



DRAFT SCOPING REPORT

for

OLIEN SOLAR ENERGY

on

Prt 4 of Farm 300 Barkly West

Lime Acres, Northern Cape

In terms of the
National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended



Prepared for Applicant: AE-AMD Renewable Energy (Pty) Ltd

By: Cape EAPrac

Report Reference: KGA167/09

Department Reference (Environmental Affairs): 14/12/16/3/3/2/371

Case Officer: To be Assigned by Department

Date: 17 September 2012

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PURPOSE OF THIS REPORT:

Stakeholder Review & Comment

APPLICANT:

AE-AMD Renewable Energy (Pty) Ltd

CAPE EAPRAC REFERENCE NO:

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SUBMISSION DATE

17 September 2012

DRAFT SCOPING REPORT & PLAN OF STUDY FOR IMPACT ASSESSMENT

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National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended

OLIEN SOLAR ENERGY

Prt 4 of Farm 300 Barkly West, Lime Acres

Submitted for:

Stakeholder Review & Comment

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Title:	DRAFT SCOPING REPORT for the proposed 'Olien Solar Energy Project'
Purpose of this report:	<p>This Draft Scoping Report forms part of a series of reports and information sources that are being provided during the Environmental Impact Assessment (EIA) for the proposed Olien Solar Project in the Northern Cape Province. In accordance with the EIA Regulations, the <u>purpose of the Scoping Report</u> is to:</p> <ul style="list-style-type: none"> • Provide a DESCRIPTION of the proposed project, including a sufficient level of detail to enable stakeholders to identify relevant issues and concerns; • Describe the LOCAL ENVIRONMENT and developmental context within which the project is proposed, to assist further IDENTIFYING ISSUES & CONCERNS; • Provide an OVERVIEW OF THE PROCESS being followed in the Scoping Phase, in particular the public participation process, as well as present the Plan of Study for EIA that would be followed in the subsequent EIA phase; • Present the issues and concerns identified to date from the BASELINE SPECIALIST STUDIES and the initial stakeholder engagement process, as well as an explanation of how these issues will be addressed through the EIA process. <p>This Draft Scoping Report is made available to all stakeholders for a 40 day review and comment period, 17 September to 29 October 2012.</p>
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Published by:	<i>Cape Environmental Assessment Practitioners (Pty) Ltd. (Cape EAPrac)</i>
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ABBREVIATIONS

AIA	Archaeological Impact Assessment
BGIS	Biodiversity Geographic Information System
BID	Background Information Document
CBD	Central Business District
ACMP	Archaeological Conservation Management Plan
CDSM	Chief Directorate Surveys and Mapping
CEMP	Construction Environmental Management Plan
dBA	Decibel (measurement of sound)
DEA	Department of Environmental Affairs
DEA&DP	Department of Environmental Affairs and Development Planning
DEIR	Draft Environmental Impact Report
DME	Department of Minerals and Energy
DSR	Draft Scoping Report
FEIR	Final Environmental Impact Report
EAP	Environmental Impact Practitioner
EHS	Environmental, Health & Safety
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMP	Environmental Management Programme
GPS	Global Positioning System
GWh	Giga Watt hour
HIA	Heritage Impact Assessment
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
IFC	International Finance Corporation
IPP	Independent Power Producer
KOP	Key Observation Point
kV	Kilo Volt
$L_{Aeq,T}$	Time interval to which an equivalent continuous A-weighted sound level
LSU	Large Stock Unit
LUDS	Land Use Decision Support
LUPO	Land Use Planning Ordinance
MW	Mega Watt
NEMA	National Environmental Management Act
NEMAA	National Environmental Management Amendment Act
NEMBA	National Environmental Management: Biodiversity Act
NERSA	National Energy Regulator of South Africa
NHRA	National Heritage Resources Act
NID	Notice of Intent to Develop
NSBA	National Spatial Biodiversity Assessment
NWA	National Water Act
PIA	Paleontological Impact Assessment
PM	Post Meridiem; "Afternoon"
SACAA	South African Civil Aviation Authority
SAHRA	South African National Heritage Resources Agency

SANBI	South Africa National Biodiversity Institute
SANS	South Africa National Standards
SDF	Spatial Development Framework
SMME	Small, Medium and Micro Enterprise
TIA	Traffic Impact Assessment
VIA	Visual Impact Assessment

VERKORTE OPSOMMING

2 INLEIDING

Cape EAPrac is deur AE-AMD Renewable Energy (Edms) Bpk aangestel (wat hierna verwys na sal word as die Aansoeker), as onafhanklike omgewingsbeoordelingspraktisyn wat verantwoordelik is vir die fasilitering van die Omvangs- en Omgewingsinvloedbepaling (OIB) proses soos vereis word in terme van die Wet op Nasionale Omgewingsbestuur (NEMA, Wet 107 van 1998, soos gewysig) vir die voorgestelde ontwikkeling van die *Olien Solar Energy Project* noord-oos van die dorp Lime Acres in die Noord-Kaap Provinsie.

Die *Olien Solar Energy Project* behels die ontwikkeling van 'n hernubare sonenergie fasiliteit met die doel om 75 Megawatt (MW) wisselstroom hernubare sonenergie te genereer. Die projek sal 'n area van ongeveer 225ha dek. Die projek sluit ook gepaardgaande infrastruktuur in, insluitend: toegangspaaie, een of meer beheer-en-kontrole geboue, opgradering van die bestaande substasie, elektriese verbindingslyn, metingstoerusting, werkswinkel en stoorplek, en 'n sekuriteitsgebou.

Die fasiliteit sal omhein word en sekuriteitstelsels sal geïnstalleer word vir veiligheid. Die ontwikkeling word voorgestel op die suidelike gedeelte van Gedeelte 4 van die Plaas 300 Barkly West, duskn Lime Acres.

3 BREE KONTEKS

Die ontwikkelingsterrein van die voorgestelde Olien hernubare sonenergie projek is Gedeelte 4 van die Plaas 300 Barkly West. Die eiendom is in privaat besit en word hoofsaaklik aangewend as weiding vir diere en wild. Die terrein is 15km oos van Lime Acres en 120km noord-wes van Kimberley geleë. Die R385 loop wes van die terrein en die Lime Acres spoorlyn, wat onder andere Postmasburg in die weste met hierdie area verbind, halveer die eiendom in twee gedeeltes. Die area noord van die spoorlyn dek ongeveer twee-derdes van die plaas met die ander derde van die plaas wat suid van die spoorlyn lê.

Die hernubare sonenergie projek word slegs op die gedeelte suid van die spoorlyn beplan. Dit is ook op dieselfde suidelike gedeelte waar 'n bestaande substasie geleë is, wat die sonenergie projek via 'n kort elektriese aansluitingslyn na die substasie sal koppel.

Die suidelike deel van die betrokke eiendom suid van die spoorlyn is ongeveer 575ha groot en die voorstel is dat die sonenergie ontwikkeling 225ha (39,13%) van hierdie 575ha sal opneem. Die eiendom het 'n Landbousone I sonering en die nodige vergunningsgebruiksregte sal bekom moet word ten einde die sonenergieprojek te mag implimenteer.

4 TERREIN BESKRYWING & EIENSKAPPE

Die ontwikkelingsterrein is geleë buite die Lime Acres stedelikegrens en toegang word via die R385 verkry. Die hele plaas se natuurlike toestand is deur die landbou-praktyke van die afgelope paar dekades, verander. Lae intensiteit vee (bees, skaap, bok, wild) boerdery word tans op die terrein onderneem.



Figuur 1a&b:terrein fotos van Gedt 4 van Plaas 300

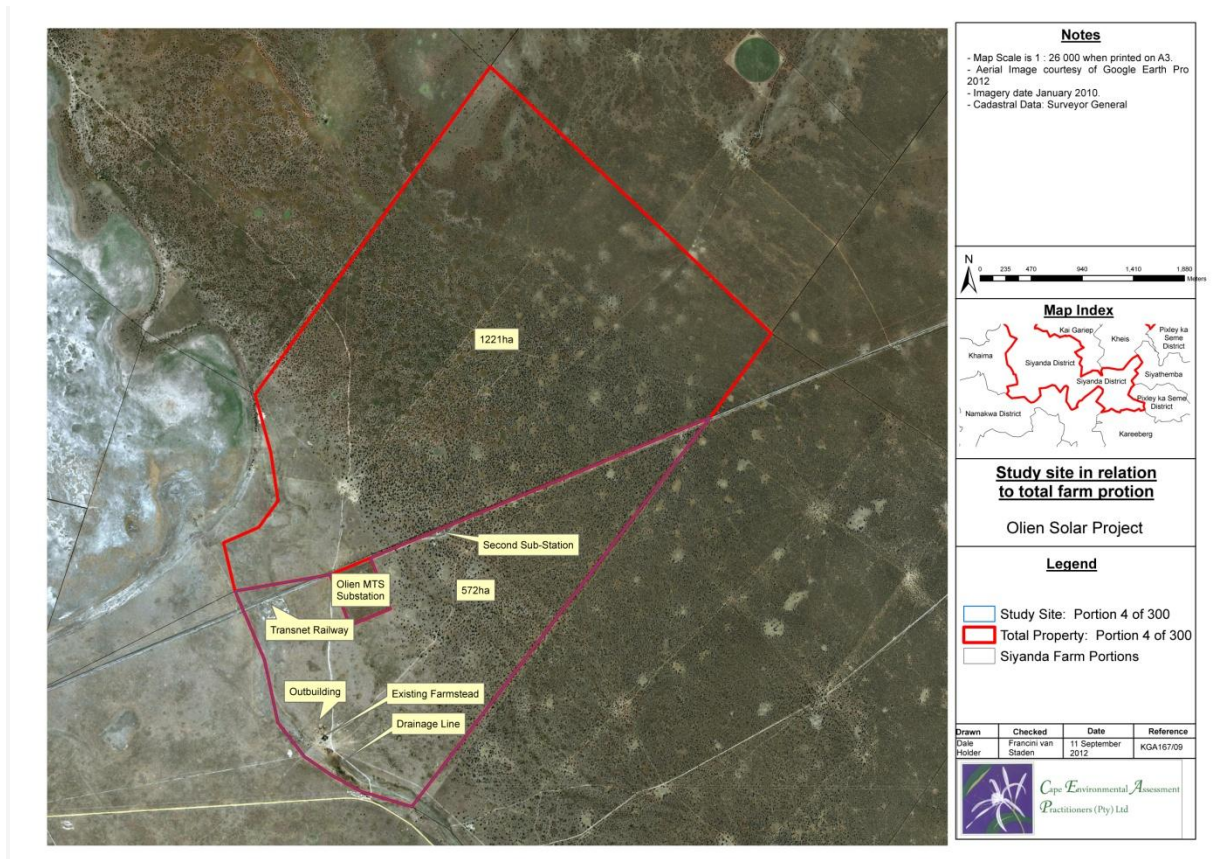
Bestaande geboue en infrastruktuur op die plaas is hoofsaaklik beperk tot die volgende:

- 'n Plaashuis met gepaardgaande buitegeboue;
- Vee fasiliteite (damme, krale);
- Twee ESKOM substasies onder andere die 'major transmission substation' genaamd die MTS Olien Substasie;
- Twee ESKOM oorhoofse kraglyne;
- Transnet spoorlyn, en
- Munisipale water pyplyn in die spoorweg serwituut.

Naas die nasionale, provinsiale en plaaslike infrastruktuur op die plaas, is dit slegs die plaashuis, buitegeboue en vee infrastruktuur wat in privaat gebruik is. Die gedeelte van die terrein waar die ontwikkeling voorgestel word, is vry van enige van die bogenoemde prominente infrastruktuur, dus sal die ontwikkeling nie inbreuk maak op die bestaande infrastruktuur nie.

SANBI BGIS klassifiseer die grondtipe in die gebied as Litho-grond (sien aangehegte LUDS Evaluering in Bylaag F). Mucina (2006) en die Nasionale Ruimtelike Biodiversiteit Assessering (BGIS, 2007) klassifiseer die gebied se oorspronklike natuurlike plantegroei as Ghaap Plateau Vaalbosveld, Suidelike Kalahari Mekkacha en Suidelike Kalahari Soutpan plantegroei. Sien Bylae F vir 'n visuele voorstelling van die SANBI inligting. Meer besonderhede oor die tipe plantegroei geïdentifiseer is ingesluit in die Ekologiese Terrein Assessering, en word in Afdeling 7 van die Hoof Verslag opgesom.

Die volgende plan wys die bestaande infrastruktuur en volledige plaas (sien Bylaag B vir 'n groter kaart):



5 ONTWIKKELING VOORSTEL EN ALTERNATIEWE

Die voorgestelde Olien Solar projek bestaan uit 'n konsentrasie van fotovoltaiiese panele wat na verwagting hernubare sonkrag tot 'n kapasiteit van 75MW (megawatt) sal genereer. Die ontwikkeling sal ook gepaardgaande infrastruktuur benodig, waarvoor voorsiening gemaak sal word. Die gepaardgaande infrastruktuur sal die volgende insluit:

- Fotovoltaiëse (PV) panele wat oor geïdentifiseerde areas sal strek en omsetters en ander elektriese toerusting sal insluit;
- Transformasie sentrum wat 'n transformator en verwante beskermingstoestelle sal insluit;
- Verspreidingsentrum vir die verspreiding van elektrisiteit na die Eskom-substasie;
- Gebou(e) vir die beheerkamer en administrasie, ongeveer 40m²;
- Elektriese meettoerusting en fasiliteite;
- Werkswinkel en stoor van ongeveer 300-400m²;
- Struktuur neersettingsarea en parkeerarea;
- Struktuur samestellingsarea;
- 'n Kort verbindingslyn na die MTS Olien Substasie;
- Enige potensiële uitbreiding van die bestaande substasie;
- Meteorologiese stasie met struktuur van 3meter hoog;
- Opgradering van die bestaande toegangspad;
- Personeel fasiliteite (kombuis, ablusie fasiliteite) van ongeveer 40m²;
- Waghuis van ongeveer 100m², en
- Omheining en sekuriteit, insluitend sekuriteitsbeligting vir die aanleg.

Verskeie alternatiewe vir toepaslike tegnologie van die sonpanele, sowel as alternatiewe vir die uitleg van die sonpanele en gepaardgaande infrastruktuur, sal oorweeg word en deur moontlike omgewingsbeperkinge ingelig word. Omgewingsbeperkinge sal gedurende die vroeë fase van die omgewingsproses geïdentifiseer word.

5.1 ALTERNATIEF 1: 75 MW (VERKOSE ALTERNATIEF)

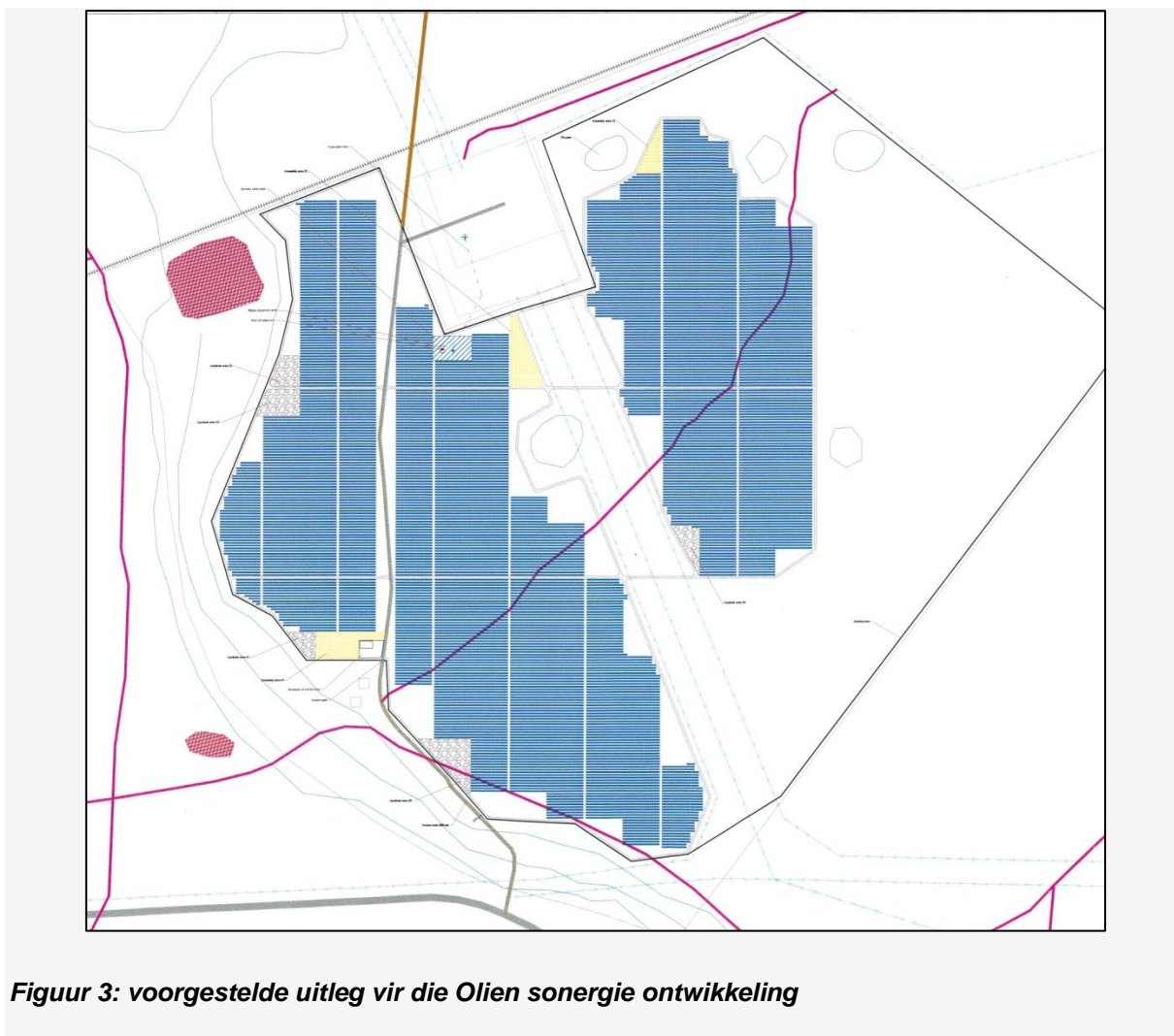
Alternatief 1, die verkose opsie vir hierdie ontwikkeling, stel 'n ontwikkeling van 'n sonenergie fasiliteit met 'n voorgestelde opwekkingsvermoë van 75 megawatt (MW) voor. Die ontwikkeling sal bestaan uit sonenergie paneel velde met vaste sonpaneel strukture (stilstaande sonenergie tegnologie). Hierdie ontwikkelingskonsep sal 'n maksimum area van 3ha per MW wat gegeneer word benodig, dus sal die ontwikkeling ongeveer 225ha opneem.

Die ontwikkelingskonsep kan beskryf word as son- of fotovoltaïese modules, geaard op grondvlak in 'n spesifieke noordelike oriëntasie, rigting en hoek, en waar die struktuur uit geen bewegende dele bestaan nie. Sonenergie fasiliteite soos wat hier voorgestel word, met vaste strukture in bepaalde posisies, is die mees algemene tegnologiese opsie. Vir die oprigting van die sonpaneel strukture, is daar 'n paar moontlike opsies vir fondasies. Hierdie moontlikhede sluit onder andere betonfondasies of drill gedrewe staalfondasies in. Die fondasie tipe sal bepaal in watter mate fondament slote nodig sal wees.



Figure 2a&b: Voorbeelde van vaste sonpaneel struktuur tegnologie

Die volgende figuur toon die beoogde uitleg van die fasiliteit, met die fotovoltaïese uitleg (blou) sowel as verdere infrastruktuur: (Sien Bylaag B vir 'n groter weergawe van die kaart).



Figuur 3: voorgestelde uitleg vir die Olien sonergie ontwikkeling

5.2 ALTERNATIEF 2: 150MW GROTER ONTWIKKELINGSAREA (FOOTPRINT)

Alternatief 2 was die aanvanklike ontwikkelingskonsep wat die ontwikkeling van die sonenergie fasiliteit op die hele deel suid van die spoorlyn, 'n gebied van 450ha, voorgestel het. 'n Ontwikkelingsarea van 450ha sou vir elektrisiteit opwekking van 150MW meegebring het. Die basiese biofisiese en ekologiese terrein ondersoek asook die terrein eienskappe het egter sekere beperkinge en areas op die terrein wat vermy moet word ten einde potensiële impakte op die omgewing te vermy, aangedui. Die volgende kaart dui die beperkinge aan:



Figuur 4: Beperkingskaart vir ontwikkelingssterrein

5.3 TEGNOLOGIESE ALTERNATIEF: SON OPSPORINGSTELSEL

Die alternatief van 'n son opsporingstelsel, waar die sonpaneel beweeg na mate die son skuif, is 'n tegnologiese alternatief wat oorweeg word vir die voorgestelde sonenergie fasiliteit. Son opsporingstelsels is 'n duurder tegnologie en behels die volg van die son, dikwels deur middel van meer as een struktuur as. As gevolg van die aantal ure wat die fotovoltaïese panele aan die son blootgestel word, kan hierdie tegnologie egter 'n hoër opbrengs lewer omdat meer sonskyn ure betrokke is, en dus kan 'n hoër kapasiteit energie gegenereer word. Hierdie tegnologie vereis egter 'n groter ontwikkelingsarea (voetprint), tussen 4.5 tot 6ha per MW wat genereer word.



Figuur 5: Tegnologiese alternatief: son opsporingstelsel tegnologie

5.4 STATUS QUO / GEEN ONTWIKKELING ALTERNATIEF

Die Status Quo alternatief stel voor dat die sonenergie ontwikkeling nie ontwikkel word nie en dat die plaas gedeelte suid van die spoorlyn, onontwikkeld en in die huidige lae-intensiteit landbou toestand bly.

Alhoewel die ontwikkelingsterrein tans gebruik word vir lae-intensiteit veeboerdery is die landbou-potensiaal van die plaas laag. As sodanig, is die voortgesette gebruik van die grond vir landbou doeleindes nie noodwendig die optimale benutting nie.

5.5 ALTERNATIEWE UITLEGTE EN ONTWERP

Alternatiewe uitlegte sal oorweeg word en as deel van die omgewingsproses en aangepas word waar nodig. As deel van die Omvangbepalingsfase, is 'n terrein-spesifieke beperkingskaart opgestel wat uit die verskillende beperkinge, wat tot en met op datum deur die spesialis geïdentifiseer is, weergee. Die studies wat onderneem is, kan in Bylae D van hierdie verslag, nagegaan word.

Hierdie beperkingskaart dien om verdere uitlegte van die voorgestelde sonenergie fasiliteit te hersien en in te lig. Hierdie omgewingsproses sal dus 'n oorweging van verskeie uitleg alternatiewe insluit en deurgaans oorweeg.

Veranderinge en / of wysigings aan die voorgestelde ontwikkeling konsep en uitleg, asook die gepaardgaande strukture en infrastruktuur (paaie, oorhoofse kraglyne, sub-stasies ens), sal dus aangepas word deur insette en terugvoering soos voorsien deur die projekspan asook soos deur die publiek, owerhede en belanghebbende partye.

6 PROFESSIONELE PROJEKSPAN

'n Projekspan is deur die Aansoeker aangestel om met die onderneming van die omgewingsproses en verwante ondersoeke en spesialis studies te help. Hierdie konsultante en spesialis sluit in:

Tabel 1:

Spesialisveld	Kontakpersoon	Maatskappy
Omgewingskonsultante	Louise van Zyl & Francini van Staden	Cape EAPrac
Ekologie	Simon Todd	Simon Todd Ecological Consulting
Paleontologie	Dr Jennifer Botha-Brink	Privaat kapasiteit
Argeologie	Dr David Morris	Privaat kapasiteit
Erfenis	Dr David Morris	Privaat kapasiteit
Landbou	Christo R Lubbe	CR Lubbe
Tegnies	JCC Berrington	AE-AMD Renewable Energy

Hierdie spesialiste het reeds basiese ondersoek / studies vir die sonenergie ontwikkeling onderneem en die inligting is gebruik om hierdie Omvangsbepalingsverslag in te lig. Die volgende afdeling verskaf meer gedetailleerde inligting oor die individuele ondersoek.

7 SPESIALIS ONDERSOEKE / STUDIES

As deel van die Omvangbepalingsfase van die omgewingsproses, is 'n aantal aspekte reeds deur spesialiste oorweeg om die huidige status van die terrein te identifiseer, asook om potensiële risiko's en impakte wat verband hou met die ontwikkeling van die hernubare energiefasiliteit, te identifiseer. Hierdie studies en ondersoek word in meer detail in die Hoof Verslag bespreek (Afdeling 7), terwyl die volle spesialis verslae beskikbaar is in Bylae D.

Landbou Potensiaal van die terrein is laag. Volgens die landbou studie is dit weens kenmerkende klimaats-en grondtoestande van die gebied. Die terrein se weidingkapasiteit word geskat as tussen 21 - 25 ha / GVE (Grootvee Eenheid), wat gelykstaande aan 'n lae weidingkapasiteit is. Gegewe die terrein se lae potensiaal vir landbou, is daar tot die gevolgtrekking gekom dat die voorgestelde sonenergie fasiliteit minimale en onbeduidende impakte op die landbou-potensiaal van die terrein sal hê veral in die lig gesien dat dit slegs op 'n relatief klein gedeelte van die groter plaas voorgestel word.

Ekologiese Terrein Analise het getoon dat die ontwikkelingsterrein 'n ekologiese sensitiwiteit het wat wissel van laag (westelike deel van die terrein) tot relatief hoog in die oostelike deel van die terrein. Die sensitiwiteit van die terrein is nou verwant aan die teenwoordigheid van 'n aantal boom spesies sowel as die digtheid van die bome na mate mens in 'n oostelike rigting beweeg. Hoewel sommige van die boom spesies wat hier gevind is onder provinsiale wetgewing beskerm word, is hulle nie skaars of bedreigde spesies nie. Oor die algemeen gesproke is die terrein se plantegroei rykdom relatief laag, met minder as 50 plantspesies wat vir die hele terrein aangeteken is. Gebaseer op die resultate van die studie, bestaan die terrein nie uit uitgebreide gebiede van hoogs sensitiewe spesies of ekosistiem tipes nie. Die moontlike impak van die ontwikkeling sal hoofsaaklik lokale impak van lae beduidendheid hê, onderhewing aan maatreëls om die moontlik impak te verlaag.

Paleontologiese studie het aangedui dat die neerslag tipe, te same met swak oppervlak blootstelling van die ontwikkelingsterrein die area nie sensitief maak vir potensiële fossiel vondse nie. Die waarskynlike afwesigheid van belangrike fossiele op die ontwikkelingsterrein, bepaal deur die gevolgtrekking van die paleontologiese ondersoek, dui aan dat geen noemenswaardige paleontologiese impakte as gevolg van die sonenergie fasiliteit, verwag word nie.

Argeologiese studie het 'n algemeen baie lae digtheid van oppervlak argeologiese materiaal bevind. Die minimale voorkoms van klipwerktuie waargeneem op die ontwikkelingsterrein, word vanuit 'n argeologiese oogpunt as van minimale belang beskou.

Erfenis studie het bewyse van die Koloniale era op die ontwikkelingsterrein gevind, wat krale van grondmateriale insluit. 'n Ry van vyf ongemerkte grafte is ook gevind. Die erfenis

spesialiste het aanbeveel dat hierdie grafte vermy moet word en dat geen infrastruktuur hier opgerig mag word nie. Vanuit 'n erfenis oogpunt is die verwagte impak minimaal en is die ontwikkelingsterrein nie met 'n hoë erfenisstatus geïdentifiseer nie.

Siviele-en Tegnologiese verslag verskaf 'n oorsig van die toepaslike tegnologie beskikbaar vir sonenergie ontwikkelings, asook hoe sonenergie bedryf word. Die verslag verduidelik die mees waarskynlike tegnologiese opsies vir hierdie projek. Motivering vir die terrein seleksie word gegee, sowel as hoe die son projek aan die bestaande elektriese stelsel sal koppel. Die infrastruktuur wat verband hou met die sonenergie ontwikkeling word in detail beskryf sowel as die basiese besonderhede van die konstruksie-, bedryfs-en potensiële buite diens stelling fases van die projek.

8 PROJEK BEPERKINGE

Die mees beduidende **ekologiese beperking** is die teenwoordigheid van **bome** in die noord-oostelike hoek van die terrein en sodoende is hierdie hele hoek geïdentifiseer as 'n gebied van **hoë ekologiese sensitiviteit**. Die sensitiviteit van die terrein neem toe in ooreenstemming met die 'n wes-oostelike helling, parallel met die toename van boom digtheid. Die digtheid van die bome bereik 'n maksimum van 50/ha in die oostelike deel van die terrein en dus word die oostelike gedeelte van die terrein as die mees sensitiewe area van die totale terrein beskryf en as sulks uitgesluit uit die ontwikkelingsarea.

'n Totaal van **ses klein panne** is vir die ontwikkelingsarea gekarteer. Daar word verwag dat hierdie panne van tyd tot tyd, water vir redelik lang periodes kan hou, met gepaardgaande ondersteuning vir fauna gemeenskappe soos die *Giant Frog*, *Pyxicephalus adspersus*, wat as 'n spesie van bewaringsbelang beskou word. Die ontwikkelingsarea vermei hierdie panne.

'n Ry van **vyf grafte** is op die ontwikkelingsterrein gedokumenteer. Die spesialis het aanbeveel dat die grafte omhein moet word en ontwikkeling moet beperk word tot nie nader as 100meter van hierdie ry grafte nie.

Tot en met op datum het die uitleg en ontwikkeling skonsep hierdie geïdentifiseerde terrein beperkinge **ten volle in ag geneem**.

'n Spesialis beperkingskaart is saamgestel (sien Bylae B) wat alle sensitiewe gebiede van die terrein waar ontwikkeling verkieslik vermy word, aandui. Verdere gedetailleerde impakstudies sal onderneem word as deel van die Impak-evalueringsfase van die omgewingsproses, en waar enige verdere beperkinge geïdentifiseer word, sal vermyding van die potensiële impakte aanbeveel word, gevolg deur die aanbeveling van gepaste versagende maatreëls om die potensiële impakte te verminder.

9 PROSES TOT EN MET OP DATUM

Hierdie Konsep Omvangbepalingsverslag is die tweede verslag in 'n reeks van vyf verskillende verslae en volg op die Aansoekvorm. Die Aansoekvorm, die eerste van die vyf verslae in hierdie omgewingsproses, is op 8 Junie 2012 aan die Departement van Omgewingsake (DO) ingedien. DO is die verantwoordelike owerheid vir hierdie proses en het die Aansoek op 4 Julie 2012 (Verw: 14/12/16/3/3/2/371) aanvaar. Hiermee is *Cape EAPrac* magtiging verleen om met die publieke deelname fase van die omgewingsproses voort te gaan.

Hierdie projek en die omgewingsproses is in die Kalahari Bulletin streeks-en plaaslike koerant (uitgawe van 5 Julie 2012) geadverteer, wat lede van die publiek vra om as belanghebbende en geaffekteerde partye te registreer.

Hierdie Konsep Omvangbepalingsverslag (Verw: KGA167/09) is aan sleutelrolspelers en Belanghebbende en Geaffekteerde Partye (B&GPe) beskikbaar gestel vir insae en die kommentaar periode strek van Maandag, 17 September tot en met Maandag, 29 Oktober 2012.

Hierdie verslag weerspieël die bevindinge van die voorlopige spesialis ondersoeke en verslae (Paleontologie, Landbou-potensiaal, Ekologie, Argeologie en Erfenis, Tegnies). Hierdie verslag en die bogenoemde ondersoeke is ook 'n instrument om die behoefte te identifiseer vir verdere spesialis ondersoeke en invloedbepalings in die geval waar kwessies / impakte nie opgelos kan word tydens die Omvangbepalingsfase nie.

As deel van die proses van openbare deelname is verskeie sleutelrolspelers geïdentifiseer en in kennis gestel van die projek asook in kennis gestel van hul reg om deel te neem en kommentaar op die voorstel te lewer. Die projek is geadverteer en belanghebbendes wat op die advertensie, kennisgewings gereageer het sal gedurende die res van die omgewingsproses op hoogte gehou word. Raadpleeg Afdeling 10 in die Hoof Verslag en Bylaag E vir inligting oor die openbare deelname.

Tot dusver is die volgende belangrike kwessies en besorgdhede geopper deur middel van informele samesprekings met die projekspan, spesialiste, owerhede en die inleidende spesialis studies:

- Grondverlies vir weiding doeleindes;
- Risiko van beserings aan vee gedurende die konstruksiefase;
- Plantegroei skoonmaak en die potensiële impak op sensitiewe ekosisteme;
- Impak op ekologiese landskap konektiwiteit en ekosisteem prosesse;
- Potensiële impak op voëllewe;
- Erosie risiko as gevolg van grondversteuring en verlies aan plantbedekking, en
- Verandering van die argeologiese en erfenis landskap.

Hierdie kwessies word in meer detail beskryf in die Hoof Verslag en Afdeling 12 van die Hoof Verslag verduidelik spesifiek hoe hierdie kwessies aangespreek sal word.

As deel van die proses van openbare deelname is die volgende stappe onderneem om nakoming van die wetgewing te verseker en ruim geleentheid aan lede van die publiek en ander belanghebbendes te voorsien om betrokke te wees en aan die omgewingsproses deel te neem. Sien Bylae E vir bewyse van die proses van openbare deelname.

Openbare deelname is volgens die vereistes van die nuwe NEMA omgewings regulasies onderneem. Die volgende omvangbepalingsfase vereistes onderneem is en nagekom word in terme van Regulasie 56:

- 'n **Advertensie** is in 'n plaaslike koerant geplaas (Kalahari Bulletin, uitgawe van 5 Julie 2012), wat lede van die publiek van die Aansoek en versoek vir Belanghebbende en Geaffekteerde Partye (B&GPe) registrasie inlig;
- 'n **Register** is geopen om die name aan te teken, kontak besonderhede en adresse van die persone wat as B&GPe vir hierdie proses registreer;
- 'n **Kennisgewingbord** (Afrikaans en Engels) is op die terrein geplaas (by die ingang na die plaas), en voorsien inligting oor die proses wat onderneem word en die ontwikkelingsvoorstel;
- **Kennisgewing briewe** is gestuur aan die volgende partye (via pos, e-pos of faks gestuur op 5 Julie 2012 & 10 September 2012):
 - o Grondeienaar;
 - o Direkte bure, en
 - o Plaaslike raadslid;
- Die **Kgatelopele Munisipaliteit** (wat jurisdiksie in die gebied het) is geregistreer as 'n sleutelrolspeler.
- Verskeie departemente van die Kgatelopele Munisipaliteit (insluitend Munisipale Bestuur, Siviele Dienste, Elektrisiteit, Stadsbeplanning, Burgermeesterskantoor) is van skriftelike kennisgewing van die voorgestelde projek, insluitende 'n digitale (CD) kopieë van hierdie verslag voorsien;
- Die **Siyanda Distrik Munisipaliteit** (insluitend die Tegnieuse Dienste, Omgewing & Gesondheid, Munisipale Bestuur en Burgermeesterskantoor) is as 'n sleutelrolspeler geregistreer, en van skriftelike kennisgewings en digitale (CD) kopieë van hierdie verslag voorsien;
- Alle ander relevante **staatsdepartemente** (insluitend die Departement van Landbou, Bosbou en Visserye, Departement van Waterwese, Departement van Gesondheid, Departement van Vervoer en Openbare Werke, Departement van Waterwese, Departement van Wetenskap & Tegnologie, Departement van Minerale & Energie (Hernubare Energie), SAHRA) is geregistreer as sleutelrolspelers en is van skriftelike kennisgewings van die voorgestelde projek voorsien.
- Alle **relevante staatsdepartemente** wat as sleutelbelanghebbendes vir hierdie omgewingsproses geregistreer is, is voorsien van digitale kopieë van die KOV;
- Hardekopie afskrifte van hierdie Konsep Omvangbepalingsverslag is geplaas by die Kgatelopele Munisipaliteit (Departement van Tegnieuse Dienste, 222 Barker Street, Danielskuil) en die Lime Acres Openbare Biblioteek, Adamstraat, Lime Acres (17 September 2012), en sal vir die duur van die gespesifiseerde kommentaar tydperk beskikbaar bly.
- 'n **Digitale kopie** van die volledige Konsep Omvangbepalingsverslag sal op die webwerf: www.cape-eaprac.co.za/active beskikbaar wees vir die gespesifiseerde kommentaar tydperk.
- Die Konsep Omvangbepalingsverslag sal beskikbaar wees vir 'n openbare oorsig en

kommentaar tydperk van 40 dae, wat strek tussen Maandag, 17 September en Maandag, 29 Oktober 2012.

10 SLOTSOM & AANBEVELINGE

Die Olien Sonenergie Projek stel die ontwikkeling van 'n sonenergie-fasiliteit, met die doel van opwekking van 75 MW hernubare sonenergie voor. Die ontwikkelingsterrein is Gedeelte 4 van die Plaas 300 Barkly West, geleë ongeveer 15km oos van die Noord-Kaapse dorp Lime Acres. Die hele plaas is van die oorspronklike natuurlik stand verander deur historiese landbou-praktyke van die afgelope paar dekades en eeue. Lae intensiewe vee (bees, skaap, bok, wild) boerdery word tans op die terrein onderneem.

Die Noord-Kaap word meer en meer vir sonenergie generasie fasiliteite aangewend as gevolg van die provinsie se hoë sonbestralingsvlakke. Die voorgestelde ontwikkelingsterrein word verder as geskik beskou weens die teenwoordigheid van die bestaande Olien MTS substasie op die plaas. Hierdie ESKOM substasie beskik oor die nodige aansluitingskapasiteit en is juis geskik vir hernubare energie aansluitings.

Voorlopige terrein beperkinge is geïdentifiseer en verwys hoofsaaklik na die ekologiese aard van die ontwikkelingsterrein.

Lede van die publiek en ander sleutelrolspelers en owerhede word versoek om hierdie Konsep Omvangsverslag te hersien en enige bekommernisse of kwessies relevant tot hierdie ontwikkeling, bekend te maak. Bekommernisse en kwessies geopper tydens die Omvangbepalingsfase sal gebruik word om die Impakevalueringsfase in te lig dat die Omvangbepalingsfase volg.

Dit verslag sal beskikbaar gestel word vir openbare oorsig en kommentaar vir 'n tydperk van 40 dae wat sal strek vanaf Maandag, 17 September 2012 tot en met Maandag, 29 Oktober 2012.

Alle kommentaar wat gedurende hierdie tydperk ontvang word, sal oorweeg word, aangespreek word en ingesluit word in die Finale Omvangbepalingsverslag wat hierdie Konsep Omvangbepalingsverslag volg.

Alle kommentaar of navrae moet asseblief gerig word aan:

Cape EAPrac
Vir Aandag: Francini van Staden
Posbus 2070
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Tel: 044 874 0365
Faks: 044 874 0432
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EXECUTIVE SUMMARY

11 INTRODUCTION

Cape EAPrac has been appointed by **AE-AMD Renewable Energy (Pty) Ltd.**, hereafter referred to as “the Applicant”, as independent environmental practitioner responsible for facilitating the Scoping & Environmental Impact Assessment (EIA) process required in terms of the National Environmental Management Act (NEMA, Act 107 of 1998, as amended) for the proposed development of the **Olien Solar Energy Project** north-east of the town Lime Acres, in the Northern Cape Province.

Olien Solar Energy Project entails the development of a solar facility with the purpose of generating 75 Megawatt (MW) of renewable solar energy. The generating capacity of the project is thus projected to be 75 MW Alternating Current (AC). The project will cover an area of approximately 225ha. The project furthermore includes associated infrastructure, including: access roads, control building(s), expansion of an existing substation, electrical connection-line, metering facilities, workshop and storage space, and guard house. The entire facility will be fenced and security systems will be installed.

The development is proposed on the southern section of the privately owned Portion 4 of the Farm 300, Barkly West, Lime Acres.

12 BROAD CONTEXT

The development site of the proposed Olien solar project is Portion 4 of Farm 300 Barkly West, and is located 15km east of Lime Acres and 120km north-west of Kimberley. The R385 runs west of the site and the Lime Acres railway line (connecting to Postmasburg to the west) bisects the property into two portions, the northern portion occupying two-thirds of the entire farm and the southern portion occupying a third of the entire farm. The solar plant is proposed on the southern section of the development site only, south of the railway line. It is also on this southern portion where an existing substation is located, to which the solar plant will be connected via a short electrical connection line.

The entire property south of the railway line is approximately 575ha in extent and it is proposed that the solar development occupies 225ha of the site (south of the railway line). The development site is zoned Agriculture I.

13 SITE DESCRIPTION AND ATTRIBUTES

The development site is located outside the Lime Acres urban edge and is accessed via the R385. The entire farm is an area of low relief and the entire farm is transformed by agricultural practices of the past few decades to centuries. Low intensive livestock (cattle, goat, sheep, game) farming is currently practiced on the site.



Figure 1a&b: site photographs of Part 4 of Farm 300

Existing buildings and infrastructure on the development site is limited to the following:

- A single farmhouse and associated outbuildings;
- Livestock facilities;
- Two Eskom substations (amongst others the Olien Major Transmission Substation, MTS);
- Two Eskom overhead power lines;
- Transnet Railway line; and
- Municipal water pipeline in the railway servitude.

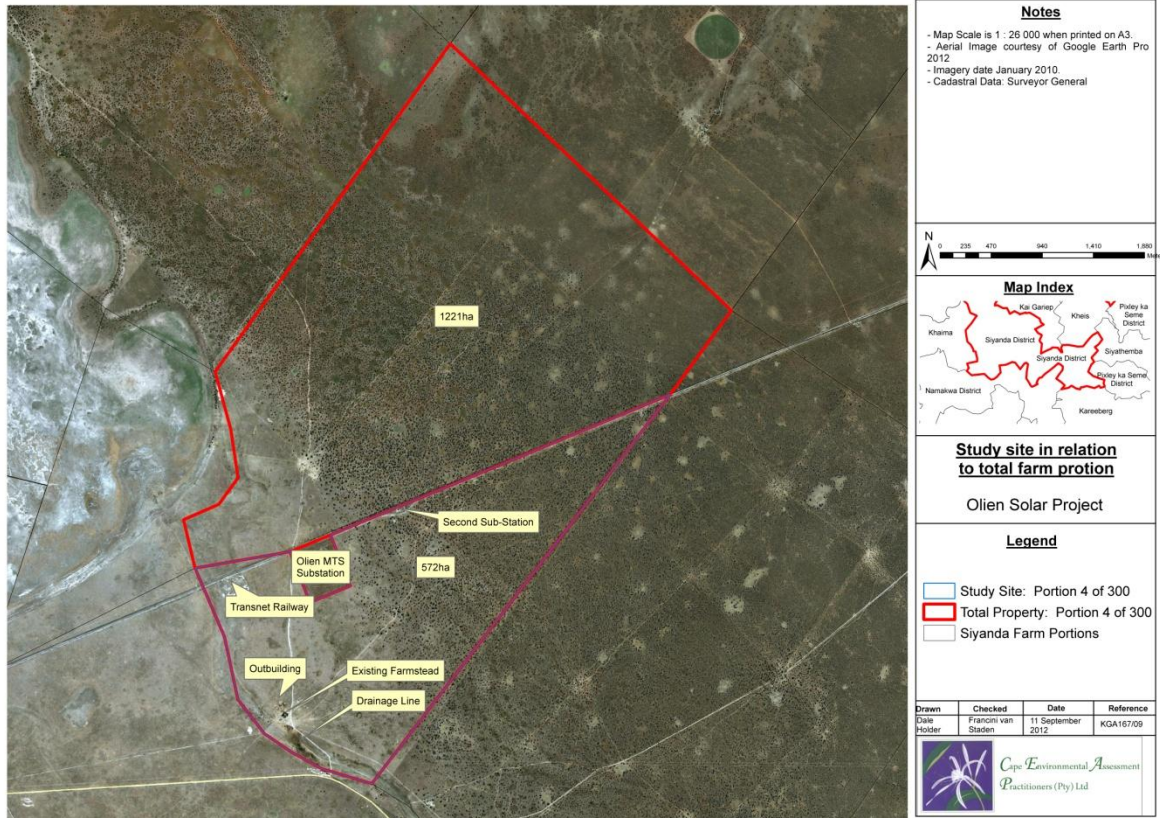
Thus, apart from the national, provincial and local infrastructure found on the farm, only the farmhouse, outbuildings and livestock infrastructure are in private use. The portion of the site where the solar plant is proposed is free of any of the above prominent infrastructures so to avoid infringing of the development with existing infrastructure.

SANBI BGIS classifies the soil class in the area as **Lithosoils** (see attached LUDS Evaluation in Appendix F).

Mucina (2006) and the National Spatial Biodiversity Assessment (BGIS, 2007) classifies the area's original natural vegetation as Ghaap Plateau Vaalbosveld, Southern Kalahari Mekgacha and Southern Kalahari Salt Pans.

Please see Appendix F for a visual representation of the SANBI determinations. More detail on the vegetation type identified is included in the Ecological Site Assessment, summarised in Section 7 of this report.

The following map shows the entire farm with existing infrastructure. Review Appendix B for a larger map:



14 DEVELOPMENT PROPOSAL AND ALTERNATIVES

The proposed Olien Solar project consists of a concentration of solar photovoltaic panels which is expected to generate renewable solar energy to the capacity of 75 MW (megawatts). The plant will also need associated infrastructure, for which provision will be made. The associated infrastructure will include the following:

- Solar field with PV panel arrays including inverters and concentrator boxes housing outdoor switchgear;
- Transformation centre housing the transformer and associated protection devices;
- Distribution centre for the distribution of voltage lines to the Eskom substation;
- Building(s) for control room and administration of approximately 40m²;
- Metering facilities;
- Workshop and storage of approximately 300-400m²;
- Hardsurface lay-down and parking area;
- Assembly area;
- A short connection line to the MTS Olien Substation;
- Any potential expansion of the above substation;
- Meteorological station with lattice structure of 3metres high;
- Upgrading of the existing access road;
- Staff facilities (kitchen, ablution facilities) of approximately 40m²;
- Guard house of approximately 100m²; and
- Fencing and security including lighting protection for the development.

Various alternatives, in terms of technology of the solar arrays, as well as layout of the solar arrays and associated infrastructure on the development site, will be considered and be informed by the environmental constraints identified during the baseline / scoping process.

14.1 ALTERNATIVE 1: 75 MW (PREFERRED ALTERNATIVE)

The Alternative 1 option for this development is for the development of a solar energy facility with a proposed generation capacity of 75 Megawatt (MW). The development will consist of solar fields of fixed rack structures (stationary solar technology). Using this development concept, a maximum of 3ha will be required per MW to be generated, thus the development concept will be developed on 225ha.

Figure 2a&b: fixed rack solar technology



The development concept can be described as solar or photovoltaic modules, fixed to ground level in a specific north-facing direction and angle, and where the structure consists of no moving parts. This technological option is a fair yielding option and requires a minimum amount of space (2 to 3ha per MW produced).

Solar collector facility developments such as what is proposed for this solar project, fixed in their array position, are the most common technological option for solar facility developments.

For the purpose of founding the solar mounts, a few possible foundation options exist, including concrete pile foundations or vibratory driven steel pile foundations. The type of foundation used will also determine the foundation trenches required.

The follow figure shows the proposed layout of the solar facility, with the photovoltaic array arrangement (blue) as well as support buildings:



Figure 3: proposed Olien Solar plant layout

14.2 ALTERNATIVE 2: 250MW INCREASED FOOTPRINT

Alternative 2 formed the initial development alternative and entailed the development of the solar facility on the entire southern section below the railway line, covering an area of 450ha. An area of 450ha would have allowed for an electricity generation capacity of 150MW.

However, the baseline biophysical and ecological investigations of the site and the site features indicated certain constraints which had to be avoided, to avoid potential impacts on the receiving environment. The following maps show the constraints graphically:



Figure 4: Site constraints map showing drainage line with 32-metre buffer, flat pans on development site with 32-metre buffers around these features, graves with 100-metre buffer and sensitive ecological north-eastern corner (See Appendix B for larger map).

14.3 TECHNOLOGICAL ALTERNATIVE: SOLAR TRACKING SYSTEM

The option of tracker technology has been considered as a technological alternative for the proposed solar facility. Tracker technology is a more expensive technology and involves the tracking of sun, often in more than one axis. As result, this technology is higher yielding as the amount of hours which the photovoltaic panels are exposed to the sun, are greatly increased. However, an increased footprint is required for this option, and 4.5 to 6ha per MW is the estimated footprint required.



Figure 5: Technological alternative: PV tracking systems

14.4 STATUS QUO / NO-GO ALTERNATIVE

The **Status Quo Alternative** proposes that the solar facility development not go ahead and that the southern section below the railway line on the farm remains undeveloped and in their current low-intensity agricultural state.

The development site is currently used for low-intensity small-scale stock farming, however; the agricultural potential of the farm has been described as low. As such, continued use of the land for agricultural purposes is potentially not the most optimal land use type.

1.1 ALTERNATIVE LAYOUTS & DESIGN

Alternative layouts will be assessed and adjusted as part of the on-going environmental process. As part of the scoping phase, a site-specific constraint map has been generated from the various constraints identified in the numerous specialist baseline studies undertaken (see **Appendix B**). This constraint map will serve to inform further layout revisions of the proposed solar park facility if required. The output of this process will thus be a consideration of several layout alternatives, each assessed and informed within the on-going EIA process.

Change and/or modifications to the proposed development concept and layout details, and the associated structures and infrastructure (roads, overhead power lines, sub-stations, grid connections etc.), will be informed and adjusted by inputs and feedback gathered from the project team and the public throughout the process.

15 PROFESSIONAL PROJECT TEAM

The project team has been appointed by the Applicant to assist with the undertaking of the EIA and associated investigations and specialists studies. These consultants and specialists are:

Table 1: Project Team

Specialist field	Contact person	Company
Environmental Assessment Practitioners	Louise van Zyl & Francini van Staden	Cape EAPrac
Ecology	Simon Todd	Simon Todd Ecological Consulting
Palaeontology	Dr Jennifer Botha-Brink	Private Capacity
Archaeology	Dr David Morris	Private Capacity
Heritage	Dr David Morris	Private Capacity
Agricultural	Christo R Lubbe	CR Lubbe
Technical	JCC Berrington	AE-AMD Renewable Energy

These specialists already completed baseline studies for the solar development and this information has been used to inform this Scoping Report. The following section provides more detailed information on the individual assessments.

16 SPECIALIST ASSESSMENT

As part of the Scoping phase of the EIA process, a number of aspects have already been considered by specialists in order to determine the current status of the target development site, as well as to identify potential risks and impacts associated with the development of the renewable energy facility. These are described in greater detail in the main report, while the full specialist reports are available in Appendix D.

Agricultural Potential concluded that the farm has a low agricultural potential study due to characteristic climatic and soil conditions of the area. The site's grazing capacity has been estimated at between 21 – 25 ha / LSU which equates to a low grazing capacity. Given the site's low agricultural potential, it was concluded that the proposed solar facility will have minimal to negligible impacts on the site's agricultural potential.

Ecological Site Analysis showed that the development site has a variable ecological sensitivity, ranging from low in the western section of the site to relatively high in the eastern section of the site. The sensitivity of the site is closely linked to the presence of a number of tree species and the density of these tree clusters. Although some of the tree species present at the site are protected under provincial legislation, they are not rare or threatened. Overall, the site's plant species richness is relatively low with less than 50 plant species recorded for the entire site. Based on the results of the study, the site does not appear to contain any extensive areas of highly sensitive species or ecosystem types and the likely impacts of the development are likely to be largely local in nature and of low to moderate significance after mitigation.

Palaeontological Study indicated that the deposit type and poor exposure on the development site indicated that the development site is not sensitive to potential fossil finds. The likely absence of important fossils on the development sites guided the conclusion that no notable palaeontological impacts are expected from the proposed solar facility at this site.

Archaeological Study indicated a generally very low density of surface archaeological material. The very low density of stone tools observed results in the development site being considered as being of minimal significance from an archaeological point of view.

Heritage Study indicated that Colonial era heritage traces were found on the development site, including calcrete cobble kraals. A row of five, unmarked, graves were also found. The heritage specialists recommended the avoidance of encroachment of infrastructure around these graves. From a heritage point of view, the development site has not been identified as bearing high heritage significance and expected impacts are minimal.

Civil and Technological Report provided an overview of the applicable technology available for solar plants and how solar plants operate. The report explains the most likely technological options for proposed for the Olien Solar project. Motivation for the site selection is given, as well as how the solar project will link to the existing electrical reticulation. The infrastructures associated with the solar plant are described in detail as well as basic details of the construction, operational and potential decommissioning phases of the project.

17 POTENTIAL CONSTRAINTS

The most significant ecological constraint is the presence of **tree clusters** in the north-eastern corner of the site and as such this entire corner has been identified as an area of high ecological sensitivity. The sensitivity of the site increases with a western to eastern gradient, parallel to the increase in density of trees. The density of the trees reaches a maximum of 50/ha in the eastern section of the site and therefore the eastern portion of the site is the most sensitive part of the site.

A **total of six small pans** were also identified within the site. These pans are thought to hold water for reasonably long periods of time after rains, with associated support for fauna communities such as the Giant Bullfrog, *Pyxicephalus adspersus*, which is a species of conservation importance.

A row of **five graves** was documented on the development site. The specialist recommended that the graves should be fenced and development **must be restricted** to no closer than 100metres from this row of graves.

To date, the layout and development concept have been informed by these identified site constraints. A specialist constraint map has been developed (see Appendix B) which identifies all sensitive areas of the site where development should ideally be avoided. Further detailed impact assessments will be undertaken as part of the Impact Assessment phase of the EIA process, and where any further constraints are identified, **avoidance of the potential impacts** will be recommended, followed by the recommendation of appropriate mitigation measures to reduce the potential impacts on the receiving environment.

18 PROCESS TO DATE

This Draft Scoping Report is the second report in a series of five different reports and follows the Application Form. The Application Form, the first of the five reports in this EIA process, was submitted to the Department of Environmental Affairs (DEA) on 8 June 2012. DEA is the competent authority for this process and has accepted the Application on 4 July 2012 (Ref: 14/12/16/3/3/2/371), authorising *Cape EAPrac* to commence with the public participation phase of the environmental process.

This project and the environmental process were advertised in the *Kalahari Bulletin* local and regional newspaper (issue of 5 July 2012), inviting the public to register as interested and affected parties.

This Draft Scoping Report (DSR) (Ref: KGA167/09) has been made available to Stakeholders and Interested and Affected Parties (I&APs) for a review and comment period extending from Monday, 17 September 2012 to Monday, 29 October 2012.

This report reflects the findings of preliminary specialist investigations and reports (Palaeontology, Agricultural Potential, Ecology, Archaeology and Heritage, Technical). This report and the aforementioned investigation is also a tool to identify the need for further specialist investigations and assessments in the event that issues/impacts cannot be resolved during the scoping phase.

As part of the public participation process various key stakeholders have been identified and notified of the project and their right to participate and comment on the proposal. The project has been advertised and stakeholders that responded to the adverts, notices and written notices will be kept informed throughout the remainder of the on-going environmental process. Please see Section 10 in the main report and Appendix E for evidence of the Public Participation process.

Thus far the following key issues and concerns were raised through informal discussions with the project team, specialists and authorities and the baseline specialist studies:

- Land loss for grazing purposes;
- Risk of injury to livestock during the construction phase;
- Vegetation clearing and potential impact on sensitive ecosystems;
- Impact on ecological landscape connectivity and ecosystem processes;
- Potential impact on avifaunal community;
- Erosion risk due to soil disturbance and loss of plant cover; and
- Modification of the archaeological and heritage landscape.

These issues are described in greater detail in the Main Report and Section 12 of the Main Report specifically explains how these issues will be addressed.

As part of the public participation process the following steps were taken to ensure compliance with the legislation and to allow ample opportunity for members of the public and key stakeholders to be involved and participate in the environmental process. Please see Appendix E for evidence of this Public Participation process. The Public Participation

Process has been undertaken according to the requirements of the new NEMA EIA regulations.

The following **scoping phase requirements** have been undertaken and complied with in terms of Regulation 56:

- An **advert** has been placed in **local newspaper** (*Kalahari Bulletin*, issues of 5 July 2012), informing members of public of: the Application and calling for Interested & Affected Parties (I&APs) to register for the process;
- A **stakeholder register** has been opened to record the names, contact details and addresses of the individuals registering as I&APs for this process;
- A **notice board** (Afrikaans and English) was placed at the site (at the entrance to the farm), providing information on the process undertaken and the development proposal.
- **Notification letters** were sent to the following parties (sent via post, e-mail or fax on 5 July 2012 & 10 September 2012):
 - Landowner;
 - Direct neighbours; and
 - Local Councillor;
- The **Kgatelopele Municipality** (which has jurisdiction in the area) was registered as a **key stakeholder**.
- Various **departments** of the Kgatelopele Municipality (including Municipal Management, Civil Services, Electricity, Town Planning & Mayor's office) were provided with written notification of the proposed project, including a digital (CD) copies of this DSR;
- The **Siyanda District Municipality** (including the Technical Services, Environmental & Health, Municipal Management and Mayor's Office) was registered as a key stakeholder, and provided with written notifications and digital (CD) copies of this DSR;
- All other relevant **state departments and organs of state** (including the Department of Agriculture, Forestry & Fisheries, Department of Water Affairs, Department of Health, Department of Transport and Public Works, Department of Water Affairs, Department of Science & Technology, Department of Minerals & Energy (Renewable Energy), SAHRA) were registered as **key stakeholders** and were provided with written notification of the proposed project.
- All relevant **organs of state and state departments** registered as key stakeholders for this environmental process have been provided with digital copies of the DSR;
- **Printed copies of the Draft Scoping Report** were placed at the Kgatelopele Municipality (Department of Technical Services, 222 Barker Street, Danielskuil) and the Lime Acres Public Library, Adam Street, Lime Acres (17 September 2012), for the duration of the specified comment period.
- A **digital copy** of the Draft Scoping Report was available for the specified commenting period at the website: www.cape-eaprac.co.za/active
- The Draft Scoping Report will be available for a **public review and comment period of 40-days**, extending Monday, 17 September 2012 and Monday, 29 October 2012.

19 CONCLUSIONS & RECOMMENDATIONS

Olien Solar Energy Project proposed the development of a solar facility with the purpose of generating 75 MW of **renewable solar energy**. The development site is Portion 4 of Farm 300 Barkly West, located approximately 15km east of the Northern Cape town of Lime Acres. The farm is an area of low relief and the entire farm is transformed by agricultural practices of the past few decades to centuries. Low intensive livestock (cattle, sheep, goat, game) farming is currently practiced on the site.

The Northern Cape is increasingly selected for solar energy generation facilities due to the province's high solar radiation levels. The development site is furthermore thought of as a feasible location for the solar facility due to the presence of the Olien MTS substation on the farm. This Eskom substation has available connection capacity and suitable for renewable energy connection. **Preliminary site constraints** have been identified and relates primarily to the ecological nature of the development site.

Members of public and other key stakeholders and commenting authorities are requested to review this Draft Scoping Report (DSR) and to raise any concerns or issues relevant to this development concept or development site. Concerns and issues raised during the Scoping phase will be used to inform the Impact Assessment phase that will follow the scoping phase.

This DSR is made available for public review and comment for a period of **40 days** extending from **Monday, 17 September 2012 and Monday, 29 October 2012**. All comments received during this period will be **considered, addressed and included** in the Final Scoping Report which will follow this Draft Scoping Report.

All comments or enquiries must be addressed to:

Cape EAPrac
Attention: Francini van Staden
P.O. Box 2070
George, 6530
Tel: 044 874 0365
Fax: 044 874 0432
E-mail: francini@cape-eaprac.co.za



MAIN REPORT

1 INTRODUCTION

Cape EAPrac has been appointed by AE-AMD Renewable Energy (Pty) Ltd, hereafter referred to as the Applicant, as the independent environmental practitioner to facilitate the Scoping & Environmental Impact Assessment (EIA) process required in terms of the National Environmental Management Act (NEMA, Act 107 of 1998, as amended) proposed development of the proposed Olien Solar Renewable Energy Project north-east of Lime-Acres, Northern Cape Province. Olien Solar Energy Project entails the development of a solar farm with the purpose of generating 75 MW of renewable solar energy. The generating capacity of the project is thus projected to be 75 MW. The project will cover an area of 225ha. The project furthermore includes associated infrastructure, including: access roads, control building(s), expansion of an existing substation, electrical connection-line, metering facilities, workshop and storage space, and guard house. The entire facility will be fenced and security systems will be installed.

1.1 PROFESSIONAL TEAM

The project team has been appointed by the Applicant to assist with the undertaking of the EIA and associated investigations and specialist studies. These consultants and specialists are:

Environmental Impact Assessment	L van Zyl & F van Staden
Ecology	Simon Todd
Heritage	Dr David Morris
Archaeology	Dr David Morris
Paleontology	Dr Jennifer Botha-Brink
Agriculture	Christo R Lubbe
Technical	JCC Berrington

These specialists already completed baseline studies for the solar development and this information has been used to inform this Scoping Report. This main report of the Draft Scoping Report reports on the individual assessments, see Section 7.

2 BROAD CONTEXT

2.1 WHY THIS DEVELOPMENT AND WHY IN THIS AREA

South Africa has for several years been experiencing considerable constraints in the availability and stability of electrical supply. Load shedding procedures have been applied since December 2005 due to multi-technical failures, as well as capacity and transmission constraints.

Eskom generates about 95% of South Africa's electricity supply, and has undertaken to increase capacity to meet growing demands. At the moment, the country's power stations are 90% coal-fired, and two huge new facilities are being built to add to this capacity. However, Eskom's plans to increase its national capacity by 40 000 megawatts in the period to 2025 have had to be scaled down due to the global economic recession (Northern Cape Business website).

International best-practice requires a 15% electricity reserve margin to deal with routine maintenance requirements and unexpected shutdowns in electricity supply systems. South Africa has historically enjoyed a large reserve margin (25% in 2002, 20% in 2004 and 16% in 2006), but that has declined over the recent past to 8% - 10%, as a result of robust economic growth and the associated demand for electricity. The spare power available to provide supply at any time of the day is known as the reserve capacity and the spare plant available when the highest demand of the year is recorded is known as the reserve margin (National Response to South Africa's Electricity Shortage, 2008). This has resulted in limited opportunities for maintenance and necessitated that power stations are run harder. This results in station equipment becoming highly stressed and an increase in unplanned outages and generator trips. The expected demand growth will rapidly erode this margin, as well as Eskom's ability to recover after it's already stressed systems shutdown.

This necessitates the additional generation of at least 3 000MW in the shortest possible time, to allow the reserve necessary to bring Eskom's system back into balance (*ibid*). This need can either be addressed from the *supply* or the *demand* side. Where the demand side interventions include short, medium and long term aspects of a national Power Conservation Programme to motivate the public to use less electricity (as mentioned above), one of the supply side options (besides Eskom building new plants and returning old plants to service) is to allow **Independent Power Producers** (IPPs) to contribute electricity to the national grid (National Response Document, 2008). **AE-AMD Renewable Energy (Pty) Ltd.** is one such body, which intends generating electricity from a renewable energy resource, namely solar.

In March 2011, the Cabinet approved South Africa's Integrated Resource Plan 2010, in terms of which energy from renewable sources will be expected to make up a substantial 42% of all new electricity generation in the country over the next 20 years. The government's New Growth Path for the economy also envisages up to 300 000 jobs being created in the "green" economy by 2020 (South Africa info website).

The Northern Cape is suggested by many to be the ideal location for various forms of alternative energy. This has resulted in a number of feasibility studies being conducted, not least of which an investigation by the Industrial Development Corporation in 2010 (R33-million spent) into potential for photo-voltaic, thermal, solar and wind power (Northern Cape Business website).

The area of the Northern Cape that borders on the Gariiep (Orange) River and Namibia boasts the highest solar radiation intensity anywhere in southern Africa. Solar energy is therefore likely to be the most viable alternative energy source for the Northern Cape, although wind-power potential is generally good along the coast (State of the Environment, S.A.)

South Africa, Lesotho and Swaziland

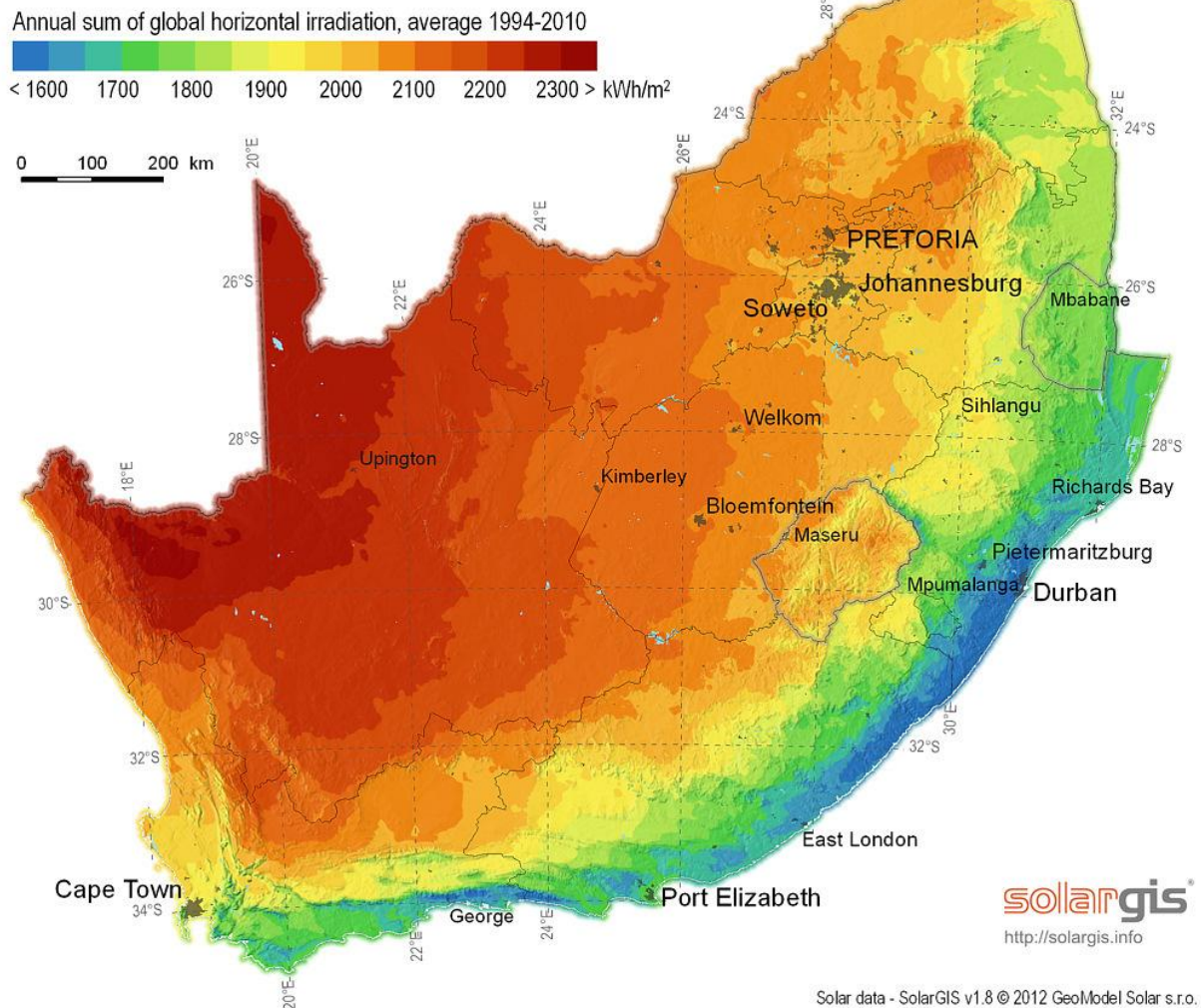


Figure 6: Solar radiation map for South Africa (Source: Solargis/info accessed on 15 August 2012).

The Northern Cape area is considered to have extremely favourable solar radiation levels over the majority of the year, making it ideal for the production of solar-power via Photovoltaic (fixed and tracking panels) and Concentrated (solar thermal) Solar systems. Several solar irradiation maps have been produced for South Africa, all of which indicate that the Northern Cape area **high solar irradiation**.

A solar-investment conference was held in November 2010 at Upington and was attended by 400 delegates from all over the world. Dipuo Peters, the national Minister of Energy, outlined the competitive advantages of the Northern Cape, over and above its extremely high irradiation levels, amongst others:

- relative closeness to the national power grid compared to other areas with comparable sunshine;
- water from the Orange River;

- access to two airports; and
- good major roads and a flat landscape (Northern Cape Business website – solar power).

The Northern Cape is not too dusty, the land is flat and sparsely populated, and there are little to no geological or climate risks, meaning that the sun can be used year-round (BuaNews online). An advantage that the Northern Cape has over the Sahara Desert is the relatively wind-free environment that prevails in the province. A Clinton Climate Initiative (CCI) pre-feasibility study has found that South Africa has one of the best solar resources on the planet (Northern Cape Business website – solar power).

To take advantage of this potential for the Northern Cape to become a national renewable-energy hub, the groundwork is being done on a mega-project that has the capacity to fundamentally change the structure of South Africa's power sector: to build a massive solar park that will generate an eighth of the country's electricity needs – 5 000MW – in the Northern Cape near Upington. Sixteen square kilometres of land (thousands of hectares) have been identified and Eskom is looking for private partners. The park, which will cost more than R150-billion, will generate 1 000MW in its first phase. A full feasibility study will now be conducted with the support of the Central Energy Fund and the Development Bank of Southern Africa (Northern Cape Business website – solar power). Significant job creation, lucrative private-sector investments, local industry development and a cleaner, more secure power supply are among the benefits of a large-scale park such as this (BuaNews online).

Indeed this potential for solar energy generation plants has resulted in the emergence of smaller solar energy projects throughout the Northern Cape. The Energy Minister, Dipuo Peters announced in February 2012 that 16 of the initial 28 preferred projects identified by the Department of Energy (DoE) under the renewable energy independent power producer (IPP) programme were located in the sun-drenched province (Creamer, Feb. 2012). Mining companies in the Northern Cape are looking to concentrating solar power (CSP) to provide power for their operations. Engineering company Group Five announced in 2011 that they were investigating the construction of a 150MW plant near Kathu. The Industrial Development Corporation (IDC) is supporting a number of projects in the province. These include a 100MW plant conceived by Abengoa Solar, a Spanish company with a global presence, and a Solafrica scheme to spend more than R3-billion on a Concentrated Solar Plant at Groblershoop (Northern Cape Business website – solar power).

Not comparable in size with these larger projects, the Olien Solar project is one such IPP solar project which intends to generate 75MW of electricity from solar-energy for inclusion into the National grid. The Olien Solar site is considered ideal, primarily due to:

- The flat topography of the proposed development site and it's the availability for use for an alternative energy generation facility; and
- The grid connection potential based in proximity to existing transmission & substation infrastructure.
- Presence of the Olien MTS Eskom substation on the farm, identified as a substation with available connection capacity and suitable for renewable energy connection, subject to Eskom's terms and conditions.

2.2 LOCATION

The development site is located within the Northern Cape Province with Kimberley as its closest regional centre. South Africa's Northern Cape Province is the country's largest province in terms of coverage but is at the same time the most sparsely populated province. The province borders Namibia and Botswana to its Northern boundaries. The Province is a prominent mining region and a number of small pockets of minerals are found and mined in the Siyanda District Municipal area. The province is also home to two major national parks: the Kalahari Gemsbok National Park and the AuGrabies Falls National Park.

The proposed site for the Olien Solar project lies approximately 8.5 km east of the R385 connecting to the R31 (north) and the R8 (south). Kimberley is the most prominent town in the area and lies approximately 120km south-east of the site while the smaller mining town Lime Acres, lies 15km east of the development site. A Transnet railway line bisects the development site and the existing Olien MTS substation is located in on Prt 4 of Farm 300.



Figure 7: Regional map of the Northern Cape

2.3 GOVERNMENT & POPULATION

The development site falls under the jurisdiction of the Kgatelopele Local Municipality and the Siyanda District Municipality. Kgatelopele Municipality covers an area of approximately 2,500km². The estimated population in this local municipal area is below 22,000 people which equals to approximately 5,300 households. The town closest to the development site, Lime Acres, has a population of 3,723.

2.4 LANDSCAPE

The entire Northern Cape Province occupies almost a third of South Africa's total land coverage and is known for its extreme climate. The prominent Orange River, which partly forms the Northern Cape's northern and international boundary adjacent to Namibia, towards the Atlantic Sea, serves the agricultural and mining industry of the Northern Cape. The

Orange River flows from east to west in the applicable district municipal area, the Siyanda District Municipality. Similarly, a number of smaller but dry rivers cross the district municipal area.

The landscape of the Northern Cape is characterised by arid plains and rock outcroppings. Although an arid climate dominates here, the province does have fertile agricultural areas, including the Orange River valley. Closer to the development site, 120km north-west of Kimberley, and the area is characterised by mining activities. Mining activities in the Northern Cape include mining for diamonds, iron ore, manganese as well as industrial minerals. In the Lime Acres and surrounding area, mining for manganese, diamonds and other raw materials such as ash (used in cement production) is undertaken. Rich limestone deposits are also found surrounding the small mining town of Lime Acres. Companies such as PPC Lime and Finch Mines operate in the Lime Acres vicinity.

The landscape of the Lime Acres area is characterised by sandy and grass plains. This semi-desert area is furthermore characterised by a continental climate with extreme high temperatures and thunderstorms during summer, and cold but dry winters. Average annual rainfall varies between 150mm and 200mm. Due to the low rainfall patterns and extreme climate, the area is characterised by dune vegetation – characterised by drought resistant plant species.

3 PLANNING CONTEXT

The development site, Portion 4 of Farm 300 Barkly West, has an Agriculture Zone I zoning. To accommodate the proposed solar development, a land use change / consent use application to Special Zone, will be necessary for the portion south of the railway line (where the development is proposed). The remainder of the farm will remain zoned as Agriculture Zone I. The land use change application will be lodged with the local municipality, in accordance with the Northern Cape Planning and Development Act (Act 7 of 1998).

It is anticipated that the rezoning application will be subject to review and comment from applicable stakeholders, authorities and State Departments.

If there are restrictive Title Deed conditions burdening the proposed development, an application for the removal thereof will be lodged at the Government of the Northern Cape Province, Department: Corporate Governance and Traditional Affairs, in accordance with the Removal of Title Deed Restriction Act (Act 84 of 1967).

4 LEGISLATIVE AND POLICY FRAMEWORK

The current assessment is being undertaken in terms of the **National Environmental Management Act (NEMA, Act 107 of 1998)**¹. This Act makes provision for the identification

¹ On 18 June 2010 the Minister of Water and Environmental Affairs promulgated new regulations in terms of Chapter 5 of the National Environmental Management Act (NEMA, Act 107 of 1998), viz, the Environmental

and assessment of activities that are potentially detrimental to the environment and which require authorisation from the competent authority (in this case, the national Department of Environmental Affairs, DEA) based on the findings of an EIA.

The proposed scheme will entail a number of listed activities, some of which require a basic environmental impact assessment, whilst others require a full scoping and environmental impact assessment. The **environmental assessment process** must be conducted by an independent environmental assessment practitioner (EAP).

Amongst others, the following Guidelines were considered in particular; the *Guideline to determining specialist involvement* (2005), *Guideline on Alternatives* (2007) and the *Guideline on Public Participation* (2007/2010). The following Guidelines were also consulted namely: *Guideline on Biodiversity Specialist Involvement*, *Guideline on Heritage Specialist Involvement* and *Guideline on Visual and Aesthetics Specialist Involvement*. In addition, the legislation that is relevant to this study is briefly outlined below. These environmental requirements are not intended to be definitive or exhaustive but serve to highlight key environmental legislation and responsibilities only.

1.2 THE CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA

The Constitution of the Republic of South Africa (Act 108 of 1996) states that everyone has a right to a non-threatening environment and that reasonable measure are applied to protect the environment. This includes preventing pollution and promoting conservation and environmentally sustainable development, while promoting justifiable social and economic development.

Conservation of energy and promotion of sustainable and renewable energy resources fulfil the requirements of the Constitution.

1.3 NATIONAL ENVIRONMENTAL MANAGEMENT ACT

The National Environmental Management Act (NEMA, Act 107 of 1998) makes provision for the identification and assessment of activities that are potentially detrimental to the environment and which require authorisation from the relevant authorities based on the findings of an environmental assessment. NEMA is a national act, which is enforced by the Department of Environmental Affairs (DEA).

A Scoping and Environmental Impact Assessment process is required in terms of NEMA. Figure 2 depicts a summary of the Scoping & EIA process.

Impact Assessment (EIA) Regulations 2010. These regulations came into effect on 02 August 2010 and replace the EIA regulations promulgated in 2006.

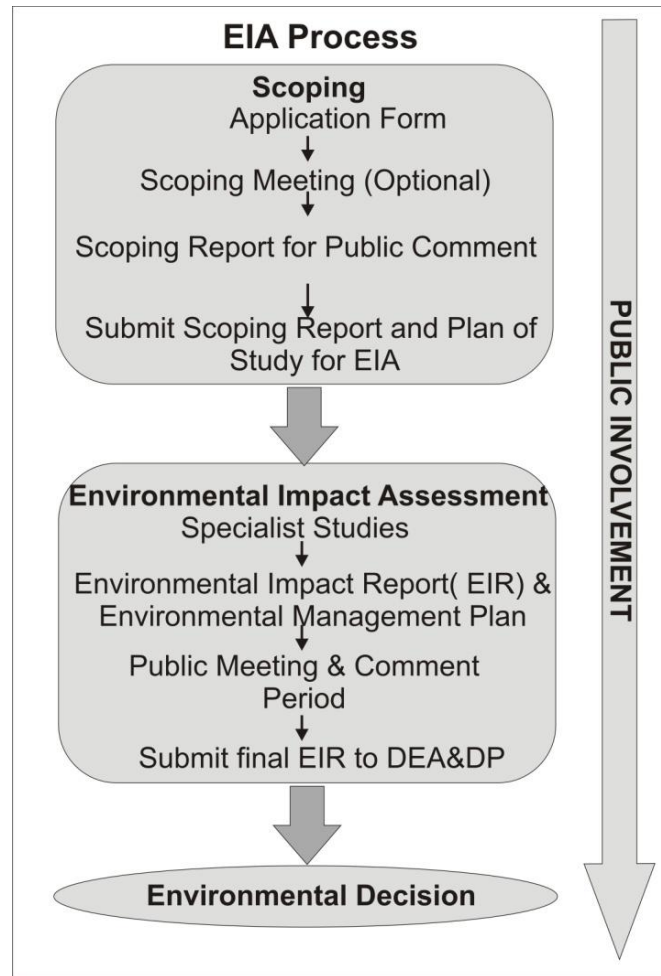


Figure 8: Summary of Scoping & EIA process

The listed activities associated with the proposed development, as stipulation under 2010 Regulations 544, 545 & 546 are as follows:

Table 1: NEMA 2010 listed activities triggered by the proposed Olien Solar Facility:

R544	Listed Activity	Activity Description
10	The construction of facilities or infrastructure for the transmission and distribution of electricity (i) outside urban areas or industrial complexes with a capacity of more than 33kV, but less than 275kV.	Short 132kV overhead power line (less than 2km) linking the proposed solar plant with the existing Olien MTS Substation on the farm.
11	The construction of (xi) infrastructure or structures covering 50 square metres or more, where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.	Potential installing of pv instructor within 32 metres from the identified freshwater pans on site. The avoidance principle will be applied as far as possible, see the site constraints map included in Appendix B of this report.

22	The construction of a road, outside urban areas, (i) with a reserve wider than 13.5m or, (ii) where no reserve exists where the road is wider than 8m or, (iii) for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Notice 545 of 2010.	Construction of internal and access road/s or upgrading of the existing access road.
R545	Listed Activity	Activity Description
1	The construction of facilities or infrastructure for the generation of electricity where the electricity output is 20MW or more .	The proposed Olien Solar facility will have a maximum capacity of 75MW .
15	Physical alteration of undeveloped, vacant or derelict land to (ii) residential, retail, commercial, recreational, industrial or institutional use where the total area to be transformed is 20ha or more .	The proposed Olien Solar facility will occupy approximately 225ha on agricultural land.

Before any of the above mentioned listed activities can be undertaken, authorisation must be obtained from the relevant authority, in this case the National Department of Environmental Affairs (DEA).

1.4 NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY (ACT 10 OF 2004) (NEM:BA)

This Act controls the management and conservation of South African biodiversity within the framework of NEMA. Amongst others, it deals with the protection of species and ecosystems that warrant national protection, as well as the sustainable use of indigenous biological resources. Sections 52 & 53 of this Act specifically make provision for the protection of critically endangered, endangered, vulnerable and protected ecosystems that have undergone, or have a risk of undergoing significant degradation of ecological structure, function or composition as a result of human intervention through threatening processes.

Relevant areas on the development site, identified by specialists as sensitive, endangered, vulnerable or protected, will be subject to the requirements of this act: the north-eastern corner of the development site has been identified as having a certain degree of ecological sensitivity and is therefore largely avoided by the solar development.

1.5 NATIONAL HERITAGE RESOURCES ACT

The protection and management of South Africa's heritage resources are controlled by the National Heritage Resources Act (Act No. 25 of 1999). South African National Heritage Resources Agency (SAHRA) is the enforcing authority.

In terms of Section 38 of the National Heritage Resources Act, SAHRA will require a Heritage Impact Assessment (HIA) where certain categories of development are proposed. Section 38(8) also makes provision for the assessment of heritage impacts as part of an EIA

process and indicates that if such an assessment is found to be adequate, a separate HIA is not required.

The National Heritage Resources Act requires relevant authorities to be notified regarding this proposed development, as the following activities are relevant:

- *the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;*
- *any development or other activity which will change the character of a site exceeding 5000 m² in extent;*
- *the re-zoning of a site exceeding 10 000m² in extent.*

Furthermore, in terms of Section 34(1), no person may alter or demolish any structure or part of a structure, which is older than 60 years without a permit issued by the SAHRA, or the responsible resources authority. Nor may anyone destroy, damage, alter, exhume or remove from its original position, or otherwise disturb, any grave or burial ground older than 60 years, which is situated outside a formal cemetery administered by a local authority, without a permit issued by the SAHRA, or a provincial heritage authority, in terms of Section 36 (3). In terms of Section 35 (4), no person may destroy, damage, excavate, alter or remove from its original position, or collect, any archaeological material or object, without a permit issued by the SAHRA, or the responsible resources authority.

The necessary applications have been submitted to SAHRA for further input and comment.

1.6 NATIONAL WATER ACT, NO 36 OF 1998

Section 21c and i of the National Water Act (NWA) requires the Applicant to apply for authorisation from the Department of Water Affairs for an activity in, or in proximity to any watercourse.

The proposed solar plant runs along a non-perennial drainage line (meaning it holds water only after abundant rain falls – the rest of the time it is completely dry). A buffer area has been recommended along this drainage line, as well as the on-site pans to prevent encroachment into these water features.

The current layout has been designed to avoid all identified drainage lines (informed by a detailed aerial and site Survey of the property). The Department of Water Affairs is a registered stakeholder on this application and has been requested to provide the necessary guidance with regards to the need for any permits/licenses.

1.7 RELEVANT REGULATIONS & GUIDELINES

Amongst others the following environmental Regulations and Guidelines were considered as background to this application:

- Brownlie S (2005). *Guideline for involving biodiversity specialists in EIA processes.* Department Environmental Affairs & Development Planning.

- DWA (2001). *Generic public participation guideline*. Department of Water Affairs and Forestry.
- DEA (2010). *Public Participation*, Integrated Environmental Management Guideline Series 7, Department of Environmental Affairs, Pretoria.
- DEAT (2002). *Integrated Environmental Management Information Series 3: Stakeholder Engagement*. Department of Environmental Affairs and Tourism, Pretoria.
- DEAT (2004). *Criteria for determining alternatives in EIAs*, Integrated Environmental Management, Information Series 11, Department of Environmental Affairs & Tourism, Pretoria.
- DEAT (2004). *Environmental management Plans*, Integrated Environmental management, Informatino Series 12, Department Environmental Affairs & Tourism
- DEAT (2005). *Assessment of Impacts and Alternatives*, Integrated Environmental Management Guideline Series, Department of Environmental Affairs & Tourism, Pretoria.
- DEAT (2005). *Guideline 4: Public Participation*, in terms of the EIA Regulations 2005, Integrated Environmental Management Guideline Series, Department of Environmental Affairs and Tourism, Pretoria.
- DEADP (2003). *Waste Minimisation Guideline for Environmental Impact Assessment reviews*. NEMA EIA Regulations Guideline & Information Series, Department Environmental Affairs & Development Planning.
- DEADP (2005). *Guideline for the review of specialist input in the EIA process*. NEMA EIA Regulations Guideline & Information Document Series, Department of Environmental Affairs & Development Planning.
- DEADP (2005). *Guideline for involving biodiversity specialists in the EIA process*. NEMA EIA Regulations Guideline & Information Document Series, Department of Environmental Affairs & Development Planning.
- DEADP (2005). *Guideline for environmental management plans*. NEMA EIA Regulations Guideline & Information Document Series, Department of Environmental Affairs & Development Planning.
- DEADP (2005). *Provincial urban edge guideline*. Department Environmental Affairs & Development Planning.
- DEAT (2006). *EIA Regulations* in terms of the National Environmental Management Act (Act No 107 of 1998) (Government Notice No R 385, R 386 and R 387 in Government Gazette No 28753 of 21 April 2006).
- DEADP (2006). *Guideline on the Interpretation of the Listed Activities*. NEMA EIA Regulations Guidelines & Information Document Series, Department of Environmental Affairs & Development Planning.
- DEADP (2007 & 2009). *Guide on Alternatives*, NEMA EIA Regulations Guidelines & Information Document Series, Department of Environmental Affairs & Development Planning.
- DEADP (2007 & 2009). *Guideline on Appeals*, NEMA EIA Regulations Guidelines & Information Document Series, Department of Environmental Affairs & Development Planning.
- DEADP (2007 & 2009). *Guideline on Exemption Applications*. NEMA EIA Regulations Guidelines & Information Document Series, Department of Environmental Affairs & Development Planning.

- DEADP (2010). *Guideline on Public Participation*. NEMA EIA Regulations Guidelines & Information Document Series, Department of Environmental Affairs & Development Planning.
- DEADP (2010). *Guideline on Need & Desirability*, NEMA EIA Regulations Guideline and Information Document Series, Department Environmental Affairs & Development Planning.
- DEADP (2010). *Guideline on Alternatives*, NEMA EIA Regulations Guideline and Information Document Series, Department Environmental Affairs & Development Planning.
- DEADP (2010). *Guideline on Transitional Arrangements*, NEMA EIA Regulations Guideline and Information Document Series, Department Environmental Affairs & Development Planning.
- DEADP (2010). *Guideline on Exemption Applications*. NEMA EIA Regulations Guideline and Information Document Series, Department Environmental Affairs & Development Planning.
- DEADP (2010). *Guideline on Appeals*. NEMA EIA Regulations Guideline and Information Document Series, Department Environmental Affairs & Development Planning.
- DEADP (2010). *Guideline on Public Participation*. NEMA EIA Regulations Guideline and Information Document Series, Department Environmental Affairs & Development Planning.
- Keatimilwe K & Ashton PJ (2005). *Guideline for the review of specialist input in EIA processes*. Department Environmental Affairs & Development Planning.
- Lochner P (2005). *Guideline for Environmental Management Plans*. Department Environmental Affairs & Development Planning.
- Munster F (2005). *Guideline for determining the scope of specialist involvement in EIA processes*. Department Environmental Affairs & Development Planning.
- Oberholzer B (2005). *Guideline for involving visual & aesthetic specialists*. Department Environmental Affairs & Development Planning.
- Winter S & Beaumann N (2005). *Guideline for involving heritage specialists in EIA processes*. Department Environmental Affairs & Development Planning.

5 SITE DESCRIPTION AND ATTRIBUTES

Table 2: Summary of property details

Property	Prt 4 of Farm 300 Barkly West
Registered Landowner	Mr Theuns Vermeulen
Size	Total farm size of 1793ha. The farm portion South of the railway line is 572ha and the solar plant is proposed on this portion of the farm.
Title Deed Number	T1690/1991
Zoning	Agriculture I

The development site of the proposed Olien solar project is Portion 4 of Farm 300 Barkly West, and is located 15km east of Lime Acres and 120km north-west of Kimberley. The R385 runs west of the site and the Lime Acres railway line (connecting to Postmasburg to the west) bisects the property into two portions: the northern 1221ha portion occupying two-thirds of the entire farm and the southern 572ha portion occupying a third of the entire farm. The solar plant is proposed on the southern section of the development site only, south of the railway line. It is also on this southern portion where an existing substation is located, to which the solar plant will be connected via a short electrical connection line.

The farm property South of the railway line is approximately 572ha in extent and it is proposed that the solar development occupies 225ha (39,13%) of the site (south of the Transnet railway line). The development site is zoned Agriculture I.

The development site is located outside the Lime Acres urban edge and is accessed via the R385. The entire farm is an area of low relief and the entire farm is transformed by agricultural practices of the past few decades to centuries. Low intensive livestock (cattle and sheep) farming is currently practiced on the site.

Existing buildings and infrastructure on the development site is limited to the following:

- A single farmhouse and associated outbuildings;
- Livestock facilities;
- Two ESKOM substations;
- Two ESKOM overhead power lines;
- Transnet Railway line; and
- Municipal water pipeline in the railway servitude.

Thus, apart from the national, provincial and local infrastructure found on the farm, only the farmhouse, outbuildings and livestock infrastructure are in private use.

The portion of the site where the solar plant is proposed, is free of any of the above prominent infrastructures so to avoid infringing of the development with existing infrastructure.



Figure 9a&b: Olien Main Transmissions (MTS) Substation

The substation on the development site is the Eskom Olien Main Transmission System (MTS) substation. According to Eskom's *Capacitij Assessment 2012* report, the available capacity for the connection of new generation projects at the Olien MTS substation is for 340 MW (Level 1) and 1020MW (Level 2), and different connection conditions have been set for Level 1 and Level 2 criteria. These connection capacities have been determined by Eskom by assessment of the existing transmission and distribution infrastructure in this area. Eskom will favourably consider connections to the MTS substations identified as having connection capacity, in event where electricity generation projects are proposed, but subject to shallow connection works only (as is proposed in the case of this Olien Solar project).

The farm is accessed via an existing access gravel road via the R385. Existing tracks on the farm provide vehicular access to both the southern and northern portions of the site.

SANBI BGIS classifies the soil class in the area as Lithosoils (see attached LUDS Evaluation in Appendix F).

Mucina (2006) and the National Spatial Biodiversity Assessment (BGIS, 2007) classifies the area's original natural vegetation as consisting of Ghaap Plateau Vaalbosveld, Southern Kalahari Mekkacha and Southern Kalahari Salt Pans.

Please see Appendix B for a visual representation of the SANBI determinations. More detail on the vegetation type identified is included in the Baseline Ecological Assessment, summarised below in Section 7.

5.1 SENSE OF PLACE

The landscape characteristics of the wider area surrounding the development site include two urban areas of restricted size (the towns of Lime Acres and Danielskuil), mining activities (Finsch & Petra Diamonds Mine close to Lime Acres) and mining associated infrastructure include an airstrip at Finsch & Petra Mine, urban transition areas between these two towns and the surrounding agricultural land. The agricultural environment is characterised by grasslands, plateau bushveld and livestock farming. The Great Pan at Silver Streams is well-known in the area and is under the ownership and management of the Northern Cape Department of Tourism, Environment and Conservation. The Great Pan which is located north and upstream of the development site is a registered CWAC site (Coordinated Waterbird Counts), as identified by the University of Cape Town's Animal Demography Unit, although bird counts at the site are irregular and current status of the pan is unknown.

6 DEVELOPMENT PROPOSAL AND ALTERNATIVES

The Olien Solar Facility project entails the development and construction of a photovoltaic (PV) facility and associated infrastructure to provide for the generation of renewable, solar energy. The proposed PV plant will convert solar energy into direct current (DC) electricity by means of the photovoltaic modules. The electricity will then be transferred to a DC/AC inverter, which will convert the energy to alternating current (AC). The inverters will be connected to a step-up transformer for the purpose of increasing the voltage to the required grid voltage. As a final outcome of the energy generation process, the solar energy generated by the facility will be transferred to the national ESKOM electricity grid.

The infrastructure of the above described PV plant will consist of:

- Solar field with PV panel arrays including inverters and concentrator boxes housing outdoor switchgear;
- Transformation centre housing the transformer and associated protection devices;
- Distribution centre for the distribution of voltage lines to the Eskom substation;
- Building(s) for control room and administration of approximately 40m²;
- Metering facilities;
- Workshop and workshop storage of approximately 300-400m²;
- Hardsurface lay-down and parking area;
- Assembly area;
- A short connection line to the MTS Olien Substation;
- Any potential expansion of the above substation;
- Meteorological station with lattice structure of 3metres high;
- Upgrading of the existing access road;
- Staff facilities (kitchen, ablution facilities) of approximately 40m²;
- Guard house of approximately 100m²; and
- Fencing and security including lighting protection for the development.

Upon installation of the above infrastructure, it is expected that the operation of the solar panels (photovoltaic arrays) will generate an output of approximately 75 megawatts (MW) for transmission to the national electricity grid via the on-site MTS Olien Substation. For details on this substation and why it allows for effective connection to the national ESKOM grid, see Section 5 above.

In general terms, the layout of PV plants is to a great extent determined by the type of technology to be implemented. Technological options including fixed rack structures, single and two axis trackers each has different spatial requirements and will therefore deliver a specific layout concept.

The technology proposed for the solar facility is the use of solar PV panels on fixed structures. During the operation of the facility, solar radiation is converted to electricity. The majority of such a facility operates on an automated basis, although staff will be appointed to manage and oversee that the facility operates optimally.

6.1 PV MODULE

PV modules are characterised according to the type of material used for the modules. Options include Si-monocrystalline, Si-Polycrystalline, Thin Film and High Concentrated modules. There are increasing developments in the options of PV modules with the current trend being towards polycrystalline module technology.

For the Olien Solar development, cognisance is given to the Independent Power Producer Procurement Programme which specifies that locally manufactured material or assembled PV modules are to be given preference with the purpose of promoting local economy and local job creation.

6.2 ACCESS AND INTERNAL ROADS

The development site will be accessed via the existing access providing vehicular access of the DR385 to the farm and Eskom substation. A new internal access road and perimeter road (providing vehicular access around the perimeter of the development) will be required to service the solar plant. The internal access road will have a road width of 10 metres while the perimeter and internal service roads will consist of a 3 metre wide road designed according to the horizontal geometry involved for the trucks transporting the PV structures and components. A road reserve of 5 metres will be included.

Open side drains will be included in the road design. The internal road depth will be designed at a minimum depth of 400mm with an aggregate compacted base layer of 150mm. Material for the base layer will possibly be obtained from the site excavation. Alternatively, aggregate from a commercial and possibly local source will be applied. Road surfaces with reduced dust levels will be investigated and included in the road designs.

Road usage during the operational phase will generally only be required for security purposes and routine inspections with minimum vehicular access for maintenance and cleaning operations.

6.3 PV MODULE STRUCTURE

Steel structures are required to support PV modules. Such structures typically consist of galvanized steel, stainless steel or anodized steel. Production rates and cost effectiveness are two main factors considered in determining the best suitable structure for the PV modules.

6.4 FOUNDATION

The type of foundation to be applied for the PV modules will be determined based on geotechnical investigations. Suitable options for foundations include mass concrete block foundations, ground screw foundations, concrete pile foundations or vibratory driven steel pile foundation. Depending on the specific geotechnical conditions of the development site, the option of a concrete pile might need to be used.

7 SPECIALIST ASSESSMENT

To date, specialists and consultants have investigated the proposed development site to determine if the proposed solar energy development is feasible, and whether the proposed facility may result in any potential impacts to the receiving environment. The EIA process is still in its Scoping Phase and therefore the appointed specialists and consultants completed baseline assessments of the sites and its surroundings. The purpose of these baseline studies was to identify the feasibility of the site for a solar facility, to determine the current status of the proposed development site and to identify any potential constraints on the site and immediate surroundings which would need to be considered as part of the planning process. Summaries of the individual baseline studies are provided below and the complete reports are attached as Appendix D of this DSR.

7.1 PALAEONTOLOGY

In terms of the National Heritage Resources Act (Act No. 25 of 1999, Section 25), a palaeontological assessment of the proposed development site is required. The purpose of this study was to determine whether there are any important fossil materials found at the proposed development site.

The Palaeontology study consisted of a desktop study to identify the palaeontological material present on the proposed development site, and in the case that important palaeontological material was found, what measures should be taken to avoid potential impact on these non-renewable resources.

It was found that the geology of the development site contains superficial deposits described as "Late Cenozoic". These deposits date back to the period Late Quaternary (2.6million years ago) to recent. The deposits on the development site are commonly associated with Florisian Mammal age taxa. Although species from this age taxa have modern counterparts, it is also known to have included extinct species such as the Long Horned Buffalo and the Giant Hartebeest. These deposits are not rich in fossils and fossils are more likely to be found in river gulleys, of which none are present on the proposed development site.

Due to the few fossils associated with these deposits and the poor exposure on the development site (i.e. no gulleys or river beds) it was found that the development site is not particularly sensitive to fossil finds. The likely absence of important fossils on the development sites guided the conclusions that no notable palaeontological impacts are expected from the proposed solar facility at this site.

The appointed palaeontologist did recommend the following mitigation measure in event that fossil material is found during the construction phase of the facility:

"The ECO (Environmental Control Officer) responsible for the development must remain aware that all sedimentary deposits have the potential to contain fossils and he/she should thus monitor all substantial excavations into sedimentary bedrock for fossil remains;

In the case of any significant fossils (e.g. vertebrate teeth, bones, burrows, petrified wood) being found during construction, they must be safeguarded and the relevant

heritage management authority (SAHRA) be informed so that a professional palaeontologist may be consulted in order to facilitate the necessary rescue operations.” (Botha-Brink, 2012).

Based on the baseline study, it is recommended that exemption from further specialist palaeontological studies and mitigation be granted for this solar development.

The baseline assessment will be presented to SAHRA for their formal comment.

7.2 AGRICULTURAL POTENTIAL


An agricultural site analysis was undertaken to evaluate the agricultural potential of the site, to determine agricultural and site constraints and to determine to what extent the proposed solar development could impact on the development site, which is currently used for livestock farming.

The agricultural site assessment included an augering survey which was carried out on a 200m grid across the development site (south of the railway line). The agricultural specialist used this data to plot soil groups of the development site, contributing to the investigation of the site’s agricultural potential.

The following soil forms were identified on site: Class VI (Brandvlei and Coega) and Class IV (Plooyburg {between 40-90cm} and Kimberley {between 60-90cm}). Class VI is the most dominant soil form found on the site and covers approximately 96% or 432ha of the development site. Coega and Brandvlei are generally not soils suitable for agricultural production and is characterised as having a “very low suitability” rating for agricultural potential. These soils have low water holding capacity, a shallow rooting zone, and are highly susceptible to erosion.

The remaining 4% or 18ha of the development site is occupied by Plooyburg and Kimberley which is also associated with poor water holding capacity and is characterised as having a “low suitability” rating for agricultural potential.

Table 3: Soils of development site.

	<p>20cm red sandy (Fine grade) single grain structure top soil.</p> <p>60cm Red brown, loamy sand (Fine grade), sub soil with no structure.</p> <p>40cm Soft Carbonate horizon with signs of wetness in carbonate horizon.</p>
<p><i>Figure a:</i> Kimberly form (Family Riverton).</p>	


	<p>The top 20cm of the soil profile consists of a brown, sandy loam, single grain structure topsoil overlaying a Hard pan Carbonate horizon. The effective rooting depth is the top 20cm. The soil family indicates that the top horizon is calcareous.</p>
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Figure b: Shows the Coega soil form (Family Marydale) which covers the largest part of the site (94%).


	<p>20-30 cm Light brown, sandy (Fine grade) with single grain structure, top soil overlaying 40–60cm Soft Carbonate horizon. The family indicates that there are no signs of wetness in the soft carbonate horizon.</p>
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Figure c: Brandvlei soil form (Family Grootvloer) that extends over about 2% of the site.

Based on the above, but also climatic factors such as the limited rainfall (the area receives between 200 and 400mm of rain annually and is furthermore characterised by high evaporation and extreme temperatures), the site is not suited for cultivation. These severe limitations are restricting agricultural practices to grazing, woodlands and wildlife.

According to the erosion classification by Schoeman, soils with a clay content of less than 20% are regarded as potentially susceptible to wind erosion. This classification, together with the very fine to medium sand grain of the site’s soils, result in the site’s soils being highly susceptible to wind erosion. In terms of the water erodibility index which considers soil factors such as clay content, leaching status, structure and transition and soil depth, the soils found on the development site is equally considered as highly susceptible to water erosion.

The site's grazing capacity has been estimated at between 21 – 25 ha / LSU which equates to a low grazing capacity.

The agricultural potential study concluded that the site has a low agricultural potential and as such, the proposed solar energy development will have minimal and negligible impacts on the site's agricultural potential.

7.3 **ECOLOGICAL**

A terrestrial fauna and flora (ecological) scoping study was undertaken for the development site by Simon Todd Consulting. This section provides an overview of the scoping report's findings (for a copy of the report, see Appendix D of this DSR).

7.3.1 **Plant Community**

No fine-scale conservation planning has yet been undertaken for the area and as such the proposed development site does not fall within a Critical Biodiversity Area. Furthermore, the site does not fall within a National Protected Areas Expansion Strategy Focus Area (NPAES). This confirms that the development site has not been identified as an area of exceptional biodiversity or of significance for the long-term maintenance of broad-scale ecological processes and climate change buffering within the region (Todd, 2012).

A field assessment, with combined desktop and literature review study, were undertaken to identify, map and assess the development site's habitats and ecological sensitive areas. According to the national vegetation map (Mucina & Rutherford 2006), three vegetation types occur within the study area, namely: Ghaap Plateau Vaalbosveld, Southern Kalahari Mekgacha and the Southern Kalahari Salt Pans.

Ghaap Plateau Vaalbosveld

The majority of the development site falls within the Ghaap Plateau Vaalbosveld vegetation type. This vegetation type including the endemic *Rennera stellate*, covers 15424 km² of the high elevation (1100-1500 m) plains of the Northern Cape, from Campbell in the south to around Vryburg in the north.

This vegetation type has a **conservation status** of '**Least Threatened**' and less than 2% of this vegetation type has been transformed. The vegetation type is however not found in any formal protected area and is therefore described as generally very poorly protected.

Southern Kalahari Mekgacha

This vegetation type is found along the southwestern boundary of the site and is associated with the large drainage area extending onto neighbouring properties to the south-west of the development site. Concurrently, Southern Kalahari Mekgacha is typically associated with river beds and slopes of the intermittent rivers of the southern Kalahari

This vegetation type has a **conservation status** of '**Least Threatened**' and a significant portion of the vegetation type is formally protected within the boundaries of the Kgalagadi Transfrontier Park.

Southern Kalahari Salt Pans

The national vegetation map (Mucina & Rutherford 2006) does not map Southern Kalahari Salt Pans as being found on the property, yet it occurs within the near proximity of the site and is furthermore thought to be associated with the small pans on the development site. This vegetation type has a **conservation status** of ‘Least Threatened’ and is similar in extent throughout the province as the Southern Kalahari Mekkacha. The following map shows the occurrences of these vegetation types on the site:

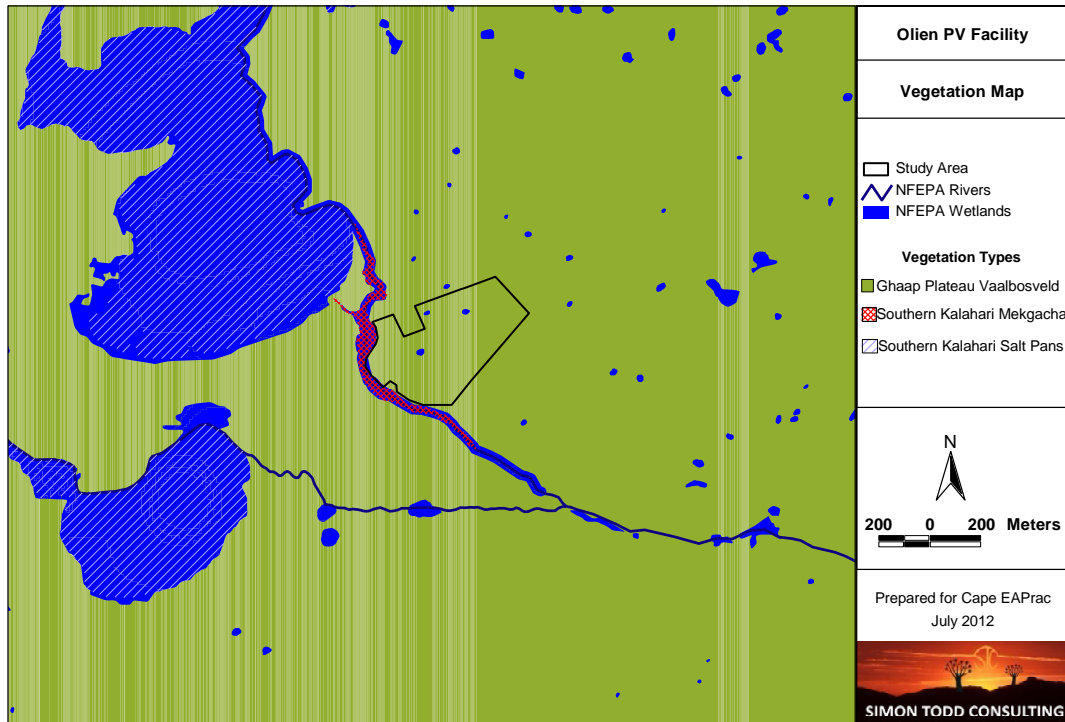


Figure 10: vegetation types on and surrounding the development site.

Habitat sensitivity

The following map shows the ecological sensitivity of the site:

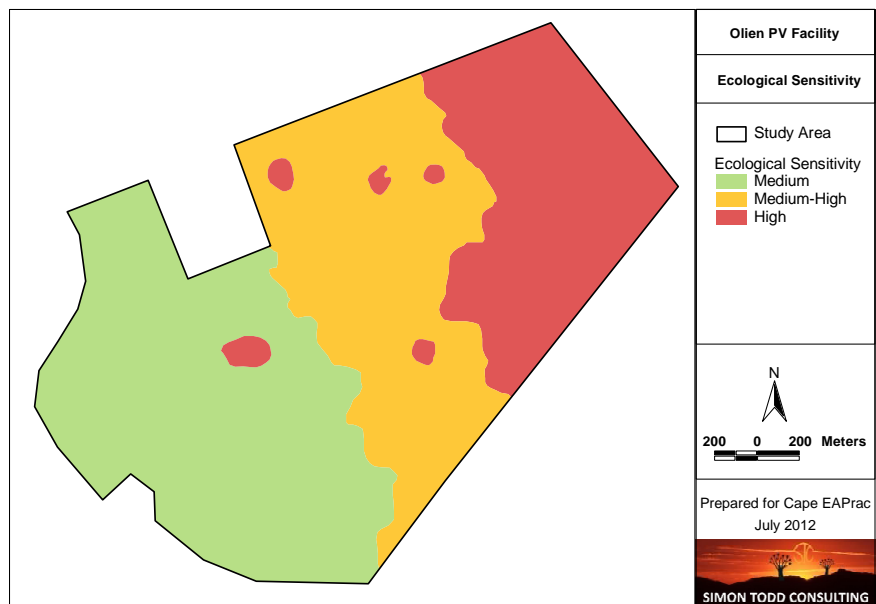


Figure 11: Ecological sensitivity of the development site.

As noted in the ecological sensitivity map, the sensitivity of the site increases with a western to eastern gradient, parallel to the increase in density of trees. The density of the trees reaches a maximum of 50/ha in the eastern section of the site and therefore the eastern portion of the site is the most sensitive part of the site.



Figure 12: two habitat types found on the development site.

It is important to note that the high sensitivity of the site is not ascribed due to the presence of particular species, general species richness or other ecological features: the high sensitivity is ascribed due to structural components (i.e. the presence and density of the woodlands cluster). The site has an overall low plant species richness. No threatened or rare plant species are found on the site.

Trees

The tree species found on the development site include *Searsia lancea* and *Olea europaea* subsp. *africana*, with occasional *Ziziphus mucronata* subsp. *mucronata* and *Gymnosporia buxifolia*. The shrub layer within the western part of the site is dominated by *Tarchonanthus camphoratus* and *Searsia tridactyla*. None of the tree species found on the site is protected under the National Forests Act (Act 84 of 1998) although provincial legislation, the new Northern Cape Nature Conservation Act (2009) applies. The tree species found on the development site which is particularly governed by this Act is the *Olea europaea* or Wild Olive.

(The Northern Cape Department of Environmental Affairs & Nature Conservation as well as the Department of Agriculture, Forestry & Fisheries are key stakeholders in this EIA process and will be requested to provide input and or comment).

No rare or threatened tree species are found on the site.

IUCN listed plant species

In terms of the IUCN list, the following four² listed plant species are known for the area including and surrounding the development site:

Boophone disticha (Family: AMARYLLIDACEAE); *Asparagus stipulaceus* (Family: ASPARAGACEAE); *Gnaphalium declinatum* (Family: ASTERACEAE); and *Antimima lawsonii* (Family: MESEMBRYANTHEMACEAE).

The status of these four listed plant species is as follows: *Boophone disticha* (Declining); *Asparagus stipulaceus* (Not Threatened); *Gnaphalium declinatum* (Not Threatened); and *Antimima lawsonii* (Rare).

The specialist has not found any of these listed plant species on the development site, but still gave recognition to the extent of the site – and for this reason it is stated that it is not impossible for some of these species to be present on the site.

7.3.2 Water features

According to the NFEPA wetland assessment, the pans found on the development site (see figure below) are rated as Rank 3 wetlands. This rating indicates that these wetlands are natural wetlands, but do not fall within any of the priority categories for wetlands and do not have intact wetland or biological significance. According to the specialist, this is because these wetlands on the development site are not of natural origin but rather associated with man-made (agricultural) dams.

The number of small pans mapped within the site is typical of the area and according to the ecological specialist, these pans can hold water for reasonably long periods of time after rain. A typical pan as found on the site is shown in figure 7.



Figure 13: typical pan on the development site

Some of the others are however little more than slightly depressed areas within the landscape and as they were found fully vegetated, do not appear to hold water on a regular basis. Although the vegetation composition of these areas is slightly different from the surrounding areas, this may be related to differences in substrate rather than moisture availability.

² One of these four plant species, the *Asparagus stipulaceus* does not actually occur in the area and is on the IUCN list as a result of the outdated taxonomy of historical species lists for the area (Todd, 2012).

The specialist noted that the dry season during which the site assessment was undertaken could have influenced the sensitivity description of these pans. Re-evaluation of the pans during the impact assessment phase of the EIA is recommended.

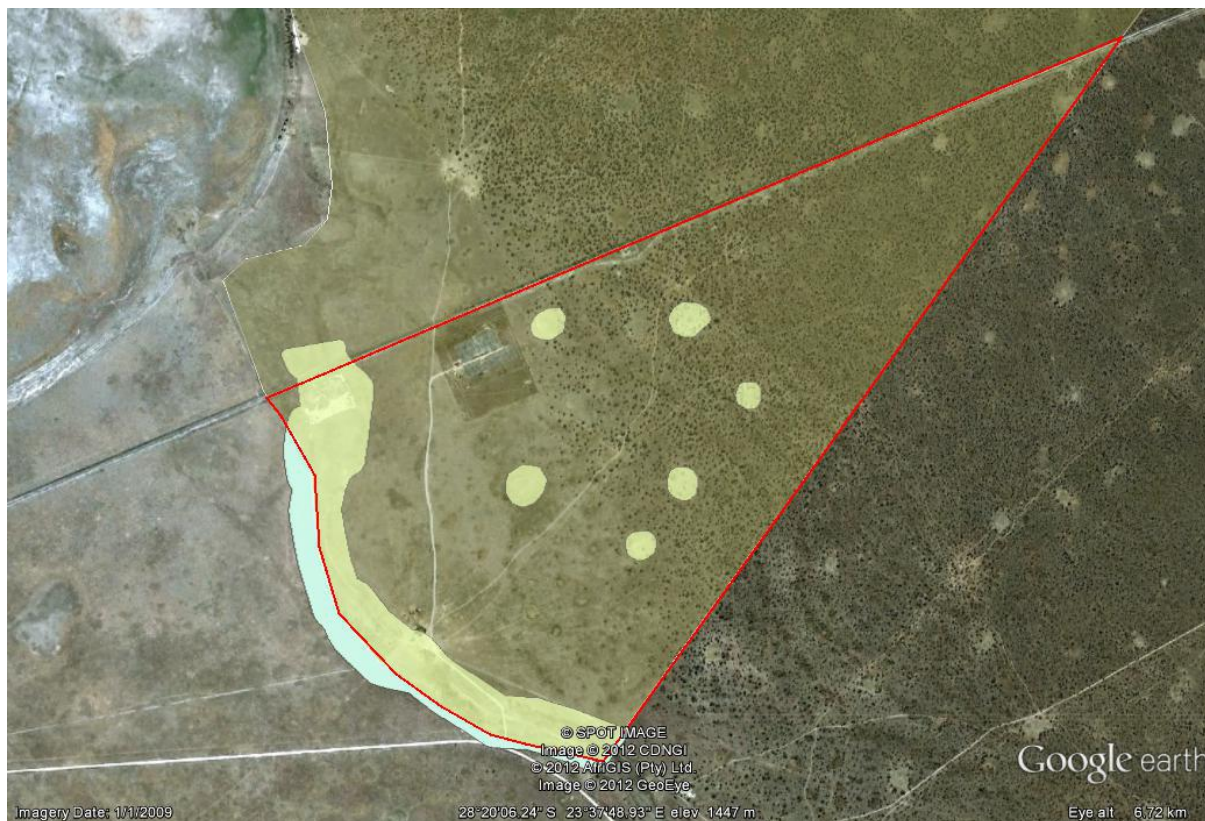


Figure 14: freshwater features including small pans mapped on development site.

7.3.3 Faunal community

The faunal community of the development site has been described as having a moderate diversity, compared to the plant community which is of lower diversity. The study indicated that **44 terrestrial mammals and 9 bat species** are associated (and potentially occur) at the development site. The absence of rocky outcrops from the site is eliminating the presence of fauna associated with these features, including most notably Rock Hyrax, *Procavia capensis*, Jameson's Red Rock Rabbit *Pronolagus randensis* and Spectacled Dormouse *Graphiurus ocellaris*.

IUCN listed mammal species

In terms of the IUCN list, the following four listed plant species are known for the area including and surrounding the development site:

Brown Hyaena (*Hyaena brunnea*); Honey Badger (*Mellivora capensis*); Black-footed Cat (*Felis nigripes*); and Natal long-fingered bat (*Miniopterus natalensis*).

The status of these four listed plant species is as follows: Brown Hyaena (Near Threatened); Honey Badger (Endangered); Black-footed Cat (Vulnerable); and Natal long-fingered bat (Near Threatened).

None of the above was spotted during the site assessment, and the specialist gave the following information as to their potential existence on the site:

- The Brown Hyaena is not likely to occur in the area on account of the agricultural land-use in the area which is not usually highly tolerant of large carnivores.
- The Black-footed Cat is a secretive species which would probably also occur at the site given that it occurs within arid, open country.
- Similarly the Honey Badger may also occur at the site, but given the extensive national ranges of these species, the impact of the development on habitat loss for these species would be minimal.
- Although the falls within the distribution range of the Natal long-fingered bat, this species is cave-dependent and the presence of this species at the site would depend on the presence of such suitable caves in the vicinity. Although there is a lot of mining activity in the area which may create suitable roosting sites in mine audits, this is largely open-cast mining and the presence of suitable caves in the area is not known.

Birds

A total of 12 listed bird species are associated with the development site. These 12 listed bird species including the following:

Chestnut-banded Plover, Black Stork, Yellow-billed Stork, Lanner Falcon, Lesser Kestrel, Kori Bustard, Lesser Flamingo, Greater Flamingo, Secretary Bird, Tawny Eagle, African Marsh-harrier, and Martial Eagle.

All of these 12 bird species are classified as Vulnerable or Near Vulnerable.

The lack of extensive, permanent wetlands or other water features eliminate the presence of water birds typical to the area, including the two flamingo species, Yellow-billed Stork, Chestnut-banded Plover and to some extent the African Marsh Harrier. Migration and movement of these birds through the site are however very possible.



Figure 15: Secretary bird (Poto source: Wikipedia.org)

Reptiles

Relatively low reptile diversity is expected for the development site. The reptile distribution range for the development site is estimated at 40 reptile species, and is thought to consist of: 1 terrapin, 23 snakes, 14 lizards and skinks and 2 geckos. A single species of conservation concern may occur at the site, the **Striped Harlequin Snake** *Homoroselaps dorsalis* (Near Threatened). It is important to note that the distribution of the Striped Harlequin Snake is not

highly restricted, and as such development of the site would not be likely to significantly impact the total population of this species.

Amphibians

The site's amphibian distribution range amounts to ten species – and as such, the site's amphibian diversity is described as moderate. Water independent amphibian species dominate due to the site's lack of extensive water features with prolonged water availability.

The only species of conservation concern which may occur at the site is the **Giant Bullfrog** *Pyxicephalus adspersus*. However, the specialist indicated that the site lies at the margin of the known giant bullfrog distribution and it has not been recorded from any of the quarter degree squares around the site, thus suggesting that is unlikely to occur at the site. The site's small and shallow pans also do not present favorable breeding grounds for this species, further confirming that it is not likely to occur on the development site.

It is also the small extent of the pans on the development site which confirms that the development is not likely to significantly impact on the amphibian community.

7.4 ARCHAEOLOGY

Dr David Morris (associated with the McGregor Museum, Kimberley) undertook a baseline site assessment and completed a Phase 1 Archaeological Impact Assessment (Scoping phase report). A summary of the findings are presented here:

The development site is found on a calcrete plain located on what is described as the Ghaap Plateau, east of Lime Acres. The archaeology of the Northern Cape is well known for its rich and varied character associated with long periods of human history.

An overall good visibility for detecting artefacts is present on the development site. Stone Age material known to the area and are from the Earlier, Middle and Later Stone Ages through the Pleistocene and Holocene times.

Two particular rock engraving sites are found in the area: close to Lime Acres as well as Danielskuil. The famous Wonderwerk Cave and well known Tsantsabane (Blinkklipkop) is also located in the region closer to Postmasburg.

The terrain covered on the development site consists of **hard calcrete** which is frequently exposed and has only shallow topsoil cover. Soils of greater depth are found in hollows and were described as **possibly dolines**, despite the deeper soils; the edges of these hollows were assessed for archaeological remains and traces.

No traces of local raw materials available for the making of stone tools were found during the baseline assessment of the site. Such materials typically include jaspilite (banded ironstone) or chert. Although none were found on the development site, the wider environment is known for such raw materials.

A very low density of surface Stone Age archaeological material was found over the development site. Materials founded include jaspolite flakes of Pleistocene age, described as probably belonging to the Middle Stone Age. These flakes were isolated and found up to 200m or more apart. Later Stone Age flakes on chert were found in the northern section of the site. These Later Stone Age flakes were also scattered fairly isolated from one another.

The site is described as having a **minimal archaeological significance** particularly due to the very low density of stone tools.

Potential destruction or at least disturbance of archaeological material is associated with the development concept. However, the expected intensity of such disturbance is described as **low** and the specialist did not recommend any specific mitigation measures.

The Northern Cape PHRA (Ngwao Bošwa ya Kapa Bokone), a key stakeholder provided with a copy of the Phase 1 report, is the responsible body for archaeological resources.

7.5 HERITAGE

Dr David Morris (associated with the McGregor Museum, Kimberley) undertook a baseline site assessment and completed a Phase 1 Heritage Impact Assessment (Scoping phase report). A summary of the findings are presented here:

Colonial era heritage traces were found in close proximity to the existing homestead. These heritage traces included the remains of kraals constructed from calcrete cobbles found north of the dwelling. A row of **five graves** were also recorded west of the homestead; the graves lacked inscriptions.

Overall, the heritage traces are described as **very low** with the colonial traces and unmarked graves being the only heritage traces. To prevent potential impact on the above, development within a **100m radius** from the unmarked graves should be **avoided**. The location of the graves or indicated in the figure below:

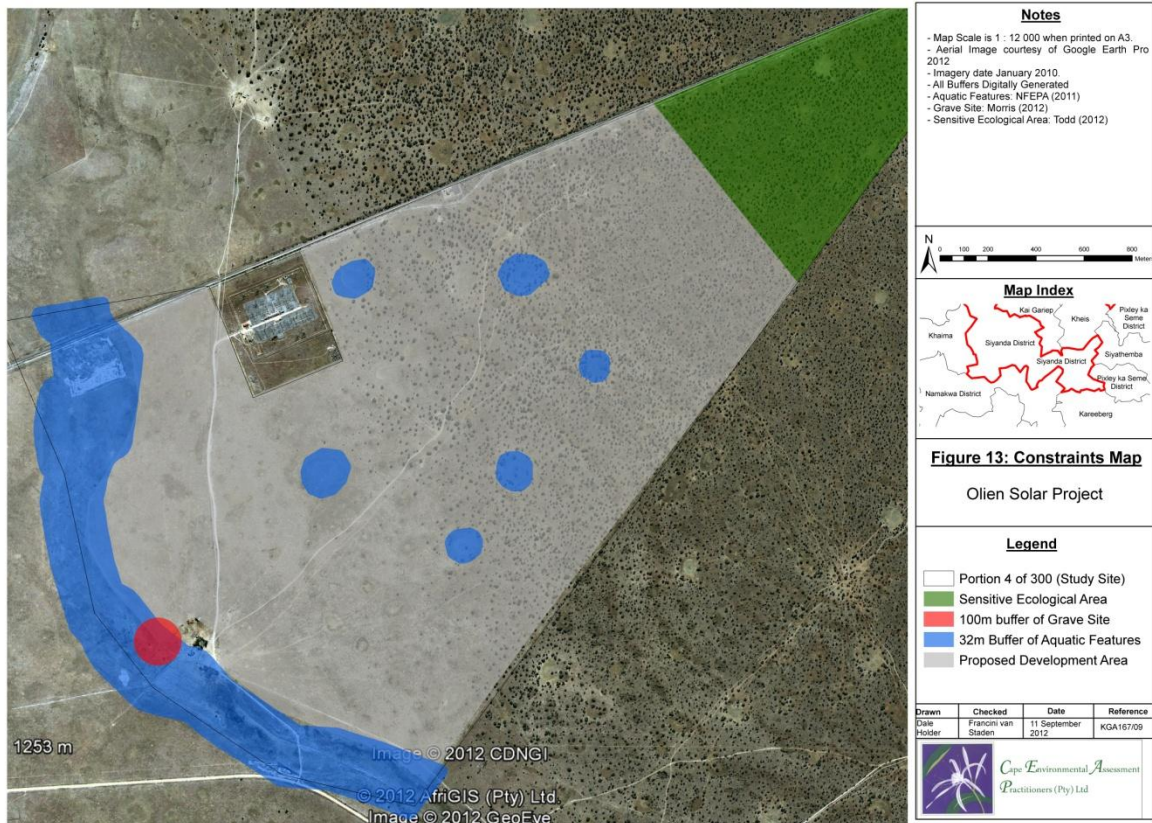


Figure 16: Constraints map showing the location of unmarked graves (red circle).

Note that the location of the graves is **not within the proposed development footprint** (the white-filled area is the proposed development footprint). As such, any potential impact on this heritage resource is effectively avoided.

The specialist highlighted that in the unlikely event of any further site/feature (e.g. an unmarked grave or an ostrich eggshell cache) being found in the course of development, SAHRA should be contacted immediately for the find to be investigated and mitigation measures to be recommended. Bošwa will likewise be contacted in respect of the built environment.

7.6 ENGINEERING ASPECTS

The civil engineering and options review report as compiled by JCC Berrington on behalf of AE-AMD Renewable Energy, provided a project description and technical background on the development type and review of available options.

The main technical features of the project are described, including PV module foundations, structures, PV modules technology, inverters, transformation centre, distribution centre, electrical reticulation and plant security and control systems. Site details and details of the construction phase are also described. For a review of the complete report, please see Annexure D5 of this report.

7.6.1 Technological options review

PV plants can consist of different technologies according to the energy generation requirements and development site attributes. Technological options include Fixed (or rack) structures, Single-axis tracker or Double-axis tracker structures. For the purpose of the Olien Solar project, the Engineering Report described fixed structures and single axis tracker:

Typically, a fixed or rack structure consists of two rows of 20 modules. The PV modules are arranged in a portrait arrangement, facing north. The foundation required for such a structure is a direct-driven or rammed installation. Ramming depth is usually determined according to soil structure and properties. Design features that allow thermal expansion of the rack structures are included, and is an important feature given the solar radiation of PV plants. This prevents mechanical loads that could affect the optimal functioning of the PV modules. Anti-theft bolts are also included in the design.



Figure 17: Fixed or rack structures

Unlike fixed structures which have no moving parts, the single-axis tracker technology consists of the PV module attached to a rotating structure. The motivation for a single-axis tracker structure is a higher energy generation output, as the PV module is not limited to solar radiation in a fixed location as the module rotates tracking solar radiation. This option involves the placement of a number of these trackers adjacent to one another with a common rotation mechanism for the trackers. This is a simplified design which allows for the most efficient use of available space. This technology furthermore needs to include precision electronics with GPS input along with proprietary positioning algorithms which ensures that the system follows an optimal angle. **Figure 18: single-axis tracker technology**



7.6.2 PV Modules

The PV modules are characterised according to the type of material used for the modules. Options include Si-monocrystalline, Si-Polycrystalline, Thin Film and High Concentrated modules. There are increasing development in the options of PV modules with the current trend being towards polycrystalline module technology.

For the Olien Solar development, cognisance is given to the Independent Power Producer Procurement Programme which specifies that locally manufactured material or assembled PV modules are to be given preference with the purpose of promoting local economy and local job creation.

7.6.3 Development layout and design considerations

The engineering report specifies the layout and design considerations specific to this Olien Solar energy project. Not only does the choice of technology, but also the PV module and tracking structure prescribe that certain layout and design considerations must be taken into account.

The project team engineers further specifies in the Engineering Report the general layout and design criteria that were considered for this proposed solar development, based on the site location and attributes. These include the following:

- A buffer area of 16 metres from the centre of any power lines;
- A buffer area of 95 metres from any provincial road;
- A buffer area of 16 metres from any Telkom line;
- A buffer area of 10 metres from any fence for security and optimal solar radiation;
- Internal and perimeter service roads with a width of 3 metres and a 5 metre road reserve; and
- A main access road with a width of 3 metres and a 10 metres road reserve.

All electrical reticulation required for the operation of the solar plant, will be installed underground. The only potentially overhead electrical line will be the 132kV line connecting the solar development to the existing Olien MTS substation (less than 2km). For more detail on the electrical component of the development, see the Technical Report included in Annexure D5 of this report.

7.6.4 Meteorological station

A meteorological station will be installed on site as part of the plant monitoring and evaluation systems. The meteorological system will potentially include the following components:

- Lattice structure 3m high for the support of the systems;
- pyranometer for tilted radiation;
- horizontal pyranometer for global radiation;
- ambient temperature sensor with natural ventilation antiradiant shield;
- anemometer at 5m height;
- vane to measure the wind direction;
- module temperature sensor;
- humidity sensor;

- data logger;
- GSM/GPRS modem; and
- UPS or non-stop power supply system.

7.6.5 Roads

The development site will be accessed via the existing access providing vehicular access of the DR385 to the farm and Eskom substation. A new internal access road and perimeter road (providing vehicular access around the perimeter of the development) will be required. The internal access road will have a road width of 10 metres while the perimeter and internal service roads will consist of a 3 metre wide road designed according to the horizontal geometry involved for the trucks transporting the PV structures and components. A road reserve of 5 metres will be included.

Open side drains will be included in the road design. The internal road depth will be designed at a minimum depth of 400mm with an aggregate compacted base layer of 150mm. Material for the base layer will possibly be obtained from the site excavation. Alternatively, aggregate from a commercial and possibly local source will be applied. Road surfaces with reduced dust levels will be investigated and included in the road designs.

Road usage during the operational phase will generally only be required for security purposes and routine inspections with minimum vehicular access for maintenance and cleaning operations.

7.6.6 Water usage

A potential concern of solar plants is the level of water usage. PV modules need to be kept clean to ensure optimal working efficiency and this requires water cleaning for the removal of dust and other particles.

For the Olien Solar project it is anticipated that the operational phase of the plant will not require extensive volumes of water. In addition to the panel cleaning, a small volume of water will be required for the security and operational personnel.

The project team engineers described that less than one litre of water is required per PV module per year. For a 75MW AC solar plant such as the proposed Olien Solar plant, the annual water requirements will equal 895,000 litre per annum or 895 kilolitre. For the domestic purposes including security and operational personnel water requirements, less than 1,000 litre per day is anticipated. Per annum, this will equal 365,000litre or 365 kilolitre.

Adding the above water volumes required, results in a total of 1260kl for the entire development, per annum.

A water servitude forms part of the civil services servitudes running across the farm in an east-westerly direction. The project team engineers are currently in discussion with Sedibeng Water (Northern Cape), a registered Water Services Provider, for the securing of water for the operational phase. Sedibeng Water has already indicated the possibility that the proposed project can be provided with the required water volumes for the operational phase of the development.

Further details of this, including details of the potential supply point and a potential confirmation of water supply will be provided at a later stage in the environmental process.

Water requirements for the construction phase is also described in the civil report (see Annexure D5 of this report for full details). The construction phase water requirements are described as a 'temporary requirement' and will mainly be needed for the production of concrete for the structure and tracker bases. A total of approximately 9megalitre of water is expected for the completion of the construction phase. This is thought to be the 'worst case scenario' and will only be the case (although unlikely) if mass concrete foundations are required. Different founding options have different water requirements and mass concrete foundations is the option which will require the highest volume of water.

As with the water securing for the operational phase, discussion is underway with Sedibeng Water for the potential supplying of the required water.

7.6.7 Construction traffic

It is estimated that the construction traffic will peak at 10 large delivery trucks daily with approximately 40 to 50 concrete trucks per day. Following the completion of the founding works, the trucks will be reduced to between 20 and 30 per day. Also, depending on which foundation option is selected, the amount of construction traffic may vary. For example, for vibratory driven steel pile foundations, the volume of traffic will be greatly reduced as concrete work will be limited.

7.6.8 Construction Phase Site Works

The nature of the development, namely a relatively open plant, will not require any specific service or haul roads to be prepared on site. Clearing of the development footprint will allow sufficient access for the excavation and construction equipment.

Although the site is fairly flat, some cut and fill activities will be required for the grading of the site to the desired level to allow for the buildings, roads and racks associated with the plant.

The clearing of the vegetation cover will however be kept to the minimum. A good ground cover can notably reduce dust levels which is a major factor in PV module efficiency. By keeping the ground vegetation cover removal levels to the minimum, the ground cover can re-vegetate quickly ensuring a good efficiency level for the function of the solar plant.

The number of trenches that will be required will depend on the number of cables implemented. Estimations for trench width is 0.6metre and depth is 1.1metre. The trenches will be backfilled using suitable material from either the on-site excavations or alternatively a local commercial aggregate source. For the purposes of this solar project, specialised trenching machinery will most likely be used.

It is not anticipated that the construction phase will require any borrow pits to be created, considering the type of terrain and expected road and structure foundations.

The limited nature of the construction earthworks indicates that minimal spoil heaps can be expected. It is possible that a small volume of material from the trenches or pile holes may be found unsuitable for backfilling, in which case it will be spoiled, on site. Alternatively, the

material will be used elsewhere on the development site (e.g. for screening on the development site perimeter with natural re-vegetation).

7.6.9 Stormwater management

The stormwater drainage and management system proposed will be designed on the concept of distributing the stormwater over the entire development site (a significant portion of the development site's ground cover will remain with natural ground cover, underneath the PV modules) to effectively allow the stormwater to drain naturally. This will allow for stormwater drainage similar to the pre-development flow.

7.6.10 Plant security

Theft of PV panels and electrical cabling is a notable risk and therefore perimeter fences and security systems will be installed as soon as is practical, including the early construction phases of the project.

The proposed perimeter fence is 2.4 m weld-mesh or wire and netting fence which is electrified or a double barrier consisting of two 2.4m high electric fences with only electric strands placed about 2 or more metres apart. A single 6m automated sliding gate will be provided for vehicular access as well as a single 1m wide gate for pedestrians.

The perimeter, access points and general site will be monitored by CCTV cameras infrared / night vision technology and passive intrusion detection systems. Security lighting will be linked to the passive intrusion detection systems and therefore lighting will not remain on throughout the night.

7.6.11 Plant power supply requirements

For the operation of the proposed Olien Solar plant, a continuous supply of power will be required, and more specifically for the monitoring and control systems, perimeter security and operation of the buildings associated with the plant. In the event that tracker technology is applied for the structures, a small amount of power will be required for the operation of this technology. It is most likely that the energy required will be obtained from Eskom (i.e. the existing farming operations / household on the farm is supplied with Eskom electricity). The developer will be responsible to confirm this energy supply with Eskom.

The current proposal is for fixed panels in which case the additional electricity will not be required.

For the purposes of emergency electricity supply, a diesel generator system will be on stand-by offering at least two hours of operation.

7.6.12 Plant monitoring and control systems

In addition to the meteorological system described under 7.6.4, a *Supervisory Control and Data Acquisition* (SCADA) system will be installed for the monitoring of the operational phase of the plant. This system will gather information from the inverters and meteorological station and will communicate this information to plant control.

7.6.13 Plant decommissioning and or upgrading

It is anticipated that the plant may need to be upgraded after an operational period of 20 years, subject to all applicable authorisations. Upgrading will involve the replacement of old PV modules with new ones, as well as the upgrading of technology. In the event that approvals are not obtained, the plant may need to be decommissioned. Decommissioning of the site can successfully return the site to its former state. The PV plant modules and materials have a recycling and or re-use value. This monetary value can even possibly cover the costs associated with decommissioning and rehabilitation of the site. The Technical Report (Annexure D5) describes the steps to be taken in the event of decommissioning.

8 NEED & DESIRABILITY

The Department's Guideline on *Need and Desirability* (August 2010) has been consulted to contribute to the consideration of the solar project's need and desirability. The concept of need and desirability can be explained in terms of its two components where *need* refers to *time* and *desirability* refers to *place*. The questions pertaining to both the project's need and desirability, as specified in the Guideline, are addressed in the following sections.

8.1 NEED (TIMING):

Is the proposed development in line with the projects and programmes identified as priorities within the credible IDP?

The proposed development will contribute to a number of key priorities identified in the Siyanda District Municipality IDP (2010 – 2011), including:

- Reduction of unemployment;
- Improving the rural and small town environments' relative position in the province's spatial economy;
- Local Economic Development; and
- Electricity supply and sufficiency.

Should the development occur here at this point in time?

Yes. Subject to the outcome of the detailed assessment. The development site is on an established farm within an existing **Agriculture I** zoning. The proposed solar project development can be allowed within this context, but the portion of the farm to be developed to accommodate the solar project will need to be rezoned to **Special Zone**, in terms of the local municipal planning scheme.

Does the community / area need the activity and the associated land use concerned?

To be verified once public participation is complete. The proposed solar project development is a project of a national interest as renewable and clean energy will be generated over the long term, and this energy will feed into the national Eskom electricity grid.

Are the necessary services with adequate capacity currently available?

Yes. The solar project will connect to an existing substation, the Olien MTS substation, which has been designated as having available capacity for the connection of new generation projects such as the proposed Olien Solar project.

Is this development provided for in the infrastructure planning of the municipality?

Yes. See above explanation.

Is this project part of a national programme to address an issue of national concern or importance?

Yes. Renewable energy generation is programme of national importance and recognition: the South African Government has set a 10 year cumulative target for renewable energy of 10 000 GWh renewable energy contribution to final energy consumption by 2013, to be produced mainly from biomass, wind, solar and small-scale hydro power (White Paper on Renewable Energy Policy, 2003). The proposed Olien Solar Project can potentially contribute to achieving these national goals.

8.2 DESIRABILITY (PLACE):

Is the development the best practicable environmental option for this land / site?

Compared to the current low yielding agricultural activities, the option of a solar farm is preferred. The baseline specialist studies to date, has shown that the identified site can accommodate the proposed solar project. Further detailed site assessments will follow and will identify should any environmental concerns arise that could affect the receiving environment.

Would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF?

No.

Would the approval of this application compromise the integrity of the existing approved environmental management priorities for the area?

No. The development and concept layout has avoided known environmental priorities and it is therefore no thought that the application will compromise the integrity of approved environmental management priorities.

Do location factors favour this land use at this place?

Yes. The Agricultural Potential Study has confirmed the low agricultural potential with severe restrictions particularly associated with the site's soil forms. As such, a solar energy project on the farm can be considered favourable.

How will the activity or the land use associated with the activity applied for, impact on sensitive natural and cultural areas?

No sensitive cultural areas have been identified on the development site. Therefore no impacts on cultural areas have been identified. The development site is not categorized as a Critical Biodiversity Area or Ecological Support Area. An ecological assessment of the site highlighted sensitive areas to be avoided, to prevent impact on sensitive natural areas.

How will the development impact on people's health and wellbeing?

No. No development is of such a nature (renewable energy) that it is not expected that it will impact on people's health and wellbeing.

Will the proposed activity or the land use associated with the activity applied for, result in unacceptable opportunity costs?

No.

Will the proposed land use result in unacceptable cumulative impacts?

At this stage, no unacceptable cumulative impacts have been identified and it is therefore not thought to be unlikely that the proposed 100MW solar project will result in unacceptable cumulative impacts. The project team and specialists will continue to investigate potential impacts and should any cumulative impacts be identified, these will be addressed.

9 POTENTIAL CONSTRAINTS

During the Scoping Phase to date, the specialists identified a number of site-specific constraints, all of which have been considered and included in the development layout plan through applying of the **avoidance principle**. See Appendix B for a visual representation of the constraints identified. The process will continue to identify site constraints to further refine the proposed solar facility layout. All the potential impacts associated with these constraints will be assessed and recommendations to avoid and/or mitigate impacts are provided during the on-going environmental process.

Plant Community:

A number of **listed and protected plant species** occur on the site, however, there are not many endangered species found on the site. The protected Wild Olive tree is the species of greatest concern and where found in dense clusters in the north-eastern corner of the site and these areas have been highlighted as sensitive areas of the site.

Fauna Community:

The development site is the habitat of a number of **vulnerable and near vulnerable bird species**. It is especially potential electricity transmission lines associated with the facility which could impact on the bird communities and therefore options of underground or shortest possible distance will need to be explored.

Water-independent amphibians associated with the area and also particularly the small extent of on-site pans. The Giant Bullfrog, *Pyxicephalus adspersus*, is the amphibian of most notably conservation concern thought to occur at the site.

Freshwater:

The NFEPA rated Rank 3 wetlands found on the development site are notably constraints. A **total of six small pans** were mapped within the site. These pans are thought to hold water for reasonably long periods of time after rain events, with associated support for fauna communities.

Agricultural:

No potential agricultural constraints have been identified. The development site has a low agricultural potential, due to climatic and soil conditions.

Palaeontology:

No potential palaeontological constraints have been identified. The development site was determined as not being sensitive to fossil finds or fossil finds of notable importance.

Archaeology:

No potential archaeological constraints have been identified. The development site was determined as bearing a very low, minimal archaeological importance.

Heritage:

A row of **five graves** was documented on the development site. The specialist recommended that the graves should be fenced and development **must be restricted** to no closer than 100metres from this row of graves.

The on-going environmental process will continue to be informed by inputs from the ecological, heritage, archaeological, palaeontological and agricultural specialists. Portions of the site considered to be sensitive have been identified and mapped on the **specialist constraint map**, see Appendix B of this DSR. The **current layout** for the solar facility already **avoids identified sites** and the layout will continue to be informed by relevant constraints.

Technical:

The solar plant's production capacity is to a great extent determined by the **available size** of the development site. The chosen technology will also determine the density of the solar structures, i.e. fixed rack systems can be developed at a **higher density** than two axis trackers.

10 PROCESS & PUBLIC PARTICIPATION TO DATE

To date, this Scoping and EIA process included a number of steps as well as commencement of the public participation process, to ensure compliance with the legislation and to allow ample opportunity for members of the public and key stakeholders to be involved and participate in the environmental process. Please see **Appendix E** for evidence of this Public Participation process. The Public Participation Process has been undertaken according to the requirements of the new NEMA EIA regulations. The following requirements i.t.o the scoping process have been undertaken and complied with in terms of Regulation 56:

Table 4: EIA Chronology of Events

CHRONOLOGY OF EVENTS	
DATE	ACTION
08-June-2012	NEMA Application submitted to the Department of Environmental Affairs.
08-June-2012	Notification of NEMA Application was sent to the Landowner of Prt 4 of Farm 300, informing them of the development proposal and the environmental process to be followed.
03-July-2012	The Department of Environmental Affairs acknowledges and accepts the NEMA Application and official reference number is granted, allowing <i>Cape EAPrac</i> to commence with the Scoping Phase of the EIA.
05-July-2012	Advertisement placed in local / regional paper (<i>Kalahari Bulletin</i> , issue of 5 July 2012) informing the public of the application, development proposal, and how to register as Interested & Affected Parties for this process.
05-July-2012	A Stakeholder Register was opened and details of all registered stakeholders were entered into this register for future correspondence regarding the process.
26-July-2012	The 21-day I&AP registration period closed. No members of public registered as Interested & Affected Parties for this process and development concept.
10-Sept-2012	Registered Stakeholders and I&APs were sent notifications informing that of the availability of the DBAR for a review and comment period of 40-days, extending from Monday, 17 September 2012 to Monday, 29 October 2012.
12-Sept-2012	A Notice Board (English & Afrikaans) was placed at the entrance to the farm and development site, informing the public of the application, development proposal, and how to register as Interested & Affected Parties for this

	process.
12-Sept-2012	The Draft Scoping Report was made available for stakeholder review and comment for a period of 40-days, extending between Monday, 17 September 2012 and Monday, 29 October 2012. Copies of the report were made available at Lime Acres Public Library and Kgatelopele Municipality (Department of Technical Services) in Danielskuil.

No issues or concerns have been raised by Interested and Affected Parties thus far in the environmental process. Comments received in response to the Draft Scoping Report will be included in the Final Scoping Report, to be submitted to the Department of Environmental Affairs (DEA) for consideration.

NOTE: The environmental Regulations make provision that as there are no substantive changes between the *Draft* Scoping Report (DSR) and *Final* Scoping Report (FSR), the Final SR can be submitted to the Department (DEA) without a further public comment period of 21-days (subject to approval by the delegated Authority). The FSR will then be made available to the public for information purposes whilst the Department considers the report.

11 ASSUMPTIONS & LIMITATIONS

This section provides a brief overview of *specific assumptions and limitations* having an impact on this environmental application process:

- It is assumed that the information on which this report is based (specialist studies and project information, as well as existing information) is **correct, factual and truthful**.
- The proposed development is **in line** with the statutory planning vision for the area (namely the local Spatial Development Plan), and thus it is assumed that issues such as the cumulative impact of development in terms of character of the area and its resources, have been taken into account during the strategic planning for the area.
- It is assumed that all the relevant **mitigation measures** and agreements specified in this report will be implemented in order to ensure minimal negative impacts and maximum environmental benefits.
- It is assumed that due consideration will be given to the **discrepancies in the digital mapping** (PV panel array layouts against possible constraints), caused by differing software programs, and that it is understood that the ultimate/final positioning of solar array will only be confirmed on-site with the relevant specialist/s.
- It is assumed that Stakeholders and Interested and Affected Parties notified during the initial public participation process will submit all relevant **comments timeously**, so that these can be considered in the impact assessment phase.

The following specialists have listed the following specific assumptions & limitations in their reports:

Palaeontological

- *Reliance on old databases.* The accuracy of the palaeontological study (desktop study) may be limited to fossil databases which are not completely up-to-date and which do not include pertinent locality or geological information. The majority of South Africa has not been studied palaeontologically, explaining the above limited noted.

Agricultural

- *Reliance on regional data from literature.* Regional information on climatic conditions, land uses, land type and terrain were accessed from literature, GIS information and satellite imagery. The field assessment did however confirm the literature findings reported on.

Ecological

- *Lower species diversity due to dry season.* The site visit took place during the dry season, and it is likely that a reasonable proportion of the plant species present, particularly annuals and forbs, were not visible at the time. Therefore, the species list recorded for the site is not likely to be comprehensive. It is however not thought that a species recording during a different season would notably change the described sensitivity of the site. Also, in order to confirm the described species diversity despite the current dry season, **a species list for the area was generated from the SIBIS data portal**, for a much larger area than the study site and is likely to include a much greater array of species than actually occurs at the site. In addition, the lists of amphibians, reptiles and mammals for the site are based on those observed at the site as well as those likely to occur in the area based on their distribution and habitat preferences. This represents a sufficiently conservative and cautious approach which takes account of the study limitations.

Archaeology

- *Deeper soils and lack of raw materials associated with stone tools.* Deeper soils found on the development site, described as hollows and possible dolines, were exposed to a lesser extent. However, the exposed edges of these hollows were examined for archaeological traces. No raw materials associated with stone tools were found on the development site, although these materials are known to the wider area.

Heritage

None identified.

Planning

- *Lack of applicable zoning category.* Due to the fact that **no applicable zoning** currently exists for alternative / renewable energy facilities or their ancillary facilities in the Northern Cape Province, it was necessary to apply for rezoning from Agriculture 1 to Special zone, as well as certain lease agreements between the Applicant and landowner.

Technical

- *Capacity and technology.* The size of the available site will greatly determine the plant's **generation capacity** as well as **preferred technology**.

12 KEY ISSUES & CONCERNS

Table 5: Key Issues & Concerns identified

Issues / Concern identified:	How it will be addressed / mitigated:
Adding value to vacant land with poor agricultural potential.	Positive aspect, no mitigation required.
Contribution to the meeting of national renewable energy targets.	Positive aspect, no mitigation required.
Promotion of Green Energy tourism and contribution of Carbon Credits.	Positive aspect, no mitigation required.
Contribution to meeting international commitment (United Nations Framework Convention on Climate Change and its Kyoto Protocol) to reduction of South Africa's greenhouse gas emissions.	Positive aspect, no mitigation required.
Land loss for grazing purposes.	Due to the low carrying capacity of 21-25ha/LSU, the potential loss of grazing equals 20 LSU or 120 SSU. The agricultural specialist confirmed this as a low loss of grazing. It is furthermore potentially possible for grazing to continue (although on a limited scale) once the construction of the facility has been completed.
Construction rubble.	Stone excavations, under the monitoring of the appointed Environmental Control Officer (ECO) must not remain on site and can rather be used as aggregate for the foundations of the PV units.
Risk of injury to livestock during the construction phase.	Care should be taken (through fencing and demarcation) that the farm's livestock do not have access to the construction site.
Vegetation clearing for PV arrays, lay down areas, access road and associated buildings could impact listed plant species as well as	As there are not many endangered species at the site, this impact is likely to be largely on protected species such as the Wild Olive.

sensitive ecosystems.	The development layout will avoid this protected tree species as far as possible, and where clearance of trees will be necessary, the necessary permits from the Department of Forestry will need to be obtained.
Disruption of ecological landscape connectivity and ecosystem processes.	Although some disruption of landscape connectivity at a local level is likely to occur as a result of the development, this is not likely to be of broader significance given the relative homogeneity of the surrounding landscape. The development footprint aims to avoid all ecological sensitive areas.
Potential impact on the avifaunal community and particularly collisions of larger birds with overhead electricity transmission lines.	The ecological specialist did not foresee extensive impact on the avifaunal community. This is particularly due to the proximity of the site to the substation - any overhead lines that may be required are likely to be relatively short resulting in a low potential impact only.
All sedimentary deposits have the potential to contain fossils.	The palaeontologist recommended that the appointed ECO must remain aware of this, and that careful monitoring for fossil remains should take place during excavations into sedimentary bedrock. In the case of finding fossilised remains, the relevant authority (SAHRA) must be contacted.
Erosion risk due to soil disturbance and loss of plant cover.	Recommendations for runoff management, as well as anti-erosion measures for construction, operation and decommissioning phases of the development, will be provided in impact assessment phase to follow, and will be included in the Environmental Management Programme (EMPr).
Modification of the archaeological and heritage landscape.	The development, and thus landscape transformation, will be restricted to a pre-determined development footprint. This footprint will avoid all known biophysical, heritage and archaeological resources to reduce the overall impact of the development on the receiving environment.
Impact on unmarked graves.	A buffer area of 100metres has been identified as per the heritage specialist's recommendations. The graves will be fenced in and no development will be allowed within 100metres of the unmarked graves.

13 PLAN OF STUDY FOR EIA

This section outlines the assessment methodology and legal context for specialist studies. Based on the issues raised by I&APs and the project team, specific impact assessments are required to address issues that may result in significant impacts. For these specialist impact assessments, the specialists have been provided with a set of criteria for undertaking their assessments, to allow for comparative assessment of all issues. These criteria are detailed in the Terms of Reference to each specialist and summarised in the sections below.

13.1 CONSULTATION WITH COMPETENT AUTHORITY

The Terms of Reference for specialists (for impact assessments) will be discussed with the competent authority upon submission of the Final Scoping Report / Plan of study for Impact Assessment.

In the event that specialist impact assessments are conflicting with regards to development/project alternatives, such findings will be discussed with the competent authority prior to advertising of the Draft Environmental Impact Report (DEIR).

13.2 PUBLIC PARTICIPATION DURING IMPACT ASSESSMENT

Registered I&APs will be informed of the availability of the DEIR that will contain the various individual specialist impact assessments and environmental management plan (EMP). If considered necessary at the time the results of the DEIR/EMP will be presented to registered I&APs at an Open House event where the specialists / project team will be present to explain their methodology, findings and answer questions. Meeting minutes / notes from such meeting(s) will be recorded and circulated to the project team for notice and included with the Final EIR for record purposes.

Comments and responses from registered I&APs received during the formal comment/review period of the DEIR/EMP will be considered and *Cape EAPrac* will respond to individual I&APs who submit comment in writing.

The outcome of the Department's decision on the FEIR will be communicated with all registered I&APs.

13.3 CRITERIA FOR SPECIALIST ASSESSMENT OF IMPACTS

In addition to the valid potential impacts identified by participating I&APs, each specialist is required to draw up a list of potential impacts (positive, negative, direct, indirect and cumulative) that may result from the various alternatives affecting his/her field of discipline. Their impact assessments must assess each of these potential impacts individually.

The assessment of impacts identified impacts must be undertaken as per the following assessment criteria. These criteria are based on the EIA Regulations, published by the Department of Environmental Affairs and Tourism (April 1998) in terms of the Environmental Conservation Act No. 73 of 1989, as well as the Specialist Guidelines drawn up in terms of the NEMA Regulations.

All possible impacts need to be assessed – the **direct, in-direct as well as cumulative impacts**. Impact criteria should include the following:

- **Nature of the impact**

This is an appraisal of the type of effect the construction, operation and maintenance of a development would have on the affected environment. This description should include what is to be affected and how.

- **Extent of the impact**

Describe whether the impact will be: local extending only as far as the development site area; or limited to the site and its immediate surroundings; or will have an impact on the region, or will have an impact on a national scale or across international borders.

- **Duration of the impact**

The specialist should indicate whether the lifespan of the impact would be short term (0-5 years), medium term (5-15 years), long terms (16-30 years) or permanent.

- **Intensity**

The specialist should establish whether the impact is destructive or benign and should be qualified as low, medium or high. The specialist study must attempt to quantify the magnitude of the impacts and outline the rationale used.

- **Probability of occurrence**

The specialist should describe the probability of the impact actually occurring and should be described as improbable (low likelihood), probable (distinct possibility), highly probable (most likely) or definite (impact will occur regardless of any prevention measures).

The impacts should also be assessed in terms of the following aspects:

- **Status of the impact**

The specialist should determine whether the impacts are negative, positive or neutral (“cost – benefit” analysis). The impacts are to be assessed in terms of their effect on the project and the environment. For example, an impact that is positive for the proposed development may be negative for the environment. It is important that this distinction is made in the analysis.

- **Cumulative impact**

Consideration must be given to the extent of any accumulative impact that may occur due to the proposed development. Such impacts must be evaluated with an assessment of similar developments planned and already in the environment. Such impacts will be either positive or negative, and will be graded as being of negligible, low, medium or high impact.

- **Degree of confidence in predictions**

The specialist should state what degree of confidence (low, medium or high) is there in the predictions based on the available information and level of knowledge and expertise.

Based on a synthesis of the information contained in the above-described procedure, the specialists are required to assess the potential impacts in terms of the following significance criteria:

- **No significance:** The impacts do not influence the proposed development and/or environment in any way.
- **Low significance:** The impacts will have a minor influence on the proposed development and/or environment. These impacts require some attention to modification of the project design where possible, or alternative mitigation.
- **Moderate significance:** The impacts will have a moderate influence on the proposed development and/or environment. The impact can be ameliorated by a modification in the project design or implementation of effective mitigation measures.
- **High significance:** The impacts will have a major influence on the proposed development and/or environment.

The final impact assessment report should as a minimum include the following sections:

- Executive Summary
- Introduction And Description Of Study
- Specialist Independence Statement
- Specialist Qualifications
- Relevant legislative framework for discipline
- Methodology
- Results
- Assessment Of Impacts (Direct, In-direct & Cumulative, including mitigation measures to reduce negative impacts and measures to enhance positive impacts and the completion of impact tables)
- Comparative Assessment between project Alternatives
- Discussion and Recommendation for Preferred Alternative
- Specialist recommendation for Pre-Construction, Construction and Operational Phases)
- Conclusion

13.4 BRIEF FOR SPECIALIST STUDIES TO BE UNDERTAKEN AS PART OF THE EIA

- Each specialist must be independent and must ensure compliance with the relevant legislative requirements and programmes relevant to his/her discipline.
- Each specialist is required to consider the project in as much detail as is required to inform his/her impact assessment.
- One development site is applicable: Portion 4 of Farm 300 Barkly West, Lime Acres.
- Specialists must ensure that they are aware of the necessary **planning, environmental and service requirements** associated with the proposal.
- Specialists must ensure that they **liaise with other relevant specialists** (via the EAP) if it seems necessary to use information from another discipline.

- Impact Assessments must **consider all the identified alternatives** in order to provide a comparative assessment of impacts:
 - The current preferred **75MW AC** alternative (based on the 30 July 2012 layout) and or any revised layouts for the Olien Solar Project, Lime Acres.
 - All **services** applicable to the development (including power line to substation and upgrading of the existing substation).
 - The **No-go option**.
 - Any further development **alternatives** identified after the Scoping Phase of the EIA.
- Specialists should consider **national and international guidelines and standards** relevant to their respective focus area.
- Any **assumptions** made and any uncertainties or **gaps in knowledge**, as well as **limitations** regarding the specialist studies, must be clearly described and explained.
- The draft impact assessment report of each specialist will be **subject to public/stakeholder review and comment** – all comments received must be considered by each specialist, responded to and the final impact assessment report updated accordingly.

The following studies will be undertaken, based on the above methodology can criteria, during the impact assessment phase of the EIA process:

- Botanical Impact Assessment
- Fauna Impact Assessment
- Civil Engineering Report (revised)

13.5 TERMS OF REFERENCE

Terms of References were developed for the individual environmental **specialist investigations**, including:

- Botanical Impact Assessment
- Fauna Impact Assessment

Copies of the individual ToRs have been included at the end of this DSR.

14 PROCESS WAY-FORWARD

The following process is to be followed for the remainder of the EIA process:

- This **Draft Scoping Report** will be available for **public review and comment** for a period of 40 days.
- Should significant change be necessary based on the comments received, the report will once again be made available to the public for a further review and comment

period of **21 days**, after which the Final Scoping Report (FSR) will be submitted to the DEA for review. Should no amendments be necessary the FSR will be submitted directly to the DEA.

- Once the DEA **accepts the Final Scoping Report and Plan of Study for Environmental Impact Report**, the relevant specialists will undertake and complete their impact assessments;
- Discussions will be held with the various specialists and project team members in order to determine **how best the development concept should be amended to avoid significant impacts**;
- In the event that amendments to the development plan are not required, the **draft environmental impact report (DEIR)** can be concluded;
- However, if an amendment becomes necessary, changes can be made to the layout plan to form another development alternative that will address and/or avoid any significantly detrimental impacts;
- Such an **alternative** will be circulated to all the relevant specialists in order for them to complete their comparative assessments and final impact assessment reports;
- The DEIR will be made available for **public review and comment**;
- All comments and inputs received during the comment & review period will be **included with the Final EIR**;
- The Final EIR will be submitted to the DEA for **consideration and decision-making**;
- The DEA's decision (Environmental Authorisation) on the FEIR will be **communicated with all registered I&APs**.

15 CONCLUSION & RECOMMENDATIONS

The Olien Solar facility, a 75 MW AC renewable energy facility that will consist of fixed photovoltaic panels, is proposed on a southern portion (below the Transnet Railway Line) on Prt 4 of the Farm 300, Barkly West. The development site is located approximately 15kilometres East of the town Lime Acres, Northern Cape Province. The site is zoned Agricultural I and low intensity livestock farming is currently performed on the farm.

This Draft Scoping Report presents the development concept for the proposed Olien Solar development, which includes associated infrastructure and security. Stakeholders are requested to review the information presented in this report and to identify environmental issues and concerns associated with the development proposal and alternatives.

This report summarises the process that has been undertaken to date, including a summary of the EIA process undertaken to date. It furthermore reports on the relevant baseline studies undertaken and available at this stage which have been used to inform the development. These include a baseline Agricultural Potential Study, baseline Ecological Site Analysis, a Palaeontological Study and a Phase 1 Archaeology and Heritage Impact Assessment.

This DSR is made available for a 40-day public review and comment period, extending between Monday, 17 September 2012 and Monday, 29 October 2012.

Stakeholders are requested to review the report and provide any preliminary feedback, comments and or issues and concerns within the specified commenting period. All comments or enquiries must be addressed to:

Cape EAPrac
Attention: Francini van Staden
P.O. Box 2070
George, 6530
Tel: 044 874 0365
Fax: 044 874 0432
E-mail: francini@cape-eaprac.co.za

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TERMS OF REFERENCE FOR A BOTANICAL IMPACT ASSESSMENT

For

**OLIEN SOLAR PROJECT, PORTION 4 OF FARM 300 BARKLY WEST, LIME ACRES,
NORTHERN CAPE**

1. INTRODUCTION & BACKGROUND TO THE STUDY

Cape Environmental Assessment Practitioners (*Cape EAPrac*) has been appointed by the Applicant, **AE-AMD Renewable Energy (Pty) Ltd** to facilitate the legally required Environmental Impact Assessment (EIA) in terms of the National Environmental Management Act (NEMA, Act 107 of 1998, as amended) for the proposed **Olien Solar Project**.

The development site is Portion 4 of Farm 300, located approximately 15 kilometres East of the town Lime Acres and approximately 120 kilometres North-West of Kimberley. See the attached aerial and topographical maps for further details.

The development proposal provides for the development of a 75MW photovoltaic plant. The plant will be developed on a 225ha section of the mentioned development site and will be identified to the specialist with the required mapping.

2. GENERAL: EIA TIMEFRAME & SPECIALIST IMPACT ASSESSMENTS

- A Full EIA process is being followed.
- Any **assumptions** made and any uncertainties or **gaps in knowledge**, as well as **limitations** (that may have compromised your ability as a specialist to fulfil the Terms of Reference) regarding the specialist studies, must be clearly described and explained.
- The proximity of the site in relation to **key features** such as the wetlands/rivers/drainage lines; national roads; Reserves/Protected Areas etc. must be considered.
- The Draft Scoping & Impact Assessment Reports will be subject to public/stakeholder review and comment – all comments received must be considered, responded to and the final impact assessment report updated accordingly.
- All assessments must be done in accordance with accepted **best practice principles**.
- Any guidelines for the required study must be referred to and adhered to. These include the DEA&DP guidelines for Specialist Studies, and any other relevant guidelines.

3. BASELINE / SCOPING STUDY

The study should include data searches, desktop studies, site walkovers / field survey of the property and baseline data collection, describing:

- The broad botanical types and characteristics of the site and its surrounds in terms of any mapped spatial components of ecological processes and/or patchiness, patch size, relative isolation of patches, connectivity, corridors, disturbance regimes, ecotones, buffering, viability, etc.
- Protected Areas (as described in NEMA National Environmental Management: Protected Areas Act 57 of 2003), if applicable.

In terms of **pattern**, Identify or describe:

- Threatened or vulnerable botanical species and the types of botanical communities;
- Red Data Book (RDB) species (give location if possible using GPS);
- The viability of an estimated population size of the RDB species that are present (include the degree of confidence in prediction based on availability of information and specialist knowledge, i.e. High=70-100% confident, Medium 40-70% confident, low 0-40% confident).
- The likelihood of other RDB species, or species of conservation concern, occurring in the vicinity (include degree of confidence).
- Any significant landscape features or rare or important vegetation associations such as seasonal wetlands, alluvium, seeps, quartz patches or salt marshes in the vicinity.
- The extent of alien plant cover of the site, and whether the infestation is the result of prior soil disturbance such as ploughing or quarrying (alien cover resulting from disturbance is generally more difficult to restore than infestation of undisturbed sites).
- The condition of the site in terms of current or previous land uses.

In terms of **process**, identify or describe:

- a. The key ecological “drivers” of ecosystems on the site and in the vicinity, such as fire.
 - b. Any mapped spatial component of an ecological process that may occur at the site or in its vicinity (i.e. *corridors* such as watercourses, upland-lowland gradients, migration routes, coastal linkages or inland-trending dunes, and *vegetation boundaries* such as edaphic interfaces, upland-lowland interfaces or biome boundaries)
 - c. Any possible changes in key processes, e.g. increased fire frequency or drainage/artificial recharge of aquatic systems.
- Would the conservation of the site lead to greater viability of the adjacent botanical communities by securing any of the functional factors listed in the first bullet?
 - Would the site or neighbouring properties potentially contribute to meeting regional conservation targets for both biodiversity patterns and botanical species?
 - Outline any further studies that may be required during or after the EIA process.
 - Identify all relevant legislation, permits and standards that would apply to the development.

- It must be indicated if there is a need for a more detailed assessment.
- If it is determined that there is no need for more detailed assessment, as established in discussions with *Cape EAPrac*, constraints must be reported.

The opportunities and constraints for development **must be described and shown graphically** on an aerial photograph or map. Your demarcated areas must be accurately defined.

Your baseline findings must be reported to the project team at an integration meeting. The details of the no development option will be discussed at these meetings.

There may be a need for you to attend a public open house meeting to present your baseline assessment.

3. IMPACT ASSESSMENT (EIA PHASE)

- The baseline assessment will need to be expanded to a full botanical impact assessment, assessing all potential botanical impacts associated with the development alternatives (including the preferred and other alternatives, including technical alternatives and No-go option, as described in the Draft Scoping Report).
- If necessary, a specialist workshop will be held prior to the commencement of the respective specialist impact assessments in order to confirm the alternatives to be assessed.
- Your specialist impact assessment will need to consider the potential negative as well as positive impacts that would result from each of the proposed alternatives and must include mitigation measures to reduce the negative impacts as well as measures that would enhance the positive impacts, for each alternative.
- The **potential impacts** and **recommended mitigation measures** must be separated into the following phases:
 - Pre-construction;
 - Construction; and
 - Operational phases.
- **Cumulative impacts** must also be described and mitigation measures provided where possible.
- Specific **management and monitoring requirements/guidelines** must be provided. These requirements/ guidelines will be used as conditions of approval for the Environmental Authorisation (should it be granted) and the Environmental Management Programme.
- The impacts must be assessed according to the criteria and table in Section 4 of this ToR and the attached tables in Appendix A of this ToR.

4. REPORT FORMAT

Your report **must** contain:

- Your name and details.
- Your expertise in this field of study.
- A declaration of independence.
- An indication of the scope of, and the purpose for which, the report was prepared.
- A description of the methodology adopted in preparing the report or carrying out the specialised process.
- A description of any assumptions made and any uncertainties or gaps in knowledge.
- A description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives, on the environment.
- Recommendations in respect of any mitigation measures that should be considered by the applicant and the competent authority.
- A description of any consultation process that was undertaken during the course of carrying out the study.
- A summary and copies of any comments that were received during any consultation process.
- Any other information requested by the competent authority.

An example of an Impact Table is attached at the end of this document. All potential issues identified during the specialist study should be recorded, summarised and assessed in an Impact Table. Criteria for this assessment are included below.

5. CRITERIA FOR ASSESSMENT

These criteria are drawn from the EIA Regulations, published by the Department of Environmental Affairs and Tourism (April 1998) in terms of the Environmental Conservation Act No. 73 of 1989.

These criteria include:

- **Nature of the impact**

This is an appraisal of the type of effect the construction, operation and maintenance of a development would have on the affected environment. This description should include what is to be affected and how.

- **Extent of the impact**

Describe whether the impact will be: local extending only as far as the development site area; or limited to the site and its immediate surroundings; or will have an impact on the region, or will have an impact on a national scale or across international borders.

- **Duration of the impact**

The specialist should indicate whether the lifespan of the impact would be short term (0-5 years), medium term (5-15 years), long term (16-30 years) or permanent.

- **Intensity**

The specialist should establish whether the impact is destructive or benign and should be qualified as low, medium or high. The specialist study must attempt to quantify the magnitude of the impacts and outline the rationale used.

- **Probability of occurrence**

The specialist should describe the probability of the impact actually occurring and should be described as improbable (low likelihood), probable (distinct possibility), highly probable (most likely) or definite (impact will occur regardless of any prevention measures).

The impacts should also be assessed in terms of the following aspects:

- **Legal requirements**

The specialist should identify and list the relevant South African legislation and permit requirements pertaining to the development proposals. He / she should provide reference to the procedures required to obtain permits and describe whether the development proposals contravene the applicable legislation.

- **Status of the impact**

The specialist should determine whether the impacts are negative, positive or neutral (“cost – benefit” analysis). The impacts are to be assessed in terms of their effect on the project and the environment. For example, an impact that is positive for the proposed development may be negative for the environment. It is important that this distinction is made in the analysis.

- **Accumulative impact**

Consideration must be given to the extent of any accumulative impact that may occur due to the proposed development. Such impacts must be evaluated with an assessment of similar developments already in the environment. Such impacts will be either positive or negative, and will be graded as being of negligible, low, medium or high impact.

- **Degree of confidence in predictions**

The specialist should state what degree of confidence (low, medium or high) is there in the predictions based on the available information and level of knowledge and expertise.

Based on a synthesis of the information contained in the above-described procedure, you are required to assess the potential impacts in terms of the following significance criteria:

No significance: the impacts do not influence the proposed development and/or environment in any way.

Low significance: the impacts will have a minor influence on the proposed development and/or environment. These impacts require some attention to modification of the project design where possible, or alternative mitigation.

Moderate significance: the impacts will have a moderate influence on the proposed development and/or environment. The impact can be ameliorated by a modification in the project design or implementation of effective mitigation measures.

High significance: the impacts will have a major influence on the proposed development and/or environment and will result in the “no-go” option on the development or portions of the development regardless of any mitigation measures that could be implemented. This level of significance must be well motivated.

6. REQUIREMENTS

- You will be required to check your relevant section(s) in the EIR to ensure that we have captured your findings correctly.

- A public meeting may be held towards the end of the EIA stage, where you will be required to present your findings. This meeting may be an open house meeting with poster presentations by each specialist. **You will be required to provide the information for your posters.**
 - After the public comment period has closed, you will be required to complete a comments and response table, which will include a summary of the comments received. Comments relevant to your study must be responded to by you.
 - The report must be submitted to us in both digital and printed format.
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TERMS OF REFERENCE FOR A FAUNA IMPACT ASSESSMENT

For

**OLIEN SOLAR PROJECT, PORTION 4 OF FARM 300 BARKLY WEST, LIME ACRES,
NORTHERN CAPE**

1. INTRODUCTION & BACKGROUND TO THE STUDY

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The development proposal provides for the development of a 75MW photovoltaic plant. The plant will be developed on a 225ha section of the mentioned development site and will be identified to the specialist with the required mapping.

2. GENERAL: EIA TIMEFRAME & SPECIALIST IMPACT ASSESSMENTS

- A Full EIA process is being followed.
- Any **assumptions** made and any uncertainties or **gaps in knowledge**, as well as **limitations** (that may have compromised your ability as a specialist to fulfil the Terms of Reference) regarding the specialist studies, must be clearly described and explained.
- The proximity of the site in relation to **key features** such as the wetlands/rivers/drainage lines; national roads; Reserves/Protected Areas etc. must be considered.
- The Draft Scoping & Impact Assessment Reports will be subject to public/stakeholder review and comment – all comments received must be considered, responded to and the final impact assessment report updated accordingly.
- All assessments must be done in accordance with accepted **best practice principles**.
- Any guidelines for the required study must be referred to and adhered to. These include the DEA&DP guidelines for Specialist Studies, and any other relevant guidelines.

3. BASELINE / SCOPING STUDY

The study should include data searches, desktop studies, site walkovers / field survey of the property and baseline data collection, describing:

- The broad fauna community characteristics of the site and its surrounds in terms of any mapped spatial components of ecological processes and/or patchiness, patch size, relative isolation of patches, connectivity, corridors, disturbance regimes, ecotones, buffering, viability, etc.
- Protected Areas (as described in NEMA National Environmental Management: Protected Areas Act 57 of 2003), if applicable.

In terms of **pattern**, Identify or describe:

- a. threatened or vulnerable fauna species and the types of faunal communities;
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- Would the conservation of the site lead to greater viability of the adjacent fauna communities by securing any of the functional factors listed in the first bullet?
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The opportunities and constraints for development **must be described and shown graphically** on an aerial photograph or map. Your demarcated areas must be accurately defined.

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There may be a need for you to attend a public open house meeting to present your baseline assessment.

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- **Duration of the impact**

The specialist should indicate whether the lifespan of the impact would be short term (0-5 years), medium term (5-15 years), long term (16-30 years) or permanent.

- **Intensity**

The specialist should establish whether the impact is destructive or benign and should be qualified as low, medium or high. The specialist study must attempt to quantify the magnitude of the impacts and outline the rationale used.

- **Probability of occurrence**

The specialist should describe the probability of the impact actually occurring and should be described as improbable (low likelihood), probable (distinct possibility), highly probable (most likely) or definite (impact will occur regardless of any prevention measures).

The impacts should also be assessed in terms of the following aspects:

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- **Accumulative impact**

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