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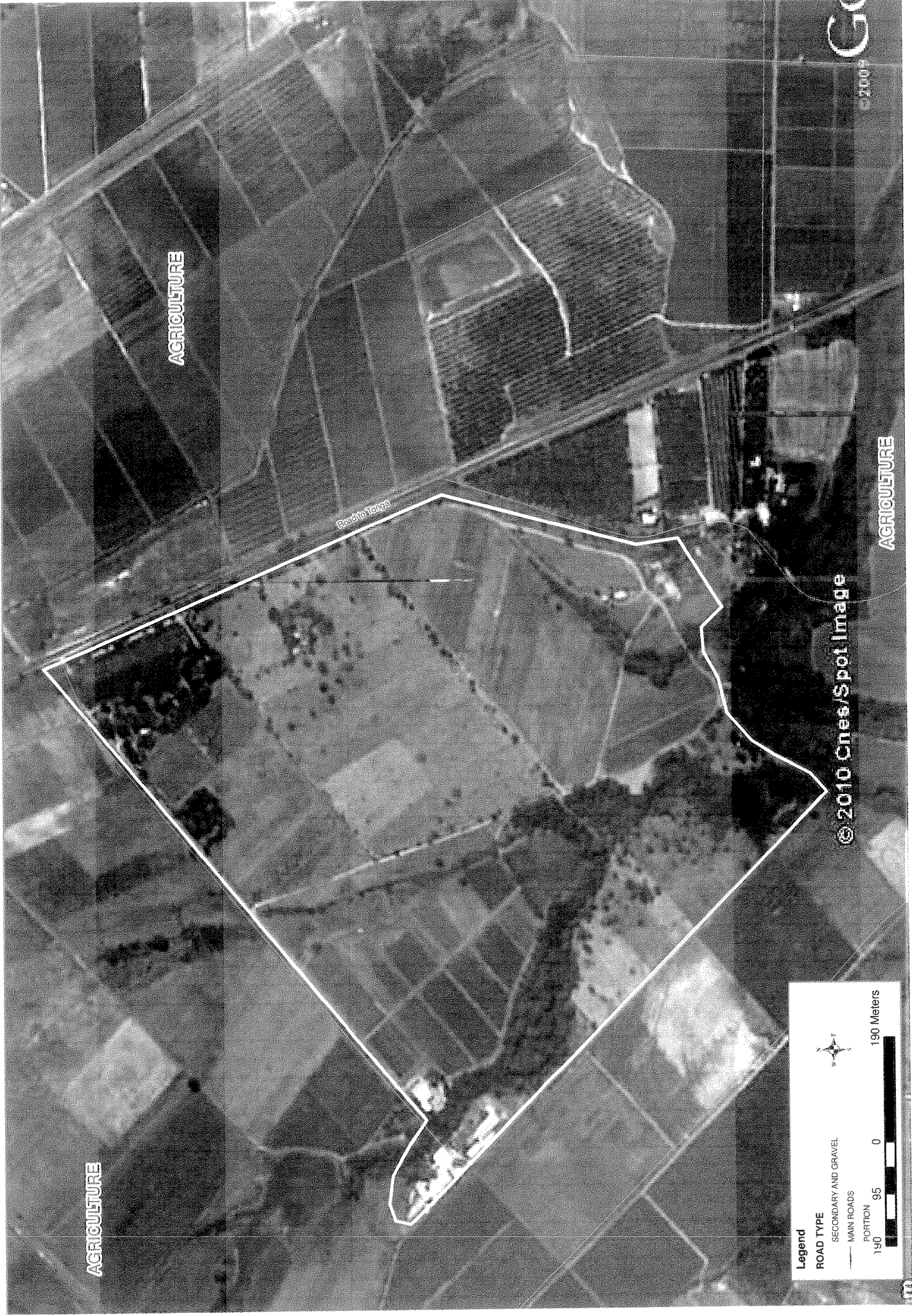
ABBREVIATIONS

ASAP	As Soon As Possible
Asl	Above sea level
BEE	Black Economic Empowerment
cm	centimetre
CMP	Construction Management Plan
DEDET	Department of Economic Development, Environment and Tourism
DWA	Department of Water Affairs
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMP	Environmental Management Programme
ESCOM	Electricity Supply Commission
GPS	Geographical Positioning System
I&AP's	Interested and Affected Parties
IEM	Integrated Environmental Management
IMRU	Intervet Malelane Research Unit
m	metre
mm	millimetre
m/s	metre per second
NA	Not Applicable
NHBRC	National Housing Building Regulations Council
OMP	Operational Management Plan
PDI	Previously Disadvantaged Individual

RES	Rhengu Environmental Services
SABS	South African Bureau of Standards
SAHRA	South African Heritage Resources Agency
sqm	square metre

APPENDIX 1:
SITE MAPS AND PHOTOGRAPHS

GOOGLE EARTH IMAGE



AGRICULTURE

AGRICULTURE

Reroto Toga

Legend

ROAD TYPE

SECONDARY AND GRAVEL

MAIN ROADS

190 95 0

190 Meters

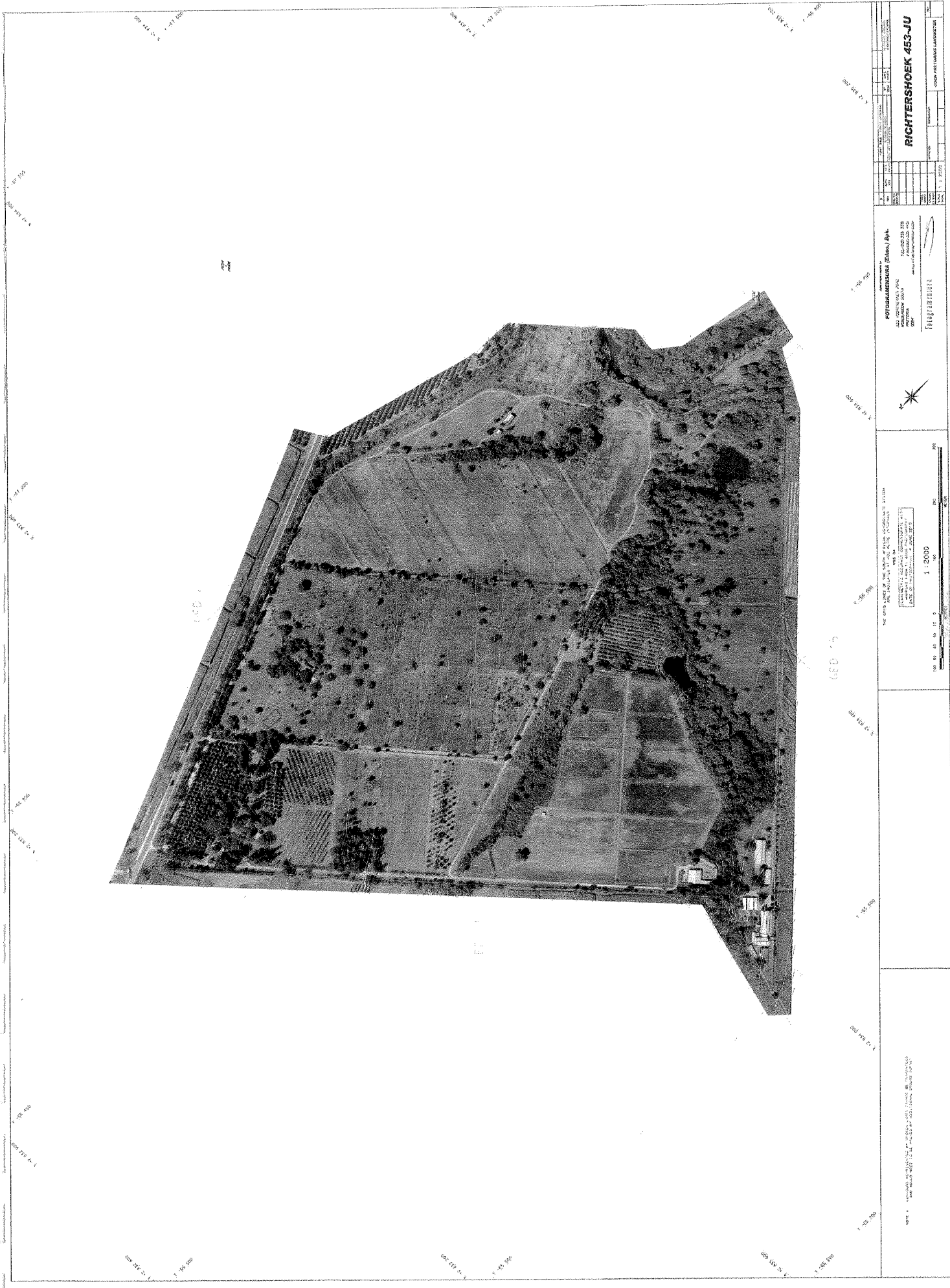
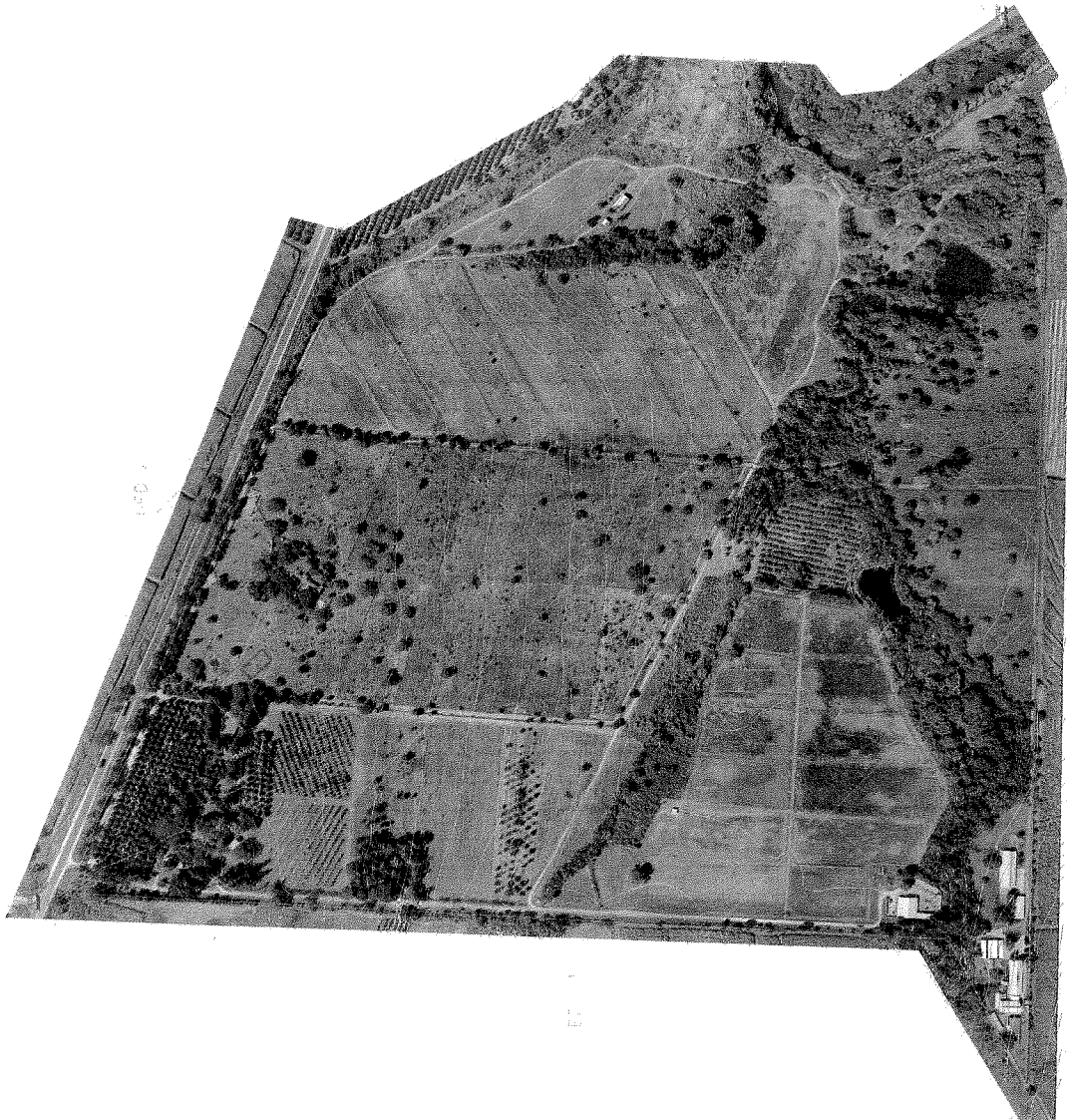


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AGRICULTURE

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GO



PROYECTO		FECHA		Escala	
1	2	3	4	5	6

RICHTERSHOEK 453-JU

PROYECTO: RICHTERSHOEK 453-JU
 ASISTENTE: [Nombre]
 INGENIERO: [Nombre]
 ESCALA: 1:2000



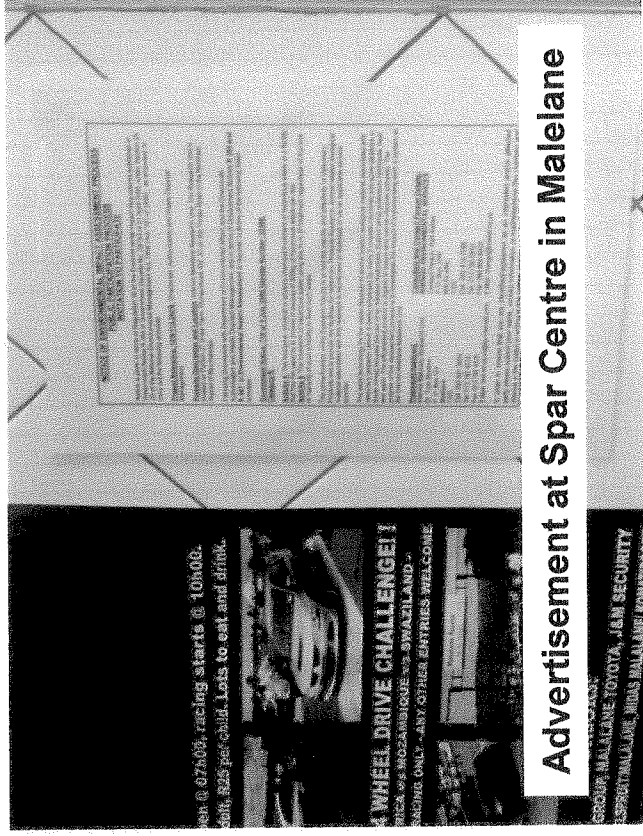
NOTA: [Texto de advertencia o instrucciones]
 ESCALA: 1:2000

NOTA: [Texto de advertencia o instrucciones]

SITE PHOTOGRAPHS

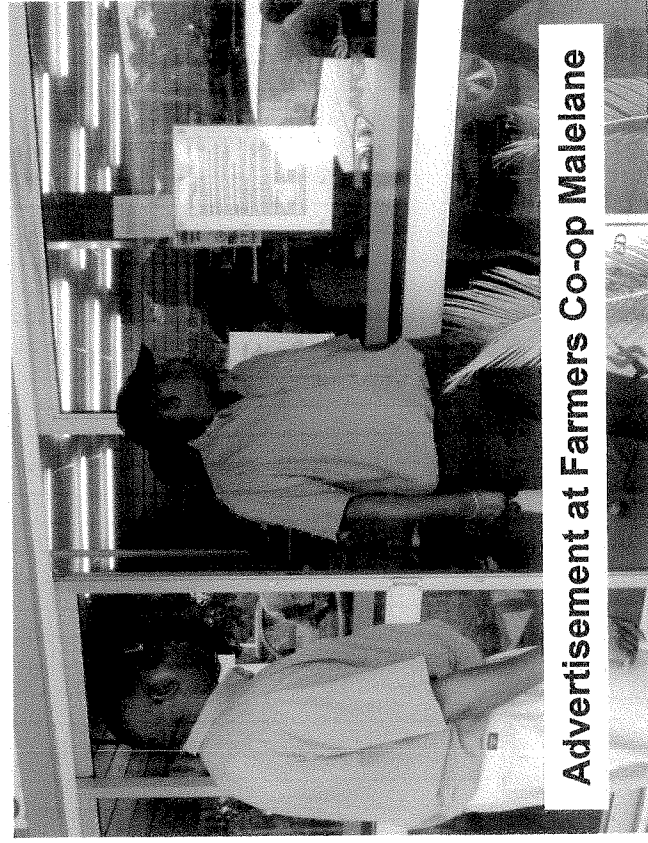


Advertisement on Front Gate to Site

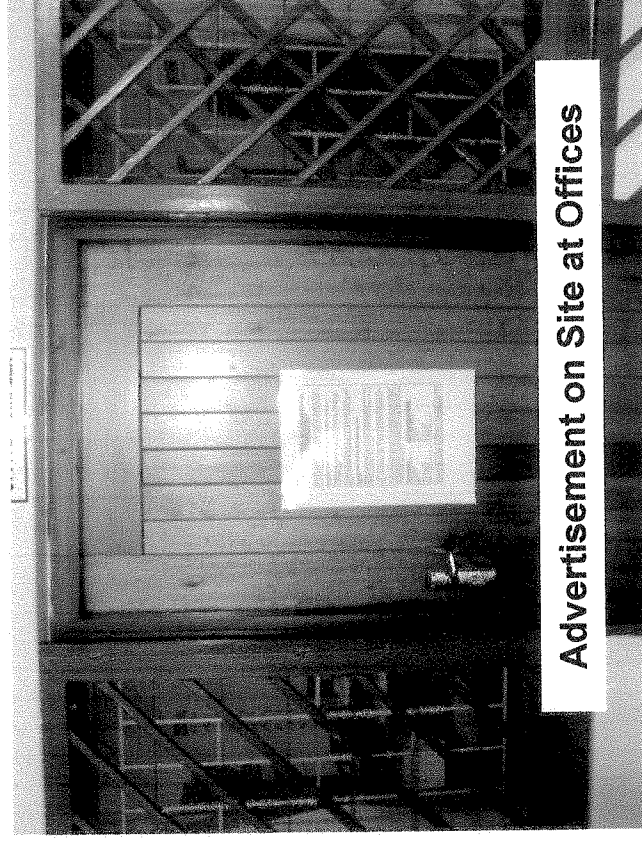


Advertisement at Spar Centre in Malelane

SITE PHOTOGRAPHS

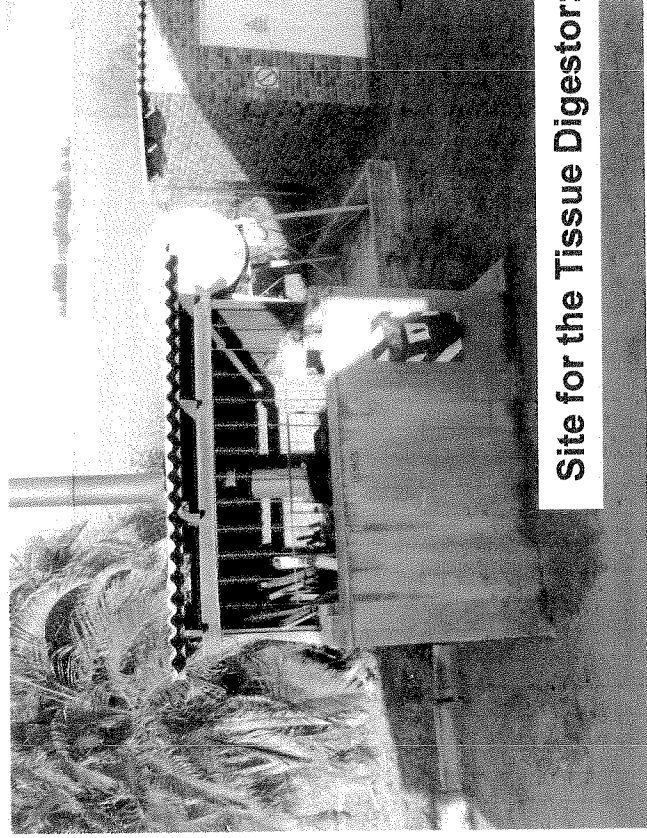


Advertisement at Farmers Co-op Malelane

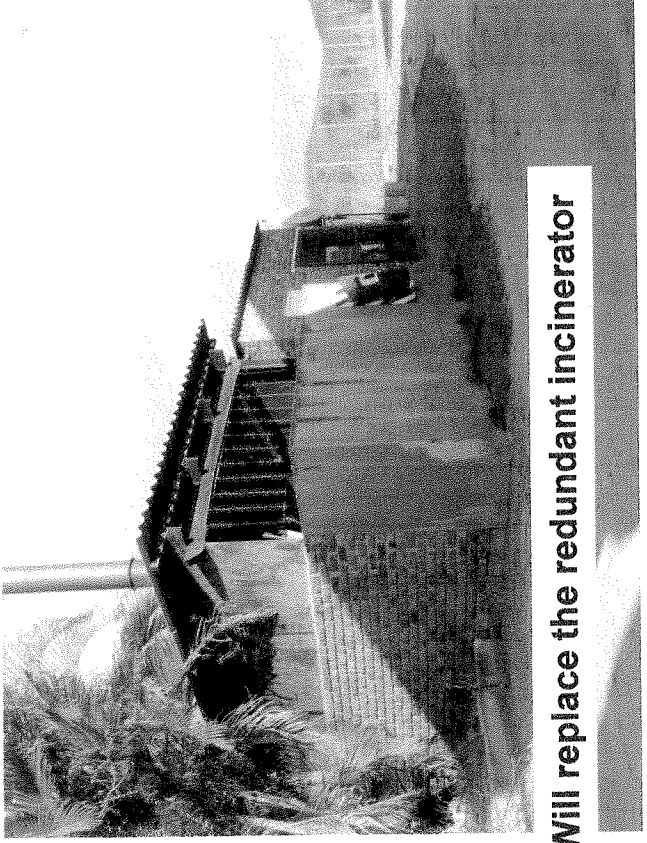


Advertisement on Site at Offices

SITE PHOTOGRAPHS



Site for the Tissue Digester: Will replace the redundant incinerator



Site for the Tissue Digester: Will replace the redundant incinerator

APPENDIX 2:

PUBLIC PARTICIPATION PROCESS

ISSUES AND RESPONSES REPORT

**COPIES OF ADVERTISEMENTS, NEWSPAPER NOTICES AND
MINUTES**

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AND LETTER FROM SAHRA

NOTICE OF ENVIRONMENTAL IMPACT ASSESSMENT PROCESS
PUBLIC PARTICIPATION PROCESS
INVITATION TO PARTICIPATE

Notice is given in terms of Regulation 56 of the Environmental Impact Regulations published in Government Notice R 385 in Government Gazette No. 28753 of 21 April 2006, under Section 24 (5) of the National Environmental Management Act, 1998 (Act. 107 of 1998) , as amended, to carry out the following activities:

Project Reference: 12/9/11/L240/6: Directorate: Authorisation and Waste Disposal Management.

Property Description and Location: Intervet Malelane Research Unit. The Research Unit is located on Portion 27 of the Farm: Richtershoek 452 JU on the Tonga Road in the Nkomazi District of Mpumalanga.

Following discussions with Department of Environmental Affairs and the Directorate: Authorisation and Waste Disposal Management, and in terms of Government Notices **R 385** and **R 387**, an **Environmental Impact Assessment** is required in terms of the following listed activities:

Government Notice: 718 of 3 July 2009 Gazette Number: 32368:
Category B:

Activity 4: The biological, physical or physico-chemical treatment of hazardous waste at a facility that has the capacity to receive in excess of 500kg of hazardous waste per day.

Activity 5: The treatment of hazardous waste using any form of treatment regardless of the size or capacity of such a facility to treat such waste.

The prime function of the Research Facility is to test the viability and effectivity of Veterinary Products and to provide the facilities for Veterinary Products Research. Animal related biological material associated with this research is incinerated or disposed of via an applicable service provider.

The latest technology for the waste disposal of animal related biological material associated with veterinary research (which is being employed by many European countries and some abattoirs in South Africa) includes the use of an Alkaline Hydrolysis System using potassium hydroxide, heat and water. The effluent/end product is organic in nature and can be used as compost. The purpose of this assessment process is to investigate the impact of implementing such a system at the Intervet Malelane Research Unit.

Proponent/Applicant:

Intervet Malelane Research Unit
Dr. Tom Strydom
P. O. Box 124
Malelane
1320
Cell: 082 901 2859
Tel: 013 792 4518
Fax: 013 792 4528
E-Mail: tom.strydom@sp.intervet.com

Consultant and Contact Person Details:

RHENGU ENVIRONMENTAL SERVICES
Contact Person: Ralf Kalwa
P. O. Box 1046
MALELANE
1320
Cell: 082 414 7088
Tel: 013 790 0553
Fax: 086 865 8003
E-Mail: rhengu@mweb.co.za

In order to ensure that you are identified/registered as an interested and/or affected party please submit your name, contact information (e-mail/telephone-/fax number) and interest in the matter in writing to the contact person on or before **31 May 2010**.

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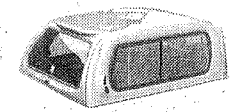
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NOTICE

NOTICE OF ENVIRONMENTAL IMPACT ASSESSMENT PROCESS PUBLIC PARTICIPATION PROCESS INVITATION TO PARTICIPATE
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Proponent/Applicant: Person Details: Intervet Malelane Research Unit SERVICES
 Dr. Tom Strydom
 P. O. Box 124
 Malelane 1320
 Cell: 082-901-2859
 Tel: 013-792-4518
 Fax: 013-792-4528
 E-Mail: tom.strydom@sp.intervet.com
 Consultant and Contact: RHENGU ENVIRONMENTAL
 Contact Person: Ralf Kalwa

NOTICE OF SALE IN EXECUTION - IMMOVA PROPERTY
 IN THE HIGH COURT C SOUTH AFRICA (TRAN PROVINCIAL DIVISION CASE NO. 51792 / 2007 FIRST RAND BANK LIM (FORMERLY KNOWN AS FIRST NATIONAL BANK SOUTHERN AFRICA LIL PLAINIFF SAM BOY MTHIMUNYE 1ST DEFENDANT AND ELOYETTE COHEN 2ND DEFENDANT
 A sale in Execution of the undermentioned property be held without reserve.

Access roads, water and electricity will be provided the nearest Rest Camp connection points and ab will include on-site sewer treatment systems. A Bas Environmental Assessee be conducted to identify, and mitigate any potential impact that these activities pose. To ensure that you registered as an intereste for affected party, please in writing, your name, cor details and interest in the on or before 21 May 2011 consultant mentioned bel background information document is available on request and an open information day for the pu will be held on 8 May 2011 Pretoriuskop and on 9 M 2010 at Berg-en-Dal Res Camps.
 Consultant: ECO 8 ENVIRONMENTAL PLANNERS,
 P.O. Box 12898, Nelspruit 1200,
 Tel: 013-744-9468
 Fax: 086 66 44 070 /
 E-mail: eco8@vodamail. ML

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 (GET) C P SMITH CHRISTO SMITH PROKUREURS ING. BELMONT VILLAS 306 PAUL KRUGERSTRAAT NELSPRUIT 1200 VERW: MNR SMITH / sq AP0175
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NOTICE OF SALE IN EXECUTION - IMMOVA PROPERTY
 IN THE HIGH COURT C SOUTH AFRICA (TRAN PROVINCIAL DIVISION CASE NO. 51792 / 2007 FIRST RAND BANK LIM (FORMERLY KNOWN AS FIRST NATIONAL BANK SOUTHERN AFRICA LIL PLAINIFF SAM BOY MTHIMUNYE 1ST DEFENDANT AND ELOYETTE COHEN 2ND DEFENDANT
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**EIA PROCESS: INTERVET MALELANE RESEARCH UNIT
WASTE LICENCE APPLICATION
PUBLIC PARTICIPATION AND AUTHORITIES REGISTER
18 JANUARY 2011**

Name & Company represented	Address	E-Mail	Fax	Telephone/Cell
Tom Strydom Intervet (Pty) Ltd	Malelane Research Unit Terra Road P.O. Box 104 Malelane, 1320	tom.strydom@sp.intervet.com	013-7924528	073-7924518 0832615891
Piet Kweek WPT (Pty) Ltd.	Wolfsraedt Stas NEWSPAPIT.	piet@waste-resolution-technologies.com	086 695 88 53.	082 844 996
Sabona Kgasi DEPT. OF ENVIRONMENTAL AFFAIRS (PTA)	4th Floor, FEDTORUM BUILDING, C/O VAN DER WALT & PRETORIUS STRS, PRETORIA	skgasi@environment.gov.za	012 320 0024	012 310 3140
Sindiswa Duma DEPT. OF ENV. AFFAIRS, PTA	371 Pretoria FEDSUS BULBINE PRETORIA	Sp.dunia@environment.gov.za	012-310 3753	012-3103612 073 2732768
Rufy Katwe Rheyn Env. Services	Box 1046 Mabasa, 1320	Rheyn@mvib.co.za	0866858003	0824147088

**EIA PROCESS: INTERVET MALELANE RESEARCH UNIT
WASTE LICENCE APPLICATION
PUBLIC PARTICIPATION AND AUTHORITIES REGISTER
8 JUNE 2010**

Name & Company represented	Address	E-Mail	Fax	Telephone/Cell
TOM STYLBOM Intervet (Pty) Ltd	MALELANE RESEARCH UNIT TONGA ROAD MALELANE 1320	tom.stylob@sp.internet.co.za	013-7924528	013-7924518
PIET KRUGER WRT	P.O. Box 435 WHITE RIVER, 1240	PIET@CONVERTECH.CO.ZA	0716046955 →	082 8414996
E. ZECHE Shosholoza	P.O. Box 684 Malelane	enerstzeche@yohoo.com	013 7900832.	082 715 2896 013 7900931
DAAN EPPARMEY FICHO SQUARE (Pty) Ltd	Postbus 151 MALALANE	echosquare@Ghyart.com	+33 2 41 22 82 83	+33 2 41 22 82 82
Jean-Michel POSTAL Intervet Pharma R&D	Rue/olivier de Serres. BP 67131 49071 BEAUCOUZE - FRANCE	jean-michel.postal@sp.internet.com		
Cameroon. Swacha	P.O. Box 744 MAROUANG 1320	cameroonswacha@gmail.com	013 7924850	082-3884020
D.A.M. Krug	P.O. Box 633 MALALANE De Hoek Bdy	082388437@vodanetmail.co.za	086563518.	0823884371

MINUTES OF THE MEETING/DISCUSSIONS
HELD WITH INTERESTED AND AFFECTED PARTIES (I&AP's): WASTE LICENCE
APPLICATION: INTERVET MALELANE RESEARCH UNIT:
8 JUNE 2010
10H00
Project Nr. 12/9/11/L240/6

1. Participants:

- | | |
|----------------------|---|
| • Dr. Tom Strydom | Intervet (Pty) Ltd. Malelane Research Unit. |
| • Piet Kruger | Waste Resolution Technologies. |
| • E. Zeelie | Farmer and Neighbour. |
| • Daan Erasmus | Echo Square Services. |
| • Jean Michel Postal | Intervet Pharma R&D. |
| • Cameron Svacha | Farmer and Neighbour. |
| • D. Kruger | Farmer and Neighbour. |
| • Ralf Kalwa | Rhengu Environmental Services. |

2. Apologies:

None.

3. Welcome and Background:

Ralf thanked the participants for the opportunity to meet. Ralf briefly explained the role of interested and affected parties in an Environmental Impact Assessment Process and encouraged everyone to participate in an open and transparent manner. They should feel free to voice their comments and provide input at any stage of the process. All the parties were asked to introduce themselves to each other. Ralf provided the following feedback:

- Intervet Malelane Research Unit has been operational since 1972 on the farm just outside Malelane-Hectorspruit in the Mpumalanga Province. The prime function of this facility is to test the viability and effectivity of Veterinary Products and to provide the facilities for Veterinary Products Research.
- In some instances, once the tests and trials have been completed, some of the animals are euthanized and this biological material is either incinerated and or disposed of via applicable Service Providers, e.g. Enviro Serv.
- During an Environmental Audit in early 2009 it was confirmed that the incinerator facility at the unit was outdated and not permitted as per the latest environmental legislation and conditions. The Environmental Audit found that the Unit would have to improve the disposal procedures of its biological material.
- The latest technology for the waste disposal of biological material (which is being used by many European countries and some abattoirs in South Africa) includes the use of an Alkaline Hydrolysis System where the tissue is digested using potassium hydroxide, heat and water. The effluent/end product is organic in nature and can be used as compost.
- Discussions with Government authorities in Nelspruit followed and it was determined that the Intervet Malelane Research Unit had to apply for a Waste Management Licence in terms of the National Environmental Management: Waste Act, 2008 (No. 59 of 2006). A precursor to this application was that an **Environmental Impact Assessment** had to be conducted as per the following regulation: "Government Gazette No. 32000: 10 March 2009.

Category B: Activity 2: The treatment of hazardous (biological) waste by a method other than biological or physiochemical treatment, including the construction of a facility and associated structures and infrastructure for such treatment.”

- To comply with **Environmental Legislation** an **Application** has been submitted to the Department of Environmental Affairs: National (DEA), in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2006, and to satisfy the regulations of the Waste Act.

Having said this, Rhengu Environmental Services (RES) were appointed to undertake this assessment process. As part of this assessment process a **Public Participation Process (PPP)** must be initiated to involve all potential interested and affected parties. This meeting would form part of this process.

4. Public Participation and Meeting:

RES has met with officials from DEA (Provincial and National). DEA: National are the lead authority for this authorisation. The department has issued an instruction to commence with the EIA. A **Newspaper Advertisement** inviting public participation was published in the Lowvelder (regional newspaper) on **23 April 2010**.

Advertisements were also placed at the entrance/access to the site on the tar road, in the towns of Malelane (Inkomazi Centre) and the local stores in the area. Furthermore the advertisement was also handed to Prudence Langa: Environmental Manager for the Nkomazi Town Council.

Ralf concluded that the purpose of this meeting was geared towards informing all the relevant parties about the scope of the development and to ensure that all the parties remain up to date on the relevant issues that will be investigated in the assessment phase. Furthermore, this meeting will afford the parties an opportunity to raise their concerns and submit suggestions pertaining to the issues that require assessment.

Dr. Tom Strydom (Intervet) was asked to inform the meeting of the functions and operations of the Research Unit.

This presentation was followed by **Piet Kruger** who informed the meeting about the implications and workings of the Alkaline Hydrolysis Process. Both presentations are attached to the minutes for reference purposes.

The following issues were raised during the meeting:

Issue	Response
<p>1. Training: What type of training is required to operate the alkaline hydrolysis machine?</p>	<p>Unskilled and semi skilled labour have been trained to operate the machine effectively within a period of 2 days.</p>
<p>2. Operational Failure: What can go wrong with the alkaline hydrolysis machine?</p>	<p>A power failure will cease operations. If the lids remain shut the liquids will remain stable until the power comes on again. The Intervet Research Unit has a standby generator on-site which can be activated to continue the supply of electricity. The heater elements and or other working components can malfunction as is the case with any mechanical apparatus. These can be easily repaired/replaced locally. It is important to note however, that we have not had any problems with our machines which are in operation to date.</p>
<p>3. End Product: What will happen to the end product?</p>	<p>The end product will be transferred into on-site Enviro-Serv Tanks which will be removed by Enviro-Serv on a regular basis. Comment from Jean Michel: It must be noted that Intervet will test substances in future, of which the ingredients are not fully understood or which have not been fully characterised, hence the use of Enviro-Serv to handle the end product off site. Above all, Intervet will always use the Precautionary Approach Principle.</p>
<p>4. Costs: The removal of the end product will be costly. If the product is safe, then why not use it on site for compost?</p>	<p>Intervet, have budgeted for the removal of the end product by the accredited firm of Enviro-Serv. This will happen with all waste that has been subjected to tests of which the ingredients are not fully characterised. Tissue material that has been subjected to known ingredients which have been fully characterised can be used as compost on site. For the time being though, all alkaline hydrolysis waste will be sent to Enviro-Serv.</p>
<p>5. Size of Facility: What is the size of the facility and will the area be bounded?</p>	<p>A designated brick and mortar building (4mX4m) with roof will be constructed to house the machine. The machine will rest on concrete floors which will be constructed to function as a bund. The Enviro-Serv Tanks will be parked on a bund concrete apron next to the facility.</p>
<p>6. Impact of process on other ingredients and chemicals.</p>	<p>It must be noted that research has shown that the alkaline hydrolysis process can destroy many chemicals. A list of the chemicals will be included in the EIA Reports.</p>
<p>7. Change of chemicals (potassium hydroxide): How often are the chemicals changed?</p>	<p>New chemicals are added for each new batch of tissue that is added to the machine.</p>
<p>8. Standard Operational Procedure (SOP)? Will the waste handling process under discussion be described in a SOP?</p>	<p>Yes, a SOP will be compiled as a matter of fact and due process. A SOP will be included in the EIA Reports.</p>

General Comments:

None.

The meeting adjourned at 12h00.

MINUTES OF THE MEETING/DISCUSSIONS
HELD WITH DEPARTMENT OF ENVIRONMENTAL AFFAIRS REPRESENTATIVES:
WASTE LICENCE APPLICATION: INTERVET MALELANE RESEARCH UNIT:
18 JANUARY 2011
12H00
Project Nr. 12/9/11/L240/6

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- | | |
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| • Piet Kruger | Waste Resolution Technologies. |
| • Sabona Kgasi | Department of Environmental Affairs |
| • Sindiswa Duma | Department of Environmental Affairs |
| • Ralf Kalwa | Rhengu Environmental Services. |

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- Intervet Malelane Research Unit has been operational since 1972 on the farm just outside Malelane-Hectorspruit in the Mpumalanga Province. The prime function of this facility is to test the viability and effectivity of Veterinary Products and to provide the facilities for Veterinary Products Research.
- In some instances, once the tests and trials have been completed, some of the animals are euthanized and this biological material is either incinerated and or disposed of via applicable Service Providers, e.g. Enviro Serv.
- During an Environmental Audit in early 2009 it was confirmed that the incinerator facility at the unit was outdated and not permitted as per the latest environmental legislation and conditions. The Environmental Audit found that the Unit would have to improve the disposal procedures of its biological material.
- The latest technology for the waste disposal of biological material (which is being used by many European countries and some abattoirs in South Africa) includes the use of an Alkaline Hydrolysis System where the tissue is digested using potassium hydroxide, heat and water. The effluent/end product is organic in nature and can be used as compost.

Dr. Tom Strydom (Intervet) was asked to inform the meeting of the functions and operations of the Research Unit.

This presentation was followed by **Piet Kruger** who informed the meeting about the implications and workings of the Alkaline Hydrolysis Process.

