DMT Kai Batla (Pty) Ltd

Basic Assessment for the Proposed Construction of Apron Stands and Expansion of the Taxiway at King Shaka International Airport, KwaZulu-Natal Province

(DEA REF: 14/12/16/3/3/1/1841)

FINAL ENVIRONMENTAL MANAGEMENT PROGRAMME

Prepared for:

Airports Company South Africa SOC Ltd

AIRPORTS COMPANY SOUTH AFRICA

Prepared by:

DMT Kai Batla (Pty) Ltd

Date:

June 2018

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DOCUMENT SUMMARY

Project:	Basic Assessment for the Proposed Construction of Apron Stands and Expansion of the Taxiway at King Shaka International Airport, KwaZulu-Natal Province (DEA REF: 14/12/16/3/3/1/1841) Final Environmental Management Programme
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Table of Contents

List of Figures

List of Tables

1 ENVIRONMENTAL AUTHORISATION APPLICATION DETAILS

The details of the Environmental Authorisation (EA) application and the parties involved are as follows:

1.1 Applicants Details

Table 1: Contact details of Proponent

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1.2 Environmental Consultant Details

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1.3 Principles of the EMPr

The aim of implementing an Environmental Management Programme (EMPr) is to ensure that all activities attributed to the project, with irreversible impacts are avoided, and measures are taken to minimise or rectify impacts where possible. The EMPr also provides on-going monitoring and management of these impacts by documenting good or bad performances and compliances with the EMPr. The implementation of this EMPr is aimed at ensuring that all activities attributed to the project, with irreversible impacts are avoided, and measures are taken to minimise or rectify impacts where possible. The EMPr also provides on-going monitoring and management of these impacts by documenting good or bad performances and compliances with the EMPr. The objectives of the EMPr include:

- Ensuring that all associated activities are undertaken in a way that minimises identified potential negative effects on the surrounding environment;
- Ensuring that appropriate environmental management measures are assimilated in the final development plans;
- Ensuring that relevant environmental management are well stipulated, understood and documented for all relevant parties;
- Ensuring that the suitable record keeping and reporting structures are put in place to ensure that implementation of the stipulated environmental management measures are monitored in the long-term; and
- Ensuring that the roles and responsibilities for the management of various aspects are clearly defined and understood.

2 INTRODUCTION

2.1 Project Background

The King Shaka International Airport (hereafter referred to as KSIA) was first conceptualized in the 1970s, however the development was halted due to economic constraints in the country during that time. The development of the KSIA was a means of addressing the limitations being experienced at the now decommissioned Durban International Airport. Between 2004 and 2007 the new airport development was once again revived, with a partnership formed between the Airports Company of South Africa SOC Limited (ACSA) and the Dube TradePort Corporation - both of whom had a common goal of creating an 'aerotropolis' in the north of Durban[1], centred around the Dube Trade Port (DTP) and the KSIA. As such, the construction of the new airport commenced in 2007 and continued until 2009. Flight testing at the airport began in December 2009, and the operation of commercial flights commenced timeously in May 2010 to accommodate the FIFA 2010 Soccer World Cup.

The concept behind the KSIA [and the DTP] was to create a catalyst for the creation of a globally competitive multi-modal trade gateway in Southern Africa. King Shaka International was designed to grow international services in this part of the country, while maintaining its position as a key airport for domestic service. This is evident in the airport having received awards from the Airport Council International as well as the Skytrax airport and airline review organisation[2].

The Applicant

South Africa's airplane terminals were owned and operated by the state until 23 July 1993, when ACSA was formally established. ACSA was formed just over 20 years ago when South Africa's main airports were transferred into a public company through the enactment of the Airports Company Act 44 of 1993. ACSA manages a system of nine airplane terminals in South Africa, including the three principle worldwide entryways of O.R. Tambo International, Cape Town International and KSIA[3]- while processing approximately 36 million passengers per annum. Although ACSA is majority owned by the South African government (through the Department of Transport (DoT)), the company is legally and financially autonomous and operates under commercial law.

The nine air terminals possessed by the Company are significant generators of direct and indirect employment and business opportunities and some are considered the centres of improvement hubs. This is aligned with the idea of the 'aerotropolis', whereby a scope of assembling, business offices, supplemented by lodgings, retail outlets, recreational buildings and workplaces are clustered around an airplane terminal- is likely to further accelerate the core role of airports. This is particularly true for the international airports like the KSIA[3].

Throughout the years, ACSA has transformed a fragmented, infrastructural parastatal into an engaged, client driven, proficient and monetarily fruitful business, whose air terminals have turned out to be critical achievement elements to Brand South Africa. ACSA continues to play its role as a key driver of South Africa's economy by demonstrating socio-economic and environmental responsibility through its activities and programmes. This is shown in its continued development of the country's airports- such as the proposed activities for the KSIA.

[1] The airport is a part of the Dube Tradeport, which includes a trade zone linked to the airport's cargo terminal, facilities to support the airport like nearby offices and transit accommodation for travellers, an integrated agricultural export zone and an Information Technology platform. Source: http://www.dubetradeport.co.za/
[2] https://en.wikipedia.org/wiki/King_Shaka_International_Airport
[3] http://www.airports.co.za/about-us/airports-company/company-profile

2.2 Project Locality

The KSIA is located in La Mercy, KwaZulu-Natal, approximately 35 km north of Durban. The airport falls within the jurisdiction of the eThekwini Municipal Area. eThekwini is the largest city in KwaZulu-Natal and the third-largest city in the country. Its land area is comparatively larger than that of other South African cities and is topographically hilly, with many gorges and ravines.

The airport precinct is bordered by the M43 to the north, the Mdloti River to the south, the R102 to the west, and the N2 freeway to the east (see Figure 1). Neighbouring communities are Mount Moreland to the near south west and Verulam to the far south-west; Tongaat to the west and north; and Umdloti to the south-east. Notable communities further away are Umhlanga to the south and Ballito to the north. The airport is accessible from both the N2 freeway and the alternative R102 road, with the M65 linking the N2 and the R102 with the airport.

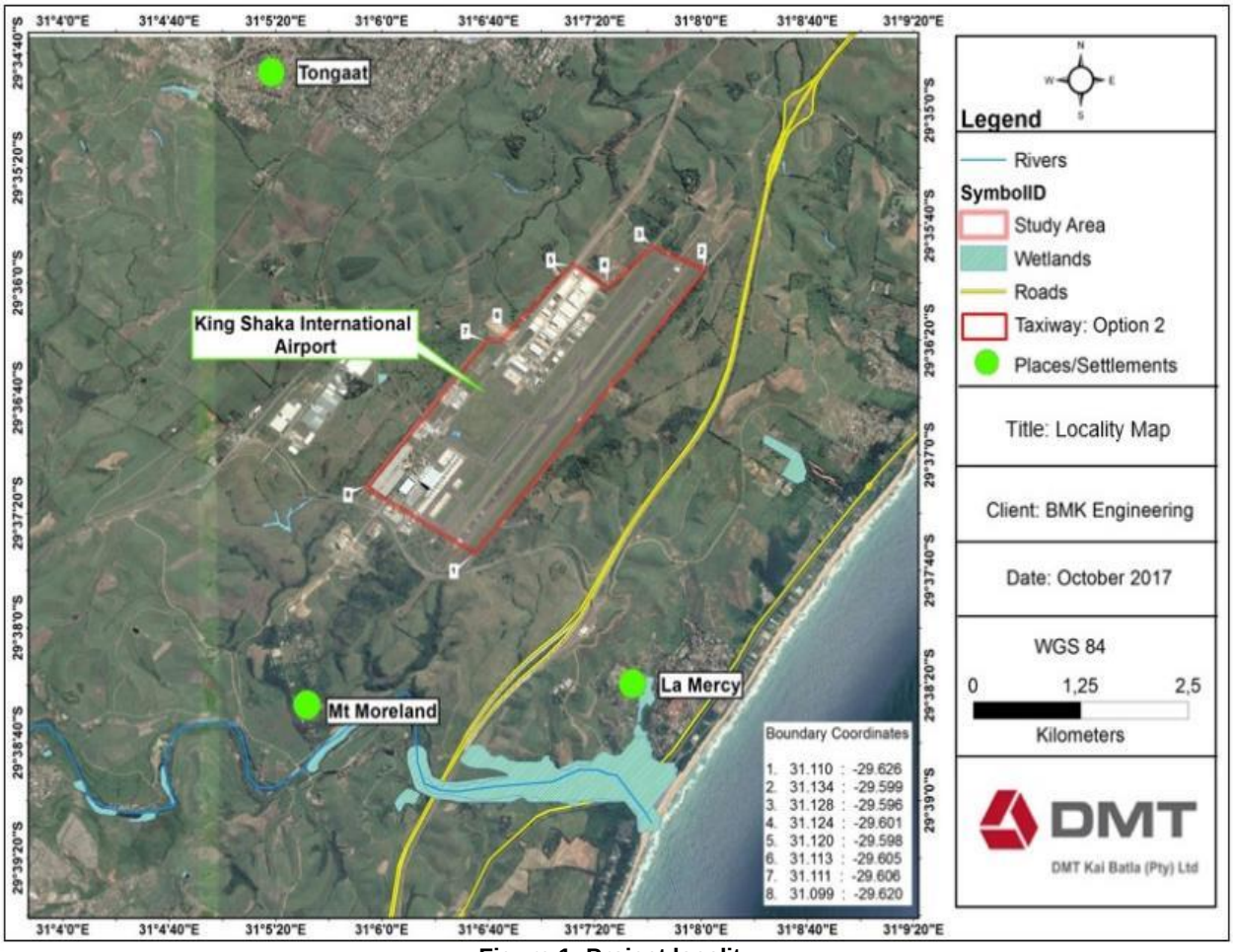

Figure 1: Project locality

2.3 Project Description

ACSA has proposed extension works at the KSIA with the construction of additional apron stands and the extension of the Bravo Taxiway. The development is aimed at addressing operational risks identified in the taxiway areas, while also increasing the airport's capacity for having larger aircraft stationed in between flight operations. Four remote wide-body aircraft stands ('aprons') will be constructed and this will be complemented by the newly extended taxiway. The development will be conducted in a manner that meets the International Civil

Aviation Organization (ICAO) Code F standards[4], and the end goal of the project is to increase the airport's overall operational capacity.

Apron Stands

An apron stand is the area of an airport where aircraft are parked, unloaded or loaded, refuelled, or boarded. There are currently four apron stands at KSIA, namely Alpha, Bravo, Charlie and Delta. The Apron Stands Bravo and Alpha are Code C[5] stands, while Charlie and Delta are Code F stands. The Apron Stands Bravo and Alpha are positioned on the opposite side (east)of the Code C apron taxiway, which provides access to the Alpha and Bravo apron stands (see Figure 2). As it stands, neither of these two aprons can currently accommodate wide-body aircraft. Charlie Apron to the west of the terminal building consists of two, Code F stands, which are MARS-configured[6] to accept Code C aircraft. Charlie stands are contact, nose-in and push-back. The Delta Apron serves the existing cargo terminal and is also suitable for the parking of two wide-body aircraft. These stands are also MARS-configured.

The new stand provision will comprise, four Code F MARS-configured aircraft stands which will be sized for a specific mix of aircraft, including future generation wide-body aircraft.

As part of the planned extension, consideration was given to reconfiguring several of the existing Alpha Apron stands as well as constructing two new apron stands. Ten stand layout options were produced from the various stand type combinations. This was moderated to five option pair combinations (which still comprised the various stand type combinations listed above) for further development/evaluation. Some of the evaluation criteria was based on cost estimates and bulk service layout development.

The following variations on the paired stand type combinations shown in Figure 3 were considered as part of the feasibility study:

1. Contact + 2 Remote (Option A1)
2. 2 Contact + 2 Future Pier Served (Option B1);
3. **2 Remote + 2 Remote (Option C) (Preferred);**
4. 2 Remote + 2 Future Pier Served (Option D1); and
5. 2 Future Pier Served + 2 Future Pier Served (Option E).

The five options represented the 'best' options selected in terms of pavement extents and operational advantages. In the feasibility studies, it was concluded that constructing four new remote stands would be the most viable option.

[4] The apron restrictions are being constructed in line with part two of the ICAO Aerodrome Reference Code which categorises aircraft types. The part two categorisation is derived from the most restrictive of either the aircraft wingspan or the aircraft outer main gear wheel span (Source: https://www.skybrary.aero/index.php/ICAO_Aerodrome_Reference_Code; 2015).

[5] The ICAO has certain standards that areas of airports need to meet or adhere too. These standards are referred to as 'Codes' (ICAO 2009).

[6] 'MARS' is an acronym for maximizing parking space on the tarmac. The Multiple Apron Ramp System (MARS) allows airport planners to make their gates – and, therefore, their aircraft turnarounds – more flexible and efficient. As more airlines acquire the new generation of larger aircraft to keep up with passenger demand, airports have to build gates to accommodate them (http://www.airportsinternational.com/2013/02/manoeuvres-on-mars/13873)

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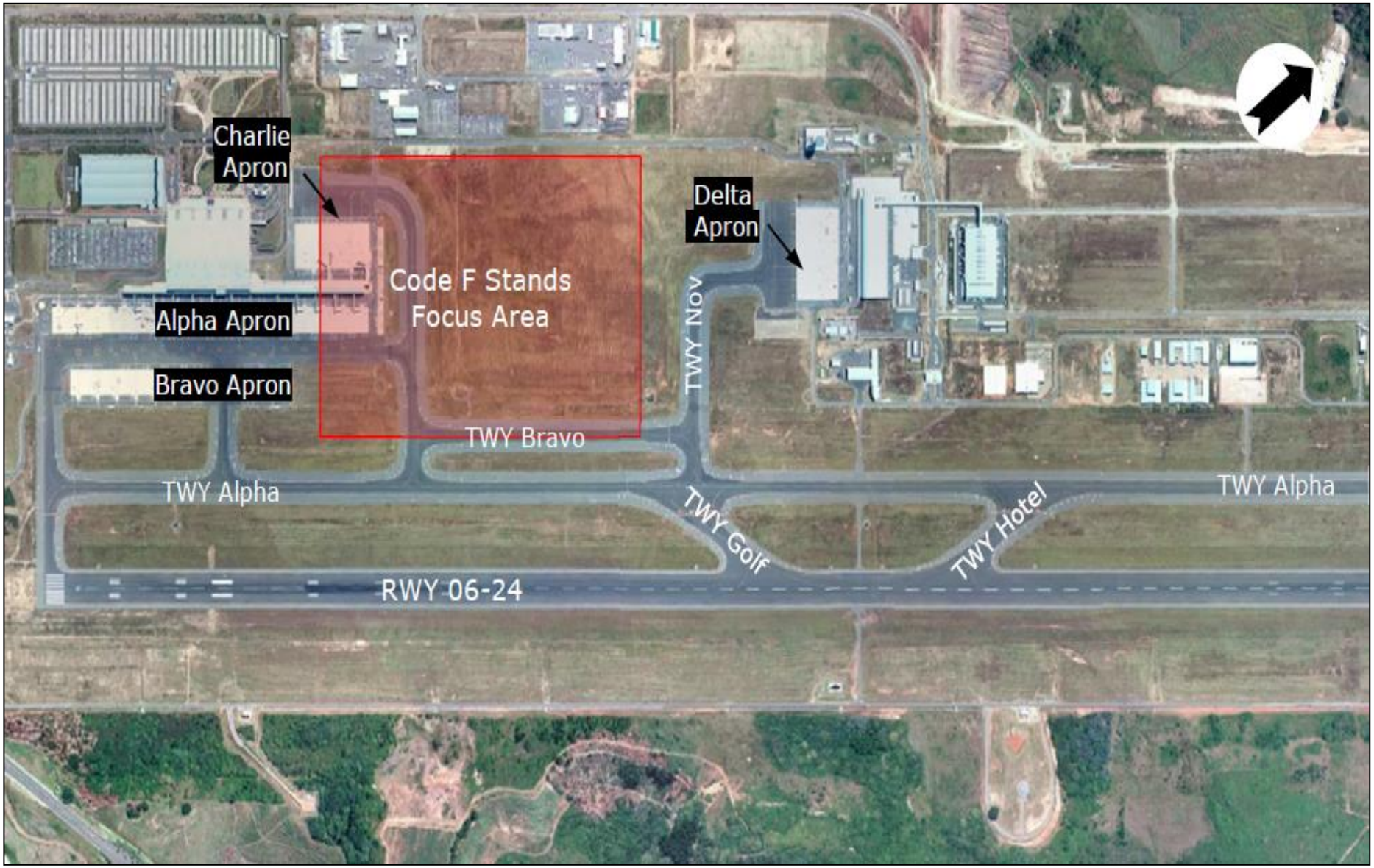

Figure 2: Project focus area (Source: BMK 2017)

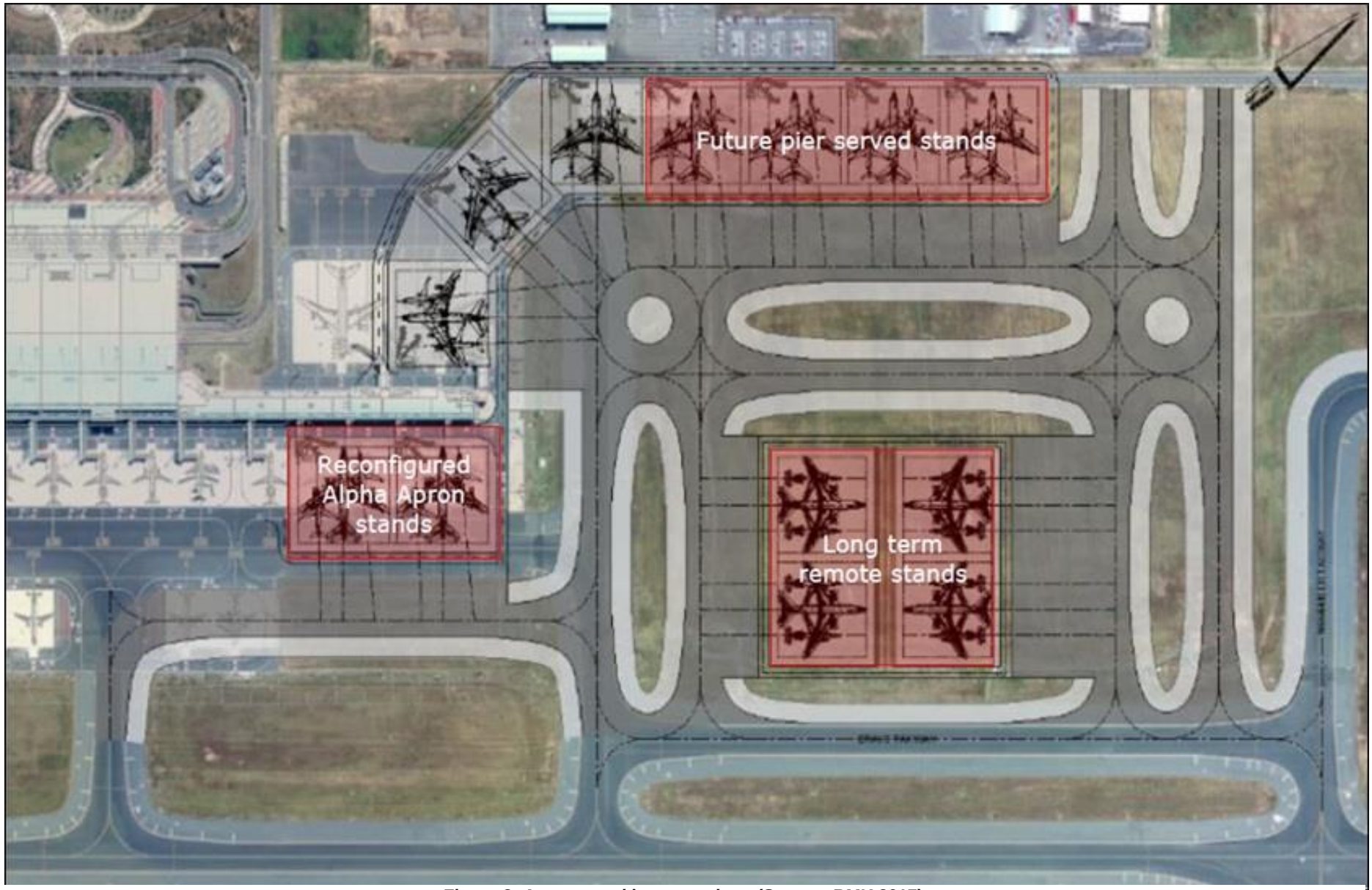

Figure 3: Apron stand layout options (Source: BMK 2017)

The layout planning and physical characteristics for aircraft stand development are governed by the standards listed in the ICAO Annex 14 (ICAO, 2016) and supporting ICAO Design Manuals (as seen in Table 3 below):

Table 3: ICAO apron geometric design standards and recommendations (Source: BMK 2017)

Physical Apron Characteristics	Code C	Code F
Minimum clearance between an aircraft and adjacent building, aircraft on another stand and other objects.	4.5 (7.5m)*	7.5
Slopes on aprons	<1%=	<1%
Max aircraft wingspan	36m	80m
Minimum stand width (MARS-configured Code F)		87.5m
Minimum HOS nose clearance	4.5m	7.5m
Minimum distance from longest aircraft to BOS line[2]	4.5m	4.5m
Service road width (dual direction)	10m (min) 12m (preferred)	
*ACSA requirement at OR Tambo Int'l Airport IATA ADRM (IATA, 2004) [2]Not and ICAO requirement		

The MARS configuration will allow for mixed aircraft usage of the Apron stand. The new stands will be power-in (nose in) and (tractor) push-back. The stands are MARS-configured to allow for two Code C aircraft to simultaneously utilise a single Code F (wide-body) stand position.

