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DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT FOR THE PROPOSED EXPANSION OF THE CAPE WINELANDS AIRPORT

(P10 OF FARM 724, RE OF FARM 724, P23 OF FARM 724, P7 OF FARM 942, RE OF FARM 474, P3 OF FARM 474 AND P4 OF FARM 474)

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DRAFT REPORT FOR COMMENT

PREPARED FOR
CAPEWINELANDS AERO (PTY) LTD

PREPARED BY
PHS CONSULTING

P.O. BOX 1752, HERMANUS, 7200 I TEL: +27 28 312 1734 I FAX: 086 508 3249,
AMANDA@PHSCONSULTING.CO.ZA / PAUL@PHSCONSULTING.CO.ZA

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AUTHOR	Amanda Fritz-Whyte	2019/367		12 Nov 2024
REVIEWER	Paul Slabbert	2019/1036		12 Nov 2024
EDITOR & REVIEW	Olivia Brunings	2023/6743 (Candidate)		12 Nov 2024

Executive summary

NOTE: This draft Environmental Impact Assessment report (EIAR) follows on the in-process Scoping report that was circulated for public comment from 24 July to 26 August 2024. The EIAR and EMPr has been compiled from specialist studies and I&AP input and will be circulated to all Registered I&APs for consideration and comment. Where required the EIAR, EMPr, specialist and technical reports will be amended to reflect further I&AP input after which the final EIAR and EMPr will be submitted to DEA&DP for decision making.

Cape Winelands Airport with International Civil Aviation Organization (ICAO) location identifier "FAWN", was formerly known as Fisantekraal Airfield (FAFK), and was acquired in November 2020 by the Applicant, who since established Cape Winelands Airport Ltd. The site is located approximately 10.5km northeast of Durbanville and 25km northeast of Cape Town International Airport (CTIA), and the current airport site is 150ha in size.

The proposed project entails the expansion of the existing Cape Winelands Airport in a phased development approach, which will include the realignment of a primary runway with an orientation of 01-19 and a length of 3.5km. Landside and airside infrastructure will also be phased based on market demand. Landside infrastructure will include, but not be limited to, passenger and cargo terminals, hotel, aircraft hangers and services, airport facilities, a bulk fuel storage facility, internal and external road infrastructure, potable water and sewage treatment infrastructure, a petrol filling station, a biodigester, solar PV, and stormwater management infrastructure. Airside infrastructure will include, but not be limited to, runways, taxiways, taxilanes, aircraft parking aprons, service roads as well as approach lights and navigational aids needed for safe operations in all weather conditions. The runway solution also includes drainage, pavement structures, paint markings and earthworks along with considerations for aircraft tracking, jetblast impact mitigation and hydroseeding requirements.

The following reasonable and feasible alternatives were considered in the Scoping Phase:

- Alternative 1 "Do Nothing", which implies development within current rights; and
- Alternative 2 ("Preferred Alternative"), which entails the construction of a 3.5km main runway at orientation 01-19 and initial retention of cross runway 14-32.

Alternative 2 consists of 2 phases:

In Phase 1 two runways will be required:

- A primary runway of 3.5km for scheduled air traffic and high-performance business jets.
- A secondary cross runway of 700m for general aviation traffic and light aircraft operations during certain wind conditions.

In Phase 2 the secondary cross runway will be closed as the projected scheduled traffic increases and airspace safety, efficiency and capacity become key considerations. The timing of the closure of the secondary cross runway will be based on a multitude of factors and will follow a risk assessment, consultative process, and an assessment of market demand, ensuring that Phase 2 of the runway development is implemented at the appropriate time.

Based on further studies and development of the SDP the 700m cross runway 14-32 was excluded from the Initial Preferred Alternative 2 to result in the New Preferred Alternative 3:

In Phase 1, the airport will comprise of one runway, which will be at an orientation of 01-19 and a length of 3.5km and will be constructed to serve up to Code 4F instrument operations. This runway will be shared by all operators, including scheduled commercial as well as general aviation, where intersection take-off points will be introduced on the runway to improve efficiency for general aviation operations.

In Phase 2 the airport development strategy is based on the continued development of the various precincts with the main runway shared by all operators, including scheduled commercial as well as general aviation.

Detailed breakdown of the proposed development and its associated infrastructure per phase:

1. Airside Precinct Development

In Phase 1, the airport will comprise of one runway, which will be at an orientation of 01-19 and a length of 3.5km and will be constructed to serve up to Code 4F instrument operations. This runway will be shared by all operators, including scheduled commercial as well as general aviation, where intersection take-off points will be introduced on the runway to improve efficiency for general aviation operations. The airside runway development in Phase 1 will also include, but not be limited to, airside systems such as CAT III Instrument Landing System (ILS), Precision Approach Path Indicator, Glidepath Antennas, Meteorological Systems, Airfield Ground Lighting (AGL) and Remote Digital Control Tower Systems.

The following additional developments are proposed as part of Phase 1 & 2 of the Airside Precinct:

Aircraft Parking Aprons: Passenger terminal apron; General aviation and FBO aprons; Isolation pad; Cargo apron (Phase 2); MRO apron (Phase 2).

Aircraft parking stands range from ICAO Code B up to ICAO Code F stands. As part of the Development, 11 MARS stands (21 code C equivalent stands) is foreseen. Some of these will be contact MARS stands and will be equipped with passenger boarding bridges (PBBs) and will be able to accommodate up to Code F aircraft. The other stands will be remote stands, to which passengers are bussed or can walk. In addition to this, 1 Code E cargo aircraft parking stand and 2 Code E MRO aircraft parking stands have been included.

Airside service roads will be constructed to provide access to airport assets for vehicles such as buses, ground service equipment and maintenance vehicles. An airport security fence will be erected in line with aviation security standards.

The bulk electricity supply will terminate within the CWA site in a position at a connection point comprising an Eskom local substation (final overhead pole, overhead drop-out line-fuses, medium voltage 3-core cable connection to metering substation fitted with dual outgoing feeder connections) housed in a fenced or secure enclosure (likely 5000mm by 4000mm).

2. Landside Precinct Development

The following developments are proposed as part of Phase 1 & Phase 2 of the Land Side Precinct:

Passenger Terminal Building (Phase 1): The PTB (Passenger Terminal Building) serves as the nexus of the airport's operations, connecting airside and landside areas, facilitating passenger and baggage movements, while adhering to rigorous national and international regulations. It has been designed in accordance with the latest ICAO Annexes and the IATA Airport Development Reference Manual (12th edition, May 2022), ensuring compliance with aviation standards. The location and approximate size of the PTB have been predetermined in the airport master plan. The PTB will be a double level building with a handling capacity of 5.2MPPA and the terminal has been designed to process both domestic and international passengers.

Facilities will be designed specifically for the intended user groups and will be compliant with the relevant standards and recommended practices. These facilities will include specialised equipment and areas to facilitate check-in and bag-drop, security screening, and, in the case of international traffic, customs and emigration / immigration.

The VIP processing facility will have direct access to the airside. Government officials, VIPs and CIPs (Commercial Important Person) will be processed through the facility.

Included in the Development for Phases 1 & 2 are commercial developments, with approximately 350 000m² of lettable area provided for. The terminal precinct encompasses a terminal plaza with landmark hotels, and an aviation museum. Included in the aeronautical hub functions are hangars, aviation clubs, an aviation training centre, workshops, light manufacturing, logistics, warehousing, and food processing.

Additional developments proposed as part of Phase 1 & Phase 2 of the Land Side Precinct development: Petrol Service Station; Hotel; Access, egress and an internal vehicular road system; Drop and go facilities which will allow passengers to drop passengers off close to the passenger terminal building; Car rental facilities; Vehicular parking (multi-storey parking, at-grade parking); Pedestrian walkways; Substations; Billboards (indoor and outdoor, static and electronic); Droneport and vertiports; Gardens; Public transport facilities (Phase 2); Carpark/VTOL (Phase 2).

3. General Aviation Precinct

The general aviation area for Phase 1 & 2, including business aviation, is located on the south of the airport site. The FBO (Fixed Base Operators) facilities are located along a dedicated taxi lane that provides direct access to/from the main runway via the parallel taxiway. A GA (General Aviation) kerbside refuelling station for AV-gas will be developed at the furthest southern corner of the GA site. A GA clubhouse with airside views will be developed, with adjacent grass parking areas for visiting GA aircraft. The helicopter operations will be from dedicated FATOs (Final Approach and Take-off areas).

The following developments are proposed as part of Phase 1 & Phase 2 of the General Aviation Precinct: Fixed Base Operators Hangars; General Aviation Hangars; Clubhouse Area; Final Approach & Take-Off Infrastructure; AVGAS Station; Substation; Remote Digital Control Tower.

4. Services Precinct

The key airport support facilities are the aircraft rescue and firefighting (ARFF) services, airport maintenance, ground support equipment (GSE) maintenance and staging, cargo, aircraft maintenance, repair and overhaul (MRO), aircraft fuel facilities and an airport operations centre. Also included is provision for solar PV, wind energy and a biodigester. Most of these facilities are located on the western side of the airport. All facilities are accessible from the secondary landside road system, accessed from the western entrance road into the airport site.

The following developments are proposed as part of Phase 1 & Phase 2 of the Services Precinct:

The fuel facilities (Phase 1) consist of a bulk fuel depot, a general aviation kerbside refuelling station and a commercial/retail service station. An underground fuel line from the bulk fuel depot to the aprons is also provided for in Phase 2.

Aircraft Rescue and Fire Fighting (Phase 1) - The airport will be equipped to provide a level of protection corresponding with Category 9 to meet the ICAO standards. The location of the rescue and firefighting station has been positioned close to the middle of the runway and complies with the ICAO requirements considering the response times of two minutes and not exceeding three minutes, to any point of the operational runway and any other part of the movement area.

Cargo Facility (Phase 1) - The cargo facility is planned for the handling of general and specialized cargo in a dedicated facility on airside. The cargo facility is expected to handle both belly cargo (on passenger aircraft) and full freighter aircraft and is, therefore, located close to the passenger terminal building. Initially, full freighter aircraft can make use of the main apron, as aircraft stand demand is limited during off-peak hours. A single dedicated freighter aircraft stand will be provided when passenger peak traffic starts to spread out.

The airport maintenance facilities (Phase 1) are planned in the services precinct, with access on both airside and landside.

GSE staging areas (Phase 1) are included close to the main apron. Two areas have been reserved for GSE parking adjacent to the main apron.

The location of the proposed MRO facility (Phase 1), including apron and taxiway, is in the North of the airport site. This includes one widebody aircraft parking position and associated hangar. Moreover, additional space for several additional aircraft is available on the site.

Catering Building (Phase 2) - located in the northern area of the airport, with direct airside access and landside access via the northern service entrance to the airport.

Solar PV, Biodigester and wind energy (Phase 1 & Phase 2) - Included in the Development is provision for solar PV and a biodigester as renewable energy sources. Wind energy (roof based and land based) is also being considered as an alternative.

Airport Operations Centre (Phase 1) - A dedicated Airport Operations Centre will provide space for several key airport support services such as airport offices, remote/digital air traffic control facilities, police services, clinic, airport staff facilities and emergency facilities, among other functions. Housed in this facility will also be a central facility for all government department officiating at the airport. It is envisaged that this Operations Centre is a multi-storey building with 5 floors with access to both landside and airside on the ground floor.

Air Traffic Control Centre (Phase 1) - The upper levels of the Airport Operations Centre will also contain an entire floor dedicated to the remote air traffic control centre.

Additional developments proposed as part of Phase 1 & Phase 2 of the Services Precinct development: Potable Water Reservoir; Groundwater Treatment Infrastructure; Potable Water Pump Station; Non-potable Water Storage; Solid Waste Storage; WWTW; Substation; Cargo Apron (Phase 2).

The following specialist studies were undertaken to assess baseline conditions and identify potential impacts: Agricultural Impact Assessment, Heritage Impact Assessment (including Visual, Cultural and Archaeological), Terrestrial Biodiversity Impact Assessment (including Faunal and Avifaunal), Aquatic Biodiversity Impact Assessment, Civil Aviation Assessment (including Concept of Operations and Obstacle Limitation Surface Assessment), Noise Impact Assessment, Traffic Impact Assessment, Socio-economic Impact Assessment, Botanical Impact Assessment, Agro-Ecosystem Assessment, Air Quality Impact Assessment and Geohydrological Impact Assessment.

Additional technical reports informing the project include Bulk Infrastructure Engineering (Sewer, Potable, and stormwater management), Bulk Electrical Engineering, Geotechnical, Architectural, Bulk Fuel Infrastructure, Outdoor Advertising Guideline, Hydropedological, Landscaping, and Spatial and Land Use Planning. Three additional aviation studies also complement and inform the proposed project: 1) Alternate Aerodrome Feasibility Study; 2) Airspace and Capacity Study and 3) Visualization of CTIA and CWA combined operations.

Additional specialist and technical studies that formed part of the Plan of Study for IA include the Major Hazard Installation (MHI) risk assessment, the Terrestrial and Freshwater Biodiversity offset studies, the Climate Change Impact Assessment, the Glint and Glare study, Poultry Biosecurity and Health study, and an Airport Bird Hazard Assessment.

The WULA technical report is also appended to the IA report to enable the two processes to run concurrent and to provide further technical information to I&APs. The WULA technical report is reliant on specialist study input, and additional specialist reports (not already included in the IA report) are appended to the WULA technical report (Geohydrological study in support of the WULA).

The final Scoping report used the comprehensive baseline assessments as planning tools to guide the planning of the proposed development, to identify all potential opportunities and constraints onsite and ensure minimal impacts occur. The significance of the positive and negative impacts associated with the alternatives proposed were assessed in the specialist studies during the IA Phase. Comments received from Interested and Affected Parties (I&APs) during the Scoping Phase informed various reports and studies and were addressed by the relevant professional team as part of the IA Phase.

The assessment of negative impacts by technical and specialist input has resulted in significance ratings for Alternative 1 (No Go), Alternative 2 and Alternative 3, as illustrated in Appendix 47.

Alternative 1 represents the No Go option, where the CWA is operated at its maximum capacity within its existing rights. Impacts associated with Alternative 1 generally rated as low to Very Low on Biophysical (Botanical, Geohydrological), Socio-economic, Air Quality and Operational Phase Waste. Only Operational Phase Noise rated as high pre-mitigation and as medium post mitigation.

Due to the similarity in footprint between **Alternative 2 and 3**, specialists tended to rate them as similar in terms of their impacts.

In terms of Biophysical impacts, the loss of 1.6ha of Very High sensitivity vegetation and 2.3ha of Medium sensitivity vegetation rates as medium to high on both Alternative 2 and 3 during the Construction Phase, and requires a terrestrial offset to mitigate to medium impact. Similarly, the loss of 6.74ha of seep wetland 1 rates as high pre-mitigation and as medium post mitigation in the Construction Phase with wetland offset mitigation required for both Alternative 2 and 3. Even with the offset requirement the impact on seep wetland 1 in terms of hydrological function and geomorphological processes remains during the Operational Phase post mitigation as medium. Further impacts on geohydrology, terrestrial fauna, flora, avifauna and freshwater ecological rate as low post mitigation for the Construction and Operational Phase.

In terms of Heritage, the cultural impact rates as low during the Construction Phase. Visual impacts rate as low post mitigation for the Construction Phase, except for transformation of land use and site character which remains medium post mitigation. In terms of the Operational Phase, the visibility from within Landscape Character Areas 1, 2 and 3 remain medium post mitigation.

Air Quality impacts rate as very low (Construction Phase) to low (Operational Phase). Noise Impacts during Construction Phase rates as very low, and low for Scenario 2 during the Operational Phase. Scenario 3 rates as high pre-mitigation and as medium post mitigation during the Operational Phase.

Impacts associated with Agro-ecosystem and Transport (up to PAL1B) rated low for both Construction and Operational Phase, while the Glint and Glare assessment rated the Operational Phase impact as very low.

In terms of Poultry Biosecurity impacts rated as low for the Construction Phase and Operational Phase, except for Visual, Noise and the use of manure in the Biodigester that rated as medium post mitigation.

The impact of the proposed project on Climate Change rated as medium post mitigation for both Construction and Operational Phase, while the impact of Climate Change on the proposed project during the Operational Phase rated as high for both risk of wildfires and risk of water scarcity. Risk of landslides and risk of extreme heat rate as medium, while the risk of flooding rate as low.

The rating on terms of waste management rates as low to very low for both Alternative 2 and 3 during the Construction Phase and Operational Phase, except for the generation of Hazardous and Industrial waste during the Operational Phase which rates as Medium to Low post mitigation.

Impacts in terms of Civil Aviation were assessed as a requirement in terms of the Civil Aviation Protocol and resulted in various studies to address the findings of the Baseline Assessment. No impact ratings were generated, but rather the impacts on Noise, Transport and Socio-economic were addressed through their various specialist studies and resultant impact ratings. The restriction on height of adjacent land was assessed through an OLS height restriction study, and the Annex 14 OLS assessed where the OLS surface is penetrated. Airspace design and operation was assessed through the CONOPS. The comments received from stakeholders and IAPs gave rise to 3 further aviation studies (APPENDIX 21: Airspace and Capacity Study; APPENDIX 22: Visualization of FACT and FAWN combined operations;

APPENDIX 23: CWA Alternate Airport study). The Civil Aviation Protocol requires a statement from SACAA of *no unacceptable impacts to civil aviation* and in light of this a Compliance Statement was prepared by NACO illustrating *no unacceptable impacts to civil aviation* and forming the basis of the response received from SACAA to date. The relevant aviation approvals will be an ongoing process beyond the EIA, but in terms of the specialist assessments to date it is clear that the proposed development is reasonable and feasible.

In terms of the current impacts assessed by specialists, the mitigation proposed and based on the recommendations from specialist and technical experts, the proposed CWA is deemed acceptable in terms of impacts. Further amendments based on I&AP input and specialist recommendations will be incorporated into a SDP amendment and development of the final Preferred Alternative 4, which will become available for IAP consideration early 2025.

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AEA	Application for Environmental Authorisation
AGL	Airfield ground lighting
AIP	Alien Invasive Plant
AIP	Aircraft Isolation Pad
amsl	Above mean sea level
ARFF	aircraft rescue and firefighting
ASASA	Advertising Standards Authority of South Africa
ATC	Air Traffic Control
ATCO	Air Traffic Control Officer
ATM	Air Traffic Movements
ATNS	Air Traffic and Navigational Services
Bionet	Cape Town Bionet
C&R	Comments and Response
CA	Competent Authority
CAA	Civil Aviation Authority
CARA	Conservation Of Agricultural Resources Act 43 of 1983
CBA	Critical Biodiversity Area
CBD	Central Business District
CMA	Catchment Management Agency
CoCT	City of Cape Town
CO	Carbon Monoxide
CO_2	Carbon Dioxide
COD	Chemical Oxygen demand (mg/l)
CONOPS	Concept of Operations

CTR	Cape Town Control Zone
CTIA	Cape Town International Airport
CV	Curriculum Vitae
CWA	Cape Winelands Airport
dB	Decibels
DCP	Drop-weight cone penetrometer
DEA&DP	Department of Environmental Affairs and Development Planning
DMRE	Department of Mineral Resources and Energy
DoT	Department of Transport
DSR	Draft Scoping Report
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EAPASA	Environmental Assessment Practitioners Association of South Africa
ECA	Environmental Conservation Act, Act 73 of 1989
EGS	Economic Growth Strategy
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EIS	Ecological Importance and Sensitivity
ELU	Existing Lawful Use
EMF	Environmental Management Framework
EMPr	Environmental Management Programme
ESA	Ecological Support Area
FAA	Federal Aviation Administration
FAFK	Fisantekraal Airfield (ICAO identifier)
FATO	Final Approach and Take-off

FAWN	Cape Winelands Airport (ICAO identifier)
FBO	Fixed Base Operations
FT	feet
GA	General Aviation
GA	General Authorisation
GCFR	Greater Cape Floristic Region
GEOSS	Geohydrological and Spatial Solutions International (Pty) Ltd
GG	Government Gazette
GN	Government Notice
GSE	ground support equipment
GVA	Gross Value Added
ha	Hectares
HIA	Heritage Impact Assessment
HWC	Heritage Western Cape
I&APs	Interested and Affected Parties
ICAO	International Civil Aviation Organization
IDP	Integrated Development Plan
IFR	Instrument Flight Rules
HDPE	High-density polyethylene
ILS	Instrument Landing System
IPTN	Integrated Public Transport Network
IWRM	Integrated Water Resource Management
JNB	OR Tambo International Airport
LCA	Landscape Character Areas
LED	Local Economic Development
LAeq	Equivalent A-weighted sound level

Leq	Equivalent continuous sound level
LReq.d	Maximum average ambient daytime (noise)
LReq.n	Maximum average ambient night-time (noise)
LReq,T	Equivalent continuous rating level
MARS	Multiple Aircraft Ramp System
µg/m^3	Micrograms per cubic metre
mg/m^2/day	Milligrams per square metre per day
MPPA	million passengers per annum
MPRDA	Minerals and Petroleum Resources Development Act
MRO	maintenance, repair, and overhaul
MTOW	Maximum Take Off Weight
NASCOM	National Airspace Committee
NATMAP	National Transport Master Plan
NCAP	National Civil Aviation Policy
NCCAS	National Climate Change Adaptation Strategy
NCCRP	National Climate Change Response Policy
NADP	National Airports Development Plan
NDCR	National Dust Control Regulations
NDP	National Development Plan
NEM: BA	National Environmental Management: Biodiversity Act
NEMA	National Environmental Management Act
NEM: AQA	National Environmental Management: Air Quality Act
NEM: WA	National Environmental Management: Waste Act
NHRA	National Heritage Resources Act
NID	Notice of Intent to Develop
NM	Nautical Miles

NO_2	Nitrogen Dioxide
NOI	Notice of Intent
NTP	National Transport Policy
NWA	National Water Act
O_3	Ozone
OECD	Organisation for Economic Co-ordination and Development
OIS	Obstacle Identification Surfaces
OLS	Obstacle Limitation Surface
PBB	Passenger Boarding Bridges
PES	Present Ecological State
PFMA	Public Finance Management Act
PLZ	Port Elizabeth International Airport
PM	Particulate Matter
POA	Power of Attorney
POS	Plan of Study
ppb	Parts per billion
PDWF	Peak Dry Weather Flow
PPP	Public Participation Process
PTB	Passenger Terminal Building
PV	Photo Voltaic
RDTS	Remote Digital Control Tower System (or Solution)
REIPPPP	Renewable Energy IPP Procurement Programme
RESAs	runway end safety areas
RPAS	remote piloted aircraft systems
RWY	Runway
S&EIR	Scoping and Environmental Impact Report

SABS	South African Bureau of Standards
SACAA	South African Civil Aviation Authority
SAHRA	South African Heritage Resources Act
SANBI	South African National Biodiversity Institute
SANS	South African National Standards
SANDF	South African National Defence Force
SARPs	Standards and Recommended Practices
SCC	Species of Conservation Concern
SDF	Spatial Development Framework
SDG	Sustainable Development Goal
SDP	Site Development Plan
SFA	Strategic Focus Areas
SID	Standard Instrument Departures
SO_2	Sulphur Dioxide
SPLUMA	Spatial Planning and Land Use Management Act 16 of 2013
SR	Scoping Report
STAR	Standard Instrument Arrivals
STP	Sewage treatment plant
SWAT	Soil and Water Assessment Tool
TIA	Traffic Impact Assessment
TMA	Terminal Manoeuvring Area
ToR	Terms of Reference
TPADD	Total Peak Annual Daily Demand
UNFCCC	United Nations Framework Convention on Climate Change
UST	Underground Storage Tank
VDB	Very High Frequency Data Broadcast

VFR	Visual flight rules
VOR	VHF Omnidirectional Range
WAM	Wide Area Multilateration
WCPSDF	Western Cape Provincial Spatial Development Framework
WHO	World Health Organisation
WULA	Water Use License Application
WWTP/WWTW	Wastewater Treatment Plant / Works
ZoVI	Zone of Visual Influence

Glossary of Terms

Activity	An activity or operation carried out as part of the construction or operation of the runway and associated infrastructure
Airfield	Defined area of land or water used for the arrival, departure and surface movement of aircraft.
Airside	The part of the airport used for the take-off, landing and taxiing of aircraft, consisting of runways, taxiways and aprons, as well as adjacent terrain and buildings or portions thereof, to which access is controlled. Usually consists of high traffic with few physical barriers and wide-open space.
Air Traffic Movement	A departure or arrival of an aircraft on the runway.
Apron	The airside area assigned for aircraft and aircraft handling equipment operations and parking.
Aquifer	An underground body of water.
Avifauna	Birds occurring within a specific habitat or region.
Baseline	Information gathered at the beginning of a study which describes the environment prior to development of a project, and against which predicted changes (impacts) are measured.
Biodiversity	The diversity, or variety, of plants, animals and other living things in a particular area or region. It encompasses habitat diversity, species diversity and genetic diversity.
Consultation	A process for the exchange of views, concerns, and proposals about a proposed project through meaningful discussions and the open sharing of information.
Construction Phase	The stage of project development comprising site preparation as well as all construction activities associated with the development.
Cumulative Impact	In relation to an activity, the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, that in itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities.
dB(A)	A unit of sound level - a weighted sound pressure level.
Ecology	The relations of organisms to one another and to their physical surroundings.
Ecosystem	The interconnected assemblage of all species populations that occupy a given area and the physical environment with which they interact.
Endemic	Found only within the study area / tendency of being found only in the study area.
Environment	The external circumstances, conditions and objects that affect the existence and development of an individual, organism or group. These circumstances include biophysical, social, economic, historical and cultural aspects.

	The surroundings or conditions in which a person, animal, or plant lives or operates.
Environmental Authorisation	The authorisation by a competent authority of a listed activity or specified activity in terms of NEMA.
Environmental Impact Assessment	A systematic process of identifying, assessing, and reporting environmental impacts associated with the project.
Environmental Impact Assessment Report	The report produced to relay the information gathered and assessments undertaken during the Environmental Impact Assessment, and as per Regulation 23 of NEMA.
Environmental Management Programme	A description of the means and environmental specifications for achieving environmental objectives and targets during all phases of a proposed project, and as per Regulations 19 and 23 of NEMA.
Fauna	The collective animals of a region or habitat.
Flight paths	Aircraft take-off (departure) and landing (approach) routes. Also referred to as flight tracks.
Flora	The collective plants growing in a geographic area, region, or habitat.
General Aviation (GA)	All civil aviation aircraft operations expect for scheduled commercial transport (as defined by the International Civil Aviation Organization).
Heritage resource	A building, area, a visual landscape, etc. that forms part of a community’s cultural legacy or tradition and is passed down from preceding generations.
Impact	A change to the existing environment, either positive or negative, that is directly or indirectly due to the development of the proposed project and its associated activities.
Independent EAP	An independent person with the appropriate qualifications, EAPASA registration, and experience, appointed by the Applicant to manage the Environmental Impact Assessment process on behalf of the Applicant.
Integrated Environmental Management	The practice of incorporating environmental management into all stages of a project’s life cycle, namely planning, design, implementation, management, and review.
Landside	The area outside an airport terminal building where road and pedestrian movements take place. It includes the road infrastructure, car rental facilities, parking, office blocks and various other services. This area is freely accessible to the public.

Mitigation Measures	Design or management measures that are intended to avoid and/or minimise or enhance an impact, depending on the desired effect.
Operational Phase	The stage of the project following the Construction Phase, during which the proposed development will function or be used as anticipated in the Environmental Authorisation.
Payload	Carrying capacity of an aircraft, including cargo, fuel, and passengers, traditionally measured in tonnes.
Runway	The defined paved area for the landing and take-off of aircraft.
Scoping	A procedure to consult with stakeholders to determine issues and concerns and for determining the extent of and approach to an EIA (one of the phases in an EIA). This process results in the plan of study for the EIA and specialist studies.
SIDS and STARS	A Standard Instrument Departure Route (SID) is a standard ATS route identified in an instrument departure procedure by which aircraft should proceed from take-off phase to the en route phase. A Standard Arrival Route (STAR) is a standard ATS route identified in an approach procedure by which aircraft should proceed from the en-route phase to an initial approach fix.
Specialist Study	A study into a particular aspect of the environment, undertaken by an expert in that discipline.
Stakeholders	All parties affected by and/or able to influence a project, often those in a position of authority and/or representing others.
Taxiway	A defined path, on a land aero- route to be followed by taxying aircraft, connecting the runway to parking aprons.
Terminal Building	The building in which passenger processing associated with arrivals and departures takes place.

1. INTRODUCTION

Cape Winelands Airport (CWA) with International Civil Aviation Organization (ICAO) location identifier “FAWN”, was formerly known as Fisantekraal Airfield (FAFK), and was acquired in November 2020 by Cape Winelands Airport Ltd. It was built in approximately 1943 to serve as a South African Air Force aerodrome during World War II, and since has served as a general flying airfield for the General Aviation (GA) sector. CWA currently facilitates unscheduled operations including recreational flying & private hangarage, flight training, aircraft maintenance, charter operations, crop spraying and aerial banner towing. CWA currently consists of four concrete runways each of 90m in width, which vary in lengths between 700m and 1500m.

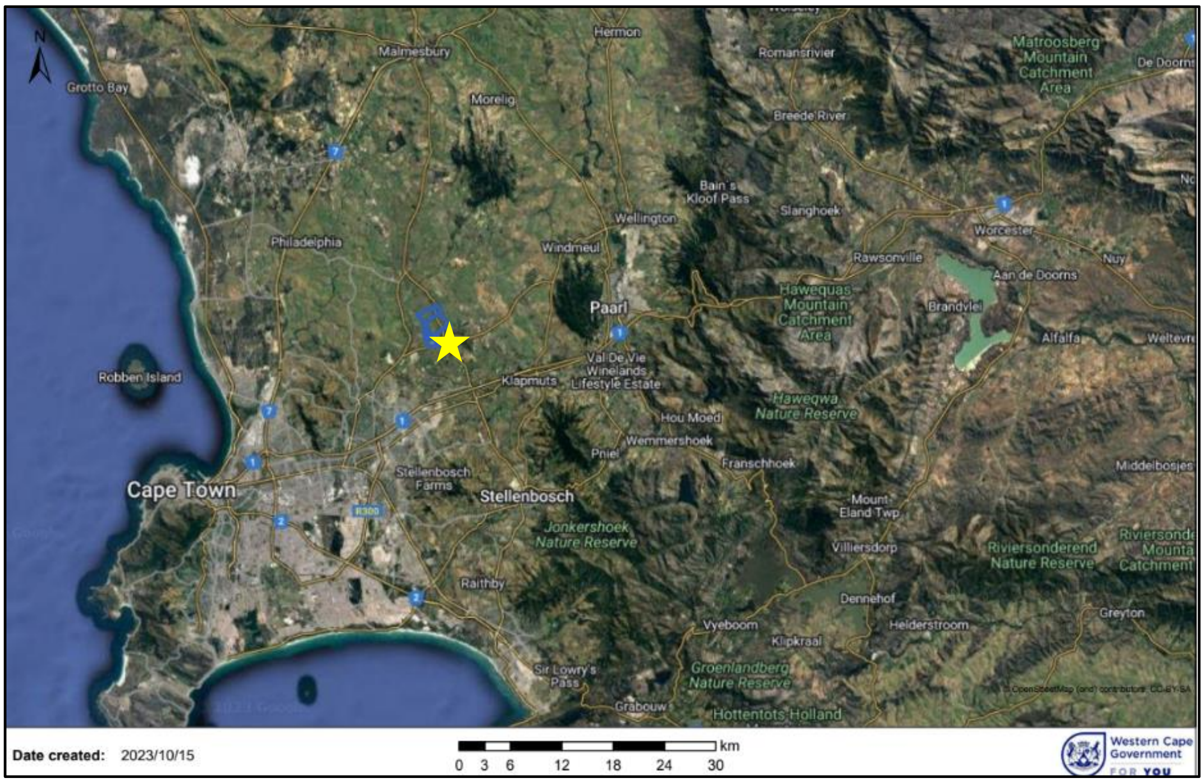


Figure 1: Regional location of CWA (indicated by yellow star and with cadastrals outlined in blue) (PHS Consulting, Oct 2023)

The site is located approximately 10.5km northeast of Durbanville and 25km northeast of Cape Town International Airport (CTIA) (refer Figure 1). As it is approximately 40km from Cape Town’s city centre with linkages from Drakenstein, Wellington, Paarl, and Stellenbosch, it is strategically positioned to enable future connectivity and new tourism nodes within the region (refer Figure 2).

Figure 2: Location of CWA in relation to regional strategic linkages (Capewinelands Aero (Pty) Ltd, June 2023)

The current CWA 150ha site covers two cadastrals and falls within the Cape Town urban edge, and it is surrounded by cultivated land, livestock, and poultry farms, including a municipal wastewater treatment facility to the north-west of the boundary.

The proposed development will extend across five additional surrounding cadastrals, combining seven cadastrals of 885ha in total size. The area of study, however, will comprise 470ha of the 885ha. The additional surrounding cadastrals making up the area of study were secured through sale or by Power of Attorney.

The following cadastrals form part of the proposed development (refer Figure 3):

- Portion 23 of Farm 724,
- RE of Farm 724,
- Portion 10 of Farm 724,
- Portion 4 of Farm 474,
- RE of Farm 474,
- Portion 7 of Farm 942,
- Portion 3 of Farm 474.

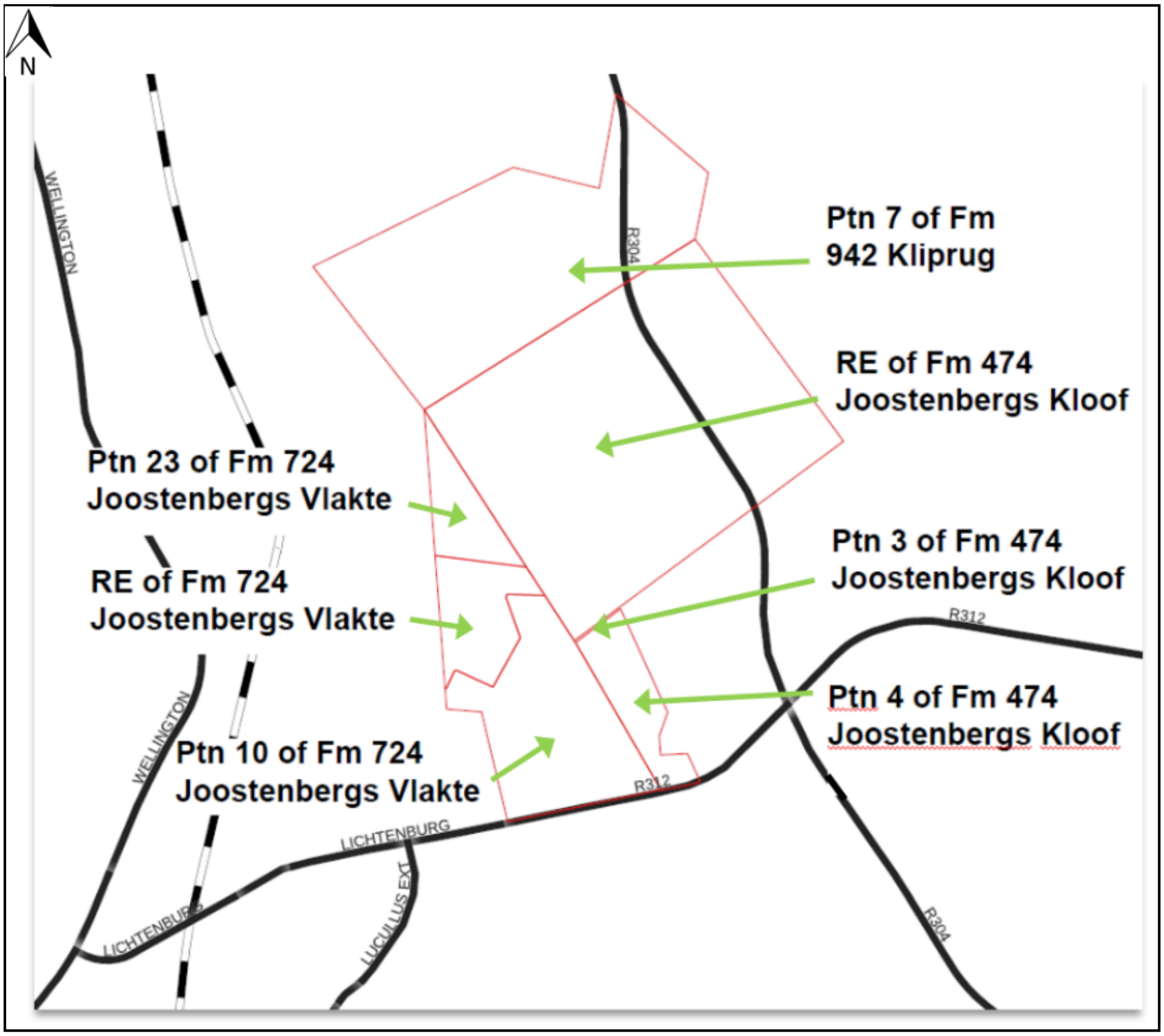


Figure 3: Cadastrals forming part of application area (Spatial Planning and Landuse; H&A Planning, 2023)

Not the entire cadastral area will entail development – parts of P7/942, P3/474 and RE/474 will be outside the proposed development area and remain with agricultural zoning and land use (shown as greyed out area in Figure 4). This excludes areas set aside for conservation or freshwater offset (refer Figure 82 & Figure 163)

Figure 4: Proposed development area shown in relation to remainder of cadastrals (greyed out) (Capewinelands Aero (Pty) Ltd, Oct 2023)

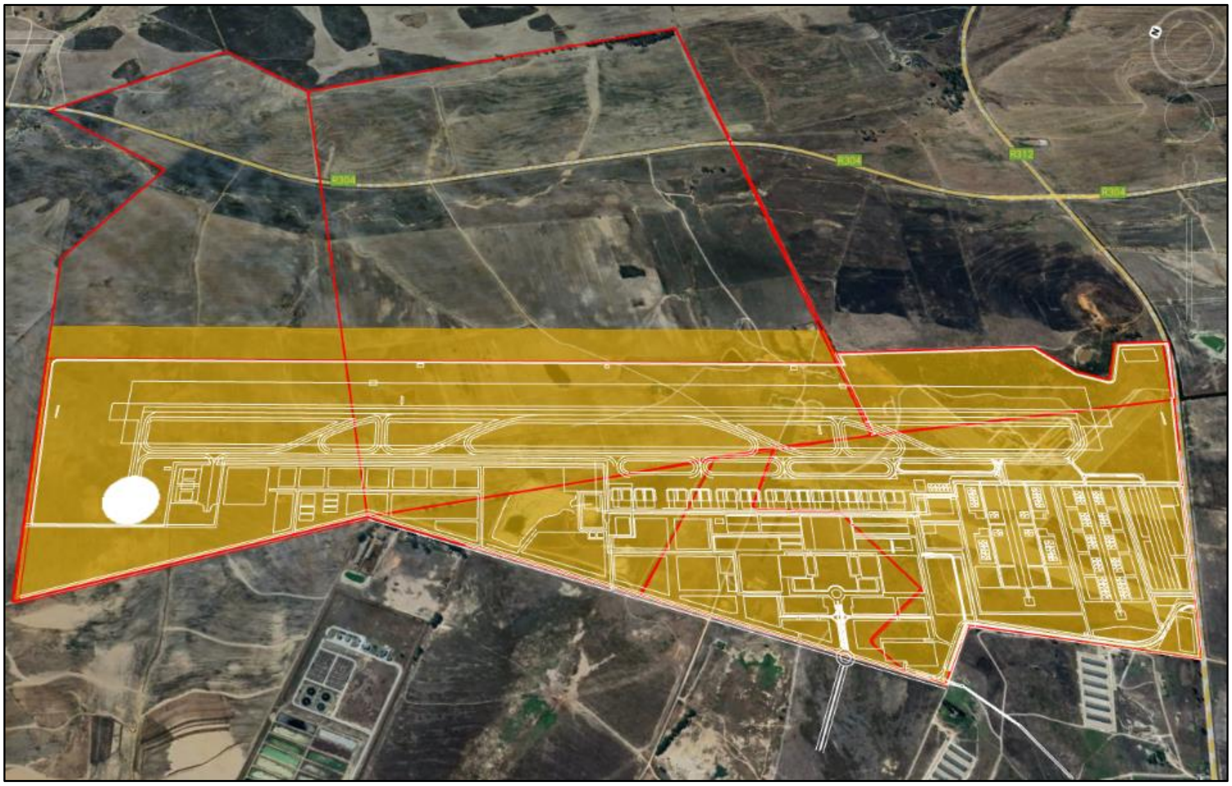


Figure 5: Proposed development area (orange) with airside and landside infrastructure overlain. Farm boundaries indicated in red outline (PHS Consulting, October 2024)

Figure 5 illustrates the proposed airside and landside layout within the development area, overlain on the cadastrals that form part of the application.

There are currently four existing concrete airstrips of 90m width, which vary in lengths between 700m and 1500m, each with its unique designation 010/190, 050/230, 140/320 and 030/210 degrees (refer Figure 6).

Figure 6: Existing runways on CWA site (Capewinelands Aero (Pty) Ltd, 2023)

The proposed development and expansion of Cape Winelands Airport will see it upgraded from a general flying airfield into a commercial airport capable of facilitating long-haul, wide-body flights by airlines and unscheduled operators from across the world. Cape Winelands Airport will serve multiple roles within the aviation sector, most notably:

1. ***Scheduled Airline Services*** for domestic and international passenger and cargo operations,
2. ***General Aviation*** for domestic and international, unscheduled, and private operations,
3. ***Alternate Airport*** for fuel planning purposes and environmental savings,
4. ***Reliever Airport***, adding redundancy and diversion capability for aircraft in the region,
5. ***Logistics Hub*** catalysing multi-modal commercial activity in the region and stimulating economic growth,
6. ***Commercial Property Developments*** stimulated and enabled by the above.

The above capabilities will in turn enable and stimulate a host of industries and commercial activities, including fixed based operations, private charter, recreational flying, flight training, helicopter, fire & rescue, aircraft maintenance refurbishment & overhaul (MRO), aircraft assembly & manufacture, hotel, conferencing & events, retail, food & beverage, warehousing, logistics and freight.

To enable the proposed vision for the project, the existing airport will be upgraded to a Category 9 Aerodrome licensed with the SACAA, and additional infrastructure and facilities will be required. One of the four existing runways will be retained and expanded as follows:

- 3.5km Code F runway, with orientation 10-190 degrees (referred to as "01-19")

The proposed expanded CWA would also serve as a significant multi-modal transport hub with excellent road, rail, and air connectivity.

Figure 7: Architectural concept plan of potential layout design (NACO, Oct 2023)

In terms of the National Environmental Management Act (No. 107 of 1998) (NEMA) the proposed expansion of the existing CWA triggers the need for Environmental Authorisation. Application has been made to Department of Environmental Affairs and Development Planning (DEA&DP) for Environmental Authorisation (EA), and the application will be supported by this EIAR as per the EIA Regulations of December 2017.

DEA&DP Western Cape was confirmed as the Competent Authority (CA) in terms of section 24(C) of NEMA that determines the Competent Authority for a listed or specified activity, which is triggered by a proposed development, based on several aspects such as geographical location, sensitive environments, constitutional mandates and functions, international conventions, or instruments that South Africa acceded to.

None of the criteria listed in section 24(C)(2) apply to the listed or specified activities for the proposed project, and neither is the Applicant one of the organisations listed in the provision, therefor the competent authority would be the provincial authority responsible for environmental affairs, which is DEA&DP Western Cape.

Proposed activities on site also trigger the need for a Water Use Licence in terms of the NWA (Act 36 of 1998), a Norm & Standards registration in terms of the NEM: WA (Act 59 of 2008 as amended), and Heritage Western Cape in terms of the NHRA (Act 25 of 1999) has indicated the need for a Heritage Impact Assessment and authorisation. These authorisation processes will be run as an “One Environmental System” process. The Applicant (Capewinelands Aero (Pty) Ltd) appointed PHS Consulting as the independent Environmental Assessment Practitioners to prepare the application and manage the associated EIA process. Detail on the EAP expertise and CV can be found in Appendix 1.