The following issues were raised during the meeting and the site visit which included a tour of the premises and all the facilities:

Issue	Response
<p>1. DEA: Comments by Provincial Environmental Department: The Draft EIR must be submitted to DEDET for comments and input.</p>	<p>RK will submit all Draft Reports to the Interested and Affected Parties that registered and all Government departments applicable. This will include DEDET and the local Nkomazi Municipality.</p>
<p>2. DEA: Copies/notifications to be included in the Appendices. Please ensure that:</p> <ul style="list-style-type: none"> • The water quality results of the farm and the stream are included in the Draft EIR and the Appendices. • The issue of some carcasses going to a Crocodile Farm nearby must be recorded in the Draft EIR. • The fact that the current incinerator will be dismantled must be highlighted in the Draft EIR. • Ensure that all copies of Accreditations are included in the EIR documents. 	<p>Comments noted. Information will be included.</p>
<p>3. DEA: What happens to the waste (household and other) at present at Intervet?</p>	<ul style="list-style-type: none"> • Household waste (black bags) is recorded and collected by the local Municipality and taken to the Landfill Site in Town. • Medical Waste (red bags) (syringes etc.) are collected by an accredited medical waste handling service provider. • Enviro-serv collects biological material.
<p>4. DEA: What quantities of biological tissue will be treated by the Alkaline Hydrolysis Machine?</p>	<p>A maximum of 6000kg per annum. This is considered as a low volume in the industry. E.g. Abattoirs etc. dispose of tons per day.</p>
<p>5. DEA: How often will the machine be used?</p>	<p>Approximately 4 or 5 days every 3 months.</p>
<p>6. DEA: Will carcasses be stored and where?</p>	<p>Intervet has a cold room facility however it is unlikely that carcasses will be stored as the post mortem process will lead into the disposal process as an online function.</p>
<p>7. DEA: What forms of energy will be required to drive the machine?</p>	<p>Electricity and Diesel driven methods will be used to provide power to the alkaline hydrolysis machine. A back-up generator will be used in times of power failure. All areas will be bunded.</p>

General Comments:

None.

The meeting and site visit adjourned at 15h00.

Issues and Responses Report: Application for a Waste Management Licence: Alkaline Hydrolysis Waste Management System: Intervet Malelane Research Unit: Project Reference: 12/9/11/L240/6

Interested and Affected Party: Questions posed by members attending the Focus Group Meeting on 8 June 2010.	Response
1. Training: What type of training is required to operate the alkaline hydrolysis machine?	Unskilled and semi-skilled labour have been trained to operate the machine effectively within a period of 2 days.
2. Operational Failure: What can go wrong with the alkaline hydrolysis machine?	A power failure will cease operations. If the lids remain shut the liquids will remain stable until the power comes on again. The Intervet Research Unit has a standby generator on-site which can be activated to continue the supply of electricity. The heater elements and or other working components can malfunction as is the case with any mechanical apparatus. These can be easily repaired/replaced locally. It is important to note however, that we have not had any problems with our machines which are in operation to date.
3. End Product: What will happen to the end product?	The end product will be transferred into on-site Enviro-Serv Tanks which will be removed by Enviro-Serv on a regular basis. Comment from Jean Michel: It must be noted that Intervet will test substances in future, of which the ingredients are not fully understood or which have not been fully characterised, hence the use of Enviro-Serv to handle the end product off site. Above all, Intervet will always use the Precautionary Approach Principle.
4. Costs: The removal of the end product will be costly. If the product is safe, then why not use it on site for compost?	Intervet, have budgeted for the removal of the end product by the accredited firm of Enviro-Serv. This will happen with all waste that has been subjected to tests of which the ingredients are not fully characterised. Tissue material that has been subjected to known ingredients which have been fully characterised can be used as compost on site. For the time being though, all alkaline hydrolysis waste will be sent to Enviro-Serv.
5. Size of Facility: What is the size of the facility and will the area be banded?	A designated brick and mortar building (4mX4m) with roof will be constructed to house the machine. The machine will rest on concrete floors which will be constructed to function as a bund.

	<p>The Enviro-Serv Tanks will be parked on a bunded concrete apron next to the facility.</p>
<p>6. Impact of process on other ingredients and chemicals.</p>	<p>It must be noted that research has shown that the alkaline hydrolysis process can destroy many chemicals. A list of the chemicals will be included in the EIA Reports.</p>
<p>7. Change of chemicals (potassium hydroxide): How often are the chemicals changed?</p>	<p>New chemicals are added for each new batch of tissue that is added to the machine.</p>
<p>8. Standard Operational Procedure (SOP)? Will the waste handling process under discussion be described in a SOP?</p>	<p>Yes, a SOP will be compiled as a matter of fact and due process. A SOP will be included in the EIA Reports.</p>
<p>9. DEA: Comments by Provincial Environmental Department: The Draft EIR must be submitted to DEDET for comments and input.</p>	<p>RK will submit all Draft Reports to the Interested and Affected Parties that registered and all Government departments applicable. This will include DEDET and the local Nkomazi Municipality.</p>
<p>10. DEA: Copies/notifications to be included in the Appendices. Please ensure that:</p> <ul style="list-style-type: none"> • The water quality results of the farm and the stream are included in the Draft EIR and the Appendices. • The issue of some carcasses going to a Crocodile Farm nearby must be recorded in the Draft EIR. • The fact that the current incinerator will be dismantled must be highlighted in the Draft EIR. <p>Ensure that all copies of Accreditations are included in the EIR documents.</p>	<p>Comments noted. Information and copies have been included under Appendices 4.6 and in the EIR .</p>
<p>11. DEA: What happens to the waste (household and other) at present at Intervet?</p>	<ul style="list-style-type: none"> • Household waste (black bags) is recorded and collected by the local Municipality and taken to the Landfill Site in Town. • Medical Waste (red bags) (syringes etc.) are collected by an accredited medical waste handling service provider. • Enviro-serv collects biological material.
<p>12. DEA: What quantities of biological tissue will be treated by the Alkaline Hydrolysis Machine?</p>	<p>A maximum of 6000kg per annum. This is considered as a low volume in the industry. E.g. Abattoirs etc. dispose of tons per day.</p>
<p>13. DEA: How often will the machine be used?</p>	<p>Approximately 4 or 5 days every 3 months.</p>
<p>14. DEA: Will carcasses be stored and where?</p>	<p>Intervet has a cold room facility however it is unlikely that carcasses will be stored as the post mortem process will lead into the disposal process as an online function.</p>

15. DEA: What forms of energy will be required to drive the machine?

Electricity and Diesel driven methods will be used to provide power to the alkaline hydrolysis machine. A back-up generator will be used in times of power failure. All areas will be banded.



SOUTH AFRICAN HERITAGE RESOURCES AGENCY

111 HARRINGTON STREET, CAPE TOWN, 8000
PO BOX 4637, CAPE TOWN, 8000
TEL: (021) 462 4502 FAX: (021) 462 4509

DATE: 9 September 2010
ENQUIRIES: Mr. Phillip Hine
Archaeology, Palaeontology and Meteorite Unit
E-mail: phine@sahra.org.za
Web site: www.sahra.org.za

YOUR REF: 12/9/11/L240/6
OUR REF: 9/2/203/0005

Mr. Ralf Kalwa
Rhengu Environmental Services
P.O. Box 1046
Malelane
1320

Dear Sir

**APPLICATION FOR A WASTE MANAGEMENT LICENCE IN TERMS OF
THE NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT, 2008
(NO. 59 OF 2008): ALKALINE HYDROLYSIS WASTE MANAGEMENT
SYSTEM ON THE INTERVET MALELANE RESEACRH UNIT FARM NEAR
HECTORSPRUIT: MPUMALANGA PROVINCE**

Thank you for your indication that development is to take place in this area.

In terms of the National Heritage Resources Act, no 25 of 1999, heritage resources, including archaeological or palaeontological sites over 100 years old, graves older than 60 years, structures older than 60 years are protected. They may not be disturbed without a permit from the relevant heritage resources authority. This means that before such sites are disturbed by development it is incumbent on the developer (or mine) to ensure that a **Heritage Impact Assessment** is done. This must include the archaeological component (Phase 1) and any other applicable heritage components. Appropriate (Phase 2) mitigation, which involves recording, sampling and dating sites that are to be destroyed, must be done as required.

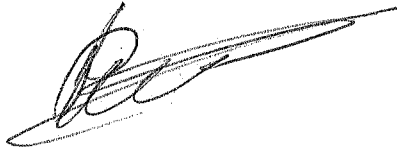
In your application received by SAHRA it was noted that the proposed project will occur within an existing industrial landscape. The likelihood of archaeological resources within the proposed project area is minimal. A Phase 1 Archaeological Impact Assessment is therefore not required in this instance. However, please note that:

- **Where bedrock is to be affected, or where there are coastal sediments, or marine or river terraces and in potentially fossiliferous superficial deposits, a Palaeontological Desk Top study must be undertaken to assess whether or not the development will impact upon palaeontological resources - or at least a letter of exemption from a Palaeontologist is needed to indicate that this is unnecessary. If the area is deemed sensitive, a full Phase 1 Palaeontological Impact Assessment will be required and if necessary a Phase 2 rescue operation might be necessary. (See attached list of accredited Palaeontologists).**

Any other heritage resources that may be impacted such as built structures over 60 years old, sites of cultural significance associated with oral histories, burial grounds and graves, graves of victims of conflict, and cultural landscapes or viewsapes must also be assessed.

Attached please find a link to a list of accredited palaeontological specialists who may be contacted to undertake the necessary palaeontological impact assessments.

Yours sincerely



PP Nonofho Ndobochani
SAHRA: Archaeology, Palaeontology and Meteorite Unit
For: CHIEF EXECUTIVE OFFICER

Copy: PHRA Mpumalanga Office

Appendices: List of accredited Palaeontologists

APPENDIX 3:
DOCUMENTATION WITH DEA



environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

Private Bag X 447, PRETORIA, 0001 - Fedsure Building, 315 Pretorius Street, PRETORIA

Ref No.: 12/9/11/L240/6

Enquiries: Ms S Duma/ Ms L Mnguni

Tel: (012) 310 3612/3284 Fax: (012) 310 3753

Email: spduma@deat.gov.za / lmnguni@deat.gov.za

Rhengu Environmental Services (Pty) Ltd
P.O. Box 1046
MALELANE
1320

Fax No. (086) 685 8003

Attention: Ralf Kalwa

APPLICATION FOR A WASTE MANAGEMENT LICENCE IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT, 2008 (NO. 59 OF 2008): ALKALINE HYDROLYSIS WASTE MANAGEMENT SYSTEM ON THE MALELANE RESEARCH UNIT FARM NEAR HECTORSPRUIT

Our letter dated 24 February 2010 refers,

This Department confirms having received an amended electronic version of information requested on page 3 of the licence application form for the above-mentioned waste management licence activity on 25 February 2010.

You are hereby reminded to comply with the requirements in Regulation 77 of GN No. R 385 pertaining to the timeframes allowed for complying with the requirements of this regulation, and Regulations 58 and 59 of GN No. R 385 with regard to the commenting period for interested and affected parties on all reports submitted.

Your application has been assigned with a reference number (12/9/11/L240/6). Kindly quote this reference number in any future correspondence in respect of your application. The responsible officer for the processing of your application is Ms Sindiswa Duma Mahlangu who can be contacted on (012)310 3612.

Please be advised that the applicant's attention to the fact that the activity in concern may not commence prior to a waste licence being granted by the Department.

Should you require further detailed information, please do not hesitate to contact this office.

Yours sincerely

Ms Nosipho Ngcaba
Director-General
Department of Environmental Affairs
Letter signed by: Mr Mpho Tshitangoni
Designation: Deputy Director: Permitting
Date: 03/03/2010
Cc: Intervet (Pty) Ltd: (013) 792 4528



environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

Private Bag X 447, PRETORIA, 0001- Fedsure Building, 315 Pretorius Street, PRETORIA

Ref No.: 12/9/11/L240/6

Enquiries: Ms Sindiswa Duma

Tel: (012) 310 3612 Fax: (012) 310 3753 Email: spduma@environment.gov.za

Rhengu Environmental Services
P.O. Box 1046
MALELANE
1320

Fax No. 086 685 8003

Attention: Ralf Kalwa

ACCEPTANCE OF THE FINAL SCOPING REPORT FOR ALKALINE HYDROLYSIS WASTE MANAGEMENT SYSTEM IN INTERVET MALELANE RESEARCH UNIT FARM NEAR HECTORSPRUIT, MPUMALANGA PROVINCE.

The Final Scoping Report dated 8 October 2010 received by the Department on 08 October 2010 refers.

The Department has evaluated the submitted Final Scoping Report (FSR) and is satisfied that the FSR complies with the requirements of the Environmental Impact Assessment (EIA) Regulations, 2006. The FSR is hereby accepted by the Department in terms of regulation 31(1) (a) of the EIA Regulations, 2006.

You may proceed with the Environmental Impact Assessment Report (EIAR) as required in terms of the EIA Regulations, 2006.

Please ensure that commenting from all the relevant authorities including but not be limited to the Provincial Department of Environmental Affairs are submitted to the Department with the final EIAR. Furthermore the comments listed below must be addressed when compiling the EIAR.

The applicant is hereby reminded to comply with the requirements of GN R.385 (77) with regard to the time period allowed for complying with the requirements of the Regulations, and GN R. 385 (58) and (59) with regard to the allowance of a comment period for interested and affected parties

on all reports submitted to the competent authority for decision-making. The reports referred to are listed in GN R. 385 (58) (3a-3g).

Please note that the activity may not commence prior to an environmental authorisation being granted by the Department.

Yours sincerely

Ms Joanne Yawitch
Deputy Director-General
Environmental Quality and Protection
Letter signed by: Ms Sindiswa Duma
Designation: Assistant Director: Permitting
Date: 22/11/10

Cc: Dr. Tom Strydom – Intervet Malelane Research Unit (013) 792 4518

APPENDIX 4:
SUPPORTIVE DOCUMENTATION

APPENDIX 4.1:

TITLE DEED

Registration No. of company/Registrasienommer van maatskappy

1984/006837/07

Certificate of change of name of company

Sertifikaat van verandering van naam van maatskappy

This is certify that/Hierby word gesertifiseer dat
HOECHST ROUSSEL VET (PROPRIETARY) LIMITED

has changed its name by SPECIAL RESOLUTION and is now called
sy naam verander het by SPESIALE BESLUIT en nou genoem word

INTERVET (PROPRIETARY) LIMITED

and that the new name has this day been entered in the Register of Companies.
en dat die nuwe naam op hierdie dag in die Register van Maatskappye aangeteken is.

Signed and sealed at Pretoria, this/Geteken en geseël te Pretoria op hede die 15
day of/dag van 2000-12-15 DECEMBER
TWE E DUISEND 2000
TWO THOUSAND
REGISTRAR OF COMPANIES
AND OF CLOSE CORPORATIONS
Registrar of Companies/Registrateur van Maatskappy

Seal of Companies Registration Office
Seël van Registrateur van Maatskappy

Certificate of change of name dated _____ herewith
Hierby sertifikaat van verandering van naam gedateer

Name of Company **HOECHST ROUSSEL VET (PROPRIETARY) LIMITED**
Naam van maatskappy

Postal Address **Private Bag X9**
Posadres **Parkview**
2122

Agent Code

Date stamp of companies Registration office

Registrar of Companies, SEAPY
N VAN BESLIEF KORPORASIES
Datumstempel van registrasiekantoor vir
Maatskappye
Registrateur van Maatskappye.

REGISTRAR OF COMPANIES
AND OF CLOSE CORPORATIONS

84/06837/07

Registration No. of company/Registrasienommer van maatskappy

Certificate of change of name of company

Sertifikaat van verandering van naam van maatskappy

This is to certify that/Hierby word gesertifiseer dat

HOECHST AG-VET (PTY) LIMITED

has changed its name by SPECIAL RESOLUTION and is now called
sy naam verander het by SPESIALE BESLUIT en nou genoem word

HOECHST ROUSSEL VET (PROPRIETARY) LIMITED

and that the new name has this day been entered in the Register of Companies.
en dat die nuwe naam op hierdie dag in die Register van Maatskappye aangeteken is.

Signed and sealed at Pretoria, this/Geteken en geseël te pretoria op hede die 28

day of/dag van May

One Thousand Nine Hundred and/Eenduisend Negehonderd NINETY SIX

Registrar of Companies/Registateur van Maatskappye

Certificate of change of name dated _____ herewith
Hierby sertifikaat van verandering van naam gedateer

Name of Company
Naam van maatskappy HOECHST ROUSSEL VET (PROPRIETARY) LIMITED

Postal Address ATT: S WIGGINS
Posadres P O BOX 8892

JOHANNESBURG
2000

Date stamp of companies-Registration Office
Registries of Companies **VAN MAATSKAPPYE**
EN VAN BESLOTE KORPORASIES
Datumstempel van registrasiekantoor vir
Maatskappye.
Registreur van Maatskappye 28

**REGISTRAR OF COMPANIES
AND OF CLOSE CORPORATIONS**

Registration No. of company/Registrasienommer van maatskappy

84/06837/07

Certificate of change of name of company

Sertifikaat van verandering van naam van maatskappy

This is to certify that/Hierby word gesertifiseer dat

HOECHST ANIMAL HEALTH (PROPRIETARY) LIMITED

has changed its name by SPECIAL RESOLUTION and is now called
sy naam verander het by SPESIALE BESLUIT en nou genoem word

HOECHST AG-VET (PROPRIETARY) LIMITED

and that the new name has this day been entered in the Register of Companies.
en dat die nuwe naam op hierdie dag in die Register van Maatskappye aangeteken is.

Signed and sealed at Pretoria, this/Geteken en geseël te Pretoria op hede die One
day of/dag van September
One Thousand Nine Hundred and/Eenduisend Negehonderd Ninety-two

Registrar of Companies/Registrateur van Maatskappye

Name of Company
Naam van maatskappy HOECHST AG-VET (PTY) LTD
Postal Address P O BOX 8692
Posadres JOHANNESBURG 2000
ATT: MR G LOMBARD

Date stamp of companies Registration Office
Registrar of Companies
Date stamp of Registrar of Companies
Maatskappye
Registrar of Companies
10 1 SEP 1992
PRETORIA
REGISTRAR OF COMPANIES

Registration No. of company/Registrasienommer van maatskappy

84/06837/01

Certificate of change of name of company

Sertifikaat van verandering van naam van maatskappy

This is to certify that/Hierby word gesertifiseer dat

Coopers Animal Health (Proprietary) Limited.

has changed its name by SPECIAL RESOLUTION and is now called sy naam verander het by SPESIALE BESLUIT en nou genoem word

Hoekst Animal Health (Proprietary) Limited.

and that the new name has this day been entered in the Register of Companies. en dat die nuwe naam op hierdie dag in die Register van Maatskappye aangeteken is.

Signed and sealed at Pretoria, this/Geteken en geseël te Pretoria op hede die 27th day of/dag van September One Thousand Nine Hundred and/Eenduisend Negehonderd Ninety One

Registrar of Companies/Registrateur van Maatskappye

Certificate of change of name dated _____ herewith Hierby sertifikaat van verandering van naam gedateer

Name of Company Naam van maatskappy HOEKST ANIMAL HEALTH

Postal Address Posadres P.O BOX 8092
JHB 2000

Date stamp of companies Registration Office Registrars of Companies 1991-09-27
Datumstempel van registrasiekantoor vir Maatskappye. PRETORIA 6001 Registrateur van Maatskappye REGISTRAR OF COMPANIES

Registrasienuommer van Maatskappy/Registration No. of Company

84 06837/07

Sertifikaat van Inlywing
van 'n Maatskappy met 'n aandeelkapitaal
Certificate of Incorporation
of a Company having a share capital

Hierby word gesertifiseer dat/This is to certify that

COOPERS ANIMAL HEALTH (PROPRIETARY) LIMITED

vandag ingelyf is kragtens die Maatskappywet, 1973 (Wet 61 van 1973), en dat die Maatskappy 'n maatskappy is met 'n aandeelkapitaal.

was this day incorporated under the Companies Act, 1973 (Act 61 of 1973), and that the Company is a company having a share capital.

Geteken en geseël te Pretoria op hede die/Signed and sealed at Pretoria this

4 dag van/day of July Eenduisend Negehonderd/

One Thousand Nine Hundred and Eighty-four (1984).

M. M. LABUSCHAGNE
Registrateur van Maatskappye/Registrar of Companies

Seël van die Registrasiekantoor vir Maatskappye.
Seal of Companies Registration Office.

Hierdie sertifikaat is nie geldig nie, tensy geseël deur die seël van die Registrasiekantoor vir Maatskappye.
This certificate is not valid unless sealed by the seal of the Companies Registration Office.

APPENDIX 4.2:
WATER RIGHTS AND PERMITS



water & forestry

Department:
Water Affairs and Forestry
REPUBLIC OF SOUTH AFRICA

Confirmation Report for Register Number: 24021176
Office: MPUMALANGA OFFICE
Workgroup: MPUMALANGA OFFICE WORKGROUP
Part 1 - DW758: COMPANY, BUSINESS OR PARTNERSHIP;
NATIONAL OR PROVINCIAL GOVERNMENT

Status: ACTIVE
Status Date: 2001/11/28 04:15:51 PM

Generic Part 1 Details

Validation

Validation Status:
Assignment Code:
Assignment Name:
Last Change Date:
Official's Name:

Verification

Verification Status:
Assignment Code:
Assignment Name:
Last Change Date:
Official's Name:

Language Preference

Applicant Language Preference

Written Communication: ENGLISH
Verbal Communication: ENGLISH

VAT Registration Information

VAT Registration Number:

Applicant Details

Name of Company: CENTEON PHARMA
Enterprise Type: (PTY) LTD
Trading Name:
Business Registration Number: 1984/006837/07
Date Established: 1984/01/01

Country Established: SOUTH AFRICA

Contact Details

Postal Address: PO BOX 124
MALELANE

1320

Street Address:

Contact Telephone Number

Area/Cell Code: 013

Number: 7904518

Extension:

Contact Person Details

Surname:

Name:

Title:

Contact Telephone Number

Number:

Extension:

Cellphone:

Fax Number:

Email:

Billing Information

Water Management Area: INKOMATI

File Number: 27/2/1/X14H/030

District Municipality Establishment Yes

Levy Payable:

Comment

WUN 1 - DW761: STORING WATER

Status: REGISTERED
Water Use Status Date: 2003/10/25 09:55:03 PM

Generic Part 2 Details

Validation

Validation Status:
Assignment Code:
Assignment Name:
Last Change Date:
Official's Name:

Verification

Verification Status:
Assignment Code:
Assignment Name:
Last Change Date:
Official's Name:

Succession/Transfer Type and Source Part 2 Details

Succession/Transfer Type:

Source Part 2 Details:

Storage of Water

Registration of: Raw Water

Storage of Raw Water

Name of Watercourse(s) where Water is to be Stored: TRIBUTARY OF LOMATI RIVER
Total Volume of Raw Water: 15180 CUBIC METRES
The Total Number of Dams for Storing of Raw Water: 2

List and Description of Dams

<i>Dam Name</i>	<i>Estimated/calculated</i>	<i>Measures for movement of aquatic species</i>	<i>Volume (m³)</i>
RICHTERSHOEK 453 JU 27:DAM 1 TO 2	ESTIMATED	No	15180

Existing Authorisation

Water Use Start Date: 1973/01/01

Existing Permit Information:

<i>Permit Number</i>	<i>Permit Date</i>

Does water use take place in terms of General Authorisation? No

If an Authorisation has Been Issued Under Other Legislation:

Property Details

Property Id: 79252
Property Record Status: COMPLETE
Record Status Date: 2008/08/23 02:58:34 PM
Property Name: RICHTERSHOEK
Office: MPUMALANGA OFFICE
Property Area:
Area Measure Unit:
Property Physical Status:
Physical Status Date:
Property Registration Date: 1973/01/01
End Date:
Property Type: UNSPECIFIED

Surveyed Property

Property Type Specific Name:
Property Number: 453
Property Portion Number: 27
Title Deed Number: T103578/1999
Surveyor-General Cadastral Code: TOJU00000000045300027
Surveyor-General Office: PRETORIA
Deeds Office: PRETORIA
Province: MPUMALANGA
Registration Division: JU

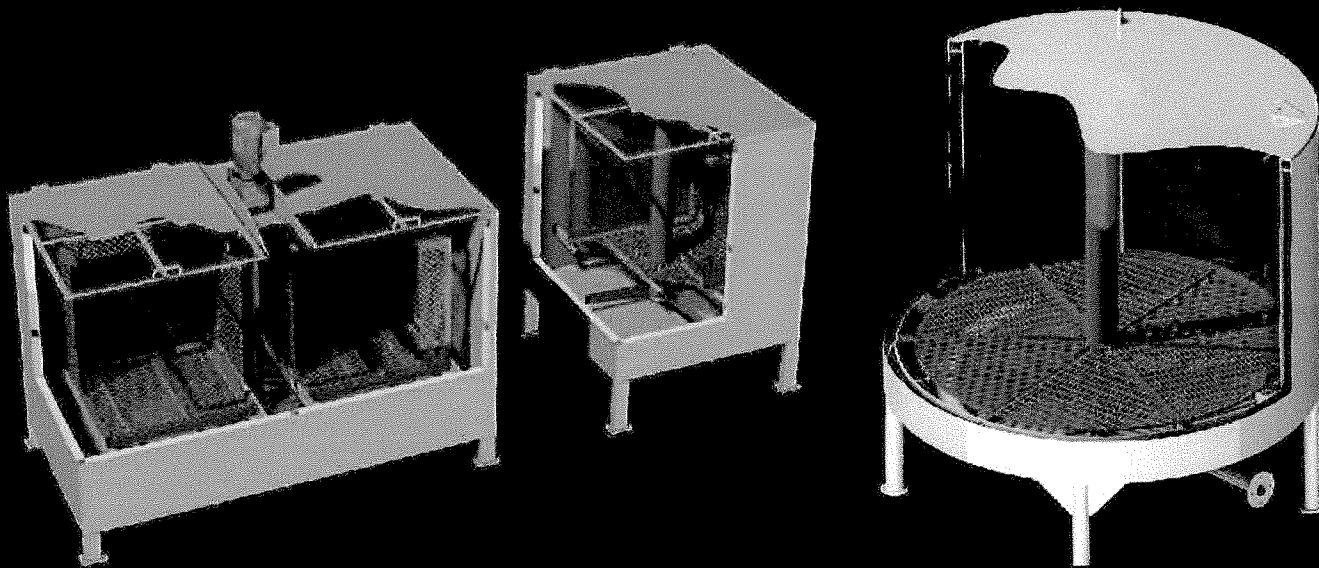
<i>Property Sequence Number</i>	<i>WUN/Property Relationship Start Date</i>	<i>WUN/Property Relationship End Date</i>
1	1973/01/01	

APPENDIX 4.3:
ALKALINE HYDROLYSIS PROCESS



Overview Of Waste Resolution Technology's

Low Pressure Tissue Digestor Systems



The Only Tissue Digestor Systems Specifically
Designed For The Effective Treatment of
Condemned Abattoir Tissue Waste

WARNING

Please be aware that this document contains graphic images of animal mortalities and may be disturbing to sensitive readers.



Introduction to Tissue Digestors

What Is a Tissue Digestor?

A tissue digestor is a specialized piece of equipment that breaks down specific organic materials through a catalysed thermo-chemical process, thereby effecting a pre-determined level of hydrolysis of the various individual constituents that once made up such organic material.

How Does It Work?

WRT's low pressure tissue digestors utilize a proprietary MAAH process (Modified Atmospheric Alkaline Hydrolysis). The MAAHP digestors employ an extensively modified version of the standard high pressure alkaline hydrolysis processes more commonly used to digest extremely biologically hazardous specimens in research facilities.

The MAAH systems uses heat, water and a metal base as the three main components to rapidly digest condemned abattoir waste. The specific tissue digestor's mechanical configuration combined with the correct ratios of heat, water and concentration of alkali provided by the metal base determines the speed, overall effectiveness and pathogen reduction capabilities of the tissue digestor system.

Principle Actions of the MAAH process

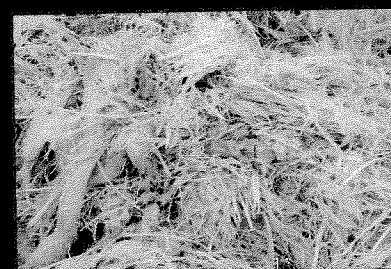
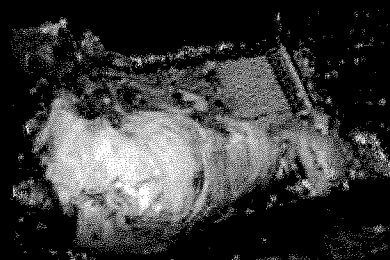
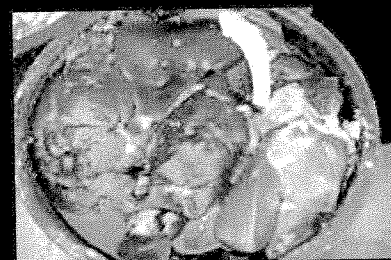
- ✓ The MAAH process leads to the degradation of proteins, the major solid constituent of all animal cells and tissues.
- ✓ The protein coats of viruses are destroyed and the peptide bonds of protein based infectious organisms are broken down during the MAAH process.
- ✓ Simple fats consist of three fatty acid chains bound through ester bonds to a molecule of glycerol. Ester bonds are also hydrolyzed, yielding basic soaps with the MAAH process.
- ✓ Polyunsaturated fatty acids and carotenoids (pigments) undergo molecular rearrangements and are destroyed by the MAAH process.

Feedstock For A WRT Tissue Digester

Digestible Material

As the name implies, WRT's tissue digestors are specifically designed to deal with **tissue waste**. Common types of tissue waste that can be effectively treated using a tissue digester would include:

- ✓ Meat, Blood, Tendons, Muscles
- ✓ Fat and Fatty Tissue
- ✓ Feathers, Hooves, Hair
- ✓ Hides and Skins
- ✓ Bone Matter
- ✓ Whole Carcasses of smaller animals (bird, dogs, cats, sheep, pigs etc). Larger carcasses are usually cut into smaller pieces prior to loading the digester.



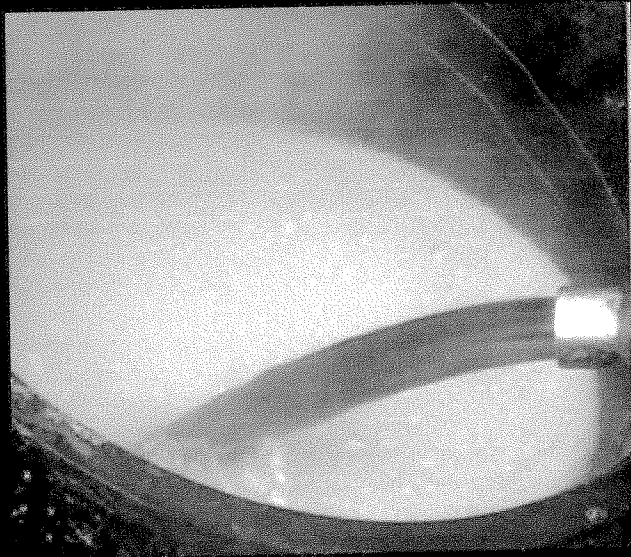
Indigestible Material

A tissue digester is a very effective means of dealing with proteinacious waste, but is not designed to digest waste derived from plants or other inorganic substances such as plastics, synthetic polymers and metals. Indigestible materials still benefit from the thermo-chemical treatment in terms of providing pathogen control, and there is no need to separate these materials if they are present in the tissue waste that is being treated. All indigestible materials can safely be removed and disposed of once the tissue digestion cycle has been completed.

What Is Left Afterwards?

Resulting Effluent

Digested tissue waste changes from a solid state to a pathogen free liquid state due to extensive hydrolyses of the organic fractions that break down the tissue into its original building blocks - amino acids, small peptides, simple sugars, basic soaps and the mineral residue of bones and teeth (Calcium Phosphate).



Final Effluent State - Solid or Liquid

Digester effluent is always discharged as a hot liquid, but the choice of digestive mixture(s) used to catalyse the process will ultimately determine whether or not the resulting digester effluent remains a liquid or solidify once cooled down to below 40 degrees Celsius. Typically the intended end use of the effluent will dictate which effluent form is desirable for the specific application.

What about the remaining bones?

Bones disintegrate entirely over time, and there is no need to remove them from the digester after each cycle. If desired, the bone shadow can be removed and land filled or dried and used as calcium phosphate treatment for garden soils.

Process Overview

TISSUE RECEIVING
CONTROL STATION

▼
CALCULATE TISSUE
WEIGHT

▶ CALCULATE WATER
REQUIREMENTS

▶ CALCULATE CHEMICAL
REQUIREMENTS

▶ LOAD DIGESTOR WITH
TISSUE, WATER & CHEMICALS

▼
INITIATE DIGESTIVE CYCLE
PROCESS 12 - 18 HOURS

▼
DISCHARGE DIGESTOR
EFFLUENT

▼
RECYCLING OPTIONS
FOR DIGESTOR EFFLUENT

1:10 COMPOST ADDITIVE

NPK LIQUID FERTILIZER

BIOGAS GENERATION

AMINO ACID EXTRACTION

PELLETIZE SOLID BOILER FUEL

▼
DISPOSAL OPTIONS
FOR DIGESTOR EFFLUENT

WATER TREATMENT PLANT

LAND FILLED AS BIO-SOLID

Effluent Characteristics

Process Parameters.

Only pH, Na & K values are process related.

Certain levels of Na & K present in all tissue by default. **All other values depend solely on the nature of the waste.**

Fertilizer & Bio-solid Samples

Fertilizer sample reflects the minimum values for Potassium content

Bio-Solid sample reflects the maximum values for Sodium content

Adjusting pH

pH can be lowered after a digestion cycle if required. This is accomplished by the addition of HNO₃ / HCL / H₂SO₄ or CO₂ and will reduce pH and E Cond. to desired level. Simple titration will determine optimum values.

Composting Dilution

Composting dilutes all values by a factor of 10 times + depending on the volume used.

Nitrogen

Nitrogen commonly around .8% – 1% depending on blood content of the waste. Nitrogen found as Kjeldal Nitrogen –mostly amino nitrogen. Addition of a pH reducing agent such as HNO₃ could increase these values.

CHEMICAL ANALYSIS OF EFFLUENT

	Fertilizer	Bio-solid
pH	10.8	12
E Cond	2850	4180 mS/m
Ca	74.87	209.9 Mg/Kg
Mg	15.79	47.1 Mg/Kg
P	404.75	298.3 Mg/Kg
Na	5700	23,490 Mg/Kg
K	16600	2570 Mg/Kg
Cu	1.47	1.95 Mg/Kg
Mn	<0.5	<.2 Mg/Kg
Fe	125.9	388.5 Mg/Kg
Zn	5.94	4.93 Mg/Kg
Al	7.9	9.39 Mg/Kg
Moisture	79.7	71.8 %
Ash	6.1	10.2 %

PATHOGEN STATUS OF EFFLUENT

TMA		10
Coliforms		No Growth
<i>Escherichia coli</i>	No Growth	No Growth
Yeast & Mould		No Growth
<i>Clostridium perfringens</i>		No Growth
<i>Salmonella</i>		Absent/25g
<i>Staphylococcus aureus</i>		No Growth
<i>Bacillus cereus</i>		No Growth
<i>Listeria</i>		Absent/25g

NOTE:

Testing of all samples as displayed above were conducted and verified by independent external parties. All samples tested by SANAS accredited laboratories.

Amino Acid Composition Of Effluent

This laboratory holds SANAS accreditation for analyses with an ASM number. Results are expressed on a wet basis, therefore as samples were received.

Analysis	Accreditation number	Unit	Sample (1)	Sample (2)	Sample (3)
			1231	1232	1233
* **Protein	Not SANAS accredited	%	4.38	4.59	5.10
Arginine	ASM 021	g/100g	0.08	0.08	0.08
Serine	ASM 021	g/100g	0.06	0.07	0.08
Aspartic acid	ASM 021	g/100g	0.29	0.33	0.33
Glutamic acid	ASM 021	g/100g	0.49	0.50	0.51
Glycine	ASM 021	g/100g	0.44	0.54	0.54
Threonine	ASM 021	g/100g	0.05	0.06	0.06
Alanine	ASM 021	g/100g	0.32	0.32	0.32
Tyrosine	ASM 021	g/100g	0.13	0.14	0.17
Proline	ASM 021	g/100g	0.34	0.33	0.33
HO-Proline	ASM 021	g/100g	0.17	0.17	0.18
Methionine	ASM 021	g/100g	0.08	0.06	0.08
Valine	ASM 021	g/100g	0.20	0.19	0.19
Phenylalanine	ASM 021	g/100g	0.16	0.15	0.16
Isoleucine	ASM 021	g/100g	0.14	0.14	0.15
Leucine	ASM 021	g/100g	0.22	0.22	0.24
Histidine	ASM 021	g/100g	0.66	0.81	0.78
Lysine	ASM 021	g/100g	0.24	0.28	0.27

Sample	Sample type	Date analysis commenced
1	Samples (unspecified)	19/06/2009
2	Samples (unspecified)	19/06/2009
3	Samples (unspecified)	19/06/2009



Product Technical Specifications

DUMPSTER TYPE TISSUE DIGESTORS

- MODEL DD500 TISSUE DIGESTOR
- MODEL DD1000 TISSUE DIGESTOR

CENTRIFUGAL TISSUE DIGESTORS

- MODEL DDR1000 TISSUE DIGESTOR
- MODEL DDR2000 TISSUE DIGESTOR
- MODEL DDR4000 TISSUE DIGESTOR

Tissue Digester Model DD500



The DD500 tissue digester is the smallest unit in the dumpster type digester range. With a 500kg (1,100 pound) normal waste load capacity, the DD500 is the perfect choice for a variety of smaller industrial applications.

Structural Dimensions

- Length 1,200 mm
- Width 1,200 mm
- Height 1,200 mm
- Working height : 1,600 mm

Volumetric Data

- Total Volume : 1,700 liters
- Operating Volume : 1,200 liters

Waste Load Capacity

- Short Cycle: 350 kilograms
- Normal Cycle: 500 Kilograms
- Long Cycle: 650 Kilograms

Operating Temperature

- 20-100 Degrees Celsius
- Atmospheric Pressure

Materials

- Main Tank : 3mm (304 Stainless)
- Outer Cover : 1mm (304 Stainless)
- Cladding : 50mm - 400 Degrees Celsius
- Motor Gearbox 3kW SEW Unit

Power Supply

- 380V
- 3 Phase
- 60A

Alternative Heating Source

- Steam Coil Conversion With Dedicated LFO or Coal Boiler also Available

Discharge System

- Electric Pump Assisted Discharge System fitted as standard option

Top Lid

- Hinged One Side

Agitator

- Driven from the Bottom through the Center

Tissue Digester Models DD1000

Structural Dimensions

- Length 2,400 mm
- Width 1,200 mm
- Height 1,200 mm
- Working height : 1,400 mm

Volumetric Data

- Total Volume : 3,400 liters
- Operating Volume : 2,400 liters

Waste Load Capacity

- Short Cycle: 750 kilograms
- Normal Cycle: 950 Kilograms
- Long Cycle: 1100 Kilograms

Operating Temperature

- 20-100 Degrees Celsius
- Atmospheric Pressure

Materials

- Main Tank : 3mm (304 Stainless)
- Outer Cover : 1mm (304 Stainless)
- Cladding : 50mm - 400 Degrees Celsius
- Motor Gearbox 5.5kW SEW Unit

Power Supply

- 380V
- 3 Phase
- 60A

Alternative Heating Source

- Steam Coil Conversion With Dedicated LFO or Coal Boiler also Available

Discharge System

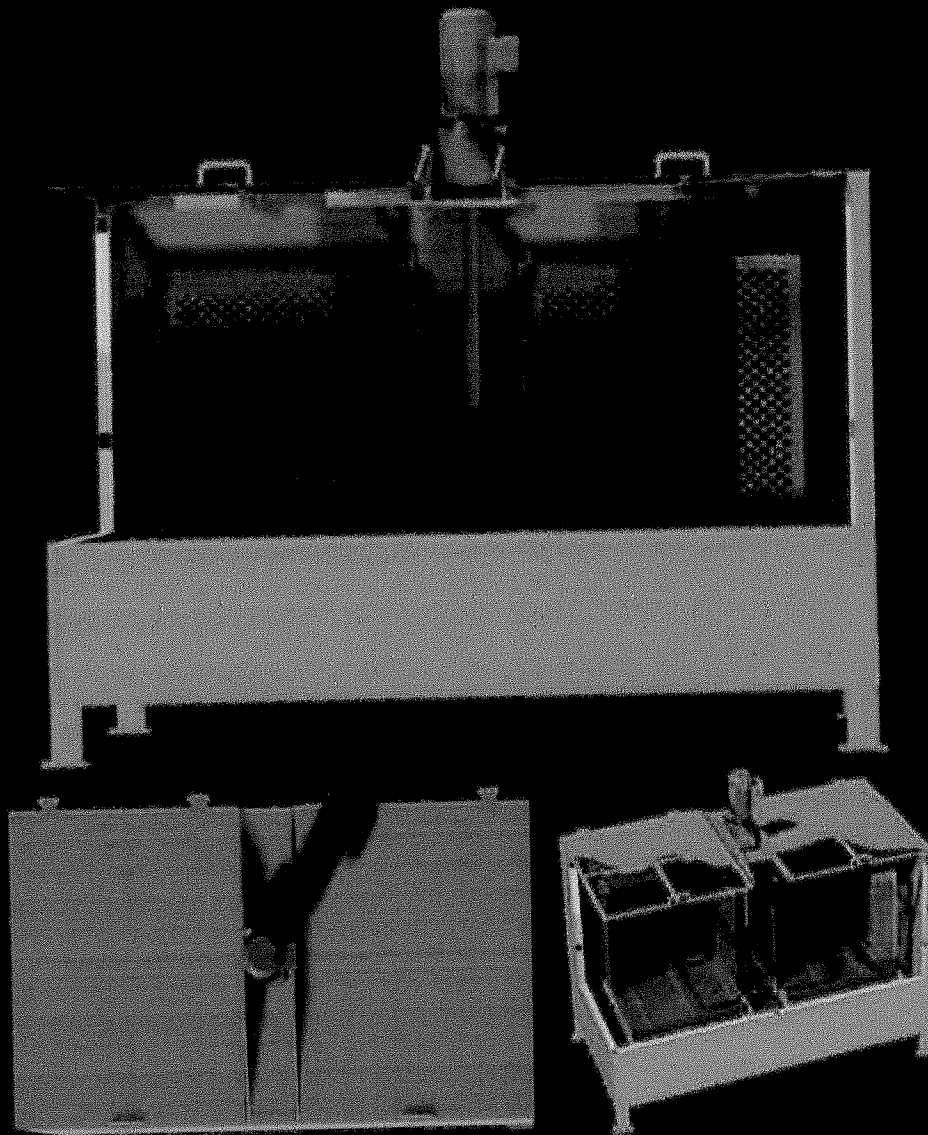
- Electric Pump Assisted Discharge System fitted as standard option

Top Lid

- Two Opening Lids Hinged on One Side

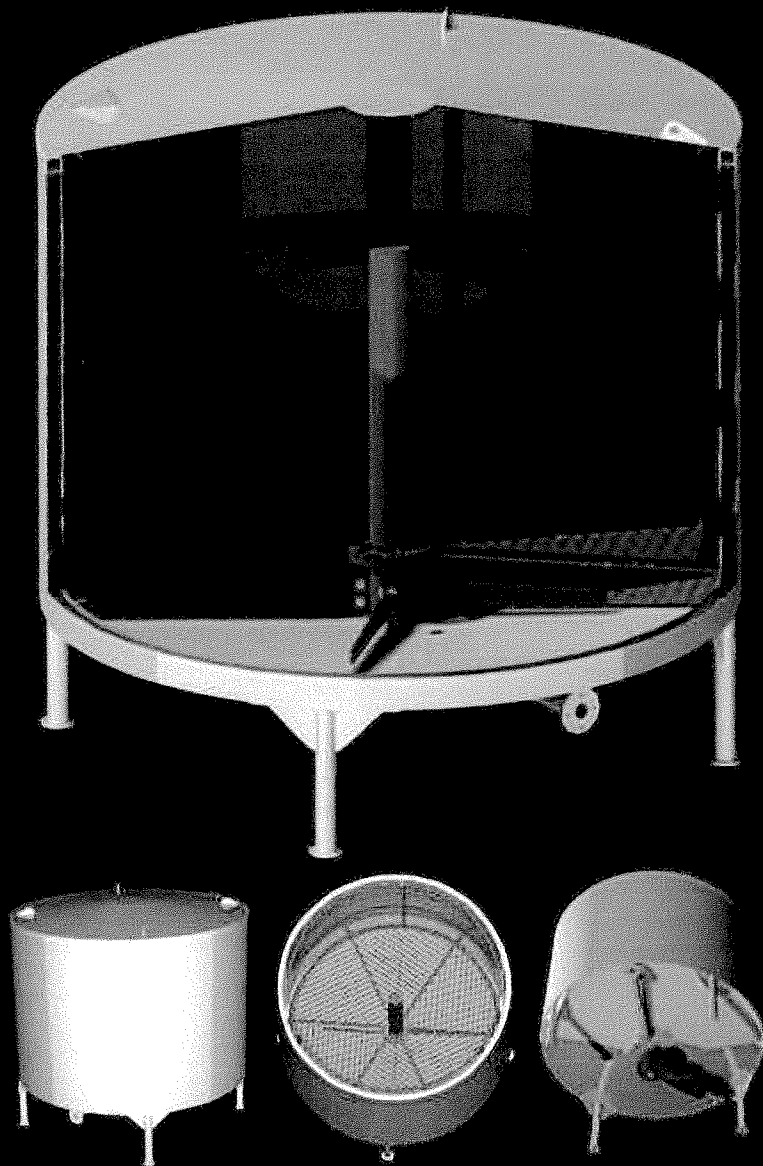
Agitator

- Driven from the top between the two Lids



The DD1000 is WRT's most versatile dumpster type tissue digester. A large load capacity of 1000kg (2,200 pounds) tissue capacity combined with robust twin basket design makes this unit the logical choice for a variety of industrial waste tissue treatment applications.

Tissue Digester Models DDR2000



The DDR2000 centrifugal tissue digester has a large cycle capacity of 2000 kilograms (4400 pounds), making this tissue digester the obvious choice for the larger enterprise that requires the capability to treat substantial quantities of waste tissue on a daily basis.

Structural Dimensions

- Diameter 2,200 mm
- Height 1,600 mm
- Working height : 2,100 mm

Volumetric Data

- Total Volume : 6,000 liters
- Operating Volume : 5,000 liters

Waste Load Capacity

- Short Cycle: 1,500 kilograms
- Normal Cycle: 1,950 Kilograms
- Long Cycle: 2,100 Kilograms

Operating Temperature

- 20-100 Degrees Celsius
- Atmospheric Pressure

Materials

- Main Tank : 3mm (304 Stainless)
- Outer Cover : 1mm (304 Stainless)
- Cladding : 50mm - 400 Degrees Celsius
- Motor Gearbox 5.5kW SEW Unit

Power Supply

- 380V
- 3 Phase
- 100A

Alternative Heating Source

- Steam Coil Conversion With Dedicated LFO or Coal Boiler also Available

Discharge System

- Electric Pump Assisted Discharge System fitted as standard option

Top Lid

- Removable or Pivot Hinge Option

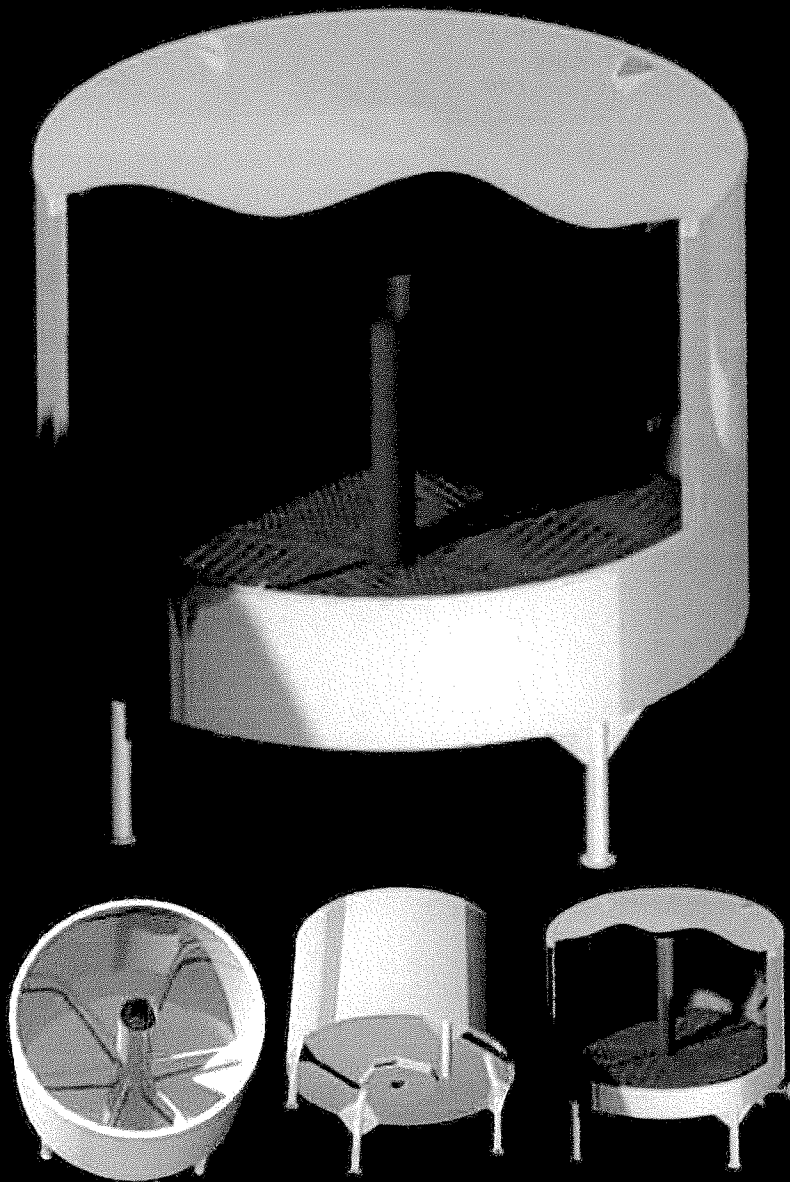
Agitator

- Driven from the Bottom through the Center

Recommended Additions

- Loading Hoist
- Working Platform
- Lid Hoist and Support

Tissue Digestor Models DDR4000



The DDR4000 centrifugal tissue digestor is a big unit capable of handling significant quantities of tissue per cycle. A load capacity of 4000 kilograms (8,800 pounds) makes this unit the biggest low pressure tissue digestor available on the market today.

Structural Dimensions

- Diameter 3,000 mm
- Height 1,800 mm
- Working height : 2,600 mm

Volumetric Data

- Total Volume : 12,700 liters
- Operating Volume : 10,000 liters

Waste Load Capacity

- Short Cycle: 3,000 kilograms
- Normal Cycle: 3,950 Kilograms
- Long Cycle: 4,100 Kilograms

Operating Temperature

- 20-100 Degrees Celsius
- Atmospheric Pressure

Materials

- Main Tank : 3mm (304 Stainless)
- Outer Cover : 1mm (304 Stainless)
- Cladding : 50mm - 400 Degrees Celsius
- Motor Gearbox 7.5kW SEW Unit

Power Supply

- 380V
- 3 Phase
- 150A

Alternative Heating Source

- Steam Coil Conversion With Dedicated LFO or Coal Boiler is Advisable to ensure rapid heating.

Discharge System

- Electric Pump Assisted Discharge System fitted as standard option

Top Lid

- Removable or Pivot Hinge Option

Agitator

- Driven from the Bottom through the Center

Recommended Additions

- Loading Hoist
- Working Platform
- Lid Hoist and Support



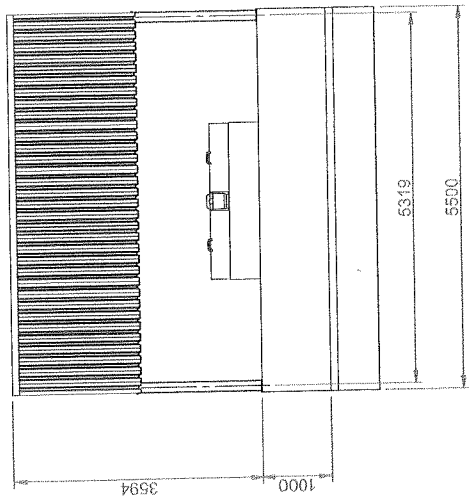
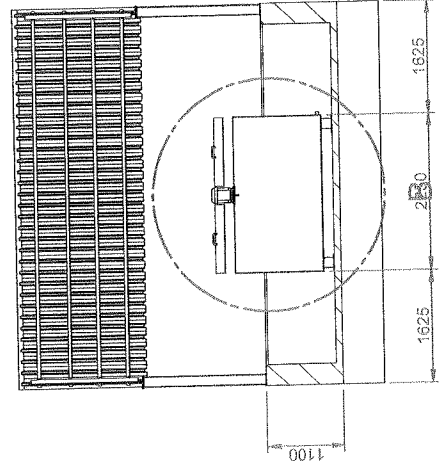
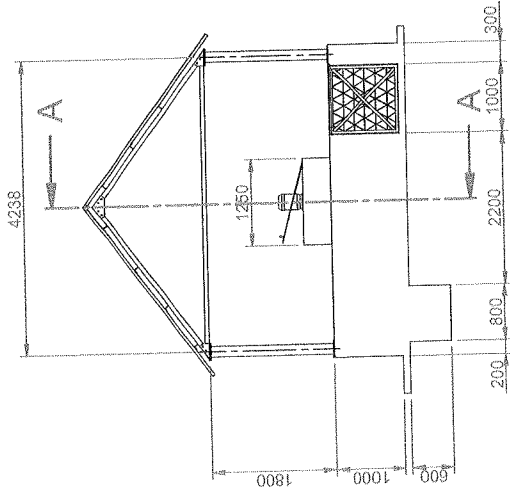
Work Area Specifications

WORKING AREA

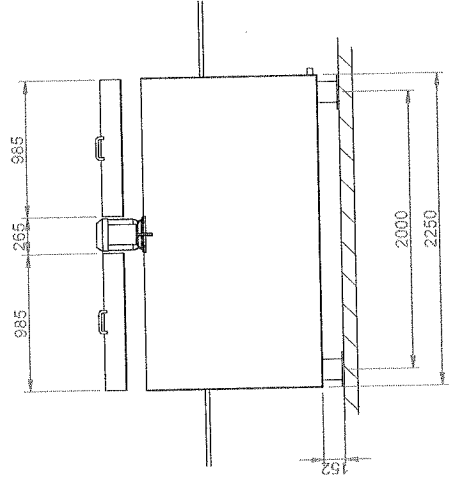
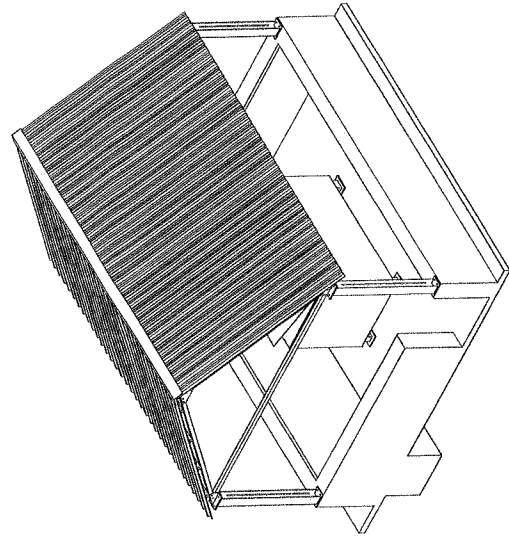
It is highly recommended that a purpose-built work area be constructed as per the drawing attached below.

A properly designed and constructed working area will ensure maximum safeguards against any unintentional spillage as well as simplify cleaning of the digester and maintaining a hygienic working environment.

Water used for cleaning purposes can be recycled through the digester, thereby not only reducing water consumption and the associated costs, but also contributes to ensuring that wash water that may contain pathogens are properly treated at the same time.



SECTION A-A



DETAIL B

North Shore Projects
 Project Engineers Plant and
 steelwork design & detailing
 P.O. Box 1000
 Hilda 9245
 Phone 033-343-2887
 Fax 033-343-2897

Counter Number	Date	Revision Number
	2009/02/23	
Drawing Number	ECP-TNK.dft	

APPENDIX 4.4:

**STANDARD OPERATIONAL PROCEDURES FOR HANDLING VARIOUS
TYPES OF WASTE MATERIALS**

	SIGNATURE	DATE
COMPILED BY : QA OFFICER		
AUTHORIZED BY: SITE MANAGER		

ISSUE DATE:
EFFECTIVE DATE:

1. PURPOSE

- 1.1 The purpose of this document is to provide the necessary regulations and instructions for the control and eventual disposal of chemical and biological waste at Malelane Research Unit.
- 1.2 The need for strict regulations on the prudent practice of laboratory processes, including waste management, primarily arise from a concern, not only for the personal safety and health of the personnel, but also from a concern for the environment. Both of these must be protected.

2. SCOPE

The procedures outlined in this document shall be followed at Malelane Research Unit where chemical and biological waste are generated, however small the amount.

3. RELEVANT DOCUMENTATION

MRU/04/01: Management of Laboratory Facilities

4. DEFINITIONS AND ABBREVIATIONS

None.

5. PERSONNEL

- 5.1 The proper handling of chemical and other laboratory wastes is the responsibility of all laboratory personnel.
- 5.2 They are required to familiarise themselves with the potential hazards of all chemicals which they use, and biological material that they handle, as well as of the proper means for their destruction and /or disposal.
- 5.3 Sufficient information on the characteristics of the waste material (on the waste containers) to fit it into the correct channel for handling and disposal shall be supplied.
- 5.4 The Site Manager is accountable for the safe handling and disposal of all materials under his supervision.
- 5.5 Disposal procedures in force should be discussed and confirmed with the review of the standard operating procedure.

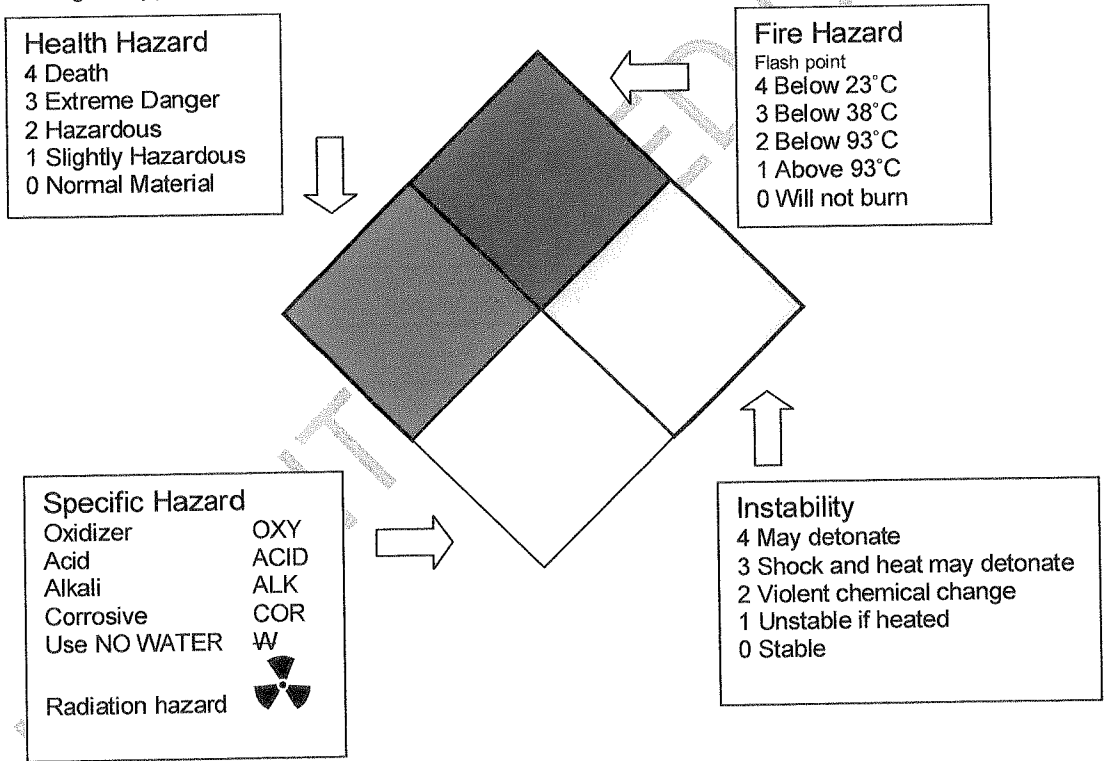
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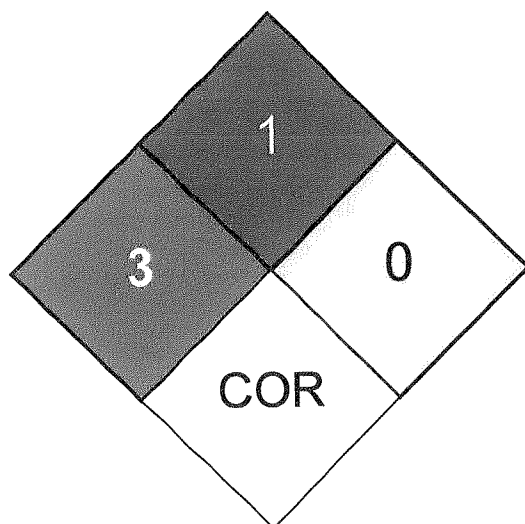
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GENERAL CONSIDERATIONS

- 6.1.1 Characterise waste according to the five classes that govern the route of disposal:
 - combustible
 - explosive
 - non-combustible
 - biological
 - non-hazardous
- 6.1.2 All chemicals will be characterised as follow:
 - fire hazard
 - instability
 - health hazard
 - specific hazard

If no labelling is supplied by the supplier the chemical will be labelled as follow:





Health Hazard level 3: Extreme Danger
Fire Hazard level 1: Above 93 C
Instability level 0: Stable
Specific Hazard Corrosive

- 6.1.3 Reduce the scale of experiments and procedures as far as possible to reduce the volume of waste generated.
- 6.1.4 Consider recovery, recycling and re-use of chemicals whenever possible and cost effective.
- 6.1.5 Chemicals that are prone to deteriorate with time, must be identified at the time of purchase by the user. Regular checks should be carried out on these chemicals and the necessary steps taken for their disposal.
- 6.1.6 Regularly check the integrity of labels. Relabel only if the identity is beyond doubt. If the identity of the contents is in doubt, the Site Manager should appoint a person to assist in the appropriate disposal procedure.
- 6.1.7 Ascertain that all reaction mixtures and containers with chemicals are provided with a proper label that will not deteriorate. Take special care when placing containers in a refrigerator or freezer where the humidity is generally high.
- 6.1.8 Empty and decontaminate all glassware and other utensils (using suitable destruction procedures e.g. hydrolysis, oxidation) before dispatching for cleaning.
- 6.1.9 Whenever possible and practical, convert extremely hazardous substances to less hazardous substances (by hydrolysis, oxidation, etc.). The required procedures must form an integral part of the experimental design.
- 6.1.10 Consider the possibility of replacing a hazardous reagent or solvent with one that is less hazardous when an experiment is planned.
- 6.1.11 Explosives (compounds that can undergo violent or explosive decomposition under appropriate conditions of reaction or initiation, such as heat, friction or shock) should only be handled by competent personnel familiar with the hazard involved, the precaution to be taken and the procedures for destroying or disposing thereof.
- 6.1.12 Place waste in appropriate designated containers according to classification. Black bins for household waste, red bags for bio-hazard waste, red bins for biological waste, yellow bins for sharps and green bins for chemical waste. The approved supplier for the household waste will collect the waste weekly and the remaining waste will remove it at frequent intervals as requested.

6.2 SOLID CHEMICAL WASTE

- 6.2.1 Use appropriate containers for the storage of solid chemical waste.

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- ...al, chemically convert hazardous substances to less hazardous substances within the laboratory (for example by hydrolysis, oxidation, etc.). The procedures required must form an integral part of the experimental design.
- 6.2.3 When in a small volume (a few grams), non-toxic chemicals that pose no hazard (see Table 1) may be disposed of through the normal channels for office waste.
- 6.2.4 Place larger volumes of chemical waste and hazardous chemical solids (for example those listed in Tables 2 and 3), in strong plastic bags within an adequately labelled outer container. Separate incompatible materials (see Tables 2 and 3).
- 6.2.5 Place solid chemical waste that contains appreciable amounts of thermally stable toxins or that would produce thermally stable toxins or corrosive vapours in the combustion process, or that contains appreciable amounts of non-combustible material, in containers destined for secure landfill. Store in a designated place until removed.
- 6.2.6 Place solid combustible chemical waste (that does **not** contain thermally stable toxins or that would not produce thermally stable toxins or corrosive vapours in the combustion process and that does not contain explosive compounds) in strong plastic bags within a temporary outer container in which they may be safely carried.
- This container should be stored in the "to be disposed off" area and removed by an approved supplier.

6.3 BIOLOGICAL WASTE

- 6.3.1 All biological waste should be placed in the biological waste containers supplied by the approved suppliers. The containers to be used are clearly stated in the information pamphlet supplied by the supplier. Refer to Appendix A.
- 6.3.2 Place used paper towels, plastic or wooden disposables and other combustible material in the bags destined for removal. Under no circumstances should non-combustible material (except those provided for in paragraph 6.5.6), or chemicals that may produce toxic or corrosive vapours when heated be placed in these bags.
- 6.3.3 It is the responsibility of the study director to warn personnel handling utensils that were in contact with blood or blood fractions of the potential hazards involved (possible zoonotic diseases), and to ensure that proper protective measures are taken.
- 6.3.4 Needles and glass tubes are not to be placed in plastic bags. They should instead be placed into a plastic container supplied by the approved supplier (Refer to Appendix A), The filled containers will be collected and replaced by the approved supplier. No container may be opened while in use or thereafter.
- 6.3.5 Filled containers must be placed in the "to be disposed off" section.

6.4 LIQUID CHEMICAL WASTE

- 6.4.1 Always consider the following:
- If liquid mixtures cannot be disposed of into one of the liquid waste containers provided, separate disposal procedures should be followed.
 - Metal cans will be quickly corroded by the acids formed when moist halogenated solvents are left in them.
 - Organic solvents should be recycled (for example by distillation) whenever this can be done cost-effectively.
 - Solutions of toxic substances, strong carcinogens, mutagens and explosive compounds should always be kept in separate, adequately labelled containers and be disposed of without undue delay.
- 6.4.2 Segregate liquid waste for bulk disposal or recovery into the following types, and place each type in the separate, adequately labelled non-metal container provided.

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- b. HYDROCARBONS (for example chloroform and dichloromethane).
- c. ETHERS (for example diethyl ether and isopropyl ether).
Note: Ether may become explosive on standing:
- d. ESTERS, KETONES, ALCOHOLS, ACETONITRILE (for example ethyl acetate, acetone methanol, isopropyl, alcohol and acetonitrile).
Note: Secondary alcohols may form explosive peroxides on standing
- e. AQUEOUS SOLUTIONS (of hazardous chemicals that can not be disposed of into the sewer system; this includes aqueous mixtures of organic solvents).

6.4.3 Never mix the following:

- a. Acetone and chlorinated solvents (an explosion may occur in the presence of a base).
- b. Acids and bases (sufficient heat may be generated to vaporize or ignite flammable materials such as carbon disulphide).
- c. Hot materials (build-up of pressure with the potential of compressive ignition).
- d. Toxic substances, strong carcinogens, mutagens or explosive compounds into the containers listed under 6.6.2 above.

6.4.4 Never fill containers to the brim. Always leave sufficient space so that pouring would not be hampered.

6.4.5 Small volumes of liquid organic waste or hazardous aqueous waste may be solidified by combining them with sufficient inert absorbent. They can be then be disposed of as solid waste destined for a secure landfill.

6.5 SHARP OBJECTS

Keep needles, Pasteur pipettes, broken glass and other sharp objects in a separate, container supplied by the approved suppliers which will be removed by the suppliers when full. Needles, glass tubes and other sharp objects are not to be placed in plastic bags.. Place the filled containers in the "to be disposed off" section until the supplier can come and collect the filled containers.

6.6 WASTE FROM THE LABORATORY

6.6.1 All general office and laboratory waste should be placed into containers supplied by the approved suppliers (Refer to appendix A) or black containers with green numbering. The waste will be collected on a regular basis and once weekly collected by the municipality for disposal.

7 RECORDS

Not applicable.

8 REFERENCES

None.

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TABLE 1
TYPICAL NON-HAZARDOUS LABORATORY WASTES

<p style="text-align: center;">ORGANIC CHEMICALS</p> <p style="text-align: center;">SUGAR AND SUGAR ALCOHOLS STARCH NATURALLY OCCURRING ALPHA-AMINO ACIDS AND SALTS CITRIC ACID AND ITS Na, K, Mg, Ca, NH₄ SALTS LACTIC ACID AND ITS Na, K, Mg, Ca, NH₄ SALTS</p> <p style="text-align: center;">INORGANIC CHEMICALS</p> <p style="text-align: center;">SULPHATES PHOSPHATES CARBONATES OXIDES CHLORIDES FLUORIDES BORATES</p> <p style="text-align: center;">LABORATORY MATERIALS NOT CONTAMINATED WITH HAZARDOUS CHEMICALS</p> <p style="text-align: center;">GLASSWARE FILTER PAPER FILTER AIDS RUBBER AND PLASTIC CLOTHING</p>

UNCONTROLLED COPY

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TABLE 2
SPECIFIC CHEMICAL INCOMPATIBILITIES

A	B
ACETYLENE AND MONOSUBSTITUTED ACETYLENE	HALOGENS GROUP 1B/11B METALS AND THEIR SALTS
AMMONIA AND NH ₄ OH	HALOGENS HALOGENATING AGENTS SILVER MERCURY AND ITS AMALGAMS
CARBON, ACTIVATED	OXIDIZING AGENTS
HYDROGEN PEROXIDE	METALS AND THEIR SALTS
NITRIC ACID	METALS SULPHURIC ACID SULPHIDES NITRITES AND OTHER REDUCING AGENTS CHROMIC ACID AND CHROMATES PERMANGANATES
MERCURY AND ITS AMALGAMS	AMMONIA AND NH ₄ OH NITRIC ACID ACETYLENE SODIUM AZIDE OXALIC ACID
OXALIC ACID	SILVER MERCURY AND ITS AMALGAMS
PHOSPHORUS (YELLOW)	OXYGEN OXIDIZING AGENTS STRONG BASES
PHOSPHORUS PENTOXIDE	WATER HALOGENATING AGENTS
SULPHURIC ACID	METALS CHLORATES PERCHLORATES PERMANGANATES NITRIC ACID

CHEMICALS IN COLUMNS A AND B SHOULD BE KEPT SEPARATE

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TABLE 3
FLAMMABILITY AND EXPLOSIBILITY
CLASSES OF INCOMPATIBLE CHEMICALS

A	B
ACIDS	BASES
ALKALI AND ALKALINE EARTH METALS	WATER
- CARBIDES	ACIDS
- HYDRIDES	HALOGENATED ORGANIC COMPOUNDS
- HYDROXIDES	OXIDIZING AGENTS
- OXIDES	- CHROMATES, DICHROMATES,
- PEROXIDES	- CrO3 HALOGENS
	- HALOGENATING AGENTS
	- HYDROGEN PEROXIDE AND PEROXIDES
	- NITRIC ACID, NITRATES
	- PERCHLORATES AND CHLORATES
	- PERMANGANATES
	- PERSULPHATES
INORGANIC AZIDES	ACIDS
	HEAVY METALS AND THEIR SALTS
	OXIDIZING AGENTS
INORGANIC CYANIDES	ACIDS, STRONG BASES
INORGANIC NITRATES	ACIDS
	METALS
	NITRITES
	SULPHUR
INORGANIC NITRITES	ACIDS
	OXIDIZING AGENTS
INORGANIC SULPHIDES	ACIDS
ORGANIC COMPOUNDS	OXIDIZING AGENTS
- ORGANIC ACYL HALIDES	BASES
	ORGANIC HYDROXY COMPOUNDS
- ORGANIC ANHYDRIDES	BASES
	ORGANIC HYDROXY COMPOUNDS
- ORGANIC HALOGEN COMPOUNDS	ALUMINIUM METAL
- ORGANIC NITRO COMPOUNDS	STRONG BASES
POWDERED METALS	ACIDS
	OXIDIZING AGENTS

CHEMICALS IN COLUMNS A AND B SHOULD BE KEPT SEPARATE



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MALELANE RESEARCH UNIT
**EDURE FOR HANDLING BIOLOGICAL
AND CHEMICAL WASTE**

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APPENDIX A: WASTE CONTAINERS

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	SIGNATURE	DATE
COMPILED BY : QA OFFICER		
AUTHORIZED BY: SITE MANAGER		

ISSUE DATE:
EFFECTIVE DATE:

1. INTRODUCTION

For removal purposes, waste generated may be grouped into the following categories:

- 1.1 Liquid and solid chemical waste for incineration,
- 1.2 Biological waste for incineration,
- 1.3 Sharps and broken glass,
- 1.4 Outside contractors
- 1.5 Domestic and office waste.
- 1.6 Bio-hazardous waste

The requirements stipulated in the Procedure for Handling Biological and Chemical Waste, document number MRU/04/03 shall be adhered to.

2. PERSONNEL

This document is applicable to all personnel.

3. SAFETY

- 3.1 Adequate protective clothing and equipment shall be worn - sufficient to protect the personnel involved from any accidental contact or from vapors / fumes emanating from the material to be handled.
- 3.2 When the services of a contractor are obtained to remove toxic waste, he shall be provided with all the necessary information and assistance in order that he may perform his function efficiently and safely.

4. EQUIPMENT

Domestic and office waste shall be disposed of in black refuse bins and waste-paper baskets.

The following containers shall be marked clearly and permanently according to their application:

- 4.1 Green plastic bin with strong plastic bin liner for solid chemical waste.
- 4.2 Red plastic bin with strong plastic bin liner for biological waste.
- 4.3 Sharps shall be placed in the yellow plastic container.
- 4.4 Broken glass shall be placed in the yellow plastic container.

5. MATERIALS AND ACCESSORIES

As described in par.4.

6. PROCEDURE

Waste removal should be done regularly to minimize storage of waste on site.

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g or disposing of chemical waste from the laboratory in any manner other than that shown in this document, without the written authorisation from the Site Manager.

Waste disposal should be considered during the planning stages of each study, and should, where necessary (for example when new disposal methods present themselves), be discussed in advance with the Site Manager.

Disposal procedures in force should be discussed and confirmed with the review of the standard operating procedure.

Disposal, with a few exceptions, is not allowed into the sewer system.

Only non-hazardous, water-soluble substances, which are biologically degradable, may be disposed of in the laboratory sink, provided that they have been sufficiently diluted.

Strong acids and bases should be neutralised (to pH 4 – 9), cooled and diluted with copious volumes of water before disposal into the sewer system.

None of the following may be poured down the drain:

- a. Explosives
- b. Flammable liquids
- c. Solid or viscous organic material
- d. Heavy metals or their compounds
- e. Toxic mixtures / compounds
- f. Malodorous mixtures / compounds
- g. Lachrymatory mixtures / compounds
- h. Used culture media containing living organisms or viruses
- i. Solutions containing acids at a concentration above 0.1 % (they form easily detonated explosive salts with metals such as copper or iron)
- j. Solid or viscous materials that may cause or lead to obstructions
- k. Substances or mixtures that may react with something else poured down another sink causing toxic or unpleasant vapours or even explosions (for example sulphur and acid, iodine and ammonia, silver nitrate and ethanol, picric acid and lead salts)
- l. Any materials that may in any way affect the biological function of the septic tanks.

If in doubt, disposal should NOT be done into the sewer system.

6.1 Domestic and Office Waste

- 6.1.1 The waste paper bins in the offices are cleaned on a weekly basis, or more often if necessary, by tipping the contents into the refuse bins in the laboratory. When the bag in the refuse bin in the laboratory is full, it is removed and placed in the "to be disposed off" section for the municipality to remove weekly. The person that removes the waste will complete a form stating receipt of the waste. This form can be found in the Safety Documentation File.

6.2 Chemical Waste

- 6.2.1 Liquid chemical waste that cannot be disposed of down the drains must be kept in their bottles and should be clearly labeled. Do not mix different chemicals in one bottle as this makes disposal difficult.
- 6.2.2 Liquid chemical waste for disposal can be stored in the Waste Tech bin. Once the bin is full, a person with a suitable background (i.e. chemical and / or toxicology) will decide on the best method for disposal of the individual chemicals. Some of the chemicals (biodegradables) may be best disposed of by being poured onto a dirt road. The remaining chemicals that require specialized disposal should be sent to an appropriate supplier. However solutions of toxic substances, strong carcinogens, mutagens and explosive compounds should always be kept in separate, adequately labeled containers and be disposed of without undue delay. Unauthorized entry to the Waste Tech bin is prohibited.

and viscous material shall be placed in an approved plastic
disposed off" section.

6.3 Biological Waste

- 6.3.1 Biological waste shall be placed in approved plastic containers or bags.
- 6.3.2 Biological waste containing toxins: Place tissues, excreta and other solid or semi-solid biological waste that contains appreciable amounts of thermally stable toxins or that would produce thermally stable toxins in the combustion process in containers destined for disposal according to legislation. Treat with lime to inhibit decomposition and compound formation during storage.
- 6.3.3 Biological waste not containing toxins: Place tissues, excreta and other solid or semi-solid biological waste that does not contain thermally stable toxins or that would not produce thermally stable toxins in the combustion process, in the containers supplied by the suppliers.
- 6.3.4 At the end of the day the bags and containers will be placed in the cool room until the container is full. The filled container will be placed in a freezer until it can be removed by an approved supplier.
- 6.3.5 Place used paper towels, plastic or wooden disposables and other combustible material in the bags destined for removal. Under no circumstances should non-combustible material or chemicals that may produce toxic or corrosive vapors when heated be placed in these bags.

6.4 Sharps and broken glass

- 6.4.1 Needles, scalpels etc. shall be placed in the approved container.
- 6.4.2 Broken glass shall be placed into the approved container.
- 6.4.3 When these containers are full, the containers shall be placed in the "to be disposed off" section until an approved supplier can come and remove the containers.

6.5 Mercury

- 6.5.1 Never incinerate or bury metallic mercury.
- 6.5.2 Spilled metallic mercury may be absorbed and collected using pieces of filter paper. Small amounts (e.g. those remaining in cracks) may be converted into the less toxic sulphide by mixing it well with flowers of sulphur.
- 6.5.3 Never dispose of solutions of mercury salts in the sewer. Collect waste material in large plastic containers, made slightly acid with acetic acid (if necessary) and add 10 g thiocacetamide per litre. Store in a ventilated area (a small amount of toxic hydrogen sulphide may be liberated), allowing the mercury to precipitate as the sulphide. The supernatant may be decanted and disposed of as aqueous liquid waste, and the mercury sulphide disposed of in a landfill.

7. RECORDS

- 7.1 All documentation or correspondence with waste removal subcontractors shall be kept on file by Administration Secretary.

8. REFERENCES

South African National Standard, SANS 100228:2006 Edition 4.
Recording and Investigation of Incidents Register, Regulation 9 of the General Administrative Regulations, Occupational Health and Safety Act 1993.

APPENDIX 4.5:
STANDARD OPERATIONAL PROCEDURES FOR HANDLING OF
EMERGENCY INCIDENTS



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AUTHORIZED BY: SITE MANAGER		

ISSUE DATE:
EFFECTIVE DATE:

1 PURPOSE

In order to ensure the existence of optimal safety conditions on the farm and in the Units, this document stipulates procedures that are to be followed during an emergency at Malelane Research Unit and to ensure the safety of personnel and test systems in emergencies.

2 SCOPE

This document applies to all laboratories, office buildings, storage areas, animal housing areas and the surrounding farm area excluding personnel housing and guest cottage.
Fire during normal working hours.
Fire outside working hours.
Power Failure
Burglary
Flood

3 RELEVANT DOCUMENTATION

MRU/02/03 : Procedure for Preventive and Corrective Action.
MRU/04/01 : Procedure for Management of Laboratory Facilities.
MRU/04/04 : Procedure for Safety
MRU/05/01/200 : Emergency Generator.
MRU/09/01 : Procedure for Handling Records.
MRU/12/01 : Procedure for Outside Support Services and Supplies.

4 DEFINITIONS AND ABBREVIATIONS

QA : Quality Assurance.
MRU : Malelane Research Unit.

5. PERSONNEL

5.1 This document applies to all personnel.

6 PROCEDURE

6.1 There must be a responsible person on the farm at all times.

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contacted over the weekend in case of emergencies.

- 6.1.2 The responsible person on duty over a weekend will be identified at the Friday morning staff meeting. The name of the responsible person will be displayed outside the following areas:
Laboratory building
Office building
- 6.1.3 Any abnormality or fault have to be reported to the Farm Manager and designated personnel member immediately.
- 6.1.4 Farm security personnel are to report incidents to the responsible person on duty over weekends and after hours.
- 6.2 A list of emergency phone numbers (including doctor, stand-by vet, ambulance, hospital, police, security, fire brigade and electrician) is available on the red health and safety boards in the Administration office main hall, the Workshop and the Laboratory .
- 6.3 The Emergency Organisation Structure is displayed on the red health and safety boards in the Administration office main hall, the Workshop and the Laboratory. The Organisation Structure displays all the relevant safety personnel and to whom must be reported during an emergency. The Organisation Structure includes the members of the Health and Safety Committee, the members of the Crisis Team, the Fire Marshals, the Fire Fighters and the First Aiders.
- 6.4 **Fire during normal working hours.**
- 6.4.1 Every staff member is responsible for alerting the building fire marshal of a fire, regardless of the size of the fire detected.
- 6.4.2 The fire marshal will assess the extent of the fire and along with trained fire fighters within the company will attempt to extinguish or contain the fire.
- 6.4.3 When the alarm has been raised all staff members along with any visitors/contractors in the building or on site will evacuate the area immediately and assemble at the designated assembly point. **The assembly point is marked in yellow with an A.**
- 6.4.4 If possible upon leaving the buildings close all doors and windows.
- 6.4.5 DO NOT STOP TO SAVE ANY POSSESSIONS!!! Leave the area as soon as possible.
- 6.4.6 Leave buildings through the closest fire exit.
- 6.4.7 Upon arrival at the assembly point, ensure that all persons are accounted for. In the case of a missing person inform the fire marshal and do not go back for a person yourself.
- 6.4.8 DO NOT LEAVE THE ASSEMBLY POINT WITHOUT THE PERMISSION OF MANAGEMENT.
- 6.4.9 Personnel in need of medical assistance will be treated by trained first aiders to the best of their ability until treated by trained medical personnel.
- 6.4.10 **When you are trapped** and cannot escape to a safer area, **stay calm**. Try to stay as low as possible to ground level due to the fact that the air is cleaner for breathing. Do not touch anything because it may be hot.
- 6.5 **Fire outside working hours.**
- 6.5.1 In case of fire in a building outside normal working hours, the smoke alarms will go off and the Security Company will be informed and contact the appropriate personnel.
- 6.5.2 Security personnel patrol the farm as well and in the case of a fire, the personnel will inform Management who will respond in the correct manner.
- 6.6 **Power failure**
- 6.6.1 The generator is set to switch on automatically when there is an Escom power failure. Should it fail to switch on, the fault should be reported immediately to the responsible person on duty.
- 6.6.2 UPS's are in place on all Servers and on most operational PC's to prevent immediate shut downs.
- 6.6.3 An alarm system is connected to the fridges and freezers that notify the Security Company of any power failures, which in turn notifies Management and the person on duty.

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- 6.7.1 All buildings are equipped with alarm systems that notify the Security Company of intrusions. The company in turn notifies the Management and appropriate personnel.
- 6.7.2 Security personnel patrol the farm after hours and report all disturbances to the Security Company and to the appropriate personnel.

6.8 Flood

- 6.8.1 In the event of a possible flood all test systems and important movable equipment will be removed from the flood line area and stored in a safe location
- 6.8.2 No personnel are allowed to enter the flood line area until it is declared safe.

7 RECORDS

Corrective action procedures should be followed where necessary (refer to MRU/02/03). Minutes of the Friday morning Staff Meeting will record the name of the responsible person on duty for that weekend.

8 REFERENCES

Intervet Malelane Research Unit Crisis Management Plan.

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APPENDIX 4.6:
COPY OF COMPANY INFORMATION
COMPLIANCE CERTIFICATES
WATER ANALYSIS RESULTS BY CSIR

INTERVET MALELANE RESEARCH UNIT

INTRODUCTION

The Intervet Malelane Research Unit was established in 1972 by Hoechst, a German owned crop science and veterinary pharmaceutical company. Since the research unit was established, ownership of the farm has changed several times and at present the farm is owned by Schering-Plough, and American veterinary pharmaceutical company.

LOCALITY

The Malelane Research Unit is situated on the Tonga Road, Richtershoek area of the Nkomazi district, in the Mpumalanga Lowveld of the Republic of South Africa. The farm is located approximately 22km from the southern border of the Kruger National Park and near the Mozambican and Swaziland borders.



SIZE

The farm is 86.5 hectares in size and has a 71.1 ha irrigation allocation from the Lomati River, which forms the southern boundary of the farm.

ALTITUDE

The farm is situated 250 meters above sea level.

TEMPERATURE

Maximum **summer** temperature: 44°C (Day)

Minimum **winter** temperature: 2°C (Night)

Frost free.

RAINFALL

Average rainfall per year is 800 mm. The Lomati River is the main source of water for irrigation purposes and is fed by the Driekoppies dam which is situated approximately 20 km upstream.

PERSONNEL

- 1 Research Veterinarian (Head R&D)
- 1 Research Veterinarian (Farm Manager MRU)
- 3 Veterinary Researchers
- 1 Veterinary Technologists
- 1 Veterinary Technologist Student
- 1 Quality Assurance Officer (Contract)
- 1 Administrative Secretary
- 7 General Assistants

LIVING QUARTERS

- 3 Houses for Veterinary Staff
- 1 Guest Cottage

ACCREDITATION

The Malelane Research Unit is a *GLP* and *GCP* quality accredited facility and obtained its accreditation under the South African National Accreditation System (SANAS) in 2002. A full time QA officer (contract) oversees the conducting of all studies and maintenance of the quality system.



RESEARCH FACILITIES

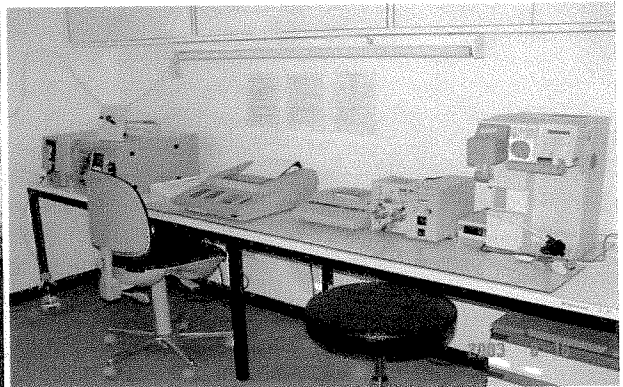
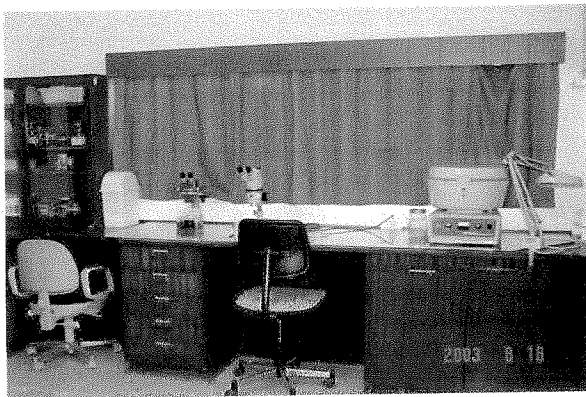
1) Office complex

An office complex with offices for the Farm Manager, Veterinary Researchers, Veterinary Technologists, Student and Administrative Secretary is available. The offices are fully equipped with telephones, computers, fax, copying, Internet and e-mail facilities. A hall is available to hold farmer's days.



2) Laboratories

A fully equipped laboratory with microscopes, centrifuges, refrigerators, deep freezes etc. is available for parasitological research and testing. A second smaller laboratory is available for dip sample analysis, tick resistance testing and Elisa testing of serum samples for Fasciolosis.



3) Cattle Shed

Floor: 42.4m x 14.8m

The shed has 12 large pens (6m x 6m) which can each be sub-divided in 4 smaller pens (3m x 3m).

Each pen is equipped with water and feeding troughs.

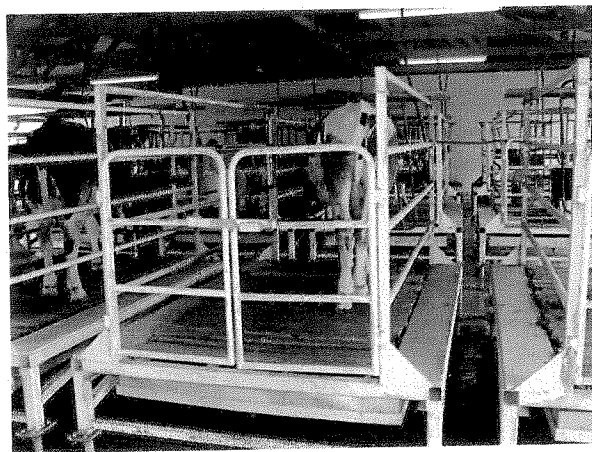
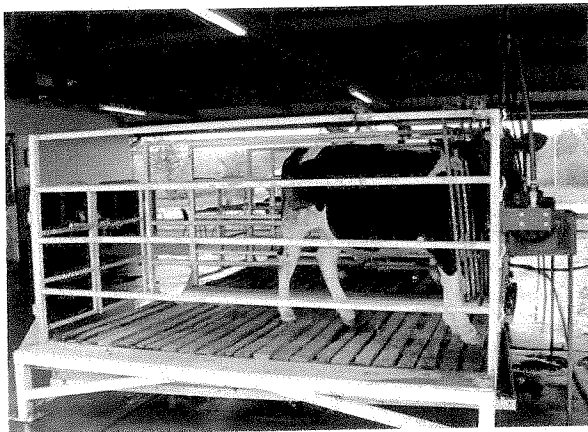
In addition a large animal scale, crush pens, neck and body clamps ensures the easy handling of animals.

Adjacent to the cattle shed is a feed store as well as an office area.



4) Tick Stables

Sixteen individual cattle stanchions are available for the conducting of stall studies for efficacy trials of acaricides especially against *Boophilus* spp. Calves can be secured to prevent grooming. The stanchions are equipped with wooden slatted floors each with a stainless steel tray underneath to facilitate tick collection. The size of each stanchion is 4.25 m².

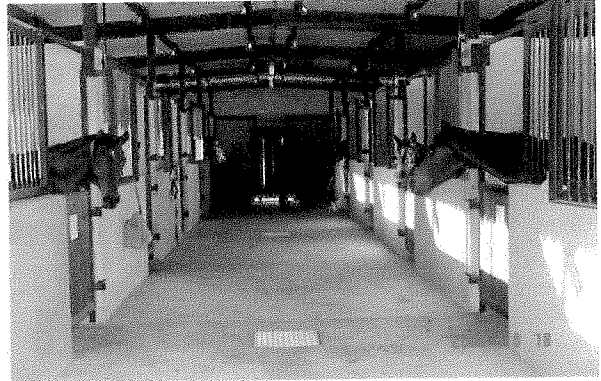


5) Horses Stables

Floor: 24m x 10m

Twelve stables (3.5m x 3.5m) are available for the stabling of horses. The stables are insect proof to prevent the transmission of African Horse Sickness to the animals.

Adjacent to the stabling area is a feed store and a tack room.

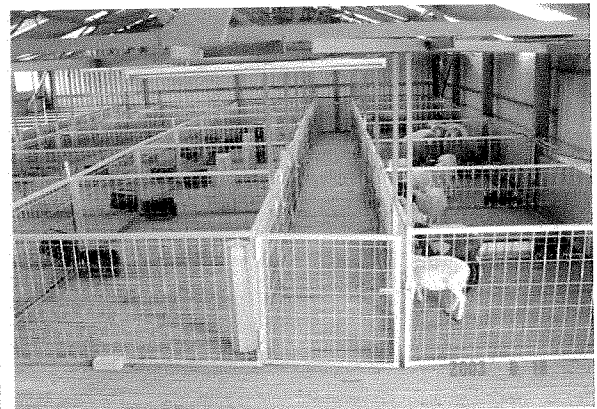
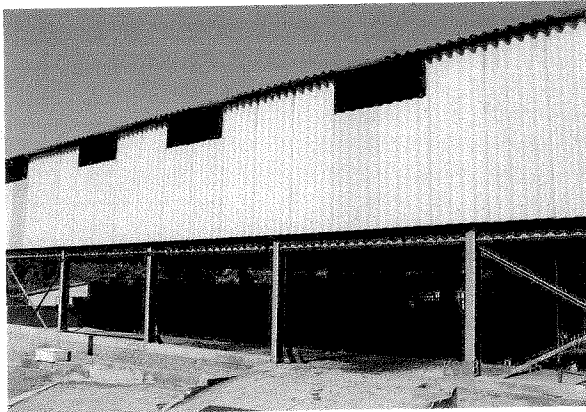


6) Sheep Shed

Size: 18 pens (2.5m x 2.5m for housing groups.

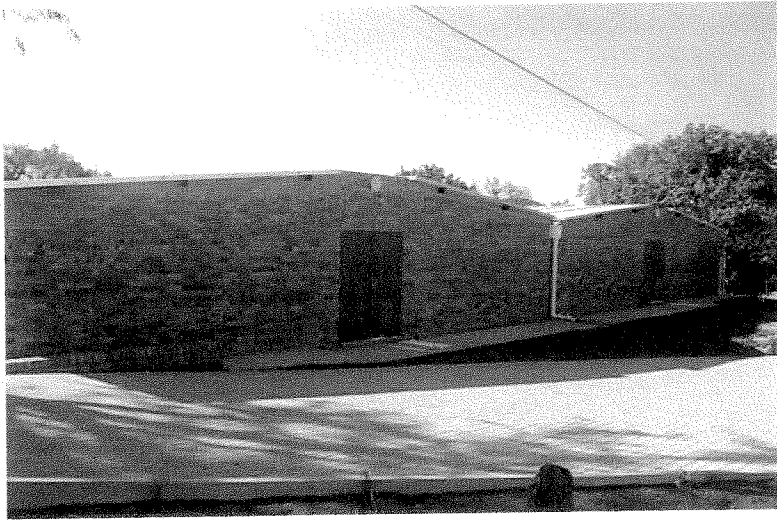
15 pens (1m x 2.5m) for housing individual sheep.

The sheep shed is raised with wooden slatted floors to allow dung to fall onto a concrete floor below. Each pen is equipped with water and feeding troughs.

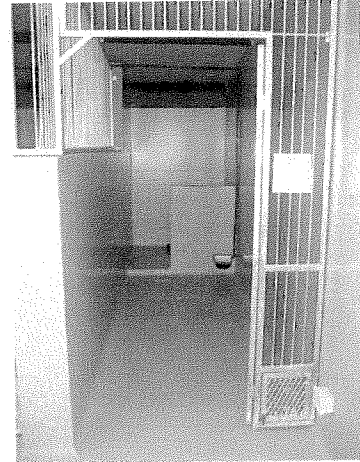
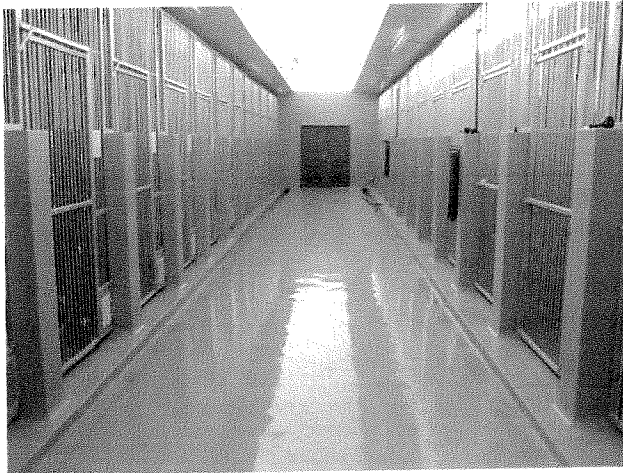


7) Companion Animal Unit

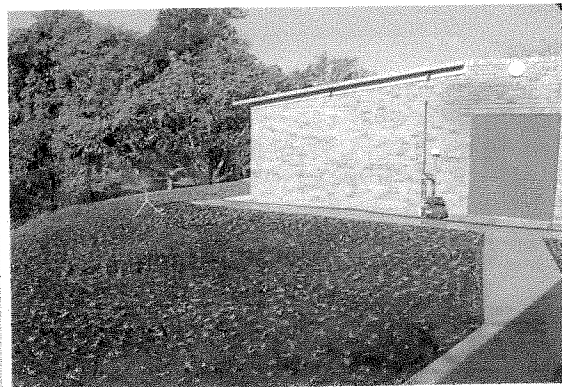
The companion animal unit comprises of 50 individual kennels each equipped with a feeding bowl and an automatic water bowl. The total size of each individual kennel is 6.47 m². Each kennel has a sleeping area equipped with a rubber mat for the dogs to sleep on. The dogs have access to an outside run area of approximately 140 m² where they can socialise during the day when they are not utilized in a study.



Dog Unit



Individual kennels



Outside run area

8) Insect Breeding Room

An insect room (4.55m x 3.65m) is available for fly and flea breeding.

A flea and tick breeding program is maintained to ensure sufficient fleas and ticks for efficacy trials on companion animals.

9) Incubators

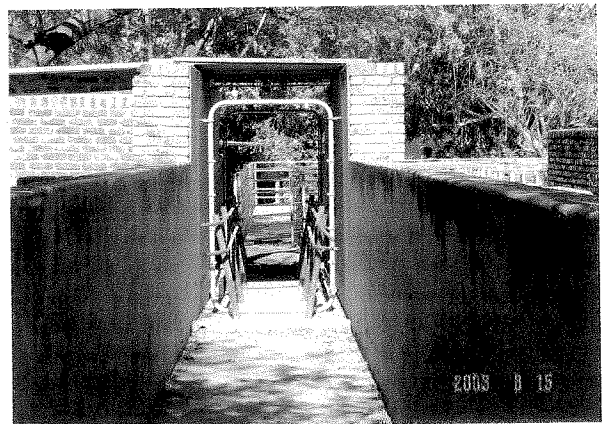
Two incubator rooms where temperature and humidity can be controlled are available for tick and insect breeding programs. One room is utilized for testing of ticks for resistance against acaricides.

10) Pens

Additional concrete floored crush pens with a neck clamp and various holding pens are available to facilitate the handling of cattle and horses especially for parasite counting.

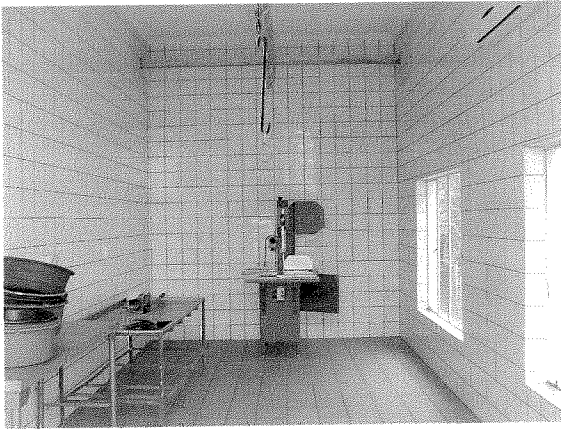
**11) Dipping facilities**

A 20 000 liter capacity plunge dipping tank as well as a spray race is available for dipping of cattle.

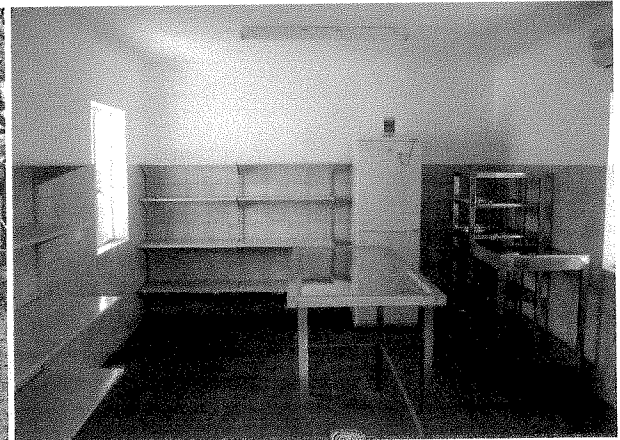


12) Post Mortem Room

A tiled room with adjacent cool room is available for the conducting of *post mortems*. A circular saw is available to enable the cutting of carcasses.

**13) Clinic**

A fully equipped clinic is situated adjacent to the dog unit to facilitate the treatment of sick dogs or cats when necessary. Adjacent to the clinic is a companion animal feed store.

**14) Workshop**

A fully equipped workshop and a welding plant are available for general maintenance of equipment.

15) Tractor and Feed Shed

A tractor shed to park tractors and general farm implements as well as a feed shed to store fodder for cattle are available.

16) Office for Farm Supervisor

The office is situated adjacent to the workshop and animal units to allow for proper control and supervision.

17) Animals

A herd of approximately 30 cattle is resident to the farm for the conducting of field tick efficacy studies.

Approximately 10 sheep are used as donors of internal parasites used for worm efficacy studies.

Twelve horses are resident to the farm for ectoparasite studies.

Twenty cats are available for flea efficacy and palatability studies.

18) Grazing

Thirty-two camps of 0.5 ha each is under irrigation and is available for field studies. Each camp is equipped with a water trough and a feeding trough.

R & D CAPACITY**1) Anti-parasitics****a) Ectoparasiticides**

Efficacy studies:

Natural tick infestations in cattle, horses and dogs.

Artificial tick infestations in cattle. (Stall studies)

Sheep scab in sheep - field studies.

Cattle and sheep lice - field studies.

Artificial flea infestations in cats.

Sheep blowfly strike (*Lucilia cuprina*)

Stomoxys and *Musca* spp in cattle, horses, dogs and cats.

Stability and stripping studies in cattle plunge dipping tanks and spray races.

b) Endoparasiticides

Sheep stall and field studies.

Cattle stall and field studies.

Horse stable and field studies.

Dogs and cats - natural infestations

2) Bioequivalence

Animal phase at MRU.

Chemical analysis at: SABS, Potchefstroom and Bloemfontein Universities.

Statistical analysis: Prof G Swan (University of Pretoria).

3) Residue studies

Animal phase at MRU.

Chemical analysis at SABS.

4) Infective Models

Pasteurella pneumonia in cattle.

Endotoxin induced mastitis in cattle.

5) Alliances

Formulations: Burchem and Plaas Chem.

Companion animal ecto- and endoparasiticides: Clin Vet in Bloemfontein

Parasitology: Bosvet and Onderstepoort.

CONTACT DETAILS:

Dr Tom Strydom - Farm Manager Malelane Research Unit

Tel: +27 13 792 4518

Fax: +27 13 792 4528

Cell: +27 83 261 5891

E-Mail: Tom.Strydom@sp.intervet.com

CERTIFICATE OF COMPLIANCE

In terms of section 22(2) (b) of the Accreditation for Conformity Assessment, Calibration and Good Laboratory Practice Act, 2006 (Act 19 of 2006), read with sections 23(1), (2) and (3) of the said Act I hereby certify that:

**INTERVET (PTY) LTD
MALELANE RESEARCH UNIT
Co. reg no: 1984/006837/07**

Facility Compliance Number: **G0011**

is in compliance with the OECD Principles of Good Laboratory Practice (1997) in the conduct of non-clinical health and environmental safety studies of test items contained in pharmaceutical products, veterinary drugs and pesticides within the following area of expertise:

RESIDUE STUDIES, TARGET ANIMAL SAFETY AND BIO-EQUIVALENCE STUDIES

Conducted on : **Veterinary Products**

Date of inspection : **03 – 05 February 2009**

The name of the facility has been added to the South African National Accreditation System register of GLP inspected facilities

The facility is subject to terms and conditions as laid down in
SANAS' GLP system

**Mr R Josias
Acting Chief Executive Officer**

**Effective Date: 01 April 2009
Certificate Expires: 30 April 2011**

This certificate is valid as per the scope as stated in the accompanying schedule of accreditation, Annexure "A"

ANNEXURE A

SCHEDULE OF COMPLIANCE

GLP Laboratory Number: G0011

<p><u>Permanent Address of Laboratory:</u> Malelane Research Unit, Intervet (Pty) Ltd. Richtershoek Tonga Road Malelane</p> <p><u>Postal Address:</u> P.O. Box 124 Malelane 1320</p> <p>Tel : 013) 792-4518 Cell : 082 807 2148 Fax : (012) 997- 2105 E-mail : dokfaffa@nashuaisp.co.za</p>	<p><u>Contact Person</u> : Dr F Malan</p> <p>Issue No. : 07 Date of Issue : 24 June 2009 Expiry Date : 30 April 2011</p>
SCOPE	
<p>Residue studies in animal tissue (Residues) Target animal safety studies. (Other) Bio-equivalence studies on veterinary products. (Other)</p>	

Original date of compliance: 30 April 2002

Page 1 of 1

ISSUED BY THE SOUTH AFRICAN NATIONAL ACCREDITATION SYSTEM

Field Manager

CERTIFICATE OF COMPLIANCE

In terms of section 22(2) (b) of the Accreditation for Conformity Assessment, Calibration and Good Laboratory Practice Act, 2006 (Act 19 of 2006), read with sections 23(1), (2) and (3) of the said Act, I hereby certify that:

**INTERVET (PTY) LTD
MALELANE RESEARCH UNIT
Co. reg no: 1984/006837/07**

Facility Accreditation Number: **GCV02**

is in compliance with the VICH Cooperation on Harmonisation of
Technical Requirements for Registration of Veterinary Medicinal Products
within the following area of expertise:

EFFICACY TESTING OF VETERINARY PRODUCTS

Conducted on : **Study Animals**

Date of inspection : **17 – 19 November 2009**

The name of the facility has been added to the South African National Accreditation System
register of GCP inspected facilities

The facility is subject to terms and conditions as laid down in
SANAS GCP system

**Mr M Phaloane
Acting Chief Executive Officer**

**Effective Date: 30 April 2009
Certificate Expires: 29 April 2011**

This certificate is valid as per the scope as stated in the accompanying schedule of accreditation, Annexure "A"

ANNEXURE A

SCHEDULE OF COMPLIANCE

GCP Laboratory Number: GCV02

<p>Permanent Address of Laboratory: Malelane Research Unit, Intervet (Pty) Ltd. Richtershoek Tonga Road Malelane</p> <p>Postal Address: P.O. Box 124 Malelane 1320</p> <p>Tel : (013) 792-4518 Fax : (012) 997-2105 Cell : 082 807 2148 E-mail : dokfaffa@nashuaisp.co.za</p>	<p>Contact Person: Dr F Malan</p> <p>Issue No. : 06 Date of Issue : 24 March 2010 Expiry Date : 29 April 2011</p>
SCOPE	
Pre-clinical and clinical efficacy studies on veterinary products.	

Original date of compliance: 30 April 2002

Page 1 of 1

ISSUED BY THE SOUTH AFRICAN NATIONAL ACCREDITATION SYSTEM

Field Manager



Fax: +27 +12 841-4653
 Alt Tel: +27 +12 841-2261
 E-mail: CAdlem@csir.co.za

Vat No: 4470114283



(T0007)

CSIR Consulting & Analytical Services

P O Box 395, Pretoria
 Building 21, Room A107/A119
 Meiring Naude Road
 Brummeria, Pretoria

Certificate of Analysis

Contact Person Magiel Minnie
 Company Intervet
 Address1 PO Box 124
 Address2 Mefelane
 Address3
 Postal Code 1320
 Tel 013 - 792 4518

Report 8273
 Date Received 18-Mar-10
 Sample description Water
 No. samples received 2
 Start date 18/03/2010


(Page 1 of 2)

Labnum		77186	77187
Sampled		RiverAbove	RiverBelow
Ammonia nitrogen	mg/l N	0.12	<0.1
Arsenic (inorg)	mg/l As	0.003	0.006
Boron	mg/l B	0.07	0.08
Cadmium	mg/l Cd	<0.003	<0.003
Chlorine (tot)	mg/l Cl2	0.01	0.01
Chromium6	mg/l Cr	<0.02	<0.02
Chromium - (tot)	mg/l Cr	<0.02	<0.02
COD	mg/l COD	<10	16
Colour	mg/l [Pt-Co]	18	30
Copper	mg/l Cu	<0.03	<0.03
Cyanide (free)	mg/l CN	<0.01	<0.01
Elect Conductivity	mS/m [25°C]	95.1	91.6
Fluoride	mg/l F	0.33	0.31
Iron	mg/l Fe	0.05	<0.03
Lead	mg/l Pb	<0.02	<0.02
Manganese	mg/l Mn	<0.03	<0.03
Mercury (tot)	mg/l Hg	<0.001	<0.001
Nitrate nitrogen	mg/l N	<2	<2
ortho Phosphate	mg/l P	<0.2	0.9
Oxygen Absorbed	mg/l OA	1.6	1.8
pH	pH units [25°C]	7.9	8.2
Phenols	mg/l Phenol	<0.004	<0.004
Selenium (inorg)	mg/l Se	<0.003	<0.003
Sodium	mg/l Na	70	77
Sulphide #	mg/l S	<0.2	<0.2
Sulphate	mg/l SO ₄	5.6	<5
TSS	mg/l [105°C]	8	6
Zinc	mg/l Zn	<0.02	<0.02
Faecal Streptococci	count/100ml	4400	700
Oil & grease #	mg/l	<10	<10
Detergent #	mg/l	0.3	0.2
# not accredited			

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 CSIR General Conditions of Contract. Samples are discarded after 30 days from issue date of certificate.

Signed:  C. Adlem : Manager (Inorganic Chemistry)

Date: 11/06/2010

Signed:  Poppy Ngobo : Technical signatory (Microbiology)

Date: 11/06/10

APPENDIX 4.7:

STANDARD OPERATIONAL PROCEDURES FOR ALKALINE
HYDROLYSIS MACHINE

WHY WASTE RESOLUTION TECHNOLOGIES

- Waste Resolution Technologies (WRT), have a specialized knowledge and understanding of the abattoir industry and its challenges.
- WRT has developed technologies to meet these challenges in an affordable and effective way.

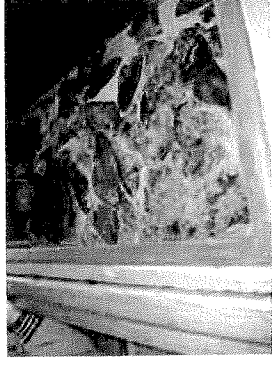
WRT's MAAHP TISSUE PROCESSOR

- **GOAL:** To effectively process (digest and liquefy) any animal tissue, into a safe, pathogen free and stable liquid.
- This is achieved through WRT's Modified Atmospheric Alkaline Hydrolysis Process.
- The process breaks down all animal tissue including blood into the basic building blocks of that tissue namely
 - Amino acids
 - Small peptides
 - Sugar
 - Soap
 - along with the mineral ash of bones and teeth.

- **THE MAAHP TISSUES PROCESSOR USES:** Heat, Water and Base Catalyst to rapidly dissolve tissue into a Hydrolyzed Protein Liquid (HP Liquid). During this process the protein coats of viruses are destroyed and the peptide bonds of protein based infectious organisms are broken down, therefore achieving a high level of **BIO-SECURITY**.

ADVANTAGES of the MAAHP TISSUE PROCESSOR

- Allows on-site treatment of all animal tissue.
- The complete system has a small footprint and a robust design.
- Very low odour process.
- MAAHP is a non burn process that is superior to incineration and burial as methods of disposal.



STEP: 3

Final inspection & press the start button

Time Required : 2 minutes

The Tissue Processor is switched on and will complete the remainder of the cycle without any supervision or human intervention.



STEP: 4

Hydrolysis through efficient automation

Time Required : 12-24 Hours

The process of the MAAHP Tissue Processor is managed automatically by means of an advanced control system that optimizes energy efficiency and process effectiveness.



- The resulting HP liquid has a commercial value and cost recovery is possible depending on the operator's circumstances.

DIGESTIBLE MATERIAL

WRT's MAAHP Tissue Processor is specifically designed to deal with animal tissue to avoid waste and to provide true denaturing include:

- Meat, Blood & Tendons
- Fat and Fatty Tissue
- Feathers, Hooves, Hair & Horns
- Hides and Skins
- Bone Matter
- Whole Carcasses of smaller animals (birds, dogs, cats, sheep, pigs etc)

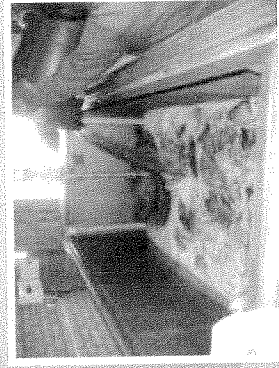
A QUICK & EASY 6 STEP SYSTEM

STEP: 1

Weigh tissue, load unit and add water

Time Required : 40 minutes

A DD1000 (1000kg per cycle) MAAHP Tissue Processor being loaded with animal tissue. This process allows for waste water to be used to save costs.



STEP: 2

Add catalyst and close the lid

Time Required : 10 minutes

After the unit is loaded with the day's animal tissue, the chemical catalyst is added and the unit is closed.

STEP: 5

Switch off & prepare for discharge.

Time Required : 2 minutes

The same unit 20 hours later just prior to being discharged. The resultant dark brown liquid or Hydrolyzed Protein Liquid (HPL) has varied applications.



STEP: 6

Discharge the HP liquid.

Time Required : 30 minutes

The HP Liquid is discharged directly into plastic holding tanks utilizing a purpose fitted pump.



MRI
Waste Resolution Technologies

Waste Resolution Technologies

WHAT CAN I DO WITH THE HP LIQUID?

1. **A Liquid Fertilizer**

The HP Liquid is an excellent liquid fertilizer. The material contains macro and micro nutrients required for plant growth. It also contains complex proteins which can provide a food source for microbes in the soil and contribute to building organic matter in the soil, according to Cornelius Oosthuizen from SA Biofarm.

2. **Compost additive**

The HP Liquid is an excellent compost additive and allows for easy and homogenous mixing into any basal ingredient, without the usual concerns about pathogens and bio-security.

3. **Biogas Additive or Biomass Converter**

The HP Liquid is also an excellent feedstock for an anaerobic digester or a biomass converter where energy recovery is the objective.

4. **Disposal via Sewage System**

Although disposal via the sewage system is an alternative, care should be taken that all relevant authorities have been informed of such disposal.

For more info about this exciting product contact:

Adriaan Gerber
Sales & Marketing Manager

Cell: 083 678 4691

Fax: 086 619 5031

sales@waste-resolution-technologies.com
www.waste-resolution-technologies.com

MRI

Waste Resolution Technologies

MRI
TISSUE PROCESSOR
SYSTEMS

Waste Resolution Technologies

MODIFIED ATMOSPHERIC ALKALINE HYDROLYSIS PROCESS

APPENDIX 4.8:

**LETTER FROM ENVIRO SERV: WASTE MANAGEMENT SERVICE
PROVIDER**

ENVIROSERV

WASTE MANAGEMENT (Pty) Ltd

17 August 2010
Intervet
Po Box 124
Malalane
1320

Reg: Sludge from the Alkaline Hydrolysis Process.

Att: Dr Tom Strydom

Based on the information supplied to EnviroServ, we will be able to transport and dispose of the waste generated from the Alkaline Hydrolysis Process. The waste will be disposed of at Holfontein H:H Hazardous landfill site. The waste will be treated and disposed of under supervision by treating the sludge with lime, crush and bury. The load will not be accepted after hours or over weekends. (Disposal time Monday to Friday from 7:30 to 16:00)

The waste will be removed and disposed of by means of the standard EnviroServ waste manifest system and documentation. The waste will be charged for according to the Holfontein weighbridge. The customer will be presented with a safe disposal certificate to be delivered with the invoice and Holfontein weighbridge slip. The waste will be transported by dangerous goods compliant vehicles and drivers that are hazmat certified. EnviroServ are permitted to transport hazardous waste over provincial borders and we have a valid operations license for transporting of hazardous waste.

All relevant certificates and documentation will be forwarded to you for review.

Please contact me if you need more information

Regards

Kobus van Tonder
Key Accounts Consultant

EnviroServ Waste Management (Pty) Ltd, Brickfield Road, Meadowdale, Germiston, P.O. Box 1547, Bedfordview, 2008
Tel: +27 11 456-5660, Fax: +27 11 454-6016 Email: info.ho@enviroserv.co.za Website: www.enviroserv.co.za

Directors: A. McLean (Brit) (Chairman), D.K. Gordon (CEO), C.L.A. Coppings, K.M. Geoghegan, E. Gombault, D.F.N. Krügel, D. Lavarinhas,
E.K. Motebang, R.P. Rocher,
O. Deftereos (ACIS.CA(SA)) (Company Secretary)
Reg No 2008/02115207

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