Furthermore, the following aircraft considerations were made in the stand design and construction planning:

- *Aircraft wingtip clearance:* The ICAO recommended minimum wingtip clearance distance between Code F aircraft is 7.5m. The corresponding ICAO minimum for Code C aircraft on a MARS configured Code F stand is 4.5m, however at OR Tambo International Airport, ACSA has adopted a 7.5m wingtip clearance.

- *Aircraft front of stand clearances:* Head of stand areas should typically allow room for a pushback tractor (tug) to manoeuvre onto the stand and not block traffic on an adjacent service road. The tractor with tow bar connected to the nose wheel gear of the most forward positioned aircraft on a stand should also be able to fit within the stand's footprint. It is proposed that a minimum clearance of 13m from the most forward aircraft's nose gear be allowed (typically 7.5m from the most forward nose position). 13m will allow for a 9m tug + 4m tow bar combination.

- *Aircraft back of stand clearances:* Typically for inspection (and maintenance) purposes, or circulation around an aircraft parked on a stand, space provisions should be made for vehicles to manoeuvre around the tail section of a parked aircraft. It is proposed that a distance of 4.5m is considered by ACSA for this purpose (reduced to 2m where space is limited) and will be assumed by BMK in the design unless otherwise directed.

- *Aircraft Mix:* Code F stands will be designed to accommodate four main codes of aircraft: Code F, Code E, Code D and Code C aircraft.

Other aspects that have been considered in the conceptualization of the Apron Stands include:

- *Connecting Taxiway Infrastructure:* New taxiway infrastructure will be required, regardless of which Code F apron stand option is selected for progression. Taxiways will be designed as Code F taxiways, with all physical design characteristics (horizontal and vertical) as per Annex 14 (ICAO, 2016) standards and recommendations – this includes taxiway minimum separation distances.

- *Service Roads:* Head-of-stand and back-of-stand service roads (bi-directional) will be included as part of the stand designs and shall be between 10 and 12m wide- space permitting.

- *GSE Layout:* A portion of the apron stand footprint will be dedicated to Ground Support Equipment (GSE). The GSE equipment type to be accommodated on-stand will be in line with airport/airline operational requirements areas will be marked according to equipment type.

The fully serviced Apron Stand offerings will include (but not be limited to) the following services:

1. Fixed electrical ground power (FEGP);
2. Fuel hydrant pits;
3. Stand number indicator boards (SNIB);
4. Stand Entry Guidance System (SEGS);
5. Floodlights;
6. Fire hydrant (American style or as specified by ACSA);
7. Emergency stop buttons (for SEGS and fuel);
8. Emergency fixed line telephone – to be confirmed;
9. Fuel/oil spill kits – to be confirmed;
10. CCTV – to be confirmed;
11. Baggage interface systems (to be confirmed);
12. Mini substations (serving multiple stands; as required);
13. Pre-conditioned air – to be confirmed;
14. Communications cabinet – to be confirmed; and
15. Back of stand slot drain infrastructure (to convey stormwater runoff into existing pollution control system).

Considering aviation standards and requirements, as well as taking the functionality/operational impact, cost, and environmental viability of the options listed above, **Option C (4 remote stands**) has been selected as the most feasible apron stand design. Option C is therefore being presented as the preferred alternative under application for authorisation

Bravo Taxiway Extension

The existing airport operates with a single runway. The runway is served by a single, full length parallel taxiway (Taxiway Alpha) and 2 Rapid Exit Taxiways (RETs) – namely taxiways Golf (G) and Hotel (H). A complex juncture of taxiway infrastructure links exists in the vicinity of RET Golf and has been identified as a 'hotspot' (defined in the ICAO *Manual on the Prevention of Runway Incursions* (ICAO, 2007) as an area where potential exists for aircraft collisions (see Figure 4). The extension of the Bravo Taxiway has been proposed to alleviate several operational issues currently being experienced in the airside manoeuvring area at the airport.

As part of the feasibility phase, two options were considered, with the options pertaining to the alignment of the link between the main taxiway extension alignment and the existing runway. Whilst there are a number of different permutations, the options presented as part of this study are:

- Option 1: RET Hotel and proposed intersection taxiway combined (positioned at RET); and
- **Option 2: Intersection taxiway positioned north of RET Hotel (Preferred.)**

Both options provide for a minimum take-off runway available (TORA) distance of 2,100m.

The Bravo Taxiway will provide some inherent benefits, which- amongst others- include:

- Simplification of the hotspot intersection. Aircraft will no longer be able to taxi along Bravo, turn right on to November (Taxiway N) and then left on to Alpha. This will prevent potential collisions with landing aircraft which may vacate the runway using RET Golf.

- The extension of Taxiway Bravo, including a new 90-degree link to the runway, will ensure that pilots of the aircraft at the proposed runway holding position will have increased visibility of landing/approaching aircraft.

- An increased take-off run distance will be afforded from the point where the taxiway joins with the runway, compared with aircraft using RET Hotel for the same purpose – approximately 800m if aircraft line-up compensations are accounted for.

From a cost point of view, Option 2 is more expensive to construct than Option 1. However, from an operational perspective Option 2 is a much simpler solution in terms of intersection geometry, providing a completely independent taxiway link to the runway, unlike that of Option 1, which has an interaction with the existing RET. The potential risk of the intersection becoming a future hotspot is less with Option 2. Therefore, Option 2 is the preferred option under application for authorisation.

The characteristics of the preferred Taxiway design are summariesd in Table 4 below.

Table 4: ICAO Annex 14 taxiway geometric design criteria *(*Source: BMK 2017)

Physical Apron Characteristics	Code C	Code F
Minimum pavement width	15m	25m
Shoulder width	5m	17.5m
Taxiway strip width	52m	102m
Graded portion of strip	25m	60m
Minimum clearance of outer main wheel to taxiway edge	4.5m	4.5m
Minimum separation distance between taxiway centre line and runway (instrument runways)	168m	190m
Maximum longitudinal slope of taxiway pavement	1.5%	1.5%
Maximum change in longitudinal slope of taxiway	1% per 30m	1% per 30m
Maximum transverse slope of taxiway pavement	1.5%	1.5%
Minimum radius of longitudinal vertical curve	3000m	3000m
K-value	K-value 30 30	K-value 30 30

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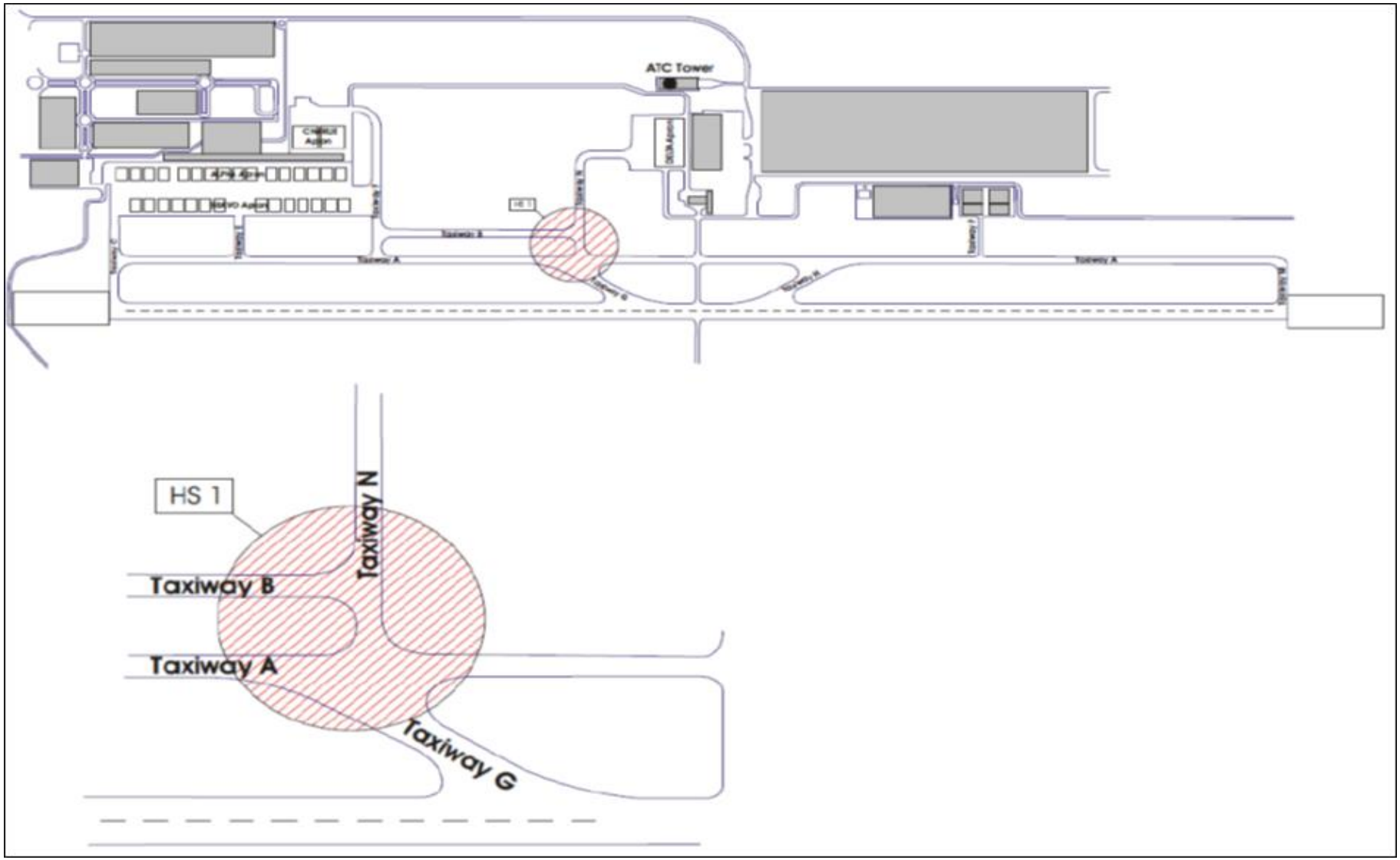

Figure 4: Depiction of the current 'hotspots' on the KSIA runways.

2.4 Constrution Works

The construction phase is envisaged to be of a 21-month duration. It is envisaged that the construction operations will be split as follows:

- Construction of the Bravo Taxi Way extension; and
- Remote stand construction.

The effect of the construction activities on the daily operations of the airport will be discussed and agreed upon with the Project Manager, Airside and Landside Management and Operation Officials before commencement of the project.

2.5 Environmental Authorisation Process

The proposed development requires Environmental Authorisation in terms of the National Environmental Management Act (NEMA) (Act 107 of 1998). Activities identified in Government Notice Regulations (GN R) 327 and 325 (Listing Notice 1 and Listing notice 3, respectively) of the EIA Regulations of 2014- as amended in 2017- will be triggered by the proposed project. Thus, a Basic Assessment (BA) process is being undertaken to obtain the authorisation. The said activities are as follows:

Table 5: Activities triggered by the proposed project

Legislation, triggered activity	Description and application
National Environmental Management Act (Act No 107 of 1998); GNR 327: Listing Notice 1 of the EIA Regulations of 2014- as amended in 2017 Activity 61: The expansion of airports where the development footprint will be increased.	ACSA has proposed the construction of 4 new apron stands to accommodate wide-body aircraft at the KSIA. Part of the development will include the extension of one of the taxiways at the airport.
National Environmental Management Act (Act No 107 of 1998); GNR 325: Listing Notice 3 of the EIA Regulations of 2014- as amended in 2017 Activity 7: The development of aircraft landing strips and runways 1,4 kilometres and shorter, in: d. KwaZulu-Natal vii. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;	ACSA is proposing the extension of the Bravo Taxiway at the KSIA. The total length of the extension works will be 1300m.
Activity 12: The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. d. KwaZulu-Natal: v. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;	Vegetation will be cleared from the remote stand site. The greatest areas to be cleared will be in Alternatives 1 and 3 (as discussed later in this report) There will also be vegetation clearing in the path of the Bravo Taxiway.

Ultimately, the outcome of the BA Process is to provide the Competent Authority (i.e. the national Department of Environmental Affairs (DEA)), with sufficient information to provide a decision on the Application in terms of granting environmental authorisation in order to avoid or mitigate any detrimental impacts that the activity may inflict on the receiving environment. In respect of this, DMT-Kai Batla (Pty) Ltd has been appointed by the BMK Engineering Consultants on behalf of ACSA, as the Independent Environmental Assessment Practitioner (EAP) to conduct the Basic Assessment process.

3 APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

3.1 Constitution of the Republic of South Africa Act No. (106 of 1996

The Constitution is the supreme Law in South Africa. Chapter 2 of the Constitution contains the Bill of Rights including section 24 which provides that:

"Everyone has the right-

(a)to an environment that is not harmful to their health or well-being; and

(b)to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that-

i. prevent pollution and ecological degradation;
ii. promote conservation; and
iii. secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."

Other rights protected by the Constitution relevant to an application for environmental authorisation include the right to administrative justice and to information, and rights, known as "socio-economic rights", such as access to adequate housing and basic services. The right to administrative justice is relevant to applications for environmental authorisations because decisions made by the competent authority in the course of the EIA process (such as the decision to accept a basic assessment report) as well as a final decision on the application fall into the definition of "administrative action"

The Constitution, and the stipulations it sets out on environmental management are the guiding principles on which environmental and development legislation has been conceptualised. The responsibility that the Applicant has to the environment needs to be in line with the Constitution- hence the need to ensure that all potential harm and pollution is highlighted and brought to the attention of the relevant decision makers (in this case, the National Department of Environmental Affairs, (DEA) given that ACSA is a State-Owned Company (SOC)).

3.2 The National Environmental Management Act (NEMA), (Act No 107 of 1998) and the Environmental Impact Assessment (EIA) Regulations of 2014- as amended in 2017(Government Notice No. R. 324, 325, and 327)

NEMA establishes a set of principles which all authorities have to consider when exercising their powers. This coincides with the role played by developers as per Section 28 of the Act, which requires that "*every person who causes, has caused or may cause significant pollution*
or degradation of the environment must take reasonable measures to prevent such pollution or
degradation from occurring, continuing or recurring". NEMA legislates the requirement to obtain environmental authorisation for certain development proposals or projects in line with the EIA Regulations. The EIA Regulations, made under section 24 of NEMA, are intended to integrate and facilitate environmental impact management with development activities or processes, in line with sustainable development objectives. They provide a method for the investigation, assessment and communication of the potential consequences or impacts of listed activities. The purpose of these Regulations

is to ensure that the impacts of activities for which environmental authorisations are necessary are properly assessed; so that the positive environmental impacts are enhanced; the activities which may have an unacceptable, negative effect on the environment are not authorised and those which are suitable for authorisation are approved, with conditions to avoid or mitigate possible detrimental effects.
The proposed project triggers activities in Listing Notice 1 (GNR 327) and Listing Notice 3 (GNR 325) of the EIA activities, as amended in 2017, and is therefore subject to Basic Assessment as the process to be followed in obtaining Environmental Authorisation.

3.3 The National Water Act, 1998 (Act No 36 of 1998)

The National Water Act, 1998 (Act No. 36 of 1998) mandates the Minister of Water Affairs to ensure that water is protected, used, developed, conserved, managed and controlled in a sustainable and equitable manner for the benefit of all persons. The Act guides the steps taken towards applications for and obtaining required authorisations in order for certain developments to proceed. This is in relation to developments that- amongst others- occur within water courses; activities that involve the abstraction of water from water courses, and the s well the disposal of water in a watercourse.

ACSA has a responsibility to implement measures to prevent pollution of any water resources during construction and operational activities. *To ensure that this responsibility is taken up, ACSA has been in consultation with the DWS on the potential impact on any watercourses and the need for a water use authorisation. The DWS has reviewed the documentation submitted by ACSA during these consultations, and have confirmed have submitted a letter to ACSA confirming that there is no need for a Water Use Licence Application (WULA).*

3.4 National Environmental Management: Biodiversity (NEM: BA) Act 10 of 2004

The purpose of the NEM:BA is to provide for the management and conservation of South Africa's biodiversity and the protection of species and ecosystems that warrant national protection. The NEM:BA makes provision for the publication of bioregional plans and the listing of ecosystems and species that are threatened or in need of protection. Threatened or Protected Species Regulations (2007), Guidelines for the determination of bioregions and the preparation and publication of bioregional plans (2009) and a National List of Ecosystems that are Threatened and in Need of Protection (2011) have been promulgated in terms of NEM:BA. A published bioregional plan is a spatial plan indicating terrestrial and aquatic features in the landscape that are critical for conserving biodiversity and maintaining ecosystem functioning. These areas are referred to as Critical Biodiversity Areas (CBA) in terms of NEM:BA. Bioregional plans provide guidelines for avoiding the loss or degradation of natural habitat in CBAs with the aim of informing EIAs and land-use planning.

The project area is underlain by KwaZulu-Natal Coastal Belt grassland, which is an endangered vegetation unit. The area also falls within a CBA, and the proposed activities will involve substantive clearing of vegetation. A s such, care must be taken to prevent any adverse impacts on the local biodiversity in accordance with NEM: BA.

3.5 National Heritage Resources Act (Act 25 of 1999); KwaZulu-Natal Heritage Act, (Act No. 4 of 2008)

The protection and management of South Africa's heritage resources are controlled by the National Heritage Resources Act (NHRA). The enforcing authority for this act is the South African National Heritage Resources Agency (SAHRA). In KwaZulu-Natal, SAHRA has delegated this authority to KwaZulu-Natal Provincial Heritage Authority (Amafa/Heritage KwaZulu-Natal). In terms of the Act, historically important features such as graves, trees, archaeological artefacts/sites and fossil beds are protected. Similarly, culturally significant symbols, spaces and landscapes are also afforded protection. Section 38 of the NHRA requires that any person who intends to undertake certain categories of development must notify SAHRA and/or AMAFA at the very earliest stage of initiating such a development and must furnish details of the location, nature and extent of the proposed development. Section 38 also makes provision for the assessment of heritage impacts as part of an EIA process and indicates that, if such an assessment is deemed adequate, a separate Heritage Impact Assessment (HIA) is not required.

Based on knowledge of the site, heritage or cultural artefacts do not occur in the development footprint. Should archaeological artefacts or skeletal material be revealed in the area during development activities, such activities should be halted, and the KZN Provincial Heritage Authority (i.e. KZN AMAFA) be notified in order for an investigation and evaluation of the find(s) to take place.

3.6 Occupational Health and Safety Act, 1993 (Act No. 85 of 1993)

The OHS Act provides for the health and safety of persons at work and for the health and safety of persons indirectly associated with the daily construction site activities; the protection of persons other than persons at work; and protects against hazards to health and safety arising out of or in connection with the activities of persons at work. This Act will be enforced during the construction and it serves to mitigate any potentially negative impacts the proposed project may have on any of the labour force and on the surrounding communities.

3.7 Noise Regulations under the Environment Conservation Act (ECA) (Act 73 of 1989); SANS 10103-2008

Noise is regulated in terms of the Noise Control Regulations of the Environmental Conservation Act (Act No. 73 of 1989 - ECA). Legislative responsibility for the Noise Control Regulations is devolved to the provinces and implemented at a local level by municipalities. In terms of airport-related noise, the noise generated within the airport is guided by *SANS 10117: Calculation and prediction of aircraft noise around airports for land use purposes.* This standard embraces the internationally acceptable approach of using land-use planning as an integral tool in mitigating the impact of aircraft noise from airports. Furthermore, in terms of the proposed project, the construction phase is likely to result in noise generation but of a temporary nature. This standard governs "*measurement and rating of environmental noise with respect to annoyance and to*

speech communication". The project proponent is required to adhere to these limits during the project development and/or operation.

In addition to these regulations, ACSA needs to ensure that the proposed operations are aligned the South African Civil Aviation Regulations (SACAR), Annexure 16 of the Chicago Convention (Volume 1) and the South African Civil Aviation Technical Standards in terms of environmental noise management at aerodromes. ACSA's responsibility as a licence holders is to ensure that aircraft noise emissions are regulated and that any issues stemming from the airport operations are handled according to the regulations and standards policies listed here.

3.8 National Environmental Management: Air Quality Act (Act No 39 of 2004)

The Air Quality Act governs the standard of air quality and sets out the requirements to be met in terms of maintaining certain air quality levels. A key aspect of the NEM:AQA is the establishment of national ambient air quality standards. The Act provides for the identification of priority pollutants (sulphur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), particulate matter (PM), ozone (O_3), lead and benzene (C_6H_6)) and the setting of ambient standards with respect to these pollutants. These standards are based on international best practice and provide the goals for air quality management and the yardstick by which the effectiveness of air quality management is measured.

The proposed Project does not trigger activities listed in terms of NEM: AQA, as the ACSA is already in possession of the necessary air emissions authorisations for the airport.

3.9 National Airports Development Plan, 2015; White Paper on National Civil Aviation Policy, 2015

Airport activities in general and aircraft operations in particular could have a major impact on the local environment as a whole. The National Civil Aviation Policy (NCAP) is focused more on the metropolitan and urban areas to facilitate the integration of the airport into its built environment and to ensure optimal utilisation of the development opportunities which the airport presents. Chapter 7 of the NCAP addresses the interaction between an airport and its environment and vice versa, and attempts to deal with all the aspects of land-use, which are not directly related to the operation of the airport. The airport environment in broad terms refers to the vicinity or area of influence of an airport. As such, the area of influence of an airport includes the airside as well as the landside of the airport. It also includes the geographic areas surrounding the airport, which are directly or indirectly affected by the airport or airport operation and vice versa. It therefore follows that the policy under this theme includes integrated development planning, land use on and around the airport and local emergency - and bulk municipal services, and development of the airport precinct and surrounding areas. Chapter 12 particularly deals with the environmental impact of aircraft operations. This impact includes noise and air pollution as well as human-induced climate change.

The National Airports Development Plan (NADP) has been initiated on the basis of the NCAP as the plan to address the gaps between the current airport network and the

future desired state. It will guide and support both overall network planning and the development of individual airports integrated within their broader spatial and transport contexts, in consultation with key stakeholders.

The KSIA expansion plans listed in this plan are as follows:

- The development of an additional 450 bays to car hire parking
- Construction of an additional 1000 bays to multi-storey parking
- ***Extension of the Bravo taxiway (this project)***

3.10 Airports Company Act 44 of 1993

The Airports Company Act 44 of 1993, under the auspices of the DoT, provides for an independent statutory body, the Regulating Committee, to oversee the economic regulation of Airports Company South Africa. The key mandate of Airports Company of South Africa includes, amongst others:

- Promoting the safe, efficient, economical and profitable operation of Airports Company South Africa airports; and
- Encouraging timely improvement of facilities at Airports Company South Africa airports so as to satisfy anticipated demand.

ACSA is regulated by the Regulating Committee stipulated in this Act through the prescription of service standards at airports and the limiting of airport charges.

3.11 Civil Aviation Act 13 of 2009

The Civil Aviation Act 13 of 2009, under the administration of the DoT, provides for the regulation and control of aviation in South Africa, the establishment of a South African Civil Aviation Authority (SACAA) with aviation safety and security oversight functions and gives effect to certain international aviation conventions, such as those standards and recommended practices of the International Civil Aviation Organisation (ICAO). The Minister of Transport is responsible with setting the regulations for the licensing, the inspection or management of aerodromes, including the technical, operational, safety and environmental management and protection standards in respect of airports in accordance with Section 155(1) of the Act as well as in accordance with the stipulations of the Airports Company Act, and other designated airports.

These regulations are applicable to all operations at the KSIA as they are at other aerodromes in South Africa.

3.12 KwaZulu-Natal Provincial Growth and Development Strategy (PGDS) 1997; Provincial Economic Development Strategy (2006)

The provincial planning framework is provided by the KwaZulu-Natal Provincial Growth and Development Strategy (PGDS, 1997- as revised) and the Provincial Economic Development Strategy (2006). The most recent revision of the PGDS was undertaken in 2016 and is purposed to:

- Be the primary growth and development strategy for KwaZulu-Natal to 2035;

- Mobilise and synchronise strategic plans and investment priorities in all spheres of government, and development partners in order to achieve the desired growth and development goals,
    - Spatially contextualise and prioritise interventions so as to achieve greater spatial equity;
    - Guide clearly defined institutional arrangements that ensure decisive and effective leadership, robust management, thorough implementation and ongoing inclusive reviews of the growth and development plan.

The PGDS recognises the need to increase the capacity of KSIA in order to make an increased contribution to the international logistics and connectivity competitive advantage of the Province.

3.13 Ethekwini Municipality Integrated Development Plan (IDP) (2017/18 – 2021/2022) and eThekwini Municipality Spatial Development Framework Review 2016-2017 (SDF)

The IDP displays the EMA's efforts in the provision of quality and affordable basic services, providing a safe and clean environment while also creating a favourable environment for local economic and social development. It provides strategic guidance for the location and nature of future development in the Municipality. The Municipal Spatial Development Framework (SDF) sets out the objectives for the desired spatial form of the municipal area. It provides strategic guidance for the location and nature of future development in the Metro. It contains a strategic assessment of the environmental impact of the SDF and identifies programs and projects for the development of land within the municipality. The development and expansion of the KSIA operations are included in the Municipality's growth objectives listed in these documents.

4 PLANNED ENVIRONMENTAL AND PERFORMANCE ASSESSMENT

4.1 Role and Responsibilities

Effective implementation of the EMPr requires that all parties or role players involved in this project need to comply with the directives set out. A concise description of impacts and their mitigation/management measures will be provided and understood by all role players responsible for the implementation and monitoring of the mitigation measures. The project will comprise of the following role players:

Table 6: Roles and Responsibilities for the personnel involved in the project

FUNCTION	RESPONSIBILITY
Developer/Proponent (ACSA)	ACSA is responsible for ensuring that the proposed development is in line with the standards of NEMA, as well as the provincial and municipal development and spatial plans. In implementing environmental management measures during the apron stand/taxiway operation, ACSA needs to: • Ensure that all parties during operational activities, are well aware of and implement the applicable environmental management requirements (as listed in the EMPr); • Ensure that all personnel are well versed with the EMPr; • Ensure that the Engineering Manager is undertaking all activities in accordance with the requirements of the EMPr and that high standards of environmental management are pursued; • Allocate and manage resources to ensure adequate supervision of environmental matters; and • Undertake and review environmental monitoring reports and verify that environmental monitoring results are within specified limits. • Ensure that personnel are adhering to the conditions of the - should the application be successful.
Lead Authority	• The Department of Environmental Affairs (DEA) is responsible for approving the Environmental Authorisation (EA) application. Ensuring that the monitoring and adherence to EMPr is carried out, by going through/reviewing audit reports submitted by the proponent and conducting regular site visits.
Engineering Manager	The Engineering Manager takes complete responsibility of the whole project and any contracted parties and ensuring that all environmental management facets are adhered to. The roles and responsibilities of the Engineering Manager during the Construction Phase will include: • Identifying the need for remedial measures with regard to proposed works; • Communicating directly with the Contractor and sub-contractors; and • Issuing non-conformance notifications to contractors that do not comply with the requirements as set out in the EMPr.
Contractor	The Contractor is responsible for the following • Ensure that all activities on site are undertaken in accordance with the EMPr; • Monitor the Contractor's activities (together with the ECO) with regard to the requirements outlined in the EMPr;

FUNCTION	RESPONSIBILITY
	• Ensure that all employees and sub-contractors comply with the EMPr; • Immediately notify the ECO of any non-compliance with the EMPr, or any other issues of environmental concern; and • Ensure that non-compliance is remedied timeously and to the satisfaction of the ECO. The Contractor has a duty to demonstrate respect and care for the environment. The Contractor will be responsible for the cost of rehabilitation of any environmental damage that may result from non-compliance with the EMPr, environmental regulations and relevant legislation.
Environmental Control Officer	ACSA's obligation is to ensure that the implementation of the project complies with the requirements of any environmental authorisations and permits, and obligations emanating from other relevant environmental legislation. This obligation is partly met through the development and the implementation of the EMPr - through its integration into the contract documentation. ACSA's is also responsible for appointing and independent Environmental Control Officer (ECO) who will be responsible for ensuring that all EMPr obligations are implemented and that all activities taking place in the project are in compliance with the EA conditions and DEA requirements.
Environmental Assessment Practitioner	As defined in Section 1 of NEMA; "the individual responsible for the planning, management and coordination of environmental impact assessments, strategic environmental assessments, environmental management plans and programmes, or any other appropriate environmental instrument introduces through regulations". DMT Kai Batla is the EAP appointed to conduct the environmental assessment as part of the environmental authorisation process.

4.2 Procedures for the Pre-Operational Phase

The implementation and monitoring procedures to be undertaken for the successful execution of the EMPr include:

- Undertaking an initial site visit during which ACSA and the parties tasked with the management and maintenance of the new apron stands and extended taxiway discuss issues of environmental concern relating to the project, and agree on roles and responsibilities, communication and reporting procedures;
- Executing an environmental awareness training workshop prior to the commencement of construction and operations for all ACSA and Contractors personnel involved- informing them of the purpose and importance of the EMPr;
- The implementation of ACSA's emergency response procedure;
- The ECO will inspect the site regularly to monitor and review the environmental performance of the new apron stands and extended taxiway against the commitments of the EMPr;

- During construction, the ECO will prepare weekly compliance checklist reports, detailing any environmental issues, non-compliance and actions to be implemented, to be submitted to the Engineering Manager or the relevant party as decided on by ACSA.
    - ECO or the Engineering Manager will be formally notified of the required corrective action;
    - The ECO will be expected to implement the required corrective action as detailed in the formal notification, and within the timeframes specified by the ECO; and
- These procedures should also be implemented for all activities during the Operational Phase- where applicable.

4.3 Environmental awareness training

Environmental awareness training courses should be provided to all personnel on site prior to the commencement of operation activities, detailing their obligations towards environmental management and in terms of the EMPr. The environmental training courses will include, amongst others, aspects such as:

- Environmental issues on site and having a full understanding of the environmental setting of the new apron stands and extended taxiway;
- Roles and responsibilities of all ACSA, external employees, service providers and all parties involved in the project;
- The operational environmental management measures;
- Toolbox talks on environmental practices and safety awareness on site, and the prevention of any incidents or disasters; and
- Cultural awareness.

Courses shall be held during normal working hours, at a suitable venue. All attendees shall remain for the duration of the course and, on completion, sign an attendance register that clearly indicates participants' names. A copy of the register shall be handed to the ECO for record keeping/ evidence of attending the training session.

4.4 Non-compliance and Corrective Action

Should, under any circumstance, the operational activities pose any damage on the environment and not comply with measures as stipulated in the EMPr, the Contractor will be held responsible for such non-compliance. It is therefore the responsibility of the Contractor to ensure that all relevant measures are taken to rectify such damage, at the wrong-doer's expense. It is the duty of the ECO to monitor compliance with the EMPr, and report and notify the Engineering Manager/ACSA of any non-compliance, highlighting the following:

- Details of the nature of the non-conformance;
- The actions to be taken to correct the situation; and
- The date by which each corrective action should be executed.

The Contractor will be held liable for any non-compliance on site. Following the identification and reporting of such occurrences, the Manager will be given 10 days to submit a Corrective Action Plan to the Engineering Manager's Environmental Management Department, which should detail how the required corrective actions will be implemented. This plan will be submitted to the ECO for approval prior to implementation. Once approved and the corrective measures have been carried out, the ECO will then determine the success or failure of the corrective action.

4.5 Environmental Management Programme Implementation and Monitoring

Environmental Records and Reports

The frequency and nature of reporting of environmental management performance will depend upon the nature of the activity and aspect that is being managed. Reporting may take several forms, i.e.:

- Reports to the ECO on critical issues that may arise;
- Compliance checklist reports on a weekly basis;
- Monthly reports on environmental performance and compliance or non - compliance;
- Performance reports on key indicators on a quarterly basis;
- Environmental monitoring reports to confirm if environmental monitoring results fall within specified limits on the EMPr; and
- Summary reports to external stakeholders.

Reports and records to be kept are presented in Table 7.

Table 7: Reports required during construction/operations

Item	Report	Frequency	From	To	Aim / Objective
1	Internal Environmental Compliance Audit Report	Bi-annual	ECO	Engineering Manager, ACSA and DEA	Detailed project compliance across all relevant legislation, identifying non-compliances, actions to be taken to rectify and timeframes to implement actions by responsible persons.
2	External Compliance Audit Report	Annual	External auditor	ACSA and DEA	Detailed plant compliance across all relevant legislation, identifying non-compliances, actions to be taken to rectify and timeframes to implement actions by responsible persons. Verify internal compliance audits.
3	Environmental, Health and Safety Monitoring	Monthly	ECO	Engineering Manager, ACSA	Verify that environmental monitoring results are within specified limits. Report on any environmental issues, non-

Item	Report	Frequency	From	To	Aim / Objective
	Reports and relevant/ accompanying checklists (environmental, first aid, baling machine, etc.)				compliance and actions to be implemented.
4	Corrective Action Plans	As required	Engineering Manager in the event of environmental non-conformance	ECO	Detail how the required corrective actions will be implemented.
5	Incident Reports	As required	Engineering Manager in the event of an incident	ECO	Report any environmental incidents, how they occurred, damage caused and how future incidents will be prevented.

In addition, the following must be considered and implemented accordingly:

- All documentation (e.g. audit/monitoring/compliance reports and notifications, required to be submitted to the Department in terms of the EA, must be submitted to the Director: Compliance Monitoring of the DEA at the following email address: DirectorCompliance@environmnet.gov.za
- The holder of the EA must, for the period during which the EA and EMPR remain valid, ensure that project compliance with the conditions of the EA and the EMPR are audited, and that audit reports are submitted to the *Director: Compliance Monitoring* of the DEA.
- The frequency of auditing and submission of the environmental audit reports must be as per the frequency indicated in this EMPR, taking into account the processes for such auditing as prescribed in Regulation 34 of GNR 326.
- The holder of the authorisation must, in addition, submit an environmental audit report within 30 days of completion of the construction phase (i.e. within 30 days of site handover) and a final environmental audit report within 30 days of completion of rehabilitation activities.
- The environmental audit reports must be compiled in accordance with appendix 7 of the EIA Regulations, 2014 and must be indicate the date of the audit, the name of the auditor and the outcome of the audit in terms of compliance with the EA conditions as well as he requirements of the approved EMPr
- Records relating to monitoring and auditing must be kept on site and made available for inspection to any relevant and competent authority in respect of this development.

5 ENVIRONMENTAL MANAGEMENT PROGRAMME

5.1 General Guidelines on site

The following measures provide guideline solutions to frequently anticipated issues on most development activities:

- The prevention of any site degradation due to non-compliance, administrative or financial problems, and inactivity during the pre-construction, construction and operational phases, illegal activities, delays caused by archaeological finds, etc. is ultimately the responsibility of the applicant/developer as stipulated under Section 28, National Environmental Management Act [NEMA] (Act No. 107 of 1998);
- Operations must be limited to the property as that is where all licensed activities will be taking place;
- Any damage incurred to be repaired immediately and to the satisfaction of the property owner/s;
    - All private and public amenities near the project site must be protected against damage at all times, and any damage must be rectified immediately;
- Relevant landowners and businesses must be informed of the starting date of construction/operations and the activities to take place;
- The Engineering Manager must adhere to all contractual agreements- including the EMPr;
- Proper documentation and record keeping of all complaints and actions taken;
- A positive attitude towards environmental management by all recycling plant personnel must be motivated through regular and effective awareness and training sessions.

5.2 Environmental Management Measures

The following tables detail the environmental management measures that have to be put in place for the various aspects of the project that may result in impacts, both negative and positive, on the receiving and surrounding environment. Environmental Management Measures in the Pre-construction and Construction Phase (Table 8); and Operational Phase (Table 9) phases are detailed. The environmental management tables also provide information on the frequency at which each aspect and management measure should be monitored, and the person responsible for implementing the management measures.

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Table 8: Pre-construction and Construction Phase EMPr

Management Aspect	Mitigation Measure/ Actions to be implemented	Monitoring Frequency	Responsibility
Construction commencement	• A written notification of commencement must be given to the DEA no later than fourteen (14) days prior to the commencement of the activity. Commencement for the purposes of this condition includes site preparation. The notice must include a date on which it is anticipated that the activity will commence, as well as a reference number.		
Authorisations	• Ensure that all required licenses and permits have been obtained before the start of construction. • A copy of the EA, and all other permits must be kept on site.	Once-off	Airports Company South Africa
Environmental Management Programme (EMPr)	• A finalized EMPr must address all authorization conditions stipulated by the DEA (and other commenting authorities). • The EMPr should also encompass all environmental impact mitigation measures as identified in the Final BAR	Once-off	ACSA
Appointment of Environmental Control Officer	• ACSA will appoint an ECO that will be tending the compliance and related as aspects on the project. • Include the EMPr in all tender documents to ensure that sufficient resources are allocated to environmental management by the Contractor.	Once-off	ACSA
Permits and Permissions	• ACSA must ensure that all licensing, permits or certificates required for the project are in place prior to the commencing of any activities on site.	Once-off	ACSA,
	• Engineering Manager must ensure that copies of all licensing, permits or certificates required are kept at the construction site camp.	On-going	Engineering Manager
Grievances	Compile and maintain a complaints' register. The register must record: • Complainant name and contact details; • Date complaint was lodged; • Person who recorded the complaint; • Nature of the complaint;	On-going	ACSA, Contractor

Management Aspect	Mitigation Measure/ Actions to be implemented	Monitoring Frequency	Responsibility
	• Actions taken to investigate the complaint and outcome of the investigation; • Action taken to remedy the situation; and • Date on which feedback was provided to complainant.		
Construction Activities	• The construction and operation of the stands and taxiway must be consistent with the requirements of the KSIA RoD with respect to the management and implementation of the conservation area.	Once-off	ACSA, Engineering Manager
Ablution Facilities	• Provide ablution facilities (i.e. chemical toilets)- if required. Should portable toilets be used, these should be secured to the ground within the site camp to the satisfaction of the Engineering Manager/ECO to prevent them toppling due to wind or any other cause. • Maintain toilets in a hygienic state (i.e. toilet paper to be provided, toilets to be cleaned and serviced regularly (at least twice- monthly by an appropriate waste contractor), and toilets to be emptied before long weekends and builders' holidays). The waste shall be disposed at a licensed waste disposal facility. • Ensure that no spillages occur when the toilets are cleaned or emptied. Repeated incidents of spillage of chemicals and or waste (i.e. more than one incident), will require toilets to be placed on a solid base with a sump. • Urination or defecation on site, other than at the designated ablution facilities, is strictly prohibited.		
Handling of Construction Materials	• Imported materials shall be free of weeds, litter and contaminants. Materials to be obtained from reputable commercial sources. • Stockpile areas shall be approved by the Engineering Consultant/ ECO before any stockpiling commences. • Where possible, stockpiles shall be located in sheltered areas where they are not exposed to the erosive effects of the wind. • Stockpiles shall not exceed 2m in height.		

Management Aspect	Mitigation Measure/ Actions to be implemented	Monitoring Frequency	Responsibility

Vegetation Clearing	• The extent of construction works must be limited to the development footprint and the designated buffer area.
	• Areas to be cleared need to be clearly marked and clearing of vegetation must only take place within these demarcated areas.
	• Ensure that no vegetation is removed or disturbed outside the delineated construction site boundary.
	• Limit clearing of vegetation to those areas within the footprint of construction activities and bulk earthworks.
	• It is recommended that a suitably qualified biodiversity specialist be tasked with any features which require permit applications prior to their removal / destruction. Any required permits must be obtained prior to the feature being removed or destroyed.
	• Retain as much indigenous vegetation as possible so it can be replanted during rehabilitation.
	• Clear as much alien vegetation as possible to retain nutrients for indigenous vegetation.
	  ○ Removal of species should take place throughout the construction phase.
	  ○ All removal of alien vegetation must be undertaken in such a way as to ensure that at no time is there excessive base ground created which would be susceptible to erosion.
	• Stockpiles shall not exceed 2m in height. If stockpiles are greater than 2m in height, then suitable measures shall be taken to avoid wind-blown dust.
		On-going	Contractor

Appointment of a Biodiversity Specialist	• A qualified biodiversity specialist must be appointed and tasked to do the following:
	  ○ Identify and features which require permit applications prior to their removal or destruction. All permits must be obtained prior to the feature being removed or destroyed.
	  ○ Identify and rescue indigenous vegetation to be replanted during the rehabilitation phase.		

Management Aspect	Mitigation Measure/ Actions to be implemented	Monitoring Frequency	Responsibility
	○ Identify and clear alien vegetation to retain nutrients for indigenous vegetation.		
Extensive earth works	• The extent of construction works must be limited to the development footprint and the designated buffer area. • Earth works should be done in accordance with the construction schedule. • Vehicles and machinery to be used by authorised/permitted personnel. • Care should be taken to avoid health and safety incidents. • Excavations to adequately barricaded and labelled. ○ This is with particular reference to excavations exceeding 1-1.5m in depth. • Excavated material to be placed in a designated place outside of the construction area	On-going	Contractor
Soil disturbance	• Topsoil stockpiles be protected against wind, erosion and seeds, i.e. by use of shade cloth or netting. • Topsoil stockpiles should not exceed 2m in height. • All soils compacted as a result of construction activities falling outside of project footprint areas should be ripped and profiled. • Sloped areas can be temporarily stabilized during construction using geotextiles. • All exposed earth should be rehabilitated promptly with suitable vegetation to stabilize the soil.	On-going	Engineering Manager/ Contractor, ECO
Soil and groundwater contamination	• It is recommended that appropriate storm water management system must be implemented during construction. The plan must include measures to ensure that all runoff from the forecourt is directed into the existing storm water management system in the interim of the newly constructed one being operational. ○ The temporary system should include an oil/water separator. • All construction vehicles should be properly maintained to prevent leaks.	On-going	Engineering Manager/ Contractor, ECO

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Management Aspect	Mitigation Measure/ Actions to be implemented	Monitoring Frequency	Responsibility
	• Cement mixing must be confined to a designated area and must be done on an impervious surface. • Any fuel stored on site must be kept in a bunded containment area and be clearly marked. • Drip trays are to be utilized during daily greasing and re-fuelling of machinery and to catch incidental spills and pollutants. • Drip trays are to be inspected on a weekly basis for leaks and effectiveness, and emptied when necessary. This is to be closely monitored during rain events to prevent overflow.		
Surface Water Drainage/ Water Management	• Potentially hazardous materials used during the construction phase (including cement and solvents) must be housed under cover (where practical) and utilised in bunded areas, where necessary. • It is recommended that vehicles and construction equipment be maintained off-site as far as possible. • Refuel and service vehicles on an impermeable surface; • Make use of a drip tray/ sand tray under the fuel nozzle when refuelling vehicles or equipment on site; • Place drip trays/sand trays under engines of vehicles or mechanical equipment when parked or stored overnight or longer; • Make all relevant staff aware of the need to prevent spills, leaks and disposal of contaminated water onto the ground • and ensure that they are adequately trained to take corrective action should an accidental spill occur. • Accidental oil and fuel spillages to be cleaned up immediately by the Contractor, placed in sealed containers and disposed accordingly. • Spill kits must be made available and the correct procedures followed during the clean-up of spills. • Any significant spills on-site must be reported to the relevant Authority (e.g. the DEA and the eThekwini Municipality) and must be remediated as per the requirements of the EMPr.	On-going	Contractor

Management Aspect	Mitigation Measure/ Actions to be implemented	Monitoring Frequency	Responsibility
Disruption to existing critical service infrastructure	• Adequate signage should be erected at the contact areas (across the terminal buildings), as well as inside the buildings to notify passengers and all airport patrons of the construction activities. • The construction schedule should be adhered to ensure that construction occurs timeously. • The extent of construction works must be limited to the development footprint and the designated buffer area to limit disruption to other airport operations. • Construction activities will be restricted to hours that will cause the least disruption.	On-going	Contractor
Disruption to airport terminals	• Adequate signage should be erected at the contact areas (across the terminal buildings), as well as inside the buildings to notify passengers and all airport patrons of the construction activities • Construction activities will be restricted to hours that will cause the least disruption. • Mechanical equipment with lower sound power levels will be selected to ensure that the permissible occupation noise-rating does not exceed the levels stipulated for the Special 10 land use zone. • Equipment will be fitted with silencers as far as possible to reduce noise. • All equipment to be adequately maintained and kept in good working order to reduce noise.	On-going	Contractor
Visual impacts	• Construction activities will be restricted to hours that will cause the least disruption. • Lighting on site is to be sufficient for safety and security purposes • No stockpiles should exceed 2m in height. Wind-blown dust from stockpiles and construction activities, should be controlled. • Limit exposed areas (removal of vegetation) to the project footprint. Keep all areas neat, clean and organized in order to portray a general tidy appearance. • The construction site and material stores, should be kept tidy.	Weekly	ECO

Management Aspect	Mitigation Measure/ Actions to be implemented	Monitoring Frequency	Responsibility
	• Measures to control wastes and litter should be included in the contract specification documents. • All rubbish and rubble removed to a recognized waste facility. • A certificate of disposal must be obtained for any waste that is disposed of. • The construction camp must be located as far from other buildings as possible.		
Noise impacts	• Construction activities will be restricted to hours that will cause the least disruption. • Vehicles and machinery to be kept in good working order • Mechanical equipment with lower sound power levels will be selected to ensure that the permissible occupation noise-rating limit is in accordance with the levels stipulated for the Special 10 land use zone. • Equipment will be fitted with silencers as far as possible to reduce noise. • All equipment to be adequately maintained and kept in good working order to reduce noise. • Introduce a formal recording system/grievance mechanism to capture public perceptions and complaints with regard to noise. • Track investigation actions and introduce corrective measures for continuous improvement.	Weekly	ECO
Traffic disruption	○ It is recommended that the public to be notified 7 days prior to construction commencing. ○ Strict adherence to working hours must be maintained. ○ Limiting the number of vehicles entering and exiting the construction site will ensure that traffic is kept to what is needed for construction and monitoring purposes. ○ Access roads should be planned ahead of time, with the public receiving sufficient warning of impending traffic. ○ Alternative routes to be provided for local motorists as far as possible should road closures be required.	On-going	Engineering Manager, ECO

Management Aspect	Mitigation Measure/ Actions to be implemented	Monitoring Frequency	Responsibility
	○ Flagmen to be posted when construction works are being undertaken adjacent to roads. ○ Signage is to be displayed indicating construction activities. ○ Any damage caused to surrounding roads as a result of construction activities must be repaired as soon as possible to prevent further deterioration to the private or public road network. • Construction vehicles and plant must not be permitted outside of the demarcated construction area.		
Dust fallout	• Minimise the extent of open areas. • Retain existing vegetation for as long as possible and only clear areas when required. • Topsoil stockpiles should be covered to prevent the surface soil from being blown away. • Minimise material handling and the frequency of disturbance of stockpiles to minimise wind erosion. • Dust suppression techniques to be used on all dust generating surfaces. ○ Pre-water areas earmarked for disturbance, if possible. • The speed of construction vehicles to be restricted to 40km/h within the construction area or near stockpiles. • Minimise travel distances on site through appropriate construction site layout and design. ○ Trucks transporting any form of soil or waste should be covered with a canvas. • Rehabilitate / revegetate exposed areas as soon as works are completed. Consider using hydro-seeding, ground-covering mesh, etc. to facilitate revegetation.	On-going	Contractor
Health and Safety and security	• The construction management needs to communicate the commencement and duration of construction activities to the community.	On-going	Engineering Manager, ECO

Management Aspect	Mitigation Measure/ Actions to be implemented	Monitoring Frequency	Responsibility
	• Clear signage needs to be put up to make and keep the community awareness of construction activities so as to prevent any hazardous occurrences. • Provide adequate safety warning signage on the roads. • Construction workers and vehicle operators must take heed of normal road safety regulations, thus all personnel must obey and respect the law of the road. A courteous and respectful driving manner must be enforced and maintained so as not to cause harm to any individual. • A safe designated speed limit must be set by the project managers to limit possible road strikes and accidents. • Construction paths must be clearly demarcated. • The position of the water main is to be placed away from the footpaths. • Demarcate and barricade the new apron stand and extended taxiway footprint to prevent access to open trenches site during construction. • Enforce the use of appropriate Personal Protective Equipment at all times (i.e. hard hats, steel capped safety boots, protective goggles). • Security to be provided (where possible) after hours to protect equipment in the construction camp. • No construction staff must be permitted to trespass on private land. Any construction personnel found to be trespassing on private land must be immediately subjected to a disciplinary action. • Access to site to be strictly controlled.		
Waste	• An integrated waste management approach must be implemented that is based on waste minimisation and must incorporate reduction, recycling, re-use and disposal where appropriate. Any solid waste shall be disposed of at a landfill licensed in terms of section 20 (b) of the National Environmental Management Waste, 2008 (Act 59 of 2008).	Weekly	Engineering Manager, ECO

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Management Aspect	Mitigation Measure/ Actions to be implemented	Monitoring Frequency	Responsibility
	• Minimise waste generation, e.g. by providing re-usable items and refillable containers (e.g. for drinking water). • Waste bins are to be located at the construction camp and construction sites and must have clear markers saying the type of waste (general or hazardous) contained therein. • Bins to have secured lids to prevent waste from being blown into the surrounding area. • Store waste in labelled containers, indicating clearly whether the waste is hazardous or non-hazardous (general waste). • Hazardous materials will be generated if there are spillages during construction and maintenance periods. This waste should be cleaned up using absorbent material provided in spill kits on site, and must be disposed of accordingly at a hazardous waste landfill. • The storage area for hazardous material must be concreted, bunded, covered, labelled and well-ventilated Waste generated by construction workers must be collected and disposed of weekly at the nearest registered landfill. • Records of all waste being taken off site must be recorded and kept as evidence • Evidence of correct disposal must be kept. • Burning of waste material will not be permitted. • Absorbent materials used to clean up spillages should be disposed of in a separate hazardous waste bin. • On-site chemical toilets will be provided for domestic purposes during construction phase. • The contractors will be responsible for the maintenance of the chemical toilets. • Should any spills or incidents occur; the material will be cleaned up immediately and disposed of appropriately. • All incidents must be reported to the responsible site officer as soon as it occurs.		

DMT Kai Batla (Pty) Ltd

Management Aspect	Mitigation Measure/ Actions to be implemented	Monitoring Frequency	Responsibility
Concrete/Cement Work	• Use Ready-Mix concrete rather than batching on site where possible. • Ensure that no cement truck delivery chutes are cleaned on site. Cleaning operations are to take place off site at a location where wastewater can be disposed of in the correct manner. If this is not possible a suitable washing facility is to be developed on site in consultation with the ECO. • Batch cement in a bunded area within the boundaries of the development footprint only (where unavoidable). • Ensure that cement is mixed on mortar boards and not directly on the ground (where unavoidable). • Physically remove any remains of concrete, either solid, or liquid, immediately and dispose of as waste. • Place cement bags in bins with lids and dispose of bags as waste to a licensed waste disposal facility. • Contaminated water from batching areas shall be contained and sediments allowed to settle before being disposed of as waste water.	On-going	Contractor, ECO
Hazardous Materials	• Keep relevant Material Safety Data Sheets (MSDS) on site for all potentially hazardous substances (as defined in the regulations for hazardous chemical substances). In the event of an emergency, procedures detailed in the MSDS shall be followed. • Maintain a register of all hazardous substances stored on site. • Store all hazardous substances (including hazardous waste substances e.g. oils, bitumen, hydraulic fluids) within secondary containment in a suitable storage facility. Major stocks of hazardous materials other than fuel should preferably be stored off-site. • No hazardous substance shall be disposed of on site. • Ensure that hazardous substances (including cement) are not placed directly on the ground.	On-going	Contractor, ECO

Management Aspect	Mitigation Measure/ Actions to be implemented	Monitoring Frequency	Responsibility
	• Develop (or adapt and implement) procedures for the safe transport, handling and storage of potential pollutants. •		
Storage and Dispensing of Fuel	• Identify a suitable designated area for the fuel storage tanks. • Store fuel in accordance with relevant SABS specifications and all fuel storage tanks shall be provided with adequate bunding (110% of the largest tank). The bund floor shall be impermeable and sloped to a sump to enable removal of spilled fuel and contaminated water. • Refuel and service vehicles on an impermeable surface; • Make use of a drip try / sand tray under the fuel nozzle when refuelling vehicles or equipment on site; • Use appropriately sized drip trays for all refuelling and/or repairs done on machinery – ensure these are strategically placed to capture any spillage of fuel, oil, etc. • Adequate fire-fighting equipment shall be provided at the fuel storage and dispensing areas. • Should any spills or incidents occur; the material will be cleaned up immediately and disposed of appropriately. • All incidents must be reported to the responsible site officer as soon as it occurs.	On-going	Contractor, ECO
Fire Control	• No fires are permitted on site except in areas approved by the ECO in consultation with ACSA. Any such areas are to be situated as far as possible from vegetated areas, flammable material stores, etc. • Ensure that no smoking is permitted on the site except for within a designated area in the site camp (to be included in the site camp Method Statement). Suitable firefighting equipment must be readily available in this area. • Appoint a fire officer who shall be responsible for coordinating emergency response in the event of a fire.	On-going	Contractor, ECO

Management Aspect	Mitigation Measure/ Actions to be implemented	Monitoring Frequency	Responsibility
	• Ensure that all personnel on site are aware of the location of firefighting equipment on the site and how the equipment is operated. • Suitably maintain firefighting equipment.		
Closure and rehabilitation	• Revegetate disturbed areas with indigenous species • Use harvested topsoil for rehabilitation. • Stabilise slopes disturbed / cleared for construction with geofabric or another appropriate erosion stabilisation technique to prevent erosion. • Remove all construction equipment, vehicles, equipment, waste and surplus materials, site office facilities, temporary fencing and other items from the site. • Clean up and remove any spills and contaminated soil in the appropriate manner. • Do not bury discarded materials on site or on any other land not designated for this purpose. • Rehabilitate affected areas on the site as soon as construction activities in the relevant area are completed, rather than undertaking all rehabilitation at the end of the contract period. • Rehabilitate areas adjacent to the site (if disturbance is unavoidable) to at least the same condition as was present prior to construction.	On-going	Contractor

DMT Kai Batla (Pty) Ltd

Table 9: Operational Phase EMPr

Management Aspect	Mitigation Measure/ Actions to be implemented	Monitoring	Responsibility
The operational Phase measures are listed here pertain to the impacts identified for the construction phase, as a result of the new Apron stand and extended Bravo Taxiway. Some of the measures listed here rare extracted from the most recent Operational Environmental Management Programme (OEMPR) Compiled by WSP Parsons Brinckerhoff for the KSIA, in April 2017 (Report N^{O} 40815-01).			
Commencement of Operations	• A written notification of operation must be given to the DEA later than fourteen (14) days prior to the commencement of the activity operational phase.		

Vegetation and Fauna Management	• Clear as much alien vegetation as possible to retain nutrients for indigenous vegetation.
	  ○ Removal of species should take place throughout the construction phase.
	  ○ All removal of alien vegetation must be undertaken in such a way as to ensure that at no time is there excessive base ground created which would be susceptible to erosion.
	• Avoid insect infestations at the airport by spraying or managing habitats that may attract insects as necessary (to minimise the attraction of birds and bats to the area).
	• Assess the risk of bat strikes, and if necessary:
	  ○ avoid using lighting wavelengths at the airport that attract insects;
	  ○ prevent the re-establishment of bushes, shrubs and trees within the site; and
	  ○ prevent bats from taking shelter in buildings by installing exclusion measures.
	• Prevent birds and bats from taking shelter in ACSA buildings and hangars by installing anti-perching spikes, netting and panelling on ledges and in holes in buildings where appropriate.
	• Limit pooling water of the airport property as far as possible to deter birds and insects from the airport property.
		On-going	ACSA

DMT Kai Batla (Pty) Ltd

Management Aspect	Mitigation Measure/ Actions to be implemented	Monitoring	Responsibility
Surface Water Drainage/ Water Management	• Provide sub-surface drainage and storm water removal systems at edges of impermeable surfaces where impermeable geological layers are shallow. • Ensure that regular maintenance is done on tar mac and other surfaces • Curtail sheet runoff from paved surfaces and access roads. • Attenuate stormwater in order to prevent erosion. • Immediately clean up and treat spills and pollution accordingly to minimise the potential of further polluting stormwater. • Wastewater disposed to sewer must be of a standard capable of treatment • Implement the hydrology management measures detailed in the existing EMPr for KSIA, as per the ROD requirements. • Ensure the measures listed in the OEMPR are implemented.	On-going	ACSA
Health effects of increased air pollution	• Monitor priority pollutants that have the potential to affect human health- as per the approvals/ROD for the initial airport development, and in accordance with the existing Air Quality Management Plan (AQMP, 2016). • Investigate and where possible implement the recommendations for the reduction in air emission, in line with the standing ROD • Ensure that the KSIA AQMP is implemented in accordance with the KSIA ROD. • Ensure the measure listed in the OEMPR are implemented.	On-going	ACSA
Noise emissions emanating from increased flights to and from the Airport	• Implement a permanent noise monitoring system at site as per current South African Civil Aviation Regulations (SACAR); and • Set up noise monitoring stations in the existing residential communities falling within the 55dbA area. • Monitor aircraft emissions regularly. • ACSA (as an aerodrome licence holder) will take full responsibility of any future noise/and or emissions complaints • Ensure the measure listed in the OEMPR are implemented.	On-going	ACSA

Management Aspect	Mitigation Measure/ Actions to be implemented	Monitoring	Responsibility
Environmental Management Procedures	• Update the existing management procedures to incorporate the project-specific management measures. Develop additional management procedures if necessary.	Prior to commissioning of new apron stands and extended taxiway	ACSA

6 COMPLIANCE AUDITS, REVISING THE EMPR AND CONCLUDING RECOMMENDATIONS

6.1 Compliance Audits and Reporting

Audits of compliance with the EA conditions and implementation of the EMPr must be undertaken internally on a biannual basis (i.e. twice a year). A report of the audit findings must be compiled, and the report should include:

- The date of when the audit was conducted;
- The name of the auditor;
- The outcome of the audit in terms of compliance with the environmental authorisation conditions and the requirements of the EMPr; and
- Corrective measures to ensure that ACSA' compliance rating is improved or maintained.

In addition, ACSA should appoint an independent party to undertake external audits on the EMPr implementation during the construction phase. The auditor must be provided with the internal audit reports for review, and must produce a report containing the type of information presented in the internal audit reports. This report must be submitted to the competent authority (i.e. the DEA) and copies should be readily available on site, to anyone (on request) and on ACSA's website- as per the conditions of the EA.

6.2 The EMPr as a Live Document

When considered necessary, the EMPr should be revised and updated to incorporate issues identified through emergencies, incidents, monitoring or audits. ACSA should be cognisant of the fact that the EMPr is a dynamic document, and revisions and updates made to it will ensure that the operation activities are planned and implemented taking identified environmental issues into account.

6.3 Concluding Remarks

In implementing the proposed project, and this EMPr, the following is recommended:

1. Maintaining the existing infrastructure- like the storm water management system, roads, fences/boundaries and other structures.
2. Managing the operational areas in accordance with the integrated and spatial development plans, and implementing the environmental protection measures detailed therein.
3. Implementing the EMPr to guide the pre-construction, construction and operational activities, and to provide a framework for the on-going assessment of environmental performance.
4. Maximising the employment of local people and the procurement of local resources during operations to ensure maximum benefit to the provincial/local economy.
5. A suitably qualified licence holder employee must be mandated with the task of monitoring compliance, and correct implementation of all mitigation measures and provisions as stipulated in the licence, EMPr and standard operation procedures.

It is also recommended that the developer appoint an independent external party to undertake annual audits of the new development's compliance with the EA conditions.