2. PURPOSE OF THIS REPORT

This EIAR evolved from the Scoping Report and the purpose is to describe:

- The EIA Process and state of this application.
- The Project and alternatives for assessment.
- The Receiving Environment (social, economic, cultural, and biophysical).
- Describe the issues and impacts identified - How the project will impact on the different elements of the receiving environment during different phases of development (planning, construction, and operation).
- The specialist investigations and impact assessments undertaken in the EIA Phase.
- The method for assessing the sustainability of the project – against which DEA&DP will make the decision on the application.
- The description of the process followed to reach the proposed development footprint within the approved site.
- Proposed mitigation and monitoring in terms of impacts and issues identified.

This draft EIAR will be circulated for ***comment purposes*** to Interested and affected Parties (I&APs) from 13 November 2024 and up to and inclusive of 13 December 2024. All comments should be submitted in writing to PHS Consulting via post, email, WhatsApp, or fax using the details below:

Contact: Amanda Fritz-Whyte / Paul Slabbert

Email: amanda@phsconsulting.co.za

Fax: 086 508 3249

Post: PO Box 1752, Hermanus, 7200, South Africa

Telephone: 028 312 1734 / 072 630 8716 (WhatsApp)

3. THE EIA PROCESS

This process is being undertaken in accordance with the EIA regulations promulgated in April 2017 in GNR 326, 327, 325, 324 in Government Gazette 40772, in terms of Section 24 of the National Environmental Management Act, Act 107 of 1998. This section:

- Summarises the EIA process including the phases and timeframes.
- Explains the relationship between the EIA and other regulatory processes.
- Explains the role of this in-process Scoping report in the process.
- Describes the public participation process and the role of Interested and Affected Parties (I&APs) in the process.

3.1. Overview

The proposed project triggers listed activities (details in section 4.2) in “Listing Notice 2” of the EIA regulations, which requires the application for environmental authorisation to follow the full Scoping and Environmental Impact Assessment process (S&EIA). The S&EIA comprises two main phases, namely the Scoping Phase and the Environmental Impact Assessment Phase. A third phase – the Pre-application Phase – is optional and can be initiated by the applicant prior to starting the two formal phases (Scoping Phase and Impact Assessment Phase) that form part of the statutory requirements. The Pre-application Phase has no regulated timeframe. The various phases, the specific timing associated with them, and the alignment of the process with other regulatory processes is summarised in Figure 8.

As indicated in Figure 8 the formal process can take a maximum of 300 days, or 350 days if significant changes are made or new information is introduced or if the competent authority (CA) requires further information following review of the Draft Impact Assessment Report and Draft Environmental Management Plan (EMPr).

The current status of the process is also indicated in Figure 8 (green arrow) – the draft pre-application phase has been completed and all comments received considered by the applicant and the specialists. The in-process scoping phase has also been completed after the applicant applied to DEA&DP for the formal process.

The final Scoping report with a summary of all comments and responses to these was submitted to DEA&DP for decision making and acceptance.

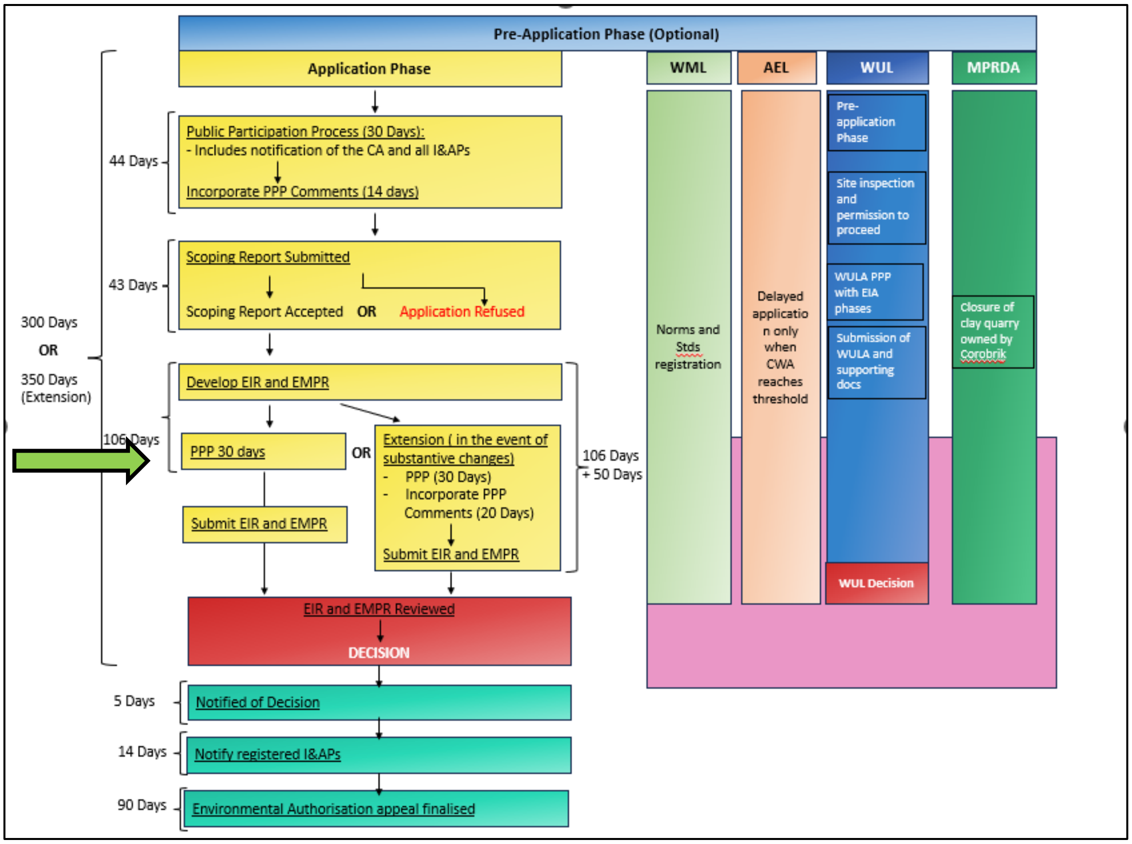


Figure 8: Overview of the S&EI process & alignment with other regulatory processes (DEA, 2014) (current point in EIA process indicated by green arrow)

The EIA process provides for alignment of decision making with other regulatory processes as required in terms of the "One Environmental System". The other regulatory processes for this project include the registration of waste activities in terms of Norms & Standards and Water Use Licence (WULA). The EIA regulations require that the Public Participation Process (PPP) involves consultation with all relevant government agencies/ departments to establish which of the Acts listed in Section 4 apply and what the process and information requirements are so that they are aligned with the EIA process.

3.1.1 Role-players

The key role-players in this EIA process are as follows:

Applicant

As a part landowner and project proponent, the **Capewinelands Aero (Pty) Ltd** is the applicant. The applicant is represented by Mr Deon Cloete.

Competent Authority (CA)

The Western Cape Department of Environmental Affairs and Development Planning (DEA&DP) Directorate Land Use Planning is the CA for the EIA process.

The Western Cape Department of Environmental Affairs and Development Planning (DEA&DP) Directorate Waste is the CA for the waste activities registration process in terms of Norms and Standards.

The Breede-Olifants CMA (BOCMA) is the CA for the Water Use Licence Application, which is administered by DWS. A WULA (WU33620) has been initiated with DWS through the e-wulaa system.

The CA for the Atmospheric Emission Licence (AEL) will be the CoCT. Note the application with CoCT will only be lodged 6 months prior to the CWA fuel phasing exceeding 1000m^3 storage. It's likely to be in 2037. This approach was confirmed with CoCT Air Quality Management.

Heritage Western Cape will be a commenting authority.

The above process will run concurrent with the other authorisation processes as part of the "One Environmental System".

CA for Airspace Approval

The consideration of and redesign of the airspace around CWA requires authorisation by The South African Civil Aviation Authority (SACAA) in terms of the Civil Aviation Act 13 of 2009. Engagement with SACAA and stakeholders within the aviation industry will be ongoing during this EIA phase (within the EIA process and within the SACAA substructures) with resultant compliance with the Civil Aviation Airspace Protocol. Proof of compliance to be appended to final EIA submission to DEA&DP.

Directly Affected Landowner

In terms of the requirements of sub-regulation 39(1) of the EIA regulations, permission is required from a landowner on whose property the activity is proposed if the applicant is not the owner or person in control of the land. This requirement excludes linear activities, such as a runway or a pipeline. Ancillary activities placed over the site however does enable this requirement.

The applicant has obtained formal landowner consent in the form of Power of Attorney's (POA's) in the required format in terms of this requirement. Formal permission has been submitted with the application to the competent authorities for the various authorisation processes.

Environmental Assessment Practitioner (EAP)

In terms of Section 12(1) of the EIA regulations, the applicant is required to appoint an independent Environmental Assessment Practitioner (EAP) registered with EAPASA to manage the application and process. The EAP is PHS Consulting (Amanda Fritz-Whyte and Paul Slabbert). As required in terms of the EIA regulations, a CV for the EAP is included as Appendix 1. The declaration of EAP independence is included in Section 12 of this report.

Registered Interested and Affected Parties (I&APs)

The registered I&APs will include all interested and affected parties registered for and/or affected parties whose name is recorded in the register opened for this application in terms of Regulation 24 of NEMA. The register is continuously updated as required and will be provided to DEA&DP as part of the final submission.

3.1.2 Pre-Application Phase

The applicant submitted a Notice of Intent (NOI) to DEA&DP to register the proposed project and to obtain a registration number (16/3/3/6/7/2/A5/20/2209/23) that was used as reference during all correspondence and on all documentation that form part of the pre-application process.

Scoping involves consultation with government authorities and stakeholders during which the objectives are to:

- Create awareness of the project and what it entails.
- Describe the status of the receiving environment prior to the commencement of the proposed developments for the expansion of the airport.
- Identify and describe potential impacts to the receiving environment.
- Identify and select feasible alternatives for further assessment.
- Define the Plan of Study (POS) for the assessment phase.

The draft pre-application Scoping Report and supplementary documentation was circulated for 30 days public participation during the pre-application phase (8 November to 8 December 2023) and all comments and responses received collated into a Comments and Responses Report (C&R report). The C&R report is appended as Appendix 30A to this draft EIAR.

3.1.3 Application for Environmental Authorisation (AEA)

The applicant applied for Environmental Authorisation (EA) to DEA&DP and a new reference number (16/3/3/2/A5/20/2046/24) was issued to be used on all correspondence and all documentation that formed part of the formal statutory process. The in-process Scoping Phase public participation was completed on the pre-application Scoping Phase DEA&DP reference number 16/3/3/6/7/2/A5/20/2209/23 considering the new number was not in hand at the time.

3.1.4 Application / Statutory Scoping Phase

Comments received during the pre-application and in-process Scoping Phase were collated into two Comments and Response reports one for each phase (Appendix 30A and 30B) and informed amendments required to the Scoping report in the application phase.

Scoping involved consultation with government authorities and stakeholders during which the objectives were to:

- Create awareness of the project and what it entails.
- Describe the status of the receiving environment prior to the commencement of the proposed developments for the expansion of the airport.
- Identify and describe potential impacts to the receiving environment.
- Identify and select feasible alternatives for further assessment.
- Define the Plan of Study (POS) for the assessment phase.

The application scoping phase concluded in the submission of the final Scoping Report to DEA&DP that included a Plan of Study (POS) for the assessment phase. In terms of the NEMA EIA regulations DEA&DP must accept the POS before the applicant may proceed with the EIA phase.

3.1.5 The Application / Statutory EIA Phase

The EIA phase entails the detailed assessment of the impacts identified during the in-process Scoping phase. The impacts are assessed according to the POS for the EIA and applied to the alternatives identified in the Scoping phase and any other alternatives that is likely to evolve during the EIA phase.

The findings of the EIA form the basis for a decision by DEA&DP regarding the proposed activity.

3.1.6 The Public Participation Process

The public participation process (PPP) provides the mechanism through which I&APs can participate in the EIA process and inform the resulting decision. Section 41 of the 2017 NEMA regulations list the requirements governing the PPP, including the way PPP is conducted, record keeping during the process, and documentation of the outcomes of the PPP. The planned process and the process to date are detailed in Chapter 9 of this EIAR. Comments received during the entire EIA process will be collated into a Comments and Response report and will be submitted with the final application documentation to DEA&DP for decision making. A summary of the issues raised by I&APs to date, and the manner in which these issues were incorporated, or the reasons for not incorporating them, is included in Table 135.

3.2 Content and Structure of the Environmental Impact Assessment Report

This report addresses the requirements for the impact assessment phase of the EIA process as outlined in the NEMA regulations of April 2017. Various interested and affected parties (I&APs), particularly decision makers (government departments), local communities, the scientific fraternity, and the aviation sector, had roles to play in compiling the POS of the EIA, and scoping was designed to measure and capture their views. The EIAR identifies and assesses potentially significant environmental impacts to get to a point where the CA is able to make a decision.

The structure of this draft IA Report fulfils the requirements of an EIAR as stipulated in Appendix 2 of the NEMA EIA Regulations, 2017. Sections 1 to 5 contain the introductory information that establishes the context within which the Impact Assessment phase is being undertaken. Section 6 describes the proposed CWA expansion project, and Section 7 gives the overview of the receiving environment that may be affected by the proposed project. Section 8 provides the Impact Assessment. Sections 9 describes the public participation process to date and planned. Section 10 provides detail on the Recommendations and the Conclusion. Table 1 below summarises the report structure.

Table 1: EIA Report Structure

SECTION	CONTENT
1	Introduction
2	Purpose of the report
3	Describes the EIA process
4	Outlines the relevant policies, the legal and institutional framework taken into account
5	Project Context, Need & Desirability, Sustainability & Climate Change

6	Describes the proposed CWA expansion project
7	Overview Of the Receiving Environment
8	Impact Assessment
9	Public Participation process
10	Conclusion and Recommendations
11	References
12	Declarations by EAP and Applicant
13	Appendices (Specialist reports, CV of EAP, Technical reports, C&R, Proof of PPP to date, WULA technical report and appendix)

The EIA regulations stipulate content requirements for the EIAR. Table 2 indicates where the content requirements have been addressed in this report.

Table 2: Summary of the Environmental Impact Assessment Report requirements

REQUIREMENTS OF THE REGULATIONS		**SECTION IN REPORT WHERE REQUIREMENT IS ADDRESSED**	
a)	**Details of the:** i) EAP who has prepared the report ii) Including a curriculum vitae	i) ii)	Appendix 1 of this report and Section 3.1.1 of this report
b)	**The location of the activity, including –** i) The 21-digit Surveyor General code of each cadastral land parcel; ii) Where available, the physical address and farm name; iii) Where the required information in terms of (i) and (ii) is not available, the coordinates of the boundaries.	i) ii) iii)	Section 6.3 of this report Section 6.3 of this report n/a
c)	**A plan which locates the proposed activity or activities applied for at an appropriate scale, or if its -** i) A linear activity, a description and coordinates of the corridor in which the proposed activity is to be undertaken; or ii) On land where the property has not been defined, the coordinates within which the activity is to be undertaken;	i) ii)	Appendix 26 of this report Appendix 26 of this report

d)	**A description of the scope of the proposed activity including –** i) All listed and specific activities triggered, ii) A description of the activities to be undertaken; including associated structures and infrastructure.	i) Section 4 of this report ii) Section 6 of this report
e)	**A description of the policy and legislative context - within which the development is proposed including the identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning framework and instruments that are applicable to this activity and are to be considered in the assessment process.**	Section 4 of this report
f)	**A motivation for the need and desirability for the proposed development, including for the activity in the context of the preferred development footprint within the approved site as contemplated in the accepted scoping report.**	Section 5 of this report
g)	**A motivation for the preferred development footprint within the approved site as contemplated in the accepted scoping report;**	Section 8 of this report
h)	**A full description of the process followed to reach the preferred development footprint within the approved site as contemplated in the accepted scoping report, including –** i) Details of the development footprint alternatives considered. ii) Details of the public participation process undertaken in terms of the Regulations, including copies of supporting documents and inputs; iii) A summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them; iv) The environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects. v) The impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts: a) can be reversed; b) may cause irreplaceable loss of resources; and c) can be avoided, managed or mitigated; vi) The methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks; vii) Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community	i) Section 8 of this report ii) Section 10 of this report iii) Table 124 Section 9 of this report iv) Section 7 of this report v) Section 8 of this report and further detail in specialist reports appended to this report vi) Section 8 of this report

	that may be affected focussing on geographical, physical, biological, social, economic, heritage and cultural aspects; viii) The possible mitigation measures that could be applied and level of residual risk; ix) If no alternative development footprints for the activity were investigated, the motivation for not considering such; and x) A concluding statement indicating the location of the preferred alternative development footprint within the approved site as contemplated in the accepted scoping report,	vii) viii) ix) x)	Section 8 of this report Section 8 of this report Section 7 of this report Section 7 of this report
i)	**A full description of the process followed to reach the proposed development footprint within the approved site as contemplated in the accepted scoping report, including –** i) A description of all environmental issues and risks that were identified during the environmental impact assessment process; and ii) An assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;	i) ii) iii)	Section 10 of this report Section 10 of this report Section 10 of this report
j)	**An assessment of each identified potentially significant impact and risk, including -** i) Cumulative impacts; ii) The nature, significance and consequence of the impact and risk; iii) The extent and duration of the impact and risk; iv) The probability of the impact and risk occurring; v) The degree to which the impact and risk can be reversed; vi) The degree to which the impact and risk may cause irreplaceable loss of resources; and vii) The degree to which the impact and risk can be mitigated;	Section 8 of this report.	
k)	**Where applicable, a summary of the findings and recommendations of any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final assessment report;**	Section 10 of this report.	
l)	**An environmental impact statement which contains –** i) A summary of the key findings of the environmental impact assessment; ii) A map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred development footprint on the approved site as contemplated in the accepted	Section 10 of this report	

	scoping report indicating any areas that should be avoided, including buffers; and; iii) A summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	
m)	**Based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation;**	Mitigation – Section 8 of this report. Conditions of authorisation – Section 10 of this report
n)	**The final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment;**	Section 7 of this report
o)	**And aspects which were conditional to the findings of the assessment either by the EAP or specialists which are to be included as conditions of authorisation;**	Section 10 of this report
p)	**A description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed;**	Section 8 of this report
q)	**A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;**	Section 10 of this report
r)	**Where the proposed activity does not include operation aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded and the post construction monitoring requirements finalised;**	n/a
s)	**An undertaking under oath or affirmation by the EAP in relation to –** i) The correctness of the information provided in the reports; ii) The inclusion of comments and inputs from stakeholders and I&APs; iii) The inclusion of inputs and recommendations from the specialist reports where relevant; and iv) Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;	Section 12 of this report
t)	**Where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;**	n/a
u)	**An indication of any deviation from the approved scoping report, including the plan of study, including –**	Section 10 of this report

	i) Any deviation from the methodology used in determining the significance of potential environmental impacts and risks; and ii) A motivation for the deviation;	
v)	**Any specific information that may be required by the competent authority; and**	n/a
w)	**Any other matters required in terms of section 24(4)(a) and (b) of the Act**	To be determined

Note: where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to an EIAR the requirements as indicated in such notice will apply.

4. LEGAL FRAMEWORK

NEMA defines the principles of sustainability and integrated environmental management and forms the basis of the environmental legal framework. Various supplementary acts under the themes of land-use planning and development, resource conservation and utilisation, and waste management and pollution control add to this legal framework, and includes policies, acts, and associated regulations applicable at a National, Provincial and Local (municipal) level.

As highlighted in Section 3, it is a requirement in the EIA process that all other relevant legislation is identified and that the process, information requirements and decision-making is aligned with the EIA process.

The relevant acts, policies and regulations are verified and listed in this section. Relevance was established through:

i. Reviewing the proposed project activities against the legislation to identify if the proposed project 'triggers' listed activities and the need for authorisation or a license.

ii. Engagement with the various government departments responsible for the administration, registration and decision making of NEMA, NWA, NEM: AQA and NEM: WA amongst others.

There are several regulatory requirements at local, provincial, and national level with which the proposed project must adhere to.

These include:

- The Constitution of the Republic of South Africa Act 108 of 1996,
- The National Environmental Management Act 107 of 1998 as amended,
- National Environmental Management: Air Quality Act 39 of 2004 (NEM: AQA) as amended and the South African National Air Quality Standards,
- National Water Act 36 of 1998 (NWA),
- National Environmental Management: Waste Act (NEM: WA), Act 59 of 2008 as amended,
- Environmental Conservation Act (ECA) Act 73 of 1989,
- National Environmental Management: Biodiversity (NEM: BA) Act 10 of 2004,
- National Heritage Resources Act (NHRA) No. 25 of 1999,
- Minerals and Petroleum Resources Development Act 28 of 2002 (MPRDA),
- Conservation Of Agricultural Resources Act 43 of 1983 (CARA),
- National Climate Change Act 22 of 2024,
- Spatial Planning and Land Use Management (SPLUMA) Act 16 of 2013,
- Western Cape Land Use Planning Act (LUPA) Act 3 of 2014,
- National Development Plan 2030 (NDP 2012),
- Western Cape Provincial Spatial Development Framework (WCPSDF) 2014,
- Western Cape Biodiversity Spatial Plan (WCBSP), 2017,

- City of Cape Town Integrated Development Plan (2022-2027),
- City of Cape Town Inclusive Economic Growth Strategy (2021),
- City of Cape Town Municipal Spatial Development Framework (2023),
- City of Cape Town Municipal Planning bylaw (2015 as amended in 2019),
- City of Cape Town Outdoor Advertising By-Law No.8969 of 2023,
- City of Cape Town: Water bylaw (2010) and City of Cape Town: Water Amendment bylaw (2018),
- City of Cape Town: Treated Effluent By-Law, 28 October 2009, promulgated 30 June 2010,
- City of Cape Town: Environmental Health By-Law, 30 June 2003,
- Northern District Plan (2023),
- Civil Aviation Act 13 of 2009,
- White Paper on National Civil Aviation Policy, 2017 (NCAP),
- National Airports Development Plan, 2015 (NDAP),
- White Paper on National Transport Policy, 2021 (NTP),
- National Transport Master Plan (NATMAP) 2050, 2011.

The legal context of the project is discussed in the text, and the relevance to the proposed project noted.

Note the summary provided is not intended to be definitive or exhaustive and serves only to highlight key environmental and planning legislation and obligations.

In addition to the acts discussed, policies, guidelines, and other planning / framework documents applicable to the proposed development are also listed and discussed in the ensuing sections.

4.1 Legislation applicable to the proposed project:

The Constitution of the Republic of South Africa Act 108 of 1996:

The Constitution provides the foundation for environmental regulation and policy. Section 24 makes provision for environmental protection for the benefit of present and future generations and the right to an environment that is not harmful to health and well-being. It is achieved through a strong legislative framework to prevent pollution and ecological degradation, promote conservation, and secure ecologically sustainable development and use of natural resources.

According to S24 of the South African Constitution 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.

The South African legislation, guidelines, and standards in terms of environmental management are based on the National Environmental Management Act and its regulations.

The proposed project is consistent with the **Constitution of the Republic of South Africa** by following the required authorisation processes, including the required public participation processes, and where required making amendments to the proposed project in order to incorporate I&AP or specialist input, in order to prevent pollution, promote conservation and enable sustainable development.

The National Environmental Management Act 107 of 1998 as amended:

The National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA), provides for co-operative environmental governance by establishing principles for decision making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by organs of state; and to provide for matters connected therewith.

Sections 24 and 44 of NEMA make provision for the promulgation of regulations that identify activities which may not commence without an EA issued by the competent authority.

On the 8th of December 2014, the EIA Regulations, 2010, were repealed and replaced by Government Notice 327, 325 and 324 (GG40772 of 7 July 2017) which governs the process, methodologies, and requirements for the undertaking of EIAs in support of EA applications.

Listing Notices 1-3 in terms of NEMA list activities that require an EA, and either a Basic Assessment (BA) process or a S&EIR process is required to obtain EA. Listing Notice 1 lists activities that require a BA process, while Listing Notice 2 lists activities that require a S&EIR process. Listing Notice 3 lists activities in certain sensitive geographic areas that require a BA process.

The regulations for both processes – BA and S&EIR -stipulate broadly that:

- Public participation must be undertaken at various stages of the assessment process;
- The assessment must be conducted by an independent EAP;
- The relevant authorities must respond to applications and submissions within stipulated time frames;
- Decisions taken by the authorities can be appealed by the proponent or any other Interested and Affected Party (IAP); and
- A draft EMPr must be compiled and released for public comment.

The proposed project was screened against the listed activities in Chapter 5 of the National Environmental Management Act, 1998 (Act 107 of 1998 NEMA) as identified in terms of Section 24(2) and 24D of NEMA Government Notice 327, 325 and 324; in Government Gazette 40772 of 7 July 2017 and found to include activities that are listed in terms of the EIA Regulations, 2014 (see Table 4). (refer Section 2 for applicable listed activities identified for the proposed development).

CWA has a responsibility to ensure that the proposed activities and the S&EIR process conforms to the principles of NEMA, and CWA is obliged to take actions to prevent pollution or degradation of the environment in terms of Section 28 of NEMA, and to ensure that the environmental impacts associated with the Project are considered and mitigated where possible.

CWA is obliged to apply for EA for these activities (as listed in Table 4) and to undertake an S&EIR process in support of the application, in accordance with the procedure stipulated in GN R543 under NEMA.

The following Guidelines have been considered in the preparation of the draft EIAR:

- Guidelines on Alternatives (March 2013)
- Guideline for involving Biodiversity Specialists in the EIA process (2005)
- Guideline for involving a Heritage Specialist in an EIA process (2005)
- Circular EADP 0028/2014: One Environmental Management System (2014)
- Guideline for the review of Specialist Input in the EIA process (June 2005)
- Public Participation Guideline in terms of NEMA 1998 Environmental Impact Assessment Regulations (2017)

- Guideline on Need and Desirability (2017)

In addition, Regulation 320 (Government Gazette 42946 dated 10 January 2020), 'Procedures for The Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in Terms of Sections 24(5)(A) & (H) and 44 of NEMA, when Applying for Environmental Authorisation' - prescribes general requirements for undertaking site sensitivity verification and for protocols for the assessment and minimum report content requirements of environmental impacts for environmental themes for activities requiring environmental authorisation.

Each protocol applies exclusively to the environmental theme identified within its scope, and more than one theme may apply to a single application for environmental authorisation. Assessments for these themes must be undertaken in accordance with the relevant protocol, or where no specific protocol has been prescribed, in accordance with the requirements of the EIA Regulations.

The site sensitivity verification for the proposed development site based on the DFFE Screening tool, produced several environmental themes (refer to Appendix 2) and requirements for specialist studies. The specialist studies conducted must comply with its specific protocol, or with Appendix 6 of NEMA requirements if no protocol has been developed or for specialist studies commissioned by the Applicant in addition to those identified during screening.

The proposed project is consistent with the **National Environmental Management Act** by following the required authorisation process, including requirements by the applicable guidelines and protocols.

National Environmental Management: Air Quality Act 39 of 2004 (NEM: AQA) as amended and the South African National Air Quality Standards:

The NEM: AQA reformed legislation in terms of air quality by providing reasonable measures for the prevention of pollution, ecological degradation and to secure ecologically sustainable development while promoting justifiable economic and social development. It provides for national norms and standards regulating air quality monitoring, management, and control.

The proposed project includes a fuel storage facility which will require authorisation to obtain an Atmospheric Emission Licence (AEL) in terms of the NEM: AQA due to Category 2 and specifically Subcategory 2.4: Storage and Handling of Petroleum Products being triggered.

The Act outlines in Schedule 2 the South African air quality standards, and includes margins of tolerance, compliance time frames and permissible frequencies by which the standards may be exceeded.

With specific reference to air quality emissions - the South African National Standard 1929 of 2009, Ambient Air Quality – Limits for Common Pollutants.

An Air Emissions Licence Is Required for the Bulk Fuel Storage on site -

Category 2: Petroleum Industry, the production of gaseous and liquid fuels as well as petrochemicals from crude oil, coal, gas or biomass:

Subcategory 2.4: Storage and Handling of Petroleum Products

Description: Petroleum products storage tanks and product transfer facilities

Application: All permanent immobile liquid storage tanks larger than 1 000m^3 cumulative tankage capacity at a site.

***** applicable to fuel storage facility (current planned total size at 2 000m^3).

The proposed project acknowledges the **NEM: AQA** and the required authorisation process to obtain an Atmospheric Emission Licence (AEL) in terms of the NEM: AQA due to Category 2 and specifically Subcategory 2.4: Storage and Handling of Petroleum Products being triggered.

NOTE: A modular and flexible approach will be followed to construct the fuel storage containers

The phased approach entails:

Jet-A1:

- 6x 80m^3 horizontals in 2028 (total capacity 480m^3),
- Adding an additional 4x 80m^3 horizontals in 2032 (total capacity 800m^3).
- The 3x 350m^3 vertical tanks to be constructed and commissioned by 2038 (to bring the total to approx. 1850m^3).

Avgas:

Avgas tanks (2x 30m^3 + 1x 9m^3) - total capacity 549m^3 in 2028, 869m^3 in 2032 and 1 919m^3 in 2038.

Diesel:

Bulk diesel storage 2x 23m^3 vertical storage tanks (supply for backup generators) by 2027.

The commercial retail service station (4x 23m^3 underground storage tanks) does not form part of an AEL application. Based on the phase approach illustrated above, an AEL application will be initiated in 2037.

Therefore, an AEL application will only be lodged 6-12 months before CWA intents to exceed the 1000m^3 and it will not form part of this EIA process. As per below the threshold will likely only be exceeded in 2038, therefore an AEL application will only be lodged in 2037.

Table 3: Flammable substance inventory

Description of equipment	Product	Additional capacity (m^{3})		
		2028	2032	2038
6x horizontal tanks, each 80m^3	Jet-A1	480		
2x double-walled horizontals, each 30m^3	Avgas	60		
1x 9m^3 aboveground tank (for general aviation airside)	Avgas	9		
4x horizontal tanks, each 80m^3	Jet-A1		320	
3x vertical tanks, each 350m^3	Jet-A1			1050
2x 23m^3 vertical storage tanks (supply for backup generators)	Diesel	46		
4x 23m^3 underground storage tanks (commercial retail service station)	Petrol / Diesel	92		
Totals		**690**	**320**	**1050**
(cumulative)		*690*	*1010*	*2060*

National Water Act (NWA) Act 36 of 1998:

The National Water Act (NWA) (Act 36 of 1998) provides the legal basis for water management in South Africa and must ensure ecological integrity, stimulate economic growth, and promote social equity when managing and using water. It is based on Integrated Water Resource Management (IWRM), which includes water quality, water quantity, pollution prevention, resource protection and protection and promotion of aquatic ecosystem quality (aquatic biota and in-stream and riparian habitat).

The IWRM approach provides for both resource directed, and source directed measures. Resource directed measures aim to protect and manage the receiving environment. Examples of resource directed actions are the formulation of resource quality objectives and the development of associated strategies to ensure ongoing attainment of these objectives; catchment management strategies and the establishment of catchment management agencies (CMAs) to implement these strategies.

Source directed measures aim to control the impacts at source through the identification and implementation of pollution prevention, water reuse and water treatment mechanisms.

The integration of resource and source directed measures forms the basis of the hierarchy of decision-making aimed at protecting the resource from waste impacts. This hierarchy is based on a precautionary approach and the following order of priority for waste management decisions and/or actions is applicable:

Step 1: Pollution Prevention.

Step 2: Minimisation of Impacts (including water reuse and reclamation and water treatment);

Step 3: Discharge or disposal of waste and/or wastewater (incorporating the site-specific risk-based approach and the polluter pays principle).

The overall Resource Protection and Waste Management Policy sets out the interpretation of policy and legal principles as well as functional and organisational arrangements for resource protection and waste management in South Africa. Operational policies describe the rules applicable to different categories and aspects relating to waste discharge and disposal activities.

The registration of water use authorizations is required in terms of section 26 (1) (c) and 34(2) of the National Water Act, 36 of 1998 (NWA).

A **General Authorisation (GA)** is an authorisation to use water without a licence, provided that the water use is within certain limits and complies with conditions set out in the Gazetted General Authorisation. This authorisation requires a registration with the Department of Water and Sanitation prior to exercising the water use(s).

The S21(a) GA has a cap of 40 000m^3/annum regardless of the size of the property based on Regulation 538 of 2016. The S21(b) GA is capped at surface storage volume of 2000m^3. In terms of S21(c) and (i) water uses the process is determined by the risk rating (L, M, H) completed by a Freshwater Ecologist. If the risk rating is LOW, it can be generally authorised. If the rating is MEDIUM or HIGH a WULA will be required. In the case of boreholes there is an exclusion in Regulation 538 of 2016 – any borehole within 500m of a wetland automatically requires a WULA even though the volume could be within the ambit of a GA.

Existing Lawful Water Use (ELU) means the use of water authorised by or under any law that took place at any time for a period of two years before the commencement of the National Water Act 1998. The qualifying period is between 1998 and 2000.

A **Schedule 1 use** is a water use permissible in terms of Schedule 1 of the NWA, and allows a landowner, or legal occupier of the land, a right to reasonable use of surface or groundwater on that property This '*reasonable use'* is defined as:

- '*reasonable domestic use in that person's household'*;
- '*small gardening not for commercial purposes*';
- '*the watering of animals (excluding feedlots) which graze on that land within the grazing capacity of that land*'.

  Schedule 1 water uses do not require any permission or registration and is over and above the other abstraction volumes on site.

Water uses exceeding the provisions of a **General Authorisation**, that cannot be classified as a **Schedule 1 use**, or that does not fall under **ELU**, will have to be authorised through a **Water Use Licence (WULA)**.

Section 21 of the National Water 36 of 1998 identifies the water uses to be authorised in terms of the act:

(a) taking water from a water resource;

(b) storing water;

(c) impeding or diverting the flow of water in a watercourse;

(d) engaging in a streamflow reduction activity contemplated in Section 36 of the Act;

(e) engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1);

(f) discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit;

(g) disposing of waste in a manner which may detrimentally impact on a water resource;

(h) disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process;

(i) altering the bed, banks, course or characteristics of a watercourse;

(j) removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people;

(k) using water for recreational purposes.

Preliminary water uses identified for the proposed project include:

a) *taking water from a water resource* – Abstraction from boreholes on site and use as potable source; taking from surface water and use on site.

b) *storing water* – Storage of water in stormwater ponds and quarry.

c) and i) *impeding or diverting the flow of water in a watercourse* and/or *altering the bed, banks, course or characteristics of a watercourse* - Construction within the regulated area of wetlands on site; Any infrastructure/ buildings within regulated area of or crossing underneath drainage lines/ streams.

e) *engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1)* - Irrigation with water containing waste, i.e., irrigation with treated water from the sewage treatment plant.

f) *discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit* – Discharge of excess treated effluent.

g) *disposing of waste in a manner which may detrimentally impact on a water resource* - Storage of domestic and biodegradable industrial wastewater for the purpose of re-use/ disposal.

CWA has a responsibility to implement measures to prevent pollution of any water resources during construction and operational activities. Since construction is proposed within the regulated area of water course or other freshwater feature, and water for the site will be abstracted from boreholes on site, an application for an integrated water use licence (WUL) is required. Public participation for the application is undertaken in conjunction with that for the EIA.

A WULA (WU33620) has been initiated with DWS through the e-wulaa system and will run concurrent with the other authorisation processes as part of the “One Environmental System”. The WULA technical report is appended for comment to this draft in-process Scoping report as Appendix 31.

The proposed project is consistent with the **NWA** by following the required authorisation process to obtain a Water Use Licence for the various water uses identified.

National Environmental Management: Waste Act 59 of 2008 (NEM: WA) as amended:

The NEM: WA aims to reform waste management to protect health and the environment. It provides reasonable measures for the prevention of pollution and ecological degradation and to enable ecologically sustainable development; provides for institutional arrangements and planning matters; national norms and standards for regulating the management of waste by all spheres of government; specific waste management measures; the licensing and control of waste management activities; the remediation of contaminated land; the national waste information system; compliance and enforcement; and matters connected therewith.

The proposed activities on site require the following in terms of the NEM: WA:

Category C:

(1) The storage of general waste at a facility that has the capacity to store in excess of 100m^3 of general waste at any one time, excluding the storage of waste in lagoons or temporary storage of such waste.

(6) The sorting, shredding, grinding, crushing, screening or baling of general waste at a waste facility that has an operational area that is 1 000m^2 and more.

A Norms & Standards registration in terms of the NEM: WA (Act 59 of 2008 as amended, is required for applicable waste activities pertaining to the proposed development. The following Norms and Standards are applicable to the project:

- National Norms and Standards for the Storage of Waste (GN 37088, 29 November 2013).
- National Norms and Standards for the Sorting, Shredding, Grinding, Crushing, Screening or Bailing of General Waste (GN 41175, 11 October 2017).
- National Norms and Standards for the Treatment of Organic Waste (GN 1984, 1 April 2022).
- National Norms and Standards for Organic Waste Composting (GN 561 in GG 44762 of 25 June 2021) read with GN 1757 in GG 45907 of 11 February 2022.

The proposed project is consistent with the **NEM: WA** by following the required registration process for the applicable waste activities identified.

Environmental Conservation Act 73 of 1989 (ECA):

The Act provides for the effective protection and controlled utilization of the environment and for matters incidental thereto. Section 25 promotes the development of Noise Control Regulations. The administration of the noise control regulations was devolved to provincial and local authorities. However, of the nine provinces, only three provinces namely, Free State, Gauteng and Western Cape have developed Noise Regulations, so in the Western Cape, noise is regulated by the Noise Control Regulations put forward in June 2013 (Provincial Gazette Number 7141 of 20 June 2013) (also refer Section 4.2 of this report).

Noise has been identified as one of the most significant environmental aspects of an airport, and the noise impacts will be modelled and assessed during the Impact Assessment Phase.

The proposed project is consistent with the **ECA** by following the required assessment process for the noise impacts associated with the proposed project.

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

The Act provides for the management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act, 1998; the protection of species and ecosystems that warrant national protection; the sustainable use of indigenous biological resources; the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources; the establishment and functions of a South African National Biodiversity Institute (SANBI); and for matters connected therewith.

In terms of Chapter 4 of the Above Act:

52. (1) (a) The Minister may, by notice in the Gazette, publish a national list of ecosystems that are threatened and in need of protection.

(b) An MEC for environmental affairs in a province may, by notice in the Gazette, publish a provincial list of ecosystems in the province that are threatened and in need of protection.

(2) The following categories of ecosystems may be listed in terms of subsection:

(a) critically endangered ecosystems, being ecosystems that have undergone severe degradation of ecological structure, function or composition as a result of human intervention and are subject to an extremely high risk of irreversible transformation;

(b) endangered ecosystems, being ecosystems that have undergone degradation of ecological structure, function or composition as a result of human intervention, although they are not critically endangered ecosystems;

(c) vulnerable ecosystems, being ecosystems that have a high risk of undergoing significant degradation of ecological structure, function or composition as a result of human intervention, although they are not critically endangered ecosystems or endangered ecosystems; and

(d) protected ecosystems, being ecosystems that are of high conservation value or of high national or provincial importance, although they are not listed in terms of paragraphs (a), (b) or (c).

(3) A list referred to in subsection (1) must describe in sufficient detail the location of each ecosystem on the list.

53. (1) The Minister may, by notice in the Gazette, identify any process or activity in a listed ecosystem as a threatening process.

(2) A threatening process, identified in terms of subsection (1) must be regarded as a specified activity contemplated in section 24(2)(b) of the National Environmental Management Act and a listed ecosystem must be regarded as an area identified for the purpose of that section.

CWA has the responsibility to identify species and ecosystems (freshwater and terrestrial) within the proposed development area and assess the possible impacts.

The proposed project is consistent with the **NEM:BA** by following the required assessment process for the biodiversity impacts associated with the proposed project.

The proposed project also takes consideration of the National Biodiversity Offset Guideline (23 June 2023) published under section 24J of the National Environmental Management Act, 1998 (Act No. 107 of 1998) where offset is required post the application of the Mitigation hierarchy.

National Heritage Resources Act 25 of 1999 (NHRA):

The National Heritage Resources Act, 2005 (Act 25 of 1999), provides for the management of national heritage resources, to set norms and maintain national standards for the management of heritage resources in South Africa, and to protect heritage resources of national significance, so that heritage resources may be bequeathed to future generations.

Section 38 (1) stipulates that subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as—

a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;

b) the construction of a bridge or similar structure exceeding 50m in length;

c) any development or other activity which will change the character of a site--

i) exceeding 5 000m^2 in extent; or

ii) involving three or more existing erven or subdivisions thereof; or

iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or

iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;

d) the re-zoning of a site exceeding 10 000m^2 in extent; or

e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

CWA has the responsibility to establish the cultural, visual and archaeological heritage setting and to assess the possible impacts of the proposed development.

The proposed project is consistent with the NHRA by following the required assessment process for the heritage impacts associated with the proposed project, and the subsequent authorisation required by HWC.

A NID was submitted to HWC as part of the Heritage Impact Assessment process, and it was confirmed that a HIA is required for the proposed project.

Minerals and Petroleum Resources Development Act 28 of 2002 (MPRDA) as amended:

The MPRDA came into effect on 1st May 2004 and governs the acquisition, use and disposal of mineral rights within South Africa.

The Uitsig quarry (described as Uitsig Clay Pit) with Mining Licence ML17/2001 on P23 of Farm 724 has an existing Mining Licence (ML17/2001) from the Department of Minerals Resources and Energy (DMRE).

The proposed project is consistent with the MPRDA for the required closure application for the quarry: The mine closure application had been lodged by Corobrik (Pty) Ltd, the current holder of the Mining Licence and owner of the land in terms of Section 43 of the MPRDA.

Conservation Of Agricultural Resources Act 43 of 1983 (CARA):

The CARA provides for the control over the utilization of the natural agricultural resources to promote the conservation of the soil, the water sources, and the vegetation, and to combat weeds and invader plants.

The proposed expansion project entails rezoning of agricultural land for use in aviation, which will require input from Western Cape Department of Agriculture: Land Use Planning.

The proposed project is consistent with the CARA by including Western Cape DoA: Land Use Planning as I&AP in the NEMA process, and for the subsequent authorisation required for the partial rezoning of agricultural land.

Spatial Planning and Land Use Management Act 16 of 2013 (SPLUMA):

The Act concerns spatial planning in South Africa at national and local level and provides for a uniform, effective and comprehensive system of spatial planning and land use management and development, and for the sustainable and efficient use of land.

According to H&A Planning the proposed development area requires an elongated shape for the runway safety area, and the landside development is located to the West of the proposed runway. These areas need to be rezoned to "*Transport Zone 1 with consent to permit an airport*". The areas East of the proposed airside currently zoned as agriculture will remain as agriculture zoning with associated farming activities.

Western Cape Land Use Planning Act (LUPA) Act 3 of 2014

The Western Cape Land Use Planning Act, 3 of 2014 was enacted in terms of SPLUMA and came into effect in July 2015. The act enables municipalities in the Western Cape to implement their own land use planning bylaws.

According to H&A Planning the proposed development area requires an elongated shape for the runway safety area, and the landside development is located to the West of the proposed runway. These areas need to be rezoned to "Transport Zone 1 with consent to permit an airport". The areas East of the proposed airside currently zoned as agriculture will remain as agriculture zoning with associated farming activities.

The City of Cape Town Municipal Planning bylaw (2015 as amended in 2019), enables the CoCT to facilitate the partial rezoning of the proposed development area.

Civil Aviation Act 13 of 2009:

The Civil Aviation Act aims to control and regulate civil aviation safety and security, oversee the implementation and compliance with the National Aviation Security program, oversee the functioning and development of the civil aviation industry, promote civil aviation safety and security, develop regulations as required by the Act and monitor and ensure compliance with the Act and international Aviation Conventions. It also allows for 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 South African Civil Aviation Authority (SACAA) is a Schedule 3A public entity in terms of the Public Finance Management Act (PFMA), and was established on 1 October 1998, following the enactment of the now repealed South African Civil Aviation Authority Act 40 of 1998. It is a stand-alone authority mandated with controlling, promoting, regulating, supporting, developing, enforcing, and continuously improving levels of safety and security throughout the civil aviation industry, and it is an agency of the Department of Transport (DoT). Compliance regulation is achieved by complying with the Standards and Recommended Practices (SARPs) of the International Civil Aviation Organisation (ICAO), whilst considering the local context.

Section 60 and 82 of the Act promotes the development of Noise Regulations for the control and operation of air traffic within or directly above the airport to limit or mitigate the noise. The Civil Aviation Regulations are embedded in section 155.

Section 155(1) of the Act empowers the Minister of Transport to make regulations regarding the use, registration, licensing, inspection, or management of aerodromes, including the technical, operational, safety and environmental management and protection standards in respect of airports, as defined in the Airports Company Act, and other designated airports.

The proposed project is consistent with the Civil Aviation Act by adhering to ICAO regulations in terms of design and operation and seeking authorisation from SACAA for the proposed project.

The Concept of Operations (CONOPS) outlines the seamless integration of the airspace around CWA with the existing controlled airspace around Cape Town, ensure safe, efficient, and harmonious air traffic management while accommodating the growing demand for air travel and aviation activities in the region, while always adhering to the South African National Airspace Masterplan (NAMP).

The NAMP is a comprehensive and strategic document developed by the SACAA that guides the development, management, and optimization of its entire airspace system, with the primary purpose to provide a long-term vision and framework for the safe, efficient, and sustainable use of the national airspace to meet current and future air traffic demand.

White Paper on National Civil Aviation Policy, 2017 (NCAP):

The White Paper on NCAP was developed to provide a primary framework for the future actions of the DoT in relation to civil aviation. It acknowledges that the present airport infrastructure, with ownership vested in all spheres of government as well as the private and non -profit sector, is an integral part of the South African transport system. This infrastructure contributes to the socio- economic development of the country in terms of direct job creation and economic activity, stimulating economic activity in the wider airport precinct (including through "airport cities" and "aerotropolises") as well as by facilitating domestic and international tourism and trade.

The proposed project is consistent with the NCAP by adhering to ICAO regulations in terms of design and operation and seeking authorisation from SACAA for the proposed project. SACAA is an agency of the Department of Transport (DoT).

National Airports Development Plan, 2015 (NADP):

The NADP has been initiated by the NCAP as the plan to address the gaps between the current airport network and the future desired state. It guides and supports both overall network planning, and the development of individual airports integrated within their broader spatial and transport contexts, in consultation with key airport stakeholders. The regulation is relevant to the project as the infrastructure being developed and upgraded forms part of the overall airport infrastructure of South Africa.

The NDAP also confirms the OR Tambo International Airport - Cape Town International Airport route is the 10th busiest in the world and South African non-scheduled, general air services and non-commercial aviation activities are experiencing similar pressures at the main commercial airports.

White Paper on National Transport Policy, 2021 (NTP):

The objective of the NTP is to create an environment that supports the development of a transport system entails economically and environmentally sustainable inclusive growth, and national and regional competitiveness. Key pillars to achieve this are to ensure transport is accessible, cost effective, time efficient and reliable, safe, and secure.

The NTP recognises the need to accommodate changing needs and circumstances in terms of civil aviation that may be the result of global developments. This includes important matters such as liberalization of air transport, introduction of new technology, greater emphasis on environmental factors and the increased need to regulate remote piloted aircraft systems (RPAS).

It states that civil aviation should support the expansion of trade and tourism, by applying free market principles “with a view to maximising consumer choice and meeting consumers’ needs” and creating “an investor-friendly environment”.

The NTP broad objectives will continue to be the principles of the international air transport policy as set out in the International Aviation Policy Document and International Air Services Act, specifically to encourage competition in the marketplace. "The DOT, in consultation with stakeholders, will formulate a policy on airline cooperation in general, and code-sharing in particular, within a framework of promoting competition and cooperation."

The national planning and integration of airports into the broader transport network, in respect of modal integration as well as in the context of the total air transport system, need to be coordinated with the other spheres of government.

Airport development should be planned holistically in accordance with a structured National Airports Development Plan, which would support national, provincial and local community objectives. Such development needs to complement the airport system, and in some cases may even allow for competition within the system, to the benefit of the user. Licensing and enforcement will be shaped to address market failures. Competition, whether for or in the market, will be encouraged where possible, and economic regulation will be applied where appropriate. In the transport sector, a level playing field will be provided, in which state-owned companies (SOE's), and the case of airports, ACSA, is expected to compete with private sector players without undue shielding from competitive forces. The State as a shareholder is represented by the Departments of Public Enterprises and Transport. In most instances, these departments together with the National Treasury determine the level of equity participation and the dividends policy. Where enabled by legislation or shareholder compacts, ACSA can determine their dividends policy. Equity participation by the shareholding department must be managed efficiently, whilst exposing ACSA to similar market risks as private sector companies, so as to harness the optimal benefits of competition. Where ACSA competes with private sector companies, it must occur in a fair setting, where all competitors are treated equally, regardless of ownership.

The proposed project is consistent with the **NTP** as it is planned within the current airport system with the aim to complement the current system but also allow for competition within the system, to the benefit of the user.

National Transport Master Plan 2050 (NATMAP 2011):

The NATMAP 2050 is the masterplan for transport infrastructure that was created to ensure a sustainable and dynamic system that is well managed and coordinated. The NATMAP 2050 aims to achieve: An integrated, smart, and efficient transport system supporting a thriving economy that promotes sustainable economic growth, supports a healthier lifestyle, provides safe and accessible mobility options, socially includes all communities, and preserves the environment. The NATMAP makes recommendations that are relevant to the development of airports as part of the national transport infrastructure network.

Civil aviation should promote the national interests of South Africa in general and facilitate and enhance the expansion of trade and tourism.

The strategic objectives of civil aviation are:

- To promote and enhance civil aviation safety, security and environmental compliance in all spheres of the civil aviation industry;
- To promote the national interest of South Africa and facilitate the expansion of trade and tourism (including sports and adventure tourism);
- To further promote the development of an efficient and productive aviation industry that is capable of competing both domestically and internationally;
- To ensure that civil aviation contributes meaningfully to the development of human resources, meeting basic needs and broadening all South African citizens' participation in the economy;
- To maintain an appropriate and cost-effective regulatory framework, and ensuring safe, secure, environmentally friendly and reliable air services, capable of responding to changing circumstances;
- To facilitate the application of free-market principles that are relevant to economic decisions in all industries as far as possible and which will apply equally to aviation services with a view to maximising consumer choice and meeting consumers' needs.

The proposed project is consistent with the **NATMAP** as it is planned as an integrated, smart, and efficient transport option to support local, regional and national economy, while promoting sustainable economic growth, providing a safe and accessible transport option, socially including all local communities, and aiming to preserve the environment.

Chicago Convention, 1944:

The Chicago Convention, also known as the Convention on International Civil Aviation, is published in Schedule 3 of the South African Civil Aviation Act No 13 of 2009. The Chicago Convention established the core principles permitting international transport by air and led to the creation of the International Civil Aviation Organisation (ICAO), a specialized agency of the United Nations charged with coordinating and regulating international air travel. The Convention establishes rules of airspace, aircraft registration and safety, and details the rights of the signatories in relation to air travel.

The proposed project is consistent with the **Chicago Convention** by adhering to ICAO regulations in terms of design and operation and seeking authorisation from SACAA for the proposed project. SACAA is an agency of the Department of Transport (DoT).

International Civil Aviation Organization (ICAO):

ICAO is a specialized agency initiated at the Chicago Convention (1944) with the core function to maintain an expert bureaucracy between the nation interacting through the aviation industry, and to research new standards and innovations in the industry. The proposed development will be planned and designed to comply with the standards and recommended practices set out by ICAO. Of particular importance in the planning and design of airports are the ICAO Annex 14, DOC 9184 - Airport Planning Manual and DOC 9157 - Aerodrome Design Manual.

Air Traffic and Navigation Services (ATNS):

The ATNS was established in terms of the ATNS Act, 1993 (Act 45 of 1993) with a mandate to provide safe, orderly, and efficient air traffic navigational and associated services to the air traffic management community on behalf of the State and in accordance with the ICAO standards and recommended practices, as well as the South African civil aviation regulations and technical standards.

The company’s strategic goals are to:

- provide safe, efficient and cost-effective air traffic management solutions and associated services,
- expand the company footprint to cover Africa and the Indian Ocean region.

ATNS has also adopted the promotion of mathematics and physical science as its flagship project, aimed at increasing the pool of potential candidates who can be attracted and trained as air traffic controllers. Since its inception in 1993, the company has renewed most of the national communication, navigation, surveillance, and air traffic management infrastructure. ATNS trains air traffic controllers from South Africa, Africa, and the Africa-Indian Ocean area.

ATNS provides valuable input in the proposed project and will be a key IAP during the public consultation phases.

City of Cape Town Outdoor Advertising and Signage By-Law No. 10518 of 2001, First Amendment By-Law 2013 repealed and replaced by City of Cape Town Outdoor Advertising By-Law No.8969 of 2023 (the By-law):

The objective of this newly promulgated By-Law is to regulate outdoor advertising in the jurisdiction of the CoCT in a manner that is sensitive to the environmental quality of different parts of the city. It seeks to strike a balance between outdoor advertising opportunities and economic development on the one hand, and the conservation of visual, tourist, traffic safety, environmental and heritage characteristics on the other hand. This By - Law aims to ensure that outdoor advertising respects the integrity of any site on which it is displayed and complements the character of the locality in which it is displayed.

The sensitivity of the proposed locality of a sign and its capacity to withstand the visual impact are the most important guiding principles for the control of outdoor advertising. Outdoor advertising signs should only be placed where they are most compatible with the surrounding locality and where they do not impact on visual corridors and/or scenic drives. Signs that compromise protected, unique or sensitive areas will not be allowed. In addition, outdoor advertising and signs should not compromise the functioning and safety of traffic and should not adversely affect the character of a locality by way of appearance, size, or illumination. Advertising on bridges, towers, telecommunication masts or pylons will not be permitted.

The types of landscapes, signs and areas of control are important factors in the classification concept utilized in this By-Law. This By-Law presumes that the type of sign gives an indication of the potential impact of such a sign on the locality in which it will be displayed. Thus, in terms of this By-Law the local character of an area in which a sign is proposed will affect the degree of control applied in that area. This By-Law recognises that the dynamics between the type of the sign, the sign itself and where it is to be located can most effectively be dealt with by the determination of areas of control. Three areas of control are applied in this By-Law: maximum, partial, and minimum areas of control. The potential for outdoor advertising and the sign types to be considered is therefore determined by permitting certain sign types in certain areas of control. Control measures are applied by means of approval or refusal, and by means of general and specific conditions and requirements. Finally, this By-Law sets out the procedures to be followed and the criteria used when obtaining approval for a sign applicable to outdoor advertising in the City of Cape Town. In doing so it recognises that there is an extensive amount of technical detail applicable to specific sign types and their effect in specific.

Schedule 1 of the City of Cape Town Outdoor Signage By Law No 8969, 2023 will classify the expanded Cape Winelands Airport as a transport interchange / terminal when approved and is will therefore be designated as “minimum control”. This classification dictates the level of regulation and oversight required for signage in this area.).

Proposed 1st Party and 3rd Party signage should comply with the newly promulgated City of Cape Town Outdoor Advertising By-Law No.8969 of 2023 (the By-law):

According to the Outdoor Advertising Guideline (Appendix 32) the *Advertising Standards Authority of South Africa (ASASA) is an independent body set up to regulate advertising in the public interest through a system of self-regulation. ASASA works closely with government, statutory bodies, consumer organisations and the advertising industry to ensure that the content of advertising meets the requirements of the Code of Advertising Practice. This Code of Advertising Practice is a voluntary code applicable to the marketing and communication industry. The airport must monitor all content to ensure compliance with the Advertising Standards Authority of South Africa.*

The proposed project will be consistent with the **City of Cape Town Outdoor Advertising By-Law No.8969 of 2023** by adhering to the required CoCT bylaw requirements and authorisation process. Refer to Appendix 32 CWA Outdoor Advertising Guideline.

City of Cape Town: Treated Effluent By-Law, 28 October 2009, promulgated 30 June 2010:

The Treated Effluent By-law allows for the safe re-use of treated effluent to contribute to a resource efficient City by reducing waste and pollution. The CWA aims to develop a wastewater treatment plant to treat sewage generated by the proposed development, and to reuse its treated effluent on site (irrigation, biodigester), thereby reducing the potable water needs on site. The proposed use of the treated effluent also requires authorisation from DWS in terms of section 39 of the National Water Act, 1998.

The proposed project is consistent with the **Treated Effluent By-Law** by adhering to the required CoCT bylaw and DWS authorisation process as part of the WULA.

City of Cape Town: Environmental Health By-Law, 30 June 2003:

The environmental health by-law prohibits and regulates health nuisances, and relates to any activity, condition, premises or thing which, on account of effluent, vapours, chemical effluvia, odours, noise, vibration, radiation, refuse, waste products, dirt, chemical or biochemical material, microbial infection, vermin, vegetation, overcrowding, lack of proper general hygiene, ventilation, lighting, design or situation potentially injurious or dangerous to health or which is/are offensive. This includes any facility for the storage, distribution or handling of water that is likely to be used by man for domestic purposes or consumption, including such water itself, which is contaminated or polluted.

Potential health nuisances related to the proposed project includes generation of dust, flies attracted to waste storage facilities, odour, and the continued provision of potable water that complies with the SANS 241:2015 drinking water standard.

The proposed project is consistent with the **Environmental Health By-Law** by adhering to the required CoCT bylaw and incorporating the requirements into the EMPr.

City of Cape Town: Water bylaw (2010) and City of Cape Town: Water Amendment bylaw (2018):

The objective of this by-law is the regulation of potable water supply systems and domestic wastewater and sewage disposal systems in the area of jurisdiction of the city.

Where it is not reasonably possible or cost effective to supply water to a consumer within a particular area, the city will determine an alternative manner of water supply. Water is supplied based on an agreement between an owner and the city, which is based on an application approved by the authorized official. Where the city cannot provide potable supply to a consumer, that consumer may develop its own supply, as in the case of CWA, but CWA will have to lodge an application as a water services intermediary (WSI) with the city to enable this self-supply. Any boreholes drilled within the city area, have to be registered with the city, but authorisation for use is still obtained from DWS in terms of section 39 of the National Water Act, 1998.

The By-law also deals with drought circumstances and of scarcity of water for distribution and supply to consumers and allows the city to prohibit or restrict the consumption of water.

The proposed development will supply itself with sanitation (sewage treatment) and potable (drinking water) services and will require a Water Services Intermediary (WSI) agreement with CoCT in terms of the Water Services Act to be able to perform these functions. The WSI agreement will follow on the completion of the EIA and WULA processes.

The proposed project is consistent with the **Water bylaw & Water Amendment bylaw** by adhering to the required CoCT bylaw and DWS authorisation process as part of the WULA.

4.2 Regulations applicable to the proposed development

The National Environmental Management Act, EIA Regulations:

The NEMA EIA Regulations of December 2017 identify three lists of activities which may not commence without an environmental authorisation from the relevant competent authority. The three lists distinguish between two classes of activities, those requiring a Basic Assessment (Listing Notice 1 GN327 and Listing Notice 3 GN324) and those requiring a full Scoping and Environmental Impact Assessment (Listing Notice 2 GN325).

Regulation 326 in GG40772 also sets out the procedure to be followed in compiling, submitting, processing, and considering an application for an environmental authorisation. These regulations stipulate who may conduct EIAs, what information must be included, the decision-making criteria and timelines, public participation requirements and the procedure for lodging appeals against decisions taken.

EIA Listed Activities

The proposed project is screened against the listed activities in Chapter 5 of the National Environmental Management Act, 1998 (Act 107 of 1998 NEMA) as identified in terms of Section 24(2) and 24D of NEMA Government Notice 327, 325 and 324; in Government Gazette 40772 of 7 July 2017. The screening is based on understanding the project development requirements related to the Site Development Plan (SDP), associated processes and infrastructure requirements.

Table 4 below gives an overview of the identified listed activities for which an application has been made to DEA&DP.

Table 4: Listed activities applied for

Listing Notice 1 (Regulation 327, GG40772 - 7 April 2017)		
Activity	**Description**	**Applicability**
9	*The development of infrastructure exceeding 1 000 metres in length for the bulk transportation of water or storm water—* *(i) with an internal diameter of 0,36 metres or more; or* *(ii) with a peak throughput of 120 litres per second or more;* *excluding where—* *(a) such infrastructure is for bulk transportation of water or storm water or storm water drainage inside a road reserve or railway line reserve; or* *(b) where such development will occur within an urban area.*	The proposed project will require development of stormwater infrastructure exceeding 1km in length. None of the exclusions apply. REFER CONCEPT LAYOUT STORMWATER PLAN & CONCEPT LAYOUT NON-POTABLE WATER PLAN IN APPENDIX 26 (ITEM 14, 18, 19) *Incoming municipal supply line of 2.5km in road reserve so excluded from this listed activity (App 26 Item 20) and not assessed in terms of NEMA.*
10	*The development and related operation of infrastructure exceeding 1 000 metres in length for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes –* *(i) with an internal diameter of 0,36 metres or more; or* *(ii) with a peak throughput of 120 litres per second or more;* *excluding where—* *(a) such infrastructure is for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes inside a road reserve or railway line reserve; or* *(b) where such development will occur within an urban area*	The proposed project will require development of sewer and non-potable supply infrastructure exceeding 1km in length. None of the exclusions apply. REFER CONCEPT LAYOUT FOUL SEWER ON SITE TREATMENT PLAN; CONCEPT LAYOUT NON-POTABLE WATER PLAN IN APPENDIX 26 (ITEM 18 & 19)

		The proposed sewer line to Fisantekraal WWTW is 571m in length so the listed activity does not apply (Appendix 26 Item 17).
12	*The development of—* *(i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or* *(ii) infrastructure or structures with a physical footprint of 100 square metres or more;* *where such development occurs—* *(a) within a watercourse;* *(b) in front of a development setback; or* *(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; — excluding—* *(aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;* *(bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;* *(cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies;* *(dd) where such development occurs within an urban area;* *(ee) where such development occurs within existing roads, road reserves or railway line reserves; or* *(ff) the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared.*	The proposed project entails the development of infrastructure with a physical footprint > 100m^2 within a watercourse or within 32m of a watercourse and none of the exclusions apply. REFER SDP DEVELOPMENT WITHIN 32M OF MAPPED WETLANDS ON SDP PHASE 2 (APPENDIX 26) (ITEM 12) The proposed project entails the rehabilitation of wetland areas in the proposed application area and development of stormwater infrastructure within 32m of a watercourse. REFER SDP STORMWATER DEVELOPMENT WITHIN 32M OF MAPPED WETLANDS ON SDP PHASE 2 (APPENDIX 26) (ITEM 31)

		REFER PROPOSED WETLAND REHABILITATION PLAN (APP 8) AND APPENDIX 26 (ITEM 30) *Incoming municipal supply line of 2.5km in road reserve so excluded from this listed activity (App 26 Item 20) and not assessed in terms of NEMA.*
13	*The development of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50 000 cubic metres or more, unless such storage falls within the ambit of activity 16 in Listing Notice 2 of 2014.*	The proposed project entails development of attenuation ponds for stormwater management on site with a combined capacity of 50 000m^3 or more. Storage of potable and non-potable (post treatment) on site in tanks/ reservoirs; storage of fire water and untreated sewage on site. REFER CONCEPT LAYOUT STORMWATER PLAN (ITEM 14); CONCEPT LAYOUT STORMWATER PONDS PLAN (ITEM 15); QUARRY AS STORMWATER ATTENUATION POND (ITEM 16) IN APPENDIX 26. REFER SDP PHASE 2: C01, C04, C10 IN APPENDIX 26 (ITEM 9).
16	*The development and related operation of facilities for the desalination of water with a design capacity to produce more than 100 cubic metres of treated water per day.*	The proposed project requires the desalination of more than 100m^3/day groundwater for use on site.

		REFER C01 AND C03 on SDP PHASE 2 (APPENDIX 26. ITEM 9).
19	*The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;* *but excluding where such infilling, depositing, dredging, excavation, removal or moving—* *(a) will occur behind a development setback;* *(b) is for maintenance purposes undertaken in accordance with a maintenance management plan;* *(c) falls within the ambit of activity 21 in this Notice, in which case that activity applies;* *(d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or* *(e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.*	The proposed project entails development of infrastructure within a watercourse and the infilling or depositing of material of more than $10m^3$ into, or the dredging, excavation, removal or moving of soil, sand, pebbles or rock of more than $10m^3$ from a watercourse and none of the exclusions apply. REFER AIRSIDE LAYOUT WITHIN 32M OF MAPPED WETLANDS ON SDP PHASE 2 BIOPHYSICAL CONSTRAINTS APPENDIX 26 (ITEM 12). The proposed project entails the rehabilitation of wetland areas on the proposed application area and stormwater management infrastructure within 32m of a watercourse. REFER CONCEPT LAYOUT STORMWATER PLAN (ITEM 14); CONCEPT LAYOUT STORMWATER PONDS PLAN (ITEM 15); QUARRY AS STORMWATER ATTENUATION POND (ITEM 16) IN APPENDIX 26.

		REFER PROPOSED WETLAND REHABILITATION PLAN (ITEM 30) APPENDIX 26. NOTE: The request to DEA&DP for adoption of a maintenance management plan will form part of the final application. Refer Appendix 38 for draft MMP.
24	*The development of a road—* *(i) 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 Government Notice 545 of 2010; or (ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres; but excluding a road—* *(a) which is identified and included in activity 27 in Listing Notice 2 of 2014;* *(b) where the entire road falls within an urban area; or* *(c) which is 1 kilometre or shorter.*	The proposed project includes the construction of road infrastructure and none of the exclusions apply. REFER CONCEPT LAYOUT ROADS PLAN AND SDP PHASE 2 PLAN (APPENDIX 26) (ITEM 7 & 13).
25	*The development and related operation of facilities or infrastructure for the treatment of effluent, wastewater or sewage with a daily throughput capacity of more than 2 000 cubic metres but less than 15 000 cubic metres.*	The proposed project entails the treatment of sewage on site. REFER C06 ON SDP PHASE 2 PLAN, CONCEPT LAYOUT FOUL SEWER TO FISANTEKRAAL WWTW PLAN AND CONCEPT LAYOUT FOUL SEWER ON SITE TREATMENT PLAN (APPENDIX 26) (ITEM 9, 17, 18).
26	*Residential, retail, recreational, tourism, commercial or institutional developments of 100m^2 or more, on land previously used for mining or heavy industrial purposes; -*	Development of commercial and tourism exceeds 100m^2 and none of the exclusions apply.

	Excluding – *(i) where such land has been remediated in terms of part 8 of the NEMA: WA (Act no59 of 2008) in which case the NEM:WA , 2008 applies; or* *(ii) where an environmental authorisation has been obtained for the decommissioning of such a mine or industry in terms of this Notice or any previous NEMA notice; or* *(iii) where a closure certificate has been issued in terms of section 43 of the Mineral and Petroleum resources Development Act, 2002 (Act no 28 of 2002) for such land.*	REFER E01.1 & E01.2 ON SDP PHASE 2 PLAN APPENDIX 26 (ITEM 8).
28	*Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development:* *(i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or* *(ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare;* *excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.*	The proposed project entails the transformation of previous agricultural land >5ha, the site is outside the urban area and none of the exclusions apply. REFER TO SDP PHASE 2 PLAN APPENDIX 26 (ITEM 7).
48	*The expansion of—* *(i) infrastructure or structures where the physical footprint is expanded by 100 square metres or more; or* *(ii) dams or weirs, where the dam or weir, including infrastructure and water surface* *area, is expanded by 100 square metres or more;* *where such expansion occurs—* *(a) within a watercourse;* *(b) in front of a development setback; or* *(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;* *excluding—*	The proposed project entails the expansion of infrastructure with more than $100m^2$ within a watercourse or within 32m of a watercourse and none of the exclusions apply. REFER AIRSIDE PRECINCT LAYOUT WITHIN 32M OF MAPPED WETLANDS ON SDP PHASE 2 PLAN APPENDIX 26 (ITEM 12).

	(aa) the expansion of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour; *(bb) where such expansion activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;* *(cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies;* *(dd) where such expansion occurs within an urban area; or* *(ee) where such expansion occurs within existing roads, road reserves or railway line reserves.*	
56	*The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre—* iii. *where the existing reserve is wider than 13,5 meters; or* *(ii) where no reserve exists, where the existing road is wider than 8 metres; excluding where widening or lengthening occur inside urban areas.*	The proposed project entails expansion of existing road infrastructure, and the site is located outside an urban area. REFER TO SDP PHASE 2 PLAN AND CONCEPT LAYOUT ROADS PLAN IN APPENDIX 26 (ITEM 7 & 13).
61	*The expansion of airports where the development footprint will be increased.*	The proposed project entails the expansion of the existing Cape Winelands Airport. REFER TO SDP PHASE 2 PLAN APPENDIX 26 (ITEM 7).

<u>Listing Notice 2 (Regulation 325, GG40772 – 7 April 2017)</u>		
Activity	**Description**	**Applicability**

1	*The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more, excluding where such development of facilities or infrastructure is for photovoltaic installations and occurs-* *(a) within an urban area; or* *(b) on existing infrastructure.*	CWA intends to generate electricity from a renewable source of more than 20MW but less than 100MW considering the available roof space and open areas proposed. The generation will be for private off-take and own use only. The operation will not feed power into the Eskom grid via a Renewable Energy IPP Procurement Programme (REIPPPP) bidding process. Therefore, the DEA&DP is the competent authority for authorisation in terms of NEMA. None of the exclusions apply. REFER SOLAR PV LAYOUT PLANS (ITEM 22A TO 22D) AND C07 (BIODIGESTER) ON SDP PHASE 2 PLAN (ITEM 9) APPENDIX 26.
4	*The development and related operation of facilities or infrastructure, for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of more than 500 cubic metres.*	The proposed development involves the development of a fuel farm with storage capacity of approximately 2000m^3: • 10x 80m^3 horizontal tanks, and 3x 350m^3 vertical storage tanks containing Jet-A1, • Avgas: 2x 30m^3 double walled horizontal tanks and

		the existing 28m^3 facility will be closed, • Additional 2x 23m^3 vertical storage tanks (diesel storage for backup generators. One Avgas 9m^3 tank will be located at the clubhouse with a dispenser where small privately-owned planes can taxi to, park and refuel without the need to call on a bowser. NOTE: A modular and flexible approach will be followed to construct the fuel farm storage containers. The phased approach entails: Jet-A1: • 6x 80m^3 horizontals in 2028 (total capacity 480m^3), • Adding an additional 4x 80m^3 horizontals in 2032 (total capacity 800m^3). • The 3x 350m^3 vertical tanks to be constructed and commissioned by 2038 (to bring the total to approx. 1850m^3). Diesel backup supply to be installed by 2027.

		Avgas: Avgas tanks (2x 30m^3 + 1x 9m^3) - total capacity 549m^3 in 2028, 869m^3 in 2032 and 1 919m^3 in 2038. The proposed development includes a commercial / retail service station providing petrol and diesel. This facility would consist of 4x 23m^3 underground storage tanks. REFER B10.1 & B10.2 (SERVICES PRECINCT PLAN ITEM 9), A16 (GA PRECINCT ITEM 10), F01 (TERMINAL PRECINCT PLAN ITEM 8) ON SDP PHASE 2 PLANS APPENDIX 26.
7	*The development and related operation of facilities or infrastructure for the bulk transportation of dangerous goods –* *(i) in gas form, outside an industrial complex, using pipelines, exceeding 1 000 metres in length, with a throughput capacity of more than 700 tons per day;* *(ii) in liquid form, outside an industrial complex, using pipelines, exceeding 1 000 metres in length, with a throughput capacity of more than 50 cubic metres per day; or* *(iii) in solid form, outside an industrial complex, using funiculars or conveyors with a throughput capacity of more than 50 tons per day.*	It is proposed to develop a feeder pipeline for the transfer of dangerous goods on site from the fuel farm to the apron with a throughput of 312m^3/day and a length of 1910m. REFER SDP PHASE 2 (ITEM 9 & 11) & VALVE CHAMBER LAYOUT PLAN (ITEM 24) APPENDIX 26.
15	*The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for —* *(i) the undertaking of a linear activity; or* *(ii) maintenance purposes undertaken in accordance with a maintenance management plan.*	The clearance of indigenous vegetation exceeds 20ha irrespective of the landing strip which is seen as a linear activity that qualifies for exclusion.

		REFER TO SDP PHASE 2 PLAN APPENDIX 26 (ITEM 7).
27	*The development of a road—* *(i) with a reserve wider than 30 metres; or* *(ii) catering for more than one lane of traffic in both directions;* *but excluding a road—* *(a) 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 Government Notice 545 of 2010, in which case activity 24 in Listing Notice 1 of 2014 applies;* *(b) which is 1 kilometre or shorter; or* *(c) where the entire road falls within an urban area.*	The proposed project entails the development of road infrastructure with more than one lane of traffic in both directions. REFER TO SDP PHASE 2 PLAN AND CONCEPT LAYOUT ROADS PLAN APPENDIX 26 (ITEM 7 & 13).

Listing Notice 3 (Regulation 324, GG40772 - 7 April 2017)		
Activity	**Description**	**Applicability**
1	*The development of billboards exceeding 18 square metres in size outside urban areas, mining areas or industrial complexes.* *(i) Western Cape - All areas outside urban areas, mining areas or industrial complexes.*	The proposed project includes the development of 12-15 billboards. REFER SDP PHASE 2 PLAN APPENDIX 26 ITEM 29.
2	*The development of reservoirs, excluding dams, with the capacity of more than 250 cubic metres.* *i. Western Cape* *i. A protected area identified in terms of NEMPAA, excluding conservancies;* *ii. In areas containing indigenous vegetation; or* *iii. Inside urban areas:* *(aa) Areas zoned for use as public open space; or* *(bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, or zoned for a conservation purpose.*	The proposed project requires development of reservoirs to hold potable water (TBC but > 250m^3), non-potable water (TBC but > 250m^3), fire water (TBC but > 250m^3) and emergency sewage (TBC but > 250m^3). REFER SERVICES PRECINCT SDP PHASE 2 PLAN C01, C04, C10 (FIRE WATER), C06 (SEWER) (ITEM 9). REFER TO CONCEPT LAYOUT FOUL SEWER ON SITE TREATMENT PLAN AND CONCEPT LAYOUT NON-POTABLE WATER PLAN APPENDIX 26 (ITEM 18, 19, 20).
3	*The development of masts or towers of any material or type used for telecommunication broadcasting or radio transmission purposes where the mast or tower –* *a) is to be placed on a site not previously sued for this purpose; and* *b) will exceed 15m in height –* *but excluding attachments to existing buildings and masts on rooftops.*	It is proposed to place a 25m high digital camera tower (DCT) to service the main runway and a 20m high digital camera tower (DCT) to service the secondary runway and heliport.

	i Western Cape *i. All areas outside urban areas* *ii. Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, or zoned for a conservation purpose, within urban areas: or* *iii. Areas zoned for use as public open space or equivalent zoning within urban areas.*	Visible elements that will exceed 15m in height are the remote-digital control towers (DCT) which will be stand-alone steel lattice masts. These will be mounted with cameras and lights. REFER D02.1 & D02.2 ON AIR SIDE PRECINCT SDP PHASE 2 PLAN APPENDIX 26 (ITEM 11). A manned control tower (ATCT) will also be included in the design. The tower is to be placed on the Operations Centre and will be a total height of 40m above ground level. REFER B14a ON SERVICES PRECINCT SDP PHASE 2 PLAN APPENDIX 26 (ITEM 9).
4	*The development of a road wider than 4 metres with a reserve less than 13,5 metres.* *i. Western Cape* *i. Areas zoned for use as public open space or equivalent zoning; ii. Areas outside urban areas; (aa) Areas containing indigenous vegetation; (bb) Areas on the estuary side of the development setback line or in an estuarine functional zone where no such setback line has been determined; or* *iii. Inside urban areas:* *(aa) Areas zoned for conservation use; or* *(bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority.*	The proposed project entails development of roads infrastructure. The site falls outside an urban area and contains indigenous vegetation. REFER TO SDP PHASE 2 PLAN AND CONCEPT LAYOUT ROADS PLAN APPENDIX 26 (ITEM 7 & 13).

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.* *Western Cape* *i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;* *ii. Within critical biodiversity areas identified in bioregional plans;* *iii. Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuarine functional zone, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas;* *iv. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning; or* *v. On land designated for protection or conservation purposes in an Environmental Management Framework adopted in the prescribed manner, or a Spatial Development Framework adopted by the MEC or Minister.*	The proposed development requires the clearance of more than 300m^2 indigenous vegetation. The clearance is not required for maintenance purposes in accordance with a maintenance management plan. The vegetation to be cleared is classified as critically endangered. REFER TO SDP PHASE 2 PLAN APPENDIX 26 (ITEM 7).
18	*The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre.* *Western Cape* *i. Areas zoned for use as public open space or equivalent zoning;* *ii. All areas outside urban areas:* *(aa) Areas containing indigenous vegetation; (bb) Areas on the estuary side of the development setback line or in an estuarine functional zone where no such setback line has been determined; or* *iii. Inside urban areas:* *(aa) Areas zoned for conservation use; or*	The proposed project entails expansion of existing road infrastructure. The site is located outside an urban area and contains indigenous vegetation. REFER TO SDP PHASE 2 PLAN AND CONCEPT LAYOUT ROADS PLAN APPENDIX 26 (ITEM 7, 13).

	(bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority.	
19	*The expansion of runways or aircraft landing strips where the expanded runways or aircraft landing strips will be longer than 1,4 kilometres in length.* *Western Cape* *i. All areas outside urban areas.*	The proposed project entails the expansion of the existing CWA landing strips to 3.5km, and the site is located outside an urban area. REFER TO SDP PHASE 2 PLAN APPENDIX 26 (ITEM 7).

NEM: WA - Applicable Norms and Standards:

During pre-application consultation with DEA&DP: Directorate Waste Licencing the following feedback was received:

"No Waste Licence application is required for the proposed project, but CWA will have to register in terms of "National Norms and Standards for the Storage of Waste" (GN926 of 29 November 2013) should the facility have the capacity to store more than 80m³ for hazardous waste and/or 100m³ for general waste at any one time and for a period exceeding 90 days.

Registration in terms of "National Norms and Standards for Sorting, Shredding, Grinding, Crushing, Screening, Chipping or Baling of General Waste" (GN1093 of 11 October 2017) if general waste is sorted, shredded, grinded, crushed, screened, chipped, or baled in an operational area at the facility exceeding 1000m². If the operational area in which waste is sorted, shredded, grinded, crushed, screened, chipped or baled does not exceed 1000m², the facility needs to register in terms of GN1093 only and adhere to section 28 of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, and sections 16(1) and 16(3) of the NEM: WA.

The biodigester resorts under the NEM: WA "National Norms and Standards for Organic Waste Treatment" (GN1984 of 1 April 2022) and no longer requires an application for a waste management licence. Facilities that have the capacity to process more than 10 tonnes of organic waste per day need to register in terms of and adhere to GN1984."

The following Norms and Standards are applicable to the project:

- National Norms and Standards for the Storage of Waste (GN 37088, 29 November 2013).
- National Norms and Standards for the Sorting, Shredding, Grinding, Crushing, Screening or Bailing of General Waste (GN 41175, 11 October 2017).
- National Norms and Standards for the Treatment of Organic Waste (GN 1984, 1 April 2022).
- National Norms and Standards for Organic Waste Composting (GN 561 in GG 44762 of 25 June 2021) read with GN 1757 in GG 45907 of 11 February 2022

A registration in terms of the Norms and Standards will be submitted to DEA&DP with a Waste Management Plan (WMP) during the Impact Assessment Phase of the proposed project. Please refer to the WMP attached as part of the EMPr Appendix 43 of this report for detailed waste management activities

NEM: AQA - South African National Air Quality Standards:

Category 2: *Petroleum Industry, the production of gaseous and liquid fuels as well as petrochemicals from crude oil, coal, gas or biomass:*

Subcategory 2.4: *Storage and Handling of Petroleum Products*

Description: *Petroleum products storage tanks and product transfer facilities*

Application: *All permanent immobile liquid storage tanks larger than 1 000m^3 cumulative tankage capacity at a site*.

The proposed project includes a fuel storage facility which will require authorisation from City of Cape Town to obtain an Atmospheric Emission Licence (AEL) in terms of the NEM: AQA due to Category 2 and specifically Subcategory 2.4: Storage and Handling of Petroleum Products being triggered.

A modular and flexible approach will be followed to construct the fuel storage containers in phases:

Jet-A1:

- 6x 80m^3 horizontals in 2028 (total capacity 480m^3),
- Adding an additional 4x 80m^3 horizontals in 2032 (total capacity 800m^3).
- The 3x 350m^3 vertical tanks should then be constructed and commissioned by 2038 (to bring the total to approximately 1850m^3).

Avgas:

Adding the Avgas tanks (2x 30m^3 + 1x 9m^3) – total storage 549m^3 in 2028, 869m^3 in 2032 and 1 919m^3 in 2038.

The commercial retail service station (4x 23m^3 underground storage tanks) does not form part of an AEL application.

The bulk diesel 2x 23m^3 vertical storage tanks for the backup generators will be in place by 2027.

From the estimated totals in the fuel storage farm, it is estimated that an AEL application is only likely in 2037.The authorisation process for the AEL will only be initiated with CoCT before CWA intents to exceed the 1000m^3 and not part of this EIA process. This has been clarified with CoCT:AQ.

Noise Regulations (GN R154 in GG13717 dated 10 January 1992):

Section 25 of the Environmental Conservation Act (ECA) Act 73 of 1989 promotes the development of Noise Regulations (GN R154 in Government Gazette No. 13717 dated 10 January 1992). The administration of the noise control regulations was devolved to provincial and local authorities, so in Western Cape, noise is regulated by the New Noise Control Regulations put forward in June 2013 (Provincial Gazette Number 7141 of 20 June 2013).

The disturbing noise and noise nuisance definitions according to the regulations:

"Disturbing noise" means a noise, excluding the unamplified human voice, which—

a) exceeds the rating level by 7dB(A);

b) exceeds the residual noise level where the residual noise level is higher than the rating level;

c) exceeds the residual noise level by 3dB(A) where the residual noise level is lower than the rating level; or

d) in the case of low-frequency noise, exceeds the level specified in Annex B of SANS 10103;

''Noise nuisance'' means any sound which impairs or may impair the convenience or peace of a reasonable person.

In Schedule 2 of the Noise Control Regulations, 2013, it is stipulated that a person may not:

a) cause a disturbing noise; or

b) allow a disturbing noise to be caused by any person, animal, machine, device, apparatus, vehicle, vessel or model aircraft, or any combination thereof.

In Schedule 3, regarding causing a noise nuisance, a person may not *build, make, construct, repair, rebuild, modify, operate or test a vehicle, vessel, aircraft, model aircraft or any other object, or allow it to be built, made, constructed, repaired, rebuilt, modified, operated or tested, in or near a residential area*.

In terms of Schedule 4 (1) of the Noise Control Regulations:

The local authority, or any other authority responsible for considering an application for a building plan approval, business license approval, planning approval or environmental authorization, may instruct the applicant to conduct and submit, as part of the application, a noise impact assessment in accordance with SANS 10328 to establish whether the noise impact rating of the proposed land use or activity exceeds the appropriate rating level for a particular district as indicated in SANS 10103, or where the noise level measurements cannot be determined, an assessment, to the satisfaction of the local authority, of the noise level of the proposed land use or activity.

In terms of Schedule 4 (3) of the Noise Control Regulations:

Where the results of an assessment undertaken in terms of sub-regulation (1) indicate that the applicable noise rating levels referred to in that sub-regulation will likely be exceeded, or will not be exceeded but will likely exceed the existing residual noise levels by 5 dB(A) or more, the applicant must provide a noise management plan, clearly specifying appropriate mitigation measures to the satisfaction of the local authority, before the application is decided; and implementation of those mitigation measures may be imposed as a condition of approval of the application.

In terms of Clause 4(4) of the Noise Control Regulations:

Where an applicant has not implemented the noise management plan as contemplated in sub-regulation (3), the local authority may instruct the applicant in writing to cease any activity that does not comply with that plan or reduce the noise levels to an acceptable level to the satisfaction of the local authority.

The World Health Organisation (WHO), together with the Organisation for Economic Co-ordination and Development (OECD) have developed their assessments on the effects of exposure to environmental noise resulting in several guideline values for different time periods and situations.

The WHO recommends a standard guideline value for average outdoor noise levels of 55dB(A) be applied during normal daytime, to prevent significant interference with the normal activities of local communities. The relevant night-time noise level is 45dB(A). In addition, the WHO recommends that during the night, the maximum level of any single event should not exceed 60dB(A) to protect against sleep disruption.

Ambient noise levels have also been specified for various environments (refer Table 5).

Table 5: WHO Guidelines for Ambient Sound Levels (Noise Scoping report, DDA, Sept 2023)

Environments	**Ambient Sound Level LAeq (dB(A))**			
	Daytime		**Nighttime**	
	Indoor	**Outdoor**	**Indoor**	**Outdoor**
Dwellings	50	55		
Bedrooms			30	45
Schools	35	55		

The OECD supports the levels recommended by the WHO, and in addition they suggest the following environmentally sustainable transport noise levels based on the (noise) receiving community (Refer Table 6).

Table 6: OECD Guidelines for Ambient Sound Levels (Noise Scoping report, DDA, Sept 2023)

Land Areas	**Max allowable ambient noise level**	
	Daytime	**Nighttime**
Urban	55	45
Rural	50	40

The SANS 10103 Code of Practice provides typical ambient noise rating levels (LReq,T) in various districts (refer Table 7 according to Table 2 in SANS 10103).

Table 7: Typical Rating Levels for Ambient Noise (Noise Scoping report, DDA, Sept 2023)

Type of district	Equivalent continuous rating level ($L_{Req.T}$) for noise (dB(A))					
	Outdoors			Indoors, with open windows		
	Day-Night $L_{R,dn}$1)	Day-time $L_{Req,d}$2)	Night-time $L_{Req,n}$2)	Day-Night $L_{R,dn}$1)	Day-time $L_{Req,d}$2)	Nighttime $L_{Req,n}$2)
a) Rural districts	45	45	35	35	35	25
b) Suburban districts with little road traffic	50	50	40	40	40	30
c) Urban districts	55	55	45	45	45	35
d) Urban districts with one or more of the following: workshops; business premises; and main roads	60	60	50	50	50	40
e) Central business districts	65	65	55	55	55	45
f) Industrial districts	70	70	60	60	60	50

Note: Daytime: 06:00 to 22:00, Night-time: 22:00 to 06:00.

1) Equivalent continuous rating levels that include corrections for tonal character and impulsiveness of the noise and the time of day.

2) Equivalent continuous rating levels that include corrections for tonal character and impulsiveness of the noise.

Table 8: Response Intensity and Noise Impact for Increases of the Ambient Noise (Noise Scoping report, DDA, Sept 2023)

Increase (dB)	Response Intensity	Remarks	Noise Impact
0	None	Change not discernible by a person	None
3	None to little	Change just discernible	Very low
3 - 5	Little	Change easily discernible	Low

5 - 7	Little	Sporadic complaints	Moderate
7	Little	Defined by South African National Noise Regulations as being 'disturbing'	Moderate
7 - 10	Little - medium	Sporadic complaints	High
10 - 15	Medium	Change of 10dB perceived as 'twice as loud', leading to widespread complaints	Very high
15 - 20	Strong	Threats of community/group action	Very high

The applicable SANS District for both the examined sensitive receptors is that of a Suburban Residential area with little road traffic, which has a guideline of 50dB(A) for day and 40dB(A) for night-time respectively.

A Noise Impact Assessment (inclusive of noise cones) is included in the Impact Assessment Phase of the proposed project with mitigation to be included in the EMPr.

The South African National Standard 1929 of 2009, Ambient Air Quality – Limits for Common Pollutants:

The South African National Ambient Air Quality Standards were published in GG32816 on the 24th of December 2009. These standards are based on international best practices and indicate safe exposure levels for most of the population.

The South African National Ambient Air Quality Standards are given in:

- The South African National Ambient Air Quality Standards (24 December 2009); and
- The National Ambient Air Quality Standard for Particulate Matter with Aerodynamic Diameter Less Than 2.5 Micron Meters (PM2.5) (29 June 2012) (Refer
- Table **9**).

Table 9: National Ambient Air Quality Standards (Air Quality Scoping report; DDA, Sept 2023)

Pollutant	Molecular Formula	Averaging Period	Concentration		Frequency of Exceedance	Compliance Date
			$\mu g/m^3$	ppb		
Sulphur Dioxide	SO_2	10 minutes	500	191	526	Immediate
		1 hour	350	134	88	Immediate

		24 hours	125	48	4	Immediate
		1 year	50	19	0	Immediate
Nitrogen Dioxide	NO_2	1 hour	200	106	88	Immediate
		1 year	40	21	0	Immediate
Carbon Monoxide	CO	1 hour	30,000	26,000	88	Immediate
		8 hours	10,000	8,700	11	Immediate
Particulate Matter	PM_{10}	24 hours	120	-	4	Immediate – 31 Dec 2014
			75	-	4	1 Jan 2015
		1 year	50	-	0	Immediate – 31 Dec 2014
			40	-	0	1 Jan 2015
	$PM_{2.5}$	24 hours	65	-	4	Immediate – 31 Dec 2015
		24 hours	40	-	4	1 Jan 2016 – 31 Dec 2029
		24 hours	25	-	4	1 January 2030
		1 year	25	-	0	Immediate – 31 Dec 2015
		1 year	20	-	0	1 Jan 2016 – 31 Dec 2029
		1 year	15	-	0	1 January 2030
Ozone	O_3	8 hours	120	61	11	Immediate
Lead	Pb	1 year	0.5	-	0	Immediate
Benzene	C6H6	1 year	10	3.2	0	Immediate – 31 Dec 2014
			5	1.6	0	1 Jan 2015

An Air Quality Impact Assessment is included in the Impact Assessment Phase of the proposed project with mitigation to be included in the EMPr.

Dust Fallout Guidelines:

On 1 November 2013, the Government Notice 827 - National Dust Control Regulations (NDCR) was published in terms of section 53 (O) of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004). The Regulations prescribe general measures for the control of dust in all areas, including residential and non-residential areas. The acceptable dust fall rates are set out in the Regulations for residential and non-residential areas as shown in Table 10.

Table 10: Acceptable Dust Fall Rates (Air Quality Scoping report; DDA, Sept 2023)

Restriction Area	**Dust Fall Rate (D) ($mg/m^2/day$) (30-day average)**	**Permitted Frequency of Exceeding Dust Fall Rate**
Residential area	D < 600	Two within a year, not sequential months.
Non-residential area	600 < D < 1200	Two within a year, not sequential months.
NOTE: the method to measure dust fall rate and the guideline for locating sampling points shall be ASTM D1739: 1970, or an equivalent method approved by any internationally recognised body.		

The South African Bureau of Standards (SABS) has published dust deposition standards that are based on the cumulative dust fall levels in the South African National Standard (SANS) 1929:2011. Four bands have been developed against which dust fallout can be evaluated (refer Table 11).

Table 11: Bands of Dust Deposition Rates Issued by SANS 1929 of 2005 (Air Quality Scoping report; DDA, Sept 2023)

No	**Band Description Label**	**Dust Fallout Rate (D) ($mg/m^2/day$) (30-day average)**	**Comments**
1	Residential	D < 600	Permissible for residential and light commercial.
2	Industrial	600 < D < 1200	Permissible for heavy commercial and industrial.
3	Action	1200 < D < 2400	Requires investigation and remediation if two sequential months lie in this band, or more than three occur in a year.

4	Alert	2400 < D	Immediate action and remediation required following the first incidence of the dust fallout rate being exceeded. Incident report to be submitted to the relevant authority.

An Air Quality Impact Assessment is included in the Impact Assessment Phase of the proposed project with mitigation to be included in the EMPr.

The Civil Aviation Regulations:

Section 155(m)(iv) of the Civil Aviation Act 13 of 2009, makes provision for general operating rules, flight rules and air traffic rules in respect of civil aviation, including prevention of nuisances arising from air navigation, aircraft factories, aerodromes, or other aircraft establishments. This includes the prevention of nuisance due to noise or vibration originating from the operation of machinery in aircraft on or above aerodromes.

Part 139 of the Regulations provide minimum standards and recommended practices on design and operation of aerodromes and heliports. The list below highlights some of the main parts that are relevant to the proposed development:

- General Aviation and Operating Flight Rules,
- Aerodromes and Heliports,
- Airspace and Air Traffic Services,
- Flight Procedure Design,
- Meteorological Information Services,
- Aeronautical Information Services,
- Instrument Flight Procedures, and
- ICAO Aeronautical Charts.

The proposed project is consistent with the **Civil Aviation Regulations** as the design and operation of the proposed expanded CWA is based on these regulations.

4.3 Policy Framework applicable to the proposed development

Climate Change Policy:

Government's National Climate Change Response Policy (NCCRP) was approved in October 2011 and was formally published as a White Paper in GG 34695, Notice No. 757. The motivation was to effectively manage climate change impacts through interventions that build and sustain South Africa's social, economic and environmental resilience and emergency response capacity, whilst also making a fair contribution to the global effort to stabilize Greenhouse Gas (GHG) concentrations in the atmosphere at a level that avoids dangerous anthropogenic interference with the climate system within a timeframe that enables economic, social and environmental development to proceed in a sustainable manner.

Following on this the National Climate Change Adaptation Strategy (NCCAS) was released in 2020 to provide a common vision of climate change adaptation and climate resilience for the country. It is based on the National Development Plan, the National Strategy for Sustainable Development, the adaptation commitments included in its Nationally Determined Contributions, sector adaptation plans, provincial adaptation plans and municipality adaptation plans. The NCCAS serves as South Africa's National Adaptation Plan and fulfils South Africa's commitment to its international obligations as outlined in the Paris Agreement under the United Nations Framework Convention on Climate Change (UNFCCC).

The main objectives are:

1) Build climate resilience and adaptive capacity to respond to climate change risk and vulnerability.
2) Promote the integration of climate change adaptation response into development objectives, policy, planning and implementation.
3) Improve understanding of climate change impacts and capacity to respond to these impacts.
4) Ensure resources and systems are in place to enable implementation of climate change responses.

While the National Climate Change Act 22 of 2024 has been promulgated, it is not yet in force as the President must still proclaim its commencement under section 38.

The 2014 Western Cape Climate Change Response Strategy was replaced by the Western Cape Climate Change Response Strategy Vision 2050: A vision for a resilient Western Cape (dated March 2022) which provides policy direction in response to climate-related risks and potential opportunities on a local government level by either creating or leveraging systemic innovative response programmes that tackle the region's vulnerability to droughts, heat and floods and take advantage of opportunities that will enable climate resilient development which fosters economic growth that is low-carbon and further creates an advanced Green Economy.

The main objectives are:

1) Responding To the Climate Emergency – Focus mainly on disaster management response, ensuring that spatial planning and development planning reduces risks to people, infrastructure, and assets.
2) Transitioning in an Equitable and Inclusive Manner to Net Zero Emissions By 2050 - Two crucial transitions are (1) a shift from internal combustion engines to electric mobility, and (2) a massive shift from fossil fuel-based energy to renewable energy sources.
3) Reducing Climate Risks and Increasing Resilience - through adaptation measures (humans and nature) and through well-managed natural systems, that can cope with the increasing climate impacts.
4) Enabling A Just Transition Through Public Sector, Private Sector and Civil Society Collaboration.

In 2019, the City of Cape Town (CoCT) Climate Change Policy (2017) was reviewed and substantively amended to form a strategy with supporting policies, by-laws, and action plans as subsidiary instruments. The City of Cape Town Climate Change Strategy (2021) identified 10 Strategic Focus Areas (SFAs) identified as being critical to ensuring the implementation of the CoCT climate change vision and principles. SFA 1 to 5 are climate change adaptation focused, SFA 6 has elements of both climate change adaptation and mitigation, and SFA 7 to 10 are climate change mitigation focused.

The City of Cape Town Climate Change Action Plan (2022) provides the local context and details the actions required to fulfil this strategic vision, whilst enabling and supporting local innovative opportunities for environmentally sustainable economic and social development.

The Cape Winelands Airport (CWA) proposed expansion project has aligned itself with the National, Provincial and Local government vision and strategies of climate change and sustainable development. A Climate Change Impact Assessment is included for the Impact Assessment Phase of the proposed project, with possible mitigation to be included in the EMPr.

The United Nations Sustainable Development Goals (SDG's) interconnect environmental, social and economic aspects of sustainable development by emphasizing sustainability.

The 17 SDGs are: No poverty (SDG 1), Zero hunger (SDG 2), Good health and well-being (SDG 3), Quality education (SDG 4), Gender equality (SDG 5), Clean water and sanitation (SDG 6), Affordable and clean energy (SDG 7), Decent work and economic growth (SDG 8), Industry, innovation and infrastructure (SDG 9), Reduced inequalities (SDG 10), Sustainable cities and communities (SDG 11), Responsible consumption and production (SDG 12), Climate action (SDG 13), Life below water (SDG 14), Life on land (SDG 15), Peace, justice, and strong institutions (SDG 16), Partnerships for the goals (SDG 17).

According to a preliminary study conducted by industry specialists the proposed CWA project is aligned with several SDGs.

CoCT Environmental Management Framework (EMF):

The CoCT EMF is integrated into the CoCT MSDF.

The Northern District Integrated district spatial development framework and environmental framework (dated March 2022) highlights development guidelines for management of environmental resources in relation to Environmental Management Zones.

The following applies to the proposed project and will be incorporated into the design and management where applicable in order to align the proposed project with the CoCT EMF:

a) Rivers, Estuaries, Wetlands and their associated buffers:
- Increase infiltration capacity in river corridors and wetlands through water sensitive urban design practices and sustainable urban drainage systems such as permeable paving, sustainable water storage systems and appropriate landscaping;
- Incorporate stormwater quality and quantity management into redevelopment proposals in line with the Management of Urban Stormwater Impacts Policy regarding treatment and management of water at source.

b) Aquifers:
- Redevelopment and new development should give preference to the use of permeable surfaces and consider vegetated infiltration zones where appropriate to protect and enhance water sensitivity and aquifer recharge capability of various land uses;
- Aquifer re-charge areas and sole-source aquifers should be protected from potential sources of pollution.

National Water Resources Management Strategy (NWRMS):

The NWRMS sets out the strategy to plan, develop, manage, protect, and control the use of South Africa's water resources effectively for the future.

The latest Water Sector Priority Focus Areas 2020 to 2030 are:

- Reducing water demand and increasing supply
- Redistributing water for transformation,
- Managing water and sanitation services under a changing climate,
- Regulating the water and sanitation sector,
- Improving raw water quality,
- Protecting and restoring ecological infrastructure for the green economy,
- Creating effective water sector institutions,
- Promoting international cooperation,
- Building capacity for action,
- Ensuring financial sustainability,
- Managing data and information in line with 4IR and global knowledge,

- Enhancing research, development, and innovation,
- Addressing legislative and policy gaps.

The proposed development will align with the following priority focus areas in line with its aim to be sustainable and water resilient in the long term:

- Reducing water demand
- Managing water and sanitation services under a changing climate
- Protecting and restoring ecological infrastructure for the green economy.

National Development Plan 2030 (NDP 2012):

The National Development Plan (NDP, National Planning Commission, 2012) sets out six interlinked priorities:

- Uniting all South Africans around a common programme to achieve prosperity and equity;
- Promoting active citizenry to strengthen development, democracy and accountability;
- Bringing about faster economic growth, higher investment and greater labour absorption;
- Focusing on key capabilities of people and the state;
- Building a capable and developmental state; and
- Encouraging strong leadership throughout society to work together to solve problems.

While the achievement of the objectives of the National Development Plan requires progress on a broad front, one of the fundamental factors is raising employment through faster economic growth. A sustainable increase in employment will require a faster-growing economy and the removal of structural impediments, such as poor-quality education or spatial settlement patterns that exclude the majority. These are essential to achieve higher rates of investment and competitiveness and to expand production and exports. However, business, labour, communities, and government will need to work together to achieve faster economic growth (p.30).

In summary, the NDP proposes to enhance human capital, productive capacity, and infrastructure to raise exports, which will increase resources for investment and reduce reliance on capital inflows. Higher investment, supported by better public infrastructure and skills, will enable the economy to grow faster and become more productive.

Rising employment and productivity will lead to rising incomes and living standards and less inequality. Shifting the economy towards more investment and lower consumption is thus necessary for long-term economic prosperity. In addition, more efficient and competitive infrastructure is required to facilitate economic activity that is conducive to growth and job creation (p.42).

The NDP identified nine main challenges facing the country and approaches to tackle these. The NDP's key objectives to be achieved by 2030, are to eliminate income poverty and reduce inequality. Of relevance are the NDP's spatial priorities for building the required national capabilities. In terms of

Urban and Rural Transformation, the NDP's human settlement targets include more people living closer to their places of work, better quality public transport and more jobs in proximity to townships (p. 68). To achieve these targets, it advocates strong measures to prevent further development of housing in marginal places, increased urban densities to support public transport, incentivising economic activity in and adjacent to townships and engage the private sector in the Gap housing market (p.47).

The NPD sets out six interlinked priorities that include enabling faster economic growth, higher investment, and greater labour absorption. The proposed project subscribes to the NDP principles when considering the large-scale investment into the region, the increased economic activity, and the resultant expected employment opportunities. The development is also expected to reduce the cost of flying for the region, uniting South Africans further by make air-travel more accessible to the public.

Western Cape Provincial Spatial Development Framework (WCPSDF) 2014:

The Western Cape Provincial Spatial Development Framework (2014) refers to the importance of a coherent framework for the Province's urban and rural areas that give spatial expression to the National and Provincial development agendas, among others. Its guiding principles include the following:

- **Spatial justice**: Past spatial and other development imbalances should be redressed through improved access to and use of land by disadvantaged communities.
- **Sustainability and resilience**: Land development should be spatially compact, resource-frugal, compatible with cultural and scenic landscapes, and should not involve the conversion of high-potential agricultural land or compromise ecosystems.
- **Spatial efficiency**: Efficiency relates to the form of settlements and use of resources - compaction as opposed to sprawl; mixed-use, as opposed to mono-functional land, uses; residential areas close to work opportunities as opposed to dormitory settlement, and prioritisation of public transport over private car use.

In terms hereof, the logical underpinning of the spatial strategy of the WCPSDF covers the following (p. 34):

- Capitalise and build on the Western Cape's comparative strengths (e.g. gateway status, knowledge economy, lifestyle offering) and leverage the sustainable use of its unique spatial assets;
- Consolidate existing and emerging regional economic nodes as they offer the best prospects to generate jobs and stimulate innovation;
- Connect urban and rural markets and consumers, fragmented settlements and critical biodiversity areas (i.e., freight logistics, public transport, broadband, priority climate change ecological corridors, etc.); and

- Cluster economic infrastructure and facilities along public transport routes (to maximise the coverage of these public investments) and respond to unique regional identities within the Western Cape.

The Province's economic prospects clearly lie in the urban space economy (i.e. the metropolitan area), with public infrastructure investment forecasted to be the leading driver of growth. Several of the key concepts related to the space-economy policies refer to the following (as adapted) (p. 76):

- Reinforce the Cape Metro region as the Province's economic engine;
- Use any new bulk economic infrastructure investment in the Cape Metro functional region to leverage private sector and community investments (i.e., energy, water, transport and freight logistics, ICT);
- Build 'land assembly' capacity in the urban space-economies and apply new land policy instruments (e.g., land banking, land value capture, etc.);
- Incentivise mixed land use and economic diversification in urban land markets;
- Regenerate and revitalise existing economic nodes in the urban space-economy (i.e., CBDs, etc.);
- Prioritise public transport investment and higher-order facilities in district centres; and
- Prioritise rollout of the 'greener' economy.

The proposed Cape Winelands Airport development is consistent with the **WCPSDF** as it will contribute toward private sector investment, reinforce the Cape Metro economy, and create additional employment (in the transport and construction sectors) that will further strengthen growth in the local economy. The project addresses spatial efficiency to some extent, i.e., mixed-use as opposed to mono-functional land uses.

Western Cape Biodiversity Spatial Plan (WCBSP), 2017:

The Western Cape Biodiversity Spatial Plan (WCBSP) is a spatial tool that forms part of a broader set of national biodiversity planning tools and initiatives that are provided for in national legislation and policy. It comprises the Biodiversity Spatial Plan Map of biodiversity priority areas, accompanied by contextual information and land use guidelines that make the most recent and best quality biodiversity information available for use in land use and development planning, environmental assessment and regulation, and natural resource management.

The main purpose of a biodiversity spatial plan is to ensure that the most recent and best quality spatial biodiversity information can be accessed and used to inform land use and development planning, environmental assessments and authorisations, natural resource management and other multi-sectoral planning processes. A biodiversity spatial plan achieves this by providing a map of terrestrial and freshwater areas that are important for conserving biodiversity pattern and ecological processes – these areas are called Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs).

The specialist reports prepared as part of the Scoping report made use of the WCBSP as part of the site baseline assessment and guidance on the assessment of sensitive areas.

City of Cape Town Integrated Development Plan (IDP) (2022-2027):

The IDP for CoCT confirms the vision to be "*a City of Hope for all – a prosperous, inclusive and healthy city where people can see their hopes of a better future for themselves, their children and their community become a reality*". To achieve this vision, six focus areas are outlined in the IDP (ECONOMIC GROWTH, TRANSPORT, SAFETY, BASIC SERVICES, HOUSING, PUBLIC SPACE, AMENITIES AND ENVIRONMENT), of which the most important is ECONOMIC GROWTH.

ECONOMIC GROWTH: *The guiding priority for everything CoCT does is to support meaningful and faster economic growth that enables people to uplift themselves out of poverty. Economic growth is needed to rekindle our hope in a more prosperous future for all*.

TRANSPORT: Efficient and sustainable public transport and quality road networks are key enablers to businesses, workers, and job seekers. A city that is better connected will be more productive and create more economic opportunities. The CoCT will work to make it safer and cheaper for all people to travel, increasing their freedom to enjoy all that the city has to offer. The city must be built on the right foundations if it is to succeed in becoming a *City of Hope*, and being a prosperous, sustainable, and inclusive city in the long term.

The proposed development is consistent with the focus areas of the CoCT IDP as it will ensure a substantial direct investment into the City of Cape Town and is also represents a significant indirect investment in the area. Direct jobs will be created that will benefit the communities in the surrounding areas during the construction and operational phases. It will directly support the transport sector by delivering additional capacity and providing airport redundancy for the City of Cape Town, promoting unrestricted/ uninterrupted air access into the region.

City of Cape Town Inclusive Economic Growth Strategy (2021):

The City of Cape Town Economic Growth Strategy (EGS) (2013) indicated its principal objectives to grow the economy and create jobs. It supported the overarching objective of the *Opportunity City* stated in the City of Cape Town (IDP 2012-2017). The EGS 2013 was replaced by the CoCT Inclusive Economic Growth Strategy (IEGS) in 2021, which feeds into the IDP 2022-2027.

The IEGS is structured around four focus areas.

- Business Facilitation, Retention and Expansion considering specific needs of businesses, challenges faced when competing within existing sectors, and barriers to growth for new sectors and to a more just economy that is sustainable, low carbon and resilient.

- Labour Market Support for supply-side challenges, specifically around skills deficiencies and job-seeking inefficiencies.
- Stimulating Investment through proactively seeking out new economic entrants to the local market, and marketing and relationship-building efforts domestically and internationally.
- Quality Service Provision to create a business-friendly environment that meets the basic needs of individuals and companies in a stable, reliable manner to reduce risk and inequalities.

The Cape Winelands Airport development is consistent with the four focus areas of the IEGS as it is anticipated to have a significant positive economic impact in the following areas:

- Job creation opportunities.
- Increased route profitability for existing airlines flying into Cape Town.
- Improved business case for future airlines, considering a new route into Cape Town in the future.
- Increased trade opportunities through the provision of additional air cargo capacity.
- Airport redundancy, ensuring air access into and from Cape Town (unhindered trade and travel).
- Growth in GGP.
- Growth in household income.

City of Cape Town Municipal Spatial Development Framework (MSDF) (2023):

Fundamental to the City's Municipal Spatial Development Framework (MSDF) is to ensure spatial transformation via dense and transit-oriented growth and development anchored by an efficient transport system. The 2012 MSDF projected long-term growth along two northern corridors, namely Durban Road and Darwin Road. The 2018 MSDF emphasised a progressive spatial transformation agenda and an inward growth focus for "an inclusive, integrated and vibrant Cape Town that substantially countered the inter-generational legacies of apartheid and provided the foundation for sustainable, inclusive spatial and economic growth". The 2022-2027 IDP sets out the vision to create a *City of Hope* – "*a demonstration of what is possible in South Africa if we work together – and living proof that South African cities can be places where people's life steadily improve, and poverty is overcome*". This implies a commitment to address spatial injustice, inequality and avoids the creation of new structural imbalances; working in partnership with the private and public sector in achieving spatial transformation by building a more inclusive, integrated, vibrant, and healthy city; and proactively responds to social, economic, climate and resource shocks and stresses.

According to Multi-Purpose Business Solutions "*the inward growth focus of the 2022-2027 MSDF (City of Cape Town, 2023b) directly supports the City's resilience and sustainability efforts and is a response to built environment stresses, such as urban sprawl. These stresses typically place the greatest burden* *on the poorest members of Cape Town society who: commute the longest distances between home and work locations; pay the greatest percentage of household income towards fares; and spend the most time getting to and from places of work. The 2022-2027 MSDF identified three main spatial strategies:*

- *Spatial strategy 1: Plan for economic growth and improve access to economic opportunities.*
- *Spatial strategy 2: Manage urban growth, and create a balance between urban development, food security and environmental protection.*
- *Spatial strategy 3: Building an inclusive, integrated, vibrant and healthy city.*

Specific reference is made to the Cape Town International Airport (p. 41), "one of Cape Town's primary freight and logistical links to global commercial markets. Retention and expansion of airport infrastructure, and intensification of associated land uses, support both the regional economy as well as job creation. Its continued role in aviation and related land uses surrounding the airport should be encouraged and actively supported. Migration of general aviation activity from CTIA to Cape Winelands Airport should be supported to promote better operational efficiencies for aviation. Other Civil Aviation Authority accredited landing strips, flying schools, as well as farms and other recreational landing areas, will continue to play a smaller role, even in the regional context."

The following policies specifically refer to the CWA:

- *Policy 5.2 Support intensification of land uses at CTIA and the CWA that enhance Cape Town's aviation enabled competitive advantage. Maintain a network of airfields used for civil aviation purposes, such as Morningstar.*
- *Policy 16.9 Support the CTIA to continue providing the national and international aviation function to a limit that is determined by its manageable impact on surrounding land uses (noise impacts). CoCT, ACSA and other aviation / airport operators to consistently engage for long-term noise monitoring and mitigation measures with*
- *Policy 16.13 Support complimentary and appropriate land development at the Cape Winelands Airport that will contribute to the efficiency of CTIA in terms of general aviation and related uses."*

The proposed development is consistent with the spatial strategies of the CoCT as it represents a private investment to establish a new economic and transport hub. It will contribute to creating and attracting investment that will facilitate economic growth and employment opportunities, while also addressing the need for improved aviation services in the CoCT.

The UDE is a management tool that forms part of the MSDF, which aims to protect areas of agricultural significance and critical natural assets from development pressures and does not allow urban development beyond the UDE line. The proposed development falls partially outside the UDE, and this is seen as a deviation from the MSDF, with site site-specific circumstances, as stipulated in section 9(1) of the City of Cape Town Municipal Planning By-Law (MPBL).

Northern District Plan (2023):

A District Plan is a framework of policies and plans that will guide the physical development of a district (in the same way that the City's SDF will guide the development of the City). The District Plan, along with the City's SDF and local plans are used by the CoCT to apply spatial concepts and structuring elements to the district.

The current CWA falls within Sub-district 3 (Lucullus Road/Maroela Road Corridor) that covers the areas East of the Malmesbury rail line, South of the R312 and South of the N1 freeway. What is of particular importance, is that the areas to the West and South of the CWA have been earmarked for residential development.

The technical document on the Northern District Plan allows for amending the urban development edge to provide for inclusion of Cape Winelands Airport as well as rounding off the urban development edge to the North of the R312 (Lichtenburg Road) and to encourage and support the development of the airport to address market needs in the area. Also, to encourage development of inter-dependent associated economic activities and the maximisation of economic opportunity within and in immediate proximity around the airport property, as appropriate.

The Sub-district 3 development guidelines acknowledges that *the airfield, located directly north of the R312, operates under private ownership. Any extension to the existing operations, or application for amendment of approvals (existing) need to follow due process, as may be prescribed.*

According to H&A Planning *the proposed expanded Cape Winelands Airport landside development falls predominantly in sub-district 3 and is indicated a* ***New Development Area*** *with the eastern boundary as a* ***Core Biodiversity Area of Coincidence****. The parts outside of the UDE falls within sub-district 4 and is shown as an* ***Area of Agricultural Significance****. With the majority of the landside proposals falling under Sub-district 3, the Cape Winelands Airport receives special attention as one of three designated "New Development Areas" (NDAs).*

Regarding the portions identified on the Biodiversity Map and SDF Plan areas of high biodiversity value, detailed ground- truthing needs to establish the extent and conservation value of those portions. To round off the urban development edge in the area to the North of the R312, CA 175/2 & 724/9 are included inside the urban development edge, and may be considered for industrial development, together with CA 175/1, to increase employment for the Fisantekraal community. Access onto the R312 needs to be resolved by applicants prior to development of proposals, which should include pedestrian movement across the R312.

Note that for any development proposals located within the noise contour zones around the airfield, the relevant authority should be consulted with regards to the applicable noise regulations and the type of development (i.e., residential, or non-residential) that could be permitted to ensure that appropriate mitigation measures are put in place, where necessary.

The AOLS (Airport obstacle limitation services) limit building heights of developments located in proximity to the airport flight paths. These developments are subject to comment from the South African Civil Aviation Authority. The OLS Height Limitations report (Appendix 20) determines these height limitations in relation to the proposed CWA development.

The Sub-district 3 area includes Fisantekraal, Joostenbergvlakte, Bloekombos and Scottsdene Area. The Sub-district covers the area to the East of the Malmesbury rail line, South of the R312 and the area South of the N1 freeway, and includes the Botfontein smallholdings, part of Brackenfell, Crammix, Scottsdene, Wallacedene, Bloekombos, Belmont Park, Kruisfontein smallholdings, Joostenbergvlakte and the area North thereof, Fisantekraal, Greenville Garden Cities and the area known as Bella Riva.

Sub-district 4 includes Philadelphia, Mikpunt, Klipheuwel, Durbanville Winelands / Agricultural and rural hinterland, and extends from the N7 in the West to the municipal boundary in the North and East and the Sub-district 3 boundary in the South and South-East.

5. PROJECT CONTEXT, NEED AND DESIRABILITY, SUSTAINABILITY AND CLIMATE CHANGE

This section provides a short summary of CWA's history which provides context for understanding the proposed expansion.

5.1 Development Context

The CWA site was constructed in approximately 1943 – preceding even Cape Town International Airport – before being transferred to the local municipality in the 1960s. Built by the government at the time, this particular site was chosen above all other available options due to the area's favourable topography and positioning from a technical aviation perspective. It was released into private hands in 1993 before being acquired by Cape Winelands Airport Ltd in November 2020.

The current airport site is zoned Transport 1 with consent for an airport, and it falls within the City of Cape Town municipality. The remaining extent (adjacent parcels) of the planned expansion are zoned Agriculture, with future rezonings still to take place.

The airport currently has a valid Category 1 Aerodrome License (number 0820) from the Civil Aviation Authority (CAA), designating the aerodrome as "Cape Winelands" with ICAO code "FAWN".

Current aviation activity at the airport consists of flight training, recreational flying, charter, and other unscheduled General Aviation (GA) activity. All flights operate under visual flight rules (VFR) and primarily make use of the runway 05-23 and 14-32 depending on wind conditions.

Flight activity at the airport averages approximately 100 air traffic movements per day, with variation based on weather conditions, seasons, and day of the week.

5.2 Need and Desirability

Cape Winelands Airport's objective is to adopt an embedded sustainability approach – prioritising, people, planet and profit. The aim is that sustainability will be fully integrated into all elements of the business.

Based on sound commercial principles, CWA will create shareholder value while positively contributing to the South African economy, enabling commercially driven investment, and making a direct economic impact. Embracing the role that CWA can play in improving lives and livelihoods it will actively work with the communities closest to the airport. With the increasing awareness of finite resources that the planet has to offer CWA intends to adopt environmentally responsible methods in all their operations.

Airports are an invaluable asset for the communities they serve, helping them to develop their full economic potential and ensure stable growth, bolstering long-term business development and employment (Airports Council International).

Airports are known drivers of commercial activity, harnessing the power of the multiplier effect to stimulate economic growth far beyond its own borders. The Western Cape is currently thriving, experiencing excellent year-on-year growth in terms of economic activity and population. For this growth to continue, new growth nodes, unrestricted air access, and the ease of connectivity, are essential.

Cape Town as a city is unique in that its geographically isolated from other cities around the world yet enjoys a substantial amount of air traffic. With the expansion of CWA into a commercial airport, Cape Town will become a "Multi-Airport City" which addresses multiple capacity constraints thereby enabling new growth opportunities and substantially improving the attractiveness and competitiveness of the region. In addition, CWA has an opportunity to harness the power of multi-airport cities to create a positive impact on the environment by reducing the carbon footprint resulting from air travel into the region. The importance of this is ever-increasing as the industry shifts its focus towards creating a greener planet, as outlined in IATA's global "net-zero carbon by 2050" target (International Air Transport Association). This is further expanded in the "Alternate Airport" subsection below.

Cape Town International Airport (CTIA) currently serves as the primary gateway to Cape Town. While CTIA is a well-established airport, the city has enjoyed tremendous growth in tourism, semigration and population, placing pressure on its transport systems. Although CTIA has future expansion plans to increase its capacity, there are multiple links in the value chain that can only be addressed by the introduction of a second airport, which once addressed will result in a net-gain in terms of air travel for the region.

The approach towards Cape Winelands Airport's (CWA) introduction into the market is one of measured conservatism with CWA expected to process 5 million passengers per annum over 25 years. CWA is expected to gain 25% market share (5 million of 20 million). This equates to CWA's own incremental growth of market share of a very gradual 1% per annum.

Considering the major capital expansion project that CWA is embarking on, which includes a 3.5km runway, the gradual traffic growth may seem misaligned. However, a critical reason for CWA implementing such infrastructure in Phase 1 is not just about scheduled passenger growth at its own airport – it is to specifically unlock the benefits enabled to the airline sector from Phase 1 by introducing a much closer alternate airport for the purposes of diversions and fuel planning on flights inbound to CTIA. To perform the role of an alternate for flights inbound to CTIA from Phase 1, it is a technical requirement for CWA to provide similar levels of runway capability as CTIA, hence the proposed runway length. The Alternate Aerodrome Feasibility Study by Munich Airport International GmbH (April 2024) (Appendix 23) analysed the general suitability of CWA as a destination alternate aerodrome for CTIA. **The study carried out confirms that CWA will be classified as an operational aerodrome by airlines, meeting all requirements of an operational aerodrome.** Besides CWA, only two South African airports provide a suitable destination alternate aerodrome for CTIA: Durban and OR Tambo Airport are able to handle all aircraft types flying to CTIA. However, the high elevation of OR Tambo Airport means that certain types of aircraft cannot take off with their maximum take-off weight. The proposed CWA fulfils all the requirements to be able to function as a destination alternate aerodrome for all aircraft types flying to CTIA. Based on the significant fuel saving for airlines, which result from planning CWA as destination alternate aerodrome for CTIA, the study concluded that CWA could be the preferred destination alternate for CTIA in the future.

The aviation sector is broad and complex, with multiple unique, heterogenous sub-sectors. The aviation sector is also currently served by multiple airport different operators, each serving different and overlapping roles. CWA aims to fulfil several key roles within the aviation sector, unlocking new markets while enhancing existing ones and creating further opportunities within the sector, significantly improving the socio-economic landscape within the region. It is important to note that CWA's role – even when considering the other operators in the market – will have an enhancing effect on the aviation sector for existing operators, as opposed to a mere redistribution of the market to existing sub-sectors.

Accordingly, CWA will fulfil the following roles within the Cape's air travel market, each expanded on further below:

1. ***Cape Town's Second Commercial Airport*** offering scheduled airline services for domestic and international passenger and cargo operations
2. ***Alternate Airport*** for diversion and fuel planning purposes, enabling significant efficiencies for the airline sector
3. ***General Aviation Airport*** for domestic and international, unscheduled, and private operations,
4. ***Reliever Airport***, adding redundancy and diversion capability for aircraft in the region,

5. ***Logistics Hub*** catalysing multi-modal commercial activity in the region and stimulating economic growth,
6. ***Commercial Property Developments*** stimulated and enabled by the above.

5.2.1 Cape Town's Second Commercial Airport

As one of the most popular tourist destinations in Africa, air travel into Cape Town is expected to double by 2050. CWA as a designated airport will generate its own traffic, facilitating domestic and international scheduled airline services and performing a complementary role to the existing Cape Town International Airport and the region by providing an injection of needed capacity (specifically during peak hours). Given the location, CWA is well positioned to provide a convenient and safe airport option for residents in the Cape Metropole and beyond. Road access to the site is through various safe routes and the site does not pose restrictions and risk to expansion through squatting and land invasion. The added capacity and convenience will in turn reduce the cost of flying and travel time on the roads for residents, thereby making air travel more affordable and accessible for South Africans.

Individual factors have been addressed below:

a) Market Demand & Capacity

CWA's market strategy is informed by research, data and extensive industry consultations. Amongst other factors, it delineates between regional-international and intercontinental scheduled services. As part of the strategy, unique opportunities have been identified. This is the basis on which CWA is willing to make a significant investment, and covers the following markets:

- Domestic scheduled services
- CWA as an international airport will contribute towards the growth and retention of current regional-international markets which are currently underserved
- CWA as an international airport will attract new regional-international markets which are currently unserved
- Intercontinental Scheduled Services
- CWA as an international airport will contribute towards the growth and retention of current inter-continental markets which are currently underserve

CWA has engaged extensively with industry to determine and gauge the interest in its proposed development – this includes letters of support from major airlines and associations representing industry. As a private developer it has an obligation and fiduciary duty to ensure its funds are invested wisely. To this end, CWA's plans have been informed by industry, responding directly to demand.

To expand and verify the above, CWA commissioned its own independent air traffic forecast by world renown airport planners – Netherlands Airport Consultants (NACO) – to analyse the market and its operators to determine the prospective demand for direct air services at CWA. This process also critically involved interviews with the domestic airlines to understand their interest, fleet, concerns and growth plans. It was on this basis that CWA was forecast by NACO to process 5 million passengers per annum by 2050 out of the total 20 million passengers into the city. CWA will process just 25% of the market. This equates to an increase in market share of just 1% per year.

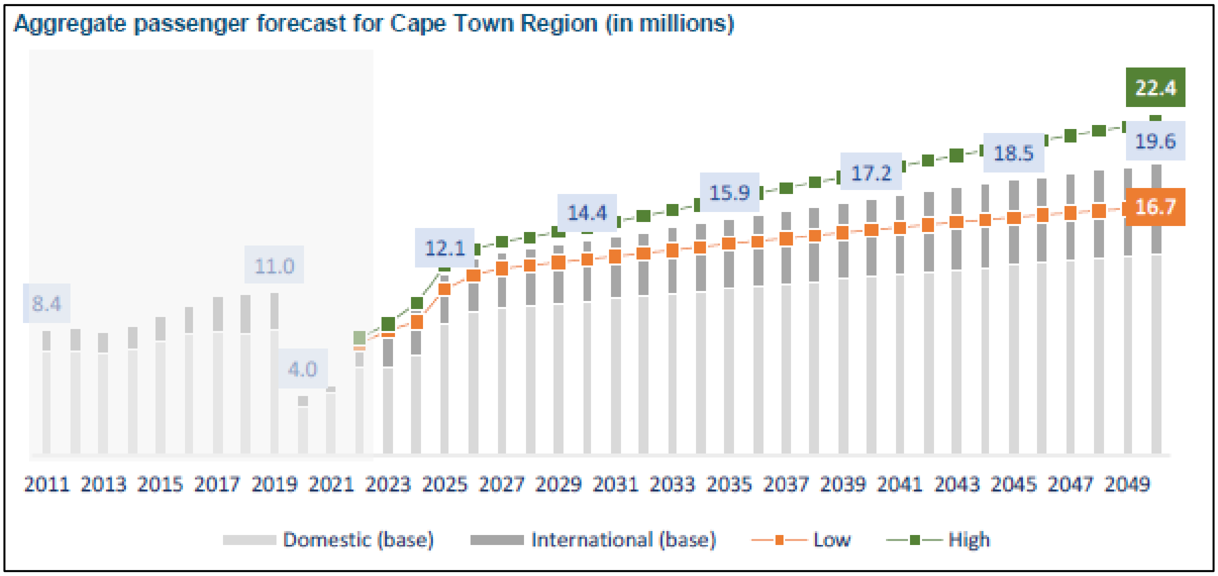


Figure 9: Projected passenger forecast (NACO Traffic forecast, 2023)

Capacity within the air transport environment depends on not just a terminal size, but rather all components within the value chain – specifically "runway slot capacity" during peak periods. Although CTIA has plans to expand certain elements of its airport, the plans do not address the fact that CTIA will still only have one main functional runway, where only a defined number of movements can be processed per hour. CWA has developed and approved its own airport masterplan to respond to its anticipated growth in operations. It must be noted that it is not infrastructure that drives demand, but rather it is demand that drives infrastructure.

b) Choice & Geographical Placement

Cape Town is surrounded by 180 degrees of ocean, resulting in urban expansion being concentrated in the directions of the national highways, ie N7/N1/N2, however specifically along the North-Eastward N1 growth corridor. Because CTIA is located along the southern national highway (N2) and as development continues to develop North and North-East from Cape Town, it places additional pressure on the existing road network as travellers are required to travel further and further to reach the existing CTIA. This is further exacerbated by the substantial growth seen in neighbouring towns of Paarl, Stellenbosch and the Winelands.

Having only one airport to choose from limits the ability of travellers to choose the most convenient option for them. The positioning of the proposed CWA – along the N1 corridor – is very desirable such that it will be a far more convenient option for hundreds of thousands of travellers who live to the North and North-East of the city.

By distributing passenger traffic across two airports, road congestion around the airports would be reduced, making it easier for passengers to reach their flights on time instead of funnelling all passengers via the N2/R300 highways. This efficiency would encourage more people to fly rather than opting for alternative modes of transport (or not flying at all). This improves air access and reduces travel times, traffic, cost as well as vehicle carbon emissions. As expansion continues in the North and North-East direction, these numbers will continue to rise.

From a location perspective, it must be emphasized that the location of the existing airfield (Fisantekraal Airfield) was chosen in 1943 as the preferred location by the government at the time due to key aviation criteria which still exist today, i.e.:

- 399 ft elevation above sea level, setting the site at above the fog belt during low visibility conditions relative to the rest of the city
- Flat land suitable for runways orientated towards the prevailing wind directions (NW and SE)
- Away from obstacles/mountains such as the Stellenbosch/Paarl mountains, or the Tygerberg Hill which is a significant obstacle for CTIA
- Positioned on the outskirts of the city, which significantly reduces the impact of noise on urban development compared to an airport positioned within a city

Airports are best located on the outskirts of cities due to the large swathes of vacant land required for such developments while also balancing the need to remain a convenient driving option and minimize the noise impact on existing developments. After considering all of the above and considering that CWA is positioned conveniently off the N1 highway, it is determined that from a desirability perspective, CWA is extremely well located.

c) Multi-Airport Cities

Stimulating Competition. It is well known that healthy competition contributes to efficiency, excellence, innovation and increased service levels which will only benefit the end consumer as well as the sustainability of all airports. Multiple airports in the same city often also lead to increased competition among airlines, which can drive down prices, improve service quality, and introduce new routes. The market will decide where to operate from. These factors can make air travel more attractive, leading to an increase in demand and improved service levels.

d) Resilience and Redundancy

Operational Resilience: Having two airports enhances the city's overall resilience to disruptions. If one airport faces operational issues, such as weather delays or maintenance closures, the other can continue to operate, ensuring that passenger flow into and out of Cape Town remains steady.

Diversifying Risk: By spreading passenger traffic across two airports, Cape Town reduces the risk associated with relying on a single facility. This diversification can attract more airlines and passengers who value reliability and consistency in their travel plans.

Given how isolated Cape Town is from the rest of the country in terms of distance, any flight diversion to another city comes at significant cost to the airline sector, and a major inconvenience to all. There are multiple costs involved;

a. Fuel consumed in an actual diversion event
b. Logistical costs incurred accommodating hundreds of passengers in a different city
c. Carrying costs associated with holding this diversion fuel every single flight (expanded further below in its own section)

With the introduction of CWA providing redundancy into the region, the above costs are substantially reduced. This will bring the cost of flying down, making air travel more affordable and thus contributing to the growth in air travel at both airports.

A few recent actual examples of issues at CTIA causing mass diversions (which were in fact not weather-related):

a. **18 April 2023** – fibre network fault caused an outage of the navigational aids (instrument landing system) that pilots rely on, causing diversions for multiple hours.

b. **12 October 2023** – hydraulic fluid spill closes the main runway for nearly 18 hours. This caused the mass diversion of aircraft, including at least 4 widebody aircraft en route from US/Europe/Middle East to JHB/Durban at enormous cost to industry.

c. **29 July 2024** – runway lights & critical airside safety systems offline due to a two-day power outage, causing the mass diversions of aircraft, including 2 wide body diversions to JHB.

e) Case Studies of dual airport cities from around the world

It is not uncommon for developed cities to have multiple airports, for reasons mentioned above. See below for a few examples of other multi-airport cities.

- **London (Heathrow and Gatwick Airports):**

  London's dual-airport system, with Heathrow and Gatwick, is one of the most cited examples. Heathrow primarily serves long-haul international flights and premium domestic services, while Gatwick has focused on low-cost carriers, charter services, and leisure travel. The complementary nature of these airports has led to an overall increase in air travel demand to and from London, as different market segments are targeted. Studies have shown that passenger numbers have grown across both airports over time, with each serving distinct but overlapping segments of the market.

- **New York City (JFK, LaGuardia, and Newark Airports):**

  New York City's three major airports have developed specific niches, with JFK focusing on international travel, LaGuardia on domestic flights, and Newark providing a mix of both. The presence of multiple airports has enabled New York to handle a higher volume of air traffic than would be possible with a single airport. Over time, this has not only absorbed local demand but also attracted more flights, routes, and airlines to the city, resulting in increased total air traffic.

- **Johannesburg (OR Tambo, Lanseria):**

  Lanseria International Airport primarily serves as a hub for low-cost carriers and regional flights. It attracts budget-conscious travellers, leisure travellers, and those living in northern parts of Johannesburg and surrounding areas. Lanseria's smaller scale and focus on low-cost airlines allow it to offer a different value proposition compared to OR Tambo, making air travel accessible to a broader segment of the population.

  By accommodating different types of traffic, Lanseria helps to alleviate some of the pressure on OR Tambo, particularly during peak travel times. This division of labour reduces congestion at OR Tambo, allowing it to operate more efficiently and handle more international traffic. Meanwhile, Lanseria's focus on domestic and regional flights reduces the likelihood of delays and enhances the overall efficiency of the air travel system in Johannesburg.

  With less congestion, both airports can provide better service, quicker turnaround times, and potentially more flights, thereby increasing the total number of passengers passing through Johannesburg.

f) Summary & Timing

Cape Town needs a second airport now and to enable the dormant market efficiencies, risk mitigation and improvements that are available to it as a city. Although Cape Town is growing, the global market is growing with other cities getting more and more competitive as a tourist destination, and thus additional effort is required in order for Cape Town to maintain its position on the global stage, never mind expanding its position. With the introduction of CWA as the second airport in the city, injecting healthy competition into the market and thereby enabling market efficiencies and improvements, combined with CWA enabling differentiation in terms of choice and geographical convenience through location and segmentation, the existence of both airports will result in the overall net increase in air travel into the region, as opposed to merely redistributing the existing market.

5.2.2 Alternate airport for fuel planning and environmental savings

A critical component of CWA's plans involves positioning itself as an "alternate" for the purposes of diversions and fuel planning (for diversions), for which it has developed a business case. Substantial interest has been received by the airline sector for CWA to fulfil this role because of the benefits that will be enabled to the airlines.

In order to affirm its viability as a designated alternate for flight operations destined for CTIA, CWA is required to at least match the infrastructure and amenities available at CTIA itself. It is for this purpose that CWA's infrastructure plans are of such a large scale, despite the only the modest growth in a direct scheduled air services expected to take place to and from CWA, which is forecast by NACO to reach 25% market share within 25 years, i.e. 1% per year.

At only 25km away from CTIA, CWA will provide airlines with a much closer alternate that can be used for diversion fuel planning on flights inbound to Cape Town, enabling significant reductions in the quantum of additional reserve fuel that is required to be carried each flight, as imposed by ICAO.

An alternate airport is a designated airport that a flight crew plans to divert to in case of unexpected events or emergencies during a flight. It is a backup airport chosen as part of the flight planning process to ensure the safety and availability of an alternative landing site if the primary destination airport becomes unavailable due to weather, equipment issues, or other factors.

For most long-haul operations inbound to Cape Town, the Alternate Airport used by airlines for fuel planning is O.R. Tambo International Airport at 1,270km away, requiring approximately 2 hours of additional fuel to be carried on each flight.

a) Current airport landscape in SA

Cape Town is geographically very isolated from all remaining airports in the country, with the closest domestic airport being George at 348km away, and the closest major international airport being

Bloemfontein, but practically actually Johannesburg at 1274km (2 hours) away due to the operational limitations at Bloemfontein.

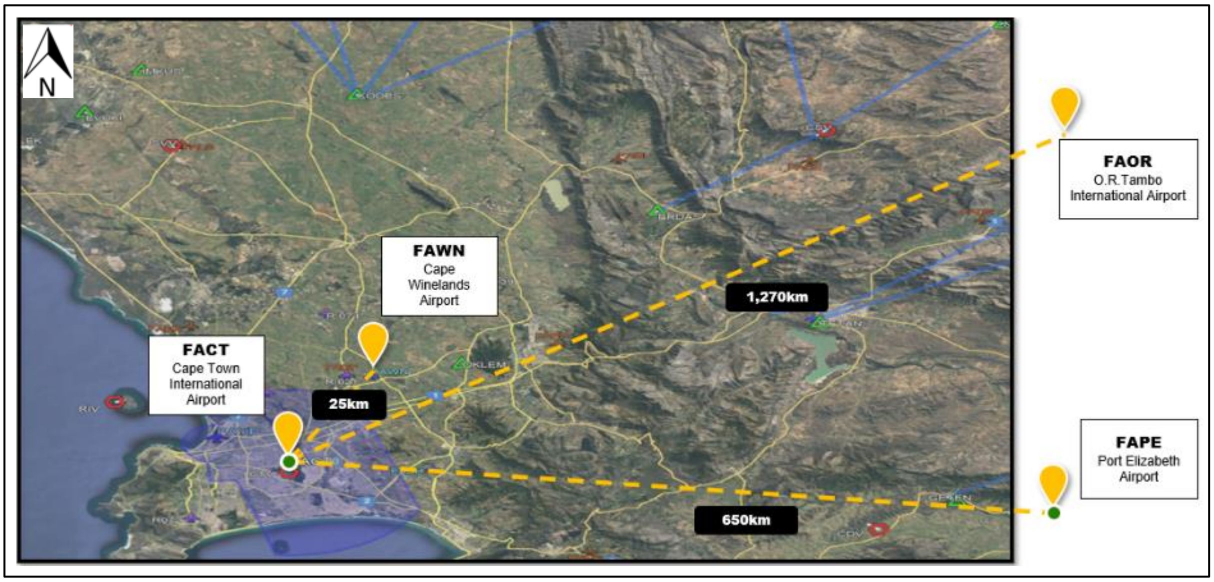


Figure 10: Location of CWA in relation to other airports (Capewinelands Aero (Pty) Ltd, June 2023)

From a safety perspective and as per the International Civil Aviation Association (ICAO) and Federal Aviation Administration (FAA) regulations, aircraft are required to carry sufficient reserve fuel each flight to divert to another airport in the unlikely event that its intended destination is not suitable to land at. Considering how isolated Cape Town as a city is within South Africa, it places a large burden on airline operators to carry undesirable and restrictive amounts of reserve fuel each flight at significant cost to industry, in case of emergency. This extra fuel contributes towards take-off weight at the expense of cargo and/or passengers and also increases operational costs in the form of increased fuel consumption and carbon emissions, due to carrying that additional weight.

The above issue is exacerbated considering how isolated Cape Town and South Africa is from the rest of the world's major tourism source markets, i.e. North America, Europe, and the Middle East. South Africa is on the edge of the earth relative to these markets. This means that airline operators are required to carry that extra reserve fuel, for extremely long periods and distances – as much as 16 hours in the case of North America.

b) The costs of a diversion

The obvious cost is that in the event of an actual diversion, a diverted aircraft burns fuel and emitting less carbon during those diversion events. The other obvious cost is the logistics and inconvenience of accommodating hundreds of stranded passengers who have diverted to another city, not to mention the delays experienced by all affected.

The most significant cost of not having a close alternate for diversion purposes, however, is the sustained cost borne by airlines and industry of carrying that extra reserve fuel (and weight), every single flight, regardless of weather. Examples were provided above of three distinct diversion events since 2023, where none of them were weather related, i.e. all of them were infrastructure related. These holding costs are expanded below.

c) The holding costs of diversion fuel

Costs to industry of holding this additional reserve fuel and take-off weight every single flight comes in multiple shapes:

i) Increased weight, therefore **increased fuel consumption**. This is due to the fact that more fuel is required to carry a heavier plane.

ii) **Increased carbon emissions**. There is a direct relationship between fuel consumption and carbon emissions, in the ratio of 3.16kg of CO_2 for every 1kg of jet fuel consumed. As carbon taxes and offsets are on the rise, this places a double cost of burning extra fuel.

iii) **Reduced payload** due to weight limits imposed by carrying such excessive reserve fuel quantities. Aircraft have various limitations impacting on how much revenue generating weight (payload) can be carried, in the form of passengers or cargo. Due to the vast distances travelled to reach Cape Town, and therefore the reserve fuel held, airlines are limited by how much revenue they can generate on routes into Cape Town.

Considering how thin the profit margins are in air travel, the above costs make a significant contribution to an airline's bottom line and financial sustainability on particular routes – specifically to CTIA. This ultimately affects the competitiveness of Cape Town as a destination on the global stage, as destinations around the world are competing for airlines to dedicate aircraft to their cities. It is a well-known fact that there is a massive global shortage of aircraft currently, due to the ongoing supply chain issues and controversies at the leading aircraft manufacturers (Boeing & Airbus).

d) Introduction of a closer diversion alternate

Once developed, CWA will provide airlines and aircraft operators with a much closer option for aircraft to diver to when enroute to CTIA – with CWA at only 25 km away from CTIA compared to George Airport at 348km or OR Tambo at 1274km. This has a direct impact on the amount of reserve fuel carried each and every flight and a significant reduction in the holding costs and actual diversion costs outlined above.

CWA is developing its infrastructure specifically to fulfil the role of a diversion alternate (among other roles), with an immediate and direct benefit to industry. From a location perspective, the positioning of CWA as an alternate for flights inbound to CTIA is extremely desirable, as any alternate outside of the city comes at additional cost and logistical challenges as outlined above and below.

e) Benefits of CWA as a closer diversion alternate

To the Passenger

Another key benefit associated with CWA as a diversion airport accrues to the passenger, with CWA as the diversion airport being located in the same city as the destination airport (CTIA), i.e. currently when aircraft are diverted from CTIA, passengers find themselves in a different city. With the existence of CWA as a diversion airport, passengers will have the immense benefit of diverting to an airport in the same city only 25km away from their intended destination, enabling them to continue their journey with minimal disruptions.

To the Airlines

CWA commissioned a study by German aerospace consultancy firm *PACE Aerospace Engineering*, with an excerpt included in Appendix 16 "CWA DIVERSION AIRPORT ANALYSIS".

Extrapolating the results of the analysis, it was quantified that the existence of CWA will enable a significant reduction in reserve fuel uplift by approximately 110 million kilograms per annum, and an annual reduction in fuel consumption and carbon emissions by up to 5% per flight and per annum. This in turn has a major positive impact on airline operations by significantly reducing the holding costs mentioned above, i.e. fuel consumption, carbon emissions, and payload limitations. This was quantified based on prevailing fuel and airfreight rates to exceed R1 billion in value per annum to the airline industry, allowing airlines to reduce costs, benefiting the broader public.

Critically, this has been corroborated by industry, with commercial terms being reached by industry and official support received by industry, such as airlines and airline associations.

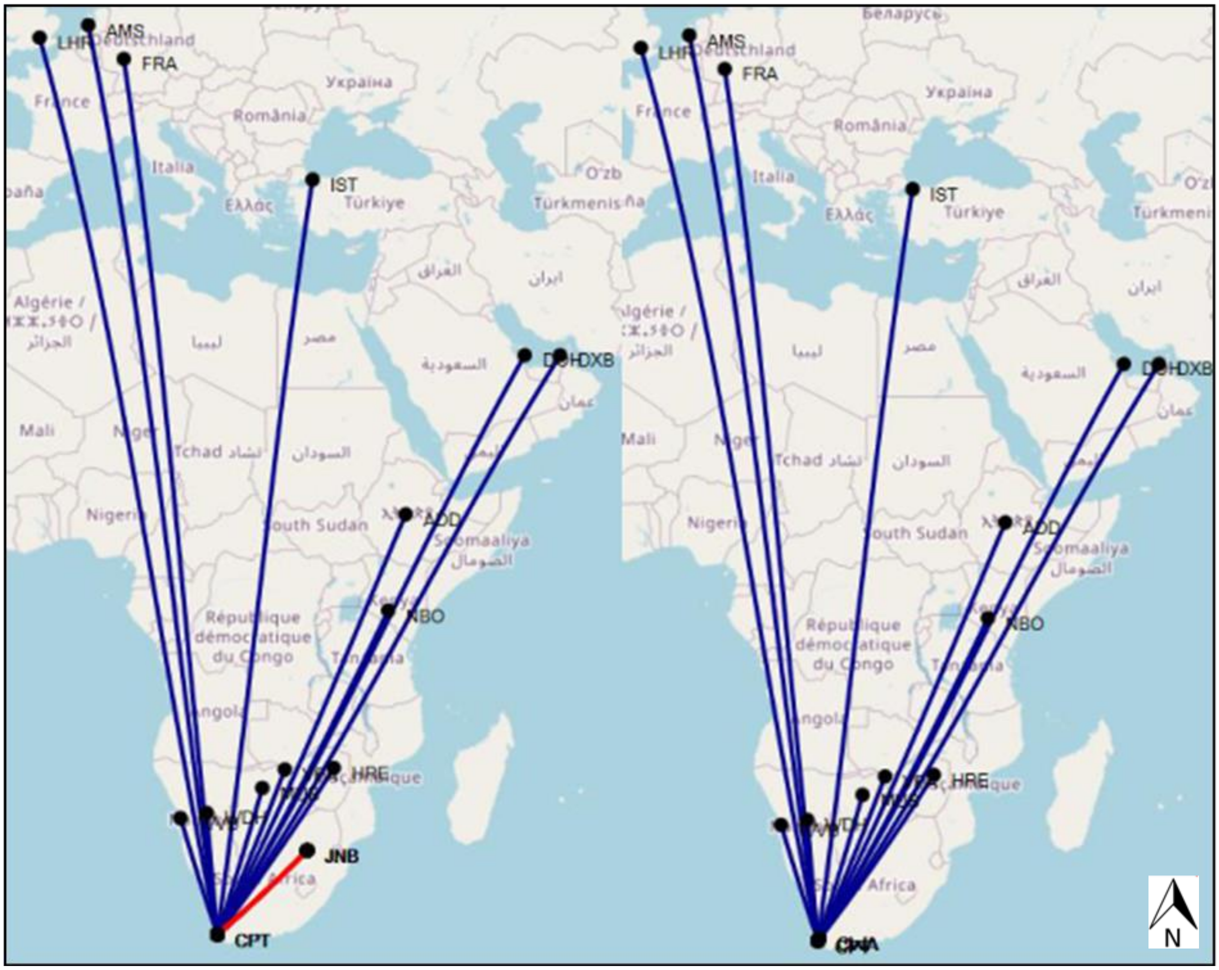


Figure 11: OR Tambo International Airport and CWA as diversion airports (PACE Aerospace Engineering & IT GmBH, Oct 2022)

By way of an example, a current Airbus A350 flying from Atlanta (USA) to Cape Town could reduce its fuel uplift by 7.8 tonnes and instead be replaced by payload (cargo), resulting in a 20% increase in payload capacity, every flight.

The individual route results generated by Pacelab Mission Suite for several takeoff and for several payloads were postprocessed. Excel was used to compare the difference in fuel, payload/takeoff weight between two scenarios: the original diversion (Port Elizabeth International Airport or OR Tambo International Airport) and the CWA as diversion. The fuel uplift saving weights reach the order of 600kg to 10tons (for the CRJ100 and for the B77W, respectively). The fuel burn saving weights reach the order of 30kg to 3tons (for the CRJ100 and for the B77W, respectively).

These weight reductions are possible because the distance from the destination airport CTIA to the CWA airport (14NM) is lower than the distance to Port Elizabeth International Airport (491NM) or OR Tambo International Airport (686NM) resulting in less fuel weight being allocated to the reserve.

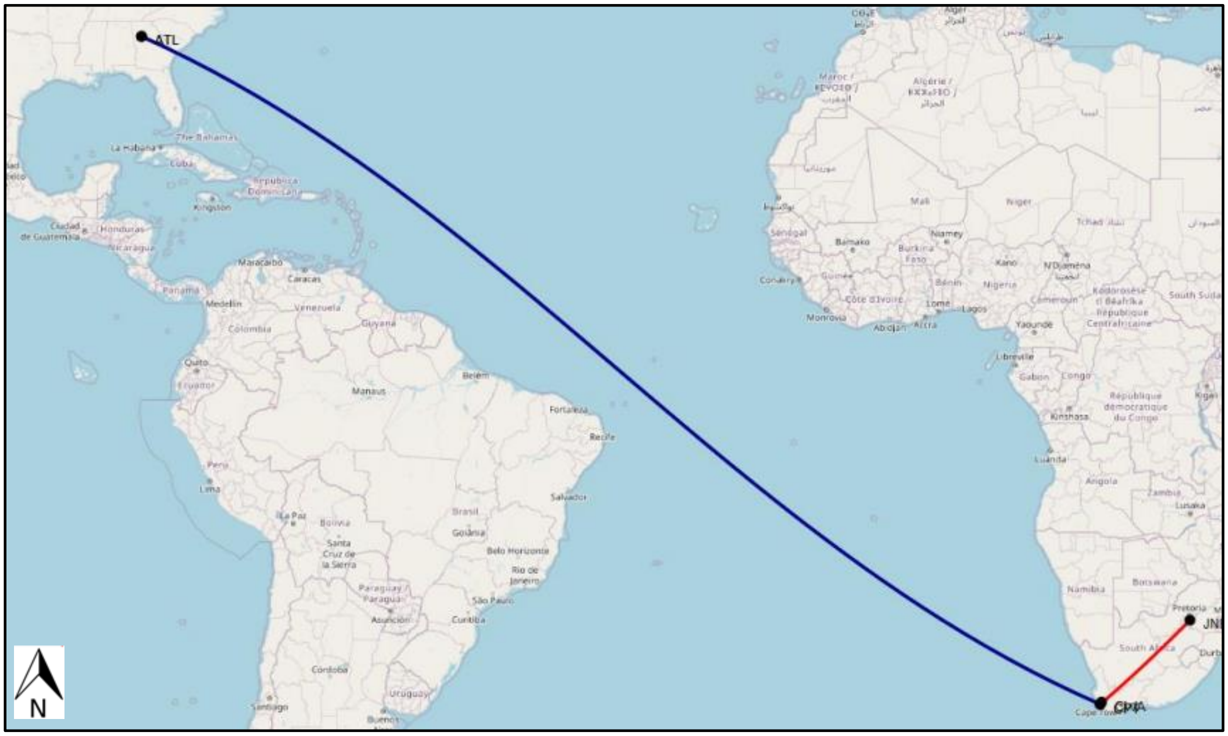


Figure 12: Route ATL – CTIA, OR Tambo and CWA as diversion airports (PACE Aerospace Engineering & IT GmBH, Oct 2022)

Table 12: Atlanta Route Fuel savings (Capewinelands Aero (Pty) Ltd, Nov 2023)

ORIGIN	ATLANTA
Aircraft	A350-900
Reserve Fuel Reduction	7.8 tonnes
Payload Capacity Increase	7.8 tonnes
Total % Payload Increase	20%
Fuel Consumption Savings	3.9 tonnes
CO_2 Emission Savings	12 tonnes

With the existence of CWA, upgrading Cape Town to a multi-airport city would therefore drastically improve the economics for airlines flying into Cape Town, making Cape Town even more attractive in terms of pricing and affordability, and therefore further boosting tourism and air travel into the region.

For comparison, London has 6 airports and Windhoek has 2. Additionally, the improved fuel economics to be enjoyed at a multi-airport city like Cape Town will increase the maximum range of aircraft flying to Cape Town, opening new route options into Cape Town that currently are not feasible, or alternatively improving the profitability of existing routes into Cape Town. From an environmental perspective, this reduction in fuel consumption has an additional benefit in the form of carbon emission reductions enroute to Cape Town by as much as 3-5% per flight (PACE, 2023). *This estimate is based on the assumptions that:*

(a) The frequency of flights to Cape Town will increase regardless of alternate selected. The exact frequency increase is unknown at this time.
(b) The range of saving is generalised over a both wide body and narrow body operations.
(c) Alternates other than OR Tambo International Airport were considered in the analysis.
(d) Reductions in reserve fuel was frequently traded for increased payload. Hence the saving is based on planned block fuel consumption which included higher payloads.

This level of CO_2 savings is equivalent to the emissions produced by 11 000 thousand passenger vehicles driven for an entire year, or the carbon sequestered by approximately 6 000 hectares of forest in a year, or the electricity use of approximately 7 000 homes in a year.

The above provides the airline industry with a major boost to their efforts to decarbonize and reach IATA's "net-zero carbon by 2050" goals. On an annual consolidated industry-wide basis, this reduction in reserve fuel could reach as much as 110 million kg, resulting in 19 million kg less fuel consumption, and therefore 60 million kg less carbon emissions per annum by 2027.

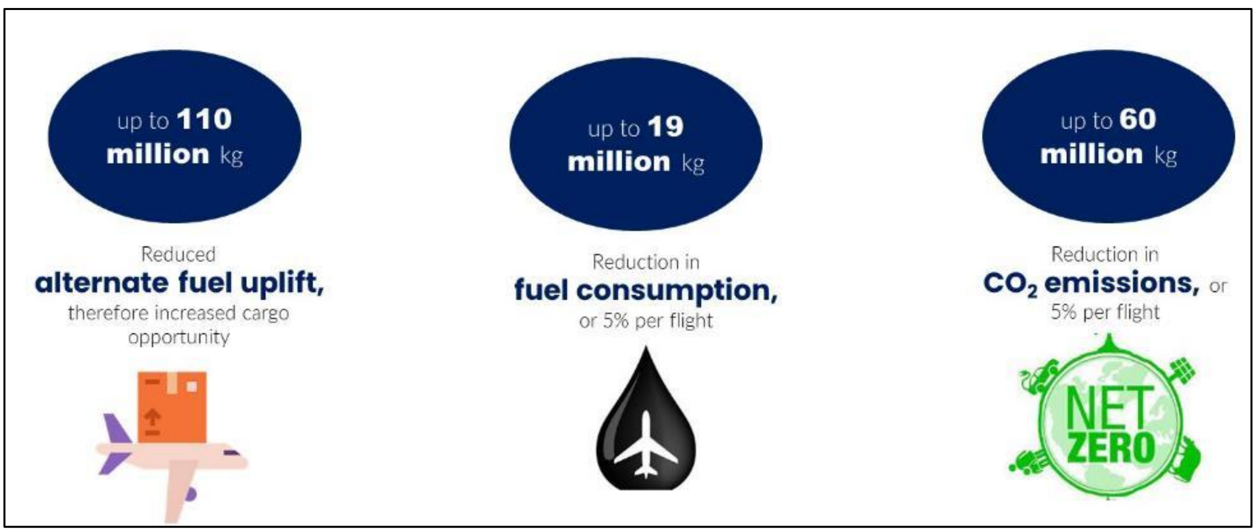


Figure 13: Projected fuel uplift, consumption, and emissions reductions (PACE Aerospace Engineering & IT GmBH, Oct 2022)

f) CWA's complementary role to CTIA on route viability and air access

The global shortage of aircraft and competitiveness in the global tourism market has been mentioned above. Cities are competing with other cities around the world to attract airlines to provide scheduled services to their cities and there is pressure for airlines to maintain or grow frequencies on existing routes. The existence of CWA, enabling substantial economic benefits for airlines impacts will actually then complement CTIA, by boosting the viability, economics and feasibility of routes into CTIA.

i) Current air access into CTIA

Given the current competition, CTIA is under pressure to retain its existing traffic. With the introduction of CWA and the associated benefits outlined above, existing routes into CTIA will enjoy greater profitability, thereby encouraging airlines to increase their frequencies into CTIA on an annual basis.

ii) New routes development into CTIA

Considering the geographical placement of Cape Town relative to the rest of the world, many aircraft and airlines flying to Cape Town are operating at the limits of their possible aircraft range in terms of distance and economic viability.

With the introduction of CWA and the associated benefits outlined above, this will assist new routes to becoming viable that previously were not viable due to aircraft range and profitability constraints. This will allow CTIA to target new routes that were previously not possible, thereby growing their own business.

Therefore, the existence of CWA as an alternate for diversion and fuel planning purposes actually serves as a key complementary role for CTIA, improving the feasibility of flying to CTIA by building resilience on existing routes while also opening it to new routes. Thus, enabling a net gain in air access into the region.

g) Weather

It is acknowledged that CTIA and CWA are in very close proximity to each other, ie 25km away, and it is therefore very likely that both airports will be impacted by the same adverse weather conditions when occurring.

However, with landing and navigational aids, aircraft can land safely in most weather conditions. Using publicly available weather data reporting at CTIA (visibility specifically), it is possible to draw conclusions on the expected weather and visibility conditions likely to be experienced at CWA. Based on internal assessments of these conditions, CWA is confident that, when considering landing and navigational aids, CWA will still be a viable and feasible alternate for diversion planning purposes by airlines despite adverse weather conditions. This will be further assessed and confirmed in the Impact Assessment Phase.

h) Summary and timing

The impact of the development of CWA in its role as an alternate for diversion and fuel planning has been assessed as having an immediate and hugely positive impact for airline operations into Cape Town as a whole. The benefits outlined above improve and maintain the economic viability of existing routes, as well assist in the realisation of new routes into Cape Town that previously were not viable. This plays a complementary role towards CTIA's own growth ambitions, as there will be routes that simply would not be feasible to target without CWA complementing the business case of flying to Cape Town, in CWA's role as a diversion alternate for fuel planning.

5.2.3 General Aviation

General Aviation ("GA)" is defined as all civilian aviation other than scheduled commercial airline operations, ie GA includes segments such as recreational aviation, corporate and private charter, business travel, flight training maintenance, agricultural aviation, sport aviation etc. Business Aviation ("BA") is a sub-sector of GA which comprises just the corporate and business travel as listed above. CWA currently serves the GA industry. However, considering how much of the proposed development has been allocated to GA it is well understood that it forms a significant component of the future business.

CWA is located approximately 10.5km northeast of Durbanville and 25km northeast of Cape Town International Airport. There are other airfields within 30km of CWA, however each are already at or near their maximum hangar capacity, with short runways suitable for only a small portion of the sector and face significant barriers to expansion due to various factors (location, size, zoning, availability of land).

Although CTIA is the main airport for the city, it is not optimal for GA operations due to airspace and runway congestion, where priority is appropriately given to the large volume of scheduled airline traffic. Operationally, mixing aircraft of different sizes as is currently taking place at CTIA also creates additional airspace inefficiencies due to the increased aerial separation required to maintain safe operations between aircraft of such differing sizes. By relocating existing GA away from CTIA, it will reduce the inefficiencies that GA creates at busy commercial airports like CTIA, assisting CTIA in achieving its own growth targets.

CWA will therefore be the only airport in the region other than CTIA with the infrastructure capable of serving the broader General Aviation (GA) sector – a sub-sector that is currently faced with significant capacity shortages rendering the industry unable to serve the ever-increasing demand. With CWA, the

GA sub-sector can finally consolidate at one airport in an environment conducive to growth, stimulating further economic activity.

In addition to an independent air traffic forecast and airport masterplan being developed by NACO, CWA has held extensive engagement with GA operators from across the country to gauge the interest and support from industry. It was concluded that there is an overwhelming shortage of GA capacity and facilities within Cape Town across the GA with various letters of being received by some GA operators. CWA's plans have therefore been informed by industry and are a direct response to demonstrated demand.

Formal responses were received from Airports Company South Africa (ACSA) and the General Aviation (GA) communities. An independent review was requested, this report details the study undertaken to review the concerns raised by all parties. That process includes an extensive review of the airspace environment. (refer Airspace and Capacity Study – Straten Consulting Services Limited (Straten CSL), March 2024, Appendix 21).

The above are expanded on below.

a) Current Market and Capacity Constraints

Currently, the GA market in Cape Town is fractured with an incomplete offering in terms of available infrastructure and facilities. Aircraft operations are determined by runway and infrastructure capability, where only the bottom and top end of the market are currently served.

On the one end is CTIA with 3.2km runway, capable of facilitating all GA, however given the size and scale of scheduled commercial operations, with priority appropriately granted to airlines, it is an impossible environment for GA to thrive.

On the other end are the current airstrips with runway length less than 900m and no landing instrumentation, catering only for light recreational flying, *ab initio* training and some fire & rescue operations. These include Stellenbosch Airfield and Morningstar Flying Club, both which are municipal owned with no possible room for expansion. Of the airfields listed, they are also totally constrained in terms of hangar capacity, with no further room for light aviation to grow.

Nothing, however, exists in the region specifically tailored for business aviation requiring runway length between 1.5km and 2.5km in length. In contrast to Johannesburg and nearly every major city in the world which contains multiple airport facilities serving business aviation, with airports such as Rand Airport, Grand Central, and Lanseria. This has put a very low ceiling on the growth prospects of aviation within the Cape. Simply, general aviation in Cape Town currently cannot grow.

b) Why investment in infrastructure is needed

A city with adequate airport infrastructure serving general and business aviation is important for several reasons:

- **Economic Impact:** General aviation airports contribute significantly to the local economy. They support businesses by providing quick and efficient travel options for executives, which can lead to faster decision-making, better client relationships, and increased investment in the area.
- **Attracting Investments**: Cities with general aviation airports are more attractive to companies and investors, particularly those with international operations. The ability to fly directly to a destination without relying on commercial schedules is a significant advantage.
- **Flight Training and Education**: General aviation airports often serve as training grounds for new pilots, playing a critical role in the aviation industry's talent pipeline. Flight schools and training programs based at these airports provide education and training opportunities that are essential for maintaining a skilled workforce.
- **Supporting Local Businesses:** Many businesses rely on the flexibility and efficiency provided by general aviation. This includes the ability to reach multiple locations in a single day, which is crucial for industries like finance, manufacturing, and technology.
- **Time Efficiency:** For executives and high-level personnel, time is a critical resource. General aviation allows for direct flights, avoiding the time-consuming layovers and delays common with commercial flights. This efficiency is a competitive advantage for businesses operating in the city.
- **Disaster Response and Humanitarian Aid:** In times of crisis, general aviation airports can serve as hubs for disaster response and humanitarian aid, offering quick deployment of supplies, personnel, and medical assistance.
- **Community and Civic Benefits**: General aviation airports often serve as community hubs, hosting events, air shows, and educational programs that foster public interest in aviation. They can also be important for civic functions, such as transporting government officials or providing access to remote government services.
- **Supporting Tourism and Events:** High-profile events, conferences, and exhibitions often draw participants who prefer the convenience of private aviation. A general aviation airport can help a city attract and accommodate such events, boosting local tourism and hospitality industries.

- **Job Creation:** The operation of a general aviation airport supports a range of jobs, from aviation-related roles (pilots, maintenance, ground crew) to indirect jobs in sectors like hospitality, retail, and transportation.

Having appropriate general aviation airport will substantially enhance Cape Town's infrastructure and economic offerings, making Cape Town more resilient, connected and attractive for business and residents.

c) Enablement Infrastructure

As per CWA's masterplan, compiled by NACO in response to demand and following significant engagement with industry, CWA is looking to introduce critical infrastructure and capacity specifically to address the "missing middle" in terms of aviation, which is the gap in airport infrastructure between major airports and minor airfields. CWA with its very conservative and measured approach to scheduled aviation, creates a very favourable environment for GA and business aviation in particular to thrive, i.e., not too busy with airlines yet and has the appropriate infrastructure to accommodate up to high-performance jets.

The introduction of the expanded CWA with its capable runway length and injection of new hangar capacity will immediately unlock latent GA demand.

d) Benefits of Market Segmentation

With the inclusion of CWA fulfilling the role of GA infrastructure provider, additional benefits are enjoyed by the city:

- **Improved Efficiency**: Segmentation allows for better management of air traffic and airport operations, reducing congestion and delays at CTIA by repositioning appropriate traffic to CWA.

- **Enhanced Customer Experience**: Tailoring services to different segments ensures that the needs of all users – whether commercial passengers, private pilots, or cargo operators – are met, improving overall satisfaction.

- **Economic Development:** Supporting a diverse aviation market through segmentation will stimulate economic growth, attracting different types of businesses and investments to the city.

e) Timing and Conclusion

A critical shortage of hangar capacity within the Cape Town GA sector exists already. A critical shortage of a suitable business-focused GA airports with suitable runway length within Cape Town exists already. Investment is required immediately to unlock the existing latent demand and to enable the sector to grow. Considering the cost and complexity in airport development, CWA has the ideal opportunity to address General Aviation alongside its other roles.

5.2.4 Reliever Airport

CWA, as a reliever airport will perform multiple functions, from relieving congestion at CTIA during times of temporary increased activity or providing redundancy to the City of Cape Town in times when the airport is closed for an extended period of time. As a reliever airport:

- CWA will improve the attractiveness of the city to host major events by providing additional airport capacity. When the city bids for a mega event, air access is always a key consideration and with added airport capacity it could be the difference between being the winning bidding city or not.
- CWA will contribute toward continuity of economic activity (trade and tourism) in the event of an extended closure at CTIA.
- CWA could provide additional temporary or permanent capacity during peak periods (slot constraint times and peak seasons noting the seasonal nature of visitor trends)
- CWA will offer redundancy in the event of catastrophic fires, structural failures, fuel or power supply interruptions, etc.

Add to that the benefits of having a second airport, as is the case with most major prospering cities, ensuring full redundancy in the event of a failure of infrastructure, services or systems at any one of the airports. As outlined further above, regular failures have been experienced at CTIA in recent times ranging from fuel supply, availability of runway and power failures. On each occasion the impact on both the airlines and passengers are significant, this in terms of disruption, costs and inconvenience.

It is clear that the relationship between CTIA and CWA is complementary in that as a first step CWA allows the market to grow substantially and on a sustainable basis.

The two main airports CTIA and CWA can in terms of their respective master plans, co-exist and integrate with smaller surrounding airfields – the consolidated picture essentially representing the Cape Town and Western Cape integrated Air Access Master Plan. The Alternate Aerodrome Feasibility Study - Munich Airport International GmbH (MAI) (April 2024) (Appendix 23), confirms the suitability of CWA as a destination alternate aerodrome for CTIA. The Visualization of CTIA and CWA combined operations - Royal NLR - Netherlands Aerospace Centre (October 2023) (Appendix 22), provides an overview and explanation of the Fast-Time Simulation AirTOp model CTIA and CWA, and shows capacity will not be affected and there will be no impact of CWA on neighbouring airports. The model has been developed to create 2 visualizations (i.e. video animations) that should highlight what the traffic flows to and from both airports could look like, and to visualize the critical points in the traffic flows. These visualizations can be used in further discussions in the airport development project.

5.2.5 Logistics Hub

CWA is located between the three major regional growth centres of Cape Town, Stellenbosch, and Drakenstein and along north-south and east-west road networks. It is also situated near a railway line linking between the Cape Town Harbour and Saldanha Harbour. Combining its air access, CWA will catalyse multi-modal commercial activity in the region and further stimulate economic growth. CWA is therefore extremely well positioned to serve both the business and the tourism industry in the Western Cape (Refer Figure 2).

5.2.6 Commercial Property Developments

To support all the operations and activities at the expanded airport, CWA will unlock property development. This includes support facilities, offices, admin buildings and hangars where applicable for each industry. This will attract further investment into the region, stimulating further economic growth and job creation.

The economic desirability of the proposed project is essential to determine whether the proposed CWA development compliments economic planning as reflected in provincial, regional, and municipal spatial development planning. It is not sufficient that the development results in some positive spin-offs if it is not compatible with planning guidance designed to maximise the overall economic potential of an area. The SDF is central to economic development planning and to guide overall development in a direction that local and provincial authorities see as desirable, based on the spatial implications of the Integrated Development Plans (IDP). The provincial, regional, and metro SDFs (together with related frameworks, interpretation reports and discussion documents) and Local Economic Development (LED) plans and strategies (together with other documents that offer guidance) are considered pertinent to this part of the assessment. Given the nature of the proposed development, the policies and plans related to housing were also consulted.

The NPD sets out six interlinked priorities that include enabling faster economic growth, higher investment, and greater labour absorption. The CWA development subscribes to the NDP principles by offering commercial opportunities close to the Northern District of the City of Cape Town.

In terms of the WCPSDF the proposed CWA development will contribute toward private sector investment, reinforce the CoCT economy and create additional employment (particularly in the transport and construction sectors) that will further strengthen growth in the local economy. The project addresses spatial efficiency to some extent, i.e., mixed-use as opposed to mono-functional land uses.

On a local scale in terms of the CoCT Inclusive Economic Growth Strategy (2021) the CWA is a large private investment that would contribute toward economic growth and job creation during both the construction and operational phases. The proposed development offers an opportunity for skills development and will contribute to transport infrastructure.

In terms of the CoCT IDP (2022-2027) the development will ensure a substantial direct investment into the CoCT and represents a significant indirect investment in the area. Direct jobs will be created that will benefit the communities in the surrounding areas during the construction and operational phases. It will directly support the transport sector by alleviating pressure on the CTIA.

City of Cape Town MSDF (2023) -the proposed development subscribes to the spatial strategies of the CoCT as it represents a private investment to establish a new economic and transport hub. It will contribute to creating and attracting investment that will facilitate economic growth and employment opportunities, while also addressing the need for improved aviation services in the CoCT.

The following policies specifically refer to the CWA:

- **Policy 5.2 -** Support intensification of land uses at CTIA and the CWA that enhance COCT aviation enabled competitive advantage. Maintain a network of airfields used for civil aviation purposes, such as Morningstar.
- **Policy 16.9 -** Support the CTIA to continue providing the national and international aviation function to a limit that is determined by its manageable impact on surrounding land uses (noise impacts). The CoCT, ACSA and other aviation / airport operators to consistently engage for long-term noise monitoring and mitigation measures with CWA.
- **Policy 16.13 -** Support complimentary and appropriate land development at the CWA that will contribute to the efficiency of CTIA in terms of general aviation and related uses.

The Northern District Plan (2023) Sub-district 3 Development Guidelines identified new development areas - areas to the West and South of CWA are earmarked for residential development. Key interventions / actions proposed in the Northern District Plan include amending the urban development edge to provide for inclusion of CWA. However, H & A Planning (2023) noted that the amendment of the urban development edge does not cover the proposed expansion of the airport, and since the landside development of airports should be inside the edge, site-specific circumstances for deviation from the MSDF will thus have to be motivated in terms of the CoCT Municipal Planning By-law during the application process.

H&A Planning points out that the Northern District Plan development guidelines for this designated “New Development Area” inclusive of the CWA (P4/474 and P10/724) and Farm portions to the West (P9/724 and P2/175) are:

1. *“The airport, located directly north of the R312 operates under private ownership. Any extension to the existing operations, or application for amendment of approvals (existing) need to follow due process, as may be prescribed. Regarding the portions identified on the Biodiversity Map and SDF Plan areas of high biodiversity value, detailed ground-truthing needs to establish the extent and conservation value of those portions.*

2. *To round off the urban development edge in the area to the north of the R312, CA 175/2 & 724/9 are included inside the urban development edge, and may be considered for industrial development, together with CA 175/1, to increase employment for the Fisantekraal community. Access onto the R312 needs to be resolved by applicants prior to development of proposals, which should include pedestrian movement across the R312.*
3. *Note that for any development proposals located within the noise contour zones around the airport, the relevant authority should be consulted with regards to the applicable noise regulations and the type of development (i.e., residential or non-residential) that could be permitted to ensure that appropriate mitigation measures are put in place, where necessary. The AOLS (Airport Obstacle Limitation Services) limit building heights of developments located in proximity to the airport flight paths. These developments are subject to comment from the South African Civil Aviation Authority."*

5.2.7 Spatial Perspective

Appendix 40 CWA in the Context of Spatial Policy and Land Use Rights Section 6 provides answers to the 2013 DEA&DP Guideline on Need and Desirability, specifically those questions related to a strategic spatial planning perspective. The outcome of the compliance analyses indicates the proposed development is aligned with the Need and Desirability Guideline. The Socio-Economic Impact Assessment (Appendix 24) reiterates that the need and desirability of the proposed project was successfully illustrated through the analysis of the DEA&DP Guideline and shows contribution to economic growth, maintaining a competitive advantage by having a diversified aviation infrastructure to cater to multiple aviation needs, alleviating capacity constraints at major hubs, and illustrating that the proposed development of CWA is more time-efficient and cost-effective than building a new airport.

It highlights that the development would contribute to infrastructure development, with existing roads, power, water, and telecommunication infrastructure that can be augmented to also benefit the surrounding area. CWA would play a role as an alternate airport, a reliever airport, a general aviation facility, a logistics hub, accommodate national and international flights and cargo, and stimulate commercial property developments around it.

Its location, ability to avoid urban constraints or have an undue negative impact on large residential communities, accessibility from major roads (N1) and railway, reducing road congestion around the two airports adds to its desirability. The site is not close to a nature reserve or within any heritage or cultural landscape area, falls outside a built-up area, the existing controlled airspace of CTIA, and the Koeberg Nuclear Protection Zone.

5.3 Sustainability and Climate Change

The National Climate Change Response Policy (NCCRP) was approved in October 2011 and was formally published as a White Paper in GG34695, Notice 757.

The motivation was to effectively manage climate change impacts through interventions that build and sustain South Africa's social, economic and environmental resilience and emergency response capacity, whilst also making a fair contribution to the global effort to stabilize Greenhouse Gas (GHG) concentrations in the atmosphere at a level that avoids dangerous anthropogenic interference with the climate system within a timeframe that enables economic, social and environmental development to proceed in a sustainable manner.

Following on this the National Climate Change Adaptation Strategy (NCCAS) was released in 2020 to provide a common vision of climate change adaptation and climate resilience for the country. It is based on the National Development Plan, the National Strategy for Sustainable Development, the adaptation commitments included in its Nationally Determined Contributions, sector adaptation plans, provincial adaptation plans and municipality adaptation plans. The NCCAS serves as South Africa's National Adaptation Plan and fulfils South Africa's commitment to its international obligations as outlined in the Paris Agreement under the United Nations Framework Convention on Climate Change (UNFCCC).

The main objectives are:

1) Build climate resilience and adaptive capacity to respond to climate change risk and vulnerability.
2) Promote the integration of climate change adaptation response into development objectives, policy, planning and implementation.
3) Improve understanding of climate change impacts and capacity to respond to these impacts.
4) Ensure resources and systems are in place to enable implementation of climate change responses.

The 2014 Western Cape Climate Change Response Strategy was replaced by the Western Cape Climate Change Response Strategy Vision 2050: A vision for a resilient Western Cape (dated March 2022) which provides policy direction in response to climate-related risks and potential opportunities on a local government level by either creating or leveraging systemic innovative response programmes that tackle the region's vulnerability to droughts, heat and floods and take advantage of opportunities that will enable climate resilient development which fosters economic growth that is low-carbon and further creates an advanced Green Economy.

The main objectives are:

1) Responding To the Climate Emergency – Focus mainly on disaster management response, ensuring that spatial planning and development planning reduces risks to people, infrastructure, and assets.

2) Transitioning in an Equitable and Inclusive Manner to Net Zero Emissions By 2050 - Two crucial transitions are (1) a shift from internal combustion engines to electric mobility, and (2) a massive shift from fossil fuel-based energy to renewable energy sources.
3) Reducing Climate Risks and Increasing Resilience - through adaptation measures (humans and nature) and through well-managed natural systems, that can cope with the increasing climate impacts.
4) Enabling A Just Transition Through Public Sector, Private Sector and Civil Society Collaboration.

In 2019, the City of Cape Town (CoCT) Climate Change Policy (2017) was reviewed and substantively amended to form a strategy with supporting policies, by-laws, and action plans as subsidiary instruments. The City of Cape Town Climate Change Strategy (2021) identified 10 Strategic Focus Areas (SFAs) identified as being critical to ensuring the implementation of the CoCT climate change vision and principles. SFA 1 to 5 are climate change adaptation focused, SFA 6 has elements of both climate change adaptation and mitigation, and SFA 7 to 10 are climate change mitigation focused:

SFA 1: URBAN COOLING AND HEAT RESPONSIVENESS

SFA 2: WATER SECURITY AND DROUGHT-READINESS

SFA 3: WATER SENSITIVITY, FLOOD-READINESS AND STORM MANAGEMENT

SFA 4: COASTAL MANAGEMENT AND RESILIENCE

SFA 5: MANAGING FIRE RISK AND RESPONSIVENESS

SFA 6: SPATIAL AND RESOURCE INCLUSIVITY

SFA 7: CARBON-NEUTRAL ENERGY FOR WORK CREATION AND ECONOMIC DEVELOPMENT

SFA 8: ZERO-EMISSION BUILDINGS AND PRECINCTS

SFA 9: MOBILITY FOR QUALITY OF LIFE AND LIVELIHOODS

SFA 10: CIRCULAR WASTE ECONOMY

The City of Cape Town Climate Change Action Plan (2022) provides the local context and details the actions required to fulfil this strategic vision, whilst enabling and supporting local innovative opportunities for environmentally sustainable economic and social development.

According to the Climate Change Impact Assessment (Appendix 29) *The Western Cape Climate Change Response Strategy (WCCCRS, 2022) reports on projections of future climate for the province. The findings are formulated from an assimilation of climate change projections from multiple global climate models compiled by CSAG (2022) for the Department of Agriculture's SmartAgri plan update. The finding presented are based on projections forced by the SSP2-4.5 shared socio-economic pathway. SSP2-4.5 represents a "middle of the road" global response to climate changes where some level of mitigation is achieved (CSAG, 2022). Projections for the Western Cape indicate that temperatures will continue to* *rise. Expected increases in mean temperature averaged over the entirety of the Western Cape are 1°C to 1.8°C by 2060, in comparison to the recent past (1981-2010). Increases in temperature are also expected to result in a greater number of hot days (days exceeding 30°C). Projected increases in the number of hot days for the Western Cape ranges from 5 more hot day per year to 30 more hot days per year for inland regions (CSAG, 2022).*

Higher uncertainty is associated with projected changes in annual precipitation over the Western Cape, with some models predicting minor decreases and others suggesting that a decrease of 20% can be expected (CSAG, 2022). Potential evapotranspiration (PET), an indicator of evaporation, is expected to increase and is largely driven by the expected temperature increase, while the frequency of droughts in the Western Cape is also expected to increase (CSAG, 2022). Thus, a decrease in rainfall is expected for most regions of the Western Cape, and even when reductions in rainfall are not predicted, increasing temperatures will result in water availability challenges for the province. Rising surface temperatures and changing precipitation patterns can be considered chronic climate related physical risks that the CWA expansion will be subjected to, due to its positioning within the Western Cape.

The CWA proposed expansion project has aligned itself with the National, Provincial and Local government vision and strategies of climate change and sustainable development in the following areas:

SFA 1: URBAN COOLING AND HEAT RESPONSIVENESS

The Architectural design responds to the external climate through a building design that is appropriate for the local climate, minimising the need for cooling and heating during seasonal changes.

The CWA team aims to develop an airport for the future with building design aligned with green building initiatives and a continuous drive to minimise resource usage on site.

The building design aims to incorporate the following elements:

1) Maximised use of natural light and cooling in summer through passive solar design based on the local climate and setting. This includes building orientation and use of shading, effective landscaping and ventilation.
2) Use of building materials, surface colours, insulation to trap heat when needed and allow cooling when needed.
3) Use of solar geysers, energy efficient lighting, water efficient flush systems and taps, endemic landscaping and water efficient irrigation systems.

SFA 2: WATER SECURITY AND DROUGHT-READINESS

The site is developing potable water supply from boreholes on site and aims to treat to potable standard and supply its potable needs in the short to medium term. Potable supply from CoCT will be added in the medium to long term. The non-potable needs will be supplied by treated sewage water. This approach allows for minimised abstraction from boreholes and increased drought resilience in the short to medium term. Landscaping on site will be water resilient and include pathways and open areas to minimise the need for irrigation.

The site will also implement water-saving technologies, such as rainwater harvesting, reuse of treated water, efficient irrigation systems, drought resistant landscaping, low use flushing systems and taps, to minimize water consumption and promote responsible water use.

SFA 3: WATER SENSITIVITY, FLOOD-READINESS AND STORM MANAGEMENT

The site has a proposed stormwater design that will focus on preventing flooding or inundation of the airside runway, taxi, and apron areas. The landside development footprint will rely on designs that can cope with extreme rain events. The stormwater management plan has been developed as part of the EIA and it includes planning for storm and flood events (Appendix 41).

SFA 5: MANAGING FIRE RISK AND RESPONSIVENESS

Fire risk management has been identified as one of the key safety considerations for the site and a fire management plan has been developed for the site as part of the EMPr. The placement of fire water tanks, inclusion of fire protection measures in the design of the buildings and a fire response plan will be implemented on site. Due to the rural setting of the airport the site will also have fire response vehicles and personnel trained in firefighting to respond quickly to any on site fire. Fire breaks will also be implemented along the site perimeter to prevent veldfires crossing onto the site. The removal of alien vegetation on the site will also decrease the intensity of runaway veldfires.

SFA 7: CARBON-NEUTRAL ENERGY FOR WORK CREATION AND ECONOMIC DEVELOPMENT

Aircraft that land at Cape Town International Airport (CTIA) are required to carry enough fuel to enable such planes to divert to a different airport in the event of an emergency. A destination alternate airport is generally the nearest airport at which an aircraft would be able to land should it become either impossible or inadvisable to land at the aerodrome of intended landing. It is typically the closest airport where an aircraft can land if it becomes either impractical or unsafe to land at the intended destination airport, i.e., an emergency. In the case of international flights entering the Cape Town region, this diversion airport is generally OR Tambo International Airport, 1 271km away in Johannesburg. In the case of domestic flights, it is either George Airport, which is 348km away, or Port Elizabeth International Airport, which is 640 km away.

The Cape Winelands Airport (CWA) Is 25km away from CTIA. The development of the CWA, as an official destination alternate, will reduce the distance that aircraft landing in the Cape Town region would need to fly in the event of an emergency, should those flights designate CWA as the destination alternate. Accordingly, flights inbound to Cape Town International Airport that specify the CWA as their destination alternate will then be allowed to reduce the amount of reserve fuel that these aircraft carry, compared to the amount of fuel required by aircraft designating either George, Port Elizabeth or, OR Tambo as their destination alternate.

If CWA acts as reliever airport for CTIA it will enable various benefits within the carbon economy:

- Optimised revenue because of efficiency (decreased fuel, increased payload).
- Reduction in cost (savings in fuel with FAWN as alternate as opposed to airports further away).
- Reduction in CO_2 emissions (towards net zero target by 2050).
- Up to 110Ml reduction in reserve fuel requirements per annum.
- Up to 18Ml reduction in fuel consumption per annum.
- Up to 56 million kg reduction in CO_2 emissions per annum.

To support the above, a German-based industry expert consultancy firm (PACE Aerospace Engineering & IT GmBH) conducted an evaluation of the above benefits. Specifically, on the reduction in reserve fuel that will be required to be carried by aircraft on flights inbound to Cape Town when CWA is selected as the fuel planning destination alternate, versus the status quo where existing airports are instead selected as the fuel planning alternate for flights inbound to Cape Town. This change in fuel planning translates into the above efficiencies and savings.

The routes analysed as part of the study were subdivided into two groups:

The routes in the first group, presented in

1) Table 13, consider the Port Elizabeth International airport as diversion.

The airports in the second group, presented in

2) Table 13, consider the OR Tambo International airport as diversion.

Table 13: Domestic routes, inbound CPT, PLZ as diversion (PACE Aerospace Engineering & IT GmBH, Oct 2022)

	A320	**B737-800**	**CRJ 100**	**E190**	**ERJ 135**
Johannesburg International (JNB)	x	x	x	x	
Johannesburg Lanseria (HLA)		x			
Durban (DUR)	x	x	x		

Port Elizabeth (PLZ)		x		x	
Bloemfontein (BFN)		x		x	x
East London (ELS)		x			
Kimberley (KIM)					x

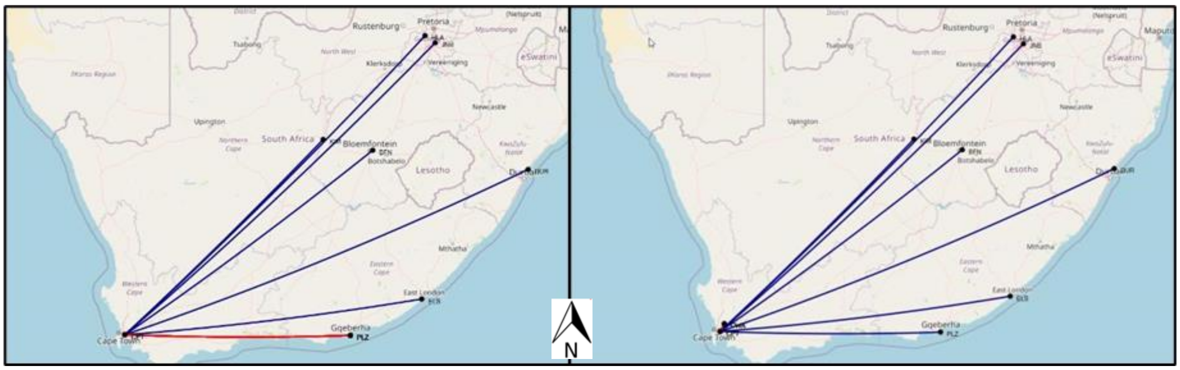


Figure 14: Port Elizabeth International and CWA as diversion airports (PACE Aerospace Engineering & IT GmBH, Oct 2022)

Table 14: Regional / International routes, inbound CPT, JNB as diversion (PACE Aerospace Engineering & IT GmBH, Oct 2022)

	B737-800	B77W	B787 -9	E190
Windhoek (WDH)	x			x
Harare (HRE)				x
Walvis Bay (WVB)				x
Maun (MUB)				x
Victoria Falls (VFA)				x
Nairobi (NBO)	x			x
Addis Ababa (ADD)	x	x	x	
London (LHR)		x	x	

Amsterdam (AMS)		**x**	**x**	
Dubai (DXB)		**x**		
Frankfurt (FRA)			**x**	
Doha (DOH)		**x**		
Istanbul (IST)			**x**	
Atlanta (ATL)		**x**	**x**	

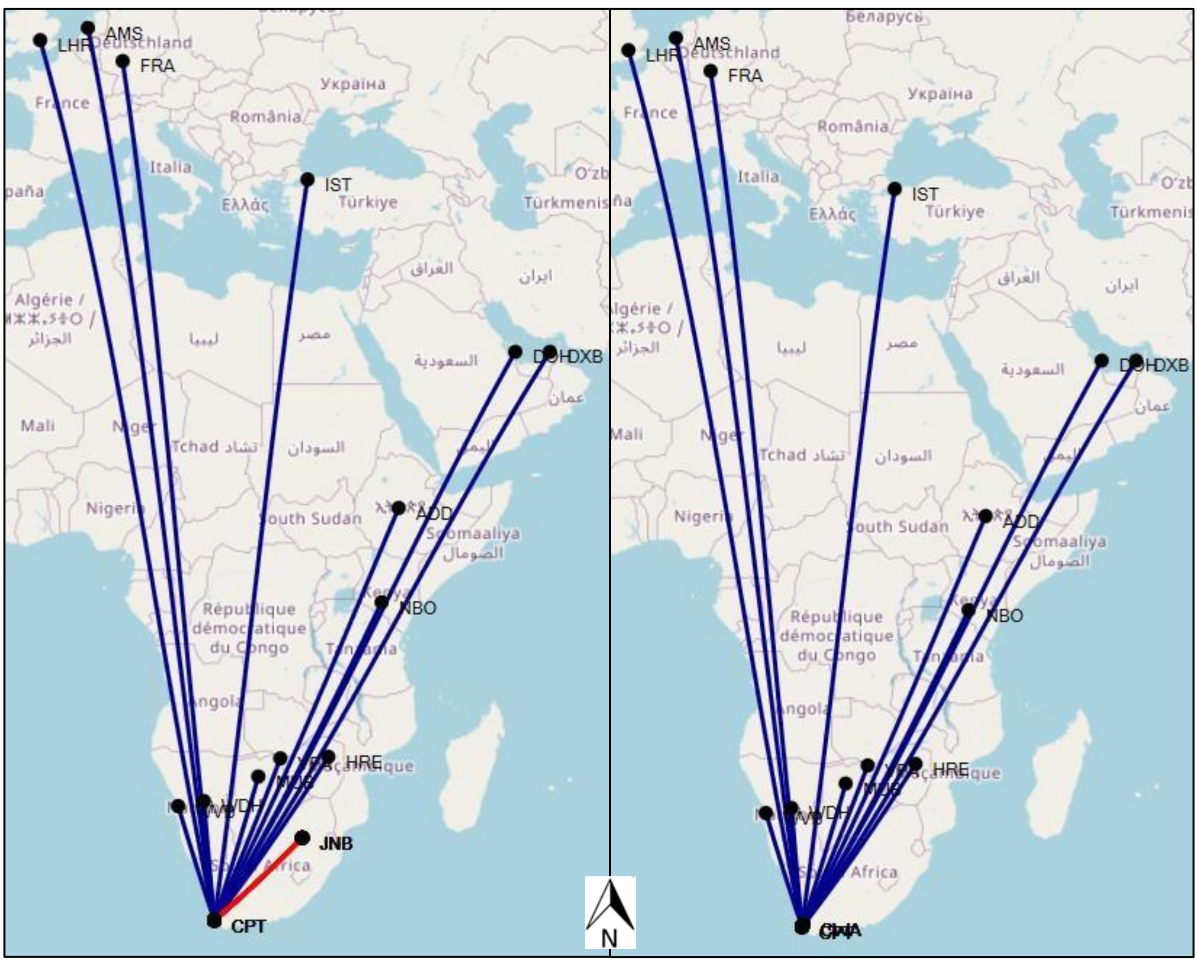


Figure 15: JNB and CWA as diversion airports (PACE Aerospace Engineering & IT GmBH, Oct 2022)

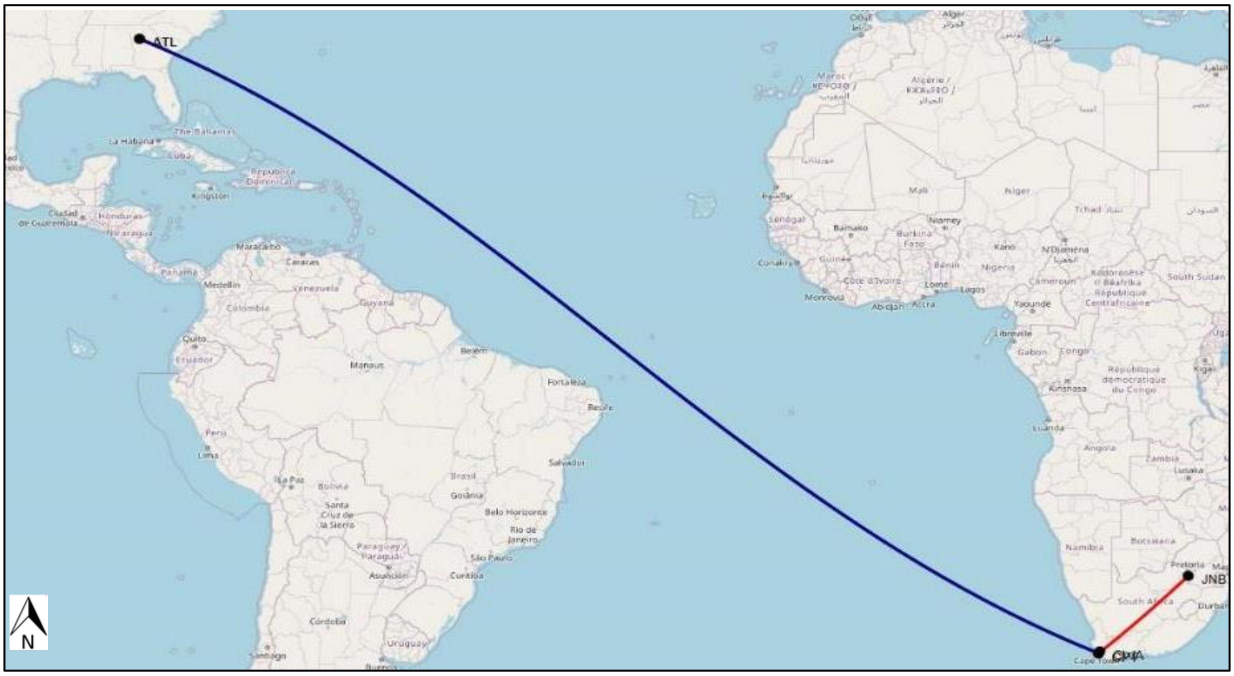


Figure 16: Route ATL – CTP, JNB and CWA as diversion airports (PACE Aerospace Engineering & IT GmBH, Oct 2022)

Table 15: Summary of results for the B77W (PACE Aerospace Engineering & IT GmBH, Oct 2022)

	Addis Ababa (ADD)	**London (LHR)**
Fuel Uplift Saving	8412 to 10364 kg	8243 to 10367 kg
Fuel Burn Saving	1175 to 2244 kg 1463 to 2794 l 19020.38 to 36325.10 ZAD 1188.77 to 2270.32 USD 3713 to 7090 kg of CO_2	2411 to 3679 kg 3003 to 4582 l 39034.04 to 59560.59 ZAD 2439.63 to 3722.54 USD 7619 to 11626 kg of CO_2
	Amsterdam (AMS)	**Dubai (DXB)**
Fuel Uplift Saving	8236 to 10358 kg	8376 to 10364 kg

Fuel Burn Saving	2420 to 3676 kg 3013 to 4578 l 39170.04 to 59514.74 ZAD 2448.13 to 3719.67 USD 7646 to 11617 kg of CO_2	1984 to 4217 kg 2470 to 5252 l 32114.30 to 68273.53 ZAD 2007.14 to 4267.10 USD 6268 to 13326 kg of CO_2
	Doha (DOH)	**Atlanta (ATL)**
Fuel Uplift Saving	8425 to 10376 kg	8327 to 9762 kg
Fuel Burn Saving	1917 to 4046 kg 2388 to 5038 l 31038.57 to 65495.73 ZAD 1939.91 to 4093.48 USD 6058 to 12784 kg of CO_2	3943 to 4907 kg 4910 to 6111 l 63826.98 to 79446.83 ZAD 3989.19 to 4965.43 USD 12458 to 15507 kg of CO_2

The individual route results generated by Pacelab Mission Suite for several takeoff weights were postprocessed. Excel was used to display the difference in fuel, payload / takeoff weight between two scenarios: the original diversion (Port Elizabeth International Airport or OR Tambo International Airport) and the CWA as diversion. The fuel uplift saving weights reach the order of 600kg to 10tons (for the CRJ100 and for the B77W, respectively), while the fuel burn saving weights reach the order of 30kg to 3tons (for the CRJ100 and for the B77W, respectively).

These weight reductions are possible because the distance from the destination airport CTIA to the CWA airport (14 NM) is lower than the distance to Port Elizabeth International Airport (491NM) or OR Tambo International Airport (686NM). The reduction in diversion distance results in less fuel weight being allocated to the reserve.

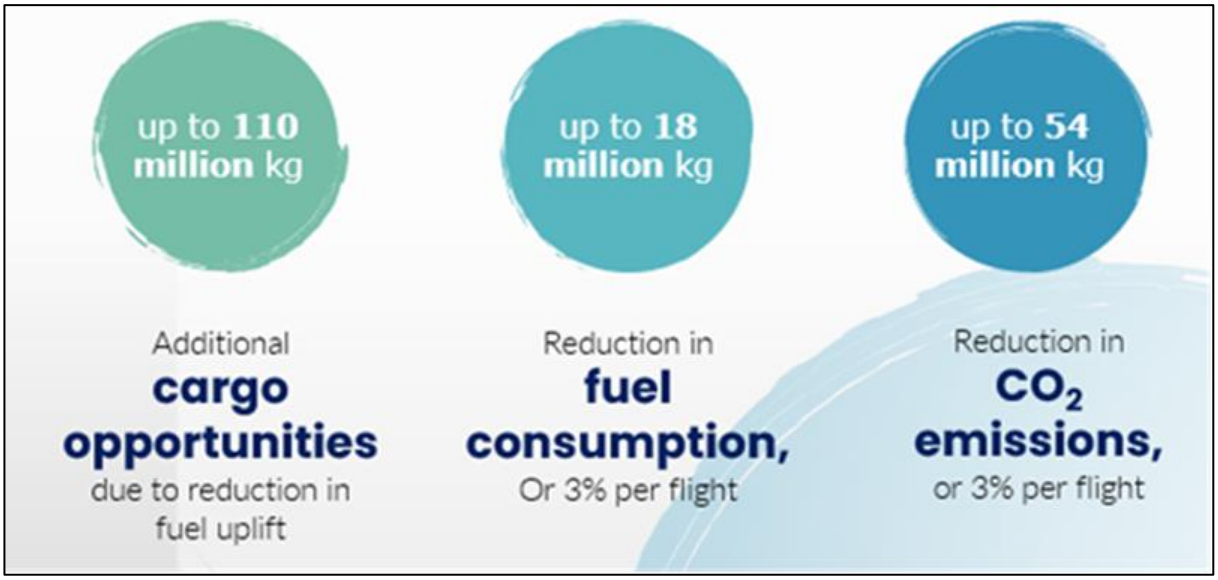


Figure 17: Projected fuel uplift, consumption, and emissions reductions (PACE Aerospace Engineering & IT GmBH, Oct 2022)

Further to the above, Solar PV and a Biodigester are proposed for development at the CWA to reduce the energy demand from Eskom with the aim to allow CWA to possibly be self-sustainable in terms of electricity.

SFA 8: ZERO-EMISSION BUILDINGS AND PRECINCTS

The site aims to reduce its dependence on fossil fuels (Eskom electricity supply) and will introduce solar PV and a biodigester in the proposed project.

Buildings will be designed and orientated to manage the internal climate and efficiently adjust to suit the required light levels, temperature, and air quality. The resultant minimisation of heating and cooling needs will by default result in reduced electricity needs and emissions.

Emission reduction will also be in the form of limiting the use of combustion engines and promoting the use of electric vehicles on site.

SFA 10: CIRCULAR WASTE ECONOMY

The overall waste management strategy for the site has been developed and a waste management plan has been compiled for the proposed project. The waste management strategy involves waste minimisation at source with the eventual aim for zero waste to landfill. A waste management plan has been developed and is included for review as part of the EMPr Appendix 43.

The biodigester is planned to run on treated sewage water (from the on-site treatment plant) and chicken manure (from adjacent farms) / biosolids form the WWTW or cultivated biomass. The plant can provide 24/7/365 continuous electrical power for CWA:

- The bio-fuel source will comprise ± 50tons/day of chicken manure.
- System designed to provide 1MW continuous power, at a cost/unit of electricity comparable to Eskom per-unit energy charges.
- The spark ignition engines provide the best fuel-economy and cost efficiency when run continuously at 100% load (i.e., 24/7/365)
- A single biogas fuelled engine should have an availability of around 93.5% (8200 Hours PA out of total of 8766 hours PA). A second engine can be used to provide the continuous backup if needed.
- The biodigester will require 3 to 5tons of treated sewage effluent per ton of chicken manure (250kl/day). If the sewage/effluent is not available, ground water (from borehole sources) can provide the supplementary volumetric requirements.
- The biodigester creates biogas which is accumulated into a (large) bladder system.
- The “waste” from the biodigester comprises “liquid fertilizer” (digestate) which can be distributed to local farms within a 40km radius of the CWA site.
- The biodigester can be combined with other sources of waste, including food waste and sewage. The sewage will be treated in the wastewater treatment plant before being used in a bio-fuel digester. The treated sewage water may be suitable for using to dilute the chicken waste (given that this is used for farm fertilizer).
- It is possible (in the future) to add other types of waste-stream sources, such as food-waste or vegetation, into the biodigester.

The **United Nations Sustainable Development Goals (SDG’s)** interconnect environmental, social, and economic aspects of sustainable development by emphasizing sustainability.

The 17 SDGs are:

No poverty (SDG 1), Zero hunger (SDG 2), Good health and well-being (SDG 3), Quality education (SDG 4), Gender equality (SDG 5), Clean water and sanitation (SDG 6), Affordable and clean energy (SDG 7), Decent work and economic growth (SDG 8), Industry, innovation and infrastructure (SDG 9), Reduced inequalities (SDG 10), Sustainable cities and communities (SDG 11), Responsible consumption and production (SDG 12), Climate action (SDG 13), Life below water (SDG 14), Life on land (SDG 15), Peace, justice, and strong institutions (SDG 16), Partnerships for the goals (SDG 17).

According to a preliminary study conducted by industry specialists the proposed project is aligned with the following SDGs:

SDG 1, 2, 3 & 4 (Reduction in poverty, hunger and increase in health, well -being and education) – the project aims to create jobs for breadwinners, resulting in the ability for households to have nutritional food on the table and for the youth to be educated.

SDG 7 (Affordable and clean energy) – the proposed project aims to produce its own renewable energy through solar PV, a biodigester and possible wind energy. These forms of energy do not result in emissions or waste products and compare favourably in terms of cost with Eskom supply.

SDG 8 (Decent Work and Economic Growth) - the project aims to be positioned as an 'airport city' and notwithstanding the additional flights that can be accommodated in the Western Cape the focus on non-aeronautical revenue on the landside, such as commercial and property development opportunities, can create job opportunities and economic growth for the region.

SDG 11 (Sustainable Cities and Communities) - the proposed project aims to be a sustainable and a green airport, and by embracing renewable energy and reducing carbon emissions, the airport can contribute to the development of sustainable and resilient cities and communities.

SDG 12 (Responsible Consumption and Production) - The proposed project emphasises sustainable practices and reduction in the amount of reserve fuel, and promotes responsible consumption and production, allowing the airport to reduce its environmental impact as well as support the reduction in global aviation fuel consumption.

SDG 13 (Climate Action) - The proposed project aims to reduce its carbon footprint and include renewable energy which will support this goal both on a local and international level.

NOTE: A Climate Change Impact Assessment has been completed attached to this report as Appendix 29. Refer Section 8.13 of this report for discussion.

According to the **National Water Resources Strategy (NWRMS)** the latest Water Sector Priority Focus Areas 2020 to 2030 are:

- Reducing water demand and increasing supply
- Redistributing water for transformation,
- Managing water and sanitation services under a changing climate,
- Regulating the water and sanitation sector,

- Improving raw water quality,
- Protecting and restoring ecological infrastructure for the green economy,
- Creating effective water sector institutions,
- Promoting international cooperation,
- Building capacity for action,
- Ensuring financial sustainability,
- Managing data and information in line with 4IR and global knowledge,
- Enhancing research, development and innovation,
- Addressing legislative and policy gaps.

The proposed water uses are in line with the following priority areas:

1) **Reducing water demand** – The site aims to reduce its water needs, while at the same time reusing water where possible to decrease the demand on the underlying aquifer. It is proposed to reuse treated effluent from the wastewater plant for irrigation and as feed material into the Biodigester.

   Future irrigation for the site will ensure efficient use of water through water conservation measures, and landscaping will be low irrigation need. Abstraction from the boreholes will be metered and monitored and use on site will be sub metered to enable early leak detection or spikes in on site usage.

2) **Managing water and sanitation services under a changing climate** – The main climate change risk to the Western Cape is reduced average rainfall. Surface water supplies will become more strained as temperatures rise, rainfall decreases and evaporation increases. Ensuring a secure subsurface supply (boreholes) and decreasing the demand from CoCT for potable supply enables the site to be more drought resilient and manage their supply more efficiently.

   Waterborne sewer is a high consumer of potable supply. The site aims to reuse treated effluent from the proposed wastewater treatment plant for irrigation and as feed material into the Biodigester, minimising the need for additional water supply and generating alternative source electricity for the site.

According to the Socio-economic Scoping study there is a *high probability that the CWA would become and remain financially sustainable over the long term. This depends mainly on the ability of the project to generate returns in excess of the cost of debt used as part of the financing structure. In this manner, the ability to service debt, meet short and long-term obligations and ensure the assets are efficaciously utilised to generate sustained revenue, form the basis for the micro-sustainability of the CWA.*

The CWA will access markets and position itself as an alternate airport for CTIA and as a hub for General Aviation, and its ability to diversify into a market space within the CMA and the surrounding districts that is generally untapped, offers the basis for a sustained market as well as a derived benefit for the CITA and enhanced synergies between the two airports.

It is envisaged that the CMA economy and the region would benefit from such an investment, where the CWA aims to serve people and provide airlines with an opportunity to transport cargo. Benefits would accrue in reducing the carbon footprint of airlines and extending revenue benefits to oil companies and fuel supply operators at CTIA. Passengers will benefit from a shorter travel distance and, in terms of cost savings, increase their discretionary income.

6. PROJECT DESCRIPTION

6.1 The Development

Cape Winelands Airport has the following vision "*To be a fresh, unique, 'first of its kind' development that blends technical aviation requirements with strong commercial property development principles. The aim is to be a true catalytic legacy project, and it is envisaged to be one of the single most impactful economic drivers the region will see in decades, creating value for all stakeholders*" (Capewinelands Aero (Pty) Ltd 2023).

The airport aims to develop into an international commercial airport and multimodal logistics hub, with excellent rail, road, and air connectivity. The airport upgrades associated with the development will deliver an airport capacity of 5.2 million passengers per annum (MPPA).

Infrastructure and facilities' sizing was appropriately matched with CWA's traffic forecast and ambitions to facilitate general aviation, domestic scheduled operations, international scheduled operations and be the planning alternate aerodrome and full reliever airport to Cape Town International Airport. The proposed development ensures that CWA can accommodate any aircraft type currently flying into Cape Town, including Code F aircraft, should airlines have to divert.

The Site Development Plan (SDP) for the proposed development is provided in Figure 18 and Figure 19 and is grouped into 5 precincts:

1) Agricultural Precinct
2) Air side Precinct
3) Services Precinct
4) Land Side Precinct
5) General Aviation Precinct

Table 16 below illustrates the Planning Activity levels per Development Phase, which is also referred to within technical and specialist studies. Proposed implementation date for PAL1A is 2027.

Table 16: Planning Activity Level linked to Phase 1 and Phase 2 (Capewinelands Aero Pty Ltd, Sept 2024)

PAL	PAL year	Million Annual Passengers (MAP)	Peak hr Pax	Commercial ATM		EIA Phases
			Two-way peak	Two-way peak hr	annual	
1A	2029	1.7	1,100	9	11,150	Phase 1
1B	2032	2.5	1,400	11	17,800	
2	2038	3.5	1,700	13	24,750	Phase 2
3	2044	4.4	2,000	15	30,950	
4	2050	5.2	2,200	17	36,100	

Refer Appendix 26 for more detail on the SDP within each precinct for Phase 1 and Phase 2.

NOTE: Due to the nature of the EIA process the current proposed SDP (Appendix 26) has evolved as an additional alternative as **Alternative 3** and has been included along with other alternatives for the EIA Phase.

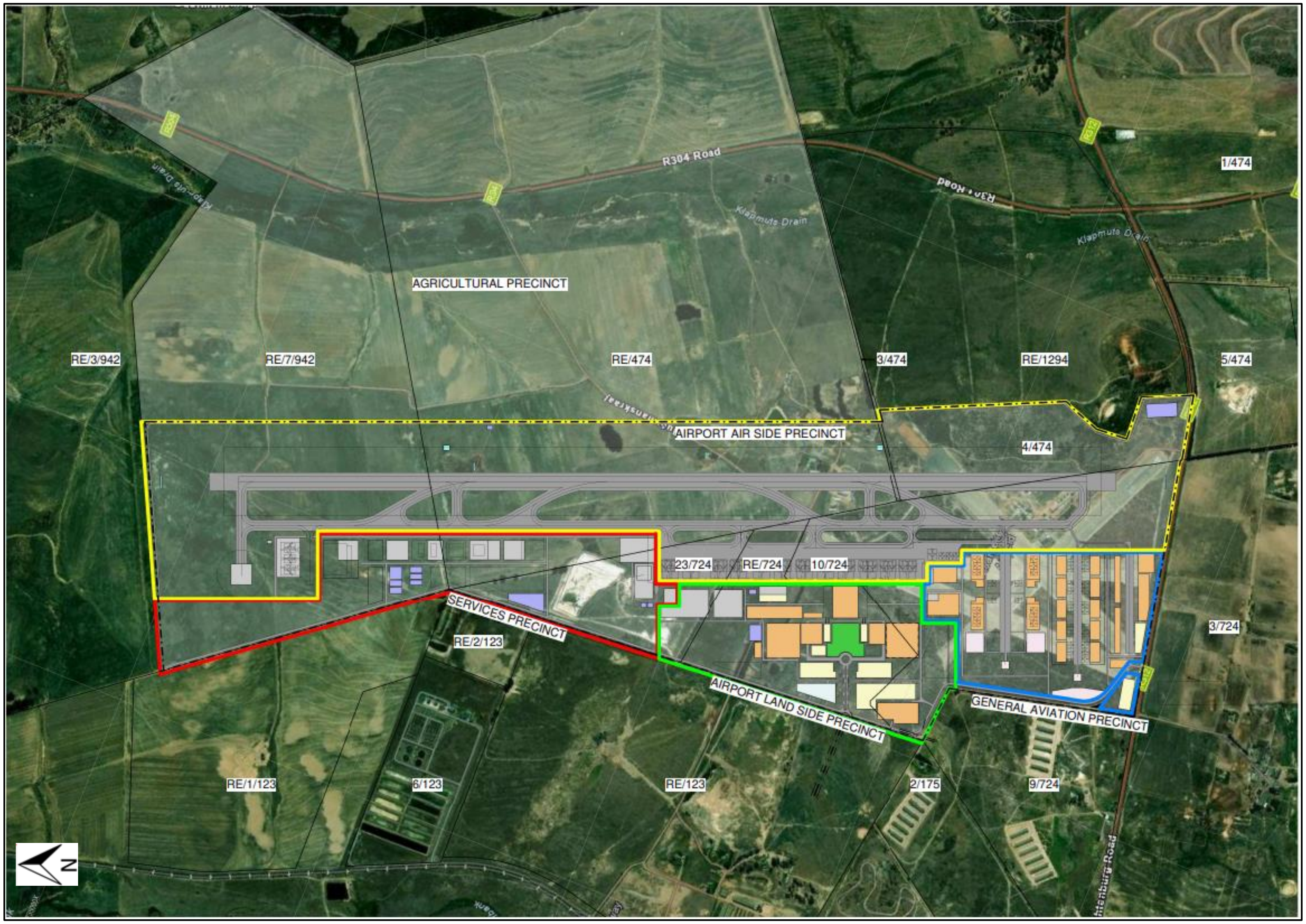


Figure 18: Proposed SDP Phase 1 – Note the five precincts (Capewinelands Aero (Pty) Ltd, August 2024)

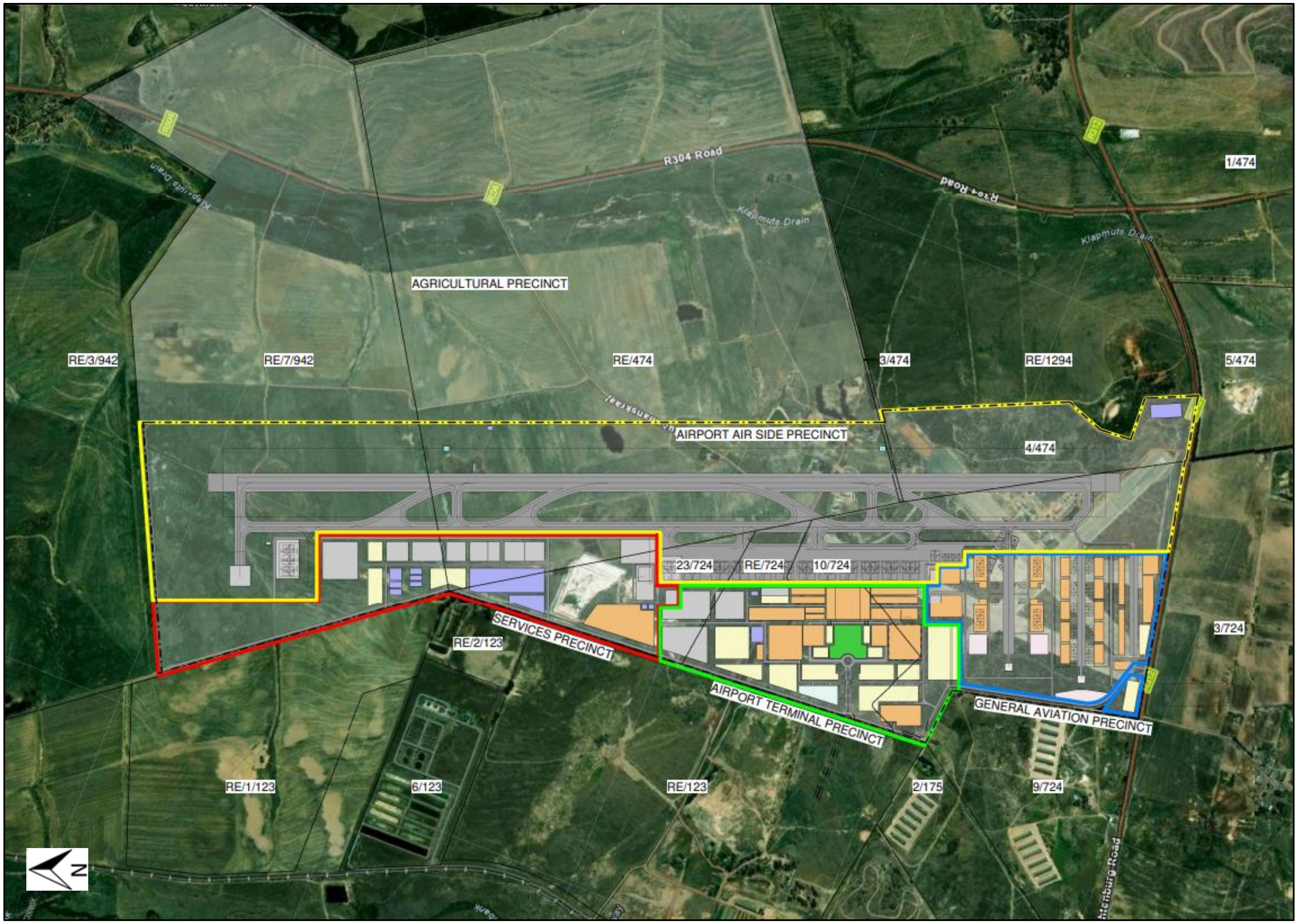


Figure 19: Proposed SDP Phase 2 – Note the five precincts (Capewinelands Aero (Pty) Ltd, August 2024)

6.2 Airside, Terminal and Landside Developments

6.2.1 Runway Development

In Phase 1, the airport will comprise of one runway, which will be at an orientation of 01-19 and a length of 3.5km and will be constructed to serve up to Code 4F instrument operations.

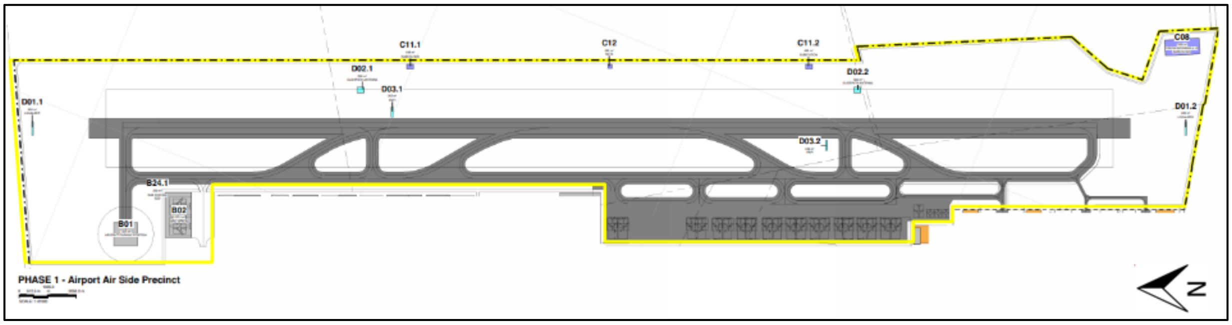


Figure 20: Planned runway layout in Phase 1 Airside Precinct (Capewinelands Aero (Pty) Ltd, August 2024)

This runway will be shared by all operators, including scheduled commercial as well as general aviation, where intersection take-off points will be introduced on the runway to improve efficiency for general aviation operations.

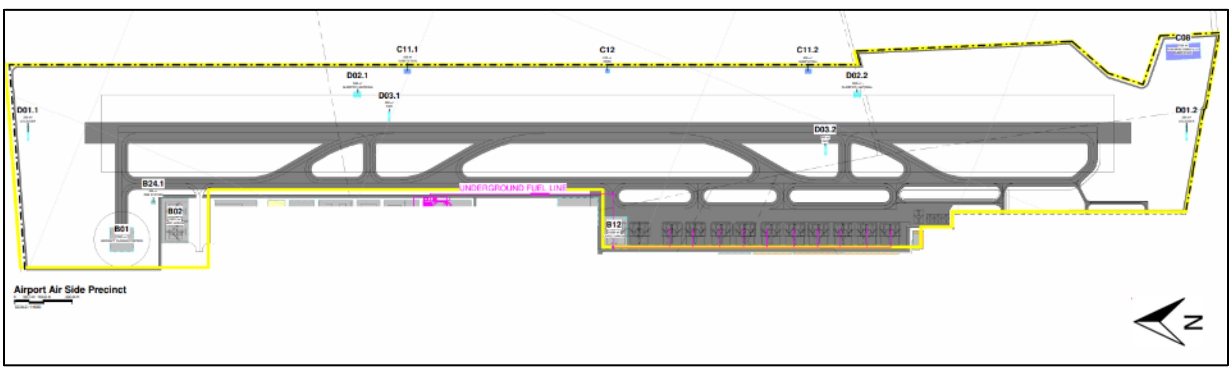


Figure 21: Planned runway layout in Phase 2 Airside Precinct (Capewinelands Aero (Pty) Ltd, August 2024)

The airside development will also include, but not be limited to, airside systems such as CAT II / III Instrument Landing System (ILS), meteorological systems and airfield ground lighting (AGL).

Refer Appendix 26 Item 6 and Item 11 for detail on layout.

6.2.2 Aircraft Parking Aprons

The following aircraft parking aprons are included in the Development:

- Passenger terminal apron
- General aviation and FBO aprons
- Cargo apron
- MRO apron
- Isolation pad

Aircraft parking stands range from ICAO Code B up to ICAO Code F stands.

As part of the Development, 11 MARS stands (21 code C equivalent stands) is foreseen. Some of these will be contact MARS stands and will be equipped with passenger boarding bridges (PBBs) and will be able to accommodate up to Code F aircraft. The other stands will be remote stands, to which passengers are bussed or can walk.

In addition to this, 1 Code E cargo aircraft parking stand and 2 Code E MRO aircraft parking stands have been included.

6.2.3 Airside Service Roads

Airside service roads will be constructed to provide access to airport assets for vehicles such as buses, ground service equipment and maintenance vehicles.

6.2.4 Airport Security Fence

An airport security fence will be erected in line with aviation security standards.

6.2.5 Passenger Terminal Building

The Passenger Terminal Building (PTB) serves as the nexus of the airport's operations, connecting airside and landside areas, facilitating passenger and baggage movements, while adhering to rigorous national and international regulations. It has been designed in accordance with the latest ICAO Annexes and the IATA Airport Development Reference Manual (12th edition, May 2022), ensuring compliance with aviation standards. The location and approximate size of the PTB have been predetermined in the airport master plan.

The PTB will be a double level building with a handling capacity of 5.2MPPA and the terminal has been designed to process both domestic and international passengers.

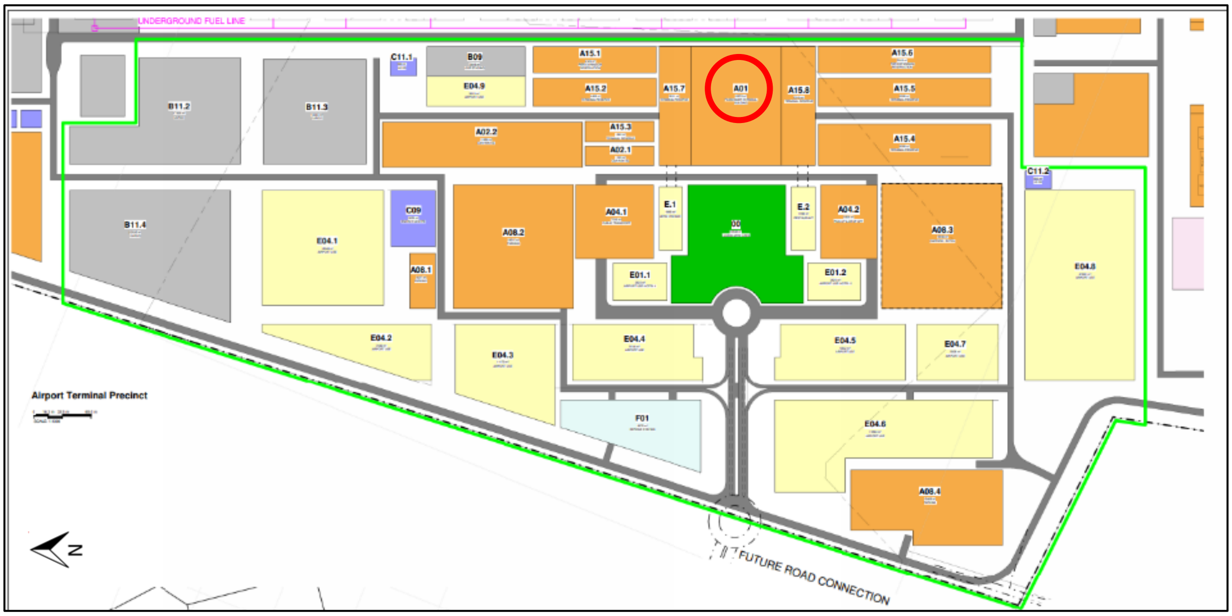


Figure 22: Planned location of Passenger Terminal Building A01 indicated by red circle within Terminal Precinct (Capewinelands Aero (Pty) Ltd, August 2024)

Table 17: PTB capacity estimates (Capewinelands Aero (Pty) Ltd, 2023)

Passenger Terminal Building Capacity
Combined peak hour arrival – 1,300 PHP
Combined peak hour departure – 1,300 PHP

Facilities will be designed specifically for the intended user groups and will be compliant with the relevant standards and recommended practices. These facilities will include specialised equipment and areas to facilitate check-in and bag-drop, security screening, and, in the case of international traffic, customs and emigration/immigration.

6.2.6 VIP Processing Facility

The VIP processing facility will have an independent access point from the landside and direct access to the airside. Government officials, VIPs and CIPs will be processed through the facility.

6.2.7 General Aviation and Fixed Base Operations Facilities

The general aviation area, including business aviation, is located at the south-western end of the airport site. The FBO facilities are located along a dedicated taxilane that provides direct access to/from the runway via the parallel taxiway.

A GA (General Aviation) kerbside refuelling station for AV-gas will be developed at the furthest southern corner of the GA site.

A GA clubhouse with airside views will be developed, with adjacent grass parking areas for visiting GA aircraft. The helicopter operations will be from dedicated FATOs (Final Approach and Take-off areas).

Refer Appendix 26 (item 5 and 10) for detail on GA Precinct layout.

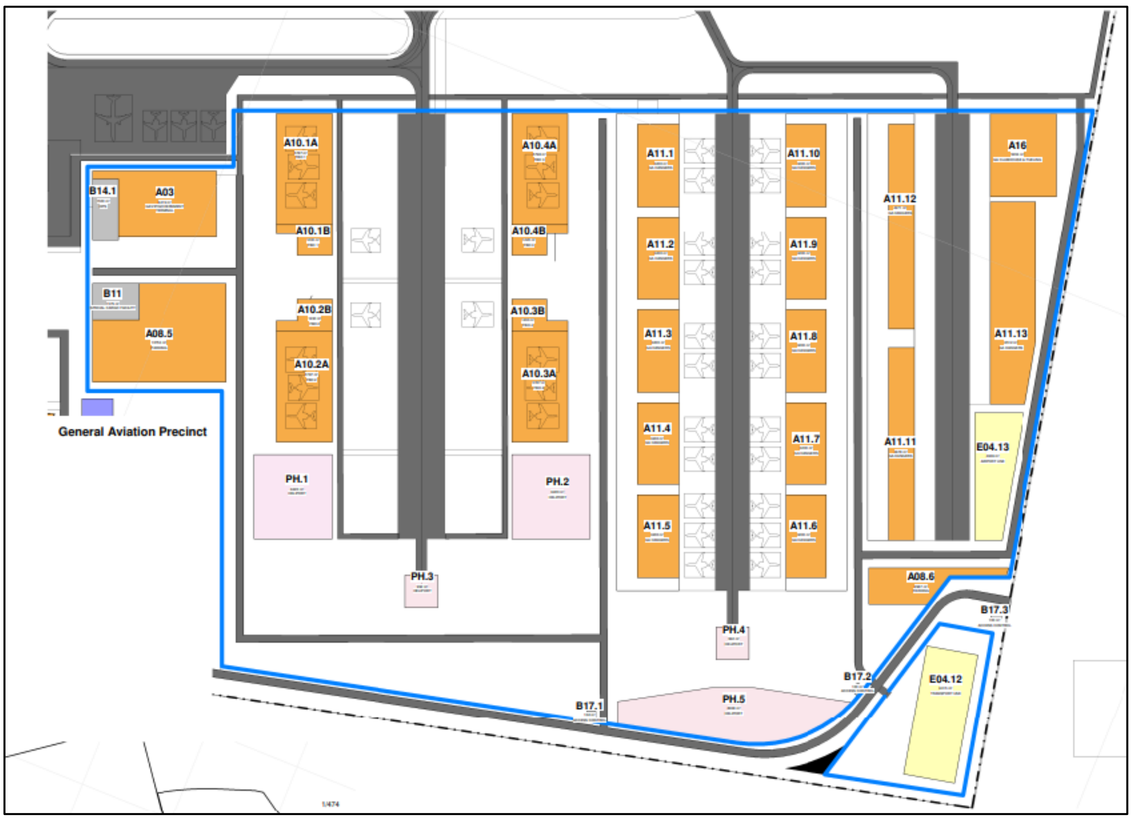


Figure 23: Planned GA Precinct (Capewinelands Aero (Pty) Ltd; August 2024)

6.2.8 Airport Support Facilities

The key airport support facilities are the aircraft rescue and firefighting (ARFF) services, airport maintenance, ground support equipment (GSE) maintenance and staging, cargo, aircraft maintenance, repair and overhaul (MRO), aircraft fuel facilities and an airport operations centre. Also included is provision for solar PV, wind energy and a biodigester. Most of these facilities are located on the western side of the airport. All facilities are accessible from the secondary landside road system, accessed from the western entrance road into the airport site.

Airport Fuel Facilities

The fuel facilities consist of a bulk fuel depot, a general aviation kerbside refuelling station and a commercial/retail service station. Refer Appendix 26 Item 23 and 24 for detail on layout.

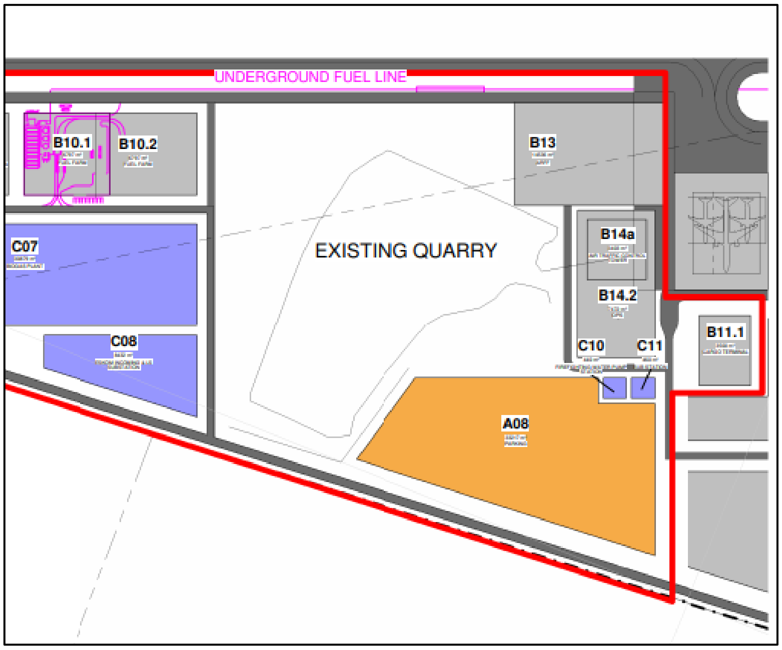


Figure 24: Planned Fuel Farm within Services Precinct indicated by purple (Capewinelands Aero (Pty) Ltd, August 2024)

Aircraft Rescue and Fire Fighting

The airport will be equipped to provide a level of protection corresponding with Category 9 to meet the ICAO standards. The location of the rescue and firefighting station is directly East of the air traffic control tower, close to the middle of the runway and complies with the ICAO requirements considering the response times of two minutes and not exceeding three minutes, to any point of the operational runway and any other part of the movement area.

Cargo Facility

The cargo facility is planned for the handling of general and specialized cargo in a dedicated facility on airside. The cargo facility is expected to handle both belly cargo (on passenger aircraft) and full freighter aircraft and is, therefore, located close to the passenger terminal building. Initially, full freighter aircraft can make use of the main apron, as aircraft stand demand is limited during off-peak hours. A single dedicated freighter aircraft stand will be provided when passenger peak traffic starts to spread out.

Airport Maintenance Facility

The airport maintenance facilities are planned in the services precinct, with access on both airside and landside.

GSE Maintenance Facility

GSE staging areas are included close to the main apron. Two areas have been reserved for GSE parking adjacent to the main apron.

MRO Facility

The location of the proposed MRO facility, including apron and taxiway, is in the services precinct of the airport site. This includes one widebody aircraft parking position and associated hangar. Moreover, additional space for several additional aircraft is available on the site.

Inflight Catering Facility

The facility is in the northern area of the airport, with direct airside access and landside access via the northern service entrance to the airport.

Solar PV, wind energy and Biodigester

Included in the Development is provision for solar PV and a biodigester. Wind energy is also being considered. Proposed location of solar PV is described in Section 6.7 of this report.

Airport Operations Centre

A dedicated Airport Operations Centre will provide space for several key airport support services such as airport offices, remote/digital air traffic control facilities, police services, clinic, airport staff facilities and emergency facilities, among other functions. Housed in this facility will also be a central facility for all government department officiating at the airport. It is envisaged that this Operations Centre is a multi-storey building with 5 floors with access to both landside and airside on the ground floor.

Air Traffic Control Centre

The upper levels of the Airport Operations Centre will contain an entire floor dedicated to the remote air traffic control centre.

6.2.9 Landside Developments

The landside development will consist of, but not be limited to, the following:

- Access, egress and an internal vehicular road system

- Drop and go facilities which will allow passengers to drop passengers off close to the passenger terminal building
- Public transport facilities
- Car rental facilities
- Vehicular parking (multi-storey parking, at-grade parking)
- Pedestrian walkways
- Billboards (indoor and outdoor, static and electronic)
- Droneport and vertiports

6.2.10 Commercial Developments

Included in the Development, and in addition to aeronautical development, are commercial developments. Approximately 350 000m^2 of lettable area will be provided for. The terminal precinct encompasses a terminal plaza with landmark hotels and an aviation museum. Included in the aeronautical hub functions are hangars, aviation clubs, an aviation training centre, workshops, light manufacturing, logistics, warehousing, and food processing.

6.3 Architectural Design Guidelines for the airport expansion

Preliminary design guidelines have been developed to encompass various facilities catering to a diverse range of needs, from terminal buildings and commercial spaces including hotels and retail establishments, to passenger services like car hire facilities.

The future airport hub is not only seen as a functional for travellers but also to establish a vibrant community centre. The airport complex will boast a large public plaza and well-landscaped areas, fostering an environment where aesthetics and functionality intertwine seamlessly.

Modern aviation has diverse requirements therefore, CWA will incorporate vital elements such as general aviation facilities, aircraft storage and maintenance hangars, and the full spectrum of support buildings necessary for accommodating aircraft that operate there.

The vision is to integrate logistics and commerce allowing warehousing and logistics facilities to co-exist alongside commercial office buildings.

The main design principles include:

a. Modern Aesthetics: All structures within the complex should embody a contemporary design language that harmonizes innovation with timeless allure.
b. Engaging Public Areas: Spaces that interface with the public, like walkways and plazas, should embrace "active boundaries," cultivating interactive and inviting environments.
c. Innovative Roofscape: Recognize rooftops as an integral fifth facet, offering a canvas to infuse creativity into the design, generating an extraordinary visual impact.
d. Functional Colonnades: For structures facing the public, incorporate colonnades to provide shelter from the elements. Extending roof eaves can further heighten weather protection, drawing inspiration from successful past examples.
e. Abundant Landscaping: Seamlessly intertwine landscaping with the areas encircling buildings, weaving in greenery, pathways, and water features to enhance both visual charm and user experience.
f. Local Material Palette: Incorporate finishes and materials that pay homage to the local context. Integrate elements like timber and stone cladding to establish a robust link with the region's distinctive identity.
g. Elevating Traditional Elements: Employ inventive design solutions to elevate the visual and utilitarian facets of buildings that employ conventional industrial construction methods.
h. Harmonious Signage: Adhere to the complex's signage guidelines for any building signs, including tenant logos, ensuring uniformity and visual cohesion throughout the compound.
i. Enhanced Road Infrastructure and Landscaping for a People-Centric Environment:

- Pedestrian Walkways and Pathways: Craft pedestrian pathways that are secure, well illuminated, and seamlessly interconnected throughout the complex.

- Bicycle Facilities: Integrate designated bicycle lanes and parking zones to encourage sustainable transportation alternatives for travellers and staff.
- Landscape-Enhanced Corridors: Ensure roadways are meticulously landscaped with verdant elements and visual motifs that heighten aesthetics, fostering a delightful ambiance.

Sustainability of the site and design has also influenced the architectural outlook and incorporates the following:

- Eco-Friendly Design: Incorporate sustainable design practices, including energy-efficient systems, renewable materials, and optimal use of natural light and ventilation.
- Water Management: Implement water-saving technologies, such as rainwater harvesting and efficient irrigation systems, to minimize water consumption and promote responsible water use.
- Energy Efficiency: Integrate energy-efficient lighting, HVAC systems, and appliances throughout the complex to reduce energy consumption and lower the environmental impact.
- Green Building Certification: Strive for recognized green building certifications to ensure the complex meets rigorous sustainability standards and contributes positively to the environment.
- Waste Reduction: Implement waste reduction and recycling programs to minimize the generation of waste and encourage responsible disposal practices.

A collection of carefully curated architectural precedents will serve as invaluable sources of inspiration and guidance throughout the design process, aiding in creating a unique and forward-looking airport complex that integrates seamlessly with the surrounding environment.

Building heights within the airport complex will be within the height guidelines, ensuring visual harmony and effective space utilization. An indication of building height has been included in the Architectural Guideline (Appendix 33).

6.4 Land Use and Zoning

The site is bordered by the R312 and Garden Cities urban development in the South, with several agricultural activities towards the East and North. North-West is a Corobrik mine in process of closure and the Fisantekraal Wastewater Treatment Works. The Bella Riva urban development and the County Fair Laying Farms are directly West of the CWA. Further West are Dirt &Dust recreational tracks, and Braam's Voerkrale. Southwest of the site is the Fisantekraal residential area, which links with the Greenville Garden Cities development.

Figure 25: Surrounding land uses indicating the current CWA site (red), acquired/ optioned land parcels (yellow and blue) and the quarry (purple star) (PHS Consulting, Oct 2023)

Figure 25 illustrates the historic airport site (red), acquired or optioned parcels in yellow (quarry is indicated by a purple star) and blue. Greenville Garden Cities future phases (2030+) are shown in orange to the South. Bella Riva is a mixed-use development to the West shown in green.

Table 18: Summary of the land parcels part of application area (Refer Figure 3)

FARM NR	Surveyor General Code																					Area (Ha)
P10 of Farm 724	C	0	5	5	0	0	0	0	0	0	0	0	0	7	2	4	0	0	0	1	0	114.1516
RE of Farm 724	C	0	5	5	0	0	0	0	0	0	0	0	0	7	2	4	0	0	0	0	0	43.6026
P23 of Farm 724	C	0	5	5	0	0	0	0	0	0	0	0	0	7	2	4	0	0	0	2	3	30.8711
P7 of Farm 942	C	0	4	6	0	0	0	0	0	0	0	0	0	9	4	2	0	0	0	0	7	256.9596
RE of Farm 474	C	0	5	5	0	0	0	0	0	0	0	0	0	4	7	4	0	0	0	0	0	397.9304
P3 of Farm 474	C	0	5	5	0	0	0	0	0	0	0	0	0	4	7	4	0	0	0	0	3	0.982
P4 of Farm 474	C	0	5	5	0	0	0	0	0	0	0	0	0	4	7	4	0	0	0	0	4	36.1295

Table 19: Summary of existing land uses on adjacent land parcels (Refer Figure 26)

Land portion	Description of landuse
RE/473	Agricultural – dryland wheat cultivation; some natural areas
RE/472	Agricultural – dryland wheat cultivation; some natural areas
RE/1294	Agricultural – dryland wheat cultivation; some natural areas
5/474	Agriculture; borrow area
ERF 4	Agriculture (feedlots, cultivation) and housing (Future Garden Cities)
9/724	County Fair chicken laying and rearing
RE/123	Agriculture (feedlots and cultivation) (Future Bela Riva)
RE/2/123	Feedlots (Future Bela Riva)
1/123	Agriculture cultivation
3/942	Agricultural – dryland wheat cultivation; some natural areas
1226	Agriculture cultivation
1225	Agriculture cultivation

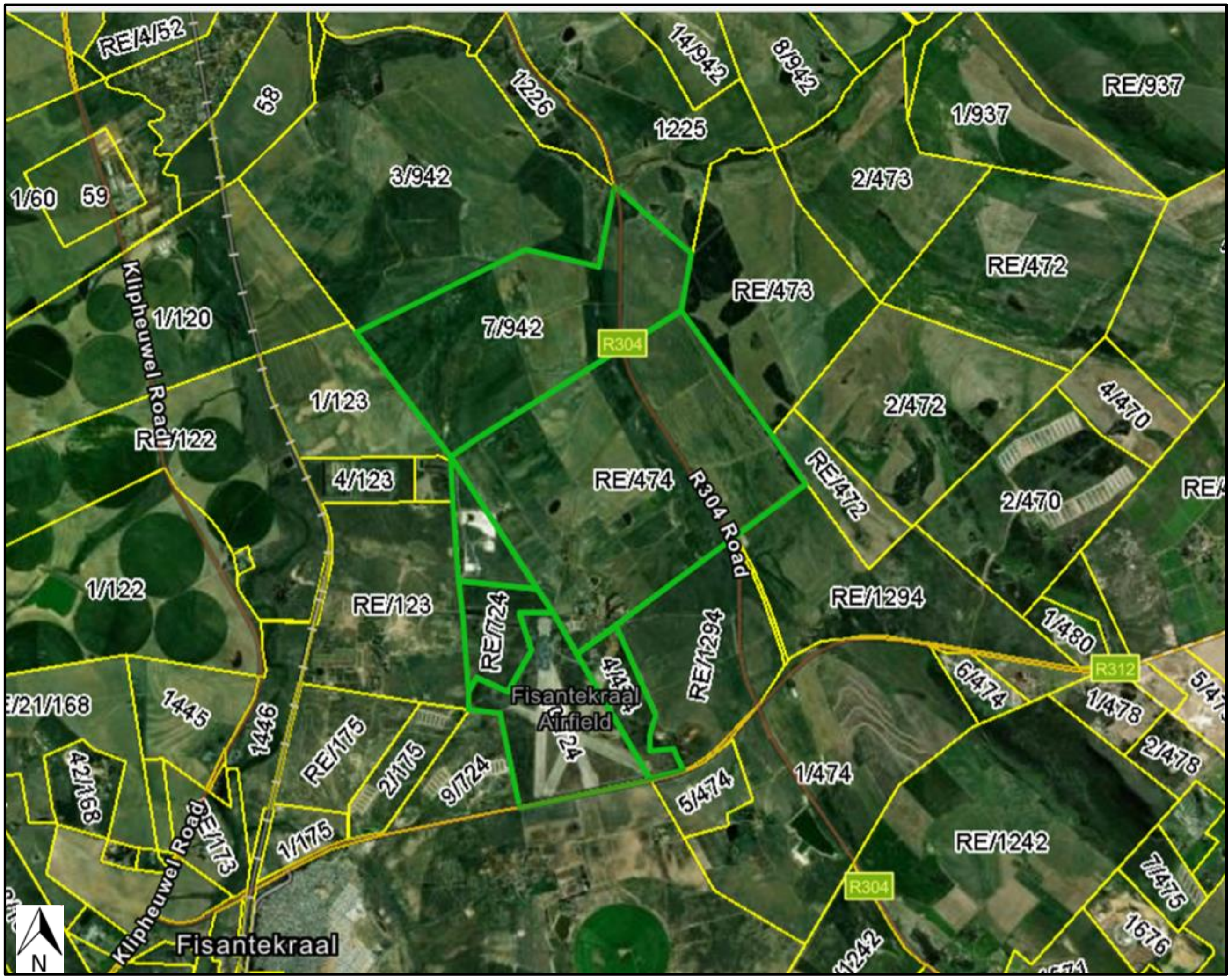


Figure 26: The application area (green parcels) and adjacent land parcels (yellow) (PHS Consulting, CFM, March 2024)

According to H&A Planning there are key interventions / actions proposed in the Northern District Plan to facilitate the achievement of the spatial objectives through the spatial vision, the role of the district and the spatial concept.

"The following specifically relates to the Fisantekraal area:

1. *Protect Mikpunt, Philadelphia and Klipheuwel from expansion.*

7. *Link Fisantekraal to the south with urban footprint via mixed-use development (employment-generating focus), dependant on bulk services and adequate accessibility. Also protect the Joostenbergvlakte smallholdings/residential estates from change in land use for the duration of the district plan.*

10. *Protect agricultural land from urban expansion.*

11. *Amend urban development edge to provide for inclusion of Cape Winelands Airport as well as rounding off the urban development edge to the north of the R312 (Lichtenburg Road)"*

In addition to the above, the CWA is specifically supported and encouraged in the District-Wide Development under Airports and other freight hubs:

"1. Encourage and support the development of the airport to address market needs in the area.

2. Encourage development of inter-dependent associated economic activities and the maximisation of economic opportunity within and in immediate proximity around the airport property, as appropriate."

H & A Planning (2023) noted that the amendment of the urban development edge includes the existing airport but does not cover the proposed expansion of the airport. Airport runways should preferably be in areas of low intensity land use such as outside the urban development edge. However, the landside development of airports should be inside the edge. Site-specific circumstances for deviation from the MSDF will thus have to be motivated in terms of the Municipal Planning By-law during the application process.

The Sub-district 3 Development Guidelines identified new development areas. The following were stated for the Cape Winelands Airport (P4/474 and P10/724) and farm portions to the West (P9/724 and P2/175):

1) *The airfield, located directly north of the R312 operates under private ownership. Any extension to the existing operations, or application for amendment of approvals (existing) need to follow due process, as may be prescribed. With regard to the portions identified on the Biodiversity Map and SDF Plan areas of high biodiversity value, detailed ground-truthing needs to establish the extent and conservation value of those portions.*

2) *To round off the urban development edge in the area to the north of the R312, CA 175/2 & 724/9 are included inside the urban development edge, and may be considered for industrial development, together with CA 175/1, to increase employment for the Fisantekraal community. Access onto the R312 needs to be resolved by applicants prior to development of proposals, which should include pedestrian movement across the R312.*
3) *Note that for any development proposals located within the noise contour zones around the airfield, the relevant authority should be consulted with regards to the applicable noise regulations and the type of development (i.e., residential, or non-residential) that could be permitted to ensure that appropriate mitigation measures are put in place, where necessary. The AOLS (Airport Obstacle Limitation Services) limit building heights of developments located in proximity to the airport flight paths. These developments are subject to comment from the South African Civil Aviation Authority."*

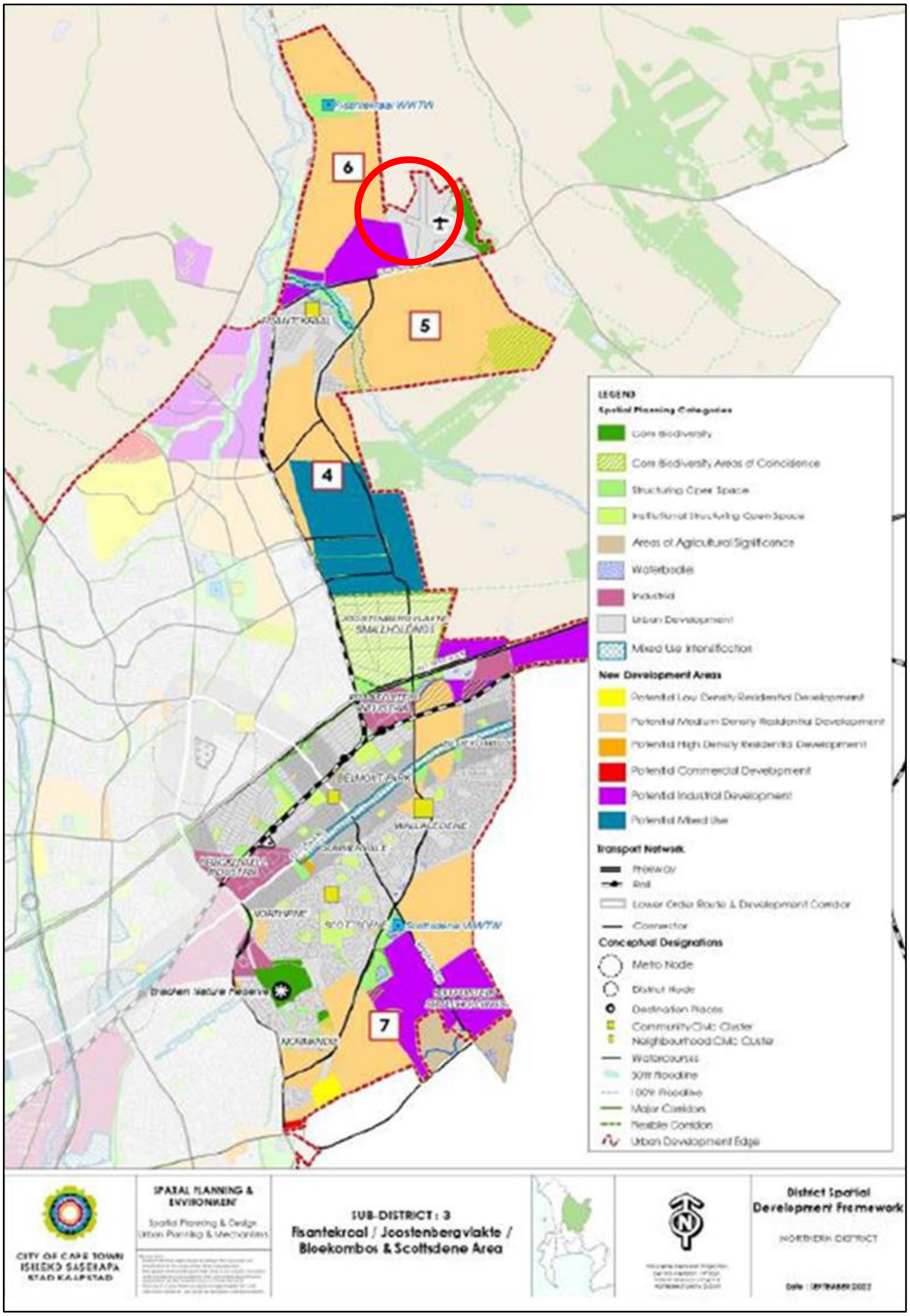


Figure 27: Northern District Plan for Sub-district 3 (Northern District Plan Vol 2, CoCT, 2023) – current CWA indicated by red circle.

6.5 Airport Access

The site currently gains access from 3 major roadways:

Table 20: Current access to site

Roadway	Classification
Klipheuwel Road (R302 / MR188)	Major Arterial (Class 2)
Lichtenburg Road (R312 / MR213)	Major Arterial (Class 2)
Koelenhof Road (R304 / MR174)	Major Arterial (Class 2)

Figure 28 indicates the Metropolitan Road & Rail Network with the site roughly indicated inside green ellipse. All the major roadways surrounding the site are currently under the authority of the Western Cape Government: Department of Transport and Public Works.

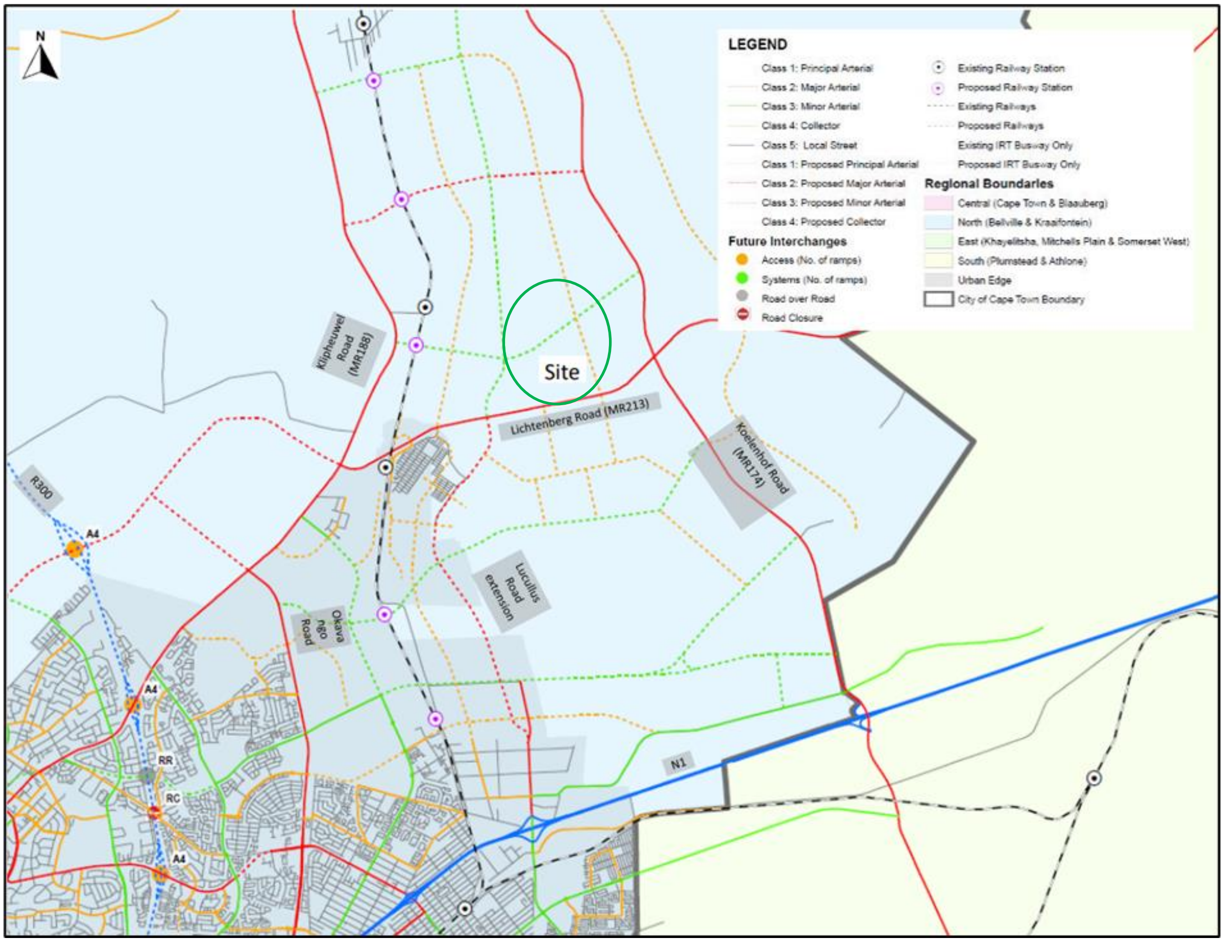


Figure 28: Metropolitan Road & Rail Network with site roughly indicated inside green ellipse (ITS Transport Scoping Report, Sept 2023)

The existing road bordering the West of the current CWA site is OP 6/8 (continuation of Melish Road).

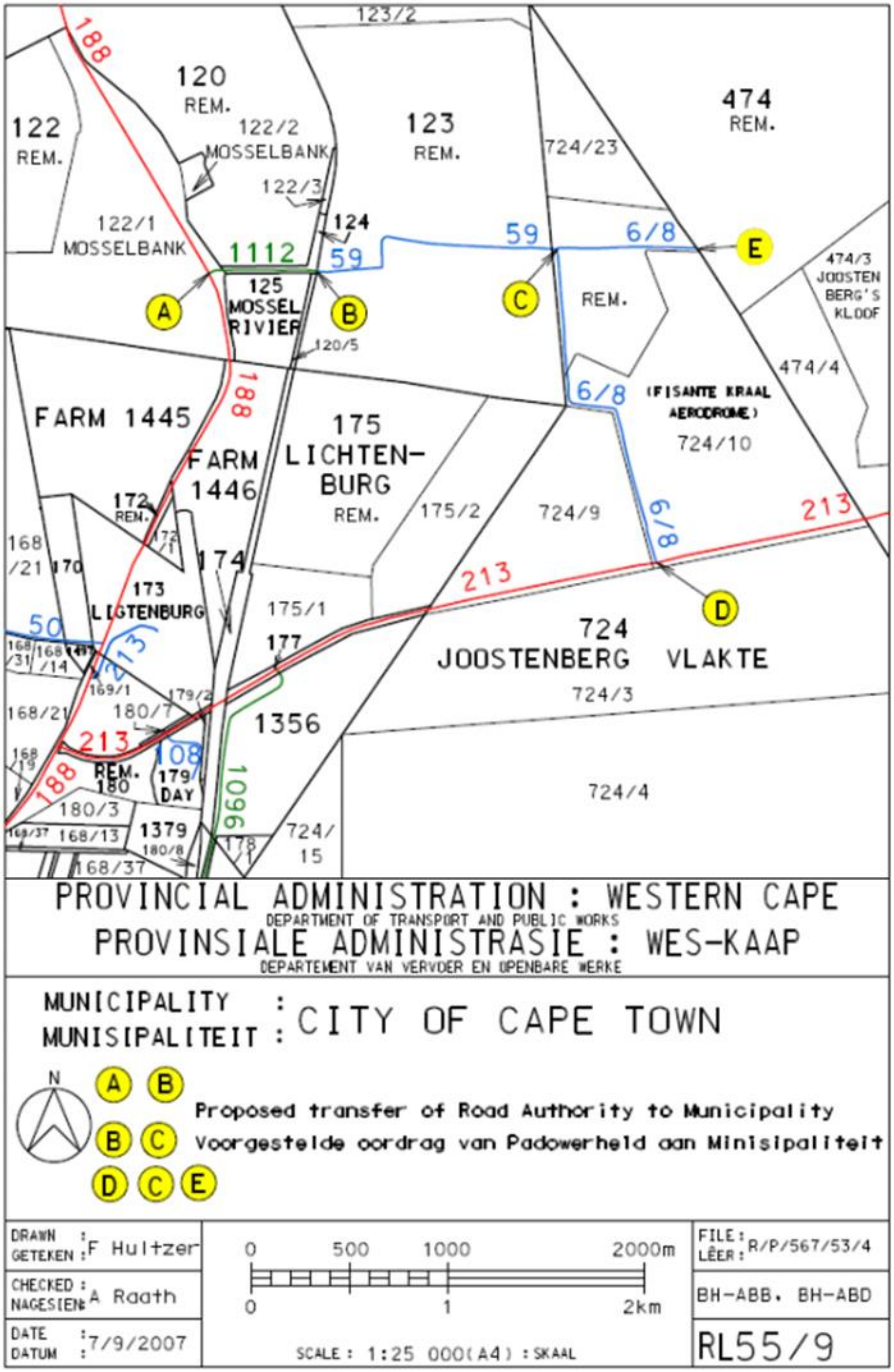


Figure 29: Provincial Roads in relation to the site with Road 6/8 indicated in blue lettering (ITS, Transport Scoping Report, Sept 2023)

6.6 Billboards and Advertising

Airports offer a distinct and captivating platform for advertising, featuring a wide range of opportunities both indoors and outdoors, from static billboards to dynamic digital screens. Advertising plays a pivotal role in an airport's revenue stream, and its incorporation within airport environments holds strategic advantages for both advertisers and the airports themselves.

Airports attract a prime, diverse, and engaged audience of travellers. These individuals, often in a receptive mindset, are more inclined to engage with advertising messages. Airport advertising provides brands with access to a valuable and influential audience, irrespective of their demographic or origin.

One of the unique aspects of airports is the extended and unmatched dwell time that passengers spend within their facilities. Travelers typically arrive well in advance of their flights, offering ample opportunities for them to interact with advertising content. Strategically placed static and digital media in high-traffic areas capitalize on this characteristic feature.

Furthermore, airports serve as international gateways, connecting people from around the world and boasting global reach. Airport advertising transcends regional boundaries, making it an ideal choice for businesses targeting both local and global markets.

The use of cutting-edge digital media in airports enables dynamic content updates, interactivity, and targeted messaging. These capabilities facilitate the creation of engaging, real-time experiences for travellers. Airports evoke feelings of comfort, reliability, brand affinity, and trust. Associating a brand with these sentiments can enhance brand affinity and trust, strengthening the brand-consumer relationship.

Beyond the benefits to advertisers, the inclusion of advertising, encompassing indoor and outdoor, static, and digital media, generates a substantial revenue stream for airport authorities. These funds can be reinvested to enhance airport facilities and improve the overall travel experience.

In summary, advertising within airports presents a strategic opportunity for businesses looking to engage a diverse and global audience, while also serving as a significant revenue generation avenue for airport authorities. By harnessing the potential of airport advertising, brands can elevate their market presence and achieve new heights in their marketing endeavours.

CWA has developed an Outdoor Advertising Guideline (Appendix 32) with focus on the types of outdoor advertising signage proposed for implementation – implementation of both 1st Party and 3rd Party Outdoor Advertising Signage will showcase the airport's offerings, welcome visitors, and provide a unique advertising opportunity for businesses.

1st Party Signage should be clear and legible from a distance, should comply with the CoCT Outdoor Advertising and Signage By-law of 2023 and “tailor made” in terms of style and size. It should also cause minimum visual impact, be aesthetically pleasing in terms of design and colour coordination, be strategically placed in high visibility areas to achieve maximum effect and well maintained.

3rd Party Outdoor Advertising Signage should comply with the CoCT Outdoor Advertising By-Law No.8969 of 2023, maintain or enhance the aesthetic quality of the environment, be “tailor made” in terms of style and integrate with the background environment to provide excellent visibility and readability. Signs should be strategically located to achieve maximum impact and visibility without causing any obstruction to transportation networks around the CWA. Further to this this signage should not cause any safety hazards, be consistent with the airport's aesthetic theme, be well maintained and freestanding structures should be internally illuminated.

The CoCT bylaw on 3rd party advertising signage has restrictions on size, height and clearance, illumination, style and profile for freestanding billboards, iconic signage, flat wall-mounted signs, digital format screens and sky signage.

The proposed outdoor billboards will be placed in the following zones of the Site Development Plan;

- Airport Precinct (Landside)
- General Aviation Precinct (Landside)

The primary entry and exit road to the Cape Winelands Airport is called Mellish Road. The total number of proposed billboards exceeding 18m^2 to be erected in Mellish Road is estimated to be 12 – 15 outdoor billboards and the possible location is indicated as a pink line adjacent to Mellish Road leading from Lichtenburg Road towards the main entrance of the Airport Precinct in Figure 30.

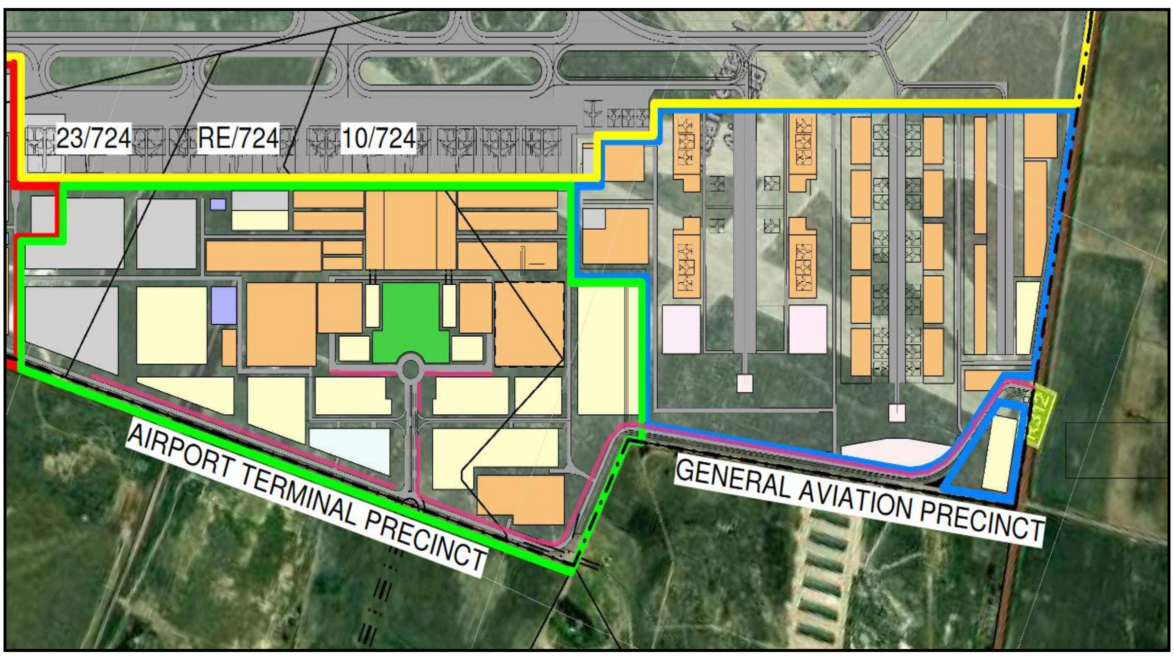


Figure 30: Pink line indicating possible placement of approx. 12-15 billboards (Capewinelands Aero (Pty) Ltd; Sept 2024)

Key points to determine the number of outdoor billboards that can be placed on Mellish Road:

- Minimum Control Area: The controls within a transport interchange can typically have stricter regulations to ensure safety and visibility.
- Spacing Requirements: The spacing of outdoor billboards must comply with the Road Traffic Safety Requirements as per the Linear spacing road speed limit.
- Size and Height Restrictions: The size and height restrictions to comply with the City of Cape Town Outdoor Signage By-Law No 8969,2023 to avoid interference with aviation operations.
- Approval Process: Cape Winelands Airport will need to obtain approval from the local municipality, which will review the application based on the specific criteria outlined in the by-law.

Recommendations:

The growing importance of sustainability has been one of the key marketing trends of recent years. Out of home advertising has several advantages from a green point of view, e.g. digital screens can be used to showcase multiple messages sequentially, without needing any extra materials. Digital solutions are designed to last several years. LED lighting delivers the same high standards of quality, with lower electricity requirements.

Environmental initiatives such as the use of LED lights, recycling paper, plastic, and monitoring waste sorting, enables the industry to truly incorporate sustainability into its core processes.

Advertisers will be encouraged to have an environmentally friendly approach when purchasing outdoor advertising furniture, by making use of recyclable materials such as steel, glass, sourcing or disposing of paper and plastics, that they are most likely to use in their campaigns.

Advertisers must also be committed to reducing the use of PVC where possible by using alternative plastics, or less polluting recyclable materials.

6.7 Bulk Electricity

The site currently contains an existing 66kV Eskom supply, and this will need to be upgraded to enable the expansion of the CWA.

According to the Electrical Engineers the ultimate rating of the Bulk Mains Supply relies on:

- individual building total area
- building usage classification (i.e., warehouse, hanger, office, retail, etc.) and
- diversified load demand (based on Watts/m^2). Note: Diversified load demand is based on internationally accepted Green Building Electrical Energy Usage models.

The Preliminary Bulk Mains Requirement was assessed to be Requirement was assessed to be 5-MVA increasing over time to 10-MVA (Notified Maximum Demand). The initial assessed load of 5MVA has been evaluated by Eskom who have confirmed their capability to provide this load. This capacity is sufficient for the PAL-1 stage defined above. The final load required by the site will be determined during the operating and expansion phases of the Airport, as described in phases PAL-2, PAL-3 and PAL-4 above. This increased load can be provided for using sustainable power systems, notably photo-voltaic power with battery storage. It is also noted that alternative sustainable sources including bio-digester generator plant and wind-turbine systems, can be used to supplement battery energy storage for the intended continuous electrical loads above 5-MVA. This will enable a final energy mix of 50% Eskom and 50% sustainable sources, with periods of off-grid power being used as far as possible.

Several types of sustainable energy sources considered, namely:

- use of chicken manure / biomass in bio-digestor plant to run spark-ignition gas- engine generator sets;
- photo-voltaic power supplies, including optional storage batteries;
- wind power turbine generator plant.

Eskom supply

The bulk mains electrical supply will be connected to the Eskom Grid via an overhead 66,000-Volt three phase connection, as follows:

1. The connection will be completed using two feeders, providing a degree of redundancy to the mains supply; this is in accordance with good engineering practice, where critical systems are connected. The (probable) routing of these feeders is illustrated below.
2. The Bulk Mains Supply will be connected to local Eskom High Voltage Substations. The feeders will be routed to the site using 66,000-Volt feeder cables, with the final routing of the Eskom connections confirmed later.
3. The bulk electricity supply will terminate within the CWA site in the High Voltage Substations on the southwest corner and the mid-west side of the airport facility (as indicated in the diagram below). The connection points will comprise an Eskom high voltagesubstation, plus a Consumer Substation fitted with 66000:11000 Volt Step-Down Power Transformers, and Medium Voltage Power Distribution Systems.
4. All equipment inside the substation enclosure to be provided by CWA Owners.
5. The outgoing cable connections will be configured as ring-feed supply ensuring high-uptime maintainability of the CWA Owners Medium Voltage Micro-Grid Electrical Network.

Figure 31: Eskom Bulk High Voltage Feeder Routing (SANDS, Bulk Electrical Services, August 2024)

Solar PV:

The entire site comprises an ideal area for the creation of photo-voltaic (PV) power sources. The following considerations will be applicable to the provision and installation of PV Power Sources:

- Given the primary function and usage of the site as an airfield, the proposed PV Power Source system was subjected to a Glint and Glare Study
- CWA intends to generate electricity from a renewable source of more than 20MW but less than 100MW considering the available roof space and open areas proposed (as proposed in Figure 32 to Figure 35). The generation will be for private off-take and own use only. The operation will not feed power into the Eskom grid via a Renewable Energy IPP Procurement Programme (REIPPPP) bidding process. Therefore, the DEA&DP is the competent authority for authorisation in terms of NEMA.
- The proposed placement of the panels on the roof areas of the various buildings are at 66% of the gross building area, allowing for placement of other services on the roof plus allowing for access and cleaning to the panels.

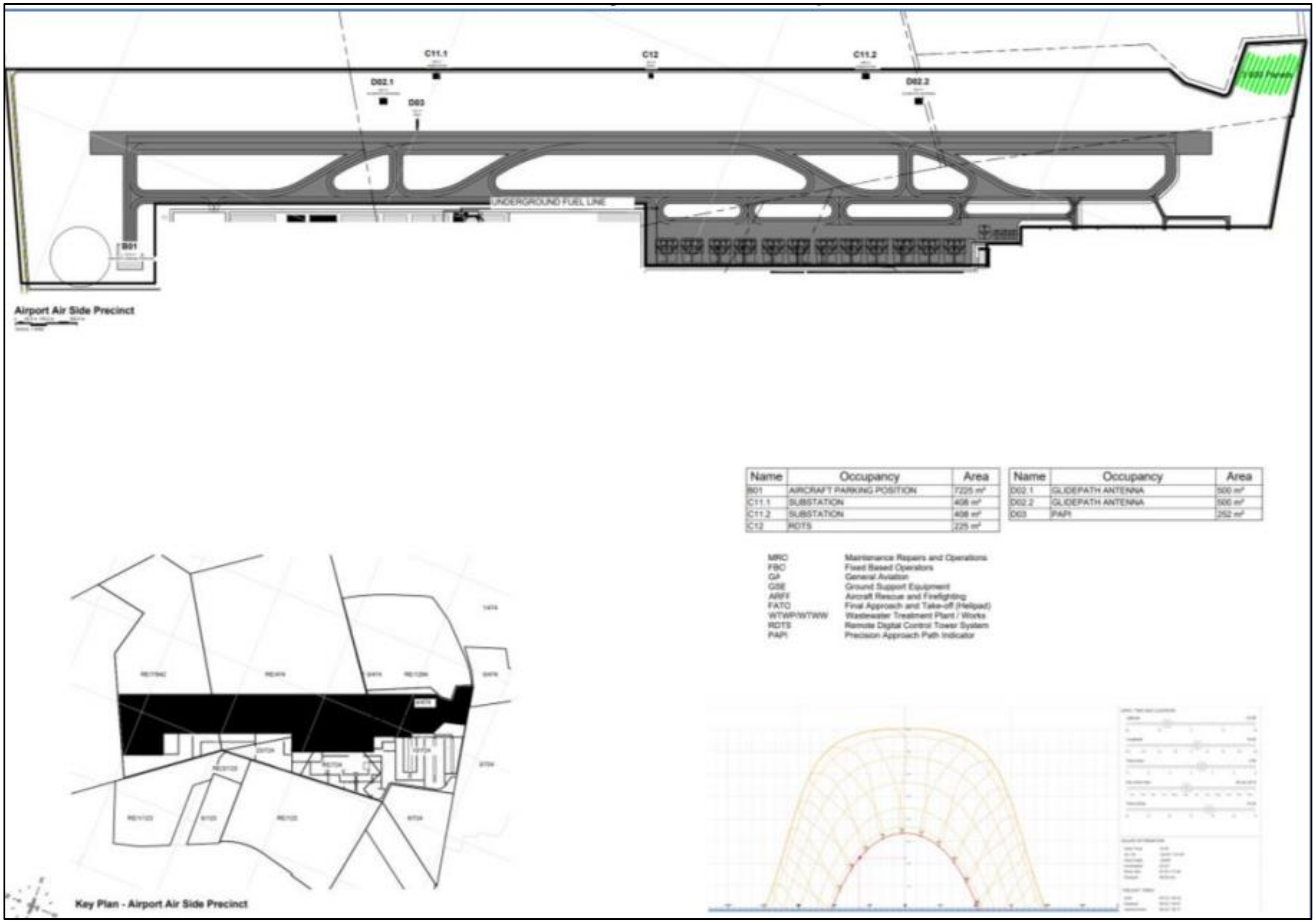


Figure 32: Air side Precinct PV Plant (PV arrays in GREEN shading) (SANDS, Electrical Bulk Services, August 2024)

Figure 33: Terminal Precinct PV Plant (PV arrays in GREEN shading) (SANDS, Electrical Bulk Services, August 2024)

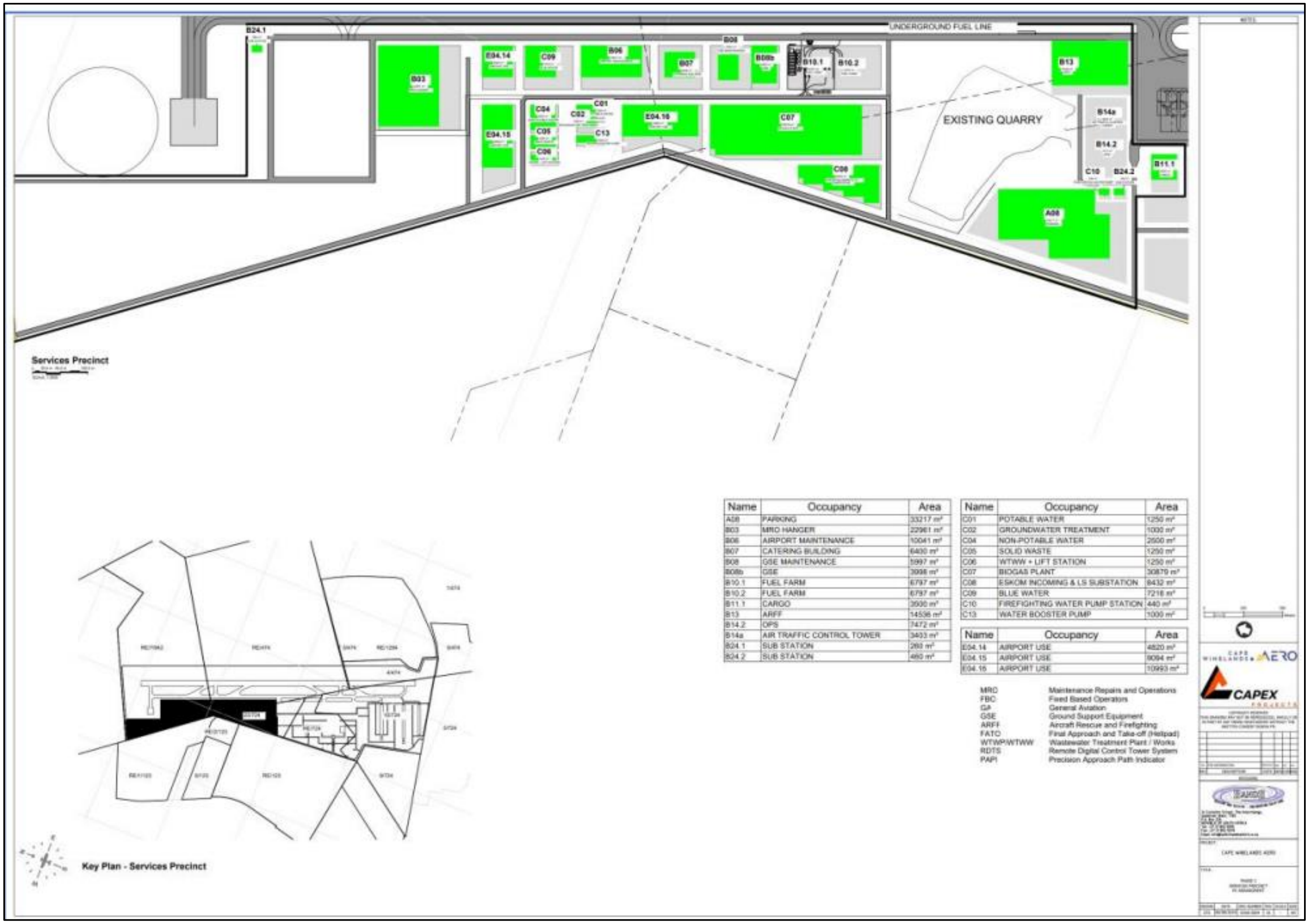
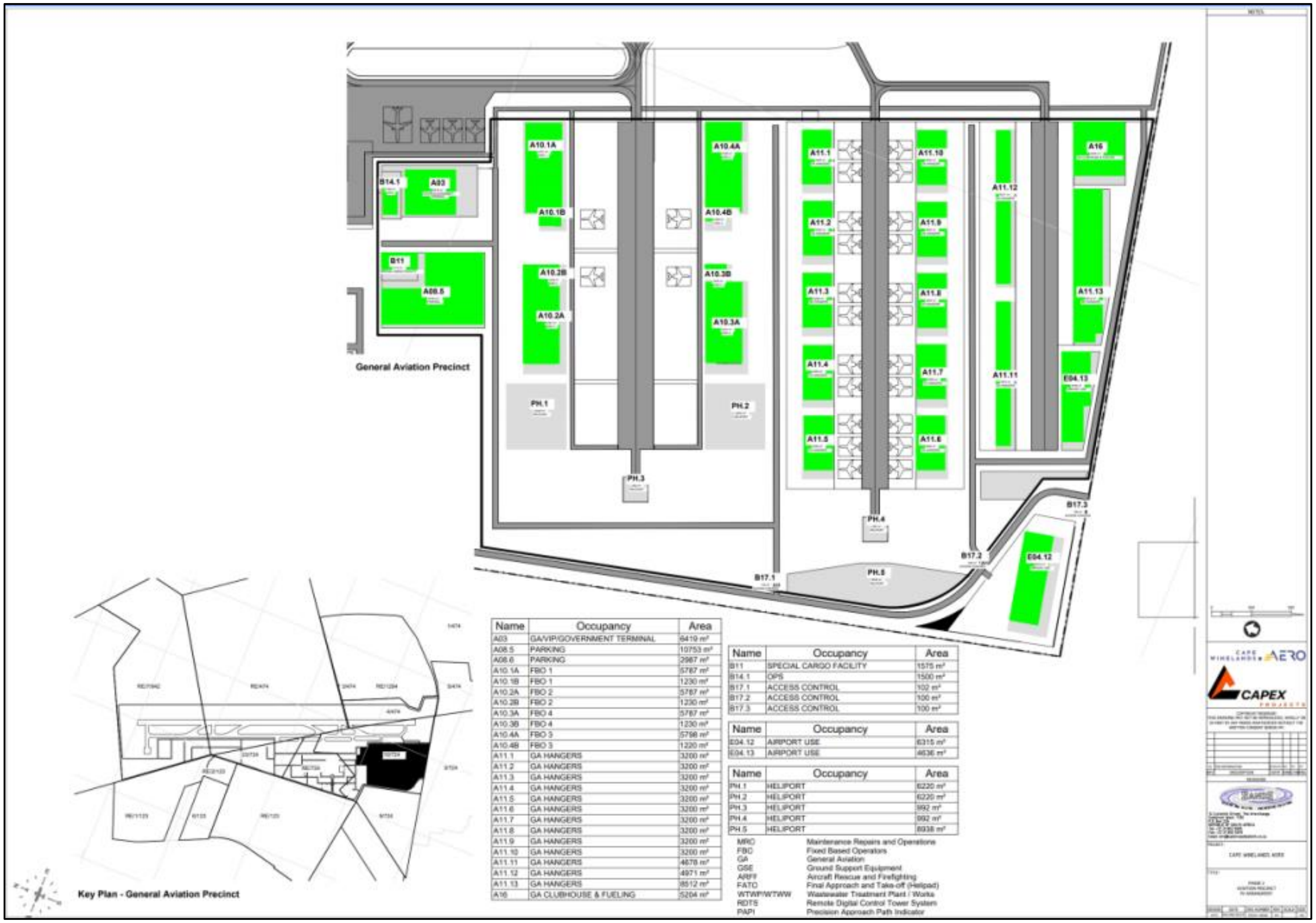


Figure 34: Services Precinct PV Plant (PV arrays in GREEN shading) (SANDS, Electrical Bulk Services, August 2024)



Name	Occupancy	Area
A03	GA/VIP/GOVERNMENT TERMINAL	6419 m²
A08.5	PARKING	10753 m²
A08.6	PARKING	2987 m²
A10.1A	FBO 1	5787 m²
A10.1B	FBO 1	1230 m²
A10.2A	FBO 2	5787 m²
A10.2B	FBO 2	1230 m²
A10.3A	FBO 4	5787 m²
A10.3B	FBO 4	1230 m²
A10.4A	FBO 3	5798 m²
A10.4B	FBO 3	1220 m²
A11.1	GA HANGERS	3200 m²
A11.2	GA HANGERS	3200 m²
A11.3	GA HANGERS	3200 m²
A11.4	GA HANGERS	3200 m²
A11.5	GA HANGERS	3200 m²
A11.6	GA HANGERS	3200 m²
A11.7	GA HANGERS	3200 m²
A11.8	GA HANGERS	3200 m²
A11.9	GA HANGERS	3200 m²
A11.10	GA HANGERS	3200 m²
A11.11	GA HANGERS	4678 m²
A11.12	GA HANGERS	4971 m²
A11.13	GA HANGERS	8512 m²
A16	GA CLUBHOUSE & FUELING	5204 m²

Name	Occupancy	Area
B11	SPECIAL CARGO FACILITY	1575 m²
B14.1	OPS	1500 m²
B17.1	ACCESS CONTROL	102 m²
B17.2	ACCESS CONTROL	100 m²
B17.3	ACCESS CONTROL	100 m²

Name	Occupancy	Area
E04.12	AIRPORT USE	6315 m²
E04.13	AIRPORT USE	4636 m²

Name	Occupancy	Area
PH.1	HELIPORT	6220 m²
PH.2	HELIPORT	6220 m²
PH.3	HELIPORT	992 m²
PH.4	HELIPORT	992 m²
PH.5	HELIPORT	8938 m²

MRO	Maintenance Repairs and Operations
FBO	Fixed Based Operators
GA	General Aviation
GSE	Ground Support Equipment
ARFF	Aircraft Rescue and Firefighting
FATO	Final Approach and Take-off (Helipad)
WTWP/WTWW	Wastewater Treatment Plant / Works
RDTS	Remote Digital Control Tower System
PAPI	Precision Approach Path Indicator

Figure 35: General Aviation Precinct PV Plant (PV arrays in GREEN shading) (SANDS, Electrical Bulk Services, August 2024)

Based on the proposed solar PV the following installation possibilities have been identified:

- Air side Precinct (Southwest corner) 2-MW
- Services Precinct 24-MW
- Terminal Precinct 39-MW
- General Aviation Precinct 14-MW

Total photo-voltaic sources peak rated value ≈ 79-MW. This figure needs to be read in conjunction with the total Mains Supply Connection Rating of 10-MVA. Please note that while there appears to be a wide gap between connection rating and PV peak rating, it must be noted that the PV rating is stated as "peak" – actual power produced is typically a fraction of this total. Excess PV power, when available, will be used for battery storage, EV and EA charging, or returned to the grid.

Biodigester:

The energy consumption is to be defined, but the study is based on a peak electricity demand of 1MWe. The biogas plant itself has been sized to provide 12,000kWh/d. Biogas production will be continuous, and gas will be stored in gas bladders protected by inflated domes for consumption at night. The size of the plant can be increased should there be a higher energy demand. It must be noted that will require a proportional increase in the daily feed to the plant.

Preliminary concept was to utilise chicken manure sourced from farms in the area. Chicken manure produces high concentrations of ammonia, and a mixed waste stream is recommended. The property includes 450ha of arable land where an energy crop can be farmed. The following feed streams are recommended:

- Chicken Manure (30t/day)
- Energy crop (Napier grass) (15t/day)
- Treated Effluent/Water (200m3/day)

It is important that organic material is not contaminated by plastic, wood, metal, etc. The waste will

be collected in a designated area and will be fed into a mix tank where the daily feed will be prepared and diluted with effluent/water for further pumping.

The anaerobic digestion process does not affect the fertiliser value of the waste and only removes the energy available in the organic material as methane. The discharge of the AD plant can be used for irrigation. The bio-digester plant planned will require significant further planning effort, reviewing the viability of the fuel stock sources, the designed rating of the plant in terms of useful electrical output, the required Environmental, Local Authority and National Regulations. The availability and combination of varied bio-mass fuel-stock sources as described will be a key design component of the bio-digester plant to maximize fuel production and provide a viable 24/7 fuel source.

An assessment was performed to estimate the waste streams required to generate 1MWe. This was evaluated in conjunction with available data on the identified waste streams in terms of bio-methane potential and used for sizing the reactor vessels (digesters).

The primary function of the biogas facility is seen as the production of electricity and the management of the organic waste can be seen as a value-added byproduct of the process. Biogas production will be constant, but gas will be stored for later consumption so that the generator can operate during load shedding event or at night when solar PV is not available.

Table 21: Waste streams required and resulting anticipated performance (SANDS, Electrical Bulk Services, August 2024)

DESIGN INPUT							
	t/d	**%TS**	**Solids**	**Liquids**	**VS/TS**	**VS%**	**T VS/d**
Chicken Manure	30.0	40.0	12.000	18.000	0.55	34.00	10.20
Grass Cuttings	15.0	25.0	3.750	11.250	0.80	22.50	3.375
Dilute Water	200	0.0	0.0	200.0	0.0	0.0	0.0
Total solid intake	45.0	6.43	15.750	229.250			13.575
Total Feed Rate (dilute)	**245 t/d**						

Table 22: Estimates for electrical production (SANDS, Electrical Bulk Services, August 2024)

Production of CH_4	5944	m^3/d		
	247.6	m^3/h		
CV of CH_4	39820	kJ/m^3	11.06	kWh/m^3
CV of Biogas	23892	kJ/m^3	6.64	kWh/m^3
Total power produced (CHP)	441	kW	397.4	m^3BG/MW
Thermo-Electric Efficiency	34.0%		2.02	kWh/m^3BG
Electrical Output (max)	1000	kWe	3.36	kWh/m^3CH4
Availability	95%		117.1	kWh/t
	11995	kWh/d		

The proposed plant will accept waste from the two waste streams from storage bins and tanks and dilute water as required. The waste will be transported to the mix tank and dilute water will be added.

The content of the mix tank is thoroughly mixed and macerated to a controlled consistency. The dilute water is introduced to control substrate density. The daily digester feed will be pumped, via an accurate positive displacement metering pump, to the primary digester stage. Six primary digesters have a combined volume of 3600m^3, providing a hydraulic retention of approximately 15 days. The primary digesters will be operated in the mesophilic range and will be held at around 37°C using heating coils supplied with hot water from the engine cooling circuit.

The heating of the digesters will utilise approximately 300kW of waste heat during winter and less in summer. The primary digesters will be mixed using circulating pumps with multiple level mixing nozzles operating in controlled cycles. From the primary digesters, the digestate will be transferred to six secondary digesters, with a combined capacity of 3600m^3, providing a further hydraulic retention of approximately 15 days. Digestate in the secondary digesters will be mixed by mixing pumps with multiple level mixing nozzles and this pump will also circulate the digestate between the two secondary digesters to ensure homogeneity. Both the primary and secondary digesters will have gas storage membranes above the tanks for consumption on demand.

Spent digestate will be processed by means of a screw press, to separate the liquid and solid fractions. The solid fraction can be supplied to a suitable off-taker such as a composting facility or be utilised on the property. The liquid fraction, which will have a low COD, can be used on the property for irrigation. It should be noted that the AD process does not alter the nutrient value of the substrate. The fertilising value is retained throughout the digestion process where only the carbon compounds are converted to methane (60%) and carbon dioxide (40%). The biogas will be fed to a drying and de-sulphurising stage where the temperature of the gas will be dropped by 20°C to remove excess condensate via a knock-out pot, and then fed to the biogas generator via a blower, delivering the gas at a minimum pressure of 5kPa. Operation of a single 1000kVA generator will be fully automatic.

<u>Chicken Manure as a feedstock source:</u>

The chicken manure is to be “harvested” at the various local farms, ideally within a 50-km radius for use at the plant. This “raw” chicken manure is typically not suitable for direct fertilizer stock and requires maturation/dilution for farm use. International studies and test plant has confirmed that chicken manure comprises a good quality feed stock for bio-fuel generation. This bio-fuel source will comprise ± 30-tons/day of chicken manure.

<u>Energy crops as feedstock source</u>

Extensive research has been done to determine the viability of growing an energy crop for the specific purpose of supplying the proposed biogas plant with feedstock. The most cited grasses for the purpose of using it to produce biogas is Napier and Vetiver.

Based on the inherent characteristics of Napier grass, a ton of fresh grass has the potential to deliver 103m^3 of biogas, while a ton of fresh Vetiver grass processed through a hammer mill has the potential to yield 260m^3 of biogas per ton.

Treated Sewage Effluent as dilution feed

The biodigester will require 3 to 5 tons of treated sewerage effluent per ton of feedstock (i.e. 200m^3/day). A significant portion of the daily water "consumption" is cycled through the plant continuously, such that the makeup water required comprises ≥ 10% ≤ 25% of the total water requirement.

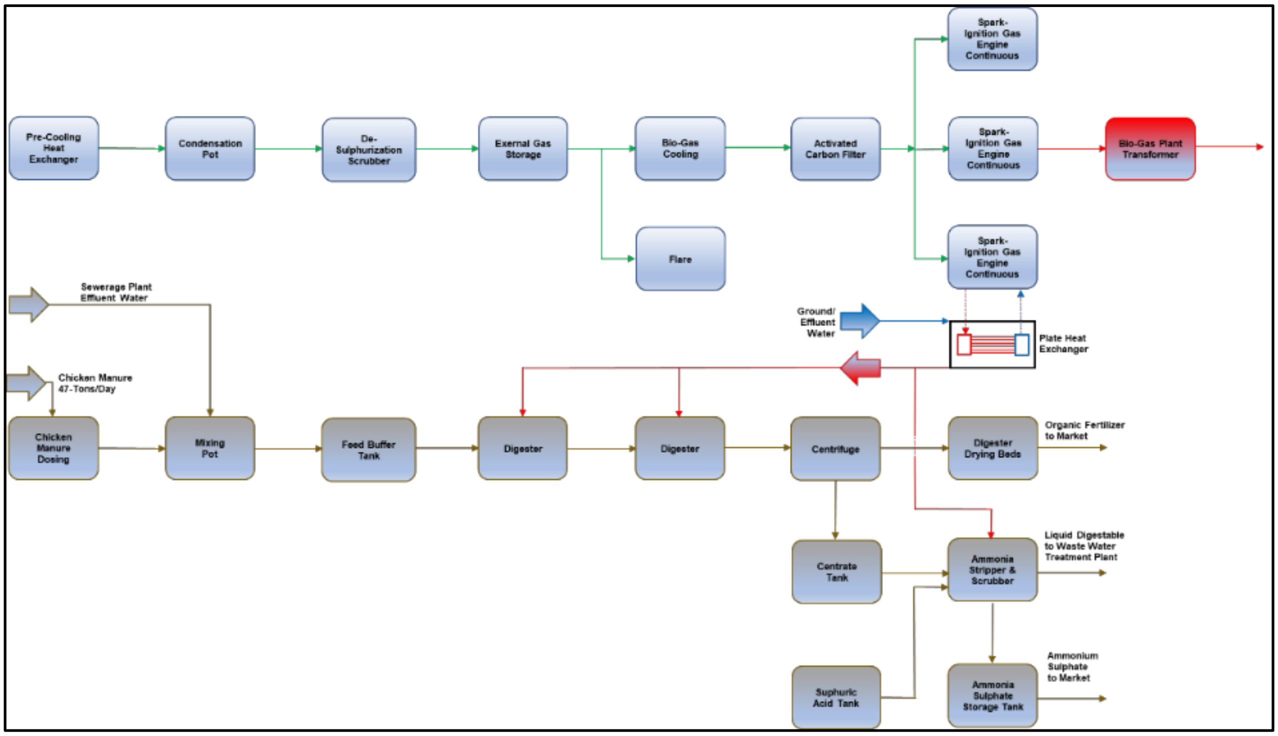


Figure 36:Conceptual layout of Bio-Digestor Plant with Gas-Engine Generator (SANDS, Electrical Bulk Services Report, Oct 2023)

Figure 37: Example of Biogas Bladder Storage (SANDS, Electrical Bulk Services Report, Oct 2023)

General Notes

- The planned plant can provide 24/7/365 continuous electrical power for CWA.
- System designed to provide 1-MW continuous power, at a cost/unit of electricity comparable to Eskom per-unit energy charges.
- The spark ignition engines provide the best fuel-economy and cost efficiency when run continuously at 100% load (i.e., 24/7/365).
- A single biogas fuelled engine should have an availability of around 93.5% (8200 Hours PA out of total of 8766 hours PA). A second engine can be used to provide the continuous backup if needed.
- The bio-digester plant creates biogas which is accumulated into a (large) bladder system.
- The "waste" from the bio-digester plant comprises "liquid fertilizer" which can be distributed to local farms within a 40km radius of the plant.
- It is possible (in the future) to add other types of waste-stream sources, such as food-waste, into the biodigester.

Secondary Backup Power Supplies:

Two backup power supplies have been considered in the Design Proposals, namely diesel driven generator plant and battery energy storage system (BESS).

1) Non-renewable diesel driven generator plant.

Due to the safety and operational requirements of the airport and supporting aircraft management systems, the electricity supply design must include multiple redundant sources of power, including diesel generator plant and uninterruptible-power supplies, designed to operate only when the Solar PV and Biodigester, and alternatively the Eskom supply, is not available.

The diesel driven generator plant will be provided for the following systems and services:

- Airport and air-control management systems
- Runway and Airside Taxiway lighting systems
- Site Security Management
- Boundary Lighting Systems
- Other miscellaneous critical power systems

Bulk fuel storage for the generator plant will likely comprise storage of approximately 46m^{3}of diesel, which will be stored in the fuel farm and distributed by bowser to the generator backup plant.

The rating of diesel driven generator plant will be ≤ 10MVA (8MW). The recovery of waste heat from this plant and converting it to chilled water or other useful forms of energy is problematic to achieve on this site due to the scale of the development and the spread-out location of the plant. Placement of the backup generators is still to be finalised and refuel is planned to be from the fuel farm with a small tank located or incorporated as part of each engine.

2) Renewable Battery Storage

Due to the scale of the planned solar PV on site provision has been made for battery energy storage, with Li-Ion batteries to be considered as economies of scale and production costs reduce.

Storage entails:

- It will be preferable to house the battery storage systems in concentrated areas, preferably in containerized outdoor enclosures, close to PV Power Source, on the airfield side.
- The inclusion of battery storage for airside buildings will be considered and included as part of the building electrical microgrid design.
- The use of gel-filled lead-acid batteries plus Li-Ion batteries, has been considered.
- The batteries planned will be fitted in enclosed, fully manufactured units, housed into containerized storage modules. The battery packs are typically rated in relatively small fraction ratings of the overall system rating - 830kWh battery containerized modules. The batteries fitted inside these modules are likely to be in the 10 to 20kWh ratings. The batteries are individually monitored for over-charge/over-temperature/overtemperature minimizing the risk of individual unit failure. The battery enclosures are all fitted with HVAC cooling and fire suppression minimizing the risk to operators and environment.
- All battery types mentioned above virtually 100% recyclable thus comprising a good environmental solution to energy storage.
- The storage/usage cycle lifetime of the battery options is governed by the permitted discharge level, battery temperatures and number of discharge events. To ensure optimal performance/life cycle the use of battery management will be essential to system longevity.
- The cost/performance capability of battery storage compared to traditional diesel driven generator plant is being considered and will be incorporated and integrated onto the MV electrical micro-grid where required and where possible

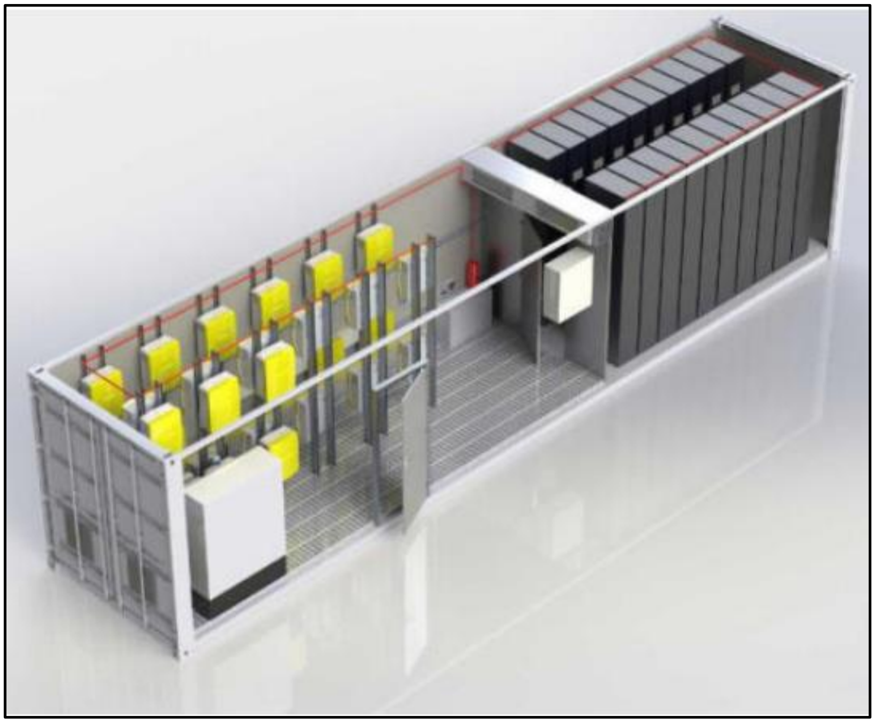


Figure 38:Typical containerized battery storage unit (SANDS, Electrical Bulk Services Report, March 2024)

Wind Energy:

Another sustainable power source to be considered is vertical wind turbines, mounted on the roofs of the various airside buildings or land based. These are incorporated at the detailed design stage of each building, with sustainable power fed into the local microgrid electrical network and has the potential to complement the planned photo-voltaic systems. Other wind turbine applications (e.g. on the ground) and other new technology will continue to be investigated to ensure the best possible energy solution for self-generation.

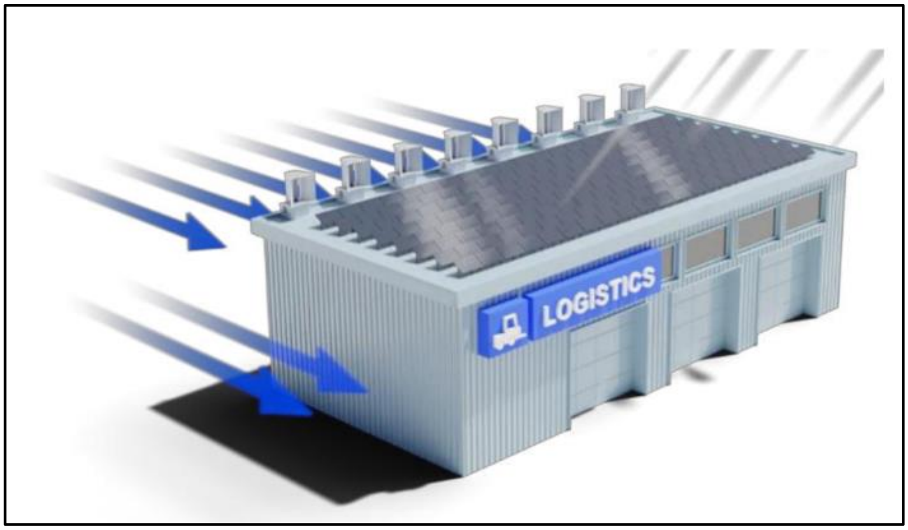


Figure 39: Rooftop mounted vertical wind turbine illustration (SANDS, Electrical Bulk Services Report, March 2024)

Energy generation summary

- The site total demand has been calculated at 10MVA.
- It is possible to provide 24/7 bio-digester plant rated at 1MVA.
- The peak capacity planned for photo-voltaic plant is 79MVA.
- It is likely the total site demand for electricity will be provided off-grid for portions of the working day cycles.
- Provision is to be made for limited battery storage; the electrical network microgrid will be capable of scalable additional battery storage modules as the technology develops.
- The inclusion of wind turbine generator sources can be incorporated onto the electrical network microgrid as the viability of these solutions improves. •
- Critical loads are estimated at 3 to 4MVA.
- Backup diesel generator power will be included for airport facility critical facilities, ensuring that applicable safety standards and requirements are achieved for aircraft operations.
- It is envisaged that ≈ 10-MVA of generator capacity will be supplied in support of these critical loads.

During the working day cycle at the airport, the primary source of power will be from the Eskom Connections. The site sources planned, including PV sources and bio-digester, will be used to offset load demand. The portion of the off sets is largely driven by the weather.

Airfield Side: Boundary & Apron Lighting Services

The boundary and apron lighting services for the airfield will comprise the following:

Boundary Lighting including Entrance and Parking Areas

- LED luminaires fitted on 6000-mm high concrete poles at 30-meter centres around the entire site.
- The designed lighting level will be 30-lux.
- A series of 30-kVA mini-substations will be provided around the site, allowing for site-wide distribution at 11,000-Volts, and 400-Volt three phase power supplies for local street lighting connections.

Apron Lighting

- EWO R-System R4 floodlights fitted on 28-m masts with integrated pulley system (to raise/lower mast-top flood lighting mounting).
- High-mast vehicle barrier around each mast light pole.
- The designed lighting level for the apron aircraft parking will be 30-lux.
- A mini-substation will be provided for the apron lighting system, allowing for connection to the site-wide distribution at 11,000-Volts, and 400-Volt three phase power supplies for local mast lighting connections.

Airfield Side: Boundary & Apron Security Services

The security services for these areas will include the following typical services and equipment:

- Hybrid daylight/thermal imaging camera system for the security envelope, allowing for automatic intruder alert monitoring.
- Outdoor rated horn speakers, fixed lighting/CCTV camera masts allowing for Security Control voice instructions to Security Staff and Intruders.
- The CCTV cameras will be mounted on concrete poles (for image stability) and connected to the monitoring/image storage headend using a dedicated fibre-optic cable network.
- The field cameras will be powered using the Boundary Lighting Electrical Network, and intruders monitored between the illuminated boundary fencing and the airfield runways using the thermal imaging.
- The CCTV will be linked to the Boundary Electric Fence Monitoring System, such that Security Control Room Operators automatically have TV Monitoring of the affected security breach.
- Electric Fence and associated monitoring system will be provided by the Security Fence Installer Specialist.
- Vehicle entry/exit control to the Cape Winelands Airport Road entrances.

6.8 Bulk Potable Water Supply

The current CWA site is serviced through an existing borehole on the eastern side of the site, and no municipal water connection exists. The nearest municipal water services are found in the Fisantekraal settlement, with the tie in point along a trunk main from the Spes Bona Reservoir a 400mm diameter pipe located in the R312 Lichtenburg Road, which terminates just after the railway crossing.

Even though there are other proposed developments near CWA where municipal water mains are proposed (Greenville to the South and Bella Riva to the West) these developments are still in the planning stage with no firm indication that water infrastructure will be in place to supply CWA by the time it is needed.

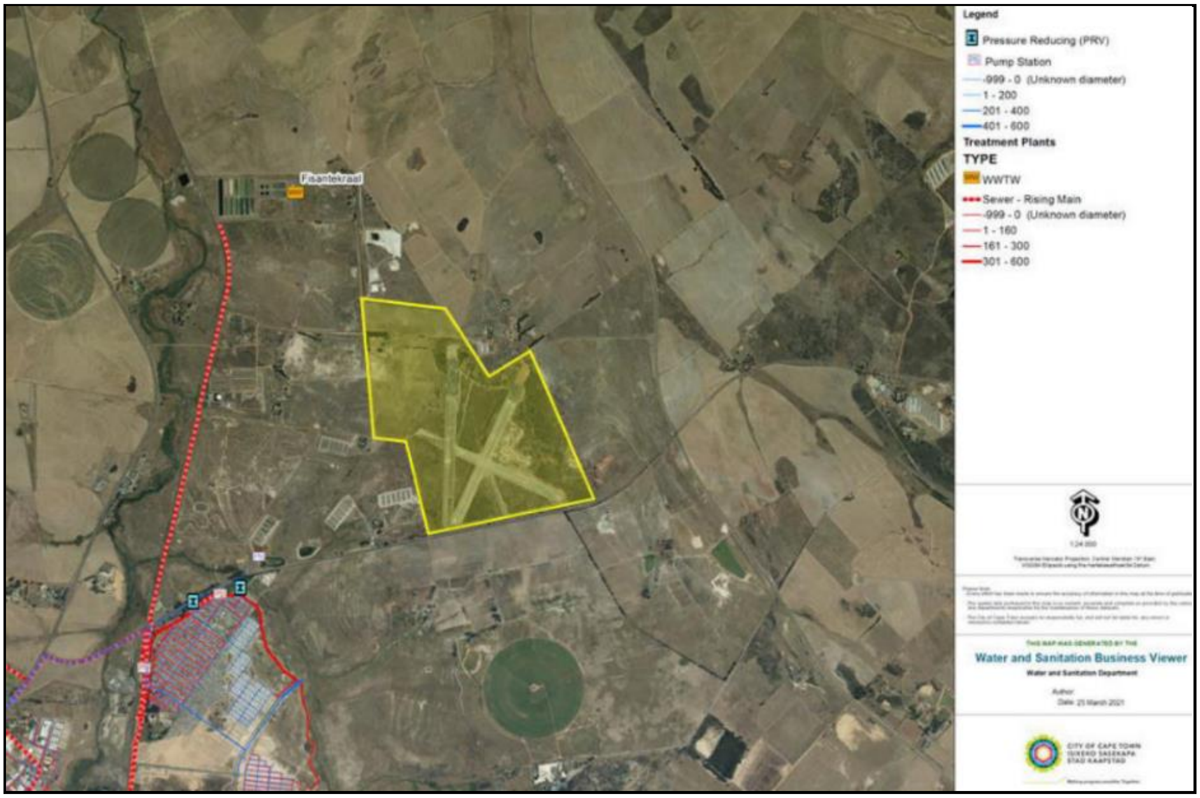


Figure 40: Overview of Existing Potable Water Infrastructure (Zutari, Engineering Services Report, Revision F)

According to the civil works report by Zutari, the CoCT has proposed the installation of a 1700mm diameter trunk main in the R312 Lichtenburg Road. This trunk main is intended to supply water to the new Muldersvlei Reservoir. As it will pass alongside the CWA Development it has been suggested to explore the feasibility of this trunk main providing water to CWA.

At this stage the aim is to provide the site with potable water through treating groundwater abstracted from boreholes on site in the short to medium term. Potable supply from CoCT will be added in the medium to long term. A treatment facility will be established on site to treat the groundwater to potable standard.

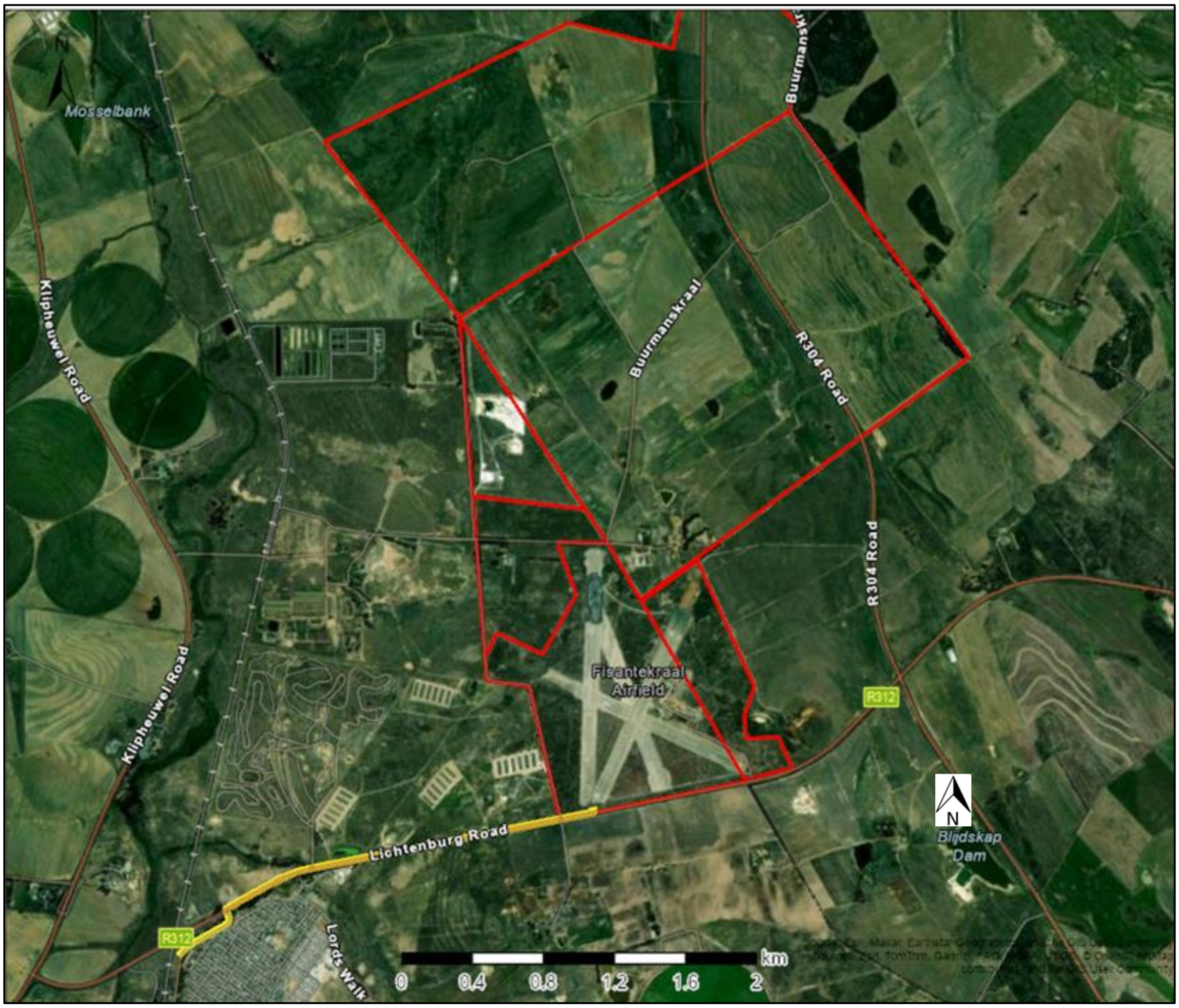


Figure 41: Proposed potable line connection to CWA site indicated by yellow line (PHS Consulting, March 2024)

Water demand calculations based on the latest Phase 2 SDP Preferