conditions of the authorisations should be brought to the attention of all persons (employees, sub-contractors etc.) associated with the

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undertaking of this activity to bind such persons to these conditions.

- r. The owner and/or developer must notify the relevant authority, in writing, within 24 hours thereof if any condition of this authorisation is not adhere to.
- s. Records related to compliance/ no-compliance with conditions of this authorisation must be kept in good order. Such records should be made available to this Department within seven (7) days from the date of written request from this Department.
- t. Non-compliance with or any decision from the conditions of this authorisation as set out in the Record of Decision is regarded as an offence, and after reasonable provision has been have for remedial action, will be dealt with in terms of Section 29, 30 and 31A of the Environment Conservation Act (Act No 73 of 1989) as well as any other appropriate legal mechanisms.

The applicant shall be responsible for all costs necessary to comply with the above conditions unless otherwise specified.

Chapter 5 – Compliance to the RoD's

5.1 Evaluation of Acid Recovery Plant (Solvents West) RoD

<u>Establishment of the Acid Recovery Plant (Solvents West)</u>			
<u>Authorisation to Undertake a Listed Activity: Construction and Operation of the Acid Recovery Plant (Solvents West) (Ref: 17/2/28/EV1, dated 26 June 2002)</u>			
It must be noted that only relevant provisions of the RoD have been reproduced and audited hereunder. Some of the provisions of the RoD relate only to the construction phase of the plant.			
RoD Requirement:	Compliance:	Compliance Status:	ISO and Other Requirements:
1. General Conditions			
Clause 1.1	Aspect registers were developed and implemented into the Solvents IMS system. Evidence of Compliance: Secunda IRCA Audit Report 12-15 April 2010 Secunda DQS Audit Report June 7-11-2010	Compliant	ISO 14001 requirement 4.3.1 Environmental Aspects 4.3.2 Legal and Other Requirements 4.5.2 Evaluation of Compliance Responsible Care
Clause 1.2	Refer to Aspect register kept by Sastech All operational waste is incorporated into the Solvents West Waste register. Waste is disposed off according to hazardous rating and classification in a licensed landfill site. Sasol Secunda Site Waste licence: 12/9/11/L1/6. Evidence of	Compliant	ISO 14001 requirement 4.3.1 Environmental Aspects 4.3.2 Legal and Other Requirements 4.5.2 Evaluation of Compliance Responsible Care

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	Compliance: Sasol Solvents Secunda Waste Audit Report done by Marsh		
Clause 1.3	All employees, Service providers and people working for or on behalf of Solvents are trained in the Emergency procedure. This forms part of the Solvents Training matrix. Training records are available from the Training department (know How)	Compliant	ISO 14001 requirement 4.4.2 Competence, Training and Awareness 4.5.4 Control of Records Responsible Care
Clause 1.4	Revere to Air Certificate Existing/valid APPA air certificates 1308/8, 1309/8 and 1308/11 Evidence of Compliance: Secunda Environmental Legal Compliance Audit Report by Marsh 13 May 2009	Compliant	ISO 14001 requirement 4.3.1 Environmental Aspects 4.3.2 Legal and Other Requirements 4.5.2 Evaluation of Compliance Responsible Care
Clause 1.5	This is managed via Corporate affairs Toll free number 0800 205 0090 or 017 610 0100 Complaints register is kept. No Complaint was received for this installation	Compliant	ISO 14001 requirement 4.4.3 Communication 4.5.3 Nonconformity, Corrective Action and Preventive Action Responsible Care

Table 5.1: Evaluation of Acid Recovery Plant (Solvents West) ROD

5.2 Evaluation of Crotonealdehyde plant RoD

<u>Establishment of Crotonealdehyde Plant</u>			
<u>Exemption to Undertake a Listed Activity: Establishment of the Crotonealdehyde Plant (Ref: 16/4/L/2001/16 dated 19 December 2001.)</u>			
It must be noted that only relevant provisions of the RoD have been reproduced and audited hereunder. Some of the provisions of the RoD relate only to the construction phase of the plant.			
RoD Requirement:	Compliance:	Compliance Status:	ISO & Other Requirement:
1. General Conditions			
Clause 1.5:	Electronic copy available on intranet for all employees. Hard copy available from SHERQ Department. The authorisation formed part of induction training during the construction period. The training of staff, contractors and sub-contractors was managed via the Principal contractor induction training program. The training program was approved by Sasol Technology Environmental department.	Compliant	BD&I Requirement Responsible Care
Clause 1.7:	All mitigation measures as recommended in the EMP were implemented as required. Integrated Business Management Audit Report for Secunda 7 December 2009	Compliant	ISO 14001 requirement 4.3.2 Legal Requirement Responsible Care
2. Establishment of the development			
Clause 2.2	The conversion of the plant was communicated to the Department refer	Compliant	No Requirement

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	to the Ethylol 99 RoD Reverence 14/3/11/FAF.HPE Dated 3 Aug 1999		
Clause 2.3	The conversion of the plant was communicated to the Department refer to the Ethylol 99 RoD Reverence 14/3/11/FAF.HPE Dated 3 August 1999.	Compliant	No Requirement
3. Construction and operation			
Clause 3.1	The conversion of the plant was communicated to the Department refer to the Ethylol 99 RoD Reverence 14/3/11/FAF.HPE Dated 3 August 1999.	Compliant	No Requirement
4. Air Pollution			
Clause 4.1	In full compliance with existing/valid APPA air certificates1308/8, 1309/8 and 1308/11 Evidence of Compliance: Secunda Environmental Legal Compliance Audit Report by Marsh 13 May 2009.	Compliant	ISO 14001 Requirement 4.3.1 Environmental Aspects Responsible Care
Clause 4.2	In full compliance with existing/valid APPA air certificates1308/8, 1309/8 and 1308/11 Evidence of Compliance: Secunda Environmental Legal Compliance Audit Report by Marsh 13 May 2009.	Compliant	ISO 14001 Requirement 4.3.2 Environmental Aspects Responsible Care
5. Water Pollution			
Clause 5.2	This is managed via Corporate affairs Toll free number 0800 205 0090 or 017 610 0100 Complaints register are kept. No Complaint was received for this installation.	Compliant	ISO 14001 requirement 4.3.3 4.3.1 Environmental Aspects 4.4.3 Communication Responsible Care

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	Sasol Secunda Site Water Licence: 16/2/7/C121/B028/1 Evidence of Compliance: Secunda Environmental Legal Compliance Audit Report by Marsh 13 May 2009.		
6. Waste			
Clause 6.1	Waste register. Waste manifest are kept Sasol Secunda Site Waste Licence: 12/9/11/L1/6. Sasol Solvent Secunda Waste Audit Report by Marsh.	Compliant.	ISO 14001 Requirement 4.3.4 Environmental Aspects 4.3.2 Legal and Other Requirements 4.5.4 Control of Records Responsible Care
7. Risk Management			
Clause 7.1	Fire extinguishing equipment is available at all times and is inspected according to Schedule. Evidence of Compliance: Health and Safety Legal Audit Report Secunda by Marsh 15 October 2009.	Compliant.	ISO 14001 Requirement 4.3.2 Legal and Other Requirements 4.5.1 Monitoring and Measurement 4.5.4 Control of Records Responsible Care
8. Monitoring			
Clause 8.1	Records of monitoring and inspections are available at all times	Compliant.	ISO 14001 Requirement 4.3.2 Legal and Other Requirements 4.5.1 Monitoring and

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			Measurement 4.5.4 Control of Records Responsible Care
9. Reporting			
Clause 9.1	MDACE has not been notified of any non-compliance with the conditions, due to no non-compliance as identified herein. All pollution incidents are reported via Synfuels Environmental Department to DEAT.	Compliant.	No Requirement
Clause 9.3	Records are kept in good order, all documents available on the electronically Intranet or hard copies available from the SHERQ department. Back-up of all these documents is also made.	Compliant	ISO 14001 requirement 4.5.4. Control Records Responsible Care
Clause 9.4	This is manage via Corporate affairs Toll free number 0800 205 0090 or 017 610 0100 Complaints register are kept. No Complaint was received for this installation.	Compliant	ISO 14001 requirement 4.4.3 Communication Responsible Care

Table 5.2: Evaluation of Crotonaldehyde plant ROD

5.3 Evaluation of Crotonaldehyde loading area RoD

<u>Establishment of Crotonaldehyde loading area</u>			
<u>Exemption to Undertake a Listed Activity: Establishment of the Crotonaldehyde loading area (Ref: Ref: 16/4/L/2001/15, dated 7 February 2002.)</u>			
It must be noted that only relevant provisions of the RoD have been reproduced and audited hereunder. Some of the provisions of the RoD relate only to the construction phase of the plant.			
RoD Requirement:	Compliance:	Compliance Status:	ISO & Other Requirement:
1. General Conditions			
Clause 1.5:	Electronic copy available on intranet for all employees. Hard copy available from SHERQ Department. The authorisation formed part of induction training during the construction period. The training of staff, contractors and sub-contractors was managed via the Principal contractor induction training program. The training program was approved by Sasol Technology Environmental department.	Compliant	BD&I Requirement Responsible Care
Clause 1.7:	All mitigation measures as recommended in the EMP were implemented as required. Evidence of Compliance: Integrated Business Management Audit Report for Secunda 7Dec 2009.	Compliant	ISO 14001 requirement 4.3.2 Legal Requirement Responsible Care

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2. Establishment of the development			
Clause 2.2	The conversion of the plant was communicated to the Department refer to the Ethylol 99 RoD Reverence 14/3/11/FAF.HPE Dated 3 August 1999.	Compliant	No Requirement
Clause 2.3	The conversion of the plant was communicated to the Department refer to the Ethylol 99 RoD Reverence 14/3/11/FAF.HPE Dated 3 August 1999.	Compliant	No Requirement
3. Construction and operation			
Clause 3.1	The conversion of the plant was communicated to the Department refer to the Ethylol 99 RoD Reverence 14/3/11/FAF.HPE Dated 3 August 1999.	Compliant	No Requirement
4. Air Pollution			
Clause 4.1	In full compliance with existing/valid APPA air certificates1308/8, 1309/8 and 1308/11 Evidence of Compliance: Secunda Environmental Legal Compliance Audit Report by Marsh 13 May 2009.	Compliant	ISO 14001 Requirement 4.3.5 Environmental Aspects Responsible Care
Clause 4.2	In full compliance with existing/valid APPA air certificates1308/8, 1309/8 and 1308/11 Evidence of Compliance: Secunda Environmental Legal Compliance Audit Report by Marsh 13 May 2009.	Compliant	ISO 14001 Requirement 4.3.6 Environmental Aspects Responsible Care

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5. Water Pollution			
Clause 5.2	This is manage via Corporate affairs Toll free number 0800 205 0090 or 017 610 0100 Complaints register are kept. No Complaint was received for this installation. Sasol Secunda Site Water Licence: 16/2/7/C121/B028/1 Evidence of Compliance: Secunda Environmental Legal Compliance Audit Report by Marsh 13 May 2009.	Compliant	ISO 14001 requirement 4.4.3 Communication Responsible Care
6. Waste			
Clause 6.1	Waste register. Waste manifest are kept Sasol Secunda Site Waste Licence: 12/9/11/L1/6. Evidence of Compliance: Sasol Solvent Secunda Waste Audit Report by Marsh.	Compliant.	ISO 14001 Requirement Environmental Aspects 4.3.2 Legal and Other Requirements 4.5.4 Control of Records Responsible Care
7. Risk Management			
Clause 7.1	Fire extinguishing equipment are available at all times and are inspected according to schedule. Evidence of Compliance: Health and Safety Legal Audit Report Secunda by Marsh 15 October 2009.	Compliant.	ISO 14001 Requirement 4.3.2 Legal and Other Requirements 4.5.1 Monitoring and Measurement 4.5.4 Control of Records Responsible Care

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8. Monitoring			
Clause 8.1	Records of monitoring and inspections are available at all times.	Compliant.	ISO 14001 Requirement 4.3.2 Legal and Other Requirements 4.5.1 Monitoring and Measurement 4.5.4 Control of Records Responsible Care
9. Reporting			
Clause 9.1	MDACE has not been notified of any non-compliance with the conditions, due to no non-compliance as identified herein. All pollution incidents are reported via Synfuels Environmental Department to DEAT.	Compliant.	No Requirement
Clause 9.3	Records are kept in good order, all documents available on the electronically Intranet or hard copies available from the SHERQ department. Back-up of all these documents is also made.	Compliant	ISO 14001 requirement 4.5.4. Control Records
Clause 9.4	This is manage via Corporate affairs Toll free number 0800 205 0090 or 017 610 0100 Complaints register is kept. No Complaint was received for this installation.	Compliant	ISO 14001 requirement 4.4.3 Communication

Table 5.3: Evaluation of Crotonaldehyde loading area ROD

5.4 Evaluation of Detergent Alcohol Plant ROD

<u>Establishment of Detergent Alcohol Plant</u>			
<u>Authorisation to Undertake a Listed Activity: Establishment of the Detergent Alcohol Plant (Ref: 16.25, dated 29 March 2000)</u>			
It must be noted that only relevant provisions of the RoD have been reproduced and audited hereunder. Some of the provisions of the RoD relate only to the construction phase of the plant.			
RoD Requirement:	Compliance:	Compliance Status:	ISO & Other Requirement:
1. General Conditions			
Clause 1.3	Air Certificate: 23/4/2/1308. Safol SLA with Water works (Sasol Secunda Site Water Licence: 16/2/7/C121/B028/1) Evidence of Compliance: Secunda Environmental Legal Compliance Audit Report by Marsh 13 May 2009. All Applicable Documents available on Intranet.	Compliant.	ISO 14001 4.3.2 Legal Requirement Responsible Care
Clause 1.4	Relevant Legal Documentation available on Intranet. Communication to this department is done via Synfuels Environmental department.	Compliant	No Requirement
Clause 1.6	Electronic copy available on intranet for all employees. Hard copy available from SHERQ Department. The authorisation formed part of induction training during the construction period.	Compliant	BD&I Requirement

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	The training of staff, contractors and sub-contractors was managed via the Principal contractor induction training program. The training program was approved by Sasol Technology Environmental department.		
Clause 1.7	Scoping report not available at the time of the audit no objective evidence was available ensuring compliance to the requirement available from Sasol Technology.	Compliant.	No Requirement
Clause 1.8	Public participation was a requirement before obtaining authorisation.	Compliant.	BD&I Requirement Responsible Care
2. Establishment of the development			
Clause 2.1	Construction started after receiving a positive authorisation. Date of Authorisation 29-03-2000.	Compliant	BD&I Requirement
3. Construction and operation			
Clause 3.2	According to management, the following plant modifications were some of those performed since the plant was constructed: ▪ 1100: Constructed two new tanks ▪ 1200: DM 1202 vent enlarged ▪ 1300: Installed FT1302 No notification of such was made to MDACE of such.	Non-compliant	No Requirement
6. Risk Assessment			
Clause 6.2	This was a requirement before obtaining authorisation. This is managed via Sasol Technology Environmental Department	Compliant	BD&I Requirement

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7. Air Pollution			
Clause 7.1	In full compliance with existing/valid APPA air certificates 1308/8, 1309/8 and 1308/11 Evidence of Compliance: Secunda Environmental Legal Compliance Audit Report by Marsh 13 May 2009. Secunda IRCA Audit Report 12-15 April 2010 Secunda DQS Audit Report June 7-11-2010	Compliant	ISO 14001 requirement 4.3.2 Legal Requirement 4.5.1 Monitoring and Measurement Responsible Care
8. Monitoring			
Clause 8.1	Ground water monitoring is conducted by Synfuels Environmental Department, SLA with this Department. Evidence of Compliance: Sasol Synfuels DQS Audit Report 2009.	Compliant.	ISO 14001 requirement 4.5.1 Monitoring and Measurement. Responsible Care
9. Reporting			
Clause 9.1	Records are kept in good order, all documents available on the Intranet or hard copies available from the SHERQ department. Back-up of all these documents is also made.	Compliant	ISO 14001 requirement 4.5.4. Control Records Responsible Care
Clause 9.3	This is managed via Corporate affairs Toll free number 0800 205 0090 or 017 610 0100 Complaints register are kept. No Complaint was received for this installation.	Compliant	ISO 14001 requirement 4.4.3 Communication Responsible Care

Table 5.4: Evaluation of Detergent Alcohol Plant ROD

5.5 Evaluation of Ethyl Acetate ROD

<u>Establishment of the Ethyl Acetate Plant</u>			
<u>Authorisation to Undertake a Listed Activity: Construction and Operation of the Ethyl Acetate Plant (Ref: 14/3/L/A/SAS.E.A, dated 14 January 2000)</u>			
It must be noted that only relevant provisions of the RoD have been reproduced and audited hereunder. Some of the provisions of the RoD relate only to the construction phase of the plant.			
RoD Requirement:	Compliance:	Compliance Status:	ISO and Other Requirements:
1. General Conditions			
Clause 1.4	Electronic copy available on intranet for all employees. Hard copy available from SHERQ Department. The authorisation formed part of induction training during the construction period. The training of staff, contractors and sub-contractors was managed via the Principal contractor induction training program. The training program was approved by Sasol Technology Environmental department.	Compliant.	BD&I Requirement Responsible Care
2.1 Establishment of the Ethyl Acetate			
Clause 2.1	The plant was commissioned at the end of April 2001. Several changes to the plant have been instituted since then; including VL201 bottoms received another line with non-return valve, emergency shutdown nitrogen on RE102, vent lines to VL102, etc. No proof was available	Non-compliant.	No requirement

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	that these were reported to MDACE, prior to implementation, as required.		
Clause 2.2	The Ethyl Acetate plant has been incorporated in the formal business units Integrated management system (ISO 14001; ISO 9001, OHSAS 18001, and Responsible Care). Communication was done via the Synfuels Environmental department. Evidence of Compliance: Secunda IRCA Audit Report 12-15 April 2010 Secunda DQS Audit Report June 7-11-2010	Compliant.	BD&I Requirement Sasol Corporate Requirement
Clause 2.3	Construction started after receiving a positive authorisation. Authorisation Date: 2000.01.14 The plant was commissioned at the end of April 2001.	Compliant.	No Requirement
3. Construction & Operation			
Clause 3.1	Records for flinging protection, earth and bonding test available from the Electrical/ Instrumentation department this form part of the maintenance strategies as identified during the Risk Based Inspections RBI form part of the risk management process. Evidence of Compliance: Integrated Business Management Audit Reprot for Secunda 7Dec 2009	Compliant.	OHSAS 18001 requirement 4.3.1 Hazard Identification, Risk Assessment and Determining Control 4.4.6. Operational control Responsible Care
Clause 3.2	EA plant is included in Solvents' Occupational Exposure Surveys conducted by the Occupational Hygiene Division of Sasol Synfuels, an Approved Inspection Authority (CI 031 OH, dated 19 April 2001)	Compliant.	OHSAS 18001 requirement 4.3.1 Hazard Identification, Risk Assessment and Determining Control 4.3.2 Legal and Other

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			Requirements Responsible Care
Clause 3.3	EA plant is included in Solvents' Occupational Exposure Surveys conducted by the Occupational Hygiene Division of Sasol Synfuels, an Approved Inspection Authority (018-2002-DL, dated 24 Jan 2002)	Compliant.	OHSAS 18001 requirement 4.3.1 Hazard Identification, Risk Assessment and Determining Control 4.3.2 Legal and Other Requirements Responsible Care
Clause 3.4	Ethyl Acetate is incorporated in the Integrated management system (ISO 14001; ISO 9001, OHSAS 18001 and Responsible Care). Third party audits are conducted on the management systems. Evidence of Compliance: Secunda IRCA Audit Report 12-15 April 2010 Secunda DQS Audit Report June 7-11-2010.	Compliant.	BD&I Requirement
Clause 3.5	In full compliance with existing/valid APPA air certificates 1308/8, 1309/8 and 1308/11 Evidence of Compliance: Secunda Environmental Legal Compliance Audit Report by Marsh 13 May 2009. Secunda IRCA Audit Report 12-15 April 2010 Secunda DQS Audit Report June 7-11-2010	Compliant.	ISO 14001 requirement 4.3.2 Legal and Other Requirements Responsible Care
Clause 3.6	The fire water is managed via central distribution point which forms part of the fire water ring system for all Sasol business units. Underground firewater ring system drawings available from Emergency management.	Compliant.	ISO 14001 requirement 4.3.1 Environmental Aspects Responsible Care

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Clause 3.7	A recommendation to improve water management is that the plant develops a water balance. This would also constitute good practice and enable the Solvents EA plant to demonstrate compliance with National Water Act 36 of 1998 requirements around preventing water wastage. Sasol Secunda Site Water Licence: 16/2/7/C121/B028/1 Evidence of Compliance: Secunda Environmental Legal Compliance Audit Report by Marsh 13 May 2009.	Compliant.	ISO 14001 Requirement 4.3.1 Environmental Aspects Responsible Care
Clause 3.9	Cu-Cr(VI) and C-Ru catalysts are being used on site, and are disposed of every two years and six years respectively. A waste classification study has not been performed on these waste streams. Disposal occurs to Holfontein H:H site. No ECA S20 (6) permits were available during the audit for the local recyclers who are recovering Cu. Documentation relating to Basel Convention to export back to supplier in Italy was also not available. Waste Register EA (14.04.08) Sasol Secunda Site Waste Licence: 12/9/11/L1/6. Evidence of Compliance: Secunda Waste Audit by Marsh.	Non-compliant.	ISO 14001 Requirement 4.3.7 Environmental Aspects 4.3.2 Legal and Other Requirements Responsible Care
Clause 3.11	Emergency Procedure – Ethyl Acetate May 2006.	Compliant.	BD&I Requirement ISO 14001 Requirement 4.4.7 Emergency Preparedness and Response Responsible Care
Clause 3.12	The approval of the final design criteria was not available at the time of	Non-	No requirement

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	the audit.	compliant.	
Clause 3.13	No information in this regard was available at the time of the audit.	Non-compliant.	No requirement
Clause 3.14	An Environmental Risk Assessment has been performed. The Risk Assessment, as available on the intranet at the time of the audit.	Compliant.	ISO 14001 requirement 4.3.1 Environmental Aspects Responsible Care
Clause 3.15	Refer to APPA permit Section 4: Air Pollution Evidence of Compliance: Secunda Environmental Legal Compliance Audit Report by Marsh 13 May 2009. Secunda IRCA Audit Report 12-15 April 2010 Secunda DQS Audit Report June 7-11-2010	Compliant.	ISO 14001 requirement 4.3.2 Legal and Other Requirements Responsible Care
Clause 3.16	No information in this regard was available at the time of the audit.	Non-compliant.	No requirement
Clause 3.17	Refer to the water management strategy at Synfuels Environmental department.	Compliant	ISO 14001 requirement 4.3.1 Environmental Aspects Responsible Care
4. Air Pollution			
Clause 4	In full compliance with existing/valid APPA air certificates 1308/8, 1309/8 and 1308/11 Evidence of Compliance: Secunda Environmental Legal Compliance Audit Report by Marsh 13	Compliant.	ISO 14001 requirement 4.3.2 Legal and Other Requirements

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	May 2009. Secunda IRCA Audit Report 12-15 April 2010 Secunda DQS Audit Report June 7-11-2010		Responsible Care
5. Risk Management			
Clause 5	General and plant specific induction and risk assessment training is provided to all staff, but only induction and generic safety training is provided for contractors. In addition, plant specific Emergency Plans are included in the SHE files which are issued to all contractors. Health and Safety Legal Audit /Report Secunda by Marsh 15 October 2009.	Compliant.	ISO 14001 requirement 4.3.1 Environmental Aspects 4.4.2 Competence, Training and Awareness OHSAS 18001 requirement 4.3.1 Hazard Identification Risk Assessment and Determining Controls Responsible Care
6. Inspection and Monitoring			
Clause 6	Monthly inspections are carried out for the plant, which, include items of waste management, gas cylinders and pressure vessels, flammable liquid store, water management etc. Other monitoring being performed on a regular basis includes: continuous on-line gas detection at ground level, alarm set points on the PLC, ad-hoc mass balances, etc. Also Audit form General Manager and SHERQ SA Manager. Scheduled morning walks by management.	Compliant	ISO 14001 Requirement 4.4.6 Operational Control 4.5. 1 Monitoring and Measurement Responsible Care
8. Environmental Auditing			
Clause 8.1	This is done by Synfuels Environmental Department, communication is	Compliant.	ISO 14001 Requirement

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	done via Synfuels Environmental department.		BD&I Requirement Responsible Care
Clause 8.2	Monthly internal audits are conducted. The RoD's are verified by external parties. Secunda IRCA Audit Report 12-15 April 2010 Secunda DQS Audit Report June 7-11-2010 Communications is done via Synfuels Environmental department.	Compliant.	ISO 14001 Requirement 4.5.5 Internal Audits 4.6 Management Review Responsible Care
9. Reporting			
Clause 9.1	MDACE has not been notified of any non-compliance with the conditions, as identified herein.	Non-compliant.	No requirement
Clause 9.2	Records are kept in good order, all documents available on the electronically Intranet or hard copies available from the SHERQ department. Back-up of all these documents is also made.	Compliant	ISO 14001 requirement 4.5.4. Control Records
Clause 9.4	This is manage via Corporate affairs. Toll free number 0800 205 0090 or 017 610 0100 Complaints register are kept. No Complaint was received for this installation.	Compliant	ISO 14001 requirement 4.4.3 Communication Responsible Care

Table 5.5: Evaluation of Ethyl Acetate Plant ROD

5.6 Evaluation of Ethylol 99 (High Purity Ethanol plant) ROD

<u>Establishment of the Ethylol 99 Plant</u>			
<u>Authorisation to Undertake a Listed Activity: Construction and Operation of the Ethylol 99 Plant (Ref: 14/3/L/A/SAS.E.A, dated 14 January 2000)</u>			
It must be noted that only relevant provisions of the RoD have been reproduced and audited hereunder. Some of the provisions of the RoD relate only to the construction phase of the plant.			
RoD Requirement:	Compliance:	Compliance Status:	ISO and Other Requirements:
1. General Conditions			
Clause 1.4	Electronic copy available on intranet for all employees. Hard copy available from SHERQ Department. The authorisation formed part of induction training during the construction period. The training of staff, contractors and sub-contractors was managed via the Principal contractor induction training program. The training program was approved by Sasol Technology Environmental department.	Compliant	BD&I Requirement Responsible Care
2.1 Establishment of the Ethylol 99			
Clause 2.1	The conversion of the plant was communicated to the Department refer to the Ethylol 99 RoD Reference 14/3/11/FAF.HPE Dated 3 August 1999.	Compliant	No Requirement
Clause 2.2	High Purity Ethanol Plant is incorporated in the Integrated management system (ISO 14001; ISO 9001, OHSAS 18001 and	Compliant.	BD&I Requirement Sasol Corporate

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	Responsible Care). Third party audits are conducted on the management systems. Evidence of Compliance: Secunda IRCA Audit Report 12-15 April 2010. Secunda DQS Audit Report June 7-11-2010.		Requirement
3. Construction & Operation			
Clause 3.1	Records for lighting protection, Earth and Bonding Tests are available from the Electrical/ Instrumentation department this form part of the maintenance strategies as identified during the risk based inspections (RBI). RBI form part of the risk management process. Fire detection systems are implemented in all operational buildings, Substations, Cabinet rooms, Flammable and chemical stores. Records of inspections are available from Emergency services. Evidence of Compliance: Secunda MHI Revalidation Report Feb 2010.	Compliant.	OHSAS 18001 requirement 4.3.1 Hazard Identification, Risk Assessment and Determining Control 4.4.6. Operational control Responsible Care
Clause 3.2	All employees were incorporated in the existing Hearing Conservation Programme. This facility is included in Solvents' Occupational Exposure Surveys conducted by the Occupational Hygiene Division of Sasol Synfuels, an Approved Inspection Authority (018-2002-DL, dated 24 Jan 2002).	Compliant.	OHSAS 18001 requirement 4.3.1 Hazard Identification, Risk Assessment and Determining Control 4.4.6. Operational control 4.5.1 Monitoring and

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	Evidence of Compliance: Health and Safety Legal Audit /Report Secunda by Marsh 15 October 2009.		Measurement Responsible Care
Clause 3.3	Illumination test were conducted prior to plant handover, recommendations made were implemented. Daily, weekly and monthly inspections (Supervisor Logbook) and exist to ensure that the adherence with salutatory requirements of Environmental Regulations for Workplaces in terms of the Occupational Health and Safety Act, 1993 (Act 85 of 1993). Evidenced of Compliance: Illumination Survey and SHERQ Monthly Logbook Audits.	Compliant.	OHSAS 18001 requirement 4.3.1 Hazard Identification, Risk Assessment and Determining Control 4.4.6. Operational control 4.5.1 Monitoring and Measurement Responsible Care
Clause 3.4	High Purity Ethanol Plant was incorporated into the NOSA 5 system. The NOSA system has been replace with the implementation of OHSAS 18001 to ensure compliance to the Occupational Health and Safety Act, 1993 (Act 85 of 1993). Evidenced of Compliance: Secunda IRCA Audit Report 12-15 April 2010. Secunda DQS Audit Report June 7-11-2010.	Compliant.	OHSAS 18001 requirement 4.3.3 Legal and Other Requirements Responsible Care
Clause 3.5	Operational controls have been implemented to ensure the design capacity of 85000t/pa is not been exceeded.	Compliant.	ISO 14001 and OHSAS 18001 requirement 4.4.6 Operational control Responsible Care
Clause 3.6	High Purity Ethanol Plant is connected to the Sasol Secunda	Compliant.	Sasol Secunda complex and

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	complex cooling water supply system. Firewater is only used for plant emergencies.		Sasol Design requirements
Clause 3.7	High Purity Ethanol Plant is connected to the Sasol Secunda complex cooling water supply system. No potable water are be utilised for plant operation.	Compliant.	Sasol Secunda complex and Sasol Design requirements
Clause 3.9	A waste classification study has not been performed on all waste streams. Disposal occurs to Holfontein H:H site. No ECA S20(6) permits were available during the audit. Refer to the Solvents West Waste Register Sasol Secunda Site Waste Licence: 12/9/11/L1/6. Evidence of Compliance: Secunda Waste Audit by Marsh.	Non-compliant.	ISO 14001 Requirement 4.3.1 Environmental Aspects 4.3.2 Legal and Other Requirements Responsible Care
Clause 3.10	Only service provider who has been audited is authorized to transport pRoDuct. Root Risk assessments available for products which are transported via road.	Compliant	ISO 14001 requirement 4.3.1 Environmental Aspects 4.4.2 Competence, Training and Awareness OHSAS 18001 requirement 4.3.1 Hazard Identification Risk Assessment and Determining Controls Responsible Care

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4. Air Pollution			
Clause 4	In full compliance with existing/valid APPA air certificates 1308/8, 1309/8 and 1308/11 Evidence of Compliance: Secunda Environmental Legal Compliance Audit Report by Marsh 13 May 2009. Secunda IRCA Audit Report 12-15 April 2010. Secunda DQS Audit Report June 7-11-2010	Compliant.	ISO 14001 requirement 4.3.2 Legal and Other Requirements Responsible Care
5. Risk Management			
Clause 5	General and plant specific induction and risk assessment training is provided to all staff (available on Know How), but only induction and generic safety training is provided for contractors (Available from Training Department). In addition, High Purity Ethanol Plant specific Emergency Plans are included in the SHE files which are issued to all contractors.	Compliant.	ISO 14001 requirement 4.3.1 Environmental Aspects 4.4.2 Competence, Training and Awareness OHSAS 18001 requirement 4.3.1 Hazard Identification Risk Assessment and Determining Controls Responsible Care
6. Inspection and Monitoring			
Clause 6	Daily, weekly and monthly inspections are carried out for the High Purity Ethanol Plant in the Supervisors Logbook, which, include items of waste management, gas cylinders and pressure vessels, flammable liquid store, water management etc. Other	Compliant	ISO 14001 Requirement 4.4.6 Operational Control 4.5.1 Monitoring and Measurement

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	monitoring being performed on a regular basis includes: continuous on-line gas detection at ground level, alarm set points on the PLC, ad-hoc mass balances, etc. Also Audit form General Manager and SHERQ SA Manager. Scheduled morning walks by management. SHERQ Department Logbook Audits.		Responsible Care
7. Decommissioning			
Clause 6	No Plans exist to decommission the High Purity Ethanol Plant. The requirement for decommissioning forms part of the six monthly SOX 404 Environmental Control test.	Compliant	SOX 404 Requirements Environmental Control
8. Environmental Auditing			
Clause 8.1	This is done by Synfuels Environmental Department; communication is done via Synfuels Environmental department. Evidence of Compliance: Secunda Environmental Legal Compliance Audit Report by Marsh 13 May 2009.	Compliant.	ISO 14001 Requirement BD&I Requirement Responsible Care
Clause 8.2	Monthly internal audits are conducted. The RoD's are verified by external parties. Communications is done via Synfuels Environmental department.	Compliant.	ISO 14001 Requirement 4.5.5 Internal Audits 4.6 Management Review Responsible Care
9. Reporting			
Clause 9.1	The Department has not been notified of any non-compliance with the conditions, as identified herein.	Non-compliant.	No requirement

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Clause 9.2	Records are kept in good order, all documents available on the electronically Intranet or hard copies available from the SHERQ department. Back-up of all these documents is also made.	Compliant	ISO 14001 requirement 4.5.4. Control Records Responsible Care
Clause 9.4	This is manage via Corporate affairs This is manage via Corporate affairs Toll free number 0800 205 0090 or 017 610 0100 Complaints register are kept. No Complaint was received for this installation.	Compliant	ISO 14001 requirement 4.4.3 Communication Responsible Care

Table 5.6: Evaluation of Ethylol 99 Plant ROD

5.7 Evaluation of 1-Hexene Train 3 ROD

<u>Establishment of 1-Hexene Train 3 Plant</u>			
Authorisation to Undertake a Listed Activity: Installation of the of the Third1-Hexene Plant (Ref 14.3(EV)) dated 13 August 1999			
It must be noted that only relevant provisions of the RoD have been reproduced and audited hereunder. Some of the provisions of the RoD relate only to the construction phase of the plant.			
Requirement:	Compliance:	Compliance Status:	ISO and Other Requirements:
1. General Conditions			
Clause 1.3:	Hexene SLA with Water works Air Certificate: 23/4/2/1308 Sasol Secunda Site Water Licence: 16/2/7/C121/B028/1 Evidence of Compliance: Secunda Environmental Legal Compliance Audit Report by Marsh 13 May 2009.	Compliant.	ISO 14001 Requirement BD&I Requirement Responsible Care
Clause 1.4:	This is done by Synfuels Environmental Department; communication is done via Synfuels Environmental department. Evidence of Compliance: Secunda Environmental Legal Compliance Audit Report by Marsh 13 May 2009.	Compliant.	ISO 14001 Requirement BD&I Requirement Responsible Care
Clause 1.6:	Electronic copy available on Sasol Solvents intranet, Operations Secunda, Production, Hexene iii, Record of decision.	Non-compliant.	No Requirement

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	Hard copy available from SHERQ Department. However the content of this Authorisation is not included in Induction training for contractors.		
Clause 1.8:	Included in scoping report. Sasol chemical industries 99-0086.03 done by Poltech (Pty) Ltd.	Compliant.	BD&I Requirement
2. Establishment of the development			
Clause 2.1	Authorisation date: 1999.08.13 Commissioning Date: 2000.	Compliant.	No Requirement
3. Construction and Operation			
Clause 3.2:	According to management, there have been no modifications to the plant from construction to present. However, refer to discussion at 7.2 below.	Non-compliant.	No Requirement
Clause 3.3:	An audit of the monitoring of pressures on the rail cars was conducted with the following findings: • No procedure or records were available for the “Spoornet repairs” referred to in the Scoping Report. No records of the pressure monitoring at Richards Bay were available. Solvents were therefore unable to determine which tankers was requiring maintenance to be performed. Result: Lack of information to determine compliance. • Effective controls were in place (N2 purging and monitoring of car pressure) to control the loading pressure	Non-compliant.	No Requirement

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	and releases to flare.		
Clause 3.4:	Solvents have not notified MDACE with respect to non-compliance with any of the conditions contained in the Authorisation.	Non-compliant.	No Requirement
4. Water Pollution			
Clause 4.1:	Bundwall Control Philosophy as publish Solvents intranet, production, Hexene, Procedure. Evidence of compliance: SHERQ Monthly SHERQ Logbook audit.	Compliant.	ISO 14001 Requirement 4.4.6 Operational Control 4.5.1 Monitoring and Measurement Responsible Care
Clause 4.2:	Sample analysis available.	Compliant.	ISO 14001 Requirement 4.4.6 Operational Control 4.5.1 Monitoring and Measurement Responsible Care
Clause 4.3:	TeePol no longer in use. Was only used during start-up Currently Using.	Non-Compliant	No Requirement
Clause 4.4:	Bundwall Control Philosophy implemented as publish Solvents intranet, production, Hexene, Procedure Evidence of compliance: SHERQ Monthly SHERQ Logbook audit.	Compliant.	ISO 14001 Requirement 4.4.6 Operational Control 4.5.1 Monitoring and Measurement Responsible Care

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5. Waste			
Clause 5.1:	Waste Register Hexene (25(1).2.2009) Sasol Secunda Site Waste Licence: 12/9/11/L1/6. Evidence of Compliance: Secunda Waste Audit by Marsh However no ECA S20 (6) permits were available during the audit for the local recyclers who are recovering catalyst. Documentation relating to Basel Convention to export back to supplier in Italy was also not available.	Non-Compliant	ISO 14001 requirement 4.3.2 Legal and Other Requirements Responsible Care
Clause 5.2 :	Waste generated during construction: Refer to Sastech Environmental Aspect register and environmental plan. Waste generated during operational Phase: Waste Register Hexene (25(1).2.2009) Sasol Secunda Site Waste Licence: 12/9/11/L1/6. Evidence of Compliance: Secunda Waste Audit by Marsh.	Compliant	ISO 14001 requirement 4.3.2 Legal and Other Requirements Responsible Care
6. Air Pollution			
Clause 6.1	Air Certificate: 23/4/2/1308 Evidence of Compliance: Secunda Environmental Legal Compliance Audit Report by Marsh 13 May 2009. Secunda IRCA Audit Report 12-15 April 2010 Secunda DQS Audit Report June 7-11-2010	Compliant.	ISO 14001 requirement 4.3.2 Legal and Other Requirements Responsible Care
7. Risk Management			
Clause 7.2:	7.2: A register of Issues raised by I&AP's during the EIA was	Non-	SO 14001 requirement 4.3.1 Environmental Aspects

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	provided (Poltech, 1999). The following comments pertain to the corresponding sections of this Issues Register: 2.5. Fugitive emissions: "Special procedure" was not available. Result: Non-compliance. 2.6. Fire water: RSAMU water is not being used, which therefore constitutes a change to the planned arrangements as per this section of the scoping report. As MDACE department was not notified of this change, there exists a finding under clause 3.2 of the RoD. The finding is also against the contradictory statements within the Scoping Document where the RSAMU water was (1) meant to be investigated as an option, and (2) was definitely to be used as cooling water. Result: Non-compliance • Selexsorb is dumped at Charlie 1 as a waste stream into a landfill at Charlie 1. Selexorb operates as an absorbent oxygenates and carbonyls. It could not be determined if SSF is authorised to receive these waste streams. Result: Insufficient information to determine compliance. 5.6.2. RSAMU (Synfuels raw water) is not being used currently. Both RSAMU and API were experimented with and the RSAMU resulted in blockages due to oil-	compliant.	4.4.2 Competence, Training and Awareness OHSAS 18001 requirement 4.3.1 Hazard Identification Risk Assessment and Determining Controls Responsible Care
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	based product in the water resulting in fouling of the tube sheets. According to management, firewater is being used for pressure testing during shutdowns. The last shutdown was in March 2008. This water is eventually drained into the OWS and not to the clean water sewer as stated in the Scoping Report. Result: Non-compliance. It is recommended that MDACE be notified of the changes from the Scoping Document as the changes in water use on-site are beneficial to the environment.		
8. Monitoring			
Clause 8.1	This is managed via Monthly water balance, this figure is also reported into the Sustainable Development Report Sasol Secunda Site Water Licence: 16/2/7/C121/B028/1 Bundwall Control Philosophy as publish Solvents intranet, production, Hexene, Procedure. Evidence of compliance: SHERQ Monthly SHERQ Logbook audit	Compliant.	ISO 14001 Requirement 4.4.6 Operational Control 4.5.1 Monitoring and Measurement Responsible Care
9. Reporting			
Clause 9.3:	Sasol used to sponsor a Highveld Community Awareness Forum (HCAF) until approx. 2003, when it was ceased due to “lack of interest from the community” (according to management). A procedure, SGR-SHE-00022 entitled “Handling SH&E related complaints from stakeholders” now	Non-compliances for failing to report complaints to	No Requirement

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	governs the process of managing external complaints. This procedure is silent on the EIA RoD requirement to “forward copies of [any] complaint to [the MDACE] Department within 24 hours”. Furthermore, a mock complaint was registered by MES with Corporate Affairs during the audit (under the supervision of Solvents management), with the feedback to MES being provided only on 16/5/08 (Mrs M Haveman from Sasol Communications) – 5 weeks after the complaint was registered.	the Department, and failing to “thoroughly investigate” all incidents “to the satisfaction of all parties concerned”.	
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Table 5.7: Evaluation of 1-Hexene Train 3 Plant ROD

5.8 Evaluation of 1-Octene Train 1 ROD

<u>Establishment of 1-Octene Plant</u>			
<u>Authorisation to Undertake a Listed Activity: Construction and Operation of the 1-Octene Plant (Ref 14.25(EV).1A(W)) dated 9 February 2000</u>			
It must be noted that only relevant provisions of the RoD have been reproduced and audited hereunder. Some of the provisions of the RoD relate only to the construction phase of the plant.			
RoD Requirement:	Compliance:	Compliance Status:	ISO and Other Requirements:
1. General conditions			
Clause 1.4	Electronic copy available on intranet for all employees. Hard copy available from SHERQ Department. The authorisation formed part of induction training during the construction period. The training of staff, contractors and sub-contractors was managed via the Principal contractor induction training program. The training program was approved by Sasol Technology Environmental department.	Compliant.	BD&I Requirement Responsible Care
2. Establishment of the Octene Plant			
Clause 2.1	Construction started after receiving a positive authorisation. Date of Authorisation 29-03-2000.	Compliant	BD&I Requirement
Clause 2.2	At the time of the Audit no proof where available, however various MOC's exists for this facility.	Non-Compliant	No Requirement

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Clause 2.3	1-Octene Plant is incorporated in the Integrated management system (ISO 14001; ISO 9001, OHSAS 18001 and Responsible Care). Third party audits are conducted on the management systems. Evidence of Compliance: Secunda IRCA Audit Report 12-15 April 2010 Secunda DQS Audit Report June 7-11-2010	Compliant.	BD&I Requirement Sasol corporate Requirement
3. Construction and Operation			
Clause 3.5	Records for lighting protection, Earth and Bonding Tests are available from the Electrical/ Instrumentation department this form part of the maintenance strategies as identified during the risk based inspections (RBI). RBI form part of the risk management process. Evidence of Compliance: Secunda MHI Revalidation Report Feb 2010	Compliant.	OHSAS 18001 requirement 4.3.1 Hazard Identification, Risk Assessment and Determining Control 4.4.6. Operational control Responsible Care
Clause 3.6	1-Octene Plant is included in Solvents' Occupational Exposure Surveys conducted by the Occupational Hygiene Division of Sasol Synfuels, an Approved Inspection Authority (CI 031 OH).	Compliant.	OHSAS 18001 requirement 4.3.1 Hazard Identification, Risk Assessment and Determining Control 4.3.2 Legal and Other Requirements Responsible Care
Clause 3.7	1-Octene Plant is included in Solvents' Occupational Exposure Surveys conducted by the Occupational Hygiene Division of Sasol Synfuels, an Approved Inspection Authority (018-2002-DL).	Compliant.	OHSAS 18001 requirement 4.3.1 Hazard Identification, Risk Assessment and Determining Control

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			4.3.2 Legal and Other Requirements Responsible Care
Clause 3.8	EIA not available at the time of the audit, all EIA are kept on a register at the Synfuels Environmental department.	Non-Compliant	No Requirement
Clause 3.10	EIA not available at the time of the audit, all EIA are kept on a register at the Synfuels Environmental department.	Non-Compliant	No Requirement
4. Air Pollution			
Clause 4.1	In full compliance with existing/valid APPA air certificates1308/8, 1309/8 and 1308/11 Evidence of Compliance: Secunda Environmental Legal Compliance Audit Report by Marsh 13 May 2009. Secunda IRCA Audit Report 12-15 April 2010. Secunda DQS Audit Report June 7-11-2010.	Compliant.	ISO 14001 requirement 4.3.2 Legal and Other Requirements Responsible Care
Clause 4.2	In full compliance with existing/valid APPA air certificates1308/8, 1309/8 and 1308/11 Evidence of Compliance: Secunda Environmental Legal Compliance Audit Report by Marsh 13 May 2009. Secunda IRCA Audit Report 12-15 April 2010. Secunda DQS Audit Report June 7-11-2010.	Compliant.	ISO 14001 requirement 4.3.2 Legal and Other Requirements Responsible Care

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Clause 4.3	In full compliance with existing/valid APPA air certificates1308/8, 1309/8 and 1308/11 Evidence of Compliance: Secunda Environmental Legal Compliance Audit Report by Marsh 13 May 2009. Secunda IRCA Audit Report 12-15 April 2010. Secunda DQS Audit Report June 7-11-2010	Compliant.	ISO 14001 requirement 4.3.2 Legal and Other Requirements Responsible Care
Clause 4.4	In full compliance with existing/valid APPA air certificates1308/8, Secunda Environmental Legal Compliance Audit Report by Marsh 13 May 2009. Secunda IRCA Audit Report 12-15 April 2010 Secunda DQS Audit Report June 7-11-2010	Compliant.	ISO 14001 requirement 4.3.2 Legal and Other Requirements Responsible Care
5. Water Pollution			
Clause 5.1	All water used during hydro testing is released into the oily water system to recycled and then re-used in the Synfuels close loop water system. Evidence of Compliance: Sasol Synfuels DQS Audit Report.	Compliant	ISO 14001 requirement 4.3.1 Environmental Aspects 4.4.6 Operational Control Responsible Care
Clause 5.2	The water used during flushing was released into the Oily water sewer. All water inside the bunded areas was tested to ensure compliance with the service level agreement between the plant and the Water department. Refer to "Bund Wall Control Philosophy for Octene Train 1 and 2 as publish Solvents intranet. Evidence of compliance: SHERQ Monthly SHERQ Logbook audit. Sasol Secunda Site Water Licence:	Compliant	ISO 14001 requirement 4.3.1 Environmental Aspects 4.4.6 Operational Control Responsible Care

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	16/2/7/C121/B028/1 Secunda Environmental Legal Compliance Audit Report by Marsh 13 May 2009.		
Clause 5.3	Design Philosophy of all bunded areas.	Compliant	BD&I requirements ISO 14001 requirement 4.3.1 Environmental Aspects 4.4.6 Operational Control Responsible Care
Clause 5.4	Plant design caters for storm water systems, all storm water systems are outside bunded areas therefore no testing of storm water takes place prior to discharge. Refer to "Bund Wall Control Philosophy for Octene Train 1 and 2 as publish Solvents intranet. Evidence of compliance: SHERQ Monthly SHERQ Logbook audit. Sasol Secunda Site Water Licence: 16/2/7/C121/B028/1 Secunda Environmental Legal Compliance Audit Report by Marsh 13 May 2009.	Compliant	ISO 14001 requirement 4.3.1 Environmental Aspects 4.4.6 Operational Control Responsible Care
Clause 5.5	The requirement has been incorporated into Bundwall Control Philosophy as publish Solvents intranet, production, Octene, Procedure. Evidence of compliance: SHERQ Monthly SHERQ Logbook audit. Sasol Secunda Site Water Licence: 16/2/7/C121/B028/1 Secunda Environmental Legal Compliance Audit Report by Marsh 13	Compliant	ISO 14001 requirement 4.3.1 Environmental Aspects 4.4.6 Operational Control Responsible Care

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	May 2009.		
Clause 5.6	The requirement has not been incorporated into Bundwall Control Philosophy.	Non-Compliant	No Requirement
Clause 5.7	No proof available at the time of the audit.	Non-Compliant	No Requirement
Clause 5.8	Refer to the water management strategy at Synfuels Environmental department.	Compliant	No Requirement
6. Waste			
Clause 6.1	Waste register. Waste manifest are kept Sasol Secunda Site Waste Licence: 12/9/11/L1/6. Evidence of Compliance: Secunda Waste Audit by Marsh.	Compliant.	ISO 14001 Requirement 4.3.8 Environmental Aspects 4.3.2 Legal and Other Requirements 4.5.4 Control of Records Responsible Care
Clause 6.2	A formal Waste Management Programme has been developed, including waste minimisation, separation and recycling initiatives. Refer to Secunda Site Waste Minimisation plan.	Compliant	ISO 14001 Requirement 4.3.1 Environmental Aspects 4.3.2 Legal and Other Requirements Responsible Care
Clause 6.3	Empty containers are returned to suppliers. Contracts with chemical suppliers were not available for review.	Compliant	No Requirement

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Clause 6.4	This is part of the plant design.	Compliant	BD&I Requirement
Clause 6.5	The requirement has been incorporated into "Bund Wall Control Philosophy for Octene Train 1 and 2 as publish Solvents intranet. Evidence of compliance: SHERQ Monthly SHERQ Logbook audit. Sasol Secunda Site Water Licence: 16/2/7/C121/B028/1 Secunda Environmental Legal Compliance Audit Report by Marsh 13 May 2009.	Compliant	ISO 14001 Requirements 4.3.1 Hazard Identification, Risk Assessment and Determining Control Responsible Care
Clause 6.6	Contract not available at the time of the audit.	No-compliant	No Requirement
7. Risk Management			
Clause 7.1	General and plant specific induction and risk assessment training is provided to all staff (Know How), but only induction and generic risk based safety training is provided for contractors. In addition, plant specific Emergency Plans are included in the SHE files which are issued to all contractors.	Compliant.	SO 14001 requirement 4.3.1 Environmental Aspects 4.4.2 Competence, Training and Awareness OHSAS 18001 requirement 4.3.1 Hazard Identification Risk Assessment and Determining Controls Responsible Care
8. Monitoring			
Clause 8.1	Water sample points are installed on all water outlets of the plants. However no proof could be obtained that the details was agreed to with	Non-compliant	ISO 14001 requirement Responsible Care

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	the Department of Water Affairs and Forestry requirements.		
Clause 8.2	Solvents Measuring and Monitoring Procedure Water records available from the Synfuels environmental department Levigo air reports.	Compliant	ISO 14001 requirement 4.5.1 Monitoring and Measurement Responsible Care
9. Reporting			
Clause 9.1	MDACE has not been notified of any non-compliance with the conditions, as identified herein. All pollution incidents are reported via Synfuels Environmental Department to DEAT.	Non-compliant.	No Requirement
Clause 9.2	Records are kept in good order, all documents available on the electronically Intranet or hard copies available from the SHERQ department.	Compliant	ISO 14001 requirement 4.5.4. Control Records Responsible Care
Clause 9.4	This is manage via Corporate affairs Toll free number 0800 205 0090 or 017 610 0100 Complaints register are kept. No Complaint was received for this installation.	Compliant	ISO 14001 requirement 4.4.3 Communication Responsible Care

Table 5.8: Evaluation of 1-Octene Train 1 Plant ROD

5.9 Evaluation of 1-Octene Train 2 ROD

<u>Establishment of 1-Octene Train 2 Plant</u>			
<u>Authorisation to Undertake a Listed Activity: Construction and Operation of the 1-Octene Plant (Ref 164.28.L2) dated 14 July 2000</u>			
It must be noted that only relevant provisions of the RoD have been reproduced and audited hereunder. Some of the provisions of the RoD relate only to the construction phase of the plant.			
RoD Requirement:	Compliance:	Compliance status:	ISO and Other Requirement:
1. General Conditions			
Clause 1.6	Electronic copy available on intranet for all employees. Hard copy available from SHERQ Department. The authorisation formed part of induction training during the construction period. The training of staff, contractors and sub-contractors was managed via the Principal contractor induction training program. The training program was approved by Sasol Technology Environmental department.	Compliant.	BD&I Requirement
Clause 1.7	The scoping report not available at the time of the audit, all scoping reports are kept on a register at the Synfuels Environmental department.	Compliant.	ISO 14001 requirement 4.3.2 Legal and Other Requirements Responsible Care
Clause 1.8	Public participation was a requirement before obtaining authorisation.	Compliant.	BD&I Requirement Responsible Care

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RoD Requirement:	Compliance:	Compliance status:	ISO and Other Requirement:
2. Establishment of the development			
Clause 2.1	Construction started after receiving a positive authorisation. Date of Authorisation 2000.09.15.	Compliant	BD&I Requirement
3. Construction and Operation			
Clause 3.2	At the time of the Audit no proof where available, however various MOC's exists for this facility.	Non-Compliant	No Requirement
8. Monitoring			
Clause 8.1	Ground water monitoring is conducted by Synfuels Environmental Dept. Evidence of Compliance: Sasol Synfuels DQS Audit Report.	Compliant.	ISO 14001 requirement 4.5.1 Monitoring and Measurement Responsible Care
9. Reporting			
Clause 9.1	Records are kept in good order, all documents available on the Intranet or hard copies available from the SHERQ department.	Compliant	ISO 14001 requirement 4.5.4. Control Records Responsible Care
Clause 9.3	This is manage via Corporate affairs. Toll free number 0800 205 0090 or 017 610 0100 Complaints register is kept. No Complaint was received for this installation.	Compliant	ISO 14001 requirement 4.4.3 Communication Responsible Care

Table 5.9: Evaluation of 1-Octene Train 2 Plant ROD

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5.10 Evaluation of Octene Train 3 Plant RoD

<u>Establishment of 1-Octene Train 3 Plant</u>			
<u>Authorisation to Undertake a Listed Activity: Construction and Operation of the 1-Octene Plant 3 (Ref 164.28.L2) dated 14 July 2007</u>			
It must be noted that only relevant provisions of the RoD have been reproduced and audited hereunder. Some of the provisions of the RoD relate only to the construction phase of the plant.			
RoD Requirement	Compliance:	Compliance status:	ISO and Other Requirement:
1. General Conditions			
Clause 1.3	Octene Train 3 SLA with Water works. Air Certificate: Temporary approval Documents available on Intranet.	Compliant.	ISO 14001 4.3.2 Legal and Other Requirement Responsible Care
Clause 1.5	Electronic copy available on intranet for all employees. Hard copy available from SHERQ Department. The authorisation formed part of induction training during the construction period. The authorisation formed part of induction training during the construction period. The training of staff, contractors and sub-contractors was managed via the Principal contractor induction training program. The training program was approved by Sasol Technology	Compliant	BD&I Requirement

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	Environmental department.		
2. Establishment of the development			
Clause 2.1	Construction started after receiving a positive authorisation.	Compliant	BD&I Requirement
3. Construction and Operation			
Clause 3.1	Refer to Synfuels Environmental Dept / DEAT. Application will only be available towards Sept 2009. Air Certificate: Temporary approval In full compliance with existing/valid APPA air certificates1308/8, Secunda Environmental Legal Compliance Audit Report by Marsh 13 May 2009. Secunda IRCA Audit Report 12-15 April 2010 Secunda DQS Audit Report June 7-11-2010	Compliant	ISO 14001 requirement 4.3.2 Legal and other Requirement 4.5.1 Monitoring and Measurement Responsible Care
Clause 3.2	Refer to Synfuels Environmental department – ambient monitoring Evidence of Compliance: Sasol Synfuels DQS Audit Report.	Compliant	ISO 14001 requirement 4.3.2 Legal Requirement 4.5.1 Monitoring and Measurement Responsible Care
Clause 3.3	Refer to Synfuels Environmental department – ambient monitoring Evidence of Compliance: Sasol Synfuels DQS Audit Report.	Compliant	ISO 14001 requirement 4.3.2 Legal and Other Requirement 4.5.1 Monitoring and Measurement Responsible Care

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Clause 3.4	Refer to Health Impact Assessment 23 Nov. 2007 Published on Solvent Intranet. This facility is included in Solvents' Occupational Exposure Surveys conducted by the Occupational Hygiene Division of Sasol Synfuels, an Approved Inspection Authority (018-2002-DL, dated 24 Jan 2002).	Compliant	ISO 14001 requirement 4.3.2 Legal and Other Requirement 4.5.1 Monitoring and Measurement Responsible Care
Clause 3.5	Health Risk Assessment 3 March 2008. This facility is included in Solvents' Occupational Exposure Surveys conducted by the Occupational Hygiene Division of Sasol Synfuels, an Approved Inspection Authority (018-2002-DL, dated 24 Jan 2002).	Compliant	ISO 14001 requirement 4.3.1 Environmental Aspects 4.4.2 Competence, Training and Awareness Responsible Care
Clause 3.6	Waste Register and Waste Management Procedure Sasol Secunda Site Waste Licence: 12/9/11/L1/6. Evidence of Compliance: Secunda Waste Audit by Marsh and SHERQ Monthly Logbook Audits.	Compliant	ISO 14001 requirement 4.3.1 Environmental Aspects 4.3.2 Legal and Other Requirement 4.5.1 Monitoring and Measurement Responsible Care
Clause 3.8	Bund Wall Procedure for Octene TR 3 as publish Solvents intranet. Evidence of compliance: SHERQ Monthly SHERQ Logbook audit. Sasol Secunda Site Water Licence: 16/2/7/C121/B028/1 Secunda Environmental Legal Compliance Audit Report by Marsh 13 May 2009.	Compliant.	ISO 14001 requirement 4.4.6 Operational Control 4.5.1 Monitoring and Measurement Responsible Care

Clause 3.9	Refer to design philosophies e.g. Fire Proofing Philosophy.	Compliant	BD&I Requirement
Clause 3.11	New plant no changes made.	Compliant	No Requirements
4. Air Pollution			
Clause 4.1	Air Certificate: Temporary approval. Evidence of Compliance: Secunda Environmental Legal Compliance Audit Report by Marsh 13 May 2009. Secunda IRCA Audit Report 12-15 April 2010 Secunda DQS Audit Report June 7-11-2010	Compliant	ISO 14001 requirement 4.3.2 Legal and Other Requirement 4.5.1 Monitoring and Measurement Responsible Care
5. Water pollution			
Clause 5.1	Bund Wall Procedure for Octene TR 3 published on Solvents intranet, Evidence of compliance: SHERQ Monthly SHERQ Logbook audit. Sasol Secunda Site Water Licence: 16/2/7/C121/B028/1 Secunda Environmental Legal Compliance Audit Report by Marsh 13 May 2009.	Compliant.	ISO 14001 requirement 4.4.6 Operational Control 4.5.1 Monitoring and Measurement Responsible Care
7. Reporting			
Clause 7.1	Records are kept in good order, all documents available on the electronically Intranet or hard copies available from the SHERQ department. Refer to procedure: Document and Document management.	Compliant	ISO 14001 requirement 4.5.4. Control Records Responsible Care

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	Secunda IRCA Audit Report 12-15 April 2010. Secunda DQS Audit Report June 7-11-2010.		
Clause 7.3	This is manage via Corporate affairs Toll free number 0800 205 0090 or 017 610 0100 Complaints register are kept. No Complaint was received for this installation.	Compliant	ISO 14001 requirement 4.4.3 Communication Responsible Care
Clause 7.4	This is manage via Corporate affairs Toll free number 0800 205 0090 or 017 610 0100 Complaints register are kept. No Complaint was received for this installation.	Compliant	ISO 14001 requirement 4.4.3 Communication Responsible Care

Table 5.10: Evaluation of 1-Octene Train 3 Plant ROD

5.11 Evaluation of AAA Plant RoD

<u>Establishment of the AAA Plant</u>			
<u>Authorisation to Undertake a Listed Activity: Construction and Operation of the AAA Plant (Ref: EMI1/1(c)/00/132, dated 30 January 2002)</u> It must be noted that only relevant provisions of the RoD have been reproduced and audited hereunder. Some of the provisions of the RoD relate only to the construction phase of the plant.			
RoD Requirement:	Compliance:	Compliance Status:	ISO and Other Requirements:
1. General Conditions			
Clause 1.4	Electronic copy available on intranet for all employees. Hard copy available from SHERQ Department. The authorisation formed part of induction training during the construction period. The authorisation formed part of induction training during the construction period. The training of staff, contractors and sub-contractors was managed via the Principal contractor induction training program. The training program was approved by Sasol Technology Environmental department.	Compliant	BD&I Requirement
2.1 Establishment of the AAA plant			
Clause 2.1	At the time of the Audit no proof where available, however various MOC's exists for this facility.	Non-Compliant	No Requirement
Clause 2.2	AAA Plant is incorporated in the Integrated management system (ISO 14001; ISO 9001, OHSAS 18001 and Responsible Care). Third party	Compliant.	BD&I Requirement Sasol Corporate

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	audits are conducted on the management systems. Evidence of Compliance: Sasolburg IRCA Audit Report 15-19 April 2010. Sasolburg DQS Audit Report 15-19 Mar 2010.		Requirement
3. Construction & Operation			
Clause 3.1	Records for lighting protection, Earth and Bonding Tests are available from the Electrical/ Instrumentation department this form part of the maintenance strategies as identified during the risk based inspections (RBI). RBI form part of the risk management process. Fire detection systems are implemented in all operational buildings, Substations, Cabinet rooms, Flammable and chemical stores. Records of inspections are available from Emergency services.	Compliant.	OHSAS 18001 requirement 4.3.1 Hazard Identification, Risk Assessment and Determining Control 4.4.6. Operational control Responsible Care
Clause 3.2	All employees were incorporated in the existing Hearing Conservation Programme. Evidence of Compliance: Sasolburg Environmental Legal Compliance Audit Report by Marsh Dec 2009. Sasolburg IRCA Audit Report 15-19 April 2010. Sasolburg DQS Audit Report 15-19 Mar 2010.	Compliant.	OHSAS 18001 requirement 4.3.1 Hazard Identification, Risk Assessment and Determining Control 4.4.6. Operational control 4.5.1 Monitoring and Measurement Responsible Care
Clause 3.3	Illumination test were conducted prior to plant handover, recommendations made were implemented. Daily, weekly and monthly inspections and exist to ensure that the adherence with salutatory	Compliant.	OHSAS 18001 requirement 4.3.1 Hazard Identification, Risk Assessment and Determining Control

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	requirements of Environmental Regulations for Workplaces in terms of the Occupational Health and Safety Act, 1993 (Act 85 of 1993) Sasolburg IRCA Audit Report 15-19 April 2010. Sasolburg DQS Audit Report 15-19 Mar 2010.		4.4.6. Operational control 4.5.1 Monitoring and Measurement Responsible Care
Clause 3.4	AAA Plant was incorporated into the NOSA 5 system. The NOSA system has been replaced with the implementation of OHSAS 18001 to ensure compliance to the Occupational Health and Safety Act, 1993 (Act 85 of 1993). Evidence of Compliance: Health and Safety Legal Audit Report Sasolburg by Marsh 10 Dec 2008.	Compliant.	OHSAS 18001 requirement 4.3.2 Legal and Other Requirements Responsible Care
Clause 3.5	Operational controls have been implemented to ensure the design capacity of 85000t/pa is not exceeded.	Compliant.	ISO 14001 and OHSAS 18001 requirement 4.4.6 Operational control Responsible Care
Clause 3.6	AAA Plant is connected to the Sasol Midland complex cooling water supply system. Firewater is only used for plant emergencies.	Compliant.	Sasol Design requirements
Clause 3.7	AAA Plant is connected to the Sasol Midland complex cooling water supply system. Firewater is only used for plant emergencies.	Compliant.	Sasol Design requirements
Clause 3.9	A waste classification study has not been performed on all waste streams. Disposal occurs to Holfontein H: H site. No ECA S20 (6) permits were available during the audit. Evidence of Compliance: Sasolburg Environmental Legal Compliance Audit Report by Marsh Dec 2009.	Non-compliant.	ISO 14001 Requirement 4.3.3 Environmental Aspects 4.3.2 Legal and Other Requirements Responsible Care

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	Sasol Solvents Saslburg Waste Audit Report by Marsh.		
Clause 3.10	Only service provider who has been audited is authorized to transport product. Root Risk assessments available for products which are transported via road.	Compliant.	No requirement
4. Air Pollution			
Clause 4	Refer to APPA permit Section 4: In full compliance with Permit 155/16, 155/25, 175/21 and 155/40 Evidence of Compliance: Sasolburg Environmental Legal Compliance Audit Report by Marsh Dec 2009. Sasolburg IRCA Audit Report 15-19 April 2010. Sasolburg DQS Audit Report 15-19 Mar 2010.	Compliant.	ISO 14001 requirement 4.3.2 Legal and Other Requirements Responsible Care
5. Risk Management			
Clause 5	General and plant specific induction and risk assessment training is provided to all staff, but only induction and generic safety training is provided for contractors. In addition, AAA Plant specific Emergency Plans are included in the SHE files which are issued to all contractors. Evidence of Compliance: Integrated Business Management Audit Report for Secunda 7Dec 2009 and Health and Safety Legal Audit Report Sasolburg by Marsh 10 Dec 2008.	Compliant.	ISO 14001 requirement 4.3.1 Environmental Aspects 4.4.2 Competence, Training and Awareness OHSAS 18001 requirement 4.3.1 Hazard Identification Risk Assessment and Determining Controls Responsible Care

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6. Inspection and Monitoring			
Clause 6	Daily, weekly and monthly inspections are carried out for the AAA Plant, which, include items of waste management, gas cylinders and pressure vessels, flammable liquid store, water management etc. Other monitoring being performed on a regular basis includes: continuous on-line gas detection at ground level, alarm set points on the PLC, ad-hoc mass balances, etc. Also Audit form General Manager and SHERQ SA Manager. Scheduled morning walks by management.	Compliant	ISO 14001 Requirement 4.4.6 Operational Control 4.5.1 Monitoring and Measurement Responsible Care
7. Decommissioning			
Clause 6	No Plans exist to decommission the AAA Plant. The requirement for decommissioning forms part of the six monthly SOX 404 test.	Compliant	SOX Requirements Environmental Control
8. Environmental Auditing			
Clause 8.1	This is done via the Landlord: Infrachem's Environmental Department , Sasolburg IRCA Audit Report 15-19 April 2010. Sasolburg DQS Audit Report 15-19 Mar 2010	Compliant.	ISO 14001 Requirement BD&I Requirement Responsible Care
Clause 8.2	Monthly internal audits are conducted. The RoD's are verified by external parties. Communications is done via Infrachem's Environmental Department	Compliant.	ISO 14001 Requirement 4.5.5 Internal Audits 4.6 Management Review Responsible Care

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9. Reporting			
Clause 9.1	The Department has not been notified of any non-compliance with the conditions, as identified herein.	Non-compliant.	No requirement
Clause 9.2	Records are kept in good order, all documents available on the electronically Intranet or hard copies available from the SHERQ department.	Compliant	ISO 14001 requirement 4.5.4. Control Records
Clause 9.4	This is manage via Corporate affairs Toll free number 0800 205 0090 or 017 610 0100 Complaints register are kept. No Complaint was received for this installation.	Compliant	ISO 14001 requirement 4.4.3 Communication Responsible Care

Table 5.11: Evaluation of AAA Plant ROD

5.12 Evaluation of Butanol RoD

<u>Establishment of the Butanol Plant</u>			
<u>Authorisation to Undertake a Listed Activity: Construction and Operation of the Butanol Plant (Ref: EM1/1(c)/00/82 dated 20 April 2001)</u> It must be noted that only relevant provisions of the RoD have been reproduced and audited hereunder. Some of the provisions of the RoD relate only to the construction phase of the plant.			
RoD Requirement:	Compliance:	Compliance Status:	ISO and BD&I Requirements:
Special Conditions			
Air Pollution	Butanol plant form part of the annual LDAR programme this is also reported via the Sustainable Development Report. Refer to APPA permit: In full compliance with Permit 155/16, 155/25, 175/21 and 155/40 Evidence of Compliance: Sasolburg Environmental Legal Compliance Audit Report by Marsh Dec 2009. Sasolburg IRCA Audit Report 15-19 April 2010 Sasolburg DQS Audit Report 15-19 Mar 2010.	Compliant	ISO 14001 requirement 4.3.2 Legal and Other Requirements Responsible Care
Storm water and effluent disposal	Butanol Plant is designed to prevent any contamination/pollution of water and is connected to the Sasol Midland complex cooling water supply system. Firewater is only used for plant emergencies. Sasolburg Environmental Legal Compliance Audit Report by Marsh Dec 2009.	Compliant	ISO 14001 Requirement 4.4.6 Operational Control 4.5.1 Monitoring and Measurement Responsible Care

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Other effluents and solid wastes	All operational areas are in bunded areas Spent catalyst is disposed off at Holfontein H: H site. No ECA S20(6) permits were available during the audit. Guard-beds catalyst is disposed off at Holfontein H: H site. No ECA S20 (6) permits were available during the audit. Any solid content from the horizontal flare knock out drum are disposed off at Holfontein H:H site. No ECA S20 (6) permits were available during the audit.	Compliant	ISO 14001 Requirement 4.4.6 Operational Control 4.5.1 Monitoring and Measurement Responsible Care
Noise Pollution	All noise generation equipment were scoped and procured with fitted silencers, where reasonably practicable.	Compliant	ISO 14001 Requirement 4.4.6 Operational Control 4.5.1 Monitoring and Measurement Responsible Care
Transportation of hazardous	Legal requirements are incorporated into the Transportation contractors contracts.	Compliant	ISO 14001 requirement 4.3.2 Legal and Other Requirements Responsible Care
Safety	Disposal occurs to Holfontein H: H site. No ECA S20 (6) permits were available during the audit; these figures are reported into the Sustainable Development Report. Evidence of Compliance: Sasolburg Environmental Legal Compliance Audit Report by Marsh Dec 2009 Sasol Solvents Saslburg Waste Audit Report by Marsh General and plant specific induction and risk assessment training is provided to all staff, but only induction and generic safety training is	Compliant	ISO 14001 requirement 4.3.1 Environmental Aspects 4.4.2 Competence, Training and Awareness OHSAS 18001 requirement 4.3.1 Hazard Identification

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	provided for contractors. In addition, AAA Plant specific Emergency Plans are included in the SHE files which are issued to all contractors. Evidence of Compliance: Integrated Business Management Audit Report for Secunda 7Dec 2009 and Health and Safety Legal Audit Report Sasolburg by Marsh 10 Dec 2008.		Risk Assessment and Determining Controls Responsible Care
Standard Conditions			
Clause 1	No proof available at the time of the audit that the advertisement was submitted to this Department.	Non-Compliant	No Requirement

Table 5.12: Evaluation of Butanol Plant ROD

5.13 Evaluation of Methyl Iso-Butyl Ketone plant (MiBK 2) RoD

<u>Establishment of MiBK 2</u>			
<u>Exemption to Undertake a Listed Activity: Establishment of the MiBK (Ref: EM1/1(c)/06/77 dated 27 April 2007.)</u> It must be noted that only relevant provisions of the RoD have been reproduced and audited hereunder. Some of the provisions of the RoD relate only to the construction phase of the plant.			
RoD Requirement	Compliance	Compliance Status:	ISO & BD&I Requirement
Specific Conditions			
Specific Conditions	General Statement.		
Environmental Management Plan	The EMP formed part of the Contractors SH&E files.	Compliant	BD&I Requirement
Operational phase	All off-loading areas of acetone are bunded and provided with a sump' All other process, loading and storage areas are bunded This forms part of the bunded area control philosophy All surfaces are concreted with watertight joints to reduce the possibility of groundwater pollution General Statement.	Compliant Compliant Compliant Compliant	Part of Sasol design specifications
The following conditions form Department of Tourism, Environmental and Economic Affairs must be adhered to			
a.	The Sasol Storm water management requirements ensure compliance to the RoD requirements.	Compliant	Part of Sasol design specifications

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b.	The MiBK plant has been formally incorporated into the Solvents IMS ensuring compliance to legal and other requirements.	Compliant	ISO 14001and OHSAS 18001 requirements 4.3.2 Legal and Other
c.	No evidence was available to state that an environmental audit report was submitted to the Department.	Non compliant	
d.	General statement. Proof of non-compliance with regulations rests with the applicant and/or the relevant contractor		
e.	General statement, that a compliance audit can be conducted at any time.		
f.	The MiBK plant has been formally incorporated into the Solvents IMS ensuring compliance to legal and other requirements.	Compliant	ISO 14001and OHSAS 18001 requirements 4.3.2 Legal and Other
g.	General statement.		
h.	General statement.		
i.	General statement.		
j.	General statement.		
k.	Electronic copy available on intranet for all employees. Hard copy available from SHERQ Department. The authorisation formed part of induction training during the construction period. The training of staff, contractors and sub-contractors was managed via the Principal contractor induction training program. The training program was approved by Sasol Technology Environmental department.	Compliant	BD&I Requirement
l.	The Department has not been notified of any non-compliance with the conditions, as identified herein.	Non-compliant.	No requirement

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m.	Records are kept in good order, all documents available on the electronically Intranet or hard copies available from the SHERQ department.	Compliant	ISO 14001 requirement 4.5.4. Control Records
n.	General statement.		
o.	General statement that the applicant shall be responsible for all costs necessary to comply with the above conditions unless otherwise specified.		

Table 5.13: Evaluation of MiBK 2 ROD

Chapter 6 – EMS of Sasol Solvents

6.1 Solvents Integrated Management System consists off the following:

There is a plethora of environmental management tools available to the business sector. Sasol Solvents have used the following tools to incorporate the requirements of the Record of Decision in order to proof compliance. These tools include amongst others; Health and Safety Management System OHSAS 18000, Environmental Management System ISO 14000, Quality Management System ISO 9000 and Responsible Care.

As stated in the introduction the Solvents South Africa Integrated Management System (IMS) consist of ISO 9001, Quality Management System, OHSAS 18001 Health and Safety Management System, ISO 14001 Environmental Management System and Responsible Care Management Practice Standards. This chapter will discuss the requirements of the Management Standards and give an overview of the current status of the Solvents IMS.

Integrated Management System

For a management system to be effective, it should not merely be a collection of these different components, but also a planned and well-defined system where all of the pieces work in conjunction with each other. The policies also set the framework for the whole system (Jackson, 1997:4). Requirements for management systems are also designed to be generic and applicable to organisations in any industry or economic sector regardless of the offered products or services (ISO 9000:1).

There are also quite a number of benefits in using management systems as a tool. These include amongst others:

- An organisation's demonstration of legal and regulatory compliance. This is the minimum requirement of a responsible organisation;
- A demonstration to stakeholders of your commitment to either quality, or safety, health, environment or any combination thereof. This is especially valuable when doing business in highly developed countries with a well-developed SH&E awareness;
- Better management of the organisation's quality, safety, health and environmental risks, both now and in the future, which can reduce potential liabilities; and
- Cost savings, resulting from more efficient business processes. This one still makes the most sense to management all over the world (BSI, 2005).

6.2 Quality Management System (ISO 9001)

Stimson (2006:45) states that ISO 9001 requires factors governing quality of product to be under control, and that the process is documented. From the legal point of view, documentation is a major asset of ISO 9001 because it provides records and internal controls.

Stimson (2006:39) states that formal work standards have been with us for centuries, since the Middle Ages at least. European craft guilds of the 11th to 15th centuries developed and maintained high standards of finished work. This quality was seen in furniture, cathedrals, and chateaux, and we still marvel the results.

Stimson (2006:41) points out that according to Mohammed Hashim and Mujeeb Khan related that these ideas indicated by the Guild Act of the 11th century England, whereby representatives of the king were invested with power to enforce uniformity in places of manufacture where the wardens of the crafts were appointed to see the work to be good and right and to reform

what defects they should find therein, and thereupon inflict due punishment upon offenders and stamp only good work with the seal of approval. The practice of ensuring the quality of a pRодукt by inspection using a pRодукt standard as a reference is still widely used today.

ISO 9001 A Process Approach

ISO 9001 is structured in a process approach with four core requirements configured as processes within a Quality Management System, as depicted in figure 6.2. The requirements in this figure are numbered by the following clauses in the ISO 9001 standard. They are:

Clause 5: Management Responsibility

Clause 6: Resource Management

Clause 7: PRодукt Realisation

Clause 8: Measure, Analysis, and Improvement.

ISO 9001 is adaptable to service and operations processes are adequately described under clause 7.

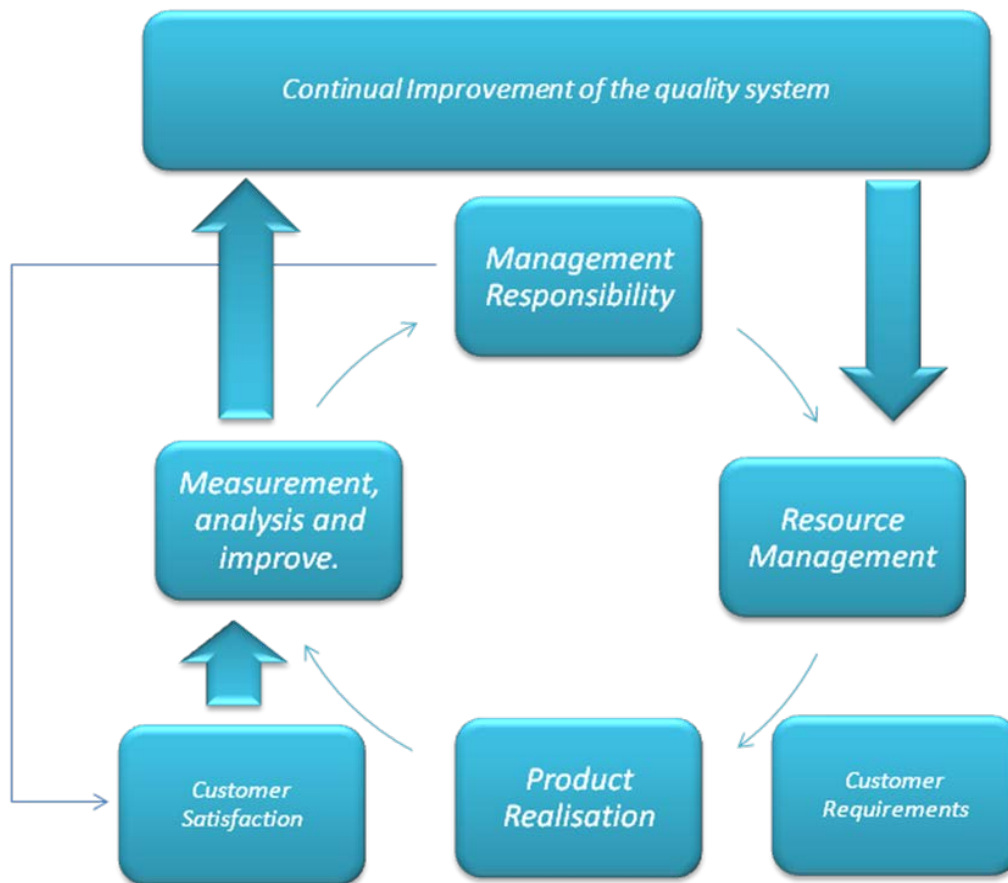


Figure 6.1: Quality Management Framework

Coleman & Douglas (2003:88) states that the 2000 revision of ISO 9000 is a significant improvement on the 1994 version and according to them it enhances integration possibilities with other standards such as OHSAS 18001 and ISO 14001, as well as having a requirement for continual improvement.

6.3 Health and Safety Management System (OHSAS 18001)

OHSAS 18001 2007 is an Occupational Health and Safety Management Standard. It defines a set of occupational health and safety (OH&S) management requirements for occupational health and safety management systems. (Praxiom, Introduction to OHSAS 18001, 2010)

OHSAS 18001 is an international occupational health and safety management system specification. OHSAS 18001 was created via a concerted effort from a number of the worlds leading national standards bodies, certification bodies, and specialist consultancies. (OHSAS 18001, Occupational Health and Safety, 2010)

OHSAS 18001 2007 was developed by the OHSAS Project Group, a consortium of 43 organisations from 28 countries. This consortium includes national standards bodies, registrars (certification bodies), OH&S institutes, and consultants. (Praxiom, Introduction to OHSAS 18001, 2010)

This new OHSAS 18001 2007 standard was officially published during July of 2007. It cancels and replaces OHSAS 18001 1999. Since it was first published in 1999, OHSAS 18001 has rapidly become the most widely used international OH&S management standard. OHSAS 18001 applies to all types of organisations. It doesn't matter what size they are or what they do. (Praxiom, Introduction to OHSAS 18001, 2010)

a. The purpose of OHSAS 18001

The purpose of OHSAS 18001 is to help organisations to manage and control their OH&S risks and to improve their OH&S performance. They can achieve this purpose by developing an OH&S Management System that complies with OHSAS 18001. An OH&S Management System is a network of interrelated elements. These elements include responsibilities, authorities, relationships, functions, activities, processes, practices, procedures, and resources. These elements are used to establish OH&S policies, plans, programs, and objectives. (OHSAS 18001, Occupational Health and Safety, Date unknown)

OHSAS helps in a variety of respects, it helps: minimise risk to employees / etc; improve an existing OH&S management system; demonstrate diligence; gain assurance; etc. The benefits can be substantial.

Certainly the concept of an OH&S Management System is rather abstract. However, fortunately, you don't really have to completely grasp, absorb or memorise what it means. Simply by meeting all of the OHSAS 18001 requirements, you will automatically establish an integrated OH&S Management System for your organisation OHSAS 18001 uses what is called the Plan-Do-Check-Act (PDCA) methodology. It uses this methodology to organise the standard and you can use it to establish your OH&S Management System. (OHSAS 18001, Occupational Health and Safety, Date unknown)

The PDCA methodology is used to organise OHSAS 18001 as indicated in figure 6.2 below

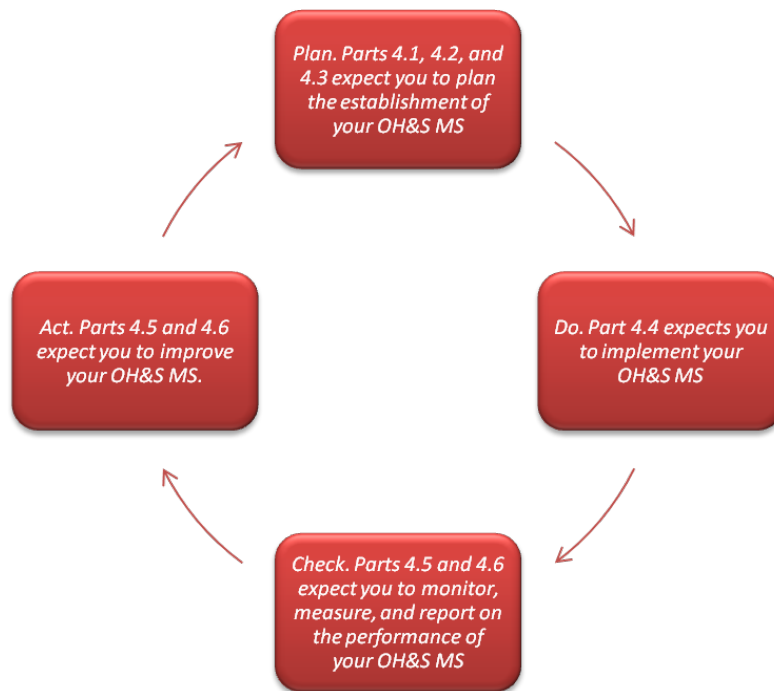


Figure 6.2: Health and Safety Management Framework

The OHSAS specification is applicable to any organisation that wishes to:

- Establish an OH&S management system to eliminate or minimise risk to employees and other interested parties who may be exposed to OH&S risks associated with its activities
- Assure itself of its conformance with its stated OH&S policy

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- Demonstrate such conformance to others
- Implement, maintain and continually improve an OH&S Management System
- Make a self-determination and declaration of conformance with this OHSAS specification.
- Seek certification/registration of its OH&S Management System by an external organisation

6.4 Responsible Care

On 3 December 1984 Union Carbide's pesticide factory in Bhopal, India had an explosion. 30 Tonnes of highly toxic methyl isocyanate were released into the densely populated community, killing thousands of people within a few days.

Fatality estimates range from Union Carbide's estimate of 3 800 to Green peace's estimate of 8 000. National Government Officials' claim 500 000 people were injured and that the legacy of the poisoning is now affecting a third generation of Bhopal's families. (Bhopal disaster.)

Canadian Chemical Producers' Association (CCPA) claims credit for officially launching the first Responsible Care program in 1985.

Responsible Care® is the chemical industry's global voluntary initiative by which companies, unite to continuously improve their health, safety and environmental performance, and communicate the stewardship of their products to interested and affected parties and staying accountable for the manufacture and supply of their products.

Responsible Care® is the world's leading voluntary industry initiative - it is run in 53 countries whose combined chemical industries account for nearly 90% of global chemicals production

a. Advantages of Responsible Care®

- Once programmes are implemented in the workplace the employees will have health and safety assurance.
- Interactions with communities to ensure enablement of the precautions are implemented to protect their health and safety.
- Statistical trends relating to safety, health and the environment should show a downward trend.
- Provide an opportunity for interaction to all employees to assist and be involved in the company's health, safety and environmental performance.
- Ensure product lifecycle assessments are implemented to protect end users and customers. (Responsible Care. Date unknown).

Responsible Care codes of practice focus on the following:

- Manufacturing — expectations for the safe, environmentally and socially responsible management of operation and facilities and ensure good health for employees.
- Stewardship — expectations for the safe, environmentally and socially responsible management for the development of new products, management of raw materials and services used through the products lifecycle.
- Accountability —expectations related to social responsibilities

The Responsible Care® Ethic and Principles for Sustainability as stipulated in Chemical and Allied Industries' Association Responsible Care Management Representative Guidebook – April 1991 ICCA. Responsible Care is based on the triple bottom line (People, profit and planet) and therefore helps the industry to operate safely through the sharing of information and implementation of rigorous management systems. Responsible Care assists industries to operate profitably by being open and transparent with their stakeholders – from local communities to local authorities and the public. It has driven a transformation in the way that

companies operate: from being secretive and defensive about their activities, to being more open, honest, and actively seeking dialogue and partnerships with stakeholders. Considering future generation by achieve ongoing reductions in the amount of contaminants and pollutants released to the air, water and land and thus protecting the public and the environment and therefore protecting the environment for the next generation. (Chemical and Allied Industries Association, 1991)

Chemical Companies are committed to do the right thing, and be seen to do the right thing. They dedicate themselves, their technology and their business practices to sustainability - the betterment of society, the environment and the economy. The principles of Responsible Care® are key to their business success, and compel them to:

- Work for the improvement of people's lives and the environment, while striving to do no harm;
- Be accountable and responsive to the public, especially our local communities, who have the right to understand the risks and benefits of what we do;
- Take preventative action to protect health and the environment;
- Innovate for safer products and processes that conserve resources and provide enhanced value;
- Engage with our business partners to ensure the stewardship and security of our products, services and raw materials throughout their life-cycles;
- Understand and meet expectations for social responsibility;
- Work with all stakeholders for public policy and standards that enhance sustainability, act to advance legal requirements and meet or exceed their letter and spirit;
- Promote awareness of Responsible Care, and inspire others to commit to these principles

Responsible Care consists of seven management practise standards. This section will discuss the seven management practise standards and the applicability to Sasol Solvents, South Africa.

1) Management Commitment

This management practice standard show Sasol Solvents Management's continues commitment and support for Responsible Care.

Leadership, commitment and the active involvement of Sasol Solvents top management are essential for maintaining an effective and efficient management system.

To survive in today's business environment, Sasol Solvents will have to pursue customer satisfaction, market domination and increased profitability.

2) Health & Safety

The implementation of this management practice Standard enables Sasol Solvents to operate in a manner to protect and promote the health and safety of employees, service providers and the public, while also providing assurance for employees through management system and workplace programmes.

Two way communication with communities of the precautions they can take to protect their health and safety

Ensure involvement of Sasol Solvents employees to assist and have inputs in the Management System.

3) Storage and Transport

The objective of this Management practice standard is to minimise the probability and potential severity of storage, distribution and transportation related incidents posing a threat to the public and the environment.

Demonstrates Sasol Solvents clear management accountability for performance against specific strategic objectives for the safe, storage, distribution and supply of products.

4) Pollution Prevention

Sasol Solvents is committed to cleaner production and waste minimisation. Sasol Solvents intends to achieve ongoing reductions in the amount of contaminants and pollutants released to the air, water and land and thus protecting the public and the environment.

The achievement and demonstration of responsible pollution prevention and resource efficiency during manufacturing and supply are a primary goal of this standard. The practice of this standard is intended to result in cleaner production and waste minimisation. The management practice standard is also designed to achieve ongoing eco efficiency in effective resource utilisation.

5) Product Stewardship

The management practice standard Product Stewardship addresses this caring at each phase of a product's in its commercial life (Life Cycle) (Cradle to Cradle) to protect users, customers and the environment.

Sasol Solvents, SA is committed to ensure the safe use of chemicals at each stage of their product lifecycle, by implementing this management practice standard in the plant design, construction and commissioning phases for new or modified facilities (e.g. expansion) for new products to eliminate or mitigate the risks to persons and the environment.

6) Community Awareness

This management practice standard promotes knowledge transfer to the community and public by assuring outreach programme for interested and affected parties. This would entail providing simplified useful non-confidential information on processes and products

Facilitate public participation to ensure a common goal in environmental governance, build trust, promote a positive image and establish active channels of communication with the public and employees of the company within the community.

7) Emergency Preparedness and Response

By the implementation of this Management Practice Standard involves establishing, developing and maintaining operational emergency response plans and assure emergency preparedness, in order to help protect employees and communities, by assuring that each facility has an emergency response plan to respond rapidly and effectively to emergencies at the facility and along its transport routes.

6.5 Environmental Management System (ISO 14000)

An Environmental Management System (EMS) can, according to Andrews et al (1999:2) be defined as "... a formal set of procedures and policies that define how an organization will manage its potential impacts on the natural environment and on the health and welfare of the people who depend on it."

The ISO 14000 Series is "a voluntary environmental management and procedural standard" (Delmas, date unknown: 18), with the purpose of "achieving continuous improvement in environmental performance" (Drury, 2000:1).

The ISO 14001 (2004:4-9) states that ISO 14001:2004 does however contain the following core elements:

- The documentation and definition of the **scope** of the organizational EMS.
- The definition of an organisational **environmental policy** which should:
 - o Be appropriate to the "nature, scale and environmental impacts of its activities, products and services;
 - o Include commitments to prevention of pollution and continual improvement;
 - o Include commitments to comply with not only "applicable legal requirements", but also other requirements "to which the organisation subscribes which relate to its environmental aspects";

- o Provide a framework for the setting of environmental objectives and targets as well as the review thereof;
- o Be implemented, maintained and also documented;
- o Be communicated to all employees of the organisation and those persons working on behalf thereof;
- o Be available to the public.
- **Planning** activities which included the establishment, implementation and maintenance of:
 - o Procedures to identify environmental aspects related to organizational “activities, products and services” which the organization can control and influence. This process must be followed up by the determination of aspects which can “have significant impact(s) on the environment”, known as “significant environmental aspects”;
 - o Procedures to, in relation to the above identified aspects, “identify and have access to the applicable legal requirements and other requirements to which the organization subscribes” and the manner in which these requirements apply to the identified aspects;
 - o Environmental targets and objectives which must be measurable and consistent and in compliance with the above described environmental policy, legal requirements and continual improvement;
 - o Programmes for achieving the above mentioned objectives and targets.
- Implementation and operational activities (**doing**), including
 - o Allocation of sufficient resources and assignment of “roles, responsibilities and authorities” for the establishment, implementation, maintenance and improvement of the EMS, which includes the appointment of representatives;
 - o EMS competence, training and awareness activities, which include the identification of training needs related to the EMS and the

- establishment of awareness procedures;
- o The establishment, implementation and maintenance of internal EMS communication procedures as well as procedures to manage the revised, documentation and response to external communications;
- o An EMS documentation system which should include the environmental policy, targets and objectives, include a description of the EMS scope, the core elements of the EMS, documents required by the Standard and documents deemed to be necessary to ensure effective processes related to significant environmental aspects;
- o A record (document) control system which includes a procedure to approve documents, review and update documents, ensure that changes and revision status of documents are identified, ensure that relevant versions of documents are available at the points where it is utilised, ensure that documents are legible and identifiable, ensure that external documents are identified and control, and to prevent unintended use of obsolete documents.
- o The identification and planning for operations that are “associated with the identified significant environmental aspects” to ensure that it is “carried out under specified conditions”;
- o Procedures to “identify potential emergency situations and potential accidents that can have impacts on the environment” and how the organisation will respond thereto.
- **Checking** activities, including the establishment, implementation and maintenance of:
 - o Monitoring and measurement procedures related to the “key characteristics” of the organisations operations that may have a significant environmental impact;
 - o Evaluation of compliance procedures to evaluate compliance with applicable legislative requirements and other requirements to which the organisation subscribes;

- o Non-conformance, corrective action and preventive action procedures;
- o A system to control records to “demonstrate conformity to the requirements of its environmental management system”, as well as the results achieved;
- o The execution of internal audits of the EMS at planned intervals to determine if the EMS “conforms to planned arrangements” and “has been properly implemented and maintained” as well as “provide information on the results of audits to management”.
- Top management review activities (**acting**) related to the EMS to ensure its “continuing suitability, adequacy and effectiveness”.

The above description is derived from the Generic Total Quality Management Model of “Plan-Do-Check-Act” figure 6.3 which almost every EMS is comprised of (UNEP et al, 2001a:13). It is schematically displayed as follows:



Figure 6.1: Environmental Management Framework

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According to Jay, S et al (2007:288) the environmental impact assessments (EIA) and environmental management systems (EMS) enable organisations to identify, assess and manage environmental impacts throughout a development's lifecycle, improving overall environmental performance.

Since the introduction of ISO 14000 standards in 1996, many organisations around the world adopted the ISO 14000 standards and required that their suppliers move toward adopting the same set of standards. ISO 14000 is series of voluntary international standards for implementing an effective Environmental Management System. ISO 14000 series include 20 separate standards ranging from environmental labeling to assessing the life-cycle of products.

- ISO 14010, 14011 and 14012: Guidelines for environmental auditing
- ISO 14015: Environmental assessment of sites & organisations
- ISO 14020, 14021, 14024 and 14025: Environmental labels & declarations
- ISO 14030, and 14031: Guideline on Environmental performance evaluation
- ISO 14040, 14041, 14042 and 14043: Environmental life cycle assessment
- ISO/TR 14047, 14048 and 14049: Environmental life cycle impact assessment
- ISO 14050: Vocabulary
- ISO 14060: Guide for the inclusion of Environmental Aspects in Product Standards

ISO 14000 standards and support documents have been developed and published to assist companies implement a value-adding Environmental Management System and improve both their practice and performance by reducing their impact of operations on the environment. Many organisations

around the world that have adopted ISO 14000 standards are requiring that their suppliers move toward adopting the same set of standards.

6.5.1 The performance of the organisation is thus measured and monitored against the criteria and targets set in the EMS. (CEM 2007: Module 6).Scope of the Solvents EMS

The manufacturing of Sasol Solvents includes:

- All manufacturing processes within Sasol Solvents
- All maintenance activities
- Effluent management
- Waste management
- Electrical reticulation
- Inbound logistics up to the battery limit
- Contractor activities

The manufacturing of Sasol Solvents excludes:

- Services and facilities by service providers
- Supply chain activities
- Sasol Oil, Secunda Operations
- Activities excluded will be influenced through contract, service level agreements and other arrangements where applicable

6.5.2 Scope as per Certificate of Registration:

ISO 9001:2000

The scope for ISO 9001:2000 certifying is “manufacture, of Solvents, Acids, Co - monomers and Safol, excluding 7.5.2 Validation of Processes and 7.5.4 Customer Property”.

ISO 14001:2004

The scope for ISO 14001:2004 certifying is activities, products and services that the organisation control or influences that have or can have a significant impact on the environment related to: the manufacture of

Solvents, Acids, Co - monomers and Safol Including receiving and off loading of raw materials.

OHSAS 18001:2007

The scope for OHSAS 18001:2007 certifying is all routine and non routine and facilities that the organisation control or influences that can result in a health and/or safety risk related to: the manufacture of Solvents, Acids, Co – monomers and Safol including off loading of raw material.

6.6 Current status of the Solvents Integrated Management System (IMS)

Certification of the Solvents IMS

The Integrated Management System for both Solvents Secunda and Sasolburg are certified by DQS South Africa. Management Systems e.g. ISO 14001 environmental management system can only be certified by an accredited third party called a certification body. The certification audits are conducted by certification bodies, these audits are carried according to specific rules or guidelines, according to the scope of the certificate awarded. Melnyk et al. (2003:330) states that the impact on corporate performance is said to be an advantage of implementing a formal, certified environmental management system over those of pursuing a less stringent package.

About DQS

DQS South Africa (Pty) Ltd, the Certification Body that specialises in the SHERQ Management System Certification has been in business in South Africa since 1995 assisting South African and multinational organisations in realising their SHERQ Management System objectives (DQS South Africa, Date unknown)

DQS - An independent and competent management partner for companies of every size and all business sectors - offers objective assessments

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according to about 100 approved norms and technical or industry-specific standards. (DQS Germany, Date unknown)

International presence - global practice

With 45,000 certified locations in more than 100 countries DQS belongs to the top group of international management certification bodies. More than 60 offices in almost 50 countries ensure a large scope of assessment services which guarantees customer proximity and lasting added value. (DQS Germany, Date unknown)

The DQS cooperation with “The International Certification Network” IQNet enhances the certification of globally active companies. DQS is established as a founding member of IQNet. (DQS Germany, Date unknown)

DQS auditors - objective and competent

More than 1,850 DQS auditors worldwide present a wide range of experience and proximity to their customers. In addition to the DQS branch knowledge and social competence the customers respect the auditor’s analytical abilities and proven practical knowledge of standards and processes. Customers located worldwide appreciate our cross-cultural competences. (DQS Germany, Date unknown)

About IRCA

IRCA Global is an international Risk Management Solution provider in the areas of Safety, Health, Environment and Quality (SHEQ). Today IRCA’s 13 operations in five countries have assisted hundreds of organisations to reduce operational risk exposure.

In the diverse modern International Industry, the pressure for businesses to survive has resulted in a focus shift towards Effective Risk Management practices. (IRCA Global Pty Ltd., Date unknown)

IRCA assists clients to address the avoidance of loss in a cost effective and

practical manner which allows them to manage their operational activities to the best interest of all stakeholders including the company, the employees, the community and the environment.

IRCA draws its expertise from an international pool of resources, and delivers a wide variety of professional services to clients. Through alliances and partnerships, IRCA has established itself to be the preferred provider for all SHEQ risk management requirements. (IRCA Global Pty Ltd., Date unknown)

IRCA Ratings

An IRCA five (5) star rating was bestowed to Solvents Secunda in 2010 with regards to their Integrated Management System for the manufacturing of Olefins, Surfactant Intermediates, Oxygenated Solvents and Acids including the receiving and offloading of raw material.

An IRCA four (4) star rating was bestowed to Solvents Sasolburg in 2010 with regards to their Integrated Management System for the manufacturing of acrylates, blends and hydrocarbons, glycol ethers and acetates and mining chemicals. (IRCA Global Pty Ltd., Date unknown)

Chapter 7 - Legal Consequences and Exposure

According to *Perdicoulis et al* (2007:385) EIA and EMS are both concerned with the environmental effects of development projects, although they came into existence from different origins. The two processes also currently have different legal and standardisation status

In this chapter, the legal consequences and legal exposure will be discussed to identify the serious concerns about deviating from the ROD, EMP and Scoping documents.

7.1 National Environmental Management Act 107 of 1998, Environmental Impact Assessment

Regulations and Listing Notices 1, 2 and 3: List of Activities and Competent Authorities (GNR543, 544, 545 and 546, GG33306 of 18 June 2010)

These Regulations came into effect on 2 August 2010 (per notice in GNR661, GG662, 663 and 664, GG33411 of 30 July 2010), and replace those Regulations and Listing Notices previously published under GNR385, 386 and 387 of 21 April 2006, as amended.

GNR543 describes the Environmental Impact Assessment (EIA) and authorisation procedure. Activities that will be undertaken that are identified in terms of Section 24(2)(a) and (d) of NEMA requires authorisation from the relevant authority. An Environmental Impact Assessment Process for these activities are required in terms of Sections 24(a) and 24(d) of NEMA, GNR544 and GNR546 (provincial based activities) contains the list of activities in respect of which a Basic Assessment (BA) is required, and GNR545 lists the activities for which the more comprehensive assessment (i.e. Scoping and Environmental Impact Assessment) must be performed. The Scoping and EIA process is generally required for those activities which will potentially have a larger environmental impact.

The assessment of the implementation of the requirements as prescribed in the Record of Decision / Authorisation into Sasol Solvents, Environmental Management System

The activities listed in these Listing Notices may not commence without the written consent of the Competent Authority (being the authority identified in the right hand column of the schedules contained in GNR 386544, 545 and 546), namely the provincial or national environmental authority.

The assessments required in terms of regulations must be performed by an independent Environmental Assessment Practitioner (EAP).

In addition, when undertaking an EIA, Sasol Solvents must ensure:

- That the consultant provides to the relevant authority access to, and opportunity for review of, all procedures, underlying data, reports and interviews with interested parties, whether or not such information may be reflected in a report required in terms of these regulations;
- Is responsible for the public participation process to ensure that all interested parties, including government departments that may have jurisdiction over any aspect of the activity, are given the opportunity to participate in all the relevant procedures contemplated in these regulations; and
- Must indemnify the government of the Republic, the relevant authority and all its officers, agents and employees, from any liability arising out of the content of any report, any procedure or any action for which the applicant or consultant is responsible in terms of these regulations.

7.2 Environmental Management Framework Regulations promulgated in terms of Section 24(5) of the National Environmental Management Act 107 of 1998 (GNR547, GG33306 of 18 June 2010)

Section 24(5)(bA)(i) states that the Minister (or an MEC with the concurrence of the Minister) may make Regulations laying down the procedure to be followed for the preparation, evaluation and adoption of Environmental Management Frameworks (EMFs).

An Environmental Management Framework is “a study of the biophysical and social-cultural systems of a geographically defined area to reveal

where specific land uses may best be practiced and to offer performance standards for maintaining appropriate use of such land”.

EMFs will typically be developed for a geographical area level and will be initiated by the Minister or the MEC, with the concurrence of the Minister. The EMF will be developed to specify the attributes of the environment in a particular geographical area such that the information will inform environmental management in that area, to be used in the consideration of applications for environmental authorisations in or affecting such geographical areas. The process for the development of EMFs as initiated by the Minister or MEC is prescribed, as is the required content thereof.

7.3 Registration of Water Use in terms of the National Water Act 36 of 1998 (GN519, GG32209 of 6 May 2009)

Section 21 of the National Water Act 36 of 1998 lists various activities which constitute ‘water use’ under the Act. The concept of water use is widely defined to include both ‘use’ of water and activities that may impact adversely on water resources. In terms of Section 22 of the Act, a person may only use water without a license under the following circumstances –

- a if that water use is permissible under Schedule 1 to the Act (which relate primarily to domestic uses of water);
- b if that water use is permissible as a continuation of an existing lawful use (i.e. was in existence 2 years prior to the coming into effect of the Act), or
- c if that water use is permissible in terms of the General Authorisation (GA) issued under Section 39 of the Act.

In terms of Regulation 3 of the Regulations Requiring that a Water Use be Registered, as published in GNR1352, GG20606 of 12 November 1999, any person who uses water in terms of Section 21 of the Act must register such use on a form obtained from the Department and submit the completed form to the responsible authority, as required under a General

Authorisation promulgated in terms of Section 39 of the Act or when requested to do so by the responsible authority.

In terms of this Notice, the Minister of Water requires that all persons using water as described in the Notice must register their water uses (i.e. whether it constituted an existing water use or not whether the parameters of the water use fell below the thresholds that required registration under a General Authorisation).

The request is applicable to all water users nationally and water users must submit their completed registration form by 30 August 2009 at the relevant DWAF Regional Office. Currently Solvents itself does not undertake any of the water uses, as listed. These uses, however, may apply to activities undertaken by Synfuels and given that Solvents uses the services of Synfuels (including for the discharge of contaminated water to the API dams), Solvents must ensure that all water uses undertaken by Synfuels (and any other service provider to Solvents) have been registered as a water use (where licenses were not required. In instances where the listed water uses were not registered (i.e. where the parameters of the water use fell below the thresholds of the GAs, etc.), a registration form must be submitted to the Department within the timeframe prescribed.

The following water uses must be registered:

- 21(e): Engaging in a controlled activity (e.g. irrigation of any land with waste or water containing waste);
- 21(f): Discharging waste or water containing waste;
- 21(g): Disposing of waste in a manner which may detrimentally impact on a water resource (e.g. waste rock dumps, ore stockpiles, tailings dams, evaporation ponds, etc.);
- 21(h): Disposing of water which contains waste from, or which has been heated in any industrial or power generation process;

- 21(j): Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of the activity or for the safety of people.

**7.4 National Environmental Management: Waste Act 59 of 2008, Section 1
National Environmental Management Act 107 of 1998, Section 2
Minimum Requirements for the Handling, Classification and Disposal of
Hazardous Waste, 2nd Edition (DWAF, 1998)**

Waste' means any substance whether or not that substance can be reduced, reused, recycled and recovered –

- (a) That is surplus, unwanted, rejected, discarded, abandoned or disposed of;
- (b) Which the generator has no further use of for the purposes of production;
- (c) That must be treated or disposed of, or
- (d) That is identified as a waste by the Minister by notice in the Gazette, and includes waste generated by the mining, medical or other sector, but –
 - (i) A by-product is not considered waste; and
 - (ii) Any portion of waste, once reused, recycled and recovered, ceases to be waste.

'Hazardous Waste' means any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical characteristics of that waste, have a detrimental impact on health and the environment.

'General Waste' means waste that does not pose an immediate hazard or threat to health or to the environment and includes domestic waste, building and demolition waste, business waste and inert waste.

The following principles, many of which are considered internationally as being essential for the management of Hazardous Waste, are acknowledged in the Minimum Requirements and will also be acknowledged in future regulations.

‘Duty of Care Principle’ – whereby the **generator** of the waste is ultimately responsible for ensuring that the waste is handled, stored, transported and disposed of according to the legislation and in an environmentally sound and responsible manner.

‘Polluter Pays Principle’ – the person or organisation causing pollution is liable for any costs involved in cleaning it up or rehabilitating its effects. The generator of the waste is thus liable unless able to prove that the transferral of management of the waste was a responsible action.

‘Precautionary Principle’ – All waste is assumed to be both highly hazardous and toxic until proven otherwise.

7.5 National Environmental Management: Waste Act 59 of 2008, Section 16

The Waste Act 59 of 2008, Section 16 came into effect on 1 July 2009. In terms of this section, a holder of waste must take all reasonable measures to –

- (c) Avoid the generation of waste and where such generation cannot be avoided, to minimise the toxicity and amounts of waste that are generated;
- (d) Reduce, reuse, recycle and recover the waste;
- (e) Where waste must be disposed of, ensure that the waste is treated and disposed of in an environmentally sound manner;
- (f) Manage the waste in such a manner that it does not endanger the health or the environment or cause a nuisance through noise, odour or visual impacts;
- (g) Prevent any employee or any person under his or her supervision from contravening this Act, and
- (h) Prevent the waste from being used for an unauthorised purpose.

7.6 Minimum Requirements for the Handling, Classification and Disposal of Hazardous Waste, 2nd Edition (DWAF, 1998)

Note: the 3rd Edition of the Minimum Requirements for the Handling, Classification and Disposal of Hazardous Waste is in the final draft stage, and is expected to be published towards the end of 2007. This 3rd edition should therefore be used once published.

Before waste is disposed of, the composition, concentration and toxicity indicators must be determined such that the waste can be classified and rated in accordance with the Minimum Requirements. This is necessary to ensure that the waste is transported appropriately, pre-treated correctly (by the Company or the waste facility) and disposed of at an appropriate facility. The initial classification of waste is to determine whether it is a general or hazardous waste. Where there is uncertainty, the precautionary principle requires that waste be classified as hazardous until proven otherwise. Any general waste contaminated by hazardous waste must be treated as hazardous waste.

The Minimum Requirements requires all hazardous waste to be classified according to SANS 10228: The Identification and Classification of Dangerous Goods for Transport, and assigned a Hazard Rating (1-4) to determine on-site storage limits and which type of disposal facilities may accept the waste.

The SANS 10228 classification determines the type of the waste, dividing all substances into the nine classes as defined in Appendix 3. Each substance found in SANS 10228 is identified by the UN Number.

The Hazard Rating differentiates between the levels of risk associated with the hazardous nature of the waste. The level of risk will determine the type of landfill the waste may be disposed at, as well as on-site storage limits.

The Hazard Ratings are described as follows:

Hazard Rating Risk Acceptable

Landfill Type

On-site Storage Limit

1. Extreme Risk H:H 10 kg
2. High Risk H:H 100 kg
3. Moderate Risk H:H or H:h 1 000 kg
4. Low Risk H:H or H:h 10 000 kg

No rating (for General Waste)

Minimal Risk General No limit, but must be temporary storage

The Hazard Rating assigned is based on various parameters, including the following:

- carcinogenicity, mutagenicity, teratogenicity,
- toxicity (LD50),
- ecotoxicity (LC50),
- biodegradation (COD and DOC),
- accumulation and persistence potentials and
- concentrations of organic and inorganic substances.

The hazard rating is then used to determine at which permitted disposal facility the waste may be disposed of – an H:H landfill may accept hazard rating 1 to 4 (i.e. including extreme and high risk) wastes, whereas an H:h landfill may only accept hazard rating 3 and 4 wastes (moderate and low risk). General waste sites cannot not accept any hazardous waste, unless it has been de-listed (i.e. when the concentration of the hazardous components is at an acceptably low level and approval from DWAF and the landfill site has been obtained).

The methodology for the classification and hazard rating is described in the Minimum Requirements for the Handling, Classification and Disposal of Hazardous Waste, 2nd Edition (DWAF, 1998), and may require laboratory analysis.

Delisting

If the concentration (laboratory analysis may be required) of the hazardous components are below acceptable risk levels (taking into account frequency of disposal and area of the proposed landfill), the waste may de-list to a lower Hazard Rating, and thus be disposed of at a less stringent landfill that accepts de-listed waste. The methodology is outlined in the Minimum Requirements. Approval must be obtained from DWAF.

7.7 Minimum Requirements for the Handling, Classification and Disposal of Hazardous Waste,

2nd Edition (DWAF, 1998)

National Environmental Management: Waste Act 59 of 2008, Sections 21 & 22, 24

In terms of the Waste Act 39 of 2008, any person who stores waste must at least take steps, unless otherwise provided by this Act, to ensure that -

7.7.1The containers in which any waste is stored, are intact and not corroded or in any other way rendered unfit for the safe storage of waste;

7.7.2Adequate measures are taken to prevent accidental spillage or leaking;

3The waste cannot be blown away;

4 Nuisances such as odour, visual impacts and breeding of vectors do not arise, and

5 Pollution of the environment and harm to health are prevented.

Any person who generates general waste that is collected by a Municipality must place the waste in a container approved, designated or provided by the Municipality for that purpose and in a location approved or authorised by the Municipality.

The minimum requirements for storage areas used for the temporary accumulation of hazardous waste are described in Section 10.2. of the Minimum Requirements for the Handling, Classification and Disposal of Hazardous Waste, 2nd Edition (DWAF, 1998), and states the following:

7.7.2 Wastes must not be mixed with wastes of a different nature or

composition. Highly hazardous waste mixed with a less hazardous or general waste would render both wastes highly hazardous.

7.7.2.2 Once the waste has been collected, the waste container must be clearly marked to prevent risk of wrong identification.

7.7.2.3 The migration of spillage into the ground and groundwater regime around all temporary waste storage areas must be prevented

1. 7.7.2.4 A firm waterproof base that is protected from storm water ingress from surrounding areas is required.
2. 7.7.2.5 An effective drainage system to a waterproof spillage collection area is required, where any spillage can be recovered and suitably treated. This area must be clearly demarcated and inaccessible to unauthorised persons.
3. 7.7.2.6 Separate storage of waste from other process chemicals or products. If non-compatible wastes are to be stored together, care should be taken to adequately separate them. Flammable or combustible wastes must in any event be stored separately from other waste materials.
4. 7.7.2.7 A generator of waste may accumulate the following quantities of hazardous waste on site for 90 days or less
 - Hazard Rating 1: 10 kg
 - Hazard Rating 2: 100 kg
 - Hazard Rating 3: 1000 kg
 - Hazard Rating 4: 10 000 kgThe methodology used to determine the hazard rating of waste is contained in section 8 of the said Minimum Requirements Document, obtainable from the Department of Water Affairs and Forestry, or downloadable at www.dwaf.gov.za. The substances that would fall within any of the 4 hazard ratings are poisonous (toxic) and infectious substances).
5. 7.7.2.8 Waste must be stored in such a manner that no pollution of the environment occurs at any time.
6. 7.7.3.9 The date upon which accumulation begins must be clearly

marked and visible for inspection on each container.

7. 7.7.2.10 Waste containers or tanks, whilst on site, must be clearly labelled as marked with the words “Hazardous Waste”.
8. 7.7.2.11 All hazardous waste storage areas must be fenced off to prevent unauthorized access.
9. 7.7.2.12 A weatherproof, durable and clearly legible notice-board in official languages at every entrance of the storage area with the words “Hazardous Waste: unauthorised entry prohibited” must be erected.

7.8 National Environmental Laws Amendment Act 14 of 2009 (GN617, GG32267 of 27 May 2009)

The Minister of Environmental Affairs and Tourism has published this Act, which provides for the amendment of the National Environmental Management Act 107 of 1998 and other specific environmental management acts (e.g. the Environment Conservation Act 73 of 1989, the National Environmental Management: Protected Areas Act 57 of 2003, etc.).

Although the Act should be reviewed in its entirety, for the purposes of this update, the following amendments outline the most significant provisions of the Act, for the purposes of your company's operation:

- Section 28: Duty of Care and Remediation of Environmental Damage - This section currently enables the Director-General of the Department of Environmental Affairs and Tourism (DEAT), or the provincial head of a department to take remedial measures to remedy a situation where damage was caused to the environment by pollution or degradation and the polluter failed to do so. The costs so incurred by the government could however only be recovered from the polluter after the completion of such work. However, the often long-term nature of environmental remediation activities and the high costs associated with such activities have prompted this

amendment, by enabling the Director-General or relevant provincial head of department to recover the costs incurred, including anticipatory costs, before undertaking the requisite remedial action.

A clause which imposes criminal penalties for unlawful, intentional or negligent actions or omissions which caused or are likely to cause pollution or degradation of the environment has been inserted into the Act. Any person found guilty of such an offence is liable on conviction to a fine of up to R10 million or imprisonment for up to 10 years (or both).

A significant proposed amendment, Clause 28(16), will see the retrospective application of Section 28, i.e. the measures required under Section 28 (including the obligation to remedy the effects of historical pollution) will apply to any potentially significant pollution or degradation to the environment that preceded the commencement date of the National Environmental Management Act in 1998. This, this provision will potentially have significant consequences for operations with legacy pollution issues and emphasises the need to prevent pollution from occurring in the first instance and to conduct detailed environmental due diligence investigations prior to the purchasing of potentially contaminated sites for development and / or use.

- Section 30: Control of Environmental Incidents - This provision will make it a statutory offence to fail to report an environmental incident, as defined in the Act. Such offence will carry a penalty of a fine of up to R100,000 or imprisonment of up to 10 years (or both).
- The penalties imposed in terms of Section 29 of the Environment Conservation Act 73 of 1989, particularly in respect of the provisions relating to waste management (i.e. establishing, providing or operating a disposal site, the disposal of waste at a site other than a

permitted disposal site, the unlawful undertaking of identified activities without authorisation, etc.) are amended to include a fine of up to R5 million (previously R100,000) as well as the current penalty of up to 10 years imprisonment. Additional penalties as prescribed by the Act are amended and provide more realistic deterrents for non-compliance.

- The penalties imposed in terms of Section 52 of the National Environmental Management: Air Quality Act 39 of 2004, previously only detailed that a 'fine' would be imposed. However, a determination has now been made to include a fine of up to R10 million as well as the current penalty of up to 10 years imprisonment which may be imposed on any offence as prescribed in Section 51 of the Act, which includes contravention or failure to comply with a condition or requirement of an Atmospheric Emission License (AEL), the supply of false or misleading information in any application for an AEL, etc.

The Act's commencement date has been postponed to a date that will be published in the Government Gazette. Marsh will keep you informed of developments in this regard.

7.9 Amendment of National Road Traffic Regulations in terms of the National Road Traffic Act 93 of 1996 (GN589, GG32258 of 27 May 2009)

Chapter VIII of the National Road Traffic Act 93 of 1996 and its Regulations deals with the transportation of dangerous goods.

In terms of this amendment, definition of 'Transport Emergency Card' has been added to the Regulations. 'Transport Emergency Card' is defined as "a card which can either be generated from the European Council of Chemical Manufacturers' Federation system, or in accordance with SANS 10232-44, listing the hazards and emergency information for a material

being transported for use by the driver during an incident, or by the emergency services, if required". This definition corresponds to that as detailed at clause 3.1.25 of SANS 10231: Transport of Dangerous Goods – Operational Requirements for Road Vehicles. Accordingly, SANS 10232-4 has been added to the suite of standards published by the South African Bureau of Standards (SABS) that are already legally binding in terms of the Act⁵, to the extent as specified in the amendment.

This amendment has therefore expanded the type of tremcard that will constitute compliance with the obligations on the consignors and carriers of dangerous goods as listed in SANS 10228.

Where Solvents is involved in the transportation of dangerous goods, the company will need to ensure compliance with the requirements as detailed above, in instances where it transports dangerous goods as detailed in SANS 10228 in excess of the exempt quantities, i.e. that compliant tremcards are developed in accordance with the specified requirements. This provision will also apply to your dangerous goods suppliers and other companies involved in the transportation of dangerous goods (including hazardous waste) on behalf of your company.

Chapter 8 – Suggestion to Mitigate Legal Non-compliance

8.1 EMP into EMS

The aim of this research was to assess all RoD's that were issued for projects and new plants of Sasol Solvents since 1997 and to determine whether the requirements, as specified in the RoD's / Authorisations, have successfully been implemented in the operational ISO14001 (2004) EMS.

The objectives of the research as stated in Chapter 1 were as follows:

- A literature review (analysis) was conducted as an initial step to obtain a broad overview on the projects and new plants which have been established at Sasol Solvents since 1997.
- A literature review (analysis) was conducted to identify which of the projects and new plants have been authorised in terms of Environmental Conservation Act/ National Environmental Management Act.
- Record of Decision's issued for every project and new plant were analysed to identify the conditions specified in the RoD's / Authorisations.
- An analysis of all the requirements / conditions identified from the RoD's / Authorisations were conducted and have been captured and formalised in the ISO14001 (2004).
- A literature review (analysis) was conducted on the current status of the Sasol Solvents EMS.
- An analysis to evaluate the compliance and/or non compliance with possible patterns in terms of the RoD conditions for each new plant or operation.
- An analysis to evaluate the legal liabilities arising from the non-compliance with ROD conditions for each new plant or operation.
- An analysis to evaluate where the EIA fits in to the EMS.
- An analysis to identify options for integration of the RoD / authorisation within the EMS.
- An analysis to identify possible challenges for integrating the RoD / authorisation within the EMS.

The assessment of the implementation of the requirements as prescribed in the Record of Decision / Authorisation into Sasol Solvents, Environmental Management System

All of the above objectives were reached in this study and it can be concluded that ISO 14001 EMS is ideally suited to be used as a management tool to ensure that the RoD requirements are implemented and complied with.

The EMS is a voluntary management system, as seen in Chapter 6, therefore organisations have the flexibility to develop the management system to fit its own needs and subsequently the EMS is suited to manage the requirements of the RoD's.

The EIA process with RoD / authorisation requirements can be considered as another requirement that fits into EMS under ISO 14001 requirements 4.3.2 Legal and Other Requirements. The RoD / authorisation requirements can be intergated into the exiating EMS. The business must consider RoD / authorisation requirements when conducting risk assessments to update their business process.

Once the business processes and legal register are updated with all of the RoD / authorisation requirements, RoD / authorisation requirements can be removed from the register as other requirements. Business processes must be upated to include measurment and monitoring requirements to measure compliance against the RoD / authorisation requirements.

As seen in Chapter 6, ISO 14001 does not ensure legal compliance; however, it is the best management tool due to the fact that it is already imbedded as a management system. The EMS consists of all the characteristics and components, which are: environmental policy, identifying environmental aspects, managing objective, targets and programs, effective monitoring and measurement, reviewing management system to promote continuous improvement and therefore support the above statement.

It is also interesting to compare the RoD / authorisation requirements between the different provinces. It is clear that the requirements / conditions from Mpumalanga are far stricter than those from the Free State.

A lack of understanding from plant personnel on the EIA process and the incorporation of the RoD / authorisation requirements into the existing EMS were identified as challenge on integrating the RoD / authorisation requirements into the Solvents Secunda EMS were identified during the research. No system or process requirements were identified as challenges.

As seen in Figure 8.1 after training and awareness with plant personnel on the EIA process an improvement were seen in 2007 during the Octene Train 3 project. All the RoD / authorisation requirements were successfully implemented during the Octene Train 3 project. The Crotonaldehyde plant and the Crotonaldehyde loading area achieved a 100% compliance status the plant a loading area have been decommissioned is 2006.

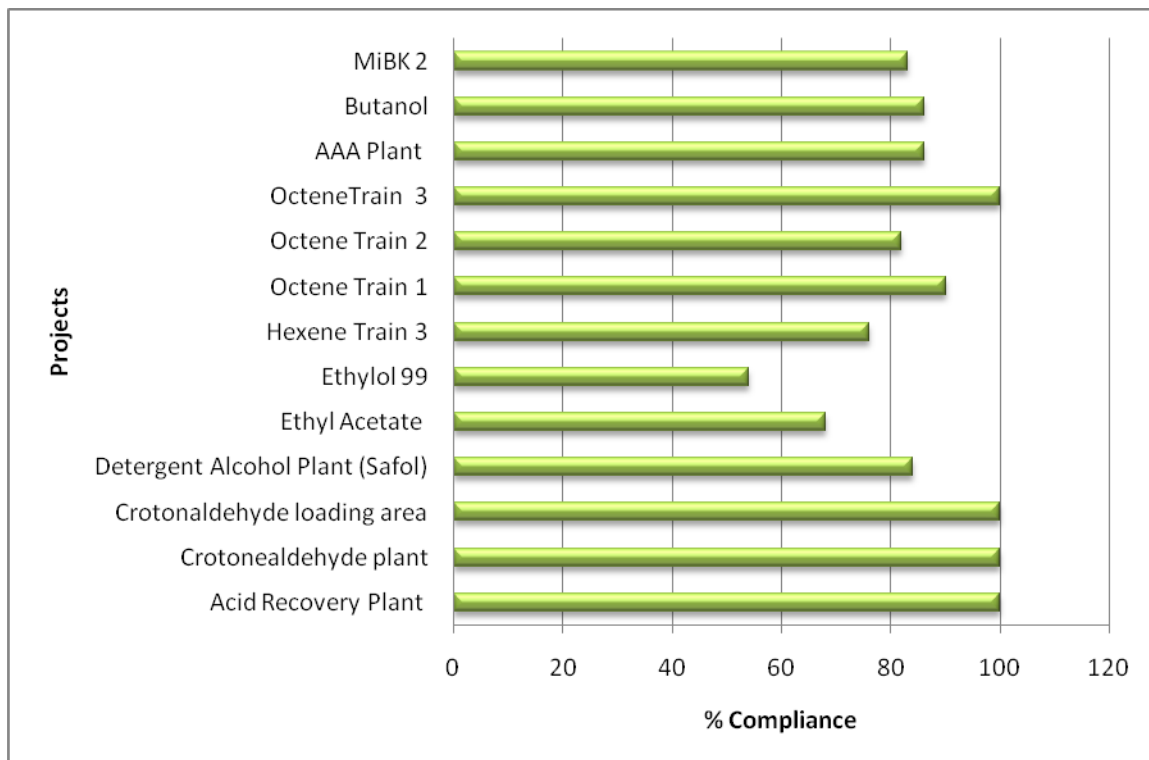


Figure 8.1: Sasol Solvents Compliance to RoDs / authorisation

The assessment of the implementation of the requirements as prescribed in the Record of Decision / Authorisation into Sasol Solvents, Environmental Management System

requirements

Therefore it can be concluded that the non-compliances is mostly because of no System requirement. The RoD requirements / conditions were therefore not specifically implemented but were rather captured in the system because of other system requirements.

Figure 8.2 is an indication of the number of deviations resulting in non compliances. The type of water usage is very prescriptive in the RoD's / authorisations. Solvents, Secunda extracts their water from the Secunda complex Synfuels the water licence owner. Therefore any change in the water suply from Synfuels results in a diviation for Solvents, Secunda according to the RoD's / authorisation requirements. These deviations were noted under ISO 14001 because of 4.3.2 Legal and Other Requirements.

Another pattern throughout the deviations was an audit report that was requested to be sent back to the Department for monitoring purposes. Solvents, Secunda conducts internal and external yearly audits. None of these reports are sent to the Department. These requirements were listed under no requirements.

It is also important to note that there is no mechanism and arrangement implemented by DACE to ensure that the requirements as stated in the RoD evaluated to ensure compliance to the RoD.

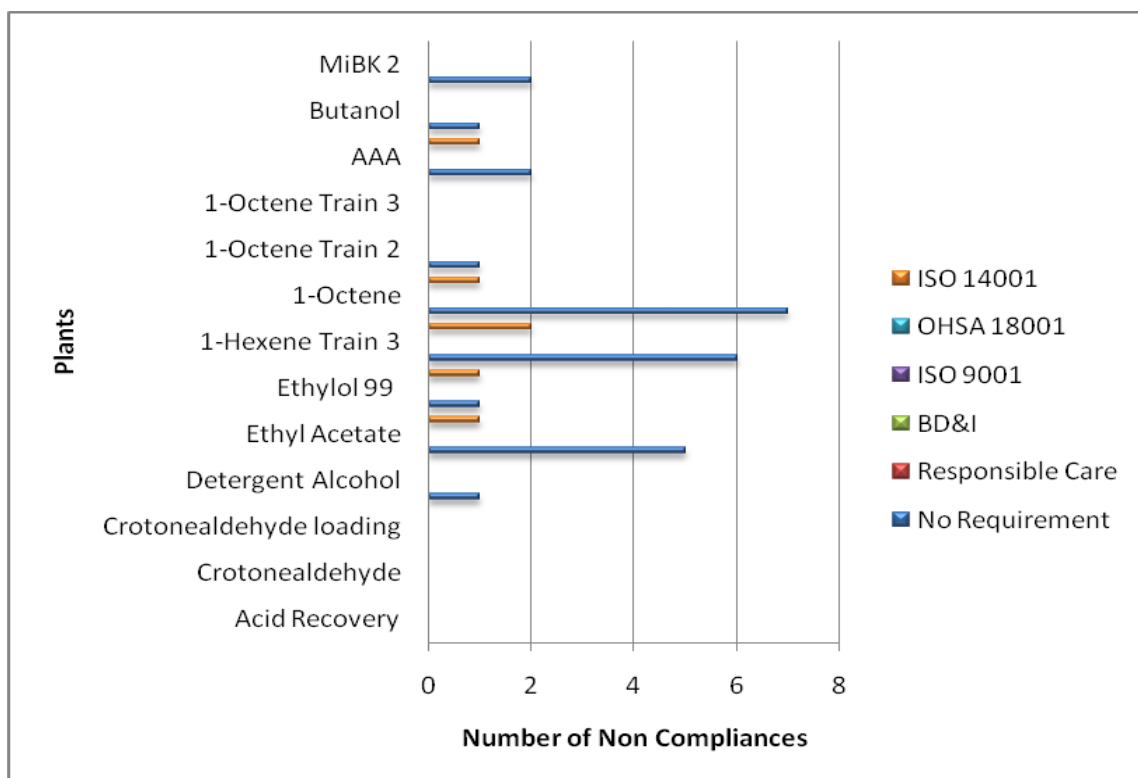


Figure 8.2: Non Compliance

8.2 Recommendations

The Record of Decisions and Environmental Management Plans submitted as part of the ROD submission must form part of the official sign off documentation before commissioning any project or new plant.

Dedicated personnel must be appointed either in the Business Units or as part of the project team to take the accountability and responsibility to ensure that all ROD's and EMP's are implemented. These dedicated personnel must further ensure that any agreements with authorities for example Air licence or Water permit requirements are included into the operational control requirements of the Business Unites for example Sasol Solvents.

8.3 Limitation

The proposed integration is unique to the Sasol Solvents. Most of the Business Units do not have dedicated SHERQ or Environmental Specialists available for project execution. Many of the Business Units are assisted from central Safety, Health and Environmental departments focusing on day to day operations.

8.4 Further Research

Further research should be done to evaluate the consistency of RoD's issued by MDACE. Many inconsistencies concerning requirements in the RoD's were identified during the evaluation process. The effect of the proposed integration between the BD&I process and the EMS to combine the resources must be evaluated to determine the efficacy.

8.5 Way Foreword

Short term solution

- The short term solution is that all outstanding RoD and EMP requirements are implemented into Sasol Solvents ISO 14001 Environmental Management System. To prevent any legal non compliance.
- Review the effectiveness of all RoD requirements implemented.
- Ensure that roles and responsibilities are clearly defined for each new project or development.
- Build capacity within the project team and Sasol Business unit to successfully implement effective solutions to the RoD, EMP and agreements with authorities.

Longer term Solution

- Employ dedicated personnel with the accountability and responsibility to assist Sasol Business Unites to successfully implement effective

solutions to the RoD, EMP and agreements with authorities. Until such time as the

- Formally entrench the RoD, EMP and agreements with authorities as hand over requirements before commissioning any new project or development.

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