

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

**PROPOSED ALOE RIDGE DEVELOPMENT,
UPINGTON**

**PORTIONS 8 AND 10 OF THE FARM MELKSTROOM
421 AND PORTION 1 OF THE FARM 563**

HENDRI VAN WYK FAMILY TRUST



//KHARA HAIS MUNICIPALITY

November 2012

MEG ref: HvW01.1/11

DENC ref: NC/EIA/SIY/KHA/UP13/2012

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SECTION A

1. ENVIRONMENTAL ASSESSMENT PRACTITIONER

1.1 Details of MEG Environmental Impact Studies

MEG Environmental Impact Studies was established in 1998 and since then undertook various Environmental Impact Assessments in the Upington-, Kuruman-, Karoo- and Kalahari-region of the Northern Cape Province. M E Geldenhuys who is personally responsible for each EIA application has a BSc-, as well as a Masters Degree in Environmental Management. With 13 years of hands-on experience since the implementation of the Environmental Conservation Act-1998 and 5 years' experience at Northern Cape Nature Conservation Department. She has been responsible for several Environmental Impact Assessments since 1998, which were completed and approved by the Provincial Department of Tourism, Environment and Conservation in the Northern Cape.

1.2 Expertise of EAP

The experience of MEG Environmental Impact Studies in the environmental management field includes various aspects such as:

KEY QUALIFICATIONS:

<p>Environmental Impact Assessment</p>	<p>Manage and coordinate various environmental impact assessments in the Northern Cape Province</p>
<p>Environmental Management</p>	<p>Identify issues and compile environmental management plans in the municipal areas of //Khara Hais Municipality, Siyanda District Municipality and Emthanjeni Municipality as required by the Integrated Development Planning Process.</p>

Environmental Management Plan	Manage and compile environmental management plans as required for the development of borrow pits and quarries for the Department of Minerals and Energy.
Environmental Management Program	Manage and coordinate various environmental management programs for the implementing of environmental friendly working procedures
Environmental Practitioner	Develop and compile environmental management reports as required by the Eurepgap and Nature=s Choice standards for the table grape export farmers in the Benede-Orange River region and Namibia.
Environmental Education	Furnish and manage an Environmental Education Resource centre for the provincial department of Northern Cape Nature Conservation Service. Compiling and presenting Environmental Education programs for youth groups and schools.

The following range of projects had been successfully completed and approved over the years by MEG Environmental Impact Studies:

Red meat abattoirs

Poultry abattoirs

Wine Cellar

Water pipelines

Solid waste sites

New Business areas

**Town extensions
/Residential developments
Storm water drainage**

Construction of power lines

Community safety centre

Low water bridges

Water abstraction facilities

Sewage works

Leisure facilities

Cemeteries

TV Towers

**Upgrading/
Rehabilitation of roads**

Agricultural Developments

Golf Estate Development

Resorts

SECTION B

2. EXISTING ENVIRONMENT

2.1 Background and Description of the activity

In 2009/2010 //Khara Hais Municipality obtained land for the development of a low-cost housing area. The area earmarked for this development is situated directly adjacent to the property of that of the Hendri van Wyk Trust, namely Portions 8 and 10 of Farm Melkstroom 421 and Portion 1 of the Farm 563 (figure 2). Both these properties are situated approximately 8km to the east of Upington and adjacent to the N14 and the entrance to Upington from Olifantshoek (Figure 1).

During the EIA process for the low-cost housing development (agri-village)(figure 4), initiated by //Khara Hais Municipality, discussions were held between the municipality and the adjacent landowners. During these discussions an agreement was reached between all parties involved that the proposed low-cost housing development for the local farmworkers as well as the proposed Aloe Ridge development (figure 3, 4 and 5) would be undertaken as a Sustainable Development Initiative (SDI) as provided for in the Spatial Development Framework (SDF) for //Khara Hais Municipality within the urban edge (figure 1).

A Sustainable Development Initiative (SDI) can be described as an overarching socio-economic development and environment rehabilitation initiative that is enabled and supported by large-scale property development. The purpose of a SDI is to ensure that large-scale development (such as the proposed Aloe Ridge development - figure 5) contributes, in a sustainable manner, to socio-economic growth and environmental rehabilitation. The proposed approach will therefore give practical effect to a developmental state as is contemplated in the Constitution as well as to national, provincial and local policies and goals.

Although the projects undertaken by //Khara Hais Municipality (low-

cost housing section with an agri-village concept – figure 4) and Hendri van Wyk Trust (Aloe Ridge – figure 5)) will be handled as two separate processes with regard to environmental impact assessment and rezoning, the SDI principle will still apply and therefore the Aloe Ridge development is an important component of this larger objective. The Aloe Ridge development, which will be discussed in this report, forms the primary economic driver for this SDI which, amongst other things, entails the development of an agricultural village (low-cost housing component) instead of the typical apartheid-era township development.

The proposed Aloe Ridge development entails the development serviced, single residential stands, group housing units, flats, a lodge, clubhouse, restaurants, agri-estate properties and an entertainment hall, together with the necessary infrastructure and services (figure 5).

This development will take place in phases of which phase 1 will entail the development of services after the approval of the EIA and the rezoning application. The remainder of the development will be done in follow-up phases.

The proposed development will be connected to the existing sewerage and water infrastructure of //Khara Hais Municipality which will be extended to provide for the adjacent low-cost housing/agricultural village development. A services agreement and cost-sharing agreement between the developer and //Khara Hais Municipality will be finalized after an engineering report in this regard have been tabled.

2.2 Description of the property

The proposed development area is located approximately 8km to the east of the Central Business District (CBD) of Upington and 2km from the nearest residential area (figure 1).

The property on which the proposed development will take place is situated between the N14 to the north and the Orange River to the

south thereof at approximately 28° 25 '31.5" S and 21° 99' 08.0" E. To the west, the development area is bordered by private land used for agricultural purposes and to the east is municipal property which has been earmarked for low income housing/agricultural village development.

The land under discussion is currently zoned for agricultural purposes and all the high potential agricultural land has been developed, mainly for vineyards. Due to the fact that the property is currently being farmed, various infrastructure, associated with normal farming activities, such as houses, sheds, dams etc. also exists on the property. This infrastructure is situated mainly on the low potential agricultural land, above the 1:50 year floodline. Directly adjacent to these buildings and infrastructure is soils with low agricultural potential. These areas have been included in the proposed Aloe Ridge Sustainable Initiative for which this environmental impact analysis is undertaken. The existing vineyards will be incorporated into the Aloe Ridge development.

The property slopes towards the south-east, in the direction of the Orange River.

2.3 Alternatives

The location of the property in relation to the formal urban area of Upington and the future agri-village development area at Melkstroom, directly adjacent to this property, provides a unique opportunity for a development of this nature and therefore no alternative site could be considered.

During the initial planning process, alternative layouts and designs were however considered, taking into account all environmental, socio-economic and agricultural factors (figure 6).

Alternative 1:

This development option comprises of approximately 540 units which

various from group housing apartments to estate units. This option also included a proposal for jetties along the Orange River to provide access to the river for the residents of Aloe Ridge.

Alternative 2:

This alternative is the revised option after inputs were received and evaluated relating to (1) the constraints for the site, (2) market needs and trends, (3) feasibility inputs and (4) bulk services.

The development option comprises of approximately 656 units which includes a hotel/lodge, a retirement village with frail care, a club house, restaurants, a function hall, estate and group housing units as well as apartments. As part of the Melkstroom SDI, middle income even as well as a commercial area and community training facilities are provided to form part of the Melkstroom Agric Village.

The design and layout were also changed so that erven are mostly north orientated to comply with the latest legislation on energy efficiency for buildings.

The two entrances for the development are also now to the requirements of SANRAL. The jetties on Orange River are not proposed anymore. This alternative will ensure that the Melkstroom SDI model be achieved, benefit the development and precinct as a whole.

No-go alternative:

With this alternative, no development is planned for the totals extend of the property. This property is included within the urban edge and therefore indicated for urban expansion in the latest SDF (figure 1) for Upington.

A no go option will result in the loss of housing for various market brackets such as (1) retirement sector (2) middle income (higher density) units for possible new economic drivers such as Solar energy (3) higher income group and (4) tourist sector.

This no-go alternative will also make no contribution towards the Melkstroom Sustainable Initiative (Melkstroom SDI). Within the SDI model Aloe Ridge will be the main economic driver and Melkstroom Agric Village the main beneficiary.

2.4 Discussion of photo material (Appendix B)

The photo material, taken from various directions, gives an indication of the proposed development site as it was during the time of the site inspection.

This section also includes some individual photos on site.

SECTION C

3. DESCRIPTION OF THE ENVIRONMENT

As mentioned previously in this report, the application area consists of Portions 8 & 10 of the Farm no. 421 and Portion 1 of the Farm no. 563, which covers a total area of approximately 135 ha of which 65ha is earmarked for the proposed development. The remainder of these properties will still be utilized for agricultural purposes.

3.1 Physical environment

The proposed development is situated in an area with a typical agricultural character. Directly adjacent to the property, farming activities includes amongst others, vineyards, extensive stock farming and even feeding pens.

The proposed development areas, which will be located on the low-potential agricultural land, are situated between the N14 to the north and the irrigation canal to the south thereof. The area below the irrigation canal and within the floodplains of the Orange River is currently used for the cultivation of grapes and these areas will not form part of the proposed development as it is located within the 1:50 year floodline of the Orange River.

Directly to the north of the irrigation canal and outside the floodplains of the Orange River, large portions of the property have also been developed for the cultivation of grapes and citrus orchids. These areas will still be used for agricultural purposes with only a small section, directly above the irrigation canal, which will form part of the estate erven (Figure 5).

The gradient of the site varies between 1:35 in the western- and 1:26 in the eastern section of the site. In general the drainage pattern on the site is in a south-easterly direction towards the Orange River and the

irrigation canal. Natural drainage areas run through the site in a southerly direction and will have to be accommodated in the proposed layout for the area.

Access to the property is obtained from the N14 which borders the property to the north.

The site visit to the proposed development area has been done on 3 April 2012 and therefore the status quo of the natural environment and its surroundings at the given time will be given in this report.

The photo material included under Par. 2.4 also gives an indication of the current status and condition of the proposed development site. During the site visit it was also found that the majority of the proposed site has been disturbed by agricultural- and associated activities.

Overhead power- and telephone lines cross the site at various places which has a visual impact. Within the property boundaries, various service roads (for farming purposes) were also observed. As a result of this, and the fact that the farm has been in production for many years, very few of the natural character and state has been preserved.

TOPOGRAPHY

A section of the site occurs on the rocky plains north of the Orange River sloping down to the alluvial plains next to the river at an altitude of about 800m above sea level. Natural run offs, drains stormwater towards the Orange River. These streams flow only after heavy rainfall events.

GEOLOGY AND SOIL TYPES

According to the geological map of the area the following geological substrates occur on the property.

The geology of the farm comprises of recent deposits of wind-blown Kalahari sands and surface limestone of Tertiary to Recent age. Some outcrops of granite occur on the eastern section of the property.

Land Types denote areas that display a marked degree of uniformity with respect to terrain form, soil pattern and climate. A terrain unit within a Land Type is any part of the land surface with homogeneous form and slope.

The area is therefore, from a topographical point of view, suitable for a development of this nature.

GEOHYDROLOGY

According to the “Preliminary assessment of the hydrogeology of the province of the Northern Cape” (Toens, 1996) the site forms part of Hydrogeological Zone 5a.

According to this report the ground water level in this zone varies from between 10 and 50m below surface. Ground water is difficult to locate in this zone and no boreholes yielding more than 2 l/s is known in this zone. In much of these areas, the ground water therefore needs to be desalinated before it can be considered acceptable for human consumption.

No boreholes are to be found on the site. Part of this application however entails the construction of a water pipeline from the existing Municipal water pipeline between Upington and Keidebees residential area, directly west of the properties.

The proposed development will take place in such a manner that it will make use of municipal water reticulation system.

CLIMATE

A summary of the broad climate of the area is provided by Mucina & Rutherford (2006). The site is situated partly in the Kalahari Karroid Shrubland and the Orange River Alluvial Vegetation types. The Kalahari Karroid Shrubland has a mean annual precipitation ranging from 100 – 200 mm and most rain falls in late summer and early autumn. The annual precipitation coefficient of variation is 38%,

indicating the unpredictable nature of the rainfall. The mean annual potential evaporation is 2878 mm, while the mean annual soil moisture stress is 86%. The mean annual temperature is 18.4°C and frost is frequent in winter.

Rainfall

The mean annual rainfall measured at the Upington weather station is 182 mm. The total annual rainfall may range from 65 mm to 539 mm during dry and wet years respectively, indicating a high variation in the annual rainfall and therefore a rainfall scenario that is highly unpredictable. The rainy season is predominantly from November to April when about 83% of the annual rainfall occurs. The wettest months are February and March and the driest periods are from June to September, when less than 5 mm of rain per month is recorded. The maximum rainfall measured over a 24 hour period at Upington was 67 mm in April. The highest monthly rainfall recorded was 228 mm, measured in January.

Temperature

The mean annual temperature for Upington is 19.1°C. The extreme maximum and minimum temperatures measured over a 25 year period were 42.0°C and -4.2°C respectively. The mean daily maximum for January is 34.3°C and for July it is 20.8°C. The mean daily minimum for January is 17.4°C and for July it is 1.7°C. Frost may occur from May to September on a mean of 19 days per year.

3.2 Biological environment

The development area which consists of Portions 8 & 10 of Farm no.421 and Portion 1 of the Farm no. 563, falls phytogeographically in the Kalahari-Highveld Transition Zone of White(1983) and consists of an extensive region stretching diagonally from Namibia to the South

African Highveld, and on the boundary of the Nama-Karoo and Savanna Biomes (Rutherford & Westfall 1986).

According to the “Biophysical survey of the Melkstroom Development, UPINGTON” dated April 2012 done by De Noel van Rooyen (Appendix G) the study area is situated in the Kalahari Karroid shrubland and the Lower Gariep Alluvial Vegetation types.

Kalahari Karroid Shrubland:

The vegetation and landscape features are low karroid shrubland on flat, gravel plains. Shrubs meet here with northern floristic elements, indicating a transition to the Kalahari region and sandy soils. The conservation status of this vegetation type is least threatened.

Lower Gariep Alluvial Vegetation:

This vegetation and landscape features are flat alluvial terraces and riverine islands supporting a complex of riparian thickets, reed beds as well as flooded grasslands and herblands populating sand banks and terraces within and along the Orange river. The conservation status of this vegetation type is endangered.

According to this report the following plant communities were distinguished on the Melkstroom Development site (see figure 7, Appendix G):

1. *Enneapogon cenchroides* grassland
2. *Dodonaea angustifolia-Galenia africana* shrubveld
3. *Acacia mellifera-Monechma genistifolium* rocky shrubland and bushveld
- 3a. *Acacia mellifera-Stipagrostis uniplumis* rocky bushveld
- 3b. *Rhigozum trichotomum-Enneapogon scaber* open rocky shrubland
4. *Acacia mellifera-Ziziphus mucronata* dense rocky bushveld
5. *Searsia pendulina-Phragmites australis* riparian vegetation of the riverbank, floodplains and canal
- 5a. *Searsia pendulina-Phragmites australis* riparian forest
- 5b. *Acacia karroo-Cynodon dactylon* vegetation of the canal

- 5c. *Phragmites australis* stream vegetation
- 6. *Cynodon dactylon* floodplain vegetation

According to the Northern Cape Nature Conservation Act, 2009 (Act no 9 of 2009), the following species that occur on site, are of importance:

Schedule 1 - Specially Protected Species:

Aloe dichotoma

Schedule 2 - Protected Species:

Aloe claviflora

Aloe hereroense

Boscia albitrunca

Boscia foetida subsp. *foetida*

Nerine laticoma

Schedule 3: Common indigenous plant species:

These are all indigenous species except those listed as Schedule 1 and 2 species.

Schedule 6 - Invasive plant species:

Argemone ochroleuca

Casuarina equisetifolia

Cereus jamacaru

Datura stramonium

Melia azedarach

Nicotiana glauca

Opuntia ficus-indica

Opuntia imbricata

Pinus sp.

Prosopis glandulosa

Salix babylonica

More detail available as Chapter 6 of the Biophysical Report (Appendix G).

According to the mentioned report, the proximity of the site to Upington and the agricultural activities in the area will contribute to a sparse faunal diversity.

Large areas of the site are disturbed by habitation, sheds, orchards, vinyards, bare areas, cultivation and tree shelterbelts. Some parts of the site have a rocky and sparse vegetation cover and are not favorable for faunal occupation. Besides some trees being protected, they form important food sources and habitats for various fauna. The underbrush normally associated with these species also forms an important micro-habitat for a number of animal species.

3.3 Social environment

The proposed development area is located within the municipal areas of //Khara Hais Municipality and the Siyanda District Municipality in the Northern Cape Province. The population of //Khara Hais Municipality is distributed mainly in and around Upington. According to Statistics South Africa, the total population count for the municipality in 2005 was 75 671 of which the male and female ratio is almost equal.

The Northern Cape and //Khara Hais Municipality had, over the past 10 years, experienced a fairly slow population growth rate, with the Northern Cape Province being the only province where the population decreased between 1996 and 2001.

According to the //Khara Hais Socio Economic Survey, (2008) nineteen percent (19%) of the population within its municipal area has some secondary education, while only 12% have completed Grade 12. Only 3% of the population have some form of higher education. Sixteen (16%) percent of the //Khara Hais Municipality's population is therefore functionally illiterate, while 7% is completely illiterate (Savannah, 2011). The reason for this can be directly linked to the low income levels in the area and will have severe negative socio economic implications for the area if not attended to as soon as possible (/ /Khara Hais SDF, 2008).

3.4 Economic environment

The //Khara Hais SDF (2008) states that 63% of the total population, within the municipal area, falls within the working category (15-65 years) and are classified as the labour market. Of these people, only 24% are employed, 13% are unemployed and 26% are not economically active which includes housewives/homemakers, students, scholars, pensioners and retired people as well as those not seeking work (Socio Economic Survey, //Khara Hais Municipality, 2008). Of those employed (labour force), 55% earn between R 401 and R 1 600 per month, and 19% earn less than R 400 per month (2008 –statistics). As can be seen from this, the employed labour force only constitutes 24% of the total population in the area. It is therefore concluded that the majority of the population lives in extreme poverty and are dependent on the income of the employed sector.

Of those employed within the //Khara Hais Municipal area, 50% are employed by the tertiary sector with Community, Social and Services sectors providing 23% of the opportunities, followed by wholesale, trade and retail sector (18%) (Khara Hais SDF, 2008).

In order to ensure that the proposed project will be sustainable and economically viable, the applicant will make use of the local community for job creation. The proposed development will take place in phases. The development will proceed as the need arises for housing. //Khara Hais Municipality will also provide the necessary services such as sewage and a water provision.

All of these work opportunities, as well as the creation of buying power, will contribute positively to the economic environment of the area.

3.5 Cultural environment

Although no signs of any cultural- and heritage were identified on site, a “Phase 1 Heritage Impact Assessment Report”(appendix H) was done as

part of the environmental impact assessment. The purpose of this report is to identify and assess features of heritage significance, identify possible impacts and propose management measures to mitigate negative impacts.

The findings by J van Schalkwyk, as mentioned in this report, states that from a heritage point of view it is recommended that the proposed development be allowed to continue. It is requested that should archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.

SECTION D

4 PUBLIC PARTICIPATION

A detailed public participation process had been followed to identify all possible interested and affected parties (I & AP's) as well as any issues of significance to the project.

4.1 Notification

Steps taken to notify potentially interested and affected parties of the application are as follow:

The public participation process had been done by means of a newspaper advertisement in "Gemsbok" (15 June 2012 – Appendix C), an on-site notice (appendix D), notices at various public places, consultation with various stakeholders (appendix E), as well as organizations, government departments etc.

Proof of notification

Notice boards, advertisements and notices notifying potentially interested and affected parties of the application has been displayed, placed or given.

4.2 Registered interested and affected parties

During the public participation process the following interested and affected parties were identified and had been consulted:

NAME	ADDRESS	NOTIFIED BY:
DENC Department of Environment and Nature Conservation	Private Bag X6102, KIMBERLEY, 8300	<i>Draft</i> SCOPING REPORT

NAME	ADDRESS	NOTIFIED BY:
DWA Department of Water Affairs	Private Bag X5912, UPINGTON, 8800	<i>Draft</i> SCOPING REPORT
DAFF Department Agriculture, Forestry and Fisheries	PO Box 2782, UPINGTON, 8801	<i>Draft</i> SCOPING REPORT
DAFF Department Agriculture , Forestry and Fisheries	PO Box 52, UPINGTON, 8801	<i>Draft</i> SCOPING REPORT
//Khara Hais Municipality	Private Bag X6003, UPINGTON, 8801	<i>Draft</i> SCOPING REPORT

ADJACENT LAND OWNERS AND INTERESTED PARTIES:

Coucillor	Private Bag X6003, UPINGTON, 8801	LETTER
Hannes van Zyl Trust	PO Box 515 UPINGTON, 8801	LETTER
Rooiland Boerdery Pty Ltd	PO Box 3251 UPINGTON, 8801	LETTER
Davidzpan Trust (GJ Steyn)	PO Box 224 UPINGTON, 8801	LETTER
Upington Irrigation Board	PO Box 59 UPINGTON, 8801	LETTER

4.3 Issues identified

The following comments have been received from adjacent land owners as well as interested and affected parties during the Scoping Phase. A detailed Comment and Response Report is attached as Appendix F:

NAME	DATE RECEIVED	COMMENTS AND RESPONSE
DENC Department of Environment and Nature Conservation	7 August 2012	The Final BAR was requested.
DWA Department of Water Affairs	20 August 2012	<p>Comments have been received from DWA:</p> <ul style="list-style-type: none"> The Department rates all perennial and non-perennial rivers together with all dry river beds and natural drainage and associated riparian areas extremely sensitive to development and that no development should be within 100m or 1:100 years flood line of the Orange River and 32m of the drainage line without authorization from DWA. <p>Response:</p> <p>No perennial or non-perennial rivers are on or nearby the proposed development and the development will take place outside the 1:100 year floodline of the Orange River. No development will take place within 32m of a natural watercourse and no construction camps and/or maintenance of vehicles will be done within this area.</p> <ul style="list-style-type: none"> Water use authorization <p>Any activity within the 100m or 1:100 year flood line from the water course or water for construction from the Orange River, water use</p>

NAME	DATE RECEIVED	COMMENTS AND RESPONSE
		<p>authorization will be required from DWA. Water use authorization will be required from DWA prior commencement of the proposed development.</p> <p>Response: Notice is taken of this important requirement, but as stated above, no perennial or non-perennial rivers are on or nearby the proposed development and the development will take place outside the 1:100 year floodline of the Orange River. No development will take place within 32m of a natural watercourse and no construction camps and/or maintenance of vehicles will be done within this area.</p> <ul style="list-style-type: none"> • Design and layout alternatives Detailed layout plans needs to be submitted to DWA showing all the facilities in the proposed development, distance from the water course and any dry river as well as sanitary facilities. <p>Response: Detail layout plans will be part of the EIA document and as soon as this project has been authorized the applicant must submit the final design to DWA.</p> <ul style="list-style-type: none"> • Storm water management

NAME	DATE RECEIVED	COMMENTS AND RESPONSE
		<p>Storm water must be diverted from the construction works and roads and must be managed in such a manner as to disperse runoff and to prevent the concentration of storm water flow. Storm water control works must be constructed, operated and maintained in a sustainable manner throughout the project. Increased runoff due to vegetation clearance and/or soil compaction must be managed.</p> <p>Storm water leaving the premises must in no way be contaminated by any substance, whether such substance is a solid, liquid, vapour or gas or a combination thereof which is produced, used, stored, dumped or spilled on the premises.</p> <p>Response: Storm water must be controlled in a sustainable manner throughout the project. As the vegetation on site is naturally sparse, the development will not lead to excessive storm water runoff. Steps will be taken to ensure that storm water does not lead to bank instability. The applicant must ensure that storm water leaving the premises will not be contaminated by any substances. The storm water will be incorporated into engineering designs and services at the site.</p>

NAME	DATE RECEIVED	COMMENTS AND RESPONSE
		<ul style="list-style-type: none"> • Generation of General Waste DWA takes note of the fact that sufficient rubbish bins and enviro loose/mobile toilet facilities will be provided for the people on site, during construction. A letter must be obtained from //Khara Hais Municipality that they will accept the waste based on this estimate. If possible, a contract stating conditions and tariffs should be entered into. A procedure or plan should be produced for handling expected and incidental waste, as well as possibly hazardous materials. <p>Response: Sufficient rubbish bins and mobile toilet facilities will be provided to the people on site, during construction. A request for this confirmation letter will be submitted to Mr Huysamen at the //Khara Hais Municipality. As soon as the letter is received by this office it will be forwarded to DWA and DENC. A procedure plan for the handling of hazardous materials will be included in the EIA report.</p> <ul style="list-style-type: none"> • Invasive alien vegetation Alien vegetation must not colonise the area and all new alien vegetation recruitment must be eradicated or controlled, using standard methods approved by the Department.

NAME	DATE RECEIVED	COMMENTS AND RESPONSE
		<p>Response:</p> <p>Alien vegetation, where applicable, on site will be controlled by the applicant.</p> <ul style="list-style-type: none"> • General <p>Soil compaction must be loosened to allow seed germination. Erosion prevention mechanisms must be in place to ensure the sustainability of all structures and activities.</p> <p>Construction camp shall not be located within the 1:100 year flood line or within 100 meters of any watercourse whatever the greatest. Operation and storage of equipment within the riparian zone must be limited as far as possible. Vehicles and other machinery must be serviced well above the 1:100 year flood line or within a horizontal distance of 100 meters from any water course or estuary.</p> <p>Material with pollution generating potential must be limited in any construction activities. Any hazardous substances must be handled according to the relevant legislation relating to transport, storage and use of the substance. Any spillage of any hazardous materials including diesel that may occur during construction and operation must be reported</p>

NAME	DATE RECEIVED	COMMENTS AND RESPONSE
		<p>immediately to DWA.</p> <p>Response: Soils that have become compacted will be loosened to allow seed germination. The necessary measures to prevent erosion on site will be applied, throughout the development, by the applicant.</p> <p>All these requirements of DWA must be met and will be included in the EIA and EMP.</p>
<p>DAFF Department Agriculture, Forestry and Fisheries</p>	<p>3 July 2012</p>	<p>Comments The following comments have been received from this department:</p> <ul style="list-style-type: none"> • The department is mainly concerned about the potential impact on protected tree species. <p>Response: This issue have been dealt with in the Final Scoping Report (Section E par. 5.2). This will also be addressed in the EMP and the EIA report.</p> <ul style="list-style-type: none"> • DAFF requests a copy of the Biophysical Report that will be done as part of the Environmental Impact Assessment Report. <p>Response: The Biophysical Report will be part of the EIA report of which DAFF will</p>

NAME	DATE RECEIVED	COMMENTS AND RESPONSE
		receive a copy.
DAFF Department Agriculture, Forestry and Fisheries	15 August 2012	<ul style="list-style-type: none"> • The developer must ensure that they conform to the requirements of Article 7.(3)b of Regulation 9238: Conservation of Agriculture Resources, 1983 (Act 43 of 1983) which states that: 7.(1) “..no land user shall utilize the vegetation in a vlei, marsh or water sponge or within the flood area of a water course or within 10 meters horizontally outside such flood area in a manner that causes or may cause the deterioration of or damage to the natural agricultural resources.” • 3)b ..”cultivate any land on his farm unit within the flood area of a water course or within 10 meter horizontally outside the flood area of a water course”. <p>And take care of:</p> <ul style="list-style-type: none"> • High potential land must not be used for residential purposes; • Protected plant and tree species must not be disturbed without the necessary permits; • Invader species like <i>Prosopis</i> should be removed; and • Pollution must be minimized during the development phases.

NAME	DATE RECEIVED	COMMENTS AND RESPONSE
		<p>Response:</p> <p>These issues have been dealt with in the Final BAR under Section E par. 5.5. A specialist Ecological survey report and the EMP will form part of the EIA report.</p>
//Khara Hais Municipality	20 June 2012	<p>The following comments have been received from the local authority:</p> <p>“The proposed development area known as Melkstroom, is within the planning norms and guidelines for the area. The proposed development is also included as such in the approved Spatial Development Framework (SDF) of //Khara Hais. The area will thus be awarded the applicable zoning which will allow the development. Council is also satisfied that the process and public participation was very comprehensive and completed successfully. This department therefore has no objection to the proposed development and supports the proposed project.”</p>
ADJACENT LAND OWNERS AND INTERESTED PARTIES:		
Councillor AJ van Rooyen	20 June 2012	No Objection to the proposed development.
Hannes van Zyl Trust	9 July 2012	Requests that the possible influence of drainage problems in the lower areas due to the proposed development, be taken into account in the design of the area.

NAME	DATE RECEIVED	COMMENTS AND RESPONSE
		<p>Response:</p> <p>This issue will be brought under the attention of the townplanners and engineers to be taken into account during the design of the development and the design of the services and infrastructure.</p>
Rooiland Boerdery Pty Ltd		No response.
Davidzpan Trust (GJ Steyn)	3 July 2012	<p>(i) Mr Steyn indicated that the area is mainly used for agricultural purposes and that they farm with sheep, ostriches etc. directly adjacent to the property and that they are of the opinion that these existing activities will not complement a housing development.</p> <p>Response:</p> <p>The proposed development directly adjacent to the property of Mr Steyn is also of an agricultural (agri-estate) nature with very few houses within existing vineyards. The character of the property directly adjacent to that of Mr Steyn will not differ much from his own situation and therefore no problems in this regard are foreseen.</p> <p>(ii) The proposed development will negatively affect the irrigation canal and drainage problems in the area.</p> <p>Response:</p> <p>The proposed development will not have a negative impact/effect on the irrigation canal and drainage in the</p>

NAME	DATE RECEIVED	COMMENTS AND RESPONSE
		<p>area as no alterations will be made to the irrigation canal without the prior consent of the Upington Irrigation Board. The nature of the irrigation canal will also not be changed. All drainage issues will be addressed by the engineers appointed for the project during the design of services and infrastructure.</p> <p>(ii) No water and or sewerage pipes may be taken over my property to services the proposed development and it will place an extra burden on the ratepayers.</p> <p>Response:</p> <p>The proposed pipelines and services to the Aloe Ridge development and any other development will have to run in the road reserve towards this area and will not cross the property of Mr Steyn without his consent. The costs of these services will be for the account of the developer and not the ratepayers.</p>
Upington Irrigation Board	July 2012	<p>Upington Irrigation Board has no objection to the proposed activities. The canal and the Aloe Ridge development should function separately as two entities and further discussions in this regard may follow.</p> <p>Response:</p> <p>All infrastructure of the Upington Irrigation Canal have been taken into consideration during all of the planning processes and will also be</p>

NAME	DATE RECEIVED	COMMENTS AND RESPONSE
		incorporated into all planning for the area. Discussions will continue as the project progresses.

SECTION E

5. DESIRABILITY OF THE PROPOSED ACTIVITY

5.1 Potential environmental impacts

The application procedures and requirements were addressed in the Plan of Study for EIA to ensure that the correct procedures were followed and the report is considered by the delegated authority in terms of the NEMA.

The following methodology was utilised in the compilation of the environmental impact study:

- An analysis of both the needs of the applicant and the scope of the project.
- Consultations took place with the applicant, specialists/experts, various departments and other interested and affected parties to exchange information and express their views and concerns.
- The proposed project was discussed.
- Site visits were conducted to identify the area where the development is proposed, identify the visual character and land uses in the area as well as obvious impacts that the proposed development may have on the environment.
- Experts were consulted to obtain a specialist report on the archaeology, and biophysical features of the area.
- Obtain information continuously from the applicant on specific aspects of the proposal that might affect the environment;
- Comprehensive and continuous liaison with various stakeholders such as interested and affected parties, departments, landowners, etc.
- Assimilate and analyse all information gathered throughout the process.
- Conclusions made and recommendations supplied in respect of the information gathered.

5.2 Specialist reports

The following specialist studies were undertaken as part of the investigation:

Biophysical Survey of the Melkstroom Development (Appendix G)

A detailed Ecological Survey, which includes a classification of the vegetation, a fauna and flora survey as well as an ecological sensitivity analysis was done by Dr. N van Rooyen, a specialist in this field, and the findings of this study, together with the recommendations made, has been included in the detailed report attached as Appendix G. This report, together with the findings and the recommendations made, should therefore form an integral part of the Record of Decision by the Department of Environment and Nature Conservation.

Archaeological and Heritage Impact study (Appendix H)

A Heritage impact assessment was undertaken by Heritage Consultant, JA van Schalkwyk, in this field. The findings of this study, together with the recommendations made, has been included in the detailed report attached as Appendix H. This report, together with the findings and the recommendations made, should therefore form an integral part of the Record of Decision by the Department of Environment and Nature Conservation.

SECTION F

6. IDENTIFIED ENVIRONMENTAL ISSUES

This section of the report addresses the possible impacts, as identified during the initial environmental impact assessment. The possible environmental impacts and suggested mitigation measures/recommendations as identified are as follows:

6.1 Historical, cultural and archaeological sites

During the site visit, held on 3 April 2012, no sites of historical, cultural and archaeological value were found at the development area. A Phase 1 Heritage Impact Assessment was done and is part of this Environmental Impact Study as Appendix H.

From the investigation it was determined that a low density surface scatter of stone tools dating to the Middle Stone Age was identified in an area of approximately 30 x30 metres square on a low hill in the centre of the study area. As this material is located on the surface it is not in primary context anymore and therefore is viewed to have a low significance. No further mitigation action is required.

According to this report, from a heritage point of view it is recommended that the proposed development be allowed to continue. It is requested that should archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.

The necessary mitigations are however also in place should any such sites be found during the implementation of the project.

Mitigation

Should any hidden human remains (highly unlikely) be disturbed, exposed or uncovered during (plant) site clearing and excavations, these should immediately be reported to an archaeologist. Burial remains should not be disturbed or removed until inspected by an archaeologist.

Site preparation activities must be monitored for the occurrence of any hidden archaeological material (Stone Age tools) and similar chance finds and if any are exposed; this should be reported to an archaeologist so that an investigation and evaluation of the finds can be made.

6.2 Flora

During the site visits, held on 3 April 2012 it was found that the proposed development site is situated in a “least threatened” Kalahari Karroid shrubland and the “endangered” Lower Gariep Alluvial Vegetation types.

As this site is a working farm with vineyards, infrastructure and housing the site has very little natural veld left, except for the riparian zone directly adjacent to the Orange river. This habitat will not be disturbed during this proposed development. During the site visit, protected flora and trees species were identified at the site and therefore a Biophysical survey (flora and fauna survey) was done as part of the Environmental Impact Study Report.

According to the report (chapter 11) the sensitivity of the aquatic plant communities is in general high, but because the development will have a low impact (the Orange river and floodplains are mostly excluded from the proposed development), the overall significance rating is low. Currently it seems that the water flowing down the natural drainage lines on site is blocked by the canal from flowing down to the Orange river. These drainage lines should be managed to prevent damage, flooding and silting of the canal, especially during mayor rainfall events.

According to the Biophysical report the significance assessment of impacts on the terrestrial ecosystems, aquatic ecosystems, rare and protected plant species and is of low significance. If the negative impacts have real effects it should not have an influence on the decision to proceed with the project.

Although the impact rating for the terrestrial ecosystem on the development site is “high” (table 10, appendix G), the rating should also be seen from the point of view of the extent of this vegetation in the region. Although the impact rating on the development on the terrestrial habitats is high, the rating on sensitivity is low, with an overall significance rating of low. The area is very disturbed in places with infrastructure and wind-breaks of alien trees contributing to the low sensitivity rating. The sensitivity of the aquatic systems is in general high, but because the development will have a low impact, the overall significance rating is low.

Mitigation

The following basic recommendations must be taken into account during the planning, construction and operation phases of this proposed development. They are as follows:

- A number of trees and shrubs of the protected *Acacia erioloba* and *Boscia albitrunca* occur scattered on the site. Individuals of *Aloe dichotoma* are also found. Protected plant and tree species should not be disturbed without the necessary permits.
- Protected plant species on site should be conserved if possible. Permits are required to remove these species.
- The root feeding zone of these trees should not be disturbed and/or compacted at all, as trees absorb moisture as well as oxygen through the fine hair roots occurring in this area. No filling, cutting or addition of topsoil should thus be done within this area.
- All invader species such as *Prosopis sp.* - *suidwesdoring*, should be removed.
- Roads should be restricted especially in areas where no planting

has been done. This will prevent unnecessary destroying of the natural vegetation and also prevent erosion. After rains, roads should be repaired and no new tracks made next to eroded roads.

General measures to be taken:

No disturbance of any protected flora may take place without the required permit from the Department of Environment and Nature Conservation and no disturbance of any protected flora may take place without the required permit.

Any possible impacts will be addressed by careful planning, the planting of endemic plants and minimal water abstraction.

6.3 Fauna

During the initial site investigation, no Red Data species were identified at the site and no remains of livestock were present at the site. Small fauna such as hares and bird species may be present, however it is not anticipated that the proposed development will have a significant negative effect on these fauna.

According to the Biophysical Survey of Melkstroom the field survey was done in March 2012 by Dr N van Rooyen of Ekotrust cc. As mentioned large areas of the site are disturbed by habitation, sheds, orchards, vineyards, bare areas, cultivation and tree shelterbelts. Some parts of the site has a rocky and sparse vegetation cover and is not favourable for faunal occupation. Along the seasonal drainage lines, some places next to the canal and on the banks of the Orange river, some dense woody vegetation is found which provides shelter and habitat for faunal species. Besides some trees being protected, they form important food sources and habitats for various fauna. The underbrush normally associated with these species also forms an important micro-habitat for a number of animal species.

According to the significance assessment of impacts on fauna the rating

is low. The need to consider a biodiversity offset is only triggered when residual biodiversity impacts of moderate to higher significance are evident.

A list of the relatively rare mammals that potentially occur in the immediate region of the study area has been included under Chapter 9 in the Biophysical report done by Dr N van Rooyen.

Habitat destruction and the possible genetic contamination of species are however all factors that can negatively impact on vertebrate species, but can be minimized through applying the following mitigation measures:

Mitigation

- No hunting of small game with dogs may be allowed.
- In order to ensure that all fauna will be able to relocate to the adjacent veld, openings should be made in the fences surrounding the proposed development area, before any construction work may begin.

An Environmental Management Plan will be compiled and included in the EIA report and this EMP will also address important issues such as the prohibition of the hunting of small game etc.

6.4 Land uses

The proposed development area is situated within the urban edge as described in the Spatial Development Framework for //Khara Hais Municipality (figure 1). In the immediate vicinity of the proposed development, various landuses such as agriculture (vineyards) residential properties, commercial, feeding pens and auctioneers are to be found. Directly north of the proposed development is the N14 road between Upington and Olifantshoek.

Although the majority of the adjacent land uses is of an agricultural

nature, the nature of the proposed development will therefore have no significant negative impact on any surrounding land uses in the area and will contribute in a positive manner as it will provide work opportunities and housing in the area.

A Geotechnical survey was done by Soilkraft cc and the report attached as Appendix I was compiled in May 2012. According to this report the site can be regarded as suitable for housing development. The classification as indicated below takes into account the parameters as set out in Table 3 of the GFSH 2 document as considered for the compilation of this report.

6.5 Water

The proposed development will be incorporated into the existing water supply system of //Khara Hais municipality. Due to the fact that the water is a scarce resource, proper planning needs to be done in order to ensure the sustainable utilization thereof and therefore a detailed bulk services investigation has been undertaken and will be included in the EIA report.

Water will be used for normal construction purposes and human consumption and no abnormalities in this regard are foreseen.

As mentioned in this report the disposal of solid waste will be done at the existing solid waste disposal site of //Khara Hais municipality. All facilities in use during the construction phase must be utilized and maintained in a manner that prevents pollution of any groundwater resources.

According to the Biophysical Report it seems that the water flowing down the natural drainage lines on site is blocked from flowing down to the Orange River by the Canal on the floodplains that flows through the site from west to east. These drainage lines should be preserved and managed to prevent damage, flooding and silting of the canal, especially

during major rainfall events.

The applicant is referred to section 19 of the National Water Act, 1998 (Act 36 of 1998) with regard to the prevention of, and remedies for the effects of pollution. In terms of this section of the Act, the person who owns controls, occupies or uses the land in question is responsible for taking measures to prevent pollution of water resources and property.

Mitigation

1. No facilities may be erected within a radius of 100m from a water source or within the 1:100 year floodline of a natural watercourse.
2. No watercourses will be disturbed and if development is closer than 32 m from a water course a delineation must be done. Water courses will be taken into account during the planning phase.
3. Detail layout plans of the final design must be submitted to Department of Water Affairs.
4. Measures should be implemented to reduce water use within the proposed development where possible.
4. Environmental education programs for workers will ensure that they will be sensitive to the environment and report incidents such as leaking taps, soil contamination, hunting of small game etc.
5. Stormwater runoff must be taken into account. Stormwater must be diverted from the construction works and roads and stormwater control works must be constructed and maintained in a suitable manner throughout the project, including the management of increased runoff due to the clearing of vegetation.
6. No contaminated stormwater may leave the site.
7. No material with pollution generating potential will be used in any construction activities.
8. No servicing of vehicles and machines within the 1:100 year floodline or within 100m of a watercourse. Oils etc. should be disposed of at a licensed site.

9. All hazardous substances must be handled according to the relevant legislation relating to transport, storage and use.

6.6 Sewage disposal

The proposed development will be incorporated into the sewerage system of //Khara Hais municipality which consists of an activated sludge process sewerage system. The Municipality and the developer will in conjunction with each other provide this service to the proposed development and to the Melkstroom Agri-Village. This sewerage system will be constructed on the adjacent property of Melkstroom Agri-Village and the approvals for this system from relevant Departements will be handled by //Khara Hais Municipality and the consulting engineers.

During the construction phase, the contractor must also provide sufficient sanitation facilities for the use of his employees. He will be solely responsible for the proper use and maintenance thereof in conditions, which are to the satisfaction of the engineer and the Municipality. All these facilities must be positioned in such a way that it will be within walking distance from the construction site.

These facilities should also be sited, in terms of the National Water Act, 1998 (Act 36 of 1996), in such a way that they do not cause water or other pollution.

Mitigation

Other specifications to be adhered to are, amongst others, the following;

- All facilities provided at the site must comply with the requirements of the Local Municipality.
- No facility may be erected within a radius of 100m from a water source.
- The applicant/contractor must be held responsible for the cleaning of the sanitary facilities to prevent health hazards for the duration of the contract.
- Sanitary facilities must be provided at a ratio of one (1) facility for

every ten (10) persons.

All sanitation facilities must be sited, in terms of the specifications of the *National Water Act no. 36 of 1998*, in such a way that they do not cause water- or other pollution.

6.7 Solid waste disposal

During the construction period

The solid waste will be restricted to household waste of workers during the construction phase. Uncontrolled dumping of waste is illegal and will not be permitted. Waste containers must be provided, emptied at regular intervals and dumped at an approved solid waste disposal site.

Should the contractor not plan to dispose of this household waste at an approved solid waste disposal site, it will be necessary to apply for a temporary waste disposal permit according to the specifications of the *National Environmental Management: Waste Act 2008 (No.59 of 2008)* under the jurisdiction of the Department of Environment and Nature Conservation. The use of temporary solid waste disposal sites is however not recommended.

During the operational phase

The proposed development will be integrated with Upington's existing refuse removal systems. The Municipality will collect the waste directly from each residence and business within the development. It is estimated that the total development will yield 650m³ solid wastes per annum. All refuse removed will be disposed of at the formal, solid waste disposal site of the municipality.

The prospect of establishing a recycling plant for solid waste management should also be investigated by the developer and the local authority as a development of this nature provides the perfect opportunity for putting the concepts of environmentally friendly development into practice.

6.8 Electricity

The area where the proposed development will take place is near to the Keidebees residential area in Upington and will form part of the existing electrical reticulation system of Escom and //Khara Hais Municipality. The proposed development will also be incorporated into this existing system.

The construction of the facilities will however comply with the requirements of SANS 10400 Section X, with regard to the design and construction material which will be used in order to ensure optimal use of energy by the facilities constructed.

Insulating the ceiling helps make a building more comfortable and energy efficient. Up to 50% of heat loss in a building can be attributed to a lack of ceilings and ceiling insulation. By insulating a building with efficient ceilings, heating and cooling expenses and energy usage can be minimized.

The flow of air into and out of a building occurs inadvertently as infiltration/infiltration and deliberately as ventilation. Air leakage into and out of the building is one of the contributors to high heating and cooling costs. Air leakage can occur wherever different material or parts of the building meet. Caulking and weather-stripping are the ideal methods that can be used in the design and construction for closing the loopholes through which heat escapes.

The current national situation with regard to the provision of electricity however requires a new way of thinking and the exploring of other ways and means of generating electricity. In this regard, the possibility of making use of electricity saving devices such as solar water heaters etc. should also be considered during the design of the building.

6.9 Air and noise pollution

Air Pollution

During the construction phase, and due to the nature of the project, an amount of smoke (from machines) and dust will be generated. Dust pollution may have an impact on the operational workers.

Mitigation

In order to minimize the effect of dust pollution, the construction area can be kept wet as far as possible and the workers must wear the necessary safety clothing.

The applicant is referred to section 19 of *the National Water Act no. 36 of 1998* with regard to the prevention of, and remedies for, the effects of pollution. In terms of this section of the Act, the person who owns controls, occupies or uses the land in question is responsible for taking measures to prevent pollution of water resources and property.

Noise Pollution

During the construction phase there may be minimal and sporadic incidents of air and noise pollution due to the construction activities such as dust and noise as a result of earthworks. Due to the fact that the area is situated nearby a residential environment, the working hours should be strictly enforced by the contractor and the developer.

Mitigation

The contractor should make adequate provision to prevent or minimize the possible effects of noise pollution. Should the noise from the construction work be found to cause problems, work hours in these areas may be restricted between 07:00 and 19:00, or as otherwise agreed between the parties involved. Strict measures should therefore be enforced, especially in terms of the contract specifications, to prevent any negative impacts in this regard.

6.10 Public health characteristics

Due to the nature of the development, there will be minimal, if any, dangers of the health of workers being jeopardized. The proposed development will occur according to the specific need of the site and the contractor will have to make use of trained staff. Where local communities are employed, it will be the responsibility of the contractor to see to their safety and to provide the relevant training for the execution of their tasks.

6.11 Risks and hazards

The applicant and the contractor should meet the following general conditions and requirements with regard to the proposed development:

- The contractor will have to ensure that all the necessary precautions in terms of the necessary legislation and contract specifications are taken to guarantee the safety of the workers and the public.
- Oil and fuel must at all times be properly stored in containers such as drums and tanks that are properly sealed.
- Drip pans must always be attached to stationary machines such as compressors, generators, etc. These drip pans should be regularly monitored and cleaned when necessary. In case of oil, diesel or petrol spills, immediate action should be taken to prevent the spill from contaminating ground- or surface water.

SECTION G

7. ENVIRONMENTAL IMPACT STATEMENT

During the Environmental Impact Assessment process it was found that the possible impacts as listed in the report can be classed as being of low significance especially if the proposed mitigation measures are adhered too. According to the Biophysical Report the impact rating on the drainage lines will also be low only if no developments occur on the floodplains and the buffer zone of 32m is enforced where no development must occur (see mitigation 1 and 2 of par.6.5).

The overall impact of the proposed development will be of a permanent nature. Minimal vegetation will be lost or changed. The significance of the loss or changing of vegetation that is not pristine must be weighed against the probable direct as well as indirect economic gain associated with the proposed development. The significance can thus be concluded as to be of low importance should the prescribed mitigation measures be implemented.

Recommendation by the Practitioner

After consideration of the proposed development it is recommended that a positive record of decision be granted on the following conditions:

1. That all the mitigation measures outlined in this report, specialist reports, as well as the Environmental Management Plan (EMP – Appendix J) are documented in the Environmental Authorisation.
2. That the mitigation measures as well as conditions of the EMP are legally binding on the applicant as well as the successful contractor.
3. That all accompanying approvals/licenses from the relevant sector departments, such as Water Affairs, Department of Agriculture, Forestry and Fisheries, Department of Environment and Nature Conservation as well as other institutions and

organizations mentioned in the report, be obtained by the developer.

Determining identified impact significance:

POTENTIAL IMPACTS	EXTENT – site specific, local, regional, national of international	INTENSITY – L within site boundary, M beyond site boundary, H widespread	DURATION – L short term (0 – 5 years), M (5 – 15 years), H (15 + years)	MITIGATORY POTENTIAL – L no mitigation for negative impact, M potential to mitigate neg. imp, H mitigate neg.imp. to insignificant effects.	ACCEPTABILITY – L acceptable, M manageable, H unacceptable	DEGREE OF CERTAINTY – L(unsure) less than 40%the likelihood of an impact occurring, M(probable) over 40 %, H(unacceptable) more than 90% sure of the
5.1 ARCHAEOLOGICAL	Site specific	L	L	L	L	L
5.2 FLORA	Site specific	L	L	M	M	L
5.3 LAND USES	Site Specific	L	M	M	L	L

POTENTIAL IMPACTS	EXTENT – site specific, local, regional, national of international	INTENSITY – L within site boundary, M beyond site boundary, H widespread	DURATION – L short term (0 – 5 years), M (5 – 15 years), H (15 + years)	MITIGATORY POTENTIAL – L no mitigation for negative impact, M potential to mitigate neg. imp, H mitigate neg.imp. to insignificant effects.	ACCEPTABILITY – L acceptable, M manageable, H unacceptable	DEGREE OF CERTAINTY – L(unsure) less than 40%the likelihood of an impact occurring, M(probable) over 40 %, H(unacceptable) more than 90% sure of the
5.4 WATER AVAILABILITY	Local	L	M	M	M	L
5.5 SEWAGE DISPOSAL	Site Specific	L	M	M	L	L
5.6 SOLID WASTE	Site Specific	L	M	M	L	L

POTENTIAL IMPACTS	EXTENT – site specific, local, regional, national of international	INTENSITY – L within site boundary, M beyond site boundary, H widespread	DURATION – L short term (0 – 5 years), M (5 – 15 years), H (15 + years)	MITIGATORY POTENTIAL – L no mitigation for negative impact, M potential to mitigate neg. imp, H mitigate neg.imp. to insignificant effects.	ACCEPTABILITY – L acceptable, M manageable, H unacceptable	DEGREE OF CERTAINTY – L(unsure) less than 40%the likelihood of an impact occurring, M(probable) over 40 %, H(unacceptable) more than 90% sure of the
5.7 POLLUTION: AIR NOISE	Site Specific Site Specific	L L	L L	M L	L L	L L
5.8 PUBLIC HEALTH	Site Specific	L	L	M	L	L
5.9 RISKS + HAZARDS	Site Specific	L	M	M	L	L

