AFGRI Poultry (Pty) Ltd.

Draft Basic Assessment Report

Locality: Sundra

Departmental Ref No: 17/2/3 N-113

SHANGONI
Management Services (Pty) Ltd

DRAFT BASIC ASSESSMENT REPORT

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Locality: Sundra

Departmental Ref No: 17/2/3 N-113

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PROJECT DETAILS

Mpumalanga Department of Economic Development, Environment and Tourism (MPDEDET)

Reference No.: 17/2/3 N-113

Project Title: Expansion of the AFGRI Daybreak (Sundra) abattoir on the remaining extent of portion 8, of the farm Modderfontein 236 IR, Mpumalanga.

Applicant: AFGRI Poultry (Pty) Ltd.

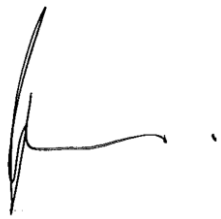
Project Number: AFG/sun/18-11-11

Compiled by: Ms. Patricia van der Walt

Date: 16 April 2012

Location: The remaining extent of portion 8 of the farm Modderfontein 236 IR, Mpumalanga.

Technical Reviewer: Mr. Brian Hayes



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Approval: Brian Hayes (Pr Eng)

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DEFINITIONS

Environment

The surroundings (biophysical, social and economic) within which humans exist and that are made up of

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

Environmental Aspects

Elements of an organization's activities, products or services that can interact with the environment.

Environmental Degradation

Refers to pollution, disturbance, resource depletion, loss of biodiversity, and other kinds of environmental damage; usually refers to damage occurring accidentally or intentionally as a result of human activities.

Environmental Impacts

Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's activities, products or services.

Environmental Impact Assessment

A study of the environmental consequences of a proposed course of action.

Environmental Impact Report

A report assessing the potential significant impacts as identified during the environmental impact assessment.

Environmental impact

An environmental change caused by some human act.

Land use

The various ways in which land may be employed or occupied. Planners compile, classify, study and analyse land use data for many purposes, including the identification of trends, the forecasting of space and infrastructure requirements, the provision of adequate land area for necessary types of land use, and the development or revision of comprehensive plans and land use regulations.

Pollution Prevention

Any activity that reduces or eliminates pollutants prior to recycling, treatment, control or disposal.

Public Participation Process

A process of involving the public in order to identify needs, address concerns, in order to contribute to more informed decision making relating to a proposed project, programme or development.

Topography

Topography, a term in geography, refers to the "lay of the land" or the physio-geographic characteristics of land in terms of elevation, slope and orientation.

Vegetation

All of the plants growing in and characterizing a specific area or region; the combination of different plant communities found there.

Waste

Waste is unwanted or undesired material left over after the completion of a process. "Waste" is a human concept: in natural processes there is no waste, only inert end products.

ABBREVIATIONS

BID	-	Background Information Document
BAR	-	Basic Assessment Report
CRR	-	Comments Response Report
MPDEDET	-	Mpumalanga Department of Economic Development, Environment and Tourism, Mpumalanga
DWA	-	Department of Water Affairs
EAP	-	Environmental Assessment Practitioner
ECA	-	Environmental Conservation Act of 1989
EIA	-	Environmental Impact Assessment
EIR	-	Environmental Impact Report
EMF	-	Environmental Management Framework
EMP	-	Environmental Management Programme
GN	-	Government Notice
I&AP	-	Interested and Affected Party
NEMA	-	National Environmental Management Act, Act 107 of 1998 as amended
R	-	Regulation

EXECUTIVE SUMMARY

The purpose of this document is to supply the Mpumalanga Department of Economic Development, Environment and Tourism (MPDEDET) with the requested information pertaining to the National Environmental Management Act (NEMA), as amended, and Regulation 22 of the Environmental Impact Assessment Regulations, 2010. Contained in this document is a brief overview of the activity and site specific information of the proposed abattoir expansion project (location, topography, surrounds, vegetation, etc.). The latter part of the document contains an environmental management framework that includes a description of activities on the site, an identification of environmental aspects and a construction- and operational- EMP for the effective mitigation of identified environmental impacts associated with the activity.

1. INTRODUCTION

This report forms part of an application for environmental authorisation for the proposed abattoir expansion on the remaining extent of portion 8, of the farm Modderfontein 236 IR, Mpumalanga. The application process is undertaken on behalf of the applicant, AFGRI Poultry (Pty) Ltd., by Shangoni Management Services (Pty) Ltd. Shangoni was appointed, as independent environmental practitioner, to assist the applicant in complying with the 2010 EIA Regulations in terms of the National Environmental Management Act (Act 107 of 1998).

An application to undertake an Environmental Impact Assessment (Basic Assessment) process was submitted to the identified competent authority, the Mpumalanga Department of Economic Development, Environment and Tourism (MPDEDET). The Department subsequently registered the project and the formal Basic Assessment (BAR) process was thereby initiated.

All the findings from the Basic Assessment process are included in this report. Also included in report is a construction- and operational- Environmental Management Plan (EMP) that addresses appropriate mitigation steps for the different phases of the project.

1.1 Applicant

Name of Applicant	AFGRI Poultry (Pty) Ltd.
Contact Person	Mr. Willem Breedt
Postal Address	PO Box 186 Sundra 2200
Telephone No.	013 661 1063
Cell phone No.	087 941 0526/079 528 5009
Fax No.	013 661 1797
Farm name and portion on which the activities take place	Remaining extent of portion 8 of the farm Modderfontein 236 IR, Mpumalanga
Co-ordinates of operation	26°09'18.38"S; 28°32'40.23"E

1.2 Appointed Environmental Assessment Practitioner

Name of firm	Shangoni Management Services (Pty) Ltd.	
Postal address	PO Box 74726 Lynwood Ridge Pretoria 0040	
Telephone No.	(012) 807 7036	
Fax	(012) 807 1014/086 643 5360	
E-mail	lizette@shangoni.co.za	
Team of Environmental Assessment Practitioners on project		
Name	Qualifications	Responsibility
Mr. H.L. de Villiers	Bsc. (Hons) (PU for CHE) MSc.(UP)	EIA Project Leader and Co-ordinator
Ms. Lizette Crous	Post Graduate Certificate Environmental Management (University of London)	EAP
Ms. Patricia van der Walt	B.Sc. (Hons) (Applied Science in Environmental Technology)	Junior EAP

Detailed CV's for the project team are appended (Appendix F).

1.3 Current situation

At present, 700 000 chickens are slaughtered at the abattoir per week. The abattoir operates 24 hours a day, 7 days a week.

The chicken slaughtering process is as follows:

1. Live birds weighing approximately 2kg are brought to the abattoir from the supplying farms.
2. The trucks stop in a holding bay until the crates of birds can be off-loaded.
3. Live birds are manually removed from the crates and suspended upside-down onto a shackle conveyor chain, feeding the birds into the processing area. Dead on arrival birds (DOAs) are removed from the crates and placed into a waste skip that is sent to the AFGRI Animal Feeds (Dryden) rendering plant on a daily basis.
4. Being suspended on the shackle chain, the birds are lowered into a stunner water trench with their heads submerged into the water. The water in the trench is charged by a high voltage and low ampere electric current that electrocutes the birds prior to the slitting of the carotid vein and artery.
5. The birds move through a blood collection tunnel where they bleed out for at least 90 seconds. The blood from the blood collection tunnel is also collected and pumped to a blood tank, from where it is poured into a container truck taken to the Dryden rendering plant.
6. To loosen the feathers, each bird is hard scalded for up to two and a half minutes.
7. Plucking occurs through mechanical abrasion, by rubber fingers or disks that are mounted onto revolving drums. The feathers are collected and taken to the Dryden rendering plant.
8. The meat is inspected and any condemned material is removed from the processing line and taken to the Dryden rendering plant.
9. Remaining pin feathers are manually removed.
10. The heads of the birds are removed.
11. The birds are washed with chlorinated water.
12. The hocks are cut.
13. The bird’s feet are scalded and plucked.
14. The birds are transferred to the Evisceration Section. This is the last step in the “dirty area” process. The next step is the first in the “clean area” process.
15. The vents are drilled and opened.
16. Viscera packs are removed.
17. The meat is inspected and condemned material is removed and taken to the Dryden rendering plant.
18. The organs are harvested and separated.
19. The crops and windpipes are removed. These are collected and sent to the Dryden rendering plant.
20. The necks are removed.

21. The carcasses are given a final chlorinated wash inside and out.
22. The carcasses are sprayed with FoodPro.
23. The carcasses are removed from the conveyor line and hung in an air chiller.
24. The carcasses are separated into the different frozen product processing lines where chicken portions are cut, for example.
25. The products are frozen.

The abattoir currently uses approximately 12l water per chicken, thus using approximately 1.2 Ml of water per day, which equates to 13.9 l/s. This is sustained by borehole water, from three onsite boreholes. Each borehole abstracts groundwater at a rate of 4.6 l/s. Municipal water is supplied to the property for domestic purposes.

Abattoir wastewater has a high organic content due to the waste materials (blood, fat, small pieces of meat, gizzard contents, manure) produced in the slaughtering process. The wastewater from the abattoir is mechanically screened to remove the solid organic material. The solids are then sent to the Dryden, AFGRI owned, rendering plant. Dryden is a registered Sterilizing plant.

From the mechanical screening, wastewater flows into two effluent reservoirs where it is chemically treated before being disposed of into a pan adjacent to the abattoir. This treatment method is inadequate and AFGRI Poultry is in the process of applying for an integrated water use license and a waste license for the proposed construction of an integrated ponding and wetland system to effectively treat the abattoir wastewater (REF: 12/9/11/L832/6).

Condemned materials at the abattoir consist of the following:

- Dead on arrival chickens (DOAs);
- Chickens killed in the intake department;
- Feathers and Blood;
- Soil and faecal matter from live bird trucks, dirty modules and crates, and the module washer screen;
- Heads and carcasses lost under the plucker machines;
- Products that are condemned during inspections.

All condemned materials are placed in designated bins and are sealed. The following procedures apply to each class of condemned material:

DOAs

DOAs are disposed of in one of two ways. In the first, the DOAs are shredded into pieces and stored in bins destined for the AFGRI Dryden rendering plant. In the second method, DOAs are

placed in locked bins in a refrigeration container at the waste collection area. Here the temperature is kept at 0°C and carcasses are placed inside crates to allow for adequate air circulation between the carcasses. The carcasses are then collected by a contracted crocodile farmer.

Condemned materials – chickens killed in the intake department

The carcasses are collected and placed in a designated, locked bin marked “Condemned material”. The carcasses are then taken to the Dryden rendering plant from here.

Feathers

Feathers from the first two pluckers are collected and conveyed to a feather press outside the department. Dried feathers are collected in containers placed underneath the feather press. Feathers from the third and fourth pluckers are washed away in the drain underneath the plucker machines, using recycled water. The feathers accumulate in the feather sump and are then pumped through a screen. The feathers are collected in dedicated containers at the condemned material collection point prior to being taken to the Dryden rendering plant. The water is sent to the treatment plant.

Blood

From the culling area, blood is pumped from the blood tunnel to a blood collection tank. The tank is emptied daily and the blood taken to the Dryden rendering plant for further processing (sterilisation).

Soil and faecal matter

Soil and faecal matter from the live bird trucks is swept together by the designated truck cleaner and collected in a wheel barrow. The wheel barrow is then emptied into the feather collection containers that are sent to the Dryden rendering plant.

Heads and carcasses lost under the plucker machines

Any heads and carcasses lost under the plucker machines are totally condemned and collected in a dedicated bin labelled “Condemned material”. The heads and carcasses are taken to the carcass shredder or the refrigerated container and are sent to the Dryden rendering plant.

Products that are condemned during inspections

Carcasses removed by a qualified meat examiner at the first meat inspection point are placed in dedicated bins marked “Condemned material”. The bin is removed by the meat inspector to determine if any disease or condition is present. The material is then either taken to the carcass shredder or the refrigeration container at the waste collection area.

Carcasses, portions or organs removed by the meat inspector at the second inspection point are collected in dedicated bins. The meat is inspected to determine if any disease or condition is present. The condemned material is placed in the carcass shredder. Shredding facilitates the pumping of the condemned material directly to the condemned material collection point where it is stored in dedicated containers provided by the Dryden rendering plant. Bins used for condemned materials at the two inspection points are washed thoroughly before being used again.

Reworked or returned products are inspected by a qualified meat inspector and any products condemned by the inspector are placed in a dedicated bin marked “Condemned material”. The bin is taken to the condemned material collection point and the material is placed in containers supplied by the Dryden rendering plant. The bins are washed and sanitized before being returned to the rework area.

All condemned material is sent to the Dryden rendering plant.

Waste bins

- All bins identified for the storage of condemned material must be clearly marked with green ink, bearing the description as mentioned in this procedure, with the letter size at least 10 cm high.
- The bins must be locked at all times.
- Bins must be leak proof. In the case of any bin being broken or damaged, the bin must be replaced with a spare bin.

1.4 Proposed Activity

The proposed project entails the expansion of the AFGRI Poultry Daybreak (Sundra) abattoir so that the processing capacity can be increased to 1.5 (one and a half) million chickens per week.

If the AFGRI Poultry Daybreak abattoir was to be expanded, the total volume of groundwater abstracted will increase, however the volume of water used per chicken will be less (11l/Chicken) due to better economies of scale.

Should the proposed expansion of the abattoir be authorised, 1 500 000 chickens will be slaughtered per week. This would mean that approximately 16 500m^3 of water would be required per week (± 2.4 Ml/day = ± 27.3 l/s).

The expansion project will include the following new developments:

- One carton freezer, within existing building

- One spiral freezer, within existing building
- Upgrading existing chiller, within existing building
- Upgrading existing spiral freezer, within existing building
- One new plantroom, outside existing building
- One pipeline from existing building to new plant room
- Expansion of – 20°C holding room, increasing the existing building footprint

Figure 1: Site layout design

As illustrated in Figure 1, the new compressor chamber is to be built adjacent to the existing abattoir buildings and will cover an area of approximately 35m x 21m.

The rest of the upgrades and new installations will take place inside or adjacent to the existing abattoir buildings (Refer to Appendix C).

1.6 Proposed Locality

The AFGRI Poultry Daybreak (Sundra) abattoir falls within the Victor Khanye Local Municipalities' jurisdiction. This local municipality forms part of the Nkangala District municipality, located within the Western Highveld of the Mpumalanga province.

The proposed site is located on the remaining extent of portion 8 of the farm Modderfontein 236 IR. The site lies approximately 14km due West from the town of Delmas.

The proposed site can be reached from the N12 (toward Witbank), by taking exit 461 towards R50/Eloff/Sundra/Bapsfontein. Turning right onto Katboschfontein Road and continuing approximately 350m to take the second left toward Modderfontein Road. The abattoir is located on the right, approximately 700m along this road.

Table 1: Direction and distance to the nearest town

Direction	Distance from site	Closest town
Sundra	4.3km	South
Delmas	14 km	East
Mandela park	5.4 km	North West

The site locality map is given below as Figure 2, the topography of the site is shown in Figure 51 and the site photographs are shown in Figure 3 to Figure 12.

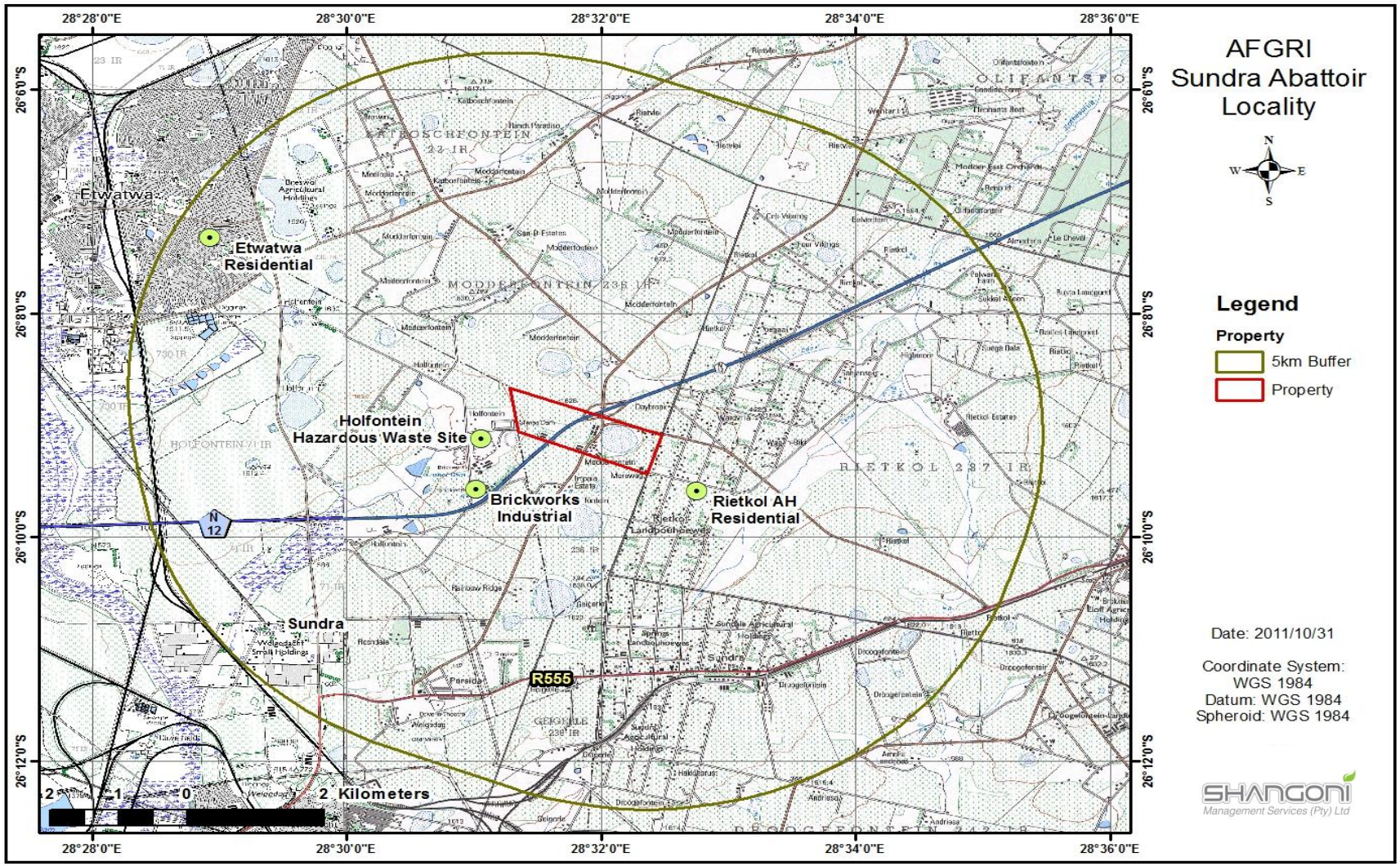


Figure 2: Site locality map

Figure 3: Site photograph 1

Figure 4: Site photograph 2

Figure 5: Site photograph 3

Figure 6: Site photograph 4

Figure 7: Site photograph 5

Figure 8: Site photograph 6

Figure 9: Site photograph 7

Figure 10: Site photograph 8

Figure 11: Site photograph 9

Figure 12: Site photograph 10

2. NATURE AND EXTENT OF THE ENVIRONMENT AFFECTED BY ACTIVITY

The following section provides a description of the baseline or status quo environment as well as the social-economic parameters that characterise the region and the study area, and is derived from various specialist studies as well as data sources including aerial photographs, topo-cadastral maps and national and provincial databases.

2.1 Biophysical aspects affected

2.1.1 Geology

The site is underlain by transported silty and residual soils presumably developed over mudrock bedrock belonging to the Vryheid Formation, Ecca Group, Karoo Supergroup and by dolomite and chert bedrock at depth belonging to the Malamani Subgroup, Transvaal Supergroup (Dekker, 2011).

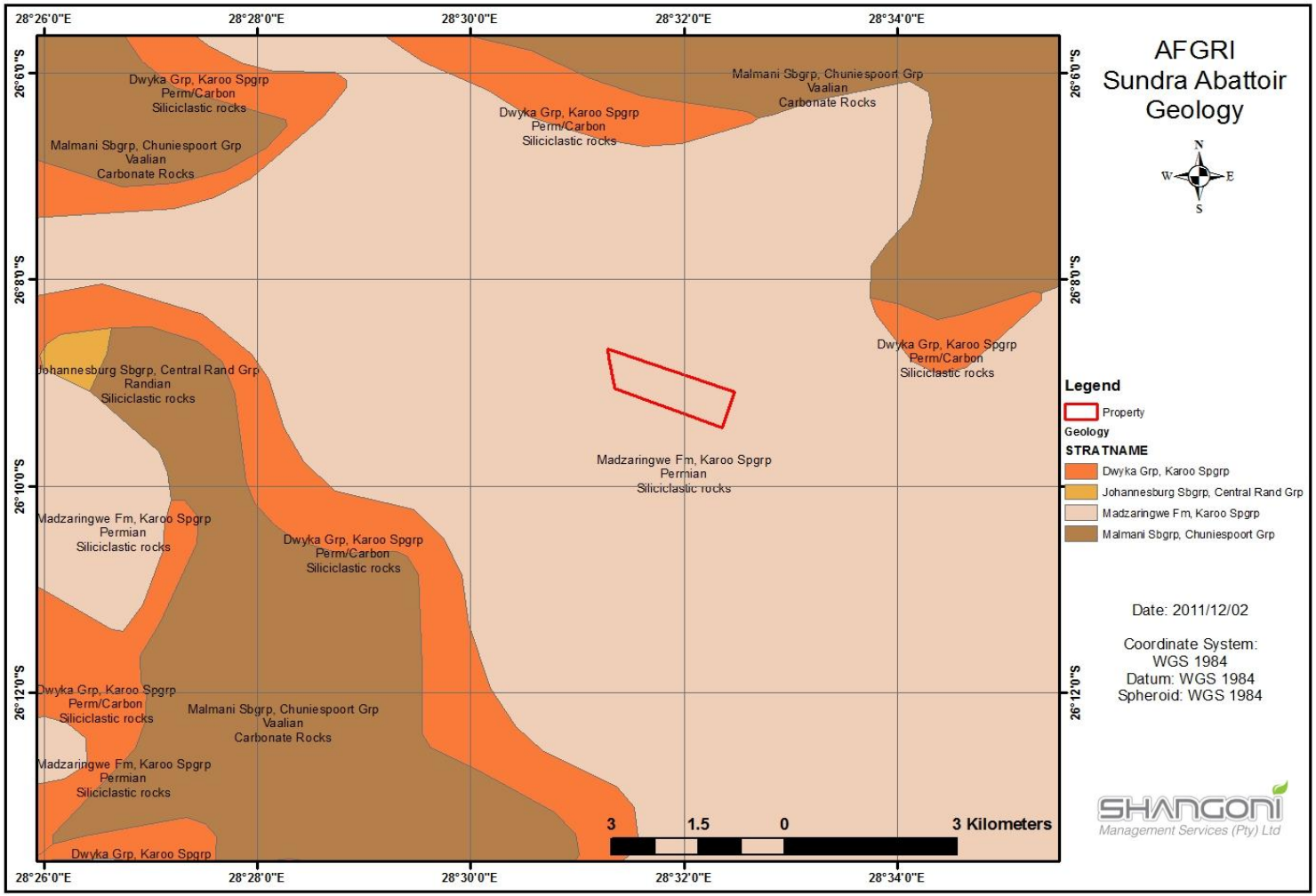


Figure 13: AFGRI Daybreak (Sundra) abattoir geology

A geotechnical investigation was carried out for the proposed AFGRI Daybreak (Sundra) wastewater treatment works. The study area for this geotechnical investigation forms part of the property, portion 8 of the farm Modderfontein 236 IR, where the AFGRI Daybreak (Sundra) abattoir is located. The geotechnical data obtained during this investigation is therefore applicable to the AFGRI Daybreak (Sundra) abattoir expansion and will be used in this basic assessment report to help describe the geology of the site.

During the geotechnical investigation, done by Mr. Johann van der Merwe, the study area was divided into two prominent material zones (Soil Zones “A” and “B”). As shown in Figure 14, Soil Zone ”A” covered the lower-lying, western portion of the study area, and the higher-lying, major eastern portion of the study area was covered by Soil Zone “B”.

Table 2: General description of the typical soil profile of zone A

Soil Zone A	
Depth (m)	**Description**
0,0 - 0,3	Moist, greyish brown, stiff, shattered, sandy silt containing fine roots; colluvium.
0,3 - 1,0	Moist, orange becoming dark yellow, firm becoming soft, voided, sandy silt containing soft ferruginous concretions toward the base; colluvium
0,3 - 1,0	Abundant medium and fine, hard nodular ferricrete, clast supported in a matrix of moist, dark red, sandy silt; ferruginised colluvium. Overall consistency is of medium density.
1,0 - 2,0	Moist, dark red and yellow blotched with light grey and black, partially to strongly ferruginised, clayey silt containing abundant coarse, hard nodular ferricrete; ferruginised colluvium. Overall consistency is dense becoming very dense.

Table 3: General description of the typical soil profile of zone B

Soil Zone B	
Depth (m)	**Description**
0,0 - 0,4	Moist, reddish dark brown, stiff, shattered, sandy silt containing fine roots; colluvium.
0,4 - 2,5	Moist, dark orange red and dark red, firm becoming soft, voided, sandy silt containing soft ferruginous concretions toward the base; colluvium
2,5 - 3,0	Abundant medium and fine, hard nodular ferricrete, clast supported in a matrix of moist, dark red, sandy silt, ferruginised colluvium. Overall consistency is medium dense becoming dense with increasing depth.

Very dense ferruginised material was found 2.0m below the soil surface of zone A. This slowed excavations to a gradual stop. With the exception of zone A, no difficulty was experienced elsewhere when digging (down to a depth of at least 3.0m).

In soil zone A, minor to moderate ground water seepage was experienced from below 0.7 m. The investigation did not find any ground water seepages in soil zone B, although the moisture condition of the material increased substantially from below 2,5m deep.

2.1.1.1 Shear Strength Characteristics:

Four undisturbed samples were taken from the study area and sent to a laboratory where saturated consolidated un-drained trial tests were performed. The parameters were measured under normal stresses of 50, 70 and 100kPa. The results are summarised in the table below. The results indicate low to moderate friction angles and correspondingly high cohesion values for the remolded sandy silt that blankets the site (Johann v.d. Merwe, 2010).

Table 4: Measured Shear Strength Parameters

Hole No.	Depth (m)	Dry density (kg/m³)	Normal stress (kPa)	Cohesion (kPa)	Angle of friction (degrees)
DB/8	2,4	1 651	50, 70, 100	23	21
DB/9*	2,0	1 549	50, 70, 100	6	12
DB/10*	0,0 – 2,2	1 777	50, 70, 100	48	11
DB/19*	0,0 – 2,3	1 753	50, 70, 100	52	10

Note: * = remolded sample.

2.1.1.2 Groundwater and soil chemistry

Very dense ferruginised material was found 2.0m below the soil surface of zone A. Above this impermeable level, minor to moderate ground water seepage (a perched water table) was experienced at depths ranging from 0.7 m to 1.3 m. The investigation did not find any ground water seepages in soil zone B, although the moisture condition of the material increased substantially from below 2,5m to a depth of 3.0m.

Non-ferrous pipes or plastic pipes are recommended for underground use as the soil and groundwater are expected to be highly aggressive towards buried metals and concrete.

2.1.1.3 Soil permeability

Falling head permeability tests were carried out on undisturbed and remolded disturbed samples. The results of these tests, shown in the table below, indicate that the coefficient of permeability of the remoulded soil samples as well as the in situ samples have a relative permeability of “impervious” in its re-compacted and natural state.

Table 5: Summary of Permeability Tests

Hole No.	Depth (m)	Initial moisture (%)	Dry density (kg/m³)	95% proctor density (kg/m³)	Coefficient of permeability (cm/s)
DB/6	0,1 – 1,1	15,0	1 793	1 808	5,0E-08
DB/6	1,1 – 2,1	16,9	1 858	1 845	6,5E-08
DB/8	0,4 – 1,8	13,9	1 852	1 960	2,1E-07
DB/8	2,4*	24,3	1 622		9,1E-08
DB/9	2,0*	17,3	1 504		1,6E-06
DB/10	1,5*	16,9	1 454		5,5E-07
DB/10	0,3 – 2,2	13,2	1 804	1 881	1,9E-06
DB/16	1,3 – 2,0	16,0	1 780	1 869	1,9E-07
DB/19	2,1*	20,7	1 539		3,3E-06

Note: * = Undisturbed sample

2.1.1.4 Excavation Characteristics

With the exception of zone A, no difficulty was experienced elsewhere with diggings. No problems are therefore expected in using conventional earth-moving machines to a depth of at least 3.0m below surface.

Very dense ferruginised material was found 2.0m below the soil surface of zone A. Above this impermeable level, minor to moderate ground water seepage was experienced at depths ranging from 0.7 m-1.3 m. The presence of this high perched ground water table may cause a situation where sidewalls may become unstable at this depth across soil zone A.

The investigation did not find any ground water seepages in soil zone B, although the moisture condition of the material increased substantially from below 2,5m to a depth of 3.0 m. In the dry season, sidewalls of deep excavations should remain stable for the duration of construction, yet instabilities may occur during the rainy season.

2.1.1.5 Earthworks

Soils were tested for their compaction characteristics. Based on the results of the compaction tests (Table 6), it is evident that the dark red, orange and dark yellow sandy silt has a fairly low compacted strength and a fairly high predicted swell after compaction. The ferruginised colluvium (silty gravels) has a moderate compacted strength and lower predicted swell than the finer-grained silt. Chemical stabilization or mechanical modification of these soils may improve the compacted strength thereof (Johan v.d. Merwe, 2010).

Table 6: A Summary of compaction tests

Hole No.	Depth (m)	Soil type	Plasticity Index	Grading Modulus	CBR	TRH14	Swell (%)
DB/6	0,0 – 1,1	Sandy SILT	12	0,54	8	G10	1,20
DB/6	1,1 – 2,1	Silty GRAVELS	7	1,27	12	G8	0,86
DB/8	0,4 – 1,8	Silty GRAVELS	15	2,06	16	G8	1,20
DB/10	0,0 – 2,2	Sandy SILT	10	1,65	19	G7	0,35
DB/16	1,3 – 2,0	Gravelly SILT	10	0,32	15	G8	0,26

Note: CBR = California Bearing Ration at 95% Mod AASHTO compaction

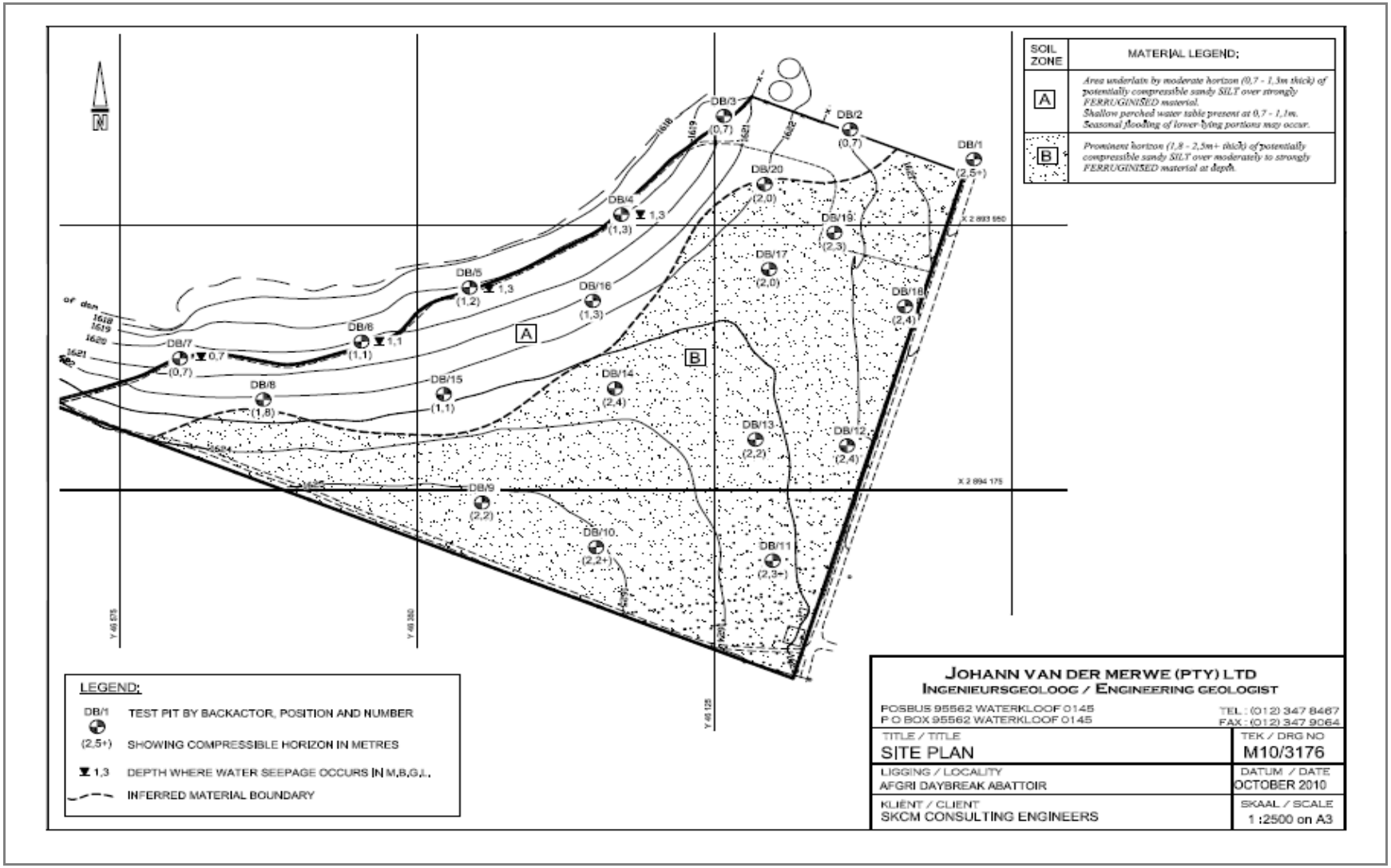


Figure 14: Location of test pits, (Johann v.d. Merwe, 2010)

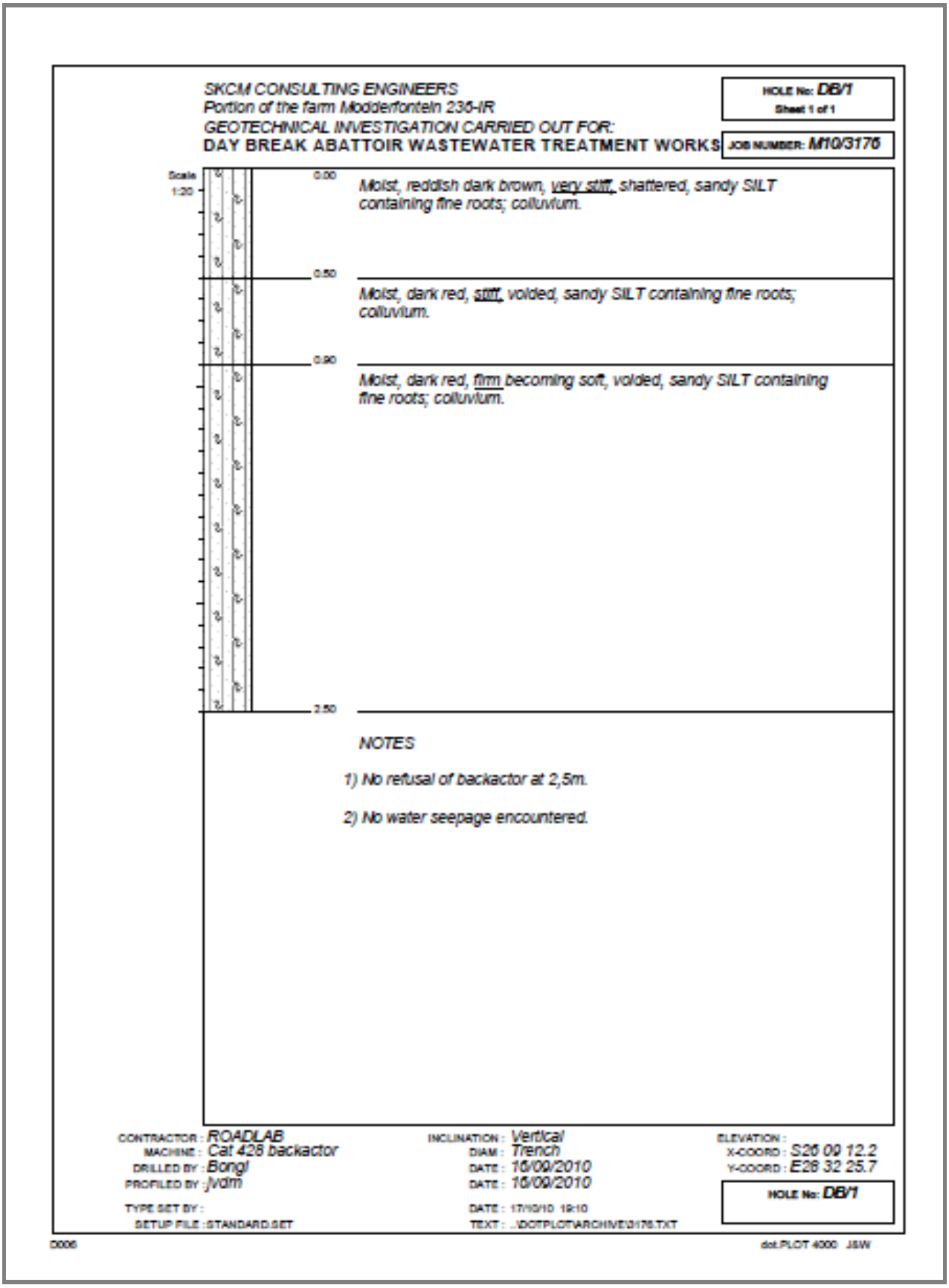


*Figure 15: Soil profile for hole DB/1 (*Johann v.d. Merwe, 2010)

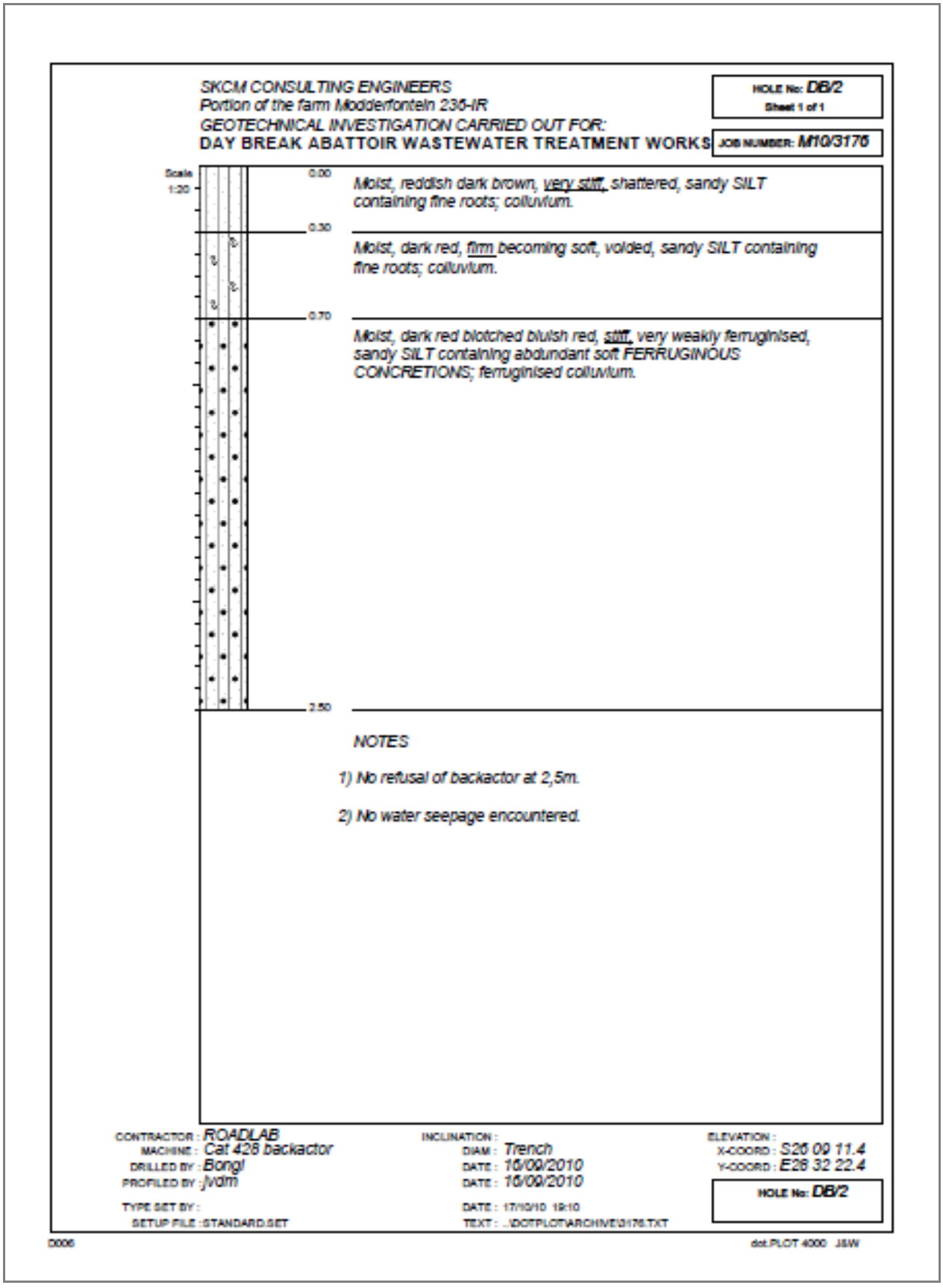


*Figure 16: Soil profile for hole DB/2 (*Johann v.d. Merwe, 2010)

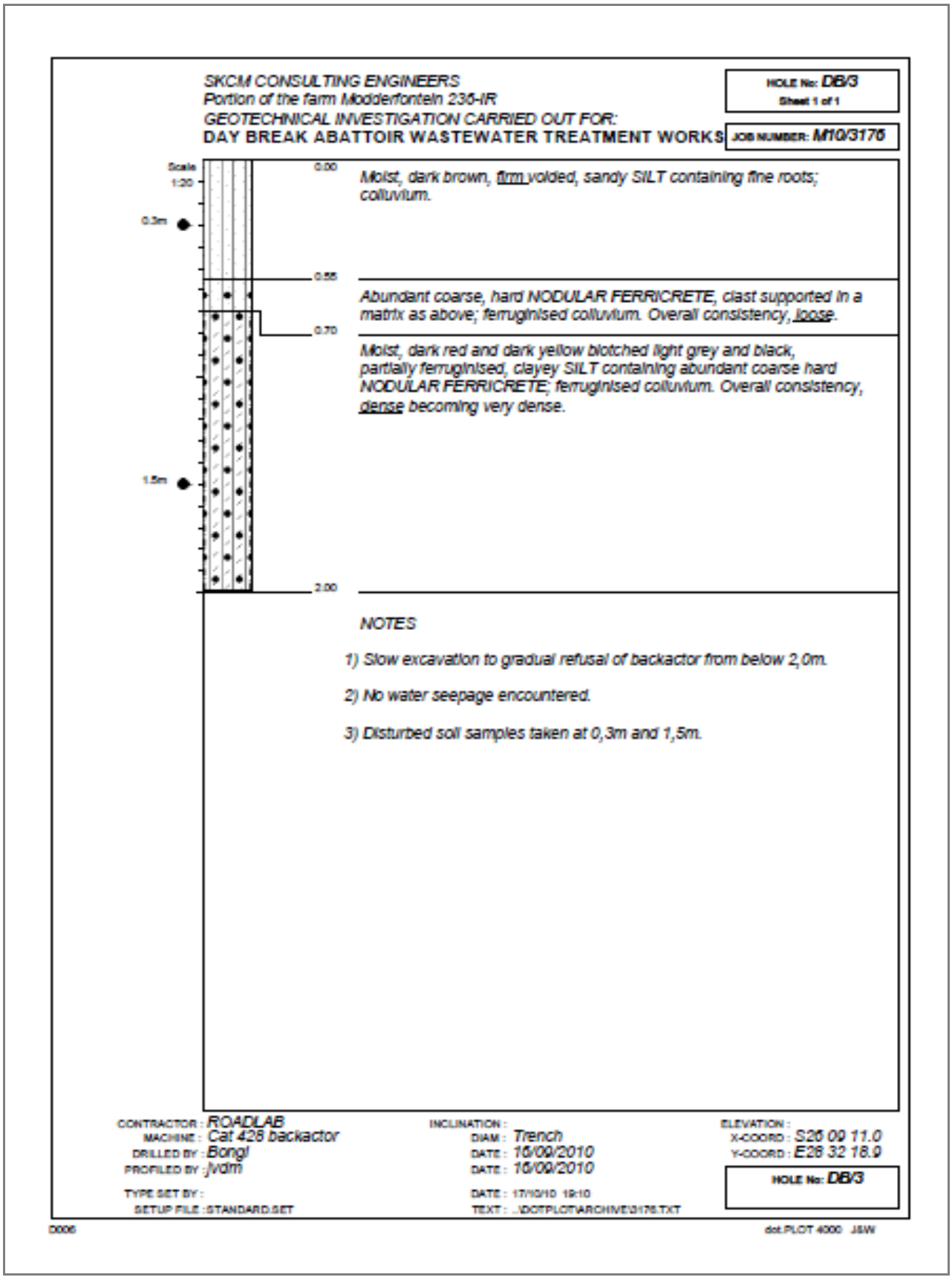


Figure 17: Soil profile for hole DB/3 (Johann v.d. Merwe, 2010)

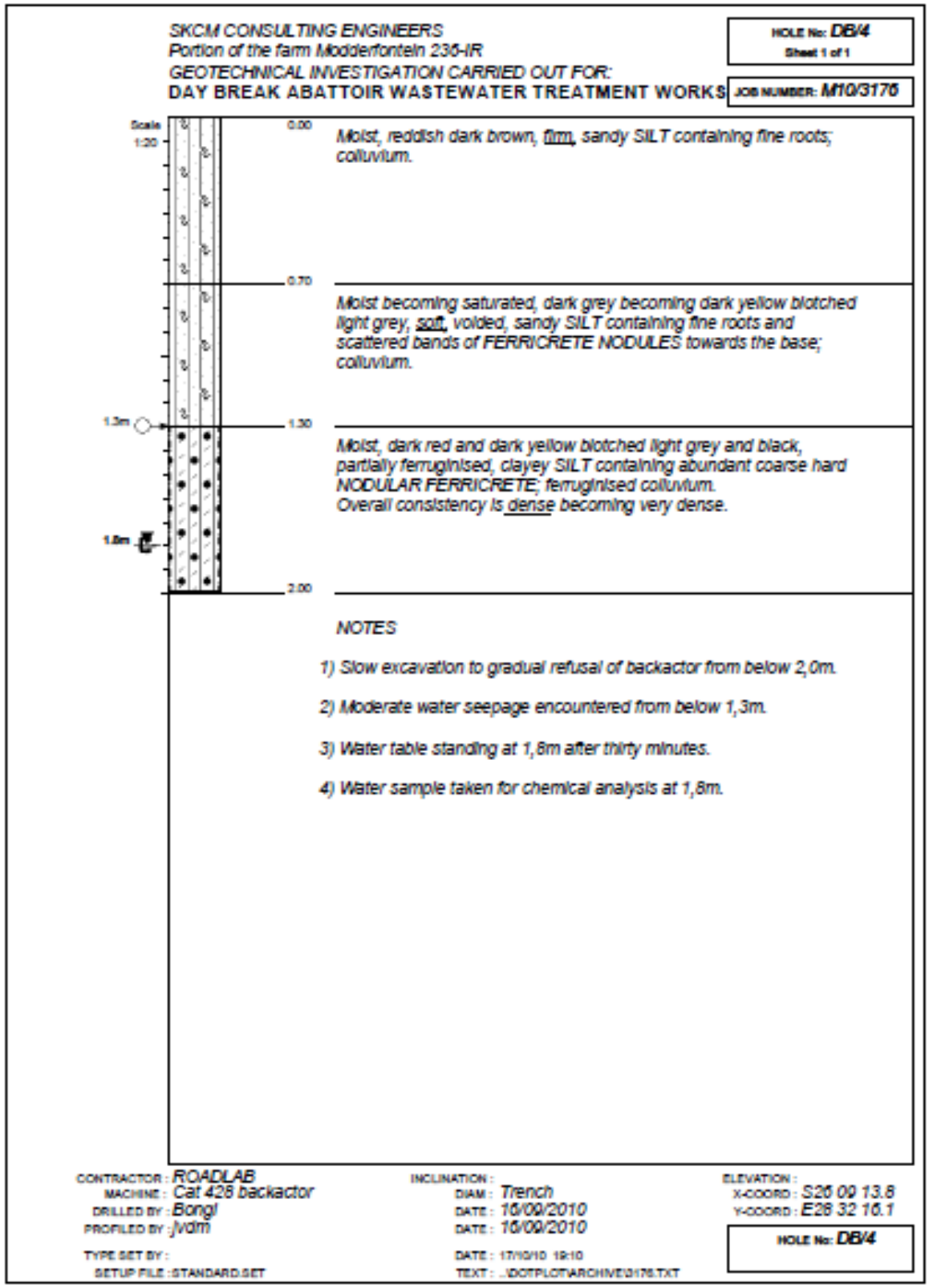


*Figure 18: Soil profile for hole DB/4 (*Johann v.d. Merwe, 2010)

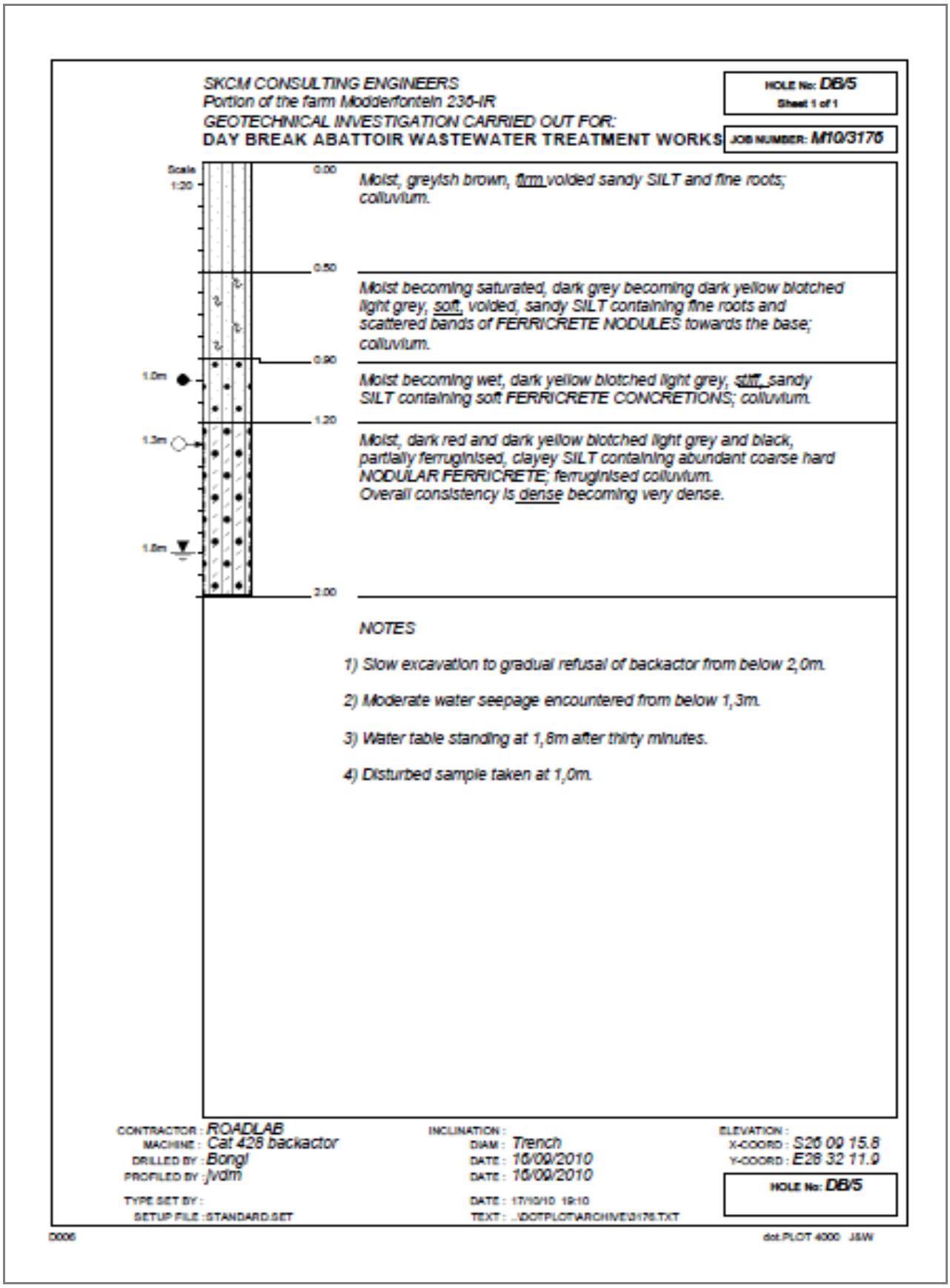


*Figure 19: Soil profile for hole DB/5 (*Johann v.d. Merwe, 2010)

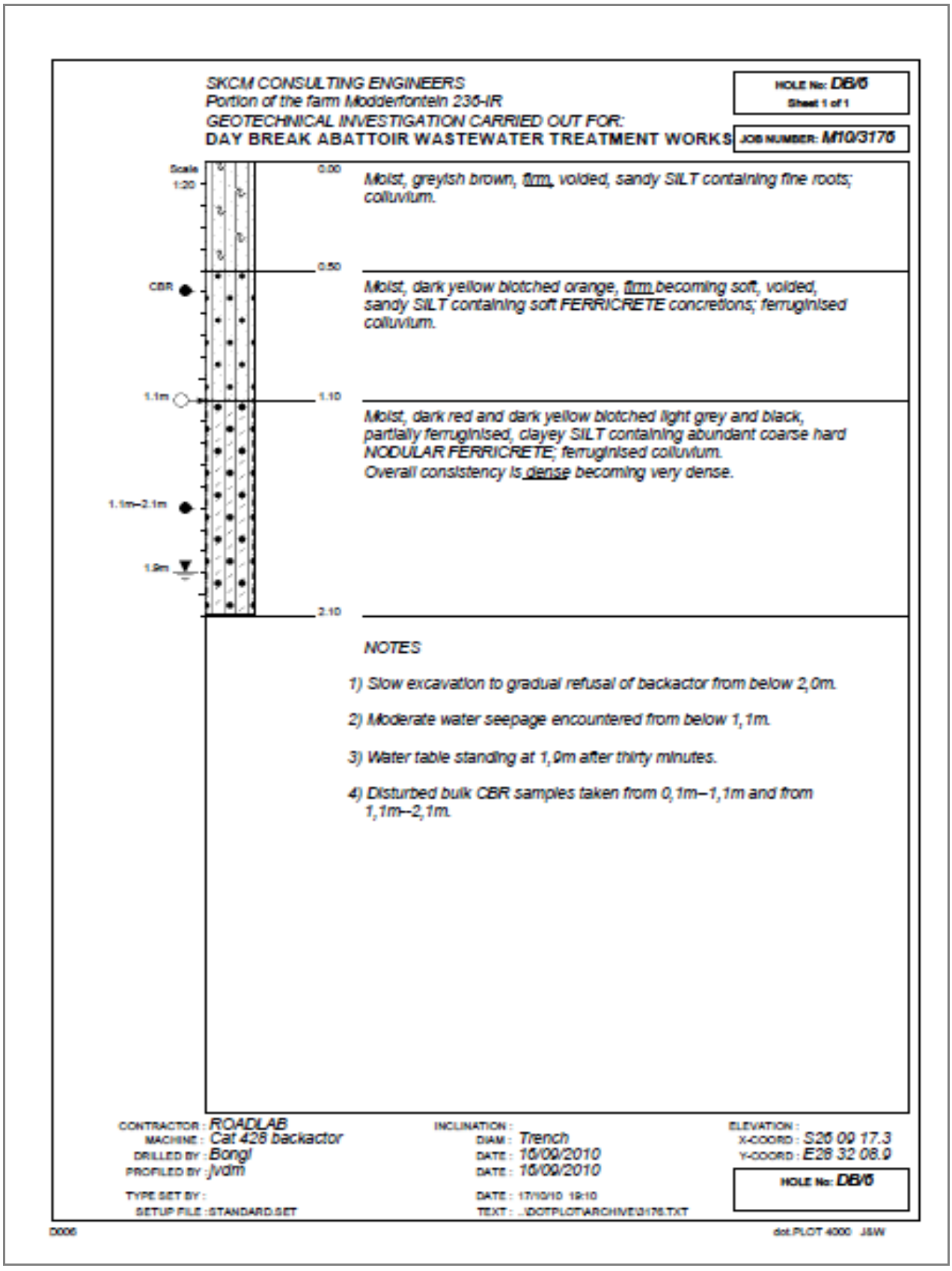


Figure 20: Soil profile for hole DB/6 (Johann v.d. Merwe, 2010)

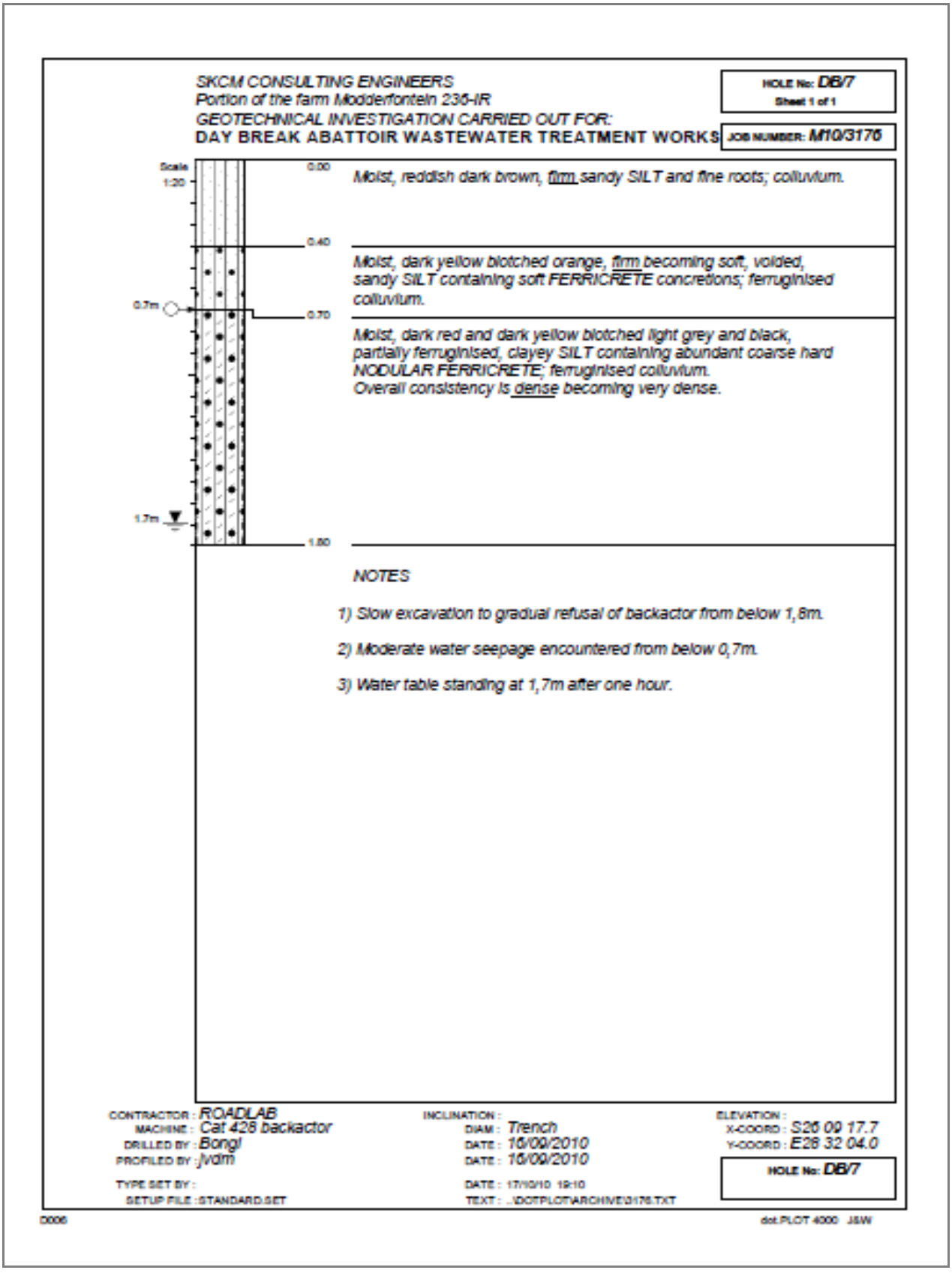


Figure 21: Soil profile for hole DB/7 (Johann v.d. Merwe, 2010)

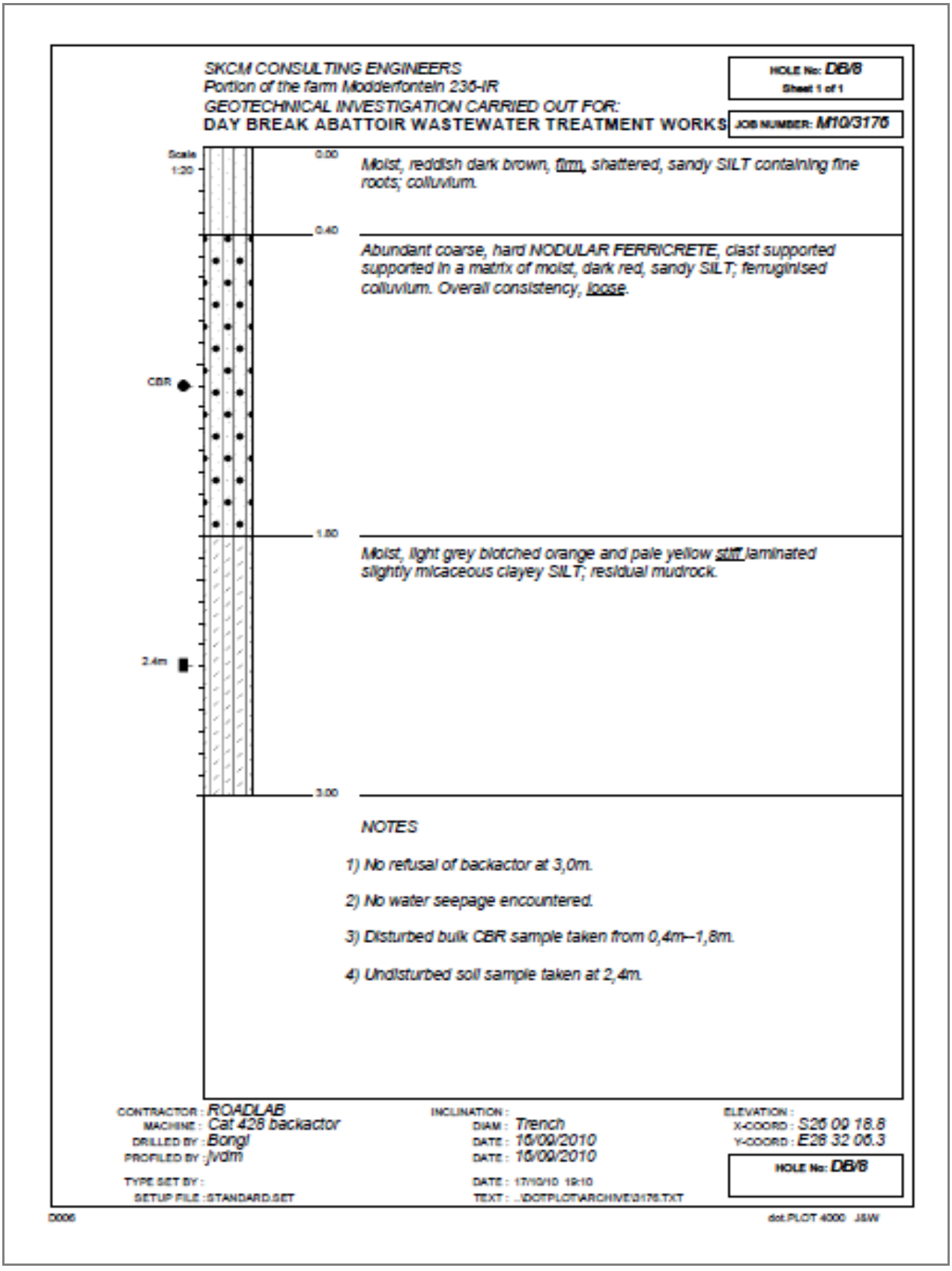


Figure 22: Soil profile for hole DB/8 (Johann v.d. Merwe, 2010)

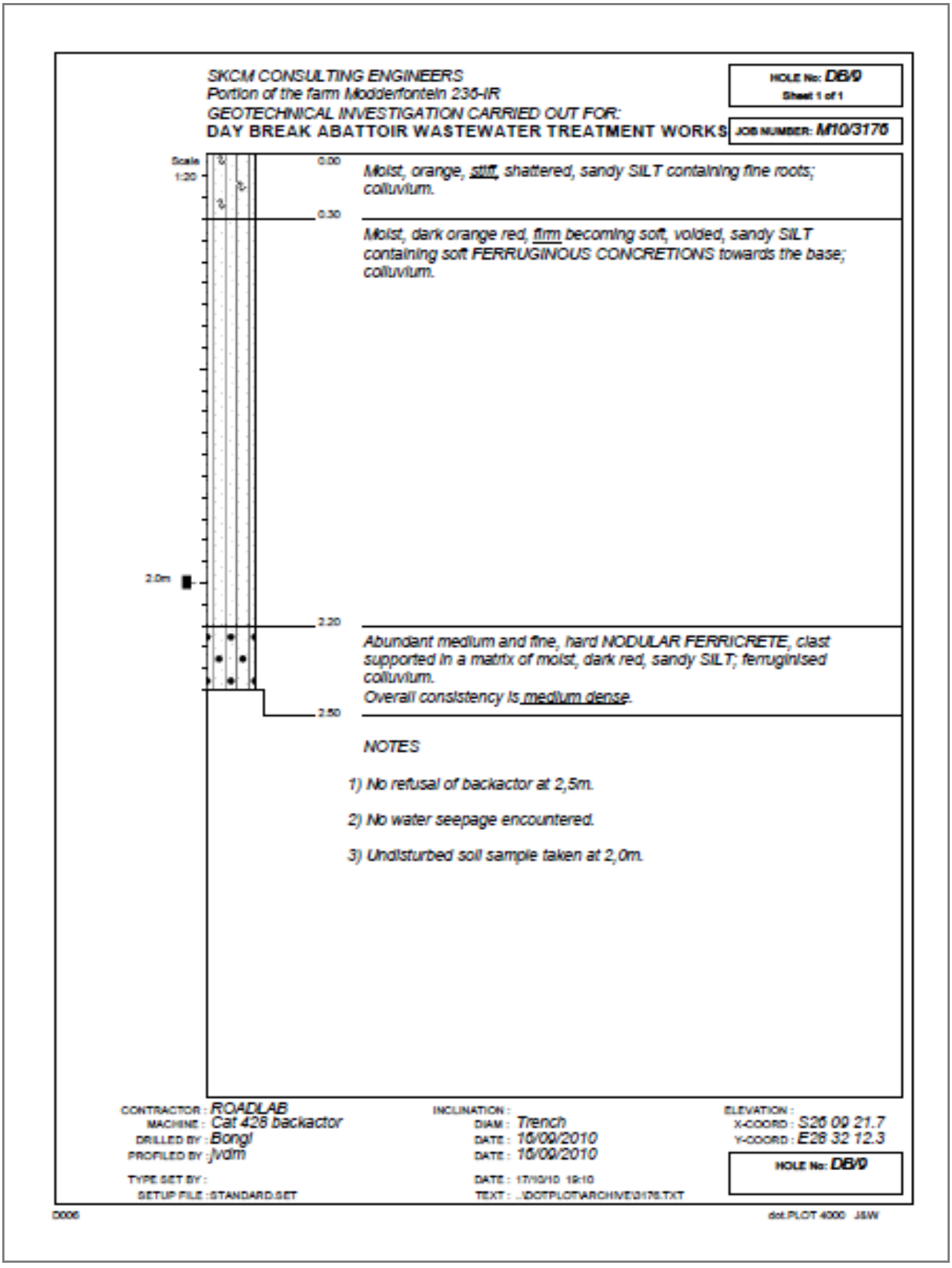


Figure 23: Soil profile for hole DB/9 (Johann v.d. Merwe, 2010)

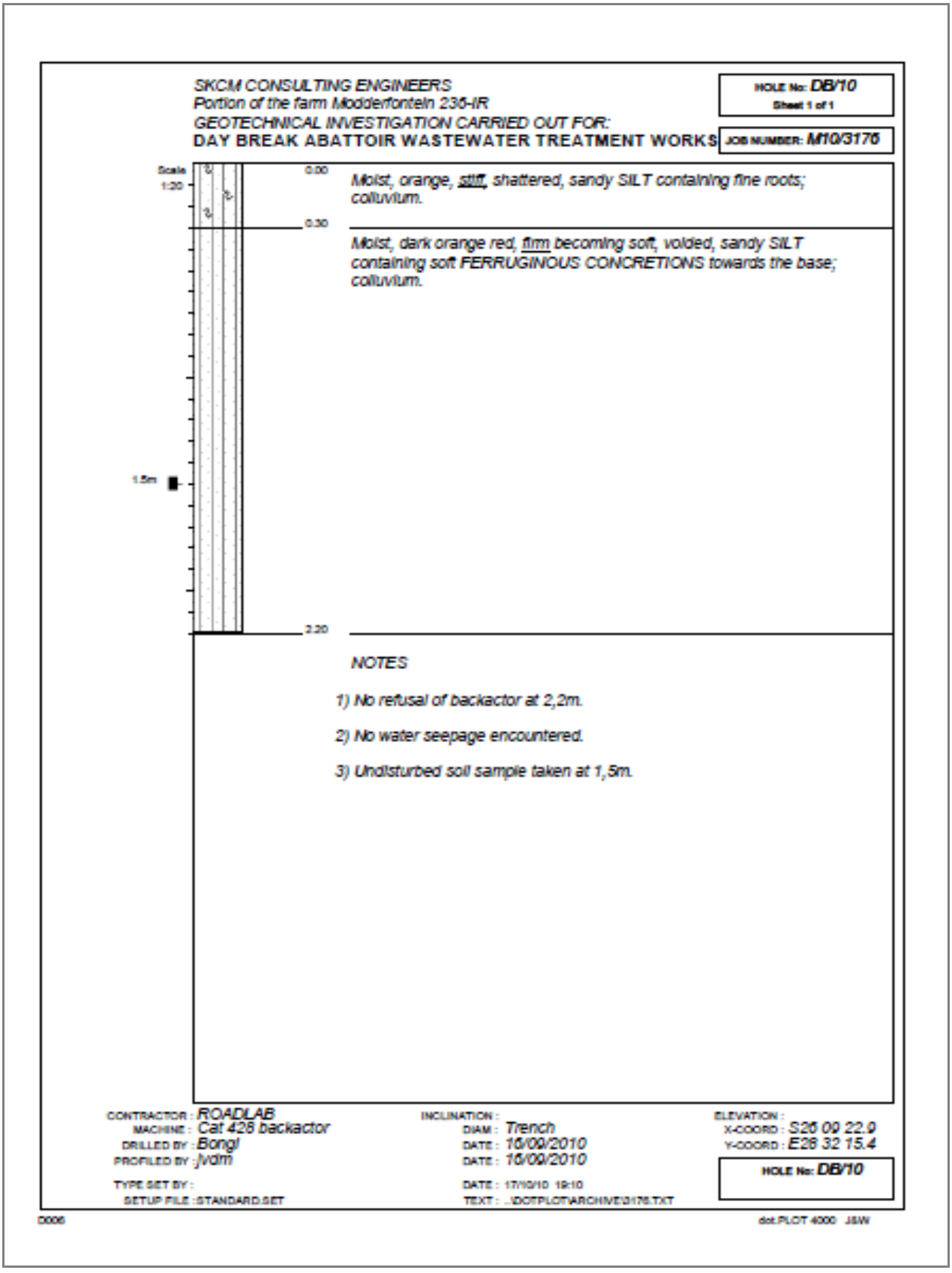


Figure 24: Soil profile for hole DB/10 (Johann v.d. Merwe, 2010)

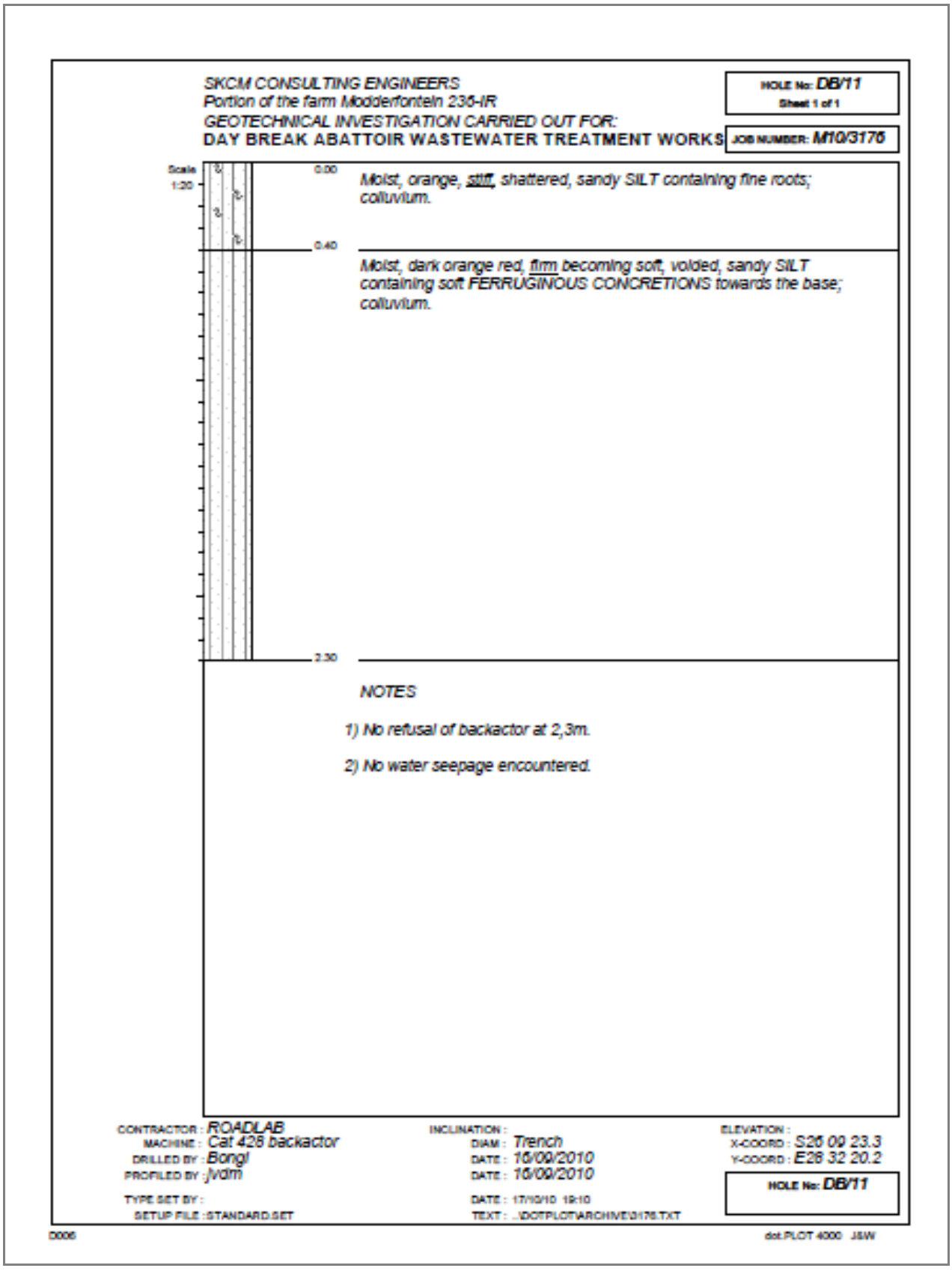


*Figure 25: Soil profile for hole DB/11 (*Johann v.d. Merwe, 2010)

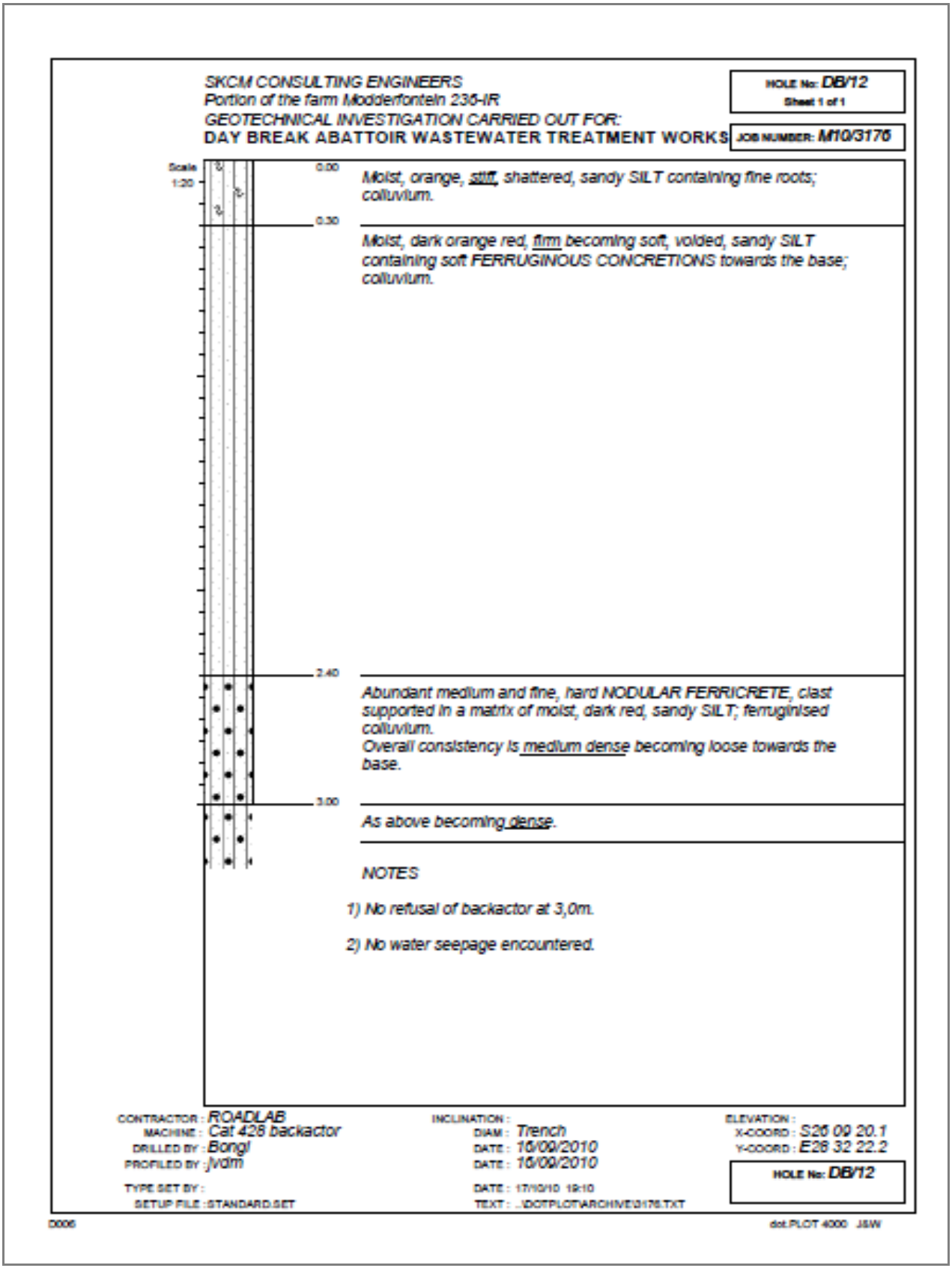


*Figure 26: Soil profile for hole DB/12 (*Johann v.d. Merwe, 2010)

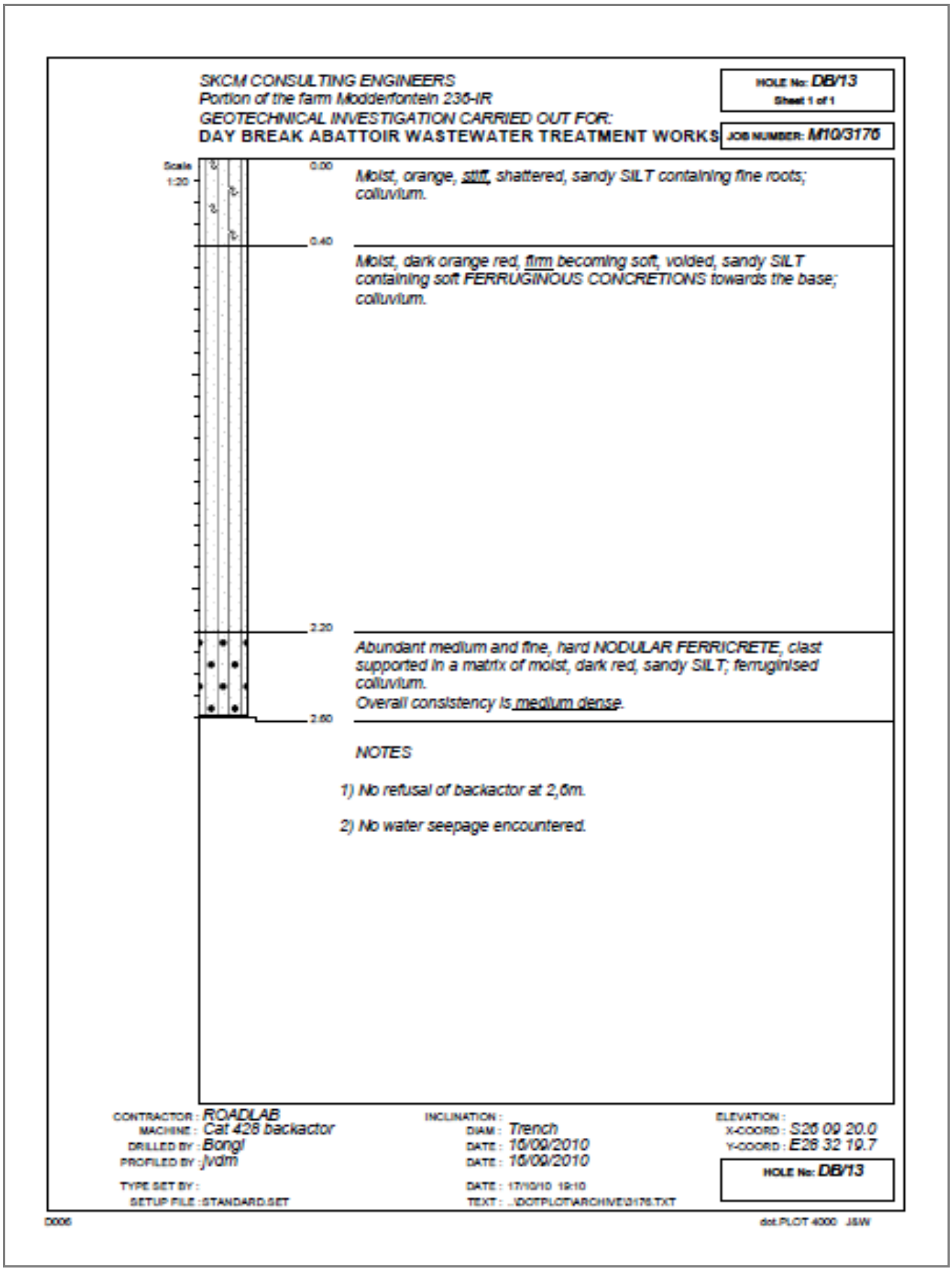


*Figure 27: Soil profile for hole DB/13 (*Johann v.d. Merwe, 2010)

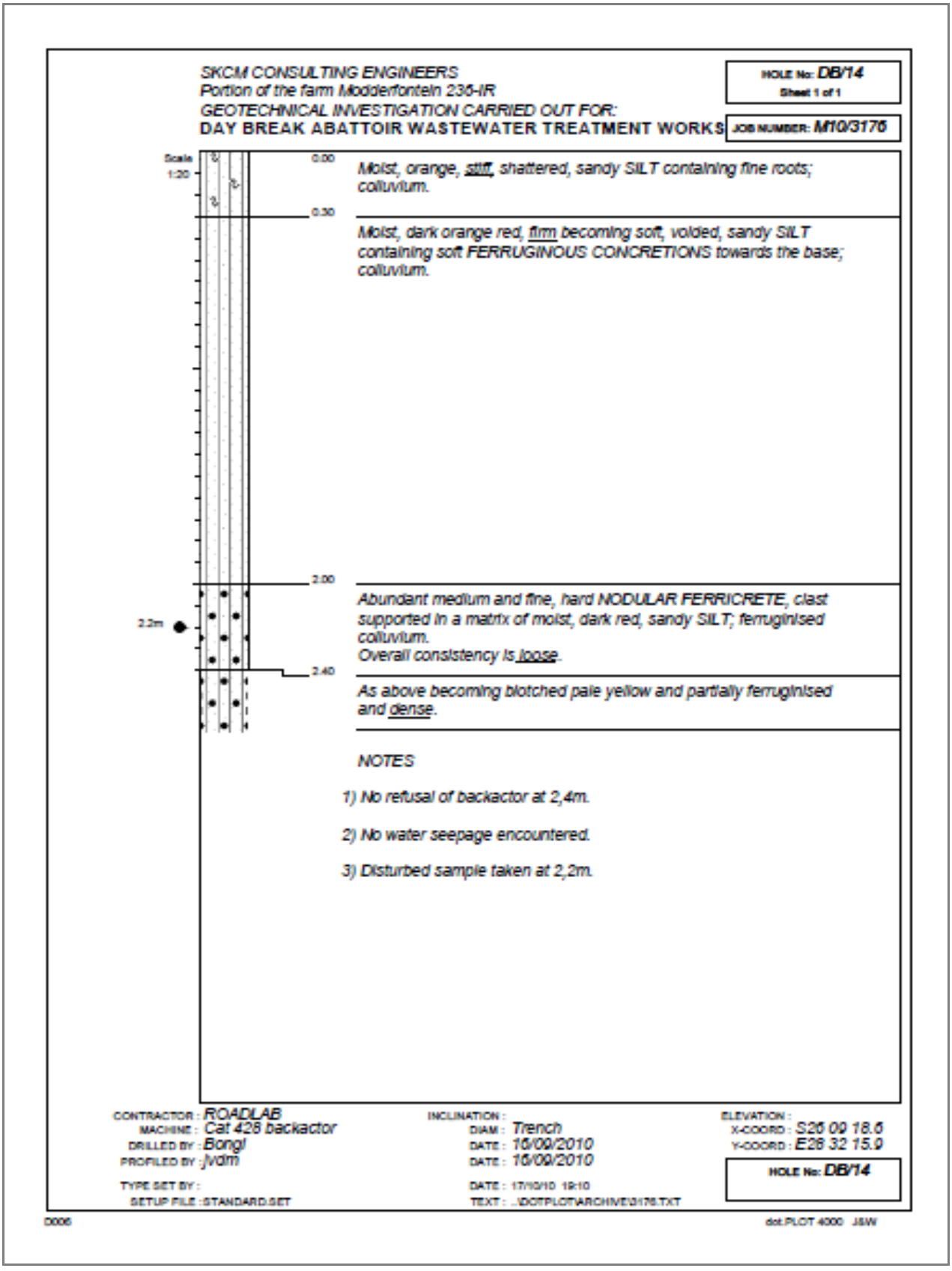


*Figure 28: Soil profile for hole DB/14 (*Johann v.d. Merwe, 2010)

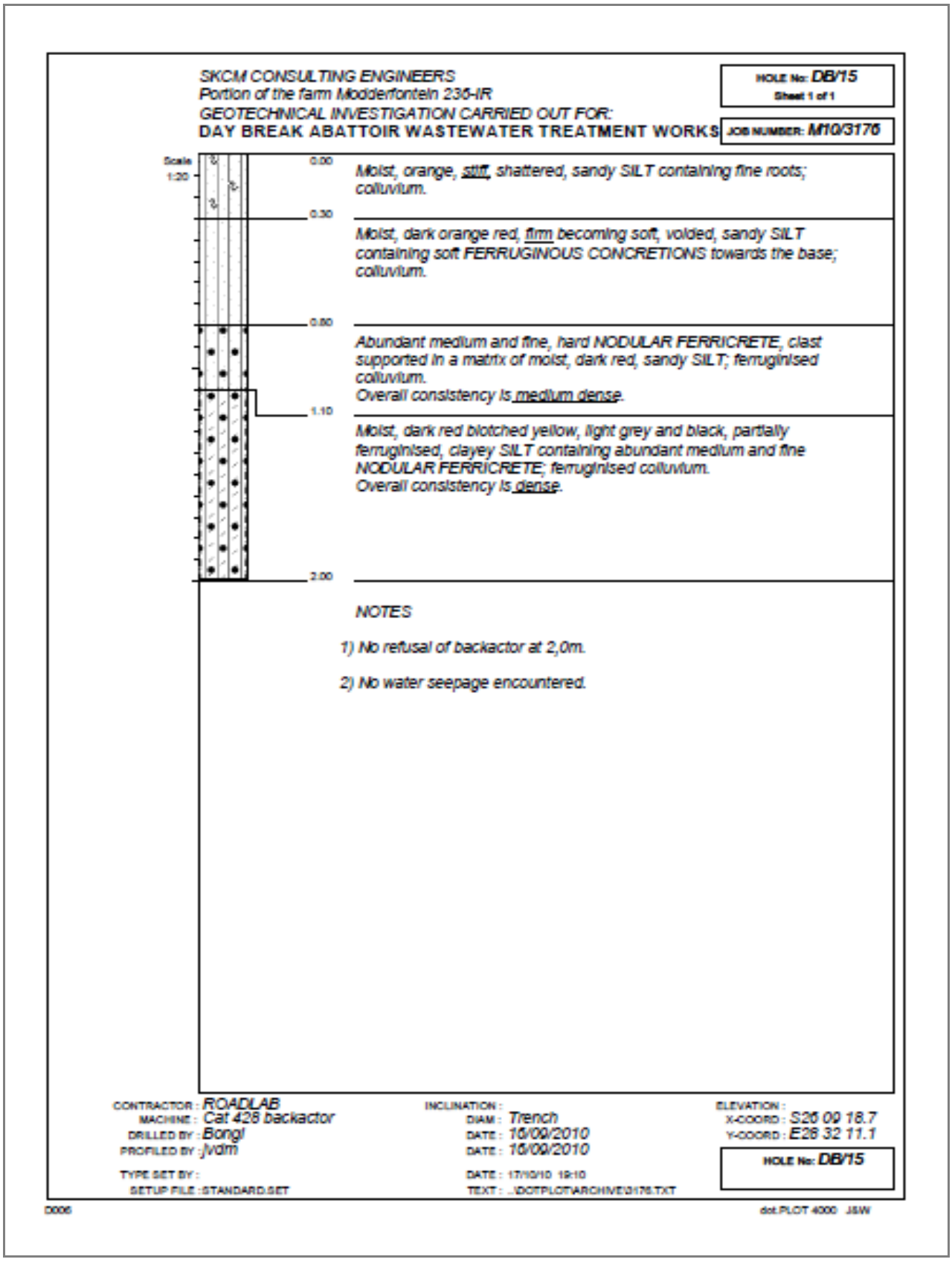


*Figure 29: Soil profile for hole DB/15 (*Johann v.d. Merwe, 2010)

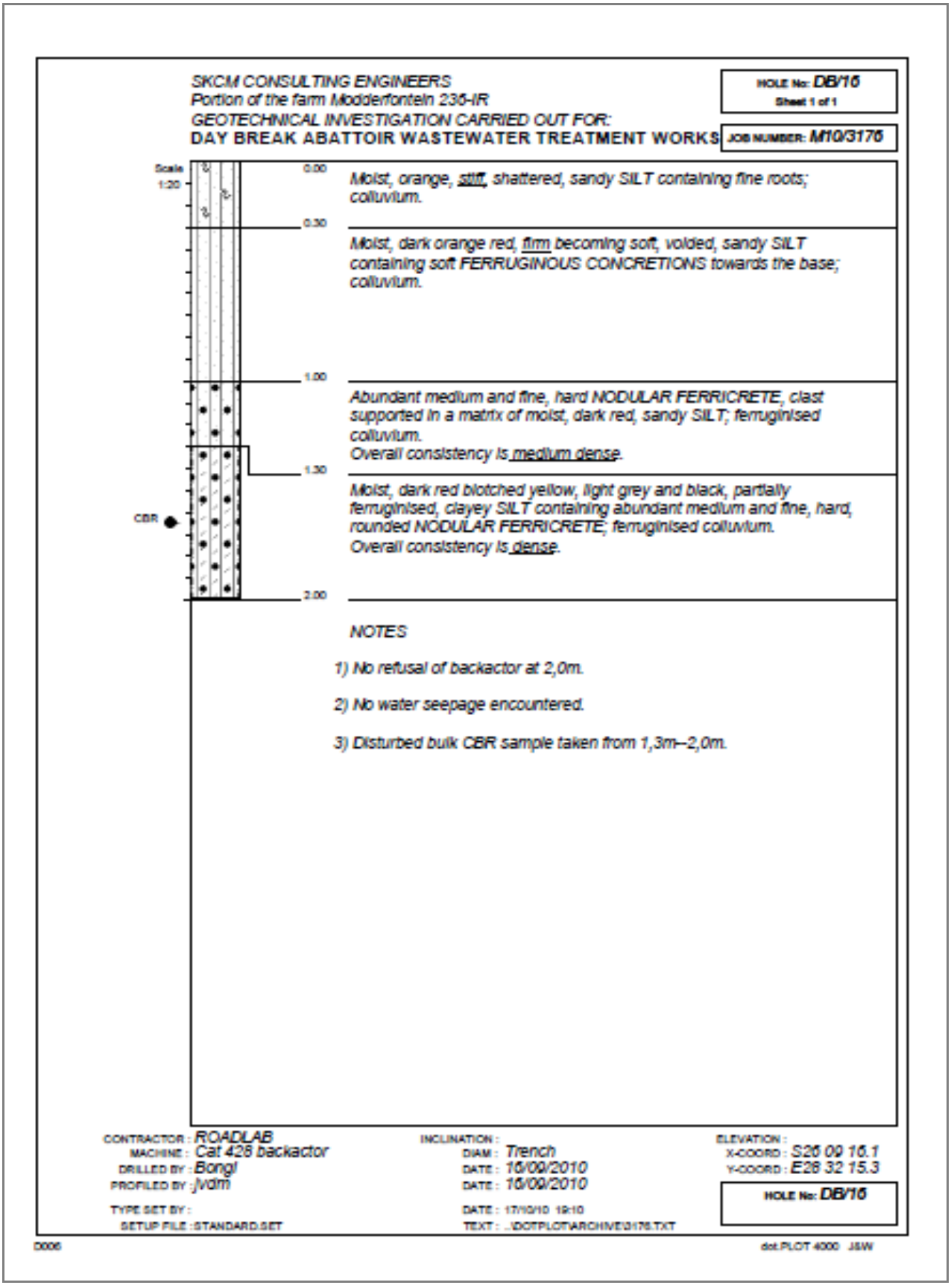


*Figure 30: Soil profile for hole DB/16 (*Johann v.d. Merwe, 2010)

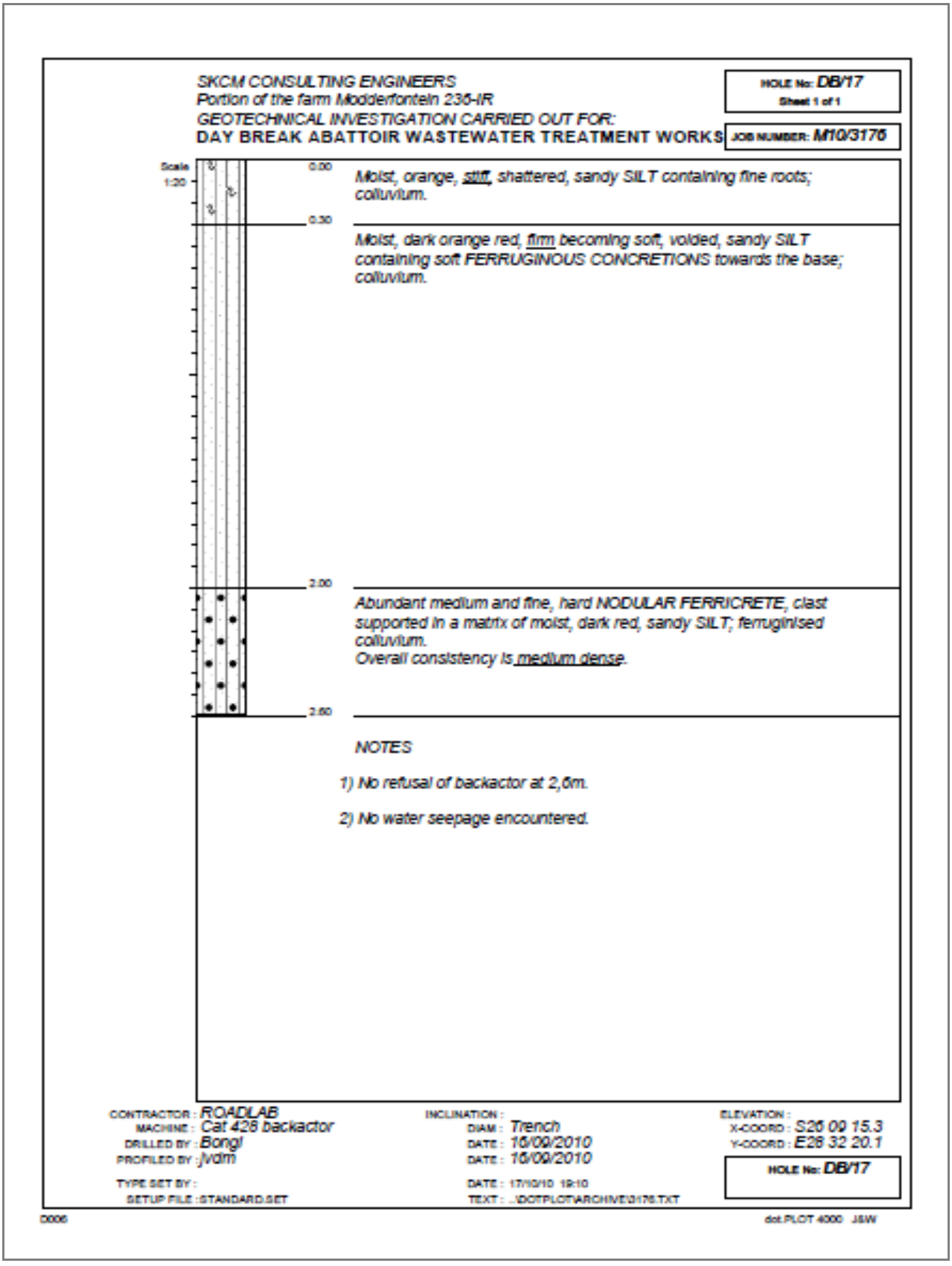


*Figure 31: Soil profile for hole DB/17 (*Johann v.d. Merwe, 2010)

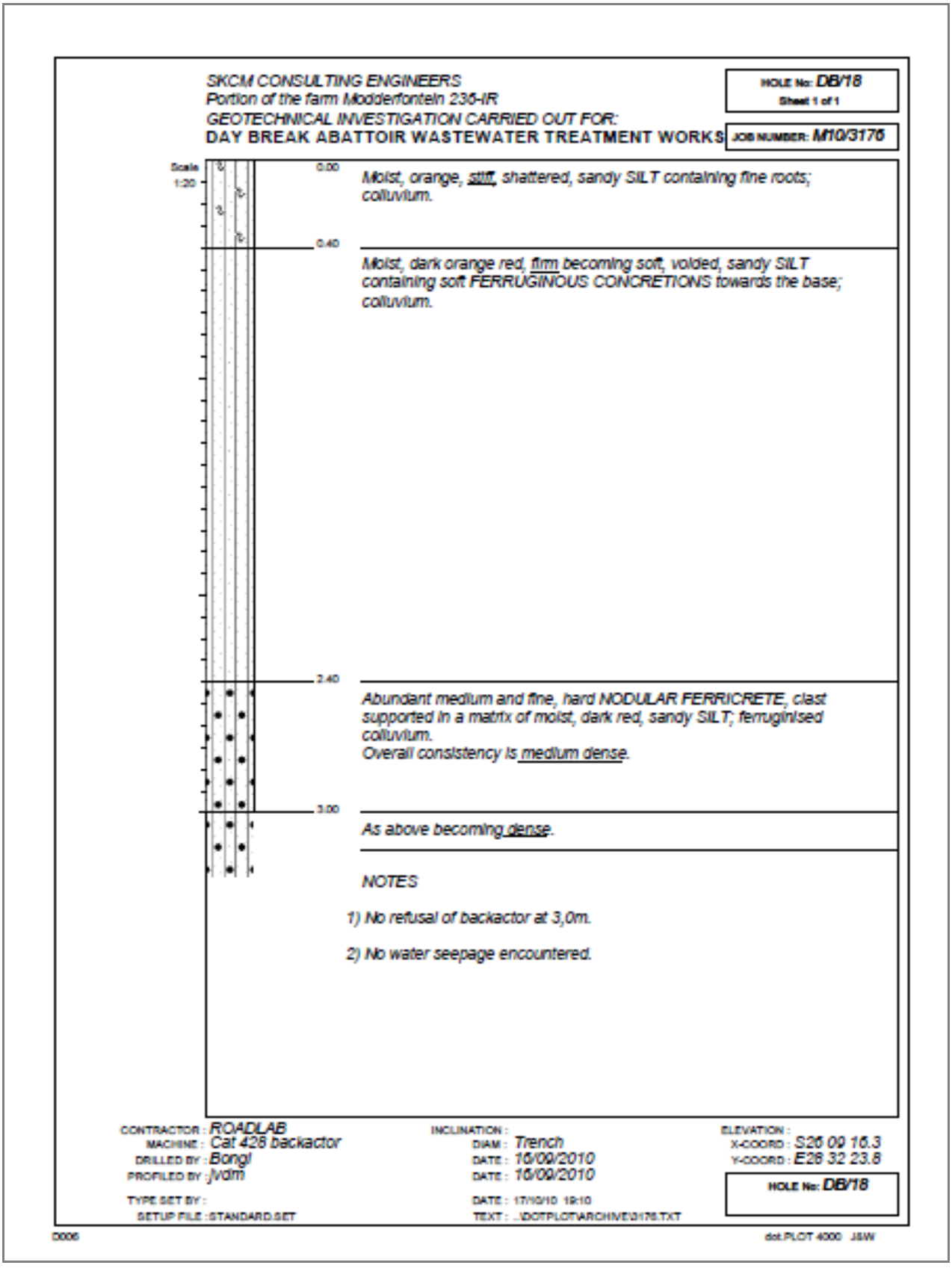


*Figure 32: Soil profile for hole DB/18 (*Johann v.d. Merwe, 2010)

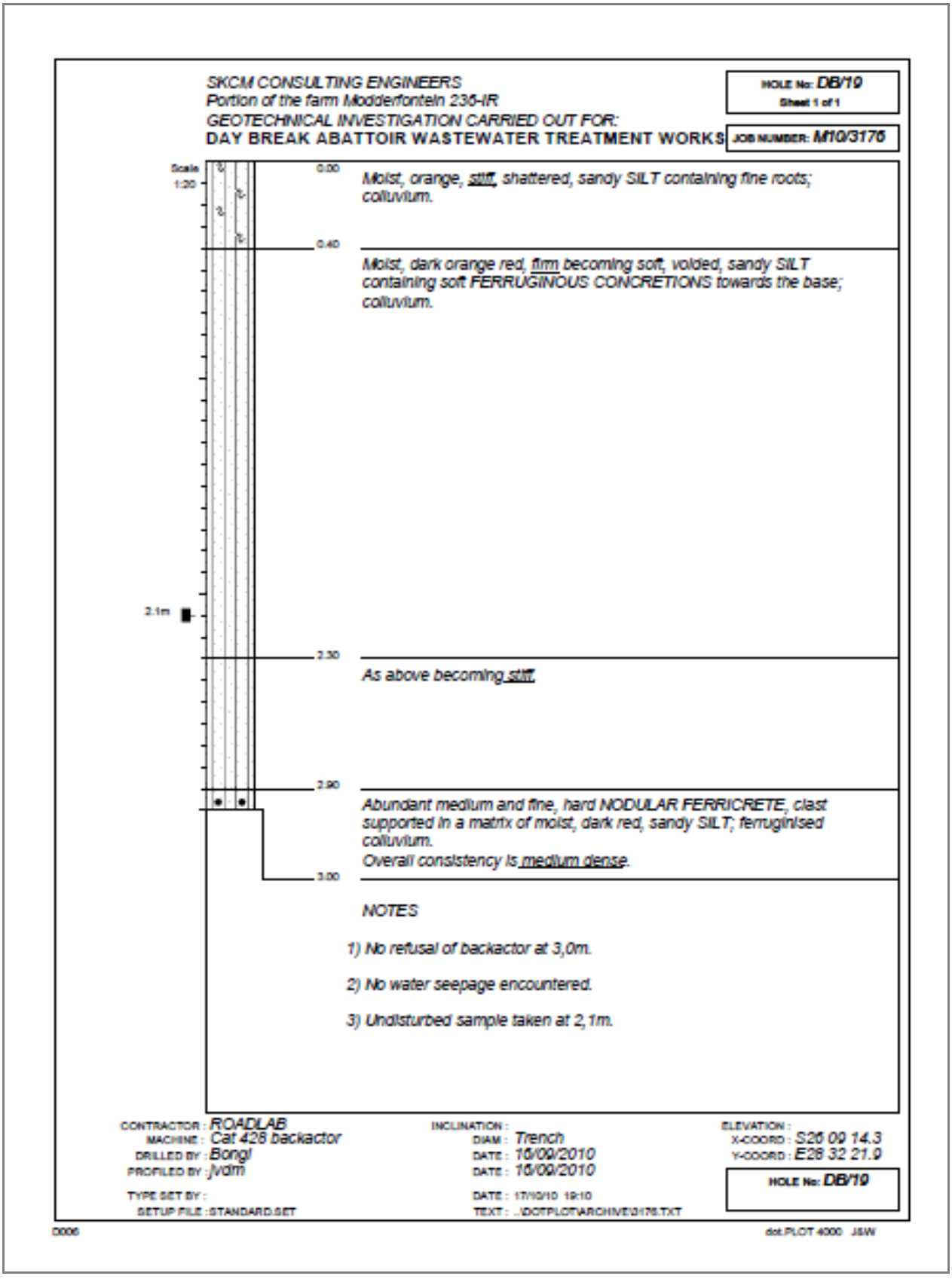


*Figure 33: Soil profile for hole DB/19 (*Johann v.d. Merwe, 2010)

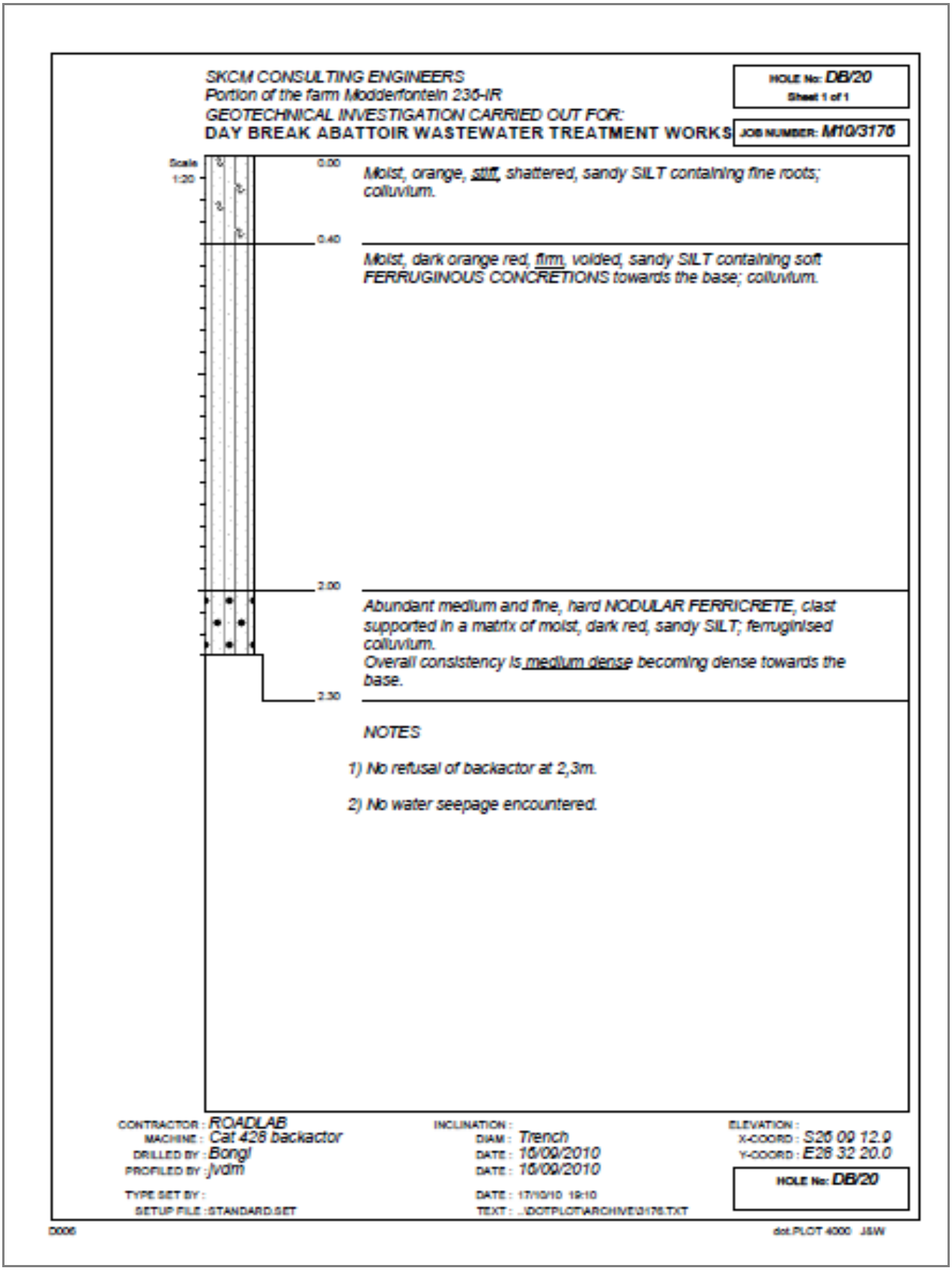


Figure 34: Soil profile for hole DB/20 (Johann v.d. Merwe, 2010)

2.1.2 Regional climate

The climate of the site is typical of Highveld conditions, with relatively warm to hot summers and fairly high rainfall, and moderate to cool winters with little or no rain. Valleys and wetlands are much cooler at night and more prone to frost than higher lying areas. The area experiences thunderstorms during the summer months, which usually occur in the late afternoons.

Rainfall

The site occurs in a summer rainfall area receiving a mean average annual rainfall of between 621.42 – 752.36mm. The variability of rainfall as well as the high intensity events will affect the construction phase of the project. It could hinder construction activities with potential soaking of cement mixtures or foundation concrete during the early phases of the construction process.

Construction should preferably be planned for the winter months to avoid construction delays that might have a negative socio-economic impact on the development.

The potential impact of the rainfall should be low if mitigated properly.

The Average Monthly Rainfall (Figure 35) for the area was obtained from the Delmas weather station, as provided by www.weathersa.com. The Average Annual Rainfall for Delmas is also provided by www.weathersa.com (Figure 36).

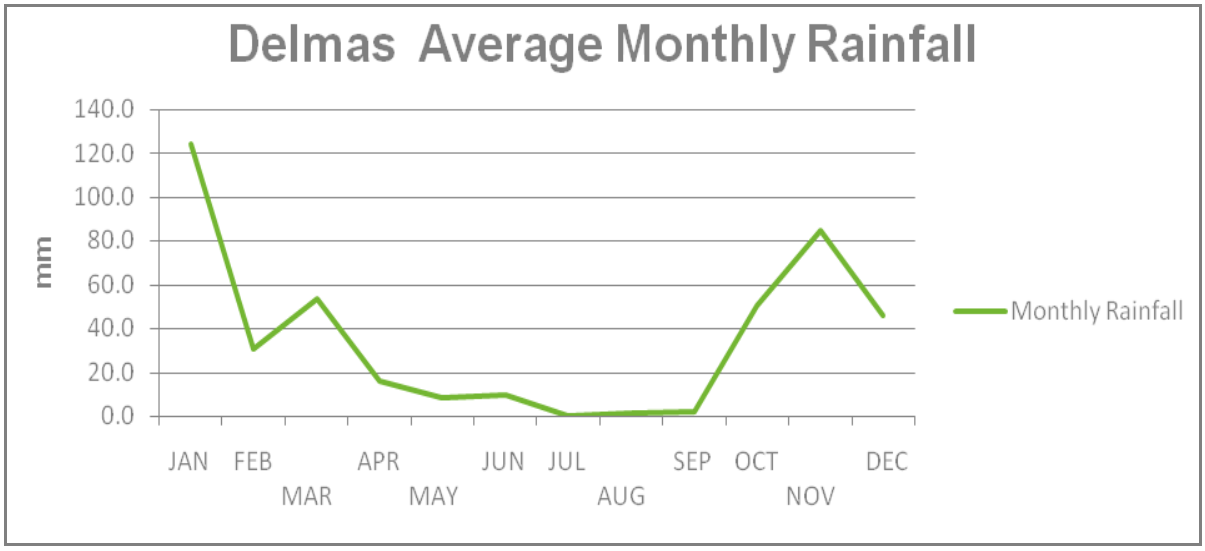


Figure 35: Delmas Average Monthly Rainfall

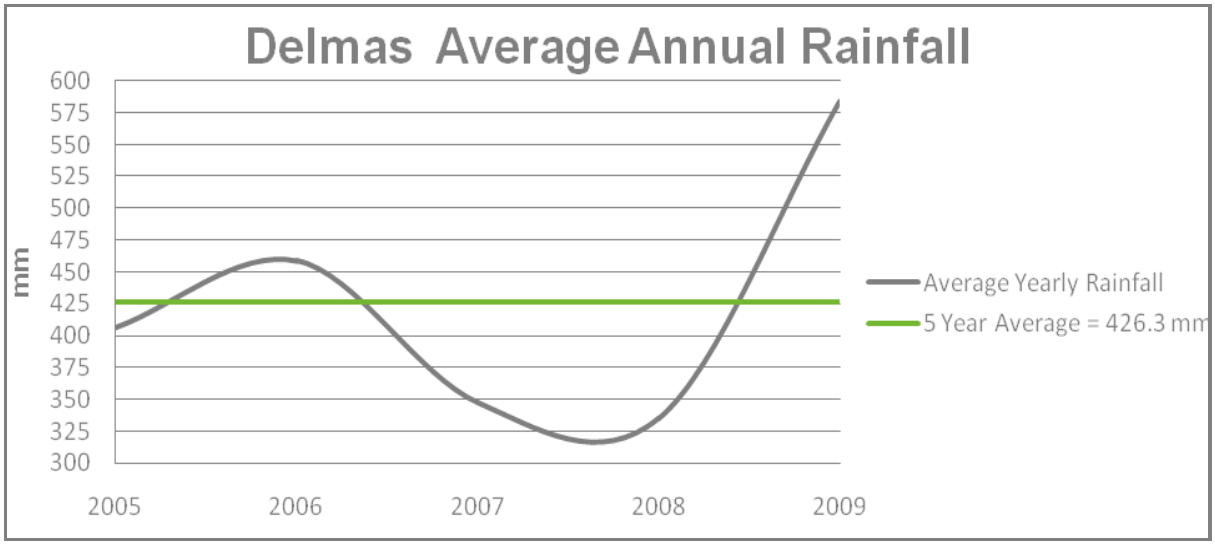


Figure 36: Delmas Average Annual Rainfall

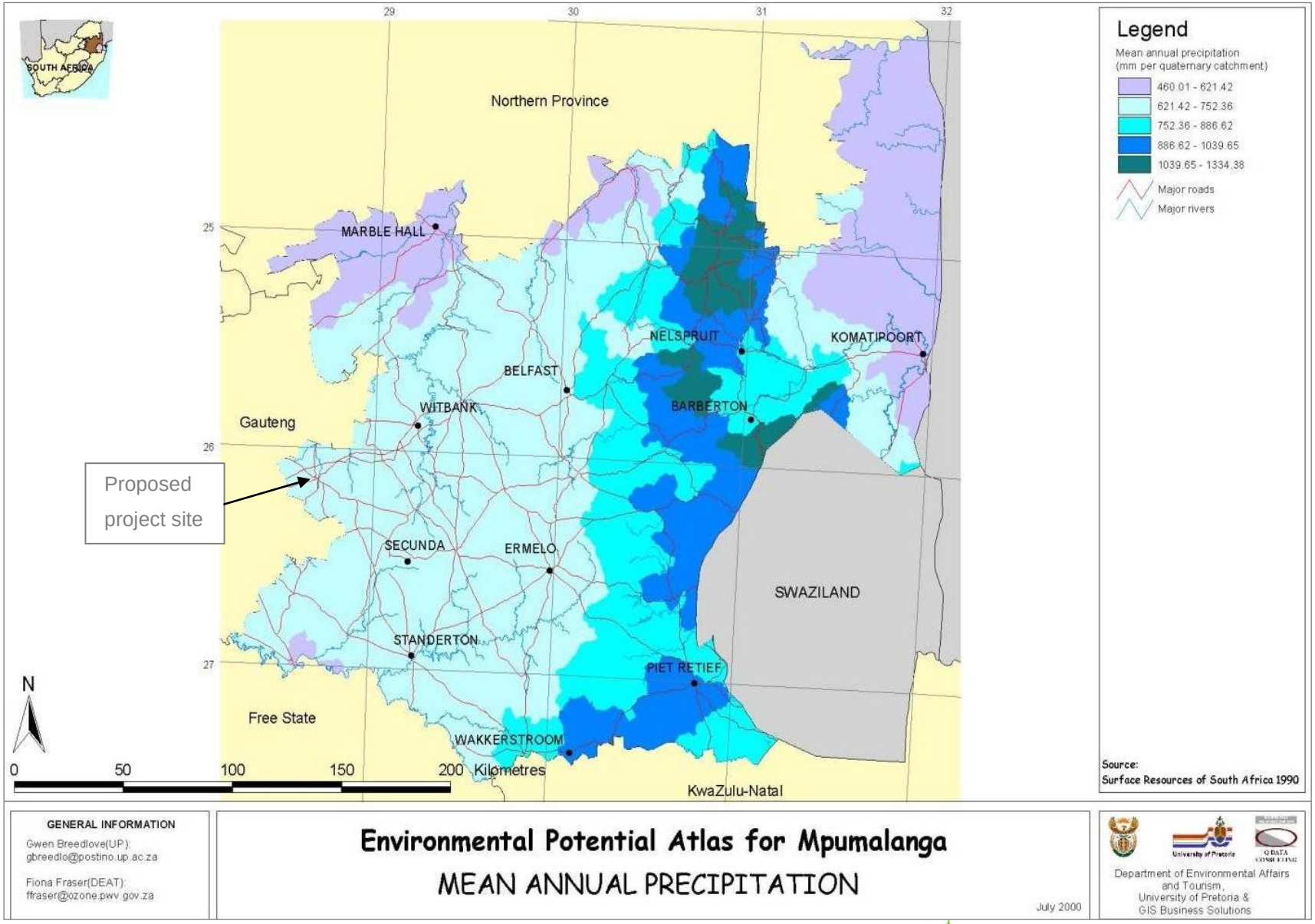


Figure 37: Mean annual precipitation in Mpumalanga

Temperature

The average mean maximum temperature of the Victor Khanye Municipal area, ranges between 25°C and 29°C, with a mean minimal temperature ranging between 1.9°C and 2.0°C,. The occurrence of frost during winter months results in the grasslands being very dry, which contributes to veldt fires.

In order to obtain a more accurate representation of the temperatures at the abattoir, average daily temperatures were obtained from the Delmas weather station (www.weathersa.com). From the figure below it can be seen that during summer months, the maximum daily temperatures will range between 23°C and 27°C and during winter months the maximum daily temperatures will range between 18°C and 22°C.

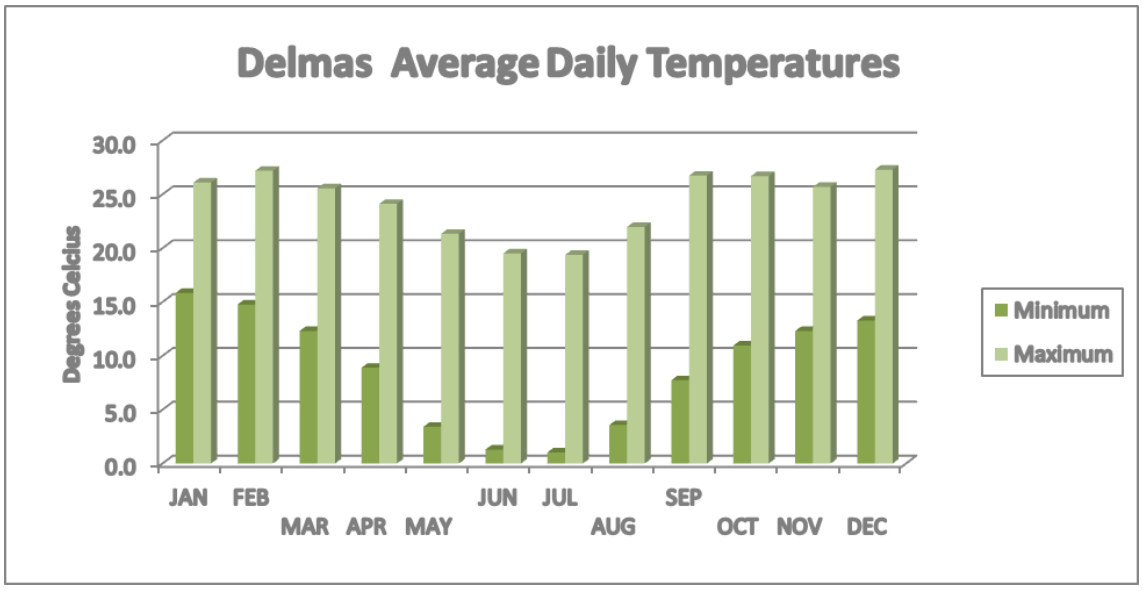


Figure 38: Maximum and Minimum Average Daily Temperatures in Delmas

Wind

The proposed site for the AFGRI Daybreak (Sundra) Poultry Abattoir expansion lies approximately 14 km due West from the town Delmas. The wind roses below give an indication of wind direction distributions across the Delmas area.

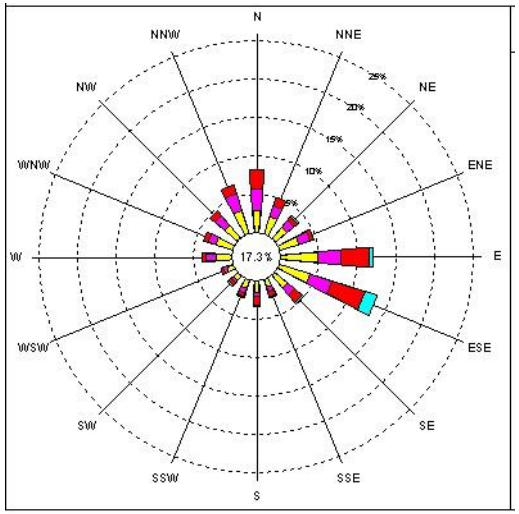


Figure 39: Wind Rose - January

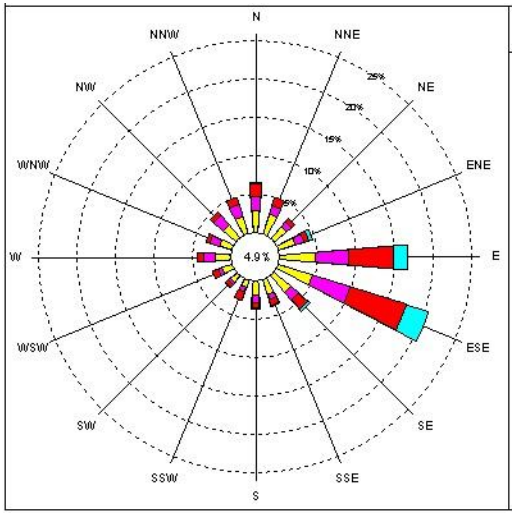


Figure 40: Wind Rose - February

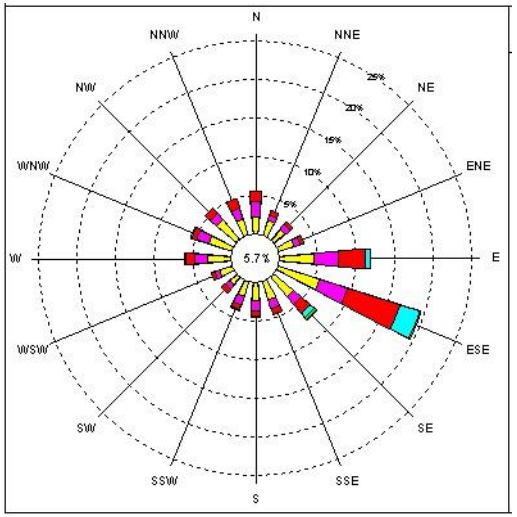


Figure 41: Wind Rose – March

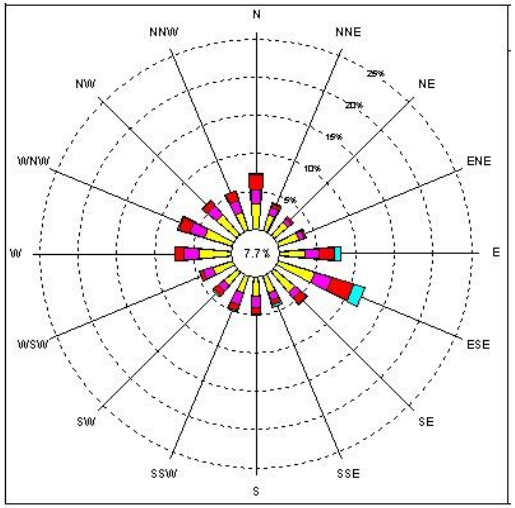


Figure 42: Wind Rose – April

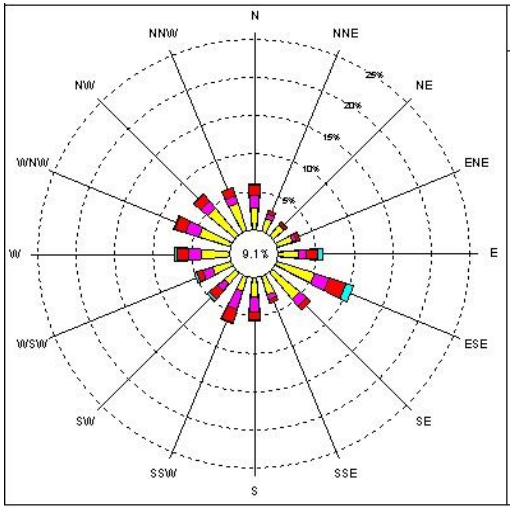


Figure 43: Wind Rose – May

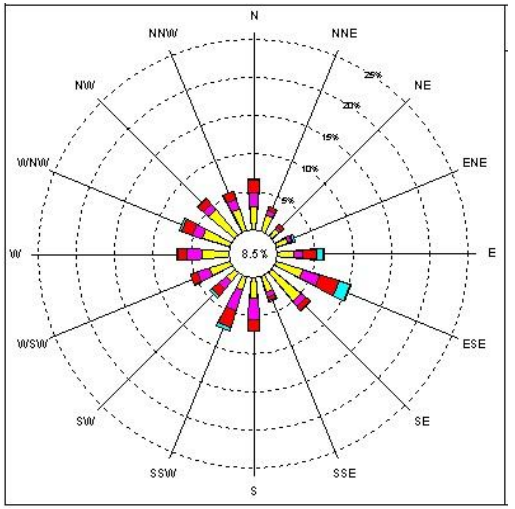


Figure 44: Wind Rose - June

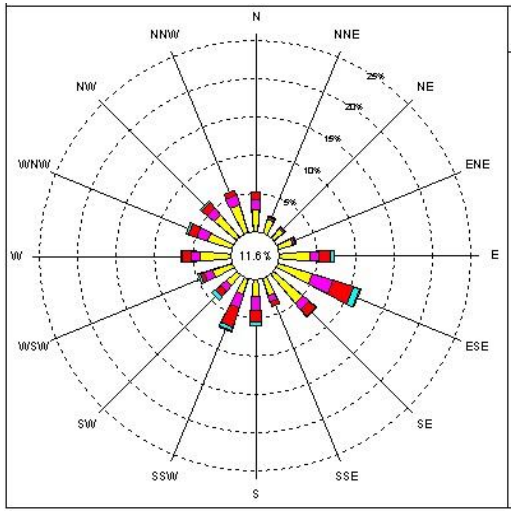


Figure 45: Wind Rose – July

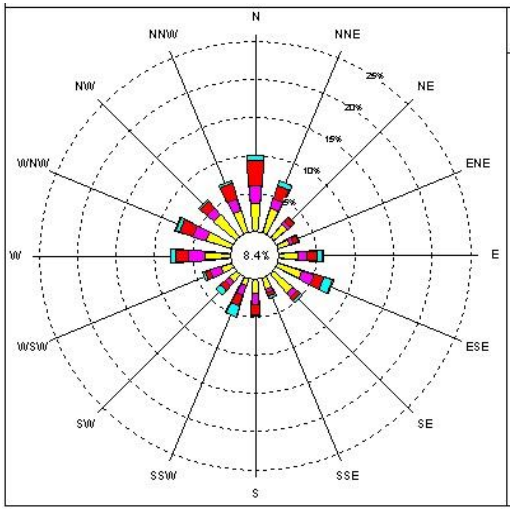


Figure 46: Wind Rose - August

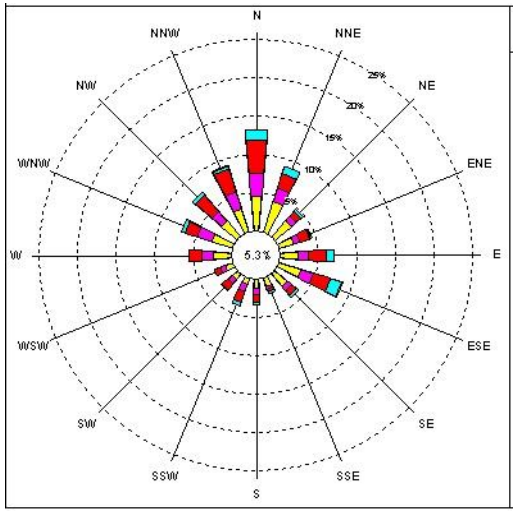


Figure 47: Wind Rose – September

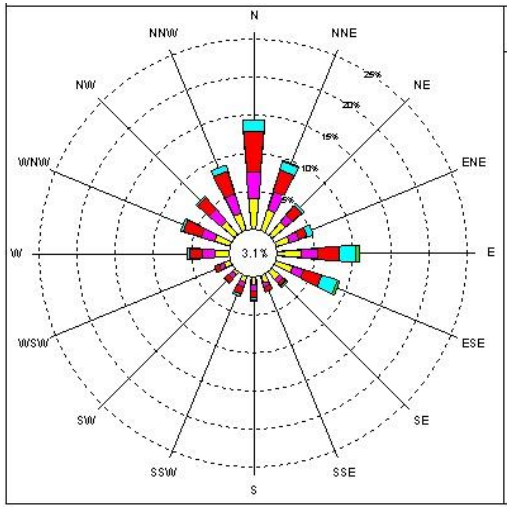


Figure 48: Wind Rose – October

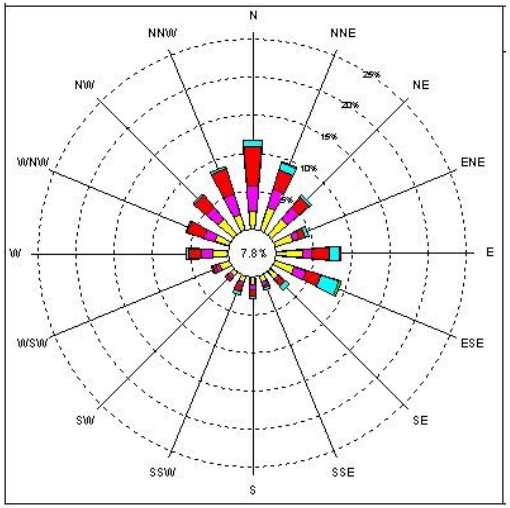


Figure 49: Wind Rose – November

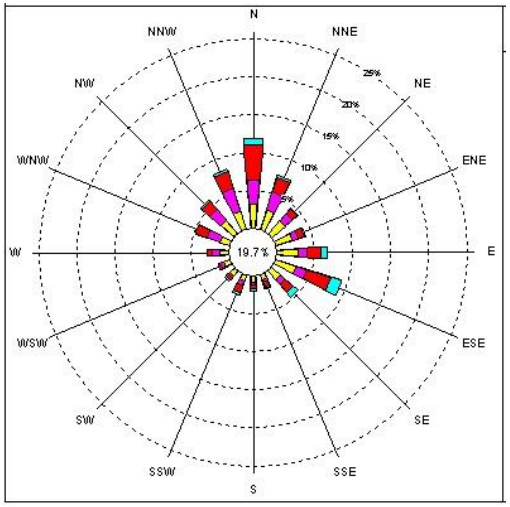


Figure 50: Wind Rose - December

2.1.3 Topography

The property covers a surface area of roughly 117 hectares. The site is located approximately 1 623 metres above mean sea level (Figure 51) and slopes towards a large pan located adjacent and to the west of the abattoir at an average gradient of less than 4%. The vegetation on site is highly disturbed and the surface area is of irregular shape. The bulk of the surrounding land is or was used for crop production.

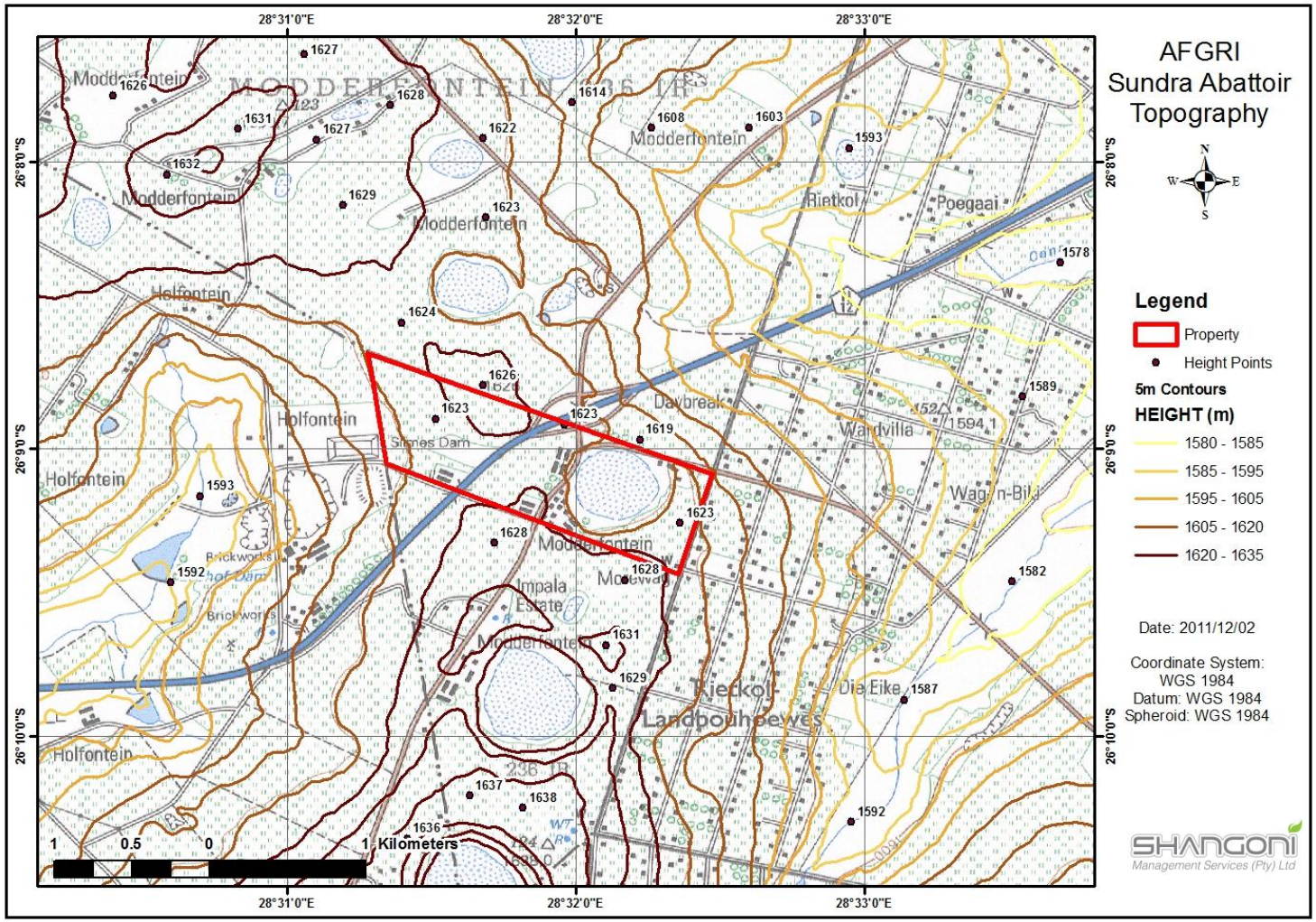


Figure 51: Topography Map of Site

Figure 52: Google earth image of AFGRI Daybreak (Sundra) Poultry at 7.63 km eye alt.

Figure 53: Google earth image of AFGRI Daybreak (Sundra) Poultry at 2.18 km eye alt.

2.1.4 Soils

Generally red, yellow and greyish soils with a low to medium base status (soil fertility) are found at the site (Figure 55). Topsoil in the area ranges in depth from 450mm to 750mm (Figure 57) and mesotrophic soils (Figure 56 and Figure 58) with a moderate inherent fertility can be expected (≥15%<35% clay).

During the geotechnical investigation, done by Mr. Johann van der Merwe, the study area was divided into two prominent material zones (Soil Zones “A” and “B”) As shown in Figure 14, Soil Zone “A” covered the lower-lying western portion of the study area, and the higher-lying, major eastern portion of the study area was covered by Soil Zone “B”. A detailed soil description of the site was given in Table 2 and Table 3.

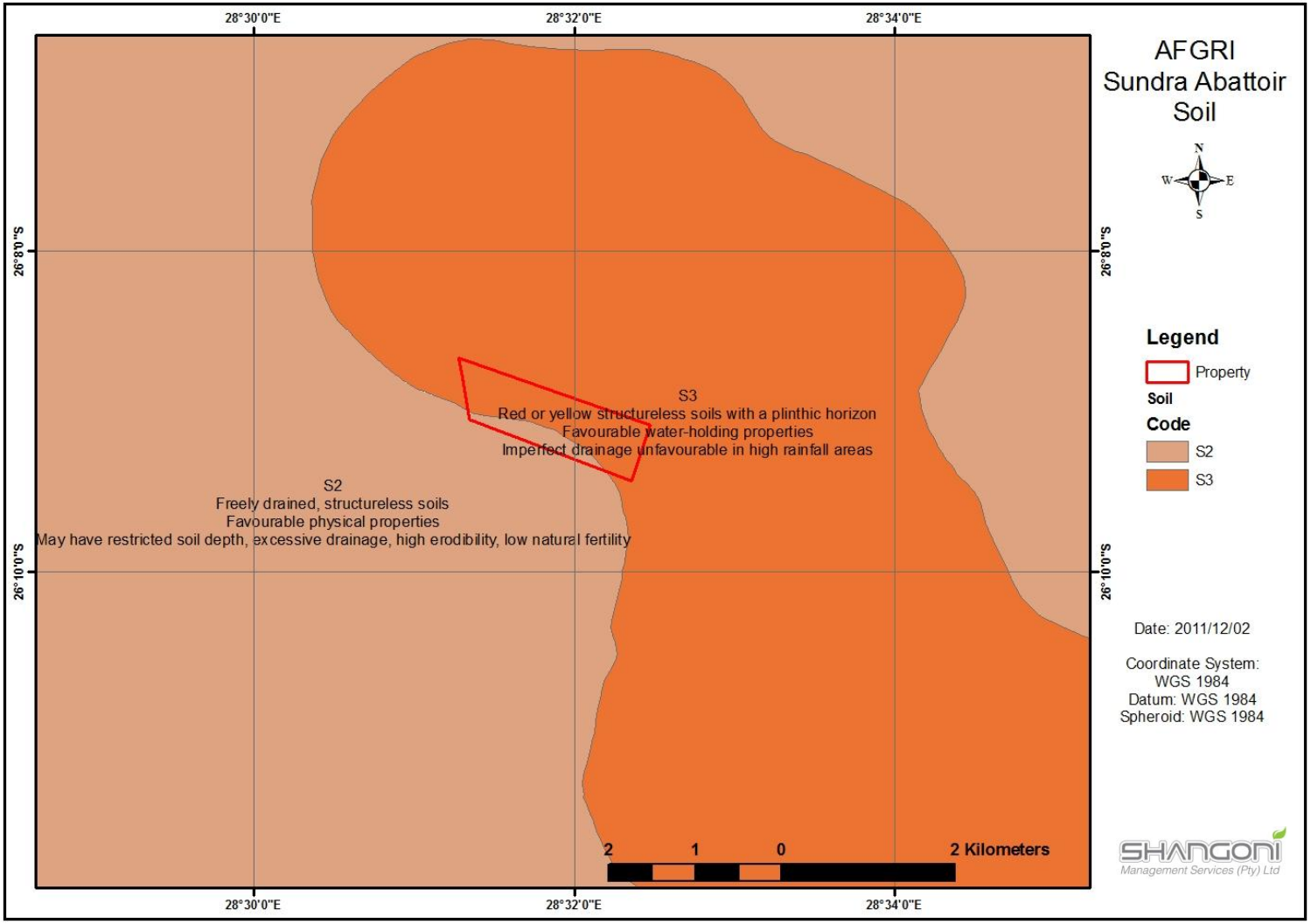


Figure 54: Soil map

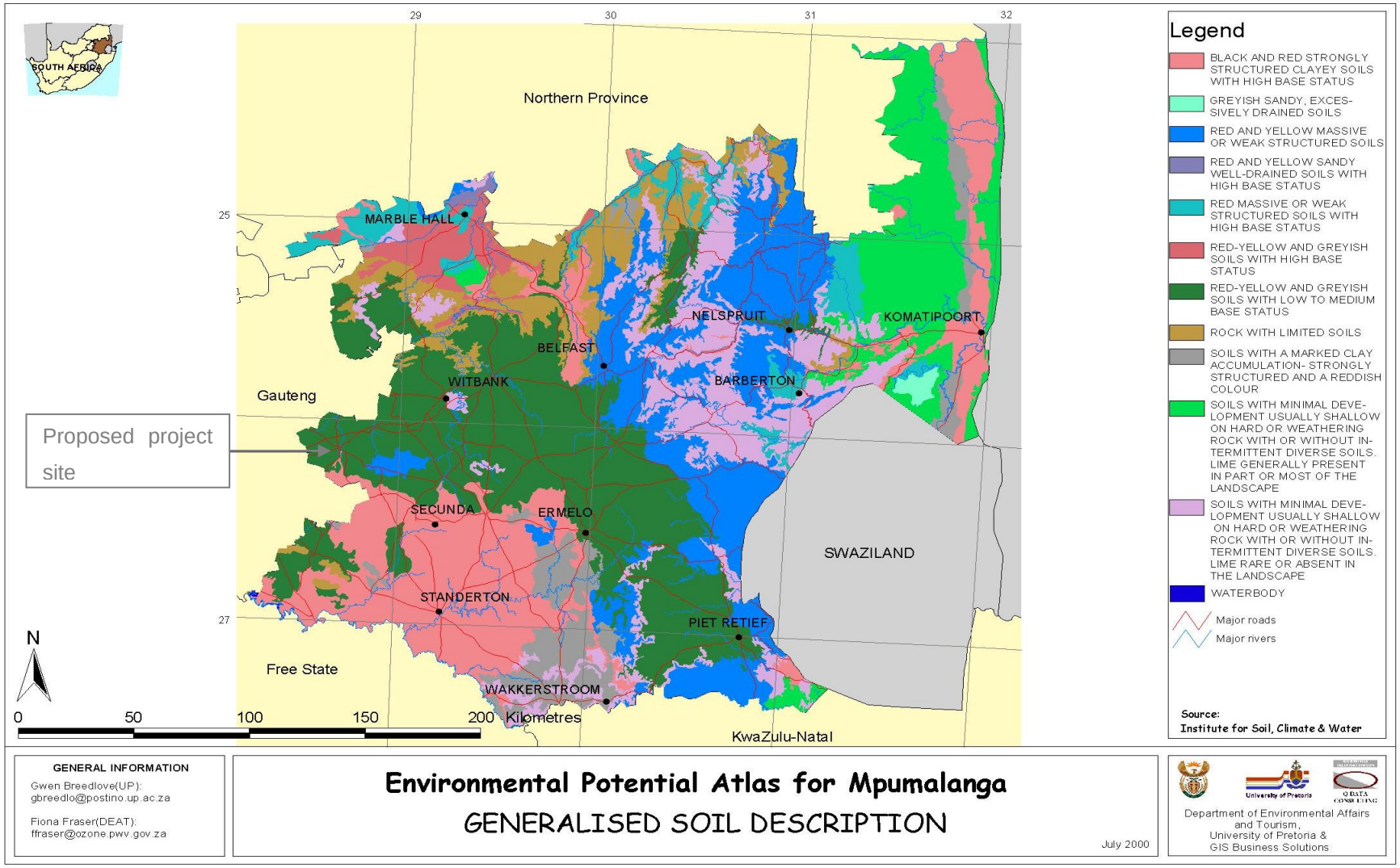


Figure 55: General soil description for Mpumalanga

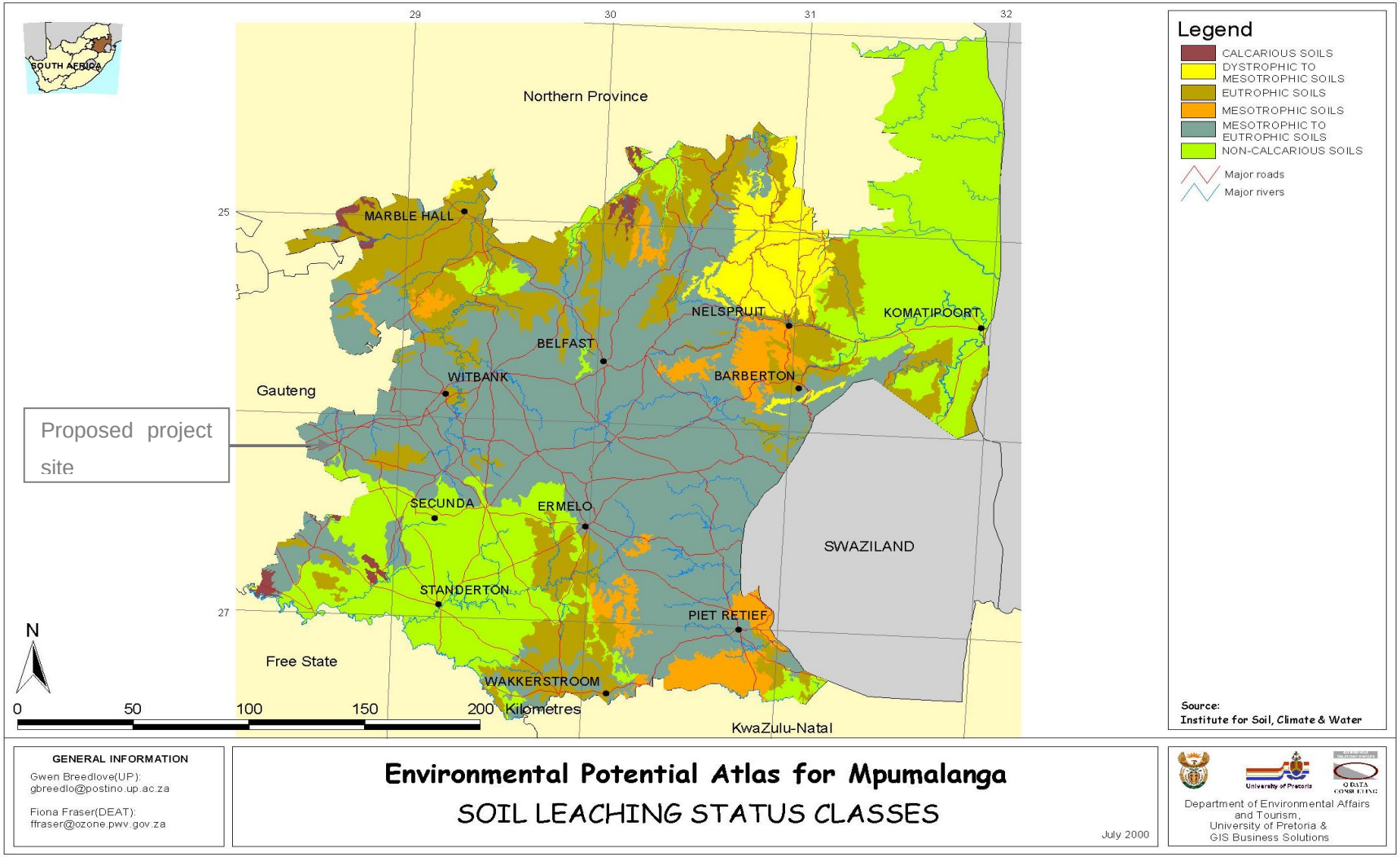


Figure 56: Soil leaching status classes for Mpumalanga

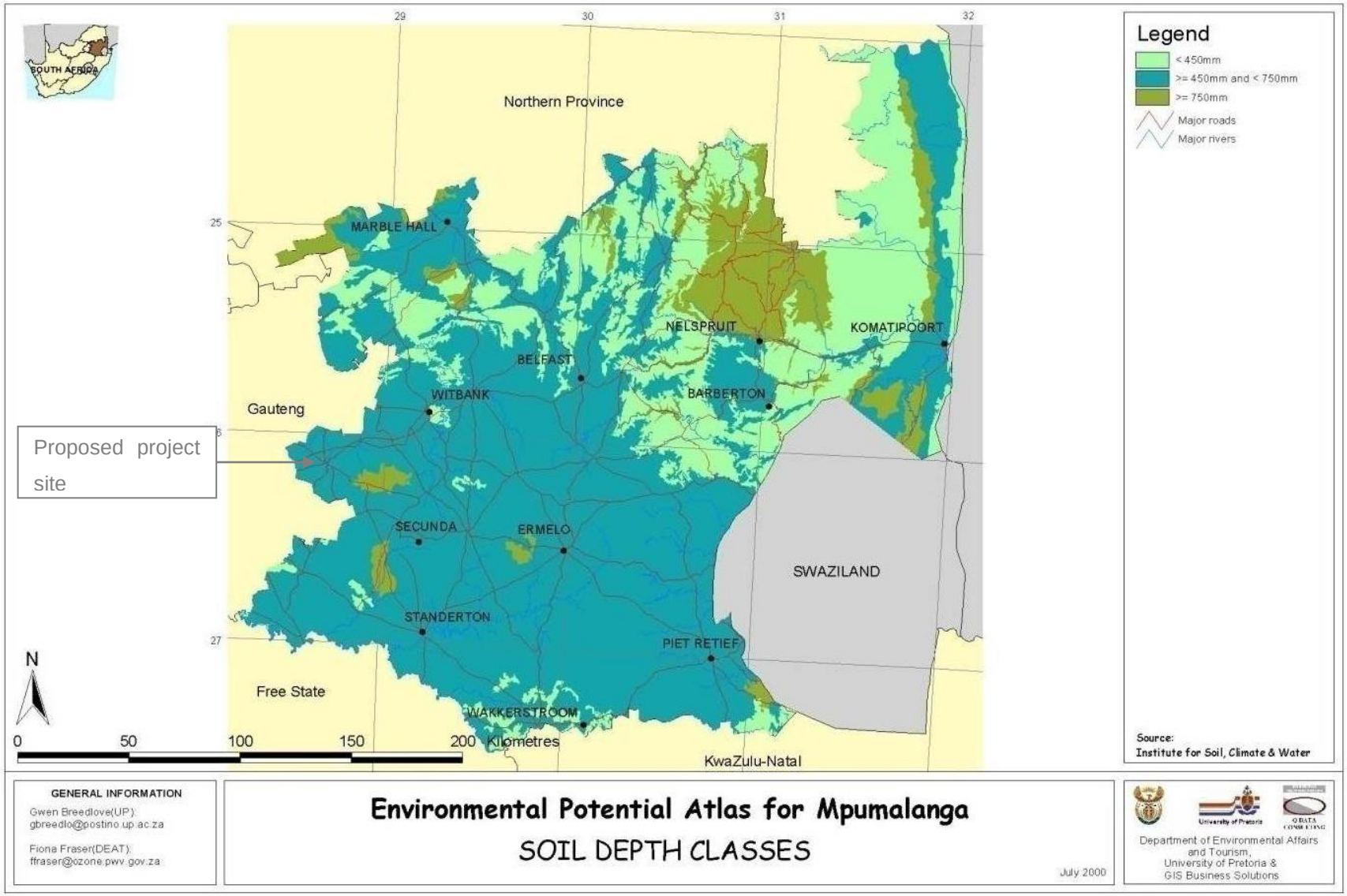


Figure 57: Soil depth in Mpumalanga

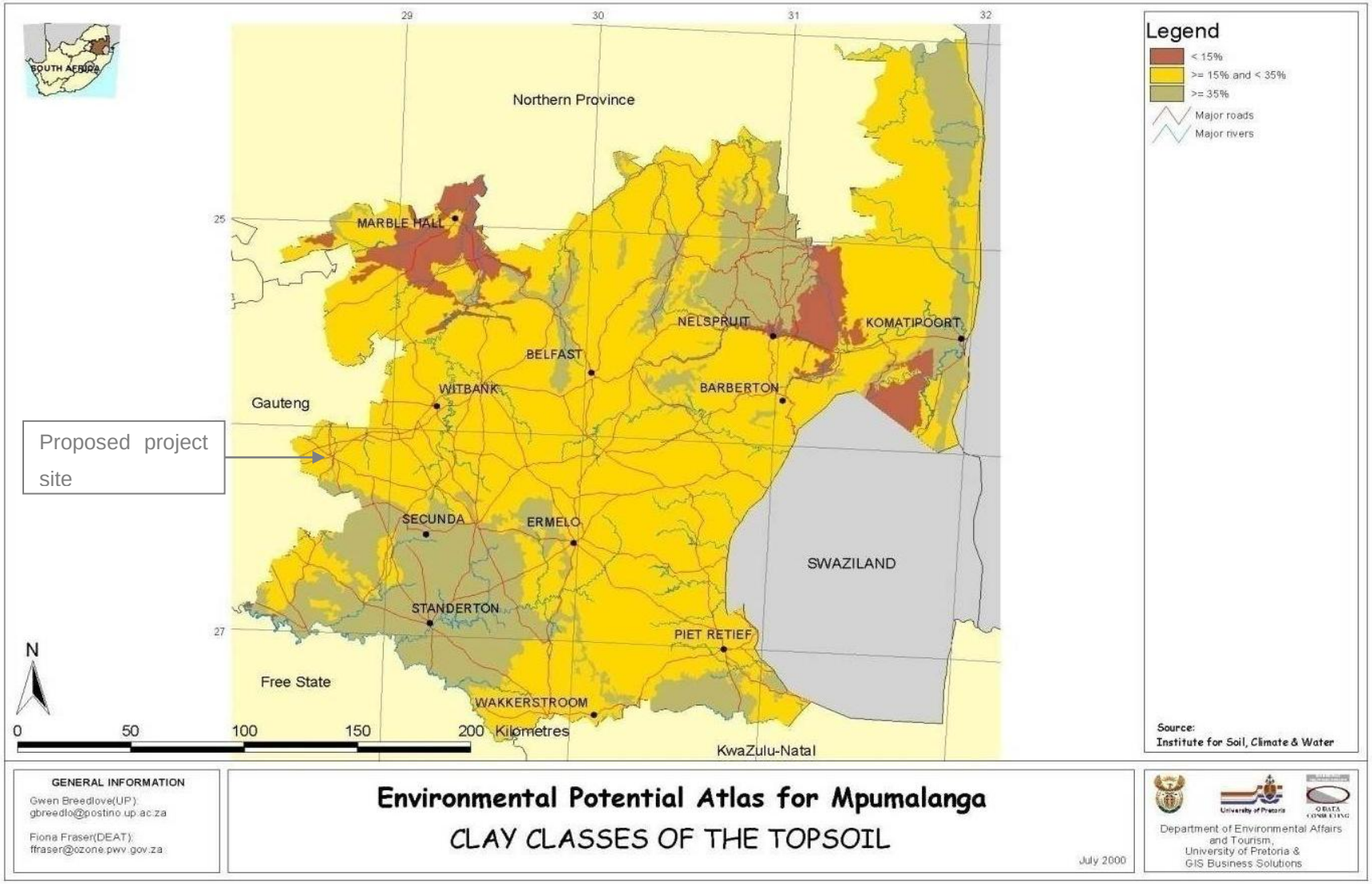


Figure 58: Clay classes of the topsoil in Mpumalanga

2.1.5 Land use and land capability

The entire site (the remaining extent of portion 8 on the farm Modderfontein 236 IR) is approximately 117ha in size and is currently zoned as Agricultural land. AFGRI rear some of their own broiler chickens on the property. The N12 Highway runs through the farm, splitting it in two. A large pan, offices, staff quarters, broiler houses and the abattoir is located to the east of the N12. There are some broiler houses located to the west of the N12; however this land is mainly used for cultivation of crops.

The surrounding land use comprise of residential development and agricultural use, together with the Enviroserve Holfontein disposal facility due West of the abattoir. According to the Environmental Potential Atlas for Mpumalanga, land capability of the site is classified as: cultivated land, vacant/unspecified and built-up land.

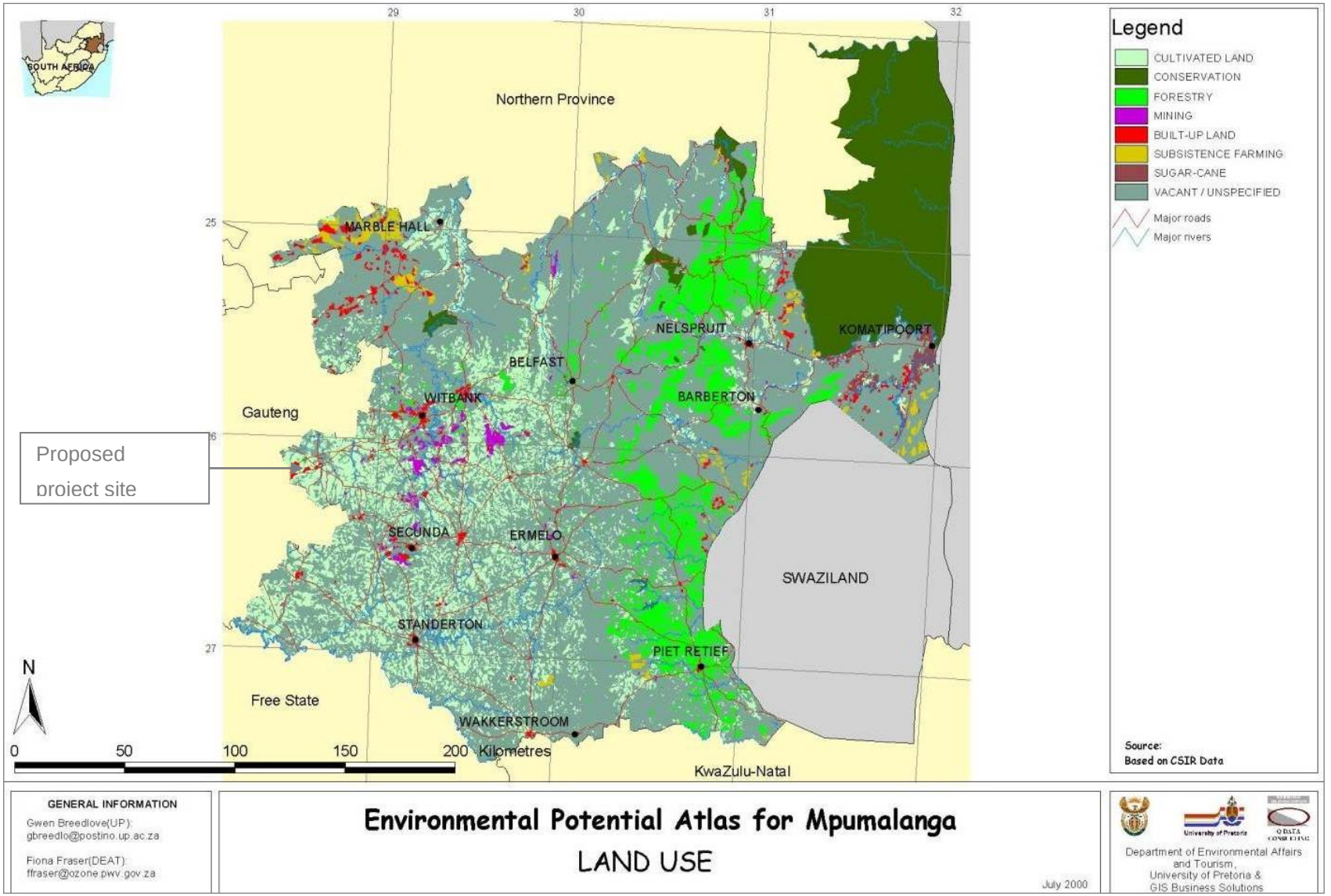


Figure 59: Land uses in Mpumalanga

2.1.6 Fauna and Flora

Vegetation

Due to the disturbed nature of the vegetation onsite, a desktop assessment was undertaken to describe the nature of any natural vegetation surrounding the site. Most of the surrounding land is or was used for crop production.

This farm falls within the Grass Land biome region and is specifically classified as Eastern Highveld Grassland (GM 12) (Figure 60). The Grassland Biome is found mainly on the high central plateau of South Africa and the inland regions of KwaZulu-Natal and the Eastern Cape.

Frost, fire and grazing maintain the dominance of grasses and prevent the establishment of trees. Fire is a natural factor caused by lightning and regular burning is essential for maintaining the structure and biodiversity of this biome. Grasslands are unique ecosystems with rich and often highly specialized animal life, both above and below ground. Formerly, native grasslands supported vast herds of ungulates such as Blesbok, Black wildebeest and Springbok. Bird densities range from 50 to 380 birds per 100 ha, and include a wide range of species.

South African grasslands essentially comprise of a simple, single-layered herbaceous community of tussocked (or bunch) grasses. It is not generally known that the majority of plant species in grasslands are non-grassy herbs, most of which are perennial plants with large underground storage structures that can live for several decades. The Grassland Biome has an extremely high biodiversity, second only to the Fynbos Biome. At a 1 000 square metre scale, the average species richness of the Grassland Biome is even higher than those of most Fynbos communities, being surpassed only by Renosterveld.

Eastern Highveld grasslands occur in the Gauteng and Mpumalanga Provinces at an altitude of 1 520 – 1 780 metres above mean sea level, but can occur as low as 1 300 metres above mean sea level. The short dense grassland is dominated by species commonly found in grasslands (*Aristida, Digitaria, Eragrostis, Tristachya* and *Themeda* among others). There are small rocky outcrops scattered throughout the grassland where some woody species and wiry, sour grasses occur (*Celtis africana, Acacia caffra, Parinari capensis, Diospyros lycioides* subsp. *lycioides, Protea caffra, P. welwitschii* and *Rhus magalismontanum).*

The natural grasslands are considered endangered with only a small percentage conserved in statutory and private reserves. The target for conservation is 24% (Mucina & Rutherford, 2006). However, the site cannot be classified as true Eastern Highveld grassland as a result of its disturbed state. For this reason, the impact of the proposed development on natural vegetation can be regarded as low.

Table 7: Dominant vegetation within the Eastern Highveld

Taxa	Species
Graminoids:	*Digitaria monodactyla, D. tricholaenoides, Brachiaria serrata, Aristida aequiglumis, A. junciformis* subsp. *galpinii, A. congesta, Cynodon dactylon, Eragrostis chloromelas, E. plana, E. sclerantha, E. curvula, E. racemosa, Heteropogon contortus, Microchloa caffra, Monocymbium ceresiiforme, Loudetia simplex, Setaria sphacelata, Themeda triandra, Sporobolus africanus, S. pectinatus, Alloteropsis semialata* subsp. *eckloniana, Andropogon appendiculatus, A. schirensis, Trachypogon spicatus, Bewsia biflora, Tristachya leucothrix, T. rehmannii, Diheteropogon amplectens, Ctenium concinnum, Eragrostis capensis, E. patentissima, E. gummiflua, Rendlia altera, Harpochloa falx, Schizachyrium sanguineum, Panicum natalens, Setaria nigrirostris* and *Urelytrum agropyroides.*
Herbs:	*Haplocarpha scaposa, Berkheya setifera, Justicia anagalloides, Acalypha angustata, Pelargonium luridum, Chamaecrista mimosoides, Euryops gilfillanii, E. transvaalensis* subsp. *setilobus, Dicoma anomala, Ipomoea crassipes, Senecio coronatus, Pentanisia prunelloides* subsp. *latifolia, Helichrysum aureonitens, H. callicomum, H. caespititium, H. rugulosum, H. oreophilum, Selago densiflora, Wahlebergia undulata* and *Vernonia oligocephala.*
Geophytic Herbs:	*Haemanthus humilis* subsp. *hirsutus, Ledebouria ovatifolia, Gladiolus crassifolius* and *Hypoxis rigidula* var. *pilosissima.*
Succulent Herbs:	*Aloe ecklonis.*
Low Shrubs:	*Stoebe plumosa* and *Anthospermum rigidum* subsp. *pumilum.*

Table 8: Dominant vegetation surrounding the Daybreak pan. Alien species are in bold. (Tye, Bremmer & van Staden S., 2010)

Grasses		Permanent	Seasonal	Temporary
Brachiaria brizantha	Common signal grass			X
Eragrostis curvula	Weeping love grass	X	X	
Eragrostis plana	Tough love grass		X	X
Hyparrhenia hirta	Common thatching grass			X
Hyparrhenia tamba	Blue thatching grass			X
Imperata cylindrical	Cottonwool grass		X	
Leersia hexandra	Rice grass	X		
Leersia hexandra	Guinea grass			X
Pennisetum clandestinum	Kikuyu grass		X	
Setaria sphacelata var. sphacelata	Common bristle grass	X	X	
Sorghum bicolor	Common wild sorgum			X
Themeda triandra	Red grass			X
Typha capensis	Bulrush	X		

Herbaceous		Permanent	Seasonal	Temporary
Bidens Formosa	Cosmos			X
Bidens pilosa	Blackjack			X
Cyperus sexangularis	Six-angled sedge	X	X	
Datura ferox	Large thorn apple			X
Helichrysum kraussii	Straw everlasting	X		
Persicaria serrulata			X	
Tagetes minuta	Khakibos			X
Verbena bonariensis	Purple Top			X

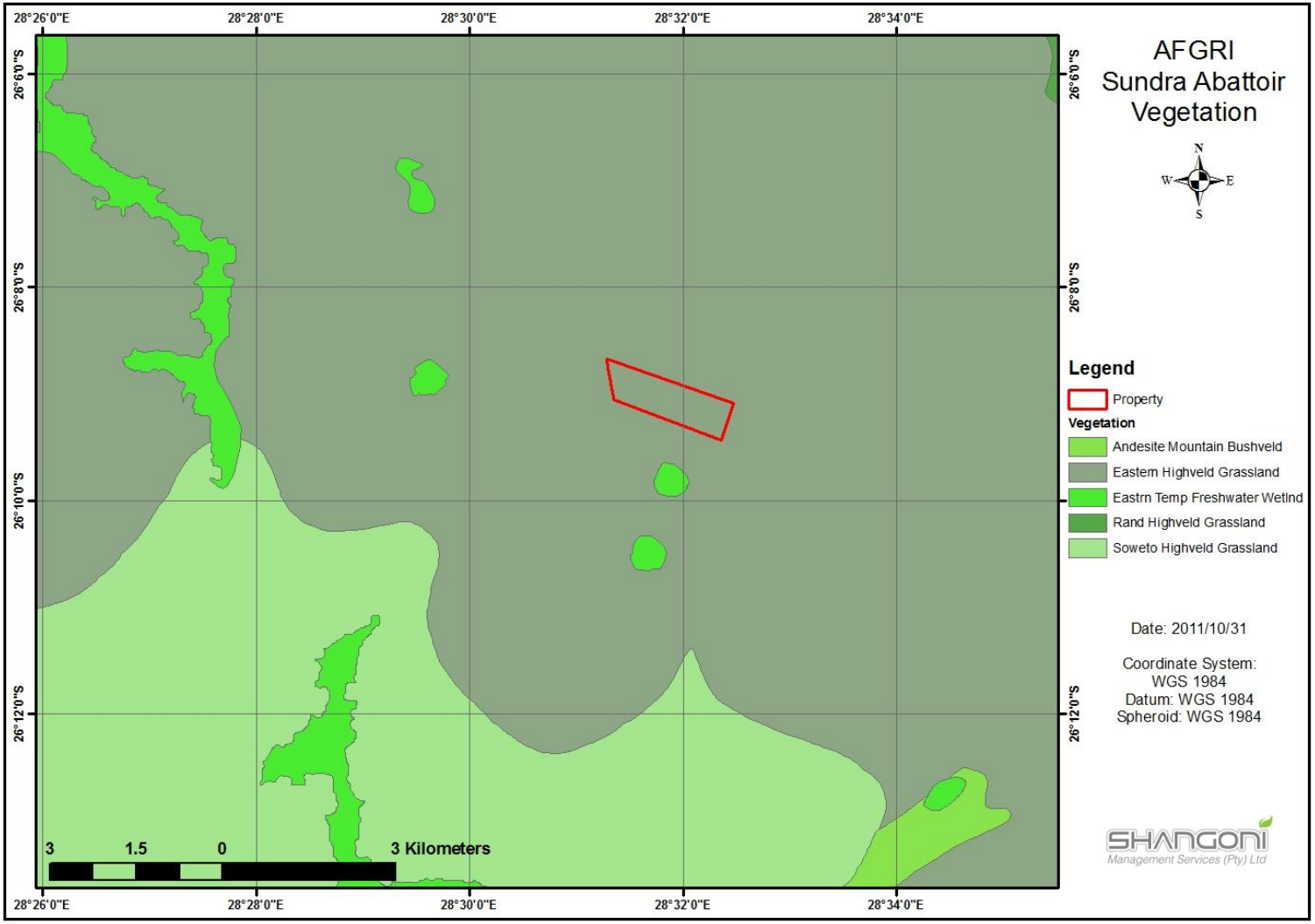


Figure 60: Vegetation map

Macro invertebrates

Macro invertebrates are small animals that are dependent on water for all or part of their life cycle. Different species of macro invertebrates vary in sensitivity to water quality-, flow- and temperature pollution and are therefore used as bio-indicators to estimate the health of a water body.

Scientific Aquatic Services conducted an aquatic ecological assessment of the three pans in the vicinity of Daybreak (Sundra) abattoir. The pans were numbered as in Figure 62. A generally diverse aquatic community was observed during the assessment; however the sensitivity ratings, observed at both the Daybreak Pan and Pan 2, were relatively low with the exception of the *Aeshinidae* species observed at the Daybreak Pan. Dragonflies are often found in reflecting water with lower dissolved oxygen levels.

The sensitivity rating in Pan 3 was found to be 41% higher than that of the Daybreak pan. This can be attributed to natural filtering processes, lower temperatures and the higher oxygen levels observed in Pan 3. (Tye, Bremmer & van Staden S., 2010).

Table 9: Aquatic Macro-Invertebrates noted during the assessment

Common Name	Scientific Name	Sensitivity/15
Leeches	*Hyrudinea*	3
Small minnow mayflies	*Baetidae (2sp)*	6
Dragonflies	*Aeshnidae*	8
Giant water bugs	*Belostomatidae*	3
Water boatmen	*Corixidae*	3
Backswimmers	*Notonectidae*	3
Ripple bugs	*Veliidae*	5
Predacious diving beetles	*Dytiscidae*	5
Midges	*Chironomidae*	2
Mosquitoes	*Culicidae*	1

Avifauna

During the aquatic ecological assessment of the three pans adjacent to the abattoir, all bird species seen or heard were recorded. A total of 45 bird species were observed. Daybreak Pan housed the greatest avifaunal diversity, with 32 species recorded. None of the species recorded during the survey were of conservation concern

Table 10: Bird species noted during the assessment (Tye, Bremmer & van Staden S., 2010).

Common Name	Scientific Name	Conservation Status
African Sacred Ibis	*Threskiornis aethiopicus*	Not Threatened
Black-crowned Nightheron	*Nycticorax nycticorax*	Not Threatened
Black-headed Heron	*Ardea melanocephala*	Not Threatened
Blacksmith Lapwing	*Vanellus armatus*	Not Threatened
Cape Shoveller	*Anas smithii*	Not Threatened
Cape Turtle-Dove	*Streptopelia capicola*	Not Threatened
Cape Wagtail	*Motacilla capensis*	Not Threatened
Cattle Egret	*Bubulcus ibis*	Not Threatened
Common Fiscal	*Lanius collaris*	Not Threatened
Common Myna	*Acridotheres tristis*	Not Threatened
Common Waxbill	*Estrilda astrild*	Not Threatened
Glossy Ibis	*Plegadis falcinellus*	Not Threatened
Grey Heron	*Ardea cinerea*	Not Threatened
Grey-headed Gull	*Larus cirrocephalus*	Not Threatened
House Sparrow	*Passer domesticus*	Not Threatened
Laughing Dove	*Streptopelia senegalensis*	Not Threatened
Lesser Swamp Warbler	*Acrocephalus gracilirostris*	Not Threatened
Levaillant's Cisticola	*Cisticola tinnies*	Not Threatened
Little Stint	*Calidris minuta*	Not Threatened
Moorhen	*Gallinula chloropus*	Not Threatened

Purple Swamphen	*Porphyrio porphyrio*	Not Threatened
Red-billed Teal	*Anas erythrorhyncha*	Not Threatened
Red-eyed Dove	*Streptopelia semitorquata*	Not Threatened
Red-knobbed Coot	*Fulica cristata*	Not Threatened
Rock Dove	*Columba livia*	Not Threatened
Ruff	*Philomachus pugnax*	Not Threatened
Southern Masked- Weaver	*Ploceus velatus*	Not Threatened
Southern Red Bishop	*Euplectes orix*	Not Threatened
Three-banded Plover	*Charadrius tricollaris*	Not Threatened
White-winged Tern	*Chilodonias leucopterus*	Not Threatened
White-faced Duck	*Dendrocygna viduata*	Not Threatened
Yellow-billed Duck	*Anas undulata*	Not Threatened

Fish

Assessing the status of the fish community at a site can provide an indication of the long-term biological integrity of an aquatic environment. The Fish Assemblage Integrity Index (FAII) according to the protocol of Kleynhans (2002) was applied to the aquatic ecological assessment of the three pans adjacent to the Daybreak (Sundra) abattoir.

Table 11: A summary of the results obtained from the application of the FAII index

Type of Result	Daybreak pan	Pan 2
Species present and number of individuals obtained	*None*	*Tilapia sparrmani 3*
Health and condition	Not applicable	Good
Expected FAII score	74.0	74.0
Observed FAII score	0	6.5
Relative FAII score	0	8.8
FAII classification (Kleynhans, 2002)	Class F (Critically modified)	Class F (Critically modified)

When compared to the reference score for pristine fish communities we can deduct that the fish communities at Daybreak pan and Pan 2 have suffered severe loss in integrity.

2.1.7 Surface water

The site area is located within the Olifants River catchment (B20B quaternary catchment) and regionally falls within the sub water management known as the Upper Olifants. The Olifants catchment area has a mean annual runoff of 2386.34-3360.88 million m^3.

The site falls within the Victor Khanye Local municipal area. This area is drained by significant rivers namely the Koffiespruit, Wilge and Kromdraaispruit.

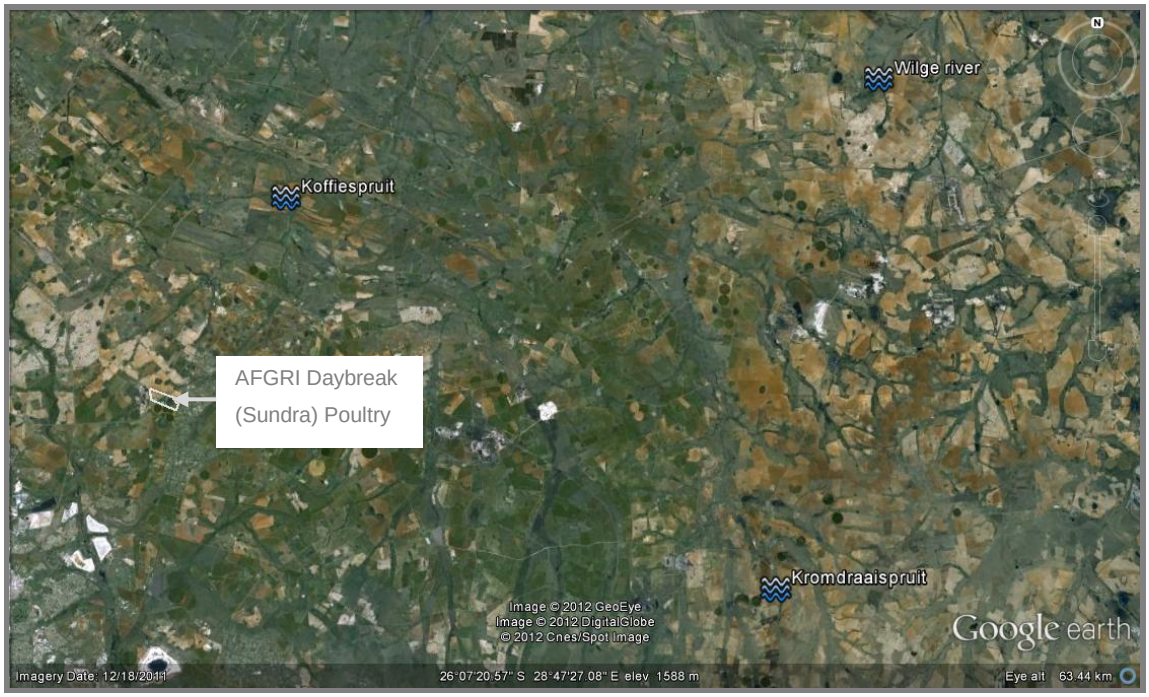


Figure 61: Google earth image of significant rivers in Victor Khanye area

Scientific Aquatic Services conducted an aquatic ecological assessment of the three pans in the vicinity of AFGRI Daybreak (Sundra) Poultry Abattoir. The pans were numbered as in Figure 62. The wastewater from the abattoir is pumped into the Daybreak pan, which falls within the Olifants Water Management area. This has an impact on surrounding water bodies, such as Pan 2 and Pan 3. Pan 2 and 3 fall in the Vaal River Catchment. Impacts resulting from the abattoir activities therefore have the potential to be expressed across catchment boundaries.

At the time of the ecological study, the three pans were considered to be in a poor ecological condition due to both present and past impacts, which include: significant alien vegetation encroachment; agricultural activities in the area; wastewater discharge from the abattoir; agricultural runoff; and rural urbanisation.

The riverine systems in the B20B quaternary catchment area have a moderate diversity of habitat types, with sponge areas and wetlands increasing their ecological sensitivity and importance. The site has a moderate importance in terms of the following: conservation, rare and endangered species and the aquatic resources. The riverine resources have a moderate sensitivity to flow requirements, with species such as *Chiloglanis pretoriae* being flow dependant. The area has a low importance in terms of migration of aquatic species. The ecology of the area is considered to be moderately sensitive to changes in water quality.

For site testing of biota, specific water quality variables were measured at each of the sampling sites. Parameters measured include pH, electrical conductivity (EC) and temperature. The results of on-site biota specific water quality analyses were used to aid in the interpretation of the data obtained during the ecological assessment. Water samples were also taken for physico-chemical analyses at all three sites. The concentrations of most trace metals were below the detection limits of the ICP MS scan (Tye, Bremmer & van Staden S., 2010).

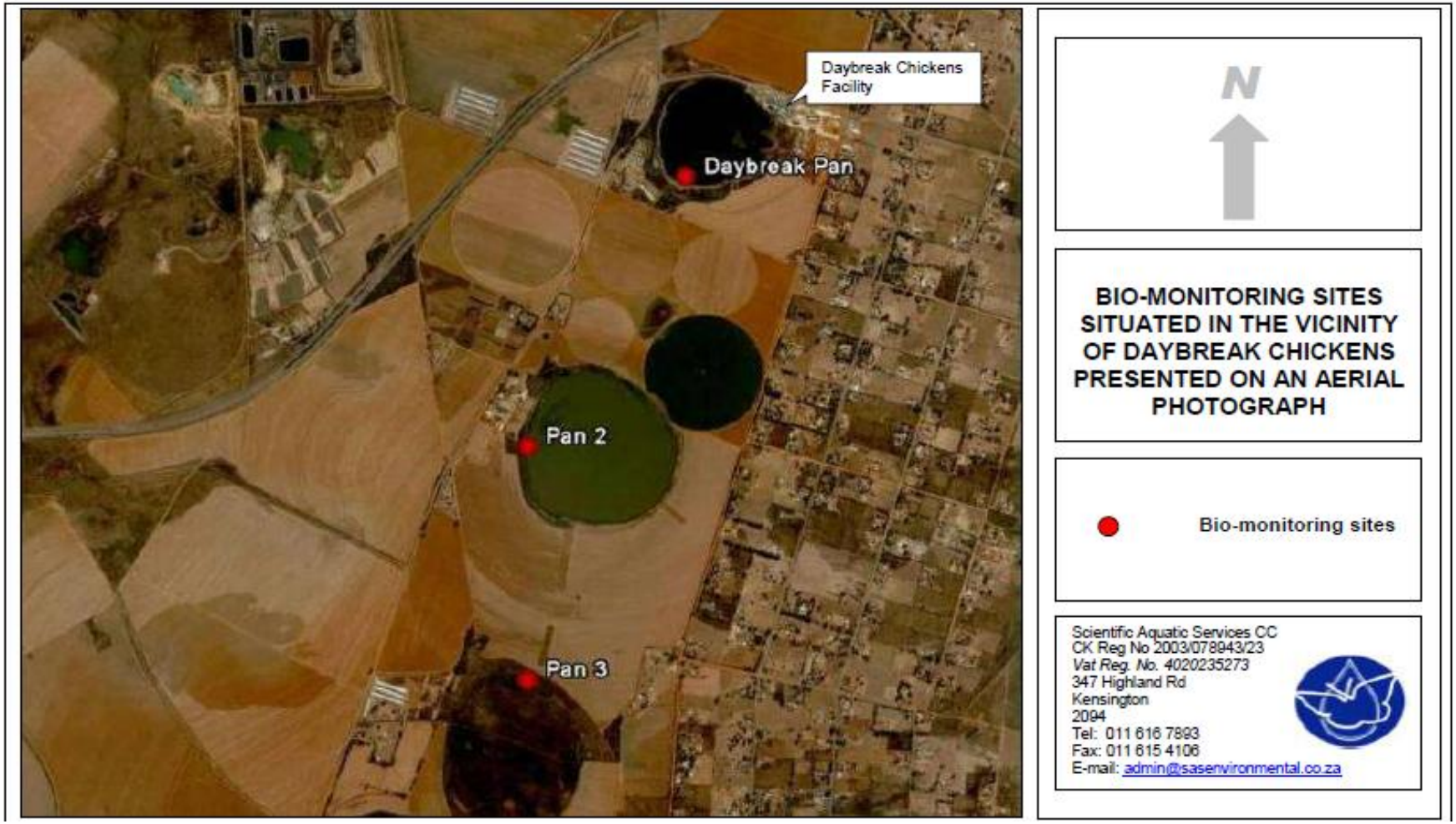


Figure 62: Three Pans used in the Aquatic Ecological Study done by Aquatic Scientific Services

Table 12: Summary of discussion, in aquatic ecological assessment, on water quality values found at the Daybreak pan, Pan 2 and Pan 3

Water Quality Parameter	Daybreak Pan	Pan 2	Pan 3	Results / Discussion
Suitability for supporting a diverse aquatic community	Unsuitable	Unsuitable	Suitable	Pan 3 was considered to contribute to the ecological importance of the area.
Total dissolved solids (TDS)		Approximately 18% higher than that of Daybreak pan.	Decreases slightly by 2.9 %	The increase in TDS, from the Daybreak pan, in Pan 2 exceeds the DWAF Transmission Wheeling Rate Guidelines (TWRG) for aquatic ecosystems and may negatively affect aquatic communities in the study area.
Chlorides	Elevated from natural sources	Elevated from natural sources - higher than at daybreak pan	Elevated from natural sources	Chlorides present may accumulate to toxic levels in moderately tolerant crops such as maize, sunflowers, sorghum and barley, thus reducing crop yields and resulting in foliar injury and posing a threat to human consumption.
Fecal coliform concentrations	Elevated	None	None	No fecal coliforms were observed in Pan 2 and Pan 3 and therefore the water can be regarded as being suitable for recreational use and irrigation. The fecal coliform concentrations found in the Daybreak pan far exceed the target levels as considered necessary for the healthy functioning of natural aquatic ecosystems as well as those of the DWAF TWQR for irrigation purposes.
Fluoride	Elevated	Elevated	Elevated	All three sites are elevated, but fall within the DWAF TWQR for watering of animals.
Chemical oxygen demand (COD)	Elevated	Elevated	Elevated	This is indicative of large amounts of oxygen depleting processes taking place, which is considered natural for the marsh conditions observed at the Pan 3.
Nitrate levels				Nitrate levels at the Daybreak pan, Pan 2 and Pan 3 fall within the levels required for the DWAF TWQR for human consumption, irrigation, as well as agriculture (livestock watering).

Phosphates	Hypertrophic conditions	Hypertrophic conditions	Hypertrophic conditions	Increased algal blooms as a result of eutrophication can lead to a decrease in biodiversity as most sensitive species cannot survive in waters with low levels of oxygen.
Electrical Conductivity (EC)	Significantly altered	Significantly altered	Significantly altered	The high EC values measured in the Daybreak pan can be attributed to the abattoir wastewater. Daybreak is not the sole contributor to salt load in Pan 2 and Pan 3, as agricultural activities also play a role. This can be assumed because of the 77% increase in salt load at Pan 2. The EC at Pan 3 is slightly less than at Pan 2. It can be assumed that Pan 3 absorbs salts and nutrients into the soils, thus acting as a natural biological filter for the high salt concentrations observed in the area. Even though high salt level in these pans is not considered unusual because of centripetal drainage patterns, however high salt loads do place stress on the aquatic community.
pH	Almost Neutral	Elevated	Elevated	pH levels in Pan 2 and Pan 3 exceed DWAF TWQR for aquatic ecosystems. Daybreak pan however is not a contributing factor to the high pH measured in Pan 2 and Pan 3.
Temperature	Elevated			The high temperature measured is a contributing factor to the poor habitat in and around the pan.

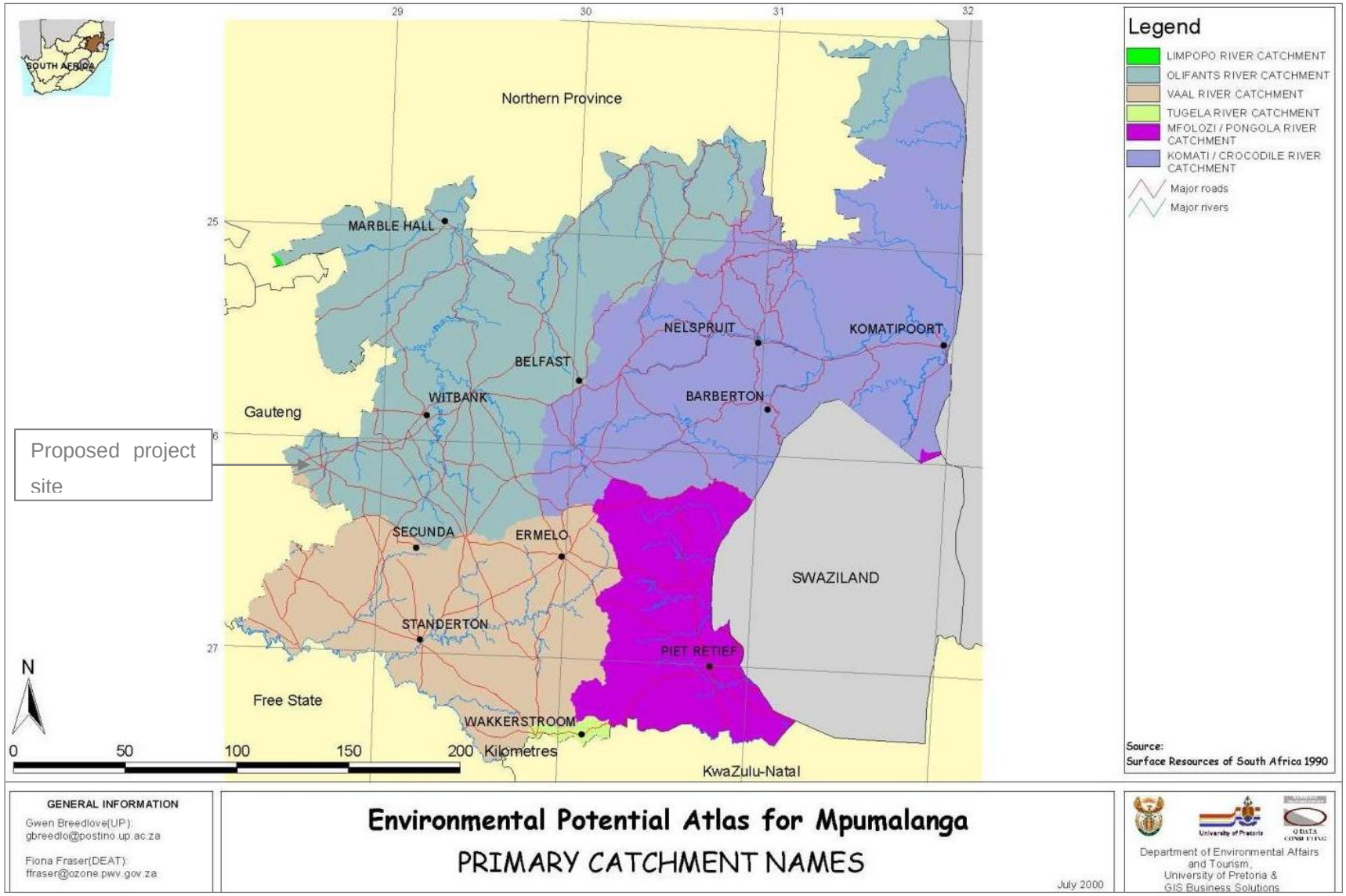


Figure 63: Primary catchments in Mpumalanga

2.1.8 Water Authority

The relevant Water Authority is the Mpumalanga regional office of the Department of Water Affairs (DWA).

2.1.9 Groundwater

The abattoir currently uses approximately 12l water per Chicken, thus approximately 1.2 Ml of water per day, which equates to 13.9 l/s. This is sustained by borehole water, from three onsite boreholes. Each borehole abstracts groundwater at a rate of 4.6 l/s. Municipal water is supplied to the property for domestic purposes.

If the abattoir was to be expanded, the total volume of groundwater abstracted will increase, however the volume of water used per chicken will be less (11l/Chicken) due to better economies of scale.

Should the proposed expansion of the abattoir be authorised, 1 500 000 chickens will be slaughtered per week. This would mean that approximately 16 500m^3 of water would be required per week (± 2.4 Ml/day = ± 27.3 l/s).

A Water Use License Application will be submitted to the Department of Water Affairs for the water use activities occurring on the site.

Groundwater use

Rison Groundwater Consulting CC undertook a hydro census in the general area of the abattoir to determine the neighbouring groundwater users, their dependence on the local groundwater resource and to evaluate the importance of the aquifer/s as a future source of water supply.

It was found that the predominant groundwater use in the area included: domestic, irrigation and livestock watering.

Aquifer parameters

Boreholes DB1 and DB12 were selected for two short duration aquifer tests, to determine local aquifer parameters (Refer to Figure 64).

Table 13: Summary of Aquifer tests

BH	SWL	BH Depth	Abstraction Rate	Drawdown	Transmissivity			Hydraulic Conductivity
					CR (CJ)	Recovery	(Average)	
	mbc	mbc	l/s	m	m²/day	m²/day	m²/day	m/day
DB 1	10.39	110.00	1.10	78.22	0.20	0.20	0.20	0.002
DB 12	4.44	65.00	0.70	28.23	0.30	0.50	0.40	0.007

The water level at DB1 recovered to 91% within 150 minutes of turning the pump off while DB12 recovered 93% within 90 minutes. Table 13 shows that the aquifer has low transmissivity but has hydraulic conductivity values that are typical of Karoo aquifers (van Bart A., 2010).

Figure 64: Boreholes located during the hydrocensus as well as sample positions at the pans.

Depth of Water Tables

AFGRI Daybreak is located on a typical Karoo aquifer. The Karoo aquifer in turn is underlain by a deeper dolomite karst aquifer. All three boreholes, used for the abstraction of abattoir process water, are at a depth of approximately 250m.

The groundwater levels within the boreholes were measured as a first step to determine the groundwater flow directions. It is known that in similar geological terrains a relationship exists between the groundwater table and the topography.

Groundwater Flow direction

The groundwater flow direction is an important parameter in determining AFGRI Daybreaks potential impact on the aquifer and other groundwater users. From the Figure below we can see that AFGRI Daybreak lies on a central topographic high, experiencing topographic lows to the east and west of the site. Groundwater flow that is controlled by the topography migrates from the high topographic areas to low lying areas i.e. from the abattoir towards the east.

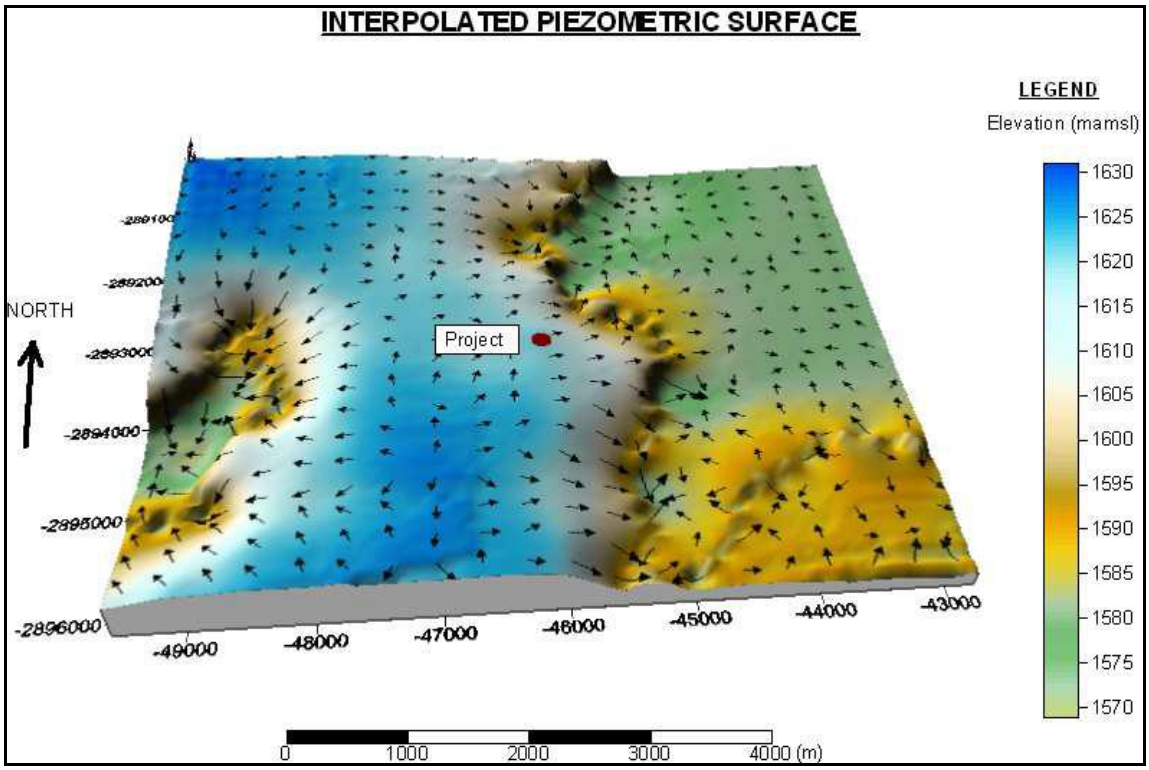


Figure 65: Interpolated 3-D piezometric surface (van Bart A., 2010).

Groundwater Flow rates

The rate of flow will indicate the risk contaminants in the groundwater pose to neighbouring properties and surface water sources.

Using average aquifer parameters (k = 0.0045), average gradient of 1.8% and a porosity of 10%, a flow velocity of 0.00081 m per day or 0.296 m per annum was estimated. It must be noted that the assumptions include a homogeneous and isotropic aquifer i.e. same aquifer parameters throughout the aquifer in all directions. Fractures within the hard rock matrix will have a significantly higher flow rate *(van Bart A., 2010).*

Due to the low aquifer parameters associated with the aquifer, the associated groundwater contamination risk is regarded as a slow process *(van Bart A., 2010).*

Groundwater Quality

The results of the groundwater quality tests were compared to recommended water quality for domestic use, as prescribed by the SANS 241 (2006) specification for drinking water. The overall groundwater samples indicate high quality water that can be classified as Class 0. (The groundwater chemistry results from the hydrocensus are presented in Table 3 of the Hydro-geological Assessment Report, attached to Annexure D of this draft Scoping Report.)

Sustainability of boreholes

The DWAF classifies the Vryheid Formation as a type d2 aquifer which typically yields between 0.1 and 0.5 L/s and is inter-granular and fractured. The Malmani Subgroup is classified as type c5 aquifer which is karst and typically yields in excess of 5 L/s. Groundwater, from the three boreholes, is abstracted from the deeper dolomite karst aquifer (van Bart A., 2010).

Presently, 700 000 chickens are slaughtered at the AFGRI Daybreak abattoir per week. The abattoir uses approximately 12l per Chicken, thus using approximately 1.2 Ml of water per day, which equates to 13.9 l/s. Each borehole thus abstracts groundwater at a rate of 4.6 l/s.

Based on the aquifer classification map of DWAF, boreholes in this aquifer yield in excess of 5 l/s thus suggesting that abstraction is currently in line with predetermined sustainable yields (van Bart A., 2010).

700 000 chickens/week x 12 l/chicken = 8 400 000 l/week
= 8 400 000 l/week ÷ 7days/week
= 1.2Ml/day ÷ 86 400 s/day
=13.9 l/s

13.9 l/s ÷ 3 boreholes = 4.6 l/s/borehole

If the AFGRI Poultry Daybreak abattoir were to be expanded, the total volume of groundwater abstracted will increase, however the volume of water used per chicken will be less (11l/Chicken) due to better economies of scale.

Should the proposed expansion of the abattoir be authorised, 1 500 000 chickens will be slaughtered per week. This would mean that approximately 16 500m^3 of water would be required per week (± 2.4 Ml/day = ± 27.3 l/s).

1 500 000 chickens/week x 11 l/chicken = 16 500 000 l/week
= 16 500 000 l/week ÷ 7days/week
= 2.4Ml/day ÷ 86 400 s/day
= 27.3 l/s

27.3 l/s ÷ 3 boreholes = 9.1 l/s/borehole

The construction of the abattoir wastewater treatment works which will treat all of the wastewater generated at the abattoir to a quality that will comply with the Department of Water Affairs' standards for discharging water into a natural water resource. Once the wastewater is treated, between 40 and 60% of the water can be re-used at the abattoir. Each borehole will thus abstract groundwater at a rate of 3.3 l/s to 5.2 l/s. Since the aquifer yield is in excess of 5 l/s, the abstraction is currently in line with predetermined sustainable yields, (REF: 12/9/11/L832/6).

16 500 000 l/week = 16 500 m³/week = 2 357 m³/day required in the abattoir.
The waste treatment plant will treat up to 2 500 m³/day, of which 40 – 60 % will be re-used.
2 500 m³ x 40% = 1 000 m³
2 500 m³ x 60% = 1 500 m³
Therefore 1 000 m³ to 1 500 m³ of treated wastewater will be re-used per day, which means only 857 to 1 357 m³/day will be abstracted from the three boreholes.

857 to 1 357 m³/day = 857 000 l/day to 1 357 000 l/day = 9.9 l/s to 15.7 l/s

9.9 l/s to 15.7 l/s ÷ 3 boreholes = 3.3 l/s to 5.2 l/s

2.1.10 Noise

Noise on and around the proposed site is generated by traffic on the N12, abattoir activities, broiler rearing activities, farming activities and residential activities.

According to Jorgensen & Johnson (1981), the noise levels generated by general construction activities on a building site can reach levels of approximately 70 dB, caused by for instance heavy machinery. It can therefore be assumed that the proposed development will have a negative impact on the environmental noise of the area once construction starts.

Sound is inversely proportional to the distance from the source and can get absorbed by buildings and vegetation barriers. Noise intensities (dB) will be at their highest on site and will decrease as you move away from their sources.

The decline curve below (Figure 66) gives an indication of how noise generated at the site will decrease with distance. This gives a clear indication of the distance that the sound would have travelled upon reaching a level of 60 dB, prescribed by the SABS as being the acceptable limit for environmental noise.

According to Figure 66, at a distance of 27 metres from the construction site, the generated noise would have decreased to a level of 60 dB and at a distance of 45 metres it would have decreased to approximately 55dB. It can therefore be said that noise travelling further than 45 metres will have a low impact on neighbouring farms and residential areas. Distances to adjacent noise receptors are shown in Figure 67.

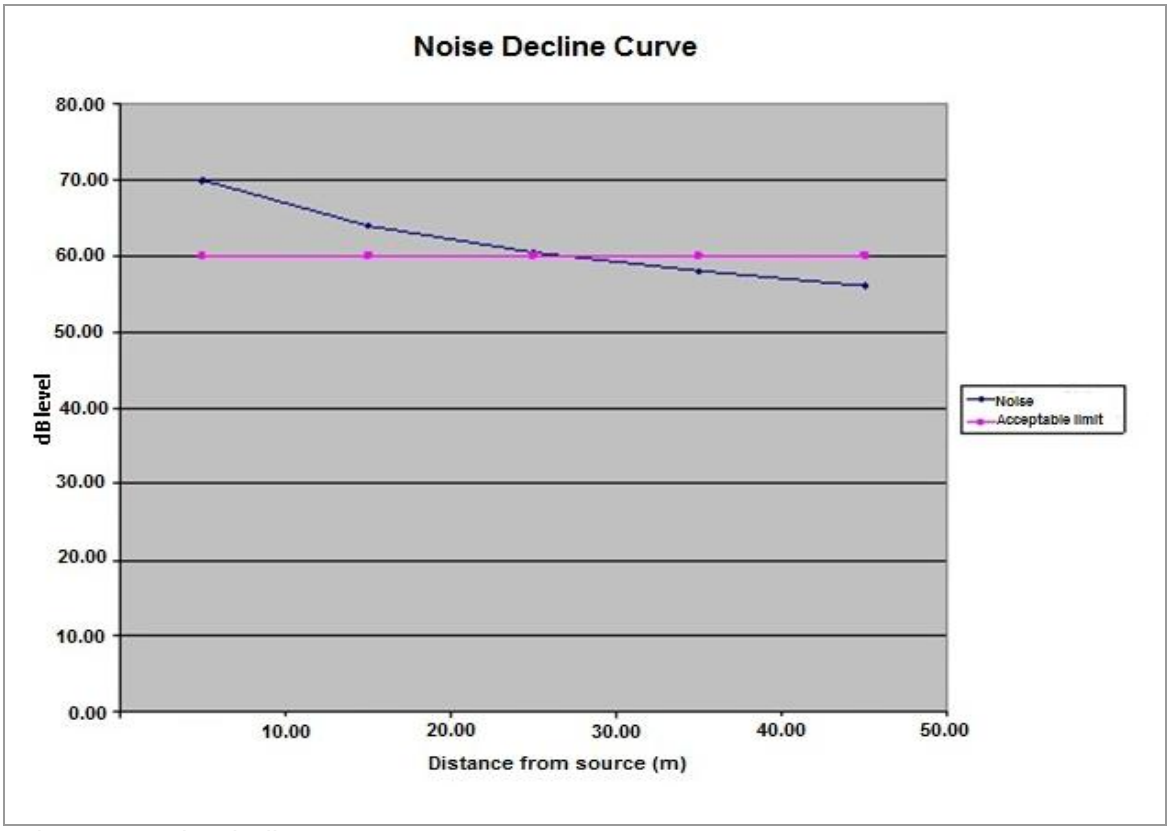


Figure 66: Noise decline curve

Figure 67: Distance from construction site to closest neighbours

2.1.11 Sites of archaeological and cultural interest

A site walk-through of the proposed development was undertaken. The objective of the study was to identify possible archaeological, cultural and historic sites within the proposed development areas.

No obvious features, sites, graves or artefacts of cultural significance that could be impacted on by the proposed development were found.

2.1.12 Visual aspects

The proposed abattoir expansion will not have a significant visual impact on the surrounding environment as only one small building will be added to the abattoir. The main abattoir building will not increase in size, leaving the existing visual impact as is.

2.1.13 Air Quality

Construction Phase

The proposed development will have a short-term and low, negative impact on the air quality of the property as a result of excavation activities that will take place during the construction phase of the project. Construction equipment will primarily produce emissions of nitrogen oxides (NOx), hydrocarbons, suspended particulates and small amounts of sulphur dioxide (SO2) from the use of diesel fuel (PM Group, 2006). With the correct mitigation measures introduced the

dust can be controlled by means of suppression techniques such as the watering of cleared areas and the introduction of speed limits for construction vehicles operating onsite.

Operational Phase

During the operational phase, a number of sources will influence the quality of the air. These sources include the following:

- Slaughtering chickens requires vast amounts of steam and hot water for cleaning and sterilisation purposes. Gasses such as CO2, CO, NOx and SO2 are produced during heat generation. The generation of these greenhouse gasses can be controlled by proper resource usage;
- Evaporation of chilling liquids and stripping of freezing- and chilling- machines, when not in use, cause emissions of NH3 and CFCs (Verheijen *et al.*, 1996). This can be mitigated through proper maintenance of equipment and the disposal of old and ineffective equipment;
- CO2 can be released from stunning equipment (European Commission, 2005);
- The coal boiler will emit Nitrous oxides as NO2, Sulphur dioxide (SO2), Carbon Dioxide (CO2) and mercury;
- Transport vehicles will emit exhaust fumes (COx, COx, NOx);
- In the animal holding bay, chicken manure and urine will produce odours;
- Odours will emanate from the “dirty area” of the abattoir, in particular from the blood and viscera;
- Odours will be released from the wastewater treatment works. These can include methane, ammonia and hydrogen sulphide. Odours will be significantly reduced through effective operation. The reduction in odour will have an overall positive impact on the current air quality.
- The temporary storage of unwanted parts, such as the feathers, before they are taken to the off-site rendering plant, will produce odours;
- Some odours may originate from the product storage and handling areas.

2.2 Socio-economic aspects

The site is located within the Victor Khanye Local Municipality. This local municipality forms part of the Mpumalanga province and falls under the jurisdiction of the Nkangal District Municipality.

2.2.1 Demography

According to the census taken in 2001, it was found that 56 207 people formed part of 13 391 households in the Delmas Local Municipality. This means that there was an average of 4.2 people per household. The site falls within ward 8 of this local municipality and according to the census taken in 2001, there were approximately 4 808 people in ward 8.

The black population in this area is larger than all other races combined. This is clear from the table below together with the fact that isiNdebele and isiZulu are the dominant languages in this area. IsiNdebele is spoken by approximately 57.3% of the population in the area. It is followed by isiZulu which is spoken by approximately 33% of the population. Only about 2% of the population speaks Afrikaans.

Table 14: Population Distribution among Ethnic Groups (Ward 8)

Ethnic group	Ward 8
African	2 461
Coloured	34
Indian	10
White	2 303
Total population	4 808

The census taken in 2001 established that the total population was made up of 49% males and 51% females.

2.2.2 Major economic activities

The Victor Khanye Local Municipality is strategically located between Johannesburg in the Gauteng province and Nelspruit in the Mpumalanga province and forms part of the Nkangala District Municipality. The N12, which runs through the site, joins the N4 Maputo corridor, the main link between the Gauteng province, Mpumalanga province and Mozambique.

The area is used mainly for rural residential purposes and / or agriculture. Management of land use change in the area is of great importance as the lack of bulk services in this area could result in excessive pollution. According to the Environmental Potential Atlas for Mpumalanga, land capability of the site is classified as: cultivated land, vacant/unspecified and build-up land.

2.2.3 Unemployment and employment

Dependency and unemployment rates are very high in the Victor Khanye Municipal area. The census done in 2001 found that approximately 41% of the population was economically active, with 23.5% of the economically active population being employed and 75% unemployed.

Poor skill aptitude can be explained from the fact that 33% of the employment population works in elementary occupations (Plant and Machine operators), and 13% are professionals, of which only 16.6% are managers, technicians and clerks.

The relatively low income levels are an indication of high poverty level and result in an increased dependency on social aid e.g. housing subsidies and child grants.

Recent analysis shows that the unemployment rate has increased, as a result of agriculture degrading noticeably. The rate of employment opportunities lost is however stabilising as mining, manufacturing and finance have been growing.

3. LEGISLATION AND GUIDELINES APPLICABLE

3.1 Laws of general application

- Constitution of the RSA, 1996 (Act No 108 of 1996)
- National Environmental Management Act, 1998 (Act No 107 of 1998)
- Environment Conservation Act, 1989 (Act No 73 of 1989 as amended)
- Promotion of Access to Information Act, 2000 (Act No 2 of 2000 as amended)

3.2 Atmospheric emissions

- National Environmental Management: Air Quality Act (Act No 39 of 2004)
- Environment Conservation Act, 1989 (Act No 73 of 1989) – Noise Control
- Regulations in terms of Section 25 of the Environment Conservation Act, 1989

3.3 Water Management

- National Water Act, 1998 (Act No 36 of 1998)

3.4 Waste management

- National Environmental Management: Waste Act (Act No 59 of 2008)

3.5 Planning of new activities

- National Environmental Management Act, 1998 (Act No 107 of 1998)

3.7 Land and Soil Management

- National Environmental Management Act, 1998 (Act No 107 of 1998)
- Environmental Conservation Act, 1989 (Act No 73 of 1989)

3.8 Heritage resources

- National Heritage Resources Act No 25 of 1999 (Act No 25 of 1999 as amended)

During the course of the development, the developer and contractors must comply with all other relevant legislation (including the bylaws of the Local Municipality).

4. PUBLIC PARTICIPATION PROCESS

4.1 Introduction

A Public Participation Process (PPP) is a requirement in terms of the 2010 EIA Regulations of the National Environmental Management Act,1998 (Act 107 of 1998) and it forms an integral part of any EIA process.

This section provides information pertaining to the PPP that was conducted by Shangoni Management Services during this particular assessment.

The purpose of this process is to gather information from the community and relevant Stakeholders that could ultimately affect the decision-making process concerning the Planning, Construction and Operational Phases of the proposed AFGRI Daybreak (Sundra) abattoir expansion project. The community and public have been identified as I&APs and have been given the opportunity to participate in this process. Their comments, whether positive or negative, will influence the decision of the Authorities and the developer's final actions.

4.2 Objectives of the PPP

The PPP has the following objectives:

- To inform I&APs as well as all Stakeholders of the proposed development;
- To provide an opportunity for I&APs and Stakeholders to raise environmental issues or concerns and make suggestions;
- To promote transparency and an understanding of the project and its consequences;
- To serve as a structure for liaison and communication with I&APs and Stakeholders.

To summarise, the objective of the on-going PPP is to promote openness and transparency concerning the proposed abattoir expansion for the duration of the project. The process should by no means be regarded as a vehicle to temper opposition or objections. Any conclusions agreed upon must be socially, financially and technically acceptable and feasible in order to meet the requirements of the National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998), and the vision of AFGRI Poultry. .

4.3 The Guidelines Followed for the PPP

The PPP for this project was conducted by Shangoni Management Services and undertaken strictly according to the guidelines in terms of the National Environmental Management Act (NEMA), No. 107 of 1998, Chapter 6:

4.4 Public Participation Process

The PPP for this project was conducted by Shangoni Management Services and undertaken strictly according to the guidelines in terms of the National Environmental Management Act (NEMA), No. 107 of 1998, Chapter 6:

54. (1) This regulation only applies in instances where adherence to the provisions of this regulation is specifically required.

(2) The person conducting a public participation process must take into account any guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential interested and affected parties of the application which is subjected to public participation by-

(a) fixing a notice board at a place conspicuous to the public at the boundary or on the fence of -
  (i) the site where the activity to which the application relates is or is to be undertaken; and
  (ii) any alternative site mentioned in the application;

(b) giving written notice to -
  (i) the owner or person in control of that land if the applicant is not the owner or person in control of the land;
  (ii) the occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
  (iii) owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
  (iv) the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;
  (v) the municipality which has jurisdiction in the area;
  (vi) any organ of state having jurisdiction in respect of any aspect of the activity; and
  (vii) any other party as required by the competent authority;

(c) placing an advertisement in –
  (i) one local newspaper; or

(ii) any official *Gazette* that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;

(d) placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or local municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official *Gazette* referred to in sub regulation (c)(ii); and

(e) using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desiring of but unable to participate in the process due to
(i) illiteracy;
(ii) disability;
(iii) or any other disadvantage.

(3) A notice, notice board or advertisement referred to in sub regulation (2) must

(a) give details of the application which is subjected to public participation; and

(b) state-

(i) that the application has been submitted to the competent authority in terms of these Regulations, as the case may be;

(ii) whether basic assessment or scoping procedures are being applied to the application, in the case of an application for environmental authorisation;

(iii) the nature and location of the activity to which the application relates;

(iv) where further information on the application or activity can be obtained; and

(vi) the manner in which and the person to whom representations in respect of the application may be made.

(4) A notice board referred to in sub regulation (2) must-

(a) be of a size at least 60cm by 42cm; and

(b) display the required information in lettering and in a format as may be determined by the competent authority.

(5) Where deviation from sub regulation (2) may be appropriate, the person conducting the public participation process may deviate from the requirements of that sub regulation to the extent and in the manner as may be agreed to by the competent authority.

(6) Where a basic assessment report, scoping report or environmental impact assessment report as contemplated in regulations 22, 28 and 31 respectively is amended because it has been rejected or because of a request for additional information by the competent authority, and such amended report contains new information, the amended basic assessment report, scoping report or environmental impact assessment report must be subjected to the processes

contemplated in regulations 21, 27 and 31, as the case may be, on the understanding that the application form need not be resubmitted.

(7) When complying with this regulation, the person conducting, the public participation process must ensure that-

(a) information containing all relevant facts in respect of the application is made available to potential interested and affected parties; and

(b) participation by potential interested and affected parties is facilitated in such a manner that all potential interested and affected parties are provided with a reasonable opportunity to comment on the application.

(8)Unless justified by exceptional circumstances, as agreed to by the competent authority, the applicant and EAP managing the environmental assessment process must refrain from conducting any public participation process during the period of 15 December to 2 January.

Register of interested and affected parties

55. (1) An EAP managing an application must open and maintain a register which contains the names, contact details and addresses of -

(a) all persons who, as a consequence of the public participation process conducted in respect of that application in terms of regulation 54, have submitted written comments or attended meetings with the applicant or EAP;

(b) all persons who, after completion of the public participation process referred to in paragraph (a), have requested the applicant or the EAP managing the application, in writing, for their names to be placed on the register; and

(c) all organs of state which have jurisdiction in respect of the *activity* to which the application relates.

(2) An EAP managing an application must give access to the register to any person who submits a request for access to the register in writing.

Registered interested and affected parties entitled to comment on submissions

56. (1) A registered interested and affected party is entitled to comment, in writing, on all written submissions, including draft reports made to the competent authority by the applicant or the EAP managing an application, and to bring to the attention of the competent authority any issues which that party believes may be of significance to the consideration of the application, provided that-

(a) comments are submitted within-

(i) the timeframes that have been approved or set by the competent authority; or

(ii) any extension of a timeframe agreed to by the applicant or EAP;

(b) a copy of comments submitted directly to the competent authority is served on the EAP; and

(c) the interested and affected party discloses any direct business, financial, personal or other interest which that party may have in the approval or refusal of the application.

(2) Before the EAP managing an application for environmental authorisation submits a final report compiled in terms of these Regulations to the competent authority, the EAP must give registered interested and affected parties access to, and an opportunity to comment on the report in writing.

(3) The report referred to in sub regulation (2) include-

(a) basic assessment reports;
(b basic assessment reports amended and resubmitted in terms of regulation 24 (4);
(c) scoping reports;
(d) scoping reports amended and resubmitted in terms of regulation 30(3);
(e) specialist reports and reports on specialised processes compiled in terms of regulation 32;
(f) environmental impact assessment reports submitted in terms of regulation 31;
(g) environmental impact assessment reports amended and resubmitted in terms of regulation 34(4); and
(h) draft environmental management programmes compiled in terms of regulation 33.

(4) The draft versions of reports referred to in sub regulation (3) must be submitted to the competent authority prior to awarding registered interested and affected parties an opportunity to comment.

(5) Registered interested and affected parties must submit comments on draft reports contemplated in sub regulation (4) to the EAP, who should record it in accordance with regulations 21, 28 or 31.

(6) Registered interested and affected parties must submit comments on final reports contemplated in sub regulation (3) to the competent authority and provide a copy of such comments to the applicant or EAP.

(7) The competent authority must, in order to give effect to section 24O of the Act, on receipt of the draft reports contemplated in sub regulation (5), request any State department that administers a law relating to a matter affecting the environment to comment within 40 days.

(8) The timeframe of 40 days as contemplated in sub regulation (7) must be read as 60 days in the case of waste management activities as contemplated in the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008), on which the Department of Water Affairs

must concur and issue a record of decision in terms of section 49(2) of the National Environmental Management: Waste Management Act, 2008 (Act No. 59 of 2008).

(9)(a)When a State department is requested by the competent authority to comment, such State department must, within 40 days or in the case of Department of Water Affairs, 60 days for waste management activities, of being requested to comment by the competent authority, provide comments to the competent authority.

(b)If a State department fails to submit comments within 40, or 60 days for waste management activities, from the date on which the Minister, MEC, Minister of Mineral Resources or identified competent authority requests such State department in writing to submit comment, it will be regarded that there are no comments.

Comments of interested and affected parties to be recorded in reports submitted to competent authority

57. (1) The EAP managing an application for environmental authorisation must ensure that the comments of interested and affected parties are recorded in reports and that such written comments, including records of meetings, are attached to the report, submitted to the competent authority in terms of these Regulations.

(2) Where a person is desiring but unable to access written comments as contemplated in sub regulation (1) due to-

(i) a lack of skills to read or write;

(ii) disability; or

(iii) any other disadvantage,

reasonable alternative methods of recording comments must be provided for.

4.5 Public Participation Process Followed

The following PPP was conducted for the proposed AFGRI Daybreak (Sundra) abattoir expansion project:

- Identification of key Interested and Affected Parties (all adjacent landowners);
- Identification of key Stakeholders;
- Informing the key Stakeholders of the process by means of correspondence;
- Placement of a press notice in the Standerton Advertiser, informing the public of the process;
- Placement of site notices at the site; and
- Correspondence with I&APs and Stakeholders and the addressing of their comments.

4.5.1 Identification & Registration of I&APs on a Database

Through networking and advertising, I&APs were registered on a database. Shangoni ensured that individuals or organisations from an institutional as well as a geographical point of view were identified.

Geographically, Shangoni focused on nearby or adjacent landowners, communities and structures that represents them. Institutionally, the focus was on those organisations or individuals that may influence policies and decisions or make a contribution to the project. Not all of these organisations were necessarily in the direct project sphere of impact.

4.5.2 Notification of key stakeholders and IAPs

Stakeholders are all the relevant Authorities and land owners which may possibly be affected by the proposed abattoir expansion. The following stakeholders were identified (Table 15):

Table 15: Stakeholders identified during the PPP

Name	Organisation/Farm	Postal Address	Contact details
Ms. Nelisiwe Sithole	Department of Agriculture, Rural Development and Land Administration	Private Bag X11219 Nelspruit 1200	Tel: 013 766 6067/6068 Email: sitholenl@mpg.gov.za
Mr. David Mahlobo	Department of Co-operative Governance and Traditional Affairs	Private Bag X11304 Nelspruit 1200	Tel: 013 766 6087/6675 Cell: 082 338 9881 Fax: 013 766 8441/2 Email: ILSetlogelo@mpg.gov.za
Mr. Isaiah Khoza	Department of Safety, Security and Liaison	Private Bag X11269 Nelspruit 1200	Tel: 013 766 4062 Fax: 013 766 4615 Email: ANMahlalela@mpg.gov.za
Ms. Sibongile Nkosi	Department of Culture, Sport and Recreation	PO Box 1243 Nelspruit 1200	Tel: 013 766 5242 Fax: 013 766 5591/8253
Ms. Mahlasedi Mhlabane	Department of Education	Private Bag X11341 Nelspruit 1200	Tel:0800 203 116 Email: L.brits@education.mpu.gov.za
Mr. J. Mbatha	Department of Finance	Private Bag X11205 Nelspruit 1200	Tel: 013 766 4229 Cell: 082 331 4533 Fax: 013 766 9424 Email: jbmbatha@mpg.gov.za
Dr. Johnson Jerry Mahlangu	Department of Health and Social Development	Private Bag X11285 Nelspruit	Tel: 013 766 3429/30/28 Fax: 013 766 3458 Email:

		1200	pauleckm@social.mpu.gov.za
Mr. David Dube	Department of Human Settlements	Private Bag X11328 Nelspruit 1200	Tel: 013 766 6233 Fax: 013 766 8430 Email: apohl@mpg.gov.za
Mr. Kgopana Mathew Mohlasedi	Department of Public Works, Roads and Transport	Private Bag X11310 Nelspruit 1200	Tel: 013 766 6978/9 Fax: 013 766 8471/67
Mr. M Mahunonyane	Department of Water Affairs, Mpumalanga Regional Office	Private Bag X11259 Nelspruit 1200	Tel: (013) 759 7310 Fax: (013) 759 7525 Email:MahunonyaneM@dwa.gov.za
Madi Moloto	Department of Water Affairs	Private Bag X10580 Bronkhorstspruit 1020	Tel: (013) 932 2061 Fax: (086) 6160 005 Cell: (082) 8874 332 mailto:MolotoM@dwa.gov.za
Mgolozeli Sinazo	Department of Water Affairs	Private Bag X10580 Bronkhorstspruit 1020	Tel: (013) 932 2061
Yolanda Segami	Vicktor Khanye Local Municipality	PO Box 6 Delmas Mpumalanga 2210	Tel: 013 665 6000 Email: envirohealth@delmasmunic.co.za
Mr. Sam Lekhuleni	Vicktor Khanye Local Municipality	PO Box 6 Delmas Mpumalanga 2210	Tel:013 665 6065 Cell: 072 834 3069 Fax: 013 665 6041 Email: envirohealth@delmasmunic.co.za
Mr. Phillip Hine	South African Heritage Resources Agency (SAHRA)	PO Box 4637 Cape Town 8000	Tel:021 462 4502 Fax: 021 462 4509 Email: phine@sahra.org.za
Mr. Tendo Ramagoma	National Heritage Council (NHC)	PO Box 74097 Lynnwood Ridge 0040	
Cllr. Diane Bath	Vicktor Khanye Local Municipality-Ward 8	PO Box 6 Delmas Mpumalanga 2210	
Mr T.C. Makola	Nkangala District Municipality	PO Box 437 Middelburg	Tel: 013 249 2000

		1050	
Ronél Risseeuw		PO Box 1089 Delmas 2210	Cell: 073 863 6418 Email: farming @hotmail.co.za
Mr. J. P. du Plessis		PO Box 562 Sundra 2200	Tel: 013 661 5051 Email: ersoftdrinks@absamail.co.za
K. Noeth		PO Box 759 Sundra 2200	Cell: 082 563 4818
Tony Rovani		PO Box 522 Sundra 2200	Tel: 013 661 2294, Cell: 082 893 5296 Email:Rovanit@vodamail.co.za
Mev. Johanna van Zyl		PO Box 74 Sundra 2200	Tel: 013 661 5047
Johan Ferreira		PO Box 654 Sundra 2200	Cell: 082 076 8713 Email: johferreira@deloitte.co.za
Marius Snyman		PO Box 211 Sundra 2200	Cell: 079 514 7383 Email: mc.snyman@vodamail.co.za
Cheryllee			Cell: 072 318 4439
B. Reinders		PO Box 232 Bedfortview 2008	Tel: 013 661 9000 Email: britzr@enviroserv.co.za
Elsabe and Jan Swanepoel		PO Box 369, Sundra 2200	Cell: 082 880 6999
Susan Muller		PO Box 731 Sundra 2200	Cell: 082 775 8692 Email: susanmullersa@yahoo.co.uk
Daan and Andri Duvenaghe		PO Box 194 Sundra 2200	Cell: 083 573 5046 Email: danresa@mweb.co.za
SM van Dyk		PO Box 64 Sundra 2200	Cell: 083 326 5432 Email: smboer@mweb.co.za
W D Emmett		PO Box 302 Sundra 2200	Cell: 083 298 7470

Shangoni sent registered letters to the Department and Organs of State containing a background information document (BID), map showing the location of the site, and a stakeholder registration form. The same letters were hand delivered to all adjacent land owners.

Figure 68 provides an example of the letters sent out to Departments, Organs of State and potential I&APs. Figure 69 to 71 provide proof that notification letters were sent to Departments, Organs of state and potential I&APs.

Table 16 provides a list of the I&APs who registered and were added to the database of I&APs during the PPP.

Table 16: Registered I&APs

Name	Farm/Association	Postal Address	Contact details
Diane Bath	Victor Khanye Local Municipality	PO Box 263 Sundra 2200	Cell: 082 571 5616 Fax: 086 271 8059 Email:dianeb@conteltech.co.za
Daan Duvenaghe		PO Box 194 Sundra 2200	083 573 5046 danresa@mweb.co.za
Jan Swanepoel		PO Box 369, Sundra 2200	Cell: 082 880 6999
Ms. Mahlasedi Mhlabane	Department of Education	Private Bag X11341 Nelspruit 1200	Tel:0800 203 116 Email: L.brits@education.mpu.gov.za

SHANGONI
Management Services (Pty) Ltd

PO Box 74726, Lynnwood Ridge, Pretoria, 0040
Block C8, Block@Nature, 472 Botterklapper Street
The Willows, 0080, Pretoria, South Africa
Tel: +27 (0) 12 807 7036
Fax: + 27 (0) 12 807 1014
www.shangoni.co.za
info@shangoni.co.za
Registration no: 2002/000002/07

20 January 2012

EIA Ref: 17/2/3 N-113
SMS Ref: AFG/sun/18-11-11

Attention: Adjacent Land Owner

APPLICATION FOR ENVIRONMENTAL AUTHORISATION: EXPANSION OF THE AFGRI POULTRY DAYBREAK (SUNDRA) ABATTOIR SITUATED ON THE REMAINING EXTENT OF PORTION 8 OF THE FARM MODDERFONTEIN 236 IR.

AFGRI Poultry (Pty) Ltd. has initiated a Basic Assessment Process to obtain Environmental Authorisation from the Mpumalanga Department of Economic Development, Environment and Tourism (MPDEDET) for the proposed expansion of their Daybreak (Sundra) abattoir situated on the remaining extent of Portion 8 of the farm Modderfontein 236 IR, Mpumalanga.

The proposed abattoir expansion project will require environmental authorisation subject to a Basic Assessment Process as required by Sections 21 to 25 of Government Notice R 543 of the EIA Regulations of 18 June 2010.

Shangoni Management Services (Pty) Ltd. was appointed as the Independent Environmental Assessment Practitioner (EAP) responsible for the Basic Assessment Procedure.

Attached please find a background information document, map of the site and a stakeholder registration form in respect of the application. Your written comments on this expansion project will be appreciated. In order to process your inputs, all written comments must reach our offices by **20 FEBRUARY 2012**. In the event of you not wishing to comment on this application, it will be appreciated if we could receive a written confirmation thereof to enable us to continue with the application.

Please do not hesitate to contact the undersigned should you require any additional information.

Contact Details: Shangoni Management Services
Miss Lizette Crous
E-mail: lizette@shangoni.co.za
Cell: 071 673 3355
Fax 2 E-mail: 086 643 5360
Fax: 012 807 1014
Online Participation: Go to www.shangoni.co.za and click on Public Participation.

Yours Faithfully,

Miss. Lizette Crous
Environmental Assessment Practitioner

DIRECTORS: R B Hayes • J Nel • J A van Rooy • C J Potgieter • H L De Villiers

Figure 68: Example of letter to adjacent land owner

List of REGISTERED LETTERS
Lys van GEREGISTREERDE BRIEWE
(with an insurance option/met 'n versekeringsopsie)

Full tracking and tracing/Volledige volg en spoor

Post Office

Name and address of sender: Lizette Crous
Naam en adres van afsender: PO Box 74726, Lynnwood Ridge, Pretoria, 0040

Enquiries/Navrae
Toll-free number
Tolvry nommer
0800 111 502

No	Name and address of addressee / Naam en adres van geadresseerde	Insured amount / Versekerde bedrag	Insurance fee / Verseke-ringsgeld	Postage / Posgeld	Service fee / Diensgeld	Affix Track and Trace customer copy / Plak Volg-en-Spoor-kliëntafskrif
1	Victor Khanye Local Municipality - Cllr. Bath PO Box 6, Delmas, 2210					REGISTERED LETTER (with a domestic insurance option) RD 622 627 796 ZA A BOOK COPY
2	Dep. of Health & Social Development - Dr. Johnson Mahlangu. P/Bag X 11285, Nelspruit, 1200					REGISTERED LETTER (with a domestic insurance option) RD 622 627 782 ZA A BOOK COPY
3	Dep. of Co-operative Governance & Traditional Affairs - Mr. David Mahlobo. P/Bag X 11304, Nelspruit, 1200					REGISTERED LETTER (with a domestic insurance option) RD 622 627 779 ZA A BOOK COPY
4	Dep. of Human Settlements - Mr David Dube P/Bag X 11328, Nelspruit, 1200					REGISTERED LETTER (with a domestic insurance option) RD 622 627 751 ZA A BOOK COPY
5	Dep. of Water Affairs - Mpumalanga Regional office - Mr. F. Matambo P/Bag X 11259, Nelspruit, 1200					REGISTERED LETTER (with a domestic insurance option) RD 622 627 765 ZA A BOOK COPY
6	Dep. of Safety, Security & Liaison - Mr. Isaiah Khoza P/Bag X 11269, Nelspruit, 1200					REGISTERED LETTER (with a domestic insurance option) RD 622 627 748 ZA A BOOK COPY
7	Dep. of Finance - M.J. Mbatha P/Bag X 11205, Nelspruit, 1200					REGISTERED LETTER (with a domestic insurance option) RD 622 627 734 ZA A BOOK COPY
8	Dep. of Public Works, Roads & Transport - Mr. Kgapana Mohlasedi. P/Bag X 11310, Nelspruit, 1200					REGISTERED LETTER (with a domestic insurance option) RD 622 627 717 ZA A BOOK COPY
9	SANRA - Mr. Phillip Hine PO Box 4637, Cape Town, 8000					REGISTERED LETTER (with a domestic insurance option) RD 622 627 725 ZA A BOOK COPY
10	Victor Khanye Local Municipality - Mr. Sam Lekhuleni PO Box 6, Delmas, 1200					REGISTERED LETTER (with a domestic insurance option) RD 622 627 703 ZA A BOOK COPY
	Total / Totaal	R	R	R	R	

Number of letters posted / Getal briewe gepos: 10

Signature of client / Handtekening van kliënt: Crous

Signature of accepting officer / Handtekening van aanneembeampte:

Date stamp: WILLOW WAY POST OFFICE 2011-12-07 0150

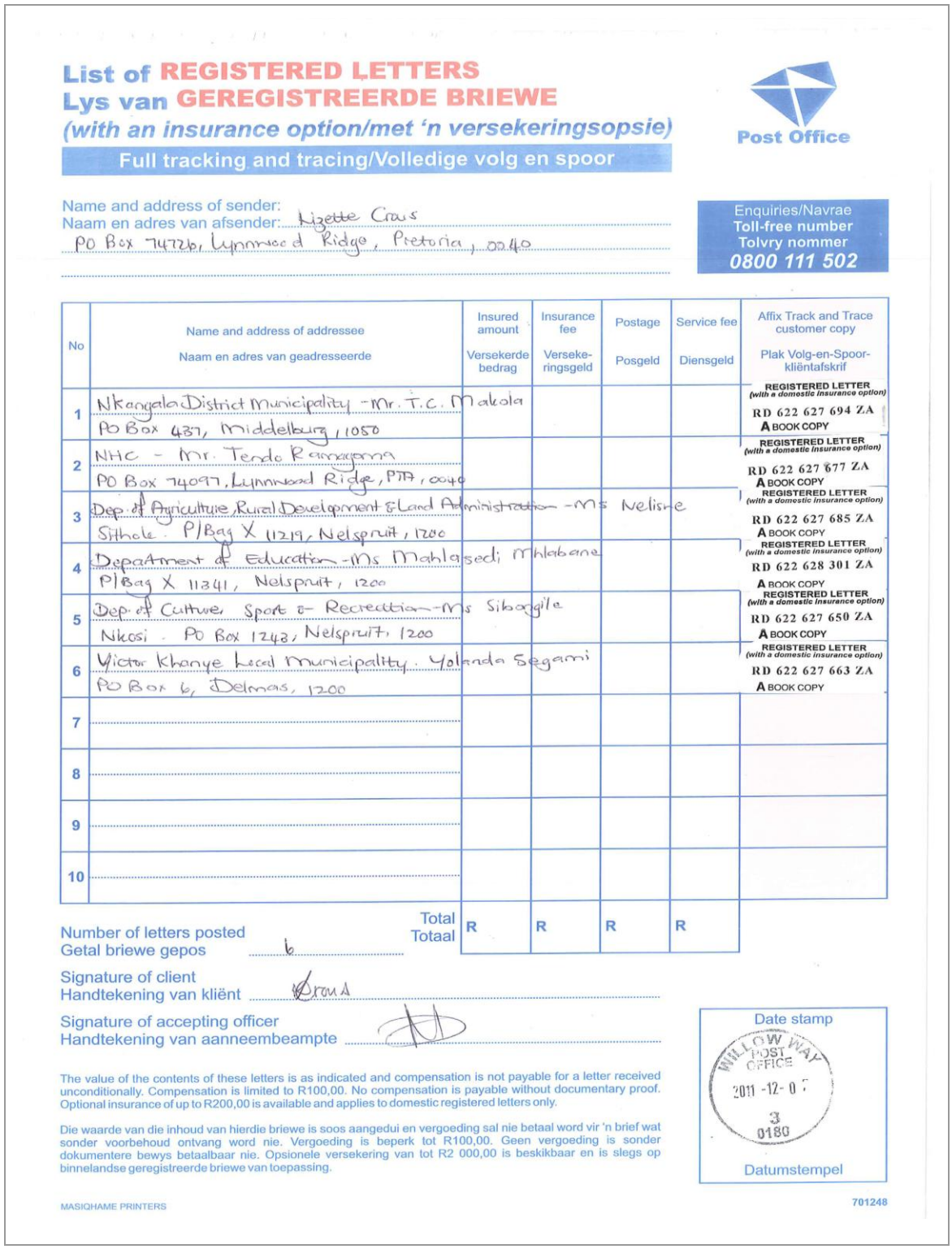
Datumstempel

The value of the contents of these letters is as indicated and compensation is not payable for a letter received unconditionally. Compensation is limited to R100,00. No compensation is payable without documentary proof. Optional insurance of up to R200,00 is available and applies to domestic registered letters only.

Die waarde van die inhoud van hierdie briewe is soos aangedui en vergoeding sal nie betaal word vir 'n brief wat sonder voorbehoud ontvang word nie. Vergoeding is beperk tot R100,00. Geen vergoeding is sonder dokumentere bewys betaalbaar nie. Opsionele versekering van tot R2 000,00 is beskikbaar en is slegs op binnelandse geregistreerde briewe van toepassing.

MASIQHAME PRINTERS 701248

Figure 69: Proof of registered letters sent (pg 1)



List of REGISTERED LETTERS
Lys van GEREGISTREERDE BRIEWE
(with an insurance option/met 'n versekeringsopsie)
Full tracking and tracing/Volledige volg en spoor

Post Office

Name and address of sender:
Naam en adres van afsender: Lizette Crous
PO Box 74726, Lynnwood Ridge, Pretoria, 0040

Enquiries/Navrae
Toll-free number
Tolvry nommer
0800 111 502

No	Name and address of addressee / Naam en adres van geadresseerde	Insured amount / Versekerde bedrag	Insurance fee / Verseke-ringsgeld	Postage / Posgeld	Service fee / Diensgeld	Affix Track and Trace customer copy / Plak Volg-en-Spoor-kliëntafskrif
1	Nkangala District Municipality - Mr. T.C. Makola PO Box 437, Middelburg, 1050					REGISTERED LETTER (with a domestic insurance option) RD 622 627 694 ZA A BOOK COPY
2	NHC - Mr. Tendo Ramaopana PO Box 74097, Lynnwood Ridge, PTA, 0040					REGISTERED LETTER (with a domestic insurance option) RD 622 627 677 ZA A BOOK COPY
3	Dep. of Agriculture, Rural Development & Land Administration - Ms Nelisiwe Sithole P/Bag X 11219, Nelspruit, 1200					REGISTERED LETTER (with a domestic insurance option) RD 622 627 685 ZA A BOOK COPY
4	Department of Education - Ms Mahlogedi Mhlabane P/Bag X 11341, Nelspruit, 1200					REGISTERED LETTER (with a domestic insurance option) RD 622 628 301 ZA A BOOK COPY
5	Dep. of Culture, Sport & Recreation - Ms Sibaqile Nkosi PO Box 1248, Nelspruit, 1200					REGISTERED LETTER (with a domestic insurance option) RD 622 627 650 ZA A BOOK COPY
6	Victor Khanye Local Municipality. Yolanda Segami PO Box 6, Delmas, 1200					REGISTERED LETTER (with a domestic insurance option) RD 622 627 663 ZA A BOOK COPY
7						
8						
9						
10						
	Total / Totaal	R	R	R	R	

Number of letters posted / Getal briewe gepos: 6

Signature of client / Handtekening van kliënt: [signature]

Signature of accepting officer / Handtekening van aanneembeampte: [signature]

Date stamp
WILLOW WAY POST OFFICE 2011 -12- 07 3 0180
Datumstempel

The value of the contents of these letters is as indicated and compensation is not payable for a letter received unconditionally. Compensation is limited to R100,00. No compensation is payable without documentary proof. Optional insurance of up to R200,00 is available and applies to domestic registered letters only.

Die waarde van die inhoud van hierdie briewe is soos aangedui en vergoeding sal nie betaal word vir 'n brief wat sonder voorbehoud ontvang word nie. Vergoeding is beperk tot R100,00. Geen vergoeding is sonder dokumentere bewys betaalbaar nie. Opsionele versekering van tot R2 000,00 is beskikbaar en is slegs op binnelandse geregistreerde briewe van toepassing.

MASIQHAME PRINTERS 701248

Figure 70: Proof of registered letters sent (pg 2)

List of REGISTERED LETTERS
Lys van GEREGISTREERDE BRIEWE
(with an insurance option/met 'n versekeringsopsie)

Post Office

Full tracking and tracing/Volledige volg en spoor

Name and address of sender:
Naam en adres van afsender: Lizelle Crous
PO Box 74726, Lynnwood Ridge, Pretoria, 0040

Enquiries/Navrae
Toll-free number
Tolvry nommer
0800 111 502

No	Name and address of addressee / Naam en adres van geadresseerde	Insured amount / Versekerde bedrag	Insurance fee / Versekeringsgeld	Postage / Posgeld	Service fee / Diensgeld	Affix Track and Trace customer copy / Plak Volg-en-Spoor-kliëntafskrif
1	Mr & Mrs Duvenage PO Box 194, Sundra, 2200					REGISTERED LETTER (with a domestic insurance option) RD 622 628 045 ZA A BOOK COPY
2	Mrs Susan Muller PO Box 731, Sundra, 2200					REGISTERED LETTER (with a domestic insurance option) RD 622 628 037 ZA A BOOK COPY
3	Mr. S.M. van Dyk PO Box 64, Sundra, 2200					REGISTERED LETTER (with a domestic insurance option) RD 622 628 054 ZA A BOOK COPY
4						
5						
6						
7						
8						
9						
10						
	Total / Totaal	R	R	R	R	

Number of letters posted / Getal briewe gepos: 3

Signature of client / Handtekening van kliënt: Braun

Signature of accepting officer / Handtekening van aanneembeampte:

Date stamp
HILLCROW POST OFFICE 2012-01-23
Datumstempel

The value of the contents of these letters is as indicated and compensation is not payable for a letter received unconditionally. Compensation is limited to R100,00. No compensation is payable without documentary proof. Optional insurance of up to R 2000,00 is available and applies to domestic registered letters only.

Die waarde van die inhoud van hierdie briewe is soos aangedui en vergoeding sal nie betaal word vir 'n brief wat sonder voorbehoud ontvang word nie. Vergoeding is beperk tot R100,00. Geen vergoeding is sonder dokumentêre bewys betaalbaar nie. Opsionele versekering van tot R2000.00 is beskikbaar en is slegs op binnelandse geregistreerde briewe van toepassing.

701248

RAND DATA FORMS 012 328 9300

Figure 71: Proof of registered letters sent (pg 3)

4.5.3 Comments and Response Report

Comments and concerns received from I&APs were incorporated into a Comments and Responses Report, which is given below as Table 17 and Appendix E.

Table 17: Comments and response report

Raised by:	Date	Issue / Comment / Concern	Response
Mrs Diane Bath	11-02-2012	1. Why has the bird life diminished at the daybreak dam? E.g.: Flamingos.	Scientific Aquatic Services conducted an aquatic ecological assessment of the three pans in the vicinity of Daybreak Chickens poultry processing facility. All bird species seen or heard during each survey were recorded. A total of 45 bird species were observed. 'None of the species recorded during the survey are of conservation concern. There is however several threatened species, which based upon South African Bird Atlas Project (SABAP) data, could potentially occur in the area. The fairly deep water in Pan 2 and the marshy grass area in Pan 3 are largely unsuitable for both Greater (near-threatened) and Lesser (near-threatened) Flamingo (*Phoenicopterus roseus* and *Phoenicopterus minor* respectively*)* and thus they are all unlikely to occur here. The shallow water areas of the Daybreak Pan, however, could provide a habitat for these two species, but considering the small extent of these areas and the overall ecological condition of the Daybreak Pan, this is considered unlikely.'
		2. Where and how will the chicken waste be disposed of and is there a license in place?	All waste from the abattoir is taken to the AFGRI Dryden rendering facility. We will verify whether a license is in place and if not, an application for a license will be submitted in the near future.
		3. Will the expansion create more jobs and if so will locals be employed?	The expansion will create more jobs and locals will be employed.
		4. How does the smell pollution get controlled?	Shangoni is currently busy with a Waste licence application for a new abattoir wastewater treatment plant for the AFGRI Daybreak (Sundra) abattoir. This new facility should treat the wastewater efficiently and decrease odours.
		5. What other community participation is there for the expansion project?	Land owners adjacent to the abattoir have been informed of the proposed expansion and the following Departments and Organs of State have also been informed: • South African Heritage Resources Agency (SAHRA) and National Heritage Council (NHC)Department of Agriculture, Rural Development and Land Administration • Department of Co-operative Governance and Traditional Affairs • Department of Water Affairs, Mpumalanga Regional Office • Nkangala District and Vicktor Khanye Local Municipality • Department of Public Works, Roads and Transport • Department of Health and Social Development • Department of Culture, Sport and Recreation • Department of Safety, Security and Liaison • Department of Human Settlements • Department of Education • Department of Finance
Mr. Daan Duvenage	28-02-2012	1. What are AFGRI's plans with all the water that is going to be pumped into their pan? The pan is already full to the point of overflowing and touches the electric fence that has been placed around the private residence for safety. The water also pushes up into the livestock camp within which the livestock walk daily.	The following is being proposed at Daybreak with regards to their wastewater: A wastewater treatment plant consisting of an integrated ponding and wetland system is being proposed for the AFGRI Daybreak abattoir. It is proposed that between 40 and 60% of the treated water will be re-used at the abattoir. A waste management license application will be submitted in due course to the National Department of Environmental
		2. When the abattoir is expanded to slaughter more chickens, the water use will	

		also increase and the pan's capacity will not be able to handle it. 3. Please provide us with a feasible solution to this problem.	Affairs for this proposed wastewater treatment plant.
Mr. Jan Swanepoel	23-03-2012	I am staying on the corner of Eight street and Modderfontein road for the last 26 years and I am driving past Daybreak at least twice a day. Since the upgrade to the facility we have seen quite a deterioration of the environment. **Groundwater** Huge quantities of groundwater are pumped from bore holes on the premises of Daybreak and it is affecting other boreholes in the area. My bore hole was badly affected and I have now substantial less water than a few years ago. The proposed huge increase in activities will definitely result in a substantial increase in usage of underground water which will have a devastating effect on the underground water availability for all the property owners in the surrounding area. Even at the present levels of extraction of underground water, there are already signs that the water supply is deteriorating. If substantial more water is used, the effect could be devastating.	At present, 700 000 chickens are slaughtered at the AFGRI Daybreak abattoir per week. This requires approximately 8 400m³ of water. Should the proposed expansion of the abattoir be authorised, 1 500 000 chickens will be slaughtered per week. This would mean that approximately 18 000m^3 of water would be required per week. The abattoir is however also proposing the construction of an abattoir wastewater treatment works which will treat all of the wastewater generated at the abattoir to a quality that will comply with the Department of Water Affairs' standards for discharging water into a natural water resource. Once the wastewater is treated, between 40 and 60% of the water can be re-used at the abattoir. This means that the abattoir will require 7 000 to 10 500m³ less water per week. If the AFGRI Poultry Daybreak abattoir was to be expanded, the total volume of groundwater abstracted will increase, however the volume of water used per chicken will be less due to better economies of scale. Water that cannot be re-used at the abattoir due to salinity levels will be available for irrigation of crops or will be discharged into the Daybreak pan. The water quality of the Daybreak pan will be significantly improved by the treated water discharged into it, allowing the pan to rehabilitate itself over time. This will not only improve the water quality of the surrounding pans together but also the environment in the region of the Northern border of the pan. The re-use and irrigation of treated water will reduce the burden on the immediate groundwater system. The treated water will be made available to neighbouring farmers who would then not need to abstract as much groundwater to irrigate their crops. There is regional concern over sinkhole formation from over-abstraction in the area. The total reduction in groundwater usage which should result would have a positive impact as it will allow groundwater to recover, reducing the risk of sinkhole formation. The DWAF classifies the Vryheid Formation as a type d2 aquifer which typically yields between 0.1 and 0.5 L/s and is inter-granular and fractured. The Malmani Subgroup is classified as type c5 aquifer which is karst and typically yields in excess of 5 L/s. Groundwater, from the three boreholes, is abstracted from the deeper dolomite karst aquifer (van Bart A., 2010). Presently, 700 000 chickens are slaughtered at the AFGRI Daybreak abattoir per week.

			The abattoir uses approximately 12l per Chicken, thus using approximately 1.2 Ml of water per day, which equates to 13.9 l/s. Each borehole thus abstracts groundwater at a rate of 4.6 l/s. Based on the aquifer classification map of DWAF, boreholes in this aquifer yield in excess of 5 l/s thus suggesting that abstraction is currently in line with predetermined sustainable yields (van Bart A., 2010). 700 000 chickens/week x 12 l/chicken = 8 400 000 l/week = 8 400 000 l/week ÷ 7days/week .= 1.2Ml/day ÷ 86 400 s/day .=13.9 l/s 13.9 l/s ÷ 3 boreholes = 4.6 l/s/borehole If the AFGRI Poultry Daybreak abattoir were to be expanded, the total volume of groundwater abstracted will increase, however the volume of water used per chicken will be less (11l/Chicken) due to better economies of scale. Should the proposed expansion of the abattoir be authorised, 1 500 000 chickens will be slaughtered per week. This would mean that approximately 16 500m^3 of water would be required per week (± 2.4 Ml/day = ± 27.3 l/s). 1 500 000 chickens/week x 11 l/chicken = 16 500 000 l/week = 16 500 000 l/week ÷ 7days/week .= 2.4Ml/day ÷ 86 400 s/day .=27.3 l/s 27.3 l/s ÷ 3 boreholes = 9.1 l/s/borehole The construction of the abattoir wastewater treatment works which will treat all of the wastewater generated at the abattoir to a quality that will comply with the Department of Water Affairs' standards for discharging water into a natural water resource. Once the wastewater is treated, between 40 and 60% of the water can be re-used at the abattoir. Each borehole will thus abstract groundwater at a rate of 3.3 l/s to 5.2 l/s. Since the aquifer yield is in excess of 5 l/s, the abstraction is currently in line with predetermined sustainable yields.

			16 500 000 l/week = 16 500 m³/week = 2 357 m³/day required in the abattoir. The waste treatment plant will treat up to 2 500 m³/day, of which 40 – 60 % will be re-used. 2 500 m³ x 40% = 1 000 m³ 2 500 m³ x 60% = 1 500 m³ Therefore 1 000 m³ to 1 500 m³ of treated wastewater will be re-used per day, which means only 857 to 1 357 m³/day will be abstracted from the three boreholes. 857 to 1 357 m³/day = 857 000 l/day to 1 357 000 l/day = 9.9 l/s to 15.7 l/s 9.9 l/s to 15.7 l/s ÷ 3 boreholes = 3.3 l/s to 5.2 l/s
		Daybreak Pan The Daybreak Pan is already an environmental disaster. The quality of water is visibly deteriorating. Green algae are now always visible and the water really smells foul. Bird life around the Daybreak pan is already severely affected. In the past, large numbers of flamingos was a common sight, but lately it is a rare occurrence to see a single flamingo. The water level of the pan is constantly increasing and it is already very close to the adjacent main road. Any increase in flow to the pan could present a major disaster. The current level of water pollution is totally unacceptable and it poses a major health risk to people living in the vicinity. The activities of AFGRI/Daybreak should actually be scaled down instead of a dramatic increase. Every additional litre of water that will be used will eventually end up in the pan that is already under immense pressure.	The AFGRI Poultry Daybreak abattoir will reach its production limit if the proposed expansion was to occur. In order to operate sustainably, the abattoir cannot afford to put more pressure on its surrounding environment. Therefore, a second abattoir was purchased in the area where scope exists for future expansions and developments. Currently, groundwater is abstracted for use in the slaughtering process and the contaminated water is then discharged into the Daybreak pan. In future, wastewater from the abattoir will be treated by the proposed AFGRI Poultry Daybreak wastewater treatment works. 40-60% of the treated water will be re-used in the abattoir. The remaining water will then either be used for irrigational purposes or it will be discharged into the Daybreak pan. The volume of water discharged into the Daybreak pan should be less due to the re-use of water in the abattoir and the irrigation of crop fields using the treated water. The water quality of the Daybreak pan should be significantly improved through the clean water (the treated wastewater) that will be discharged into it. This will allow the pan to rehabilitate itself over time.
		Air pollution Air pollution is quite a regular occurrence at the plant. The processes employed are using hazardous chemical and frequent spillage of these chemicals, do occur. Large quantities of ammoniac gasses were released in the atmosphere in the past which can have devastating effects on humans in the surrounding areas. The air is also frequently polluted with odours that can be detected far from the site.	The AFGRI Poultry Daybreak abattoir has strict Health and Safety management systems and waste management procedures. These procedures ensure the proper handling, storage and disposal of Hazardous Chemicals and Waste. The management systems should ensure that ammonium gases are not released into the atmosphere. The proposed wastewater treatment works will decrease the accumulation of wastewater and as a result should decrease the odours released from the wastewater.
		Noise Pollution The facility is also responsible for severe noise pollution. Their operation is quite noisy and when the electricity supply is down, huge diesel generators are used that can be heard kilometres away. Power failures are a common occurrence on Sundra and	In the event of a power failure, the same working hours will apply for power generators as for electricity. Mitigation measures for the noise generated by generators will be investigated. Alternative

		therefore noise pollution is already a problem. Any increase in activity will lead to an increase in noise pollution.	technologies, running times and the possibility of enclosing noise producing machines within buildings will be investigated. The site workers and contractors will adhere to the requirements of the Occupational Health and Safety Act, 1993 (Act 85 of 1993). The following are actions that will aid in mitigating the noise produced during the construction and operational phases of this project: (Please refer to the Environmental Management Plan in the draft Basic Assessment Report for the AFGRI Poultry Daybreak abattoir expansion (REF: 17/2/3 N-113) and the quantitative risk assessment in the AFGRI Poultry Daybreak IWULA (REF: 12/9/11/L832/6), both of which will be distributed in due course.) **Construction Phase** All plant and machinery are to be fitted with adequate silencers and regular maintenance of vehicles and equipment. Working hours should be restricted to daylight hours. Working procedures should be structured so as to avoid the unnecessary generation of noise. No sound amplification equipment such as sirens, loud hailers or hooters are to be used on site except in emergencies and no amplified music is permitted on site. If work is to be undertaken outside of normal work hours permission must be obtained from the ECO and the abattoir manager. No noisy work is to be conducted over the weekends or on religious public holidays. **Operational Phase** Ensure that machinery on site is in proper working condition, fitted with the necessary silencing equipment. Make sure that the workers on site stick to the prescribed working hours. Maintain a dB reading of less than 50dB at the site boundary. Keep equipment in good repair and attend to loose or rattling covers, worn bearings and broken equipment.
		General The track record of this facility to manage the water quality of the pan and the environment is very poor and any expansion of the facility should not be allowed and the current activities should actually be scaled down.	AFGRI Poultry Daybreak is obligated to undertake a habitat assessment study once a year for three years to ensure that the rehabilitation of the Daybreak pan is stable, failing which, corrective action must be taken to rectify any impacts. (Refer to the GN 1199 General Authorisations, dated 18 December 2009, in terms of Section 39 of the NWA, 1998 (Act 36 of 1998): **(9) Monitoring and reporting**)
Department of Education.	20-04-2012	Correspondence on the aforementioned instance refers.	Comments Noted

Mrs. M.O.C. Mhlabane		The Department of Education has no objection regarding the extension of the Daybreak (Sundra) abattoir. It is hoped that you find this in order.	

4.5.4 Registering Stakeholders

All key stakeholders were registered and will receive this draft Basic Assessment Report.

4.5.5 Press Notices

In accordance with the National Environmental Management Act (NEMA) 1998, (Act No. 107 of 1998), a notice was placed in the Beeld newspaper, on the 7th of December 2011. The press notice is shown below as Figure 72 and Figure 73.

Press notices are crucial to create awareness of the project and to reach a broader range of I&APs.

NOTICE OF APPLICATION FOR ENVIRONMENTAL AUTHORIZATION

Notice is hereby given that an application for environmental authorization in terms of the EIA Regulations of 2010 (Regulations in terms of Chapter 5 of the National Environmental Management Act of 1998, as amended) has been lodged with the Mpumalanga Department of Economic Development, Environment and Tourism (DEDET). The activity requires an application subject to a Basic Assessment Process as required by Sections 21 to 25 of Government Notice R. 543 of the EIA Regulations.

EIA Ref. Number: 17/2/3 N-113

Applicant: AFGRI Poultry (Pty) Ltd.

Project Name: Expansion of the AFGRI Sundra abattoir situated on the remaining extent of Portion 8 of the farm Modderfontein 236 IR, Mpumalanga.

Project Location: The remaining extent of Portion 8 of the farm Modderfontein 236 IR.

Project Description: The proposed expansion project will entail the following:

- The expansion of the AFGRI Daybreak (Sundra) abattoir to accommodate the processing of 1.5 (one and a half) million chickens per week.

Activities applied for: EIA Regulations Listing Notice 1 of 2010 (R544), Activity No. 30:

The expansion of facilities for the slaughter of animals where the daily product throughput will be increased by more than:

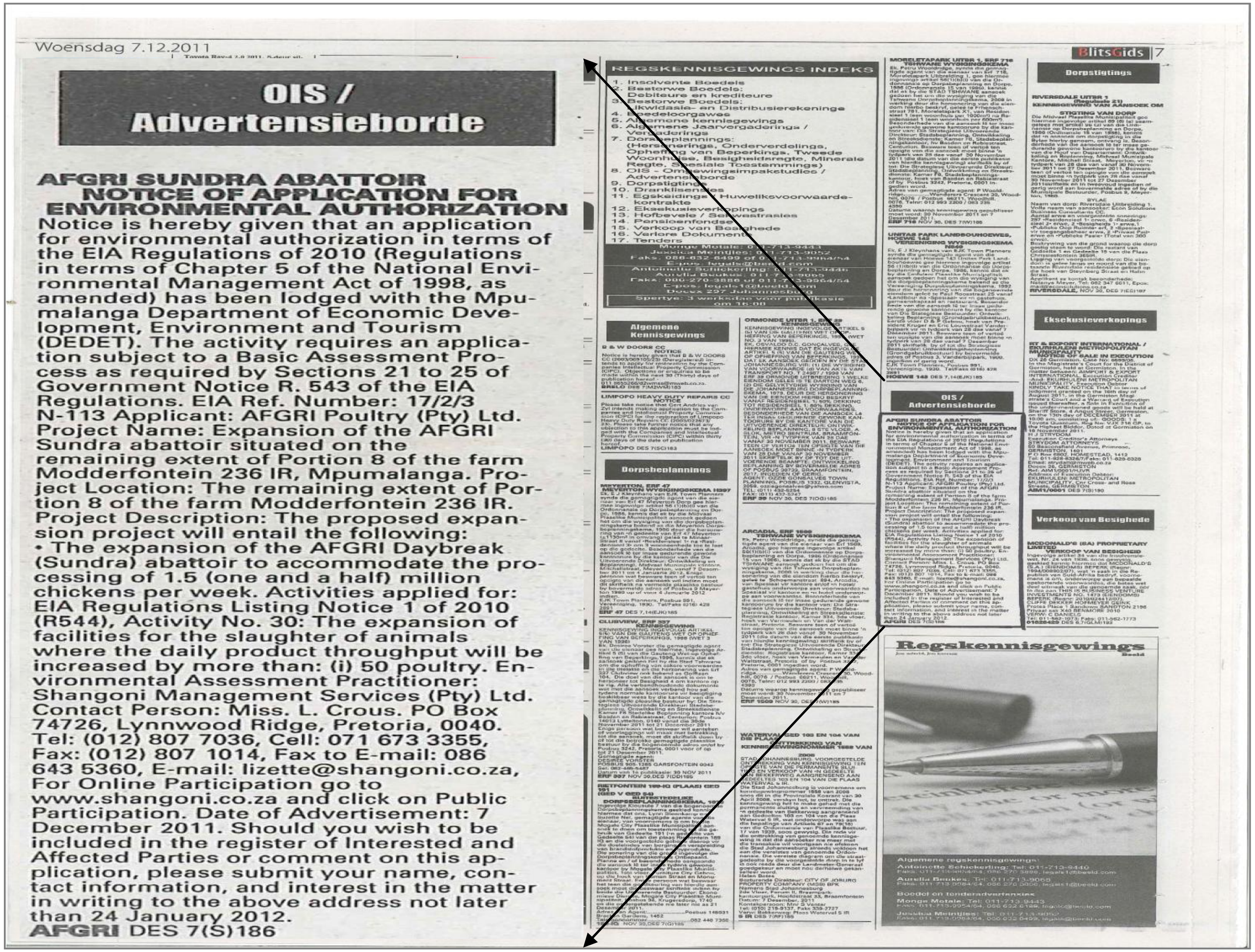
(i) 50 poultry.

Environmental Assessment Practitioner:
Shangoni Management Services (Pty) Ltd.
Contact Person: Miss. L. Crous.
PO Box 74726,
Lynnwood Ridge,
Pretoria,
0040.

Tel: (012) 807 7036,
Cell: 071 673 3355,
Fax: (012) 807 1014,
Fax to E-mail: 086 643 5360,
E-mail: lizette@shangoni.co.za, For Online Participation go to www.shangoni.co.za and click on Public Participation.

Date of Advertisement: 7 December 2011.
Should you wish to be included in the register of Interested and Affected Parties or comment on this application, please submit your name, contact information, and interest in the matter **in writing** to the above address not later than 24 January 2012.

Figure 72: Wording of site notice


Woensdag 7.12.2011

OIS / Advertensieborde

AFGRI SUNDRA ABATTOIR
NOTICE OF APPLICATION FOR ENVIRONMENTAL AUTHORIZATION

Notice is hereby given that an application for environmental authorization in terms of the EIA Regulations of 2010 (Regulations in terms of Chapter 5 of the National Environmental Management Act of 1998, as amended) has been lodged with the Mpumalanga Department of Economic Development, Environment and Tourism (DEDET). The activity requires an application subject to a Basic Assessment Process as required by Sections 21 to 25 of Government Notice R. 543 of the EIA Regulations. EIA Ref. Number: 17/2/3 N-113 Applicant: AFGRI Poultry (Pty) Ltd. Project Name: Expansion of the AFGRI Sundra abattoir situated on the remaining extent of Portion 8 of the farm Modderfontein 236 IR, Mpumalanga. Project Location: The remaining extent of Portion 8 of the farm Modderfontein 236 IR. Project Description: The proposed expansion project will entail the following:

• The expansion of the AFGRI Daybreak (Sundra) abattoir to accommodate the processing of 1.5 (one and a half) million chickens per week. Activities applied for: EIA Regulations Listing Notice 1 of 2010 (R544), Activity No. 30: The expansion of facilities for the slaughter of animals where the daily product throughput will be increased by more than: (i) 50 poultry. Environmental Assessment Practitioner: Shangoni Management Services (Pty) Ltd. Contact Person: Miss. L. Crous. PO Box 74726, Lynnwood Ridge, Pretoria, 0040. Tel: (012) 807 7036, Cell: 071 673 3355, Fax: (012) 807 1014, Fax to E-mail: 086 643 5360, E-mail: lizette@shangoni.co.za, For Online Participation go to www.shangoni.co.za and click on Public Participation. Date of Advertisement: 7 December 2011. Should you wish to be included in the register of Interested and Affected Parties or comment on this application, please submit your name, contact information, and interest in the matter in writing to the above address not later than 24 January 2012.

AFGRI DES 7(S)186

Figure 73: Proof of newspaper advertisement

4.5.6 Placement of Public Notices

The site notices (A2) were placed on the perimeter fence surrounding the AFGRI Daybreak (Sundra) abattoir (as shown in Figure 72 to Figure 76).

Figure 74: Photograph of first site notice.

Figure 75: Photograph of first site notice (zoomed).

Figure 76: Photograph of the second site notice.

Figure 77: Photograph of third site notice.

Figure 78: Photograph of fourth site notice.

4.5.7 Issuing I&APs and Stakeholders with a Draft BAR

This draft Basic Assessment Report (hereafter referred to as the dBAR) will be sent to all Departments and Organs of State as well as all registered I&APs in order to obtain their comments and notices. The report will also be submitted to the Mpumalanga Department of Economic Development, Environment and Tourism for review.

4.5.8 Conclusions of the Public Participation Exercise

In conclusion, the Public Participation exercise has provided adequate information to enable an understanding of what the proposed abattoir expansion project would entail and also to address the concerns and comments of this Basic Assessment.

5. NEED AND DESIRABILITY FOR THE ACTIVITY

A need and desirability for this project is evident from the following perspectives:

5.1 Developer

The proposed project entails the expansion of the AFGRI Poultry Daybreak (Sundra) abattoir so that the processing capacity can be increased to 1.5 (one and a half) million chickens per week. The daybreak abattoir expansion will focus on IQF production, to achieve as low as possible unit costs. The decrease production cost will inevitably lead to an increase in profits.

5.2 Local Community

The proposed project will create employment oppertunities for unskilled laborers during the construction phase. The operation currently employs 800 workers and will have 860 employees after expansion. The creation of jobs will have a positive impact on the local community.

The local economy will also be stimulated through the construction phase where building materials would need to be supplied.

5.3 District and Provincial Benefit

To reach the production target of 1.5 million chickens per week, the number of chickens supplied to the abattoir would need to increase. This means that either existing suppliers (broiler farms) would need to increase their production capacities (expand) or that new suppliers must be sourced. The net result would be the stimulation of a targeted agricultural sector in the Western region of Mpumalanga.

The planned capital investment during the development phase will be 150.9 million Rand. At district level, the construction industry and building suppliers would also be stimulated for a short time during the construction phase.

6. IDENTIFIED ALTERNATIVES

Typically, alternative assessments are conducted to assist in comparing various projects or attributes of projects that will occur. The most critical comparison is evaluating any proposed project against the No-Go option. The alternatives assessment then considers alternatives to project site selection for the proposed development; alternatives to layout of the development; and alternatives to construction methodologies and / or materials used for the development.

The alternatives assessment was conducted using a simple cost-benefit analysis of each proposed alternative, through assessing various environmental attributes. These attributes can include physical (geology and soils, surface water quality and quantity, groundwater quality and quantity); biophysical (flora and fauna, sensitive environments); and social (site of archaeological or cultural importance, land use issues, social health and welfare).

The impact of the each alternative was then evaluated in terms of whether it has a positive, negative, or no impact. In this instance, the impact is not evaluated in terms of significance but rather whether or not it will arise. Positive impacts are assigned a value of 1; no impact a value of 0; and a negative impact a value of -1.

By adding all of the attribute scores for each alternative, a suitability score is derived which indicates the preferred alternative. A total positive score indicates the project benefits outweigh the potential negative impacts, while a total negative score indicates the project environmental costs outweigh the potential benefits. Essentially, the highest scoring alternative is then carried forward for full impact evaluation.

6.1 No-Go Option

The potential impact of the preferred project option on environmental and socio-economic attributes – identified during the assessment phase – is evaluated against the potential impact of the no-go option on the same attributes. The summary of this assessment is provided in Table 18 hereafter.

Table 18: Development vs. No-Go Option

Attribute	Development Option	No-go Option 2
Physical environment		
Air Pollution	-1	-1
Noise Pollution	-1	-1
Water Quality	-1	-1
Water Quantity	-1	-1
Visual Aesthetics	0	0
Biophysical environment		
Fauna and Flora	0	0
Sensitive Environments	0	0
Social environment		
Traffic	-1	-1
Impact on property values	1	0
Safety and security	0	0
National and regional economy	1	0
Infrastructure development	0	0
Total	-3	-5

The no-go alternative means that the abattoir is not expanded and will not benefit from a higher processing rate.

The negative environmental impacts expected by the proposed development can be mitigated to acceptable limits. The positive social impacts outweigh the negative impacts and the consideration of the “no-go” option can be justifiably dismissed as a sustainable alternative.

6.2 Alternatives to Site Selection

Firstly, it must be stated that the proposed development aims at utilizing the applied property to its full economic potential, taking the natural as well as socio-economic environment into consideration.

As the proposed activity is the expansion of an existing facility, no site alternatives have been considered.

6.3 Construction Alternatives:

6.3.1 Alternative Design

As the proposed activity is the expansion of an existing abattoir, the expansion will have the same design as the existing facility.

6.3.2 Activity Alternatives

No activity alternatives exist as the abattoir activities will merely be expanded.

6.3.3 Location Alternatives

No location alternatives have been considered as the proposed development is the expansion of an existing facility.

6.3.4 Process Alternatives

No process alternatives exist as the proposed development is the expansion of an existing facility with processes already in place.

6.3.5 Scheduling Alternatives

It is recommended that construction take place during the drier months to avoid any complications in wet weather. No detailed information regarding the proposed time frame for the project is available yet, however it is anticipated that construction will start as soon as possible after all the necessary approvals have been obtained.

6.3.6 Input Alternatives

Chickens are the main input at a chicken abattoir and therefore no input alternatives can be considered.

7. ENVIRONMENTAL IMPACT ASSESSMENT

All activities that are related to the proposed expansion of the abattoir that could have some impact on the environment were identified. These impacts can be of environmental, socio-economic or cultural nature. Impacts are often not only confined within the direct scope of the proposed activity and can accumulate as a network of indirect impacts on the surrounding area.

Different impacts are associated with the construction and operational phases of the proposed activity. The significance will be determined by both the extent and duration of the impact. The environmental risk of any aspect is determined by a combination of parameters associated with the impact. Each parameter connects the physical characteristics of an impact to a quantifiable value to rate the environmental risk. A description of the parameters used in this impact assessment is listed in Table 19 below.

Table 19: Environmental impact assessment parameters

Parameters	Description
Extent	Refers to the physical or geographical size that is affected by the impact. It can be categorised into the following ranges: • Onsite – Within specific site boundary (weight value – 1) • Local – Within municipal boundary (weight value – 2) • Regional – Outside municipal boundary (weight value – 3)
Duration	Time span associated with impact: • Short term – 1 Year or less (weight value – 1) • Medium term – 1-5 Years (weight value –2) • Long term – Longer than 5 Years (weight value – 3)
Intensity and reversibility	The severity of an impact on the receiving environment: • Low – Natural and/or cultural processes continue in a modified way and is reversible (weight value – 1) • Medium – Natural and/or cultural processes stop and is partially reversible (weight value – 2) • High – Natural and/or cultural processes disturbed to an irreversible state (weight value – 3)
Significance of Impact / Consequence	Adding the extent, duration and intensity together provides the significance of the impact (High, Medium or Low). **Extent + Duration + Intensity = High/Medium/Low Impact**
Probability	The likelihood of an impact occurring: • Unlikely – 0% - 45% chance of the potential impact occurring (weight value – 1) • Possible – 46% - 75% chance of the potential impact occurring (weight value – 2) • Likely - >75% chance of the potential impact occurring (weight value – 3)
Environmental Risk Refer to 20 below	Multiplication of the significance of the impact by the probability of the impact occurring produces a final conclusion of the overall risk that an impact poses to the surrounding environment. **High/Medium/Low Impact X Probability = High/Medium/Low Environmental Risk**

Table 20: Environmental Risk Matrix

Significance of Impact				
		Low Impact (3 → 5)	Medium Impact (6 → 8)	High Impact (9)
Probability	Definite / Very Likely 3	9 - 15 L - M	18 - 24 M - H	27 H
	Possible 2	6 - 10 L - M	12 – 16 M	18 M - H
	Unlikely 1	3 - 5 L	6 – 8 L	9 L

ENVIRONMENTAL RISK	**Guidelines for Control Strategies**
(H) - High	Proactively reduce risk level, short term response.
(M- H) Medium to High	Proactively reduce risk level, short term response.
(M) – Medium	Management strategies to reduce risk level, short to medium term response.
(L – M) Low to Medium	Management strategies to reduce risk level, short to medium term response, operational control and housekeeping.
(L) - Low	Operational control and housekeeping.

See tables below for a summary of impacts, their associative mitigating actions and the significance of the pre- and post- mitigation of each of the identified activities. The tables also provide an environmental risk assessment of pre- and post- mitigation of identified activities. The tables are for Construction- and Operational- phases of the proposed project.

7.1 Construction Phase

Table 21: Environmental risk assessment: Construction activities

Activity: Construction activities required to expand the abattoir.	
Nature of Environmental Impact: Potential harm to the environment due to workers or contractors being unaware of how their activities may impact the environment or due to unauthorised access to the site.	
Before Mitigation	
Extent of the Impact	2
Duration of the Impact	1
Intensity of the Impact	2
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**5**
Probability	2
Environmental Risk = Significance of Impact X Probability	**10**
Objective of Mitigation Measures	
To prevent harm to the environment through the actions of uneducated workers or contractors.	
Proposed Mitigation	
• The contractor is to ensure that all employees, including sub-contractors and their employees, are required to attend on-site Environmental Awareness Training prior to commencing work on site. • Follow-up Environmental Awareness Training may be required from time to time as new subcontractors or crews commence work or for specific activities that may potentially impact the environment, or if work is being undertaken in sensitive environments. • The contractor is to maintain accurate records of any training undertaken. • Training is to cover all aspects of the EMP, procedures to be followed, the sensitivity of the site and importance of adhering to “no-go” areas. • The ECO shall monitor the contractor’s compliance with the requirement to provide sufficient environmental awareness training to all site staff. • Environmental signage is to be displayed on the site including – “no smoking”, “fire hazards”, etc. • Emergency numbers are to be clearly displayed. • All construction workers shall be issued with ID badges and clearly identifiable uniforms. • All construction workers shall be transported to and from site on a daily basis. • Workers shall remain on the site at all times during the work day and no one will be allowed to leave site by foot, not even during break times. • Night watchmen are to be provided with adequate cooking and heating facilities (no open fires), a suitable method of disposing of wastewater, and access to communication equipment. • Access to fuel and other equipment stores is to be strictly controlled.	
After Mitigation	
Extent of the Impact	1
Duration of the Impact	1
Intensity of the Impact	1
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**3**
Probability	1
Environmental Risk = Significance of Impact X Probability	**3**

Table 22: Environmental risk assessment: Site clearance

Activity: Clearance of site and other construction activities.	
Nature of Environmental Impact: Loss of degraded vegetation during site clearance; Potential disturbance of natural vegetation on No-Go Areas.	
Before Mitigation	
Extent of the Impact	1
Duration of the Impact	1
Intensity of the Impact	2
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**4**
Probability	2
Environmental Risk = Significance of Impact X Probability	**8**
Objective of Mitigation Measures	
To minimise the loss of degraded vegetation or disturbance of natural vegetation during site clearance.	
Proposed Mitigation	
• All reasonable measures should be taken to ensure- ➢ The stability of the watercourse (Daybreak Pan) is not detrimentally affected by impeding or diverting the flow; ➢ Scouring, erosion or sedimentation of the watercourse (Daybreak Pan) is prevented; and ➢ Rehabilitation of the watercourse (Daybreak Pan), including riparian and instream habitat, is undertaken after any impedance or diversion of flow. • Acceptable construction, maintenance and operational practices are to be followed to ensure consistent, effective and sustainable impedance or diversion flow. • Before any construction takes place the proposed area for the abattoir expansion will be pegged out. All construction activities will be limited to these areas in order to reduce the footprint of the proposed activity and avoid impact on adjacent natural vegetation and animal life. • Effective planning of the construction operations. • Construction areas should be fenced off or barricaded prior to and during construction. • Site clearing is to be limited to only the area necessary for carrying out the specified works. • Significant indigenous trees and landscaped areas to be retained are to be clearly demarcated as “no-go” areas prior to earthworks commencing and are to be protected as such for the duration of the construction phase. • The contractor is to draw up a plan for submission to the ECO and the abattoir manager indicating the locations of construction infrastructure including the site-camp, paint or cement cleaning pits, toilets, stores, site office, and “no-go” areas. • The minimum standard to fencing of “no-go” areas is 2 strands of wire 500mm apart on droppers of 3m spacing, with danger tape zigzagged between the wires. • The site boundary is to be clearly demarcated and screened from the commencement of works. The erection of the final boundary fence or wall is preferable. • All demarcation is to be regularly maintained. • All sensitive environments or “no-go” areas are to be demarcated with a wire and danger-tape temporary barrier fence attached to planted posts (wooden or metal) at a minimum. • No unauthorised entry, stockpiling, dumping or storage of equipment in “no-go” areas, or outside the site boundary is permitted. • All construction activities, plant, labour and materials are to be restricted within the site boundary. • Should the only means of completing specified work be to enter “no-go” areas, authorisation must be provided in writing by the ECO. • All trees and natural features to be retained and protected are to be indicated on the site plan and demarcated. Demarcation is to remain in place for the duration of the work on site.	

• Search and rescue (if necessary) is to take place prior to commencement of work on site. • Removal of vegetation is to be avoided until such time as soil stripping is required. • Should construction in areas that have been stripped not commence within a short period of time the exposed areas shall be re-vegetated or stabilised. Soil stabilising measures could include rotovating in straw bales (at a rate of 1 bale/20m²), applying mulching or brush packing, or creating windbreaks using brush or bales. • Disturbed areas should be rehabilitated once the construction activities have ended.	
After Mitigation	
Extent of the Impact	1
Duration of the Impact	1
Intensity of the Impact	1
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**3**
Probability	1
Environmental Risk = Significance of Impact X Probability	**3**

Table 23: Environmental risk assessment: Impact on watercourse

Activity: Impeding or diverting the flow of water in the Daybreak Pan. Altering the bed, banks, course or characteristics of the Daybreak Pan.	
Nature of Environmental Impact: Potential change to the hydrology, water quality, biota, in- stream and riparian habitat of the Daybreak pan.	
Before Mitigation	
Extent of the Impact	1
Duration of the Impact	1
Intensity of the Impact	2
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**4**
Probability	2
Environmental Risk = Significance of Impact X Probability	**8**
Objective of Mitigation Measures	
To prevent or minimise the potential impeding or diverting of the flow of water in the Daybreak Pan. To prevent or minimise the potential altering of the bed, banks, course or characteristics of the Daybreak Pan.	
Proposed Mitigation	
• All reasonable measures should be taken to ensure- ➢ The stability of the watercourse (Daybreak Pan) is not detrimentally affected by impeding or diverting the flow; ➢ Scouring, erosion or sedimentation of the watercourse (Daybreak Pan) is prevented; and ➢ Rehabilitation of the watercourse (Daybreak Pan), including riparian and in stream habitat, is undertaken after any impedance or diversion of flow. • Acceptable construction, maintenance and operational practices are to be followed to ensure consistent, effective and sustainable impedance or diversion flow. • Structures and hardened surfaces associated with the construction may not be erosive; be structurally unstable, induce any flooding; or be a health and safety hazard • Prevent potential, measurable or cumulative detrimental: ➢ change in the stability of a watercourse; ➢ change in the physical structure of a watercourse; ➢ scouring, erosion or sedimentation of a watercourse; or ➢ decline in the diversity of communities and composition of the natural, endemic vegetation;	

➢ change in the quantity, velocity, pattern, timing, water level and assurance of flow in a watercourse. • Because of the close proximity of the wastewater treatment works and the abattoir to the Daybreak pan, AFGRI Daybreak must ensure that the water use is not detrimental to the health and safety of the public, by placing warning notices around the Pan. • Upon completion of the construction of the wastewater treatment works and expansion of the abattoir ➢ a systematic rehabilitation programme must be undertaken to restore the watercourse to its condition prior to the commencement of the water use; ➢ all disturbed areas must be re-vegetated with indigenous vegetation suitable to the area; and ➢ an active campaign for controlling new exotic and alien vegetation must be implemented within a disturbed area. • Upon completion of the construction activities, a habitat assessment study must be undertaken annually for three years to ensure that the rehabilitation is stable, failing which, remedial action must be taken to rectify any impacts. • Rehabilitation structures must be inspected regularly for the accumulation of debris, blockages instabilities and erosion with concomitant remedial and maintenance actions. • Copies of all designs, risk assessments, rehabilitation plans and any other reports required must be made available upon written request to the responsible authority. • The water user must ensure that there is a budget sufficient to complete and maintain the water use as set out in this notice. The Department may at any stage of the process request proof of budgetary provisions.

After Mitigation	
Extent of the Impact	1
Duration of the Impact	1
Intensity of the Impact	1
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**3**
Probability	1
Environmental Risk = Significance of Impact X Probability	**3**

Table 24: Environmental risk assessment: Stockpiling

Activity: Stockpiling of topsoil and cleared vegetation.	
Nature of Environmental Impact: Potential loss of valuable topsoil due to inadequate stockpiling practices; Potential loss of indigenous vegetation; Potential erosion of cleared areas.	
Before Mitigation	
Extent of the Impact	1
Duration of the Impact	2
Intensity of the Impact	2
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**5**
Probability	2
Environmental Risk = Significance of Impact X Probability	**10**
Objective of Mitigation Measures	
To ensure the proper management of topsoil and cleared indigenous vegetation and to minimise erosion of cleared areas.	
Proposed Mitigation	
• Before any construction takes place the proposed area for expansion will be pegged out. All construction activities will be limited to these areas.	

• Topsoil (top 150mm) is to be stockpiled in discrete areas and retained for future landscaping efforts. • Topsoil stockpiles shall not exceed 1m in height and 2m in width and shall be protected from wind, erosion and runoff by covering with a suitable fabric approved by the ECO. Once earthworks are complete, disturbed areas are to be re-vegetated or rehabilitated. • Cleared indigenous vegetation can be stockpiled for possible reuse in later rehabilitation or landscaping, or as a brush pack for erosion prevention. • Stockpiles of vegetation are only to be located in areas approved by the abattoir manager and may not exceed 2m in height. Methods of stacking must take cognizance of the possible creation of a fire hazard. • No burning of stockpiled vegetation is permitted. • The contractor is to ensure that all reasonable measures are taken to limit erosion and sedimentation from construction activities. Erosion protection measures include cut-off drains and/or berms. • Any sub-soil or rocks removed should also be stockpiled separately and be used during the rehabilitation. • Once the construction activities have been completed, the remaining disturbed area must be top soiled, sloped and re-vegetated as soon as possible using suitable grass species. This re-vegetation will assist in reducing the potential of erosion. If sterilization of the topsoil during stockpiling has occurred inorganic fertilizers will be used to supplement the soils before seeding of the area takes place. Compacted soil should be ripped to ensure effective re-vegetation.	
After Mitigation	
Extent of the Impact	1
Duration of the Impact	1
Intensity of the Impact	2
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**4**
Probability	1
Environmental Risk = Significance of Impact X Probability	**4**

Table 25: Environmental risk assessment: Fire establishment

Activity: Construction activities.	
Nature of Environmental Impact: Potential disturbance of natural vegetation surrounding the proposed site as a result of runaway veldt fires caused by workers or contractors.	
Before Mitigation	
Extent of the Impact	2
Duration of the Impact	1
Intensity of the Impact	2
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**5**
Probability	2
Environmental Risk = Significance of Impact X Probability	**10**
Objective of Mitigation Measures	
To prevent the occurrence of avoidable veldt fires.	
Proposed Mitigation	
• Basic fire-fighting equipment is to be placed at strategic locations on site (e.g. at the site office, flammable material store and watchman's container). • Equipment is to be maintained in good working order to the satisfaction of local fire authorities. • No open fires are permitted. A dedicated braai facility may be permitted in an area approved by the ECO, if the campsite in close proximity to firefighting equipment. At no time is a braai fire to be left unattended.	

• Smoking is prohibited near places where any readily combustible or flammable materials are present. Notices are to be prominently displayed prohibiting smoking in such areas. • Welding, flame cutting and other hot work is only to be undertaken in places where the necessary safety precautions are in place (i.e. not near potential sources of combustion and with a fire extinguisher immediately accessible). • All flammable materials are to be stored in a suitable, lockable storage area. • Combustible materials may not accumulate on the construction site. • Cooking is to be restricted to bottled gas facilities in designated areas approved by the ECO. This facility is to be supervised and strictly controlled. • Fire extinguishers must be readily available.	
After Mitigation	
Extent of the Impact	2
Duration of the Impact	1
Intensity of the Impact	1
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**4**
Probability	1
Environmental Risk = Significance of Impact X Probability	**4**

Table 26: Environmental risk assessment: Cement and concrete

Activity: The storage, mixing and disposal of cement and concrete.	
Nature of Environmental Impact: Potential water and/or soil pollution due to incorrect management of concrete and cement.	
Before Mitigation	
Extent of the Impact	2
Duration of the Impact	2
Intensity of the Impact	2
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**6**
Probability	2
Environmental Risk = Significance of Impact X Probability	**12**
Objective of Mitigation Measures	
To prevent the contamination of soil and water as a result of concrete and cement used on site.	
Proposed Mitigation	
• No mixing of concrete or cement directly on the ground is permitted. The mixing of concrete will only be done on mortarboards (dugga-boards). • Ready-mix trucks are not permitted to clean chutes on site. Cleaning into foundations or a dedicated cleaning pit is permitted. • Bricklayers and plasterers are to minimise any cement spill or runoff in their work area and are to ensure that the work area is cleaned of all cement spillage at end of each workday. • Both used and unused cement bags are to be stored in weatherproof containers so as not to be affected by rain or runoff. • Contaminated soil resulting from concrete or cement spills, including residue produced by the washing of cavities, is to be removed immediately after the spillage has occurred and placed on the appropriate rubble stockpile. • Runoff from the washing out of wall cavities is to be contained against the building by excavations of berms around the foundations. All reasonable measures must be taken to prevent the dirty water from contaminating the Daybreak Pan. • Clean stormwater must be kept away from areas where it could be contaminated and must be directed to the stormwater drainage system.	
After Mitigation	
Extent of the Impact	2
Duration of the Impact	1
Intensity of the Impact	1
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**4**
Probability	1
Environmental Risk = Significance of Impact X Probability	**4**

Table 27: Environmental risk assessment: Generation of wash water

Activity: The cleaning of vehicles, equipment and construction areas.	
Nature of Environmental Impact: Potential soil, surface water and ground water contamination due to contaminated wash water.	
Before Mitigation	
Extent of the Impact	2
Duration of the Impact	2
Intensity of the Impact	2
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**6**
Probability	2
Environmental Risk = Significance of Impact X Probability	**12**
Objective of Mitigation Measures	
To prevent the contamination of the soil, surface water and ground water as a result of polluted wash water.	
Proposed Mitigation	
• No washing of vehicles or equipment is permitted on site. • Cleaning of equipment is to take place within designated areas. • A dedicated cleaning area is to be installed to facilitate washing of all cement and painting equipment. The cleaning area could be a plastic lined cleaning pit or dedicated plastic or metal drums, located as close as possible to a water point or within reach of a hose no longer than 10m. • No wastewater may be disposed of on site, onto the soil or into any water body. • Soil contaminated with hazardous substances, fuel or oil shall be treated as hazardous waste and removed from site. • Runoff from the washing activities is to be contained against the building by excavations of berms around the foundations. All reasonable measures must be taken to prevent the dirty water from contaminating the Daybreak Pan. • Clean stormwater must be kept away from areas where it could be contaminated and must be directed to the stormwater drainage system.	
After Mitigation	
Extent of the Impact	2
Duration of the Impact	1
Intensity of the Impact	1
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**4**
Probability	1
Environmental Risk = Significance of Impact X Probability	**4**

Table 28: Environmental risk assessment: Hazardous waste

Activity: Generation of hazardous waste.	
Nature of Environmental Impact: The potential pollution of soil, surface water and ground water due to hazardous waste spills.	
Before Mitigation	
Extent of the Impact	2
Duration of the Impact	2
Intensity of the Impact	3
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**7**
Probability	2
Environmental Risk = Significance of Impact X Probability	**14**
Objective of Mitigation Measures	
To prevent soil, surface water and ground water contamination due to hazardous substances.	
Proposed Mitigation	
• Equipment and vehicles are to be repaired immediately upon developing leaks. Drip trays shall be supplied for all repair work undertaken on machinery on site. • Drip trays are to be utilised during daily greasing and re-fuelling of machinery and to catch incidental spills and pollutants. • Drip trays are to be inspected daily for leaks and effectiveness and emptied when necessary. This is to be closely monitored during rain events to prevent overflow. Oil and diesel spills are considered hazardous. Disposal of such contaminants are should be done by following the recommended steps. • Appropriate equipment to deal with fire or pollution incidents is to be readily available on site. This includes fire extinguishers, spill kits for hydrocarbon spills, drip trays for plant or machinery leaks, drums or containers for contaminated water and drip trays for minor hydrocarbon spills. • Soil contaminated with hazardous substances, fuel or oil shall be treated as hazardous waste and removed from site.	
After Mitigation	
Extent of the Impact	2
Duration of the Impact	2
Intensity of the Impact	1
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**5**
Probability	1
Environmental Risk = Significance of Impact X Probability	**5**

Table 29: Environmental risk assessment: General waste and building rubble

Activity: Production of general waste and building rubble.	
Nature of Environmental Impact: Potential soil, surface water and ground water contamination due to general waste generated.	
Before Mitigation	
Extent of the Impact	1
Duration of the Impact	1
Intensity of the Impact	2
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**4**
Probability	2
Environmental Risk = Significance of Impact X Probability	**8**
Objective of Mitigation Measures	
To prevent soil, surface water and ground water contamination due to general waste produced.	
Proposed Mitigation	
• A construction refuse collection structure shall be erected on commencement of construction work within the boundaries of the site. The minimum requirement is as follows: ➢ 4 ready-fence panels (3m x 1.8m) covered with shade cloth or hessian, one panel being movable to provide access. The structure shall have a roof (ready fence panel, or similar) to contain waste materials in windy conditions. The floor shall be lined with DPC plastic to prevent ground contamination from leachate such as cement powder residue or empty chemical or paint containers. ➢ Alternatively, refuse skips can be used but also need to be covered with shade cloth to ensure the containment of waste. • Refuse bins shall be provided for domestic waste (lunch litter) and placed in designated eating areas and any other areas where deemed necessary to control littering. • Refuse bins are not to overflow and are to be emptied regularly. No littering is permitted on site. • Building rubble is to be kept separate from other construction waste. Rubble is to be kept clean of brick ties, plastics, papers and cement bags at all times. • Rubble stockpiles and refuse structures shall be positioned to permit easy access by removal trucks. • Accumulation of large stockpiles of rubble and waste is not permitted. Waste is to be removed at regular intervals at a minimum frequency of once a week. • All waste is to be disposed of at approved landfill sites, no burning or burying is permitted. • The contractor shall delegate a specific waste management job description to an individual or team if directed by the ECO.	
After Mitigation	
Extent of the Impact	1
Duration of the Impact	1
Intensity of the Impact	1
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**3**
Probability	1
Environmental Risk = Significance of Impact X Probability	**3**

Table 30: Environmental risk assessment: Dust

Activity: Construction activities and vehicles travelling to and from the site.	
Nature of Environmental Impact: Generation of dust as a result of cleared vegetation and from the increase in vehicle frequency. Nature of Socio-economic Impact: Nuisance due to dust generated.	
Before Mitigation	
Extent of the Impact	2
Duration of the Impact	1
Intensity of the Impact	2
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**5**
Probability	3
Environmental Risk = Significance of Impact X Probability	**15**
Objective of Mitigation Measures	
To prevent the generation of dust and nuisance.	
Proposed Mitigation	
• All areas impacted by construction shall be regularly maintained including roads and pavements. • A dustcart needs to be onsite to water down dusty roads on dry windy days. • Speed bumps or traffic speed signs need to be erected to reduce speeding onsite, which could result in the generation of dust. • Regular maintenance of vehicles to address wear of tires and breaks. Optimal engine combustion will allow for 'cleaner' exhaust emissions.	
After Mitigation	
Extent of the Impact	1
Duration of the Impact	1
Intensity of the Impact	2
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**4**
Probability	1
Environmental Risk = Significance of Impact X Probability	**4**

Table 31: Environmental risk assessment: Traffic

Activity: Increased traffic frequency on road infrastructure.	
Nature of Environmental and/or Socio-economic Impact: Potential wear of access roads, potential accidents on access roads, potential unpermitted transport of materials and potential loss of materials being transported on the access roads.	
Before Mitigation	
Extent of the Impact	2
Duration of the Impact	1
Intensity of the Impact	2
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**5**
Probability	3
Environmental Risk = Significance of Impact X Probability	**15**
Objective of Mitigation Measures	
Minimise the impact of construction activities on the immediate and surrounding natural and social environment and prevent contamination resulting from construction activities.	
Proposed Mitigation	
• Ensure that all construction vehicles using adjoining roads are roadworthy. • All loads are to be securely fastened when being transported. • All vehicles are to adhere to the tonnage limitation and acquire a permit as required. • All speed limits and other traffic regulations on the public roadways must be adhered to.	
After Mitigation	
Extent of the Impact	2
Duration of the Impact	1
Intensity of the Impact	1
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**4**
Probability	2
Environmental Risk = Significance of Impact X Probability	**8**

Table 32: Environmental risk assessment: Utilisation of groundwater

Activity: Utilisation of groundwater.	
Nature of Environmental Impact: Potential wastage of water and depletion of water resource as a result of poor management.	
Before Mitigation	
Extent of the Impact	2
Duration of the Impact	1
Intensity of the Impact	2
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**5**
Probability	2
Environmental Risk = Significance of Impact X Probability	**10**
Objective of Mitigation Measures	
Prevent the wastage of a natural resource (groundwater).	
Proposed Mitigation	
• Leaking water taps and hosepipes are to be repaired immediately. • Running water taps and hosepipes are not to be left unattended. • Unused water standpipes are to be buried to prevent damage and resultant water leaks. • Taps are to be attached to secured supports and used in preference to standpipes with no valve mechanism to open and close water supply. All hose and tap connections are to be fitted with correct and appropriate plumbing fittings.	
After Mitigation	
Extent of the Impact	2
Duration of the Impact	1
Intensity of the Impact	1
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**4**
Probability	1
Environmental Risk = Significance of Impact X Probability	**4**

Table 33: Environmental risk assessment: Ablution facilities

Activity: Installation and use of ablution facilities.	
Nature of Environmental Impact: Potential unsanitary conditions on site, potential surface- and ground-water contamination and potential soil contamination.	
Before Mitigation	
Extent of the Impact	2
Duration of the Impact	2
Intensity of the Impact	1
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**5**
Probability	3
Environmental Risk = Significance of Impact X Probability	**15**
Objective of Mitigation Measures	
Prevent the contamination of the soil, surface- and ground-water.	
Proposed Mitigation	
• Sufficient ablution facilities shall be provided – minimum of 1 toilet per 15 workers. • Plumbed facilities are preferred. Chemical facilities are to be serviced regularly. • Toilets should have properly closing doors and supplied with toilet paper. • The location of toilets is to be approved by the ECO prior to site establishment, but shall be located within 100m of any work point. • Chemical toilets are to be serviced weekly. The contractor is to ensure that no spillage occurs and that the contents are removed from site according to approved methods. • Chemical toilets are to be emptied prior to temporary site closure for a period longer than 4 days. • Only the use of ablution facilities will be permitted onsite. • All reasonable measures must be taken to prevent the dirty water from contaminating the Daybreak Pan. • Clean storm water must be kept away from areas where it could be contaminated and must be directed to the storm water drainage system.	
After Mitigation	
Extent of the Impact	1
Duration of the Impact	1
Intensity of the Impact	1
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**3**
Probability	1
Environmental Risk = Significance of Impact X Probability	**3**

Table 34: Environmental risk assessment: Hazardous chemicals

Activity: Storage and handling of hazardous chemicals, including fuel.	
Nature of Environmental Impact: Potential hazardous chemical spills, resulting from incorrect management of resources, can cause soil, surface water and groundwater pollution.	
Before Mitigation	
Extent of the Impact	2
Duration of the Impact	2
Intensity of the Impact	1
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**5**
Probability	2
Environmental Risk = Significance of Impact X Probability	**10**
Objective of Mitigation Measures	
To prevent or minimise soil and water contamination as a result of accidental spillages of hazardous chemicals used onsite.	
Proposed Mitigation	
• Proper handling, storage and disposal of hazardous chemicals. All fuels and flammable materials are to be handled safely, stored safely and clearly labelled. • Flammable materials are to comply with standard fire safety regulations. • Drip trays must be used to collect spillage from equipment, vehicles and plant. These should be emptied regularly into secondary containers. • Fuels and flammable materials are to be handled in a safety conscious manner. • If refueling on site or from drums, the ground must be protected and proper dispensing equipment is to be used i.e. hand pumps and funnels. Drums may not be tipped to dispense fuel. • All fuels and flammable materials are to be stored safely and clearly labeled. • Safety signage including “No Smoking”, “No Naked Lights” and “Danger”, and product identification signs, are to be clearly displayed on fuel stores and tanks. • All liquid fuels (petrol and diesel) are to be stored in tanks or containers with lids. • Fuel and flammable materials are to be kept under lock and key at all times and are to be stored at a central, easily accessible location. • Storage areas for fuels and flammable materials are to comply with standard fire safety regulations. • Adequate fire-fighting equipment shall be available close at hand and no smoking is permitted within the vicinity of storage areas. • All personnel handling fuels and hazardous materials are to be issued with the appropriate Personal Protective Equipment (PPE).	
After Mitigation	
Extent of the Impact	1
Duration of the Impact	1
Intensity of the Impact	1
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**3**
Probability	1
Environmental Risk = Significance of Impact X Probability	**3**

Table 35: Environmental risk assessment: Noise

Activity: Generation of noise from construction vehicles and machinery.	
Nature of Environmental Impact: Potential disturbance or nuisance to neighbors as a result of the increase in ambient noise from construction vehicles and machinery.	
Before Mitigation	
Extent of the Impact	2
Duration of the Impact	1
Intensity of the Impact	2
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**5**
Probability	3
Environmental Risk = Significance of Impact X Probability	**15**
Objective of Mitigation Measures	
Minimise noise generation from construction activities.	
Proposed Mitigation	
• The site workers and contractors will adhere to the requirements of the Occupational Health and Safety Act, 1993 (Act 85 of 1993). • Regular maintenance of vehicles and equipment. • All plant and machinery are to be fitted with adequate silencers. • Working hours should be restricted to daylight hours. • Working procedures should be structured so as to avoid the unnecessary generation of noise. • No sound amplification equipment such as sirens, loud hailers or hooters are to be used on site except in emergencies and no amplified music is permitted on site. • If work is to be undertaken outside of normal work hours permission must be obtained from the ECO and the abattoir manager. • No noisy work is to be conducted over the weekends or on religious public holidays.	
After Mitigation	
Extent of the Impact	1
Duration of the Impact	1
Intensity of the Impact	2
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**4**
Probability	1
Environmental Risk = Significance of Impact X Probability	**4**

Table 36: Environmental risk assessment: Resource usage during construction

Activity: The use of resources such as electricity, water, oil, grease, fuel and construction materials.	
Nature of Environmental Impact: Potential wastage of valuable resources due to inefficient or redundant usage.	
Before Mitigation	
Extent of the Impact	1
Duration of the Impact	1
Intensity of the Impact	2
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**4**
Probability	2
Environmental Risk = Significance of Impact X Probability	**8**
Objective of Mitigation Measures	
To prevent the unnecessary wastage of resources.	
Proposed Mitigation	
• Regular maintenance and inspection of equipment, such as water pipes, to prevent leaks. • Regular site inspection by supervisors. • Proper environmental training and awareness.	
After Mitigation	
Extent of the Impact	1
Duration of the Impact	1
Intensity of the Impact	1
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**3**
Probability	1
Environmental Risk = Significance of Impact X Probability	**3**

7.2 Operational Phase

Table 37: Environmental risk assessment: Dust

Activity: Generation of dust.	
Nature of Environmental Impact: Air quality degradation as a result of the accumulation of dust.	
Before Mitigation	
Extent of the Impact	2
Duration of the Impact	2
Intensity of the Impact	2
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**6**
Probability	2
Environmental Risk = Significance of Impact X Probability	**12**
Objective of Mitigation Measures	
To minimise the potential impact of dust pollution caused by vehicles and other activities onsite.	
Proposed Mitigation	
• A water bowser needs to be onsite to water down dusty roads on dry windy days. • Speed bumps or traffic speed signs need to be erected to reduce speeding onsite that could result in the generation of dust. • Roads must be tarred or paved where possible. • Windbreaks should be used near large coal stockpiles.	
After Mitigation	
Extent of the Impact	1
Duration of the Impact	2
Intensity of the Impact	1
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**4**
Probability	1
Environmental Risk = Significance of Impact X Probability	**4**

Table 38: Environmental risk assessment: Generation of odours

Activity: Generation of odours at the abattoir.	
Nature of Environmental Impact: Potential social impact due to nuisance caused by odours generated.	
Before Mitigation	
Extent of the Impact	2
Duration of the Impact	3
Intensity of the Impact	2
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**7**
Probability	2
Environmental Risk = Significance of Impact X Probability	**14**
Objective of Mitigation Measures	
To minimise the impact of odours created at the abattoir.	
Proposed Mitigation	
• Airtight bags and bins should be used. • Good housekeeping should be maintained. • Manure from bird holding areas should be collected and stored in airtight containers. • Abattoir wastewater treatment works must be adequately designed, operated and maintained to minimise the emission of odours. • All waste needs to be removed frequently.	
After Mitigation	
Extent of the Impact	2
Duration of the Impact	3
Intensity of the Impact	1
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**6**
Probability	1
Environmental Risk = Significance of Impact X Probability	**6**

Table 39: Environmental risk assessment: Storm water management

Activity: Storm water management.	
Nature of Environmental Impact: Potential pollution, siltation and erosion of the Daybreak Pan.	
Before Mitigation	
Extent of the Impact	2
Duration of the Impact	3
Intensity of the Impact	2
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**7**
Probability	2
Environmental Risk = Significance of Impact X Probability	**14**
Objective of Mitigation Measures	
Excessive rain and incorrect storm water management can result in over flow of the pans in the WWTW or clean runoff water becoming contaminated by running through the bird holding area at the abattoir. The objective of these mitigations is to prevent or minimise impacts as a result of incorrect storm water management surrounding the Daybreak pan.	
Proposed Mitigation	
• All reasonable measures should be taken to ensure- ➢ The stability of the watercourse (Daybreak Pan) is not detrimentally affected by impeding or diverting the flow; ➢ Scouring, erosion or sedimentation of the watercourse (Daybreak Pan) is prevented; and ➢ Rehabilitation of the watercourse (Daybreak Pan), including riparian and instream habitat, is undertaken after any impedance or diversion of flow. • The water user must follow acceptable construction, maintenance and operational practices to ensure consistent, effective and sustainable impedance or diversion flow. • Clean storm water must be kept away from areas where it could be contaminated and must be directed to a storm water drainage system. • Storm water measures will be inspected on a regular basis in order to ensure that the structures are functional and not causing soil erosion. • The storm water drainage system must be maintained (free-draining) and not contaminated by other waste sources. Storm water must be kept separate from the wastewater treatment system. • Storm water must be diverted away from bird holding areas, chemical storage areas and wastewater treatment areas. • Placing of erosion prevention structures or vegetation to reduce water velocity at concentration points within the drainage system. • Placing of culverts underneath road foundation. • All reasonable measures must be taken to prevent the dirty water from contaminating the Daybreak Pan.	
After Mitigation	
Extent of the Impact	1
Duration of the Impact	2
Intensity of the Impact	1
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**4**
Probability	1
Environmental Risk = Significance of Impact X Probability	**4**

Table 40: Environmental risk assessment: Noise

Activity: Increase in ambient noise level as a result of operating machinery (e.g. conveyors) and vehicles used during operation.	
Nature of Environmental Impact: Potential noise pollution, potential nuisance due to noise, potential disturbance of feeding or breeding animals.	
Before Mitigation	
Extent of the Impact	2
Duration of the Impact	3
Intensity of the Impact	2
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**7**
Probability	2
Environmental Risk = Significance of Impact X Probability	**14**
Objective of Mitigation Measures	
To prevent the facility becoming a nuisance to adjacent landowners as a result of the increase in environmental sound levels.	
Proposed Mitigation	
• Ensure that machinery on site is in proper working condition, fitted with the necessary silencing equipment. • Make sure that the workers on site stick to the prescribed working hours. • Maintain a dB reading of less than 50dB at the site boundary. • Keep equipment in good repair and attend to loose or rattling covers, worn bearings and broken equipment.	
After Mitigation	
Extent of the Impact	1
Duration of the Impact	3
Intensity of the Impact	1
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**5**
Probability	2
Environmental Risk = Significance of Impact X Probability	**10**

Table 41: Environmental risk assessment: Spillage of hazardous materials

Activity: Accidental spillage of hazardous chemicals or materials, such as fuel and chlorine.	
Nature of Environmental Impact: Potential soil surface water and/or ground water contamination.	
Before Mitigation	
Extent of the Impact	2
Duration of the Impact	2
Intensity of the Impact	2
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**6**
Probability	2
Environmental Risk = Significance of Impact X Probability	**12**
Objective of Mitigation Measures	
To prevent the spilling of hazardous chemicals or materials to soil, surface water and ground water bodies.	
Proposed Mitigation	
• Proper storage of chemicals in a lockable, well ventilated building. • Storage areas for hazardous chemicals are to comply with standard fire safety regulations. • Safety signage including “No Smoking”, “No Naked Lights” and “Danger”, and product identification signs, are to be clearly displayed in areas housing chemicals. • Adequate fire-fighting equipment shall be available close at hand and no smoking is permitted within the vicinity of storage areas. • Chemicals are to be properly labeled and handled in a safety conscious manner. • All personnel handling hazardous chemicals and hazardous materials are to be issued with the appropriate Personal Protective Equipment (PPE). • Limited access to the storage areas. • Bund walls to retain possible spillages. • The removal of only the daily-required amount of chemicals to be used from the shed. • If refueling on site or from drums, the ground must be protected and proper dispensing equipment is to be used i.e. hand pumps and funnels. Drums may not be tipped to dispense fuel. • Use of drip trays during filling of machinery or equipment. Drip trays should be emptied into secondary containers on a regular basis. • Spill kits should be readily available.	
After Mitigation	
Extent of the Impact	1
Duration of the Impact	3
Intensity of the Impact	2
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**6**
Probability	1
Environmental Risk = Significance of Impact X Probability	**6**

Table 42: Environmental risk assessment: General and domestic waste

Activity: Generation of general and domestic waste.	
Nature of Environmental Impact: Potential pollution of soil, surface water and/or groundwater by waste generated onsite.	
Before Mitigation	
Extent of the Impact	2
Duration of the Impact	2
Intensity of the Impact	2
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**6**
Probability	2
Environmental Risk = Significance of Impact X Probability	**12**
Objective of Mitigation Measures	
To prevent the contamination of the natural environment by pollutants from general and domestic waste generated onsite.	
Proposed Mitigation	
• The Service Manager should ensure that waste containers are provided for the collection of general waste at various points on the premises. • Proper domestic waste management and overall waste management on site. • Installation of sufficient waste bins and skips where necessary. • All containers shall be kept in a clean and hygienic manner. • Storage containers shall be stored in a manner that prevents the harbouring of pests. • Training of staff in proper hygiene. • Frequent (weekly) collection of waste in bins. • Disposal of waste at the municipal landfill site.	
After Mitigation	
Extent of the Impact	1
Duration of the Impact	1
Intensity of the Impact	1
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**3**
Probability	1
Environmental Risk = Significance of Impact X Probability	**3**

Table 43: Environmental risk assessment: Hazardous waste

Activity: Generation of hazardous waste, such as feathers, blood and condemned material.	
Nature of Environmental Impact: Potential pollution of soil, surface water and/or groundwater by hazardous waste generated onsite.	
Before Mitigation	
Extent of the Impact	2
Duration of the Impact	3
Intensity of the Impact	2
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**7**
Probability	3
Environmental Risk = Significance of Impact X Probability	21
Objective of Mitigation Measures	
To prevent the contamination of the natural environment by pollutants from hazardous waste generated onsite.	
Proposed Mitigation	
• Skips containing condemned material or material destined for the rendering plant are to be sealed. • Proper storage of manure, condemned material and unwanted material destined for the rendering plant or other disposal method away from surface water bodies and boreholes. • Dead on arrival chickens (DOAs) must be stored in locked bins prior to removal by an approved crocodile farmer or transport to the rendering plant. • Condemned material must be placed in locked bins and sent to a licensed rendering plant. • Feathers must be collected into dedicated containers and sent to a licensed rendering plant. • Blood must be piped into containers and taken to a licensed rendering plant. Care must be taken to avoid spillages. Any spills must be cleaned immediately. • Soil and faecal matter from live bird trucks must be collected and stored in rendering plant containers and sent to a licensed rendering plant. • Pipes transporting abattoir wastewater must be checked for leaks and regularly maintained. • Drums containing chicken parts, such as chicken feet, must be stored within the abattoir building.	
After Mitigation	
Extent of the Impact	2
Duration of the Impact	2
Intensity of the Impact	2
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**6**
Probability	1
Environmental Risk = Significance of Impact X Probability	**6**

Table 44: Environmental risk assessment: Water use

Activity: Water use.	
Nature of Environmental Impact: Potential wastage and/or pollution of water.	
Before Mitigation	
Extent of the Impact	2
Duration of the Impact	2
Intensity of the Impact	2
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**6**
Probability	3
Environmental Risk = Significance of Impact X Probability	**18**
Objective of Mitigation Measures	
To prevent the wastage and/or pollution of water used at the abattoir.	
Proposed Mitigation	
• High-pressure hoses should be used to minimise the amount of water used. • Provide roofing for bird unloading areas and the processing plant to minimise the amount of contaminated storm water, wastewater and wash water. • Contaminated water should be efficiently treated and re-used where possible. • Clean storm water must be kept away from areas where it could be contaminated and must be directed to the storm water drainage system. • All floors within the processing area of the abattoir must have concrete floors graded so that water runs down drains. • All chemical storage areas must be situated on impermeable concrete floors with bunding capable of containing 110% of any spillage. • Treated abattoir wastewater should be re-used at the abattoir as far as possible and as permitted by the salinity levels of the water. • Leaking taps and hose pipes are to be repaired immediately. • Running water taps and hosepipes are not to be left unattended. • Unused standpipes are to be buried to prevent damage and resultant water leaks. • Taps are to be attached to secured supports and used in preference to standpipes with no valve mechanism to open and close the water supply. All hose and tap connections to be fitted with correct and appropriate plumbing fittings.	
After Mitigation	
Extent of the Impact	2
Duration of the Impact	2
Intensity of the Impact	2
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**6**
Probability	1
Environmental Risk = Significance of Impact X Probability	**6**

Table 45: Environmental risk assessment: Sanitation

Activity: General sanitation onsite.	
Nature of Environmental Impact: Potential surface and/or ground water contamination.	
Before Mitigation	
Extent of the Impact	2
Duration of the Impact	3
Intensity of the Impact	2
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**7**
Probability	2
Environmental Risk = Significance of Impact X Probability	**14**
Objective of Mitigation Measures	
To prevent the contamination of the natural environment by pollutants from poor sanitation onsite.	
Proposed Mitigation	
• Ablution facilities should be maintained to prevent or minimize blockage and leakages. • Sewerage systems should be kept separate from storm water system. • Awareness of the importance of proper hygiene should be created among employees. • Toilets should have properly closing doors and supplied with toilet paper.	
After Mitigation	
Extent of the Impact	1
Duration of the Impact	2
Intensity of the Impact	1
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**4**
Probability	1
Environmental Risk = Significance of Impact X Probability	**4**

Table 46: Environmental risk assessment: Abattoir wastewater

Activity: Treatment of abattoir wastewater.	
Nature of Environmental Impact: Potential pollution of surface and ground water resources as well as natural pans.	
Before Mitigation	
Extent of the Impact	2
Duration of the Impact	3
Intensity of the Impact	2
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**7**
Probability	3
Environmental Risk = Significance of Impact X Probability	21
Objective of Mitigation Measures	
To prevent the contamination of the natural environment by abattoir wastewater.	
Proposed Mitigation	
• An efficient abattoir wastewater treatment system must be implemented. • Wastewater must be treated to DWA General Limit standards. • The wastewater treatment plant must be capable of treating 2 500m^3 of wastewater per day. • The following parameters should be monitored for the treated wastewater: ➢ Faecal Coliforms (per 100ml) ➢ Chemical Oxygen Demand (mg/l) ➢ pH ➢ Ammonia (ionized and un-ionised) as Nitrogen (mg/l) ➢ Nitrate/Nitrite as Nitrogen (mg/l) ➢ Chlorine as Free Chlorine (mg/l) ➢ Suspended Solids (mg/l) ➢ Electrical Conductivity (mS/m) ➢ Ortho-Phosphate as phosphorous (mg/l) ➢ Fluoride (mg/l) ➢ Soap, oil or grease (mg/l) ➢ Dissolved Arsenic (mg/l) ➢ Dissolved Cadmium (mg/l) ➢ Dissolved Chromium (VI) (mg/l) ➢ Dissolved Copper (mg/l) ➢ Dissolved Cyanide (mg/l) ➢ Dissolved Iron (mg/l) ➢ Dissolved Lead (mg/l) ➢ Dissolved Manganese (mg/l) ➢ Mercury and its compounds (mg/l) ➢ Dissolved Selenium (mg/l) ➢ Dissolved Zinc (mg/l) ➢ Boron (mg/l) • Anaerobic ponds must be designed to have long enough retention periods so that a satisfactory level of breakdown can occur. • The treatment works must be designed carefully so that overloading does not occur. • Depending on the Electrical conductivity of the final effluent, 40- 60 % of the treated water from the wastewater treatment plant will be re-used as wash water inside AFGRI Daybreak abattoir. The final Electrical conductivity will be dependent on the brine wastage inside the abattoir, because the biological treatment system will not provide removal of salinity of the raw wastewater within the limit of 150 mS/m. Additional treatment required, in order to re-use the water in the abattoir, would be conventional sand filtration and chlorine disinfection • The remaining treated water will be used for irrigation of crops on the property or disposed of into the Daybreak Pan. These water use activities may only occur provided for each activity no more than 2000m^3 is discharged on any given day and that the treated water complies to the General Limit standards set out in table 3.1 of the GN 399 General Authorisations, dated March 2004, in terms of Section 39 of the National Water Act, 1998 (Act 36 of 1998).	
After Mitigation	
Extent of the Impact	2
Duration of the Impact	3
Intensity of the Impact	1
Significance of Impact = Extent of Impact + Duration of	**6**

Impact + Intensity of Impact	
Probability	1
Environmental Risk = Significance of Impact X Probability	**6**

Table 47: Environmental risk assessment: Outbreak of disease or infection of chickens

Activity: Slaughtering of chickens at the abattoir.	
Nature of Environmental Impact: Potential outbreak of disease or the occurrence of infected chickens. Visitors and/or staff entering the abattoir can introduce diseases. Chickens may be infected with for example *Salmonella.*	
Before Mitigation	
Extent of the Impact	3
Duration of the Impact	2
Intensity of the Impact	2
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**7**
Probability	2
Environmental Risk = Significance of Impact X Probability	**14**
Objective of Mitigation Measures	
To prevent the occurrence of diseases and infections within the abattoir.	
Proposed Mitigation	
• All chickens should originate from a closed biosecurity compartment. • Proper management of hazardous waste produced (blood, feathers, carcasses and other condemned material). • Installation of footbaths with disinfectant at all the entrances to the abattoir. • Installation of showers for all staff working on site. • Installation of rodent bait raps and flytraps. • Access control to and from the premises and access to the premises only by prior arrangement. • Monitoring and auditing of processes by a contracted veterinarian or state vet. • Crates and modules must be washed with a sanitizer solution before they are re-loaded onto trucks. Trucks must also be washed before crates and modules are re-loaded.	
After Mitigation	
Extent of the Impact	1
Duration of the Impact	2
Intensity of the Impact	1
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**4**
Probability	1
Environmental Risk = Significance of Impact X Probability	**4**

Table 48: Environmental risk assessment: Resource use during operation

Activity: Usage of resources such as electricity, water and chlorine.	
Nature of Environmental Impact: Potential wastage of valuable resources due to inefficient or redundant use.	
Before Mitigation	
Extent of the Impact	1
Duration of the Impact	2
Intensity of the Impact	2
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**5**
Probability	2
Environmental Risk = Significance of Impact X Probability	**10**
Objective of Mitigation Measures	
To prevent the unnecessary wastage of resources.	
Proposed Mitigation	
• Regular maintenance and inspection of equipment, such as hose pipes, to prevent leaks. • Regular site inspection by supervisors. • Proper environmental training and awareness. • Monitoring of resource consumption. • Implementation of technologies which can reduce resource consumption.	
After Mitigation	
Extent of the Impact	1
Duration of the Impact	2
Intensity of the Impact	1
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**4**
Probability	1
Environmental Risk = Significance of Impact X Probability	**4**

Table 49: Environmental risk assessment: Atmospheric emissions

Activity: Burning of coal in the boiler.	
Nature of Environmental Impact: Potential release of greenhouse gases due to emissions from the boiler.	
Before Mitigation	
Extent of the Impact	3
Duration of the Impact	3
Intensity of the Impact	2
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**8**
Probability	3
Environmental Risk = Significance of Impact X Probability	24
Objective of Mitigation Measures	
To minimise the amount of greenhouse gases released during the coal burning process.	
Proposed Mitigation	
• Boilers should use clean fuels free of heavy metals and toxic wastes. • Combustion equipment and air pollution control equipment should be designed and operated to minimise the production and emission of air pollutants. • Stacks should be high enough to prevent ground level concentrations of pollutants from reaching undesirable levels.	
After Mitigation	
Extent of the Impact	3
Duration of the Impact	3
Intensity of the Impact	1
Significance of Impact = Extent of Impact + Duration of Impact + Intensity of Impact	**7**
Probability	1
Environmental Risk = Significance of Impact X Probability	7

7.3 Environmental Impact Statement and Recommendation

During the construction phase, the project can be expected to have **low** negative impacts on various environmental attributes with proper mitigation measures implemented.

Similarly, the project can be expected to have a positive impact on the regional and local socio-economy during the construction phase. This will be as a result of the creation of jobs as well as procurement opportunities from local suppliers in the area. These benefits can be maximised through preference in procurement processes to local firms and employment of local labourers.

Once operational, the expansion of the abattoir will directly contribute to the local economy and indirectly to the regional and national economy. Benefits of the project outweigh the potential negative environmental and social impacts, which can be mitigated to within acceptable levels.

Based on the outcomes of the risk assessments conducted as part of the EIA, coupled with the recommendations made by the EAP, the overall negative impact of the project is of **Low - Medium significance**, which can be reduced to **Low significance** through the implementation of simple, effective mitigation measures.

The following recommendations are thus made:-

1) **The project should be approved and allowed to proceed.**
2) **The Mitigation measures proposed above, which has been incorporated into the EMP in more detail, must be implemented during the construction and operational phases.**
3) **A communications pathway must be established that would allow the designated ECO to accept and deal with stakeholder complaints.**
4) **Mitigation measures proposed above should be incorporated as far as possible into the operational plan for the development.**
5) **Strict monitoring and enforcement of requirements of the EMP must be undertaken to ensure that contractors and operators adhere to these requirements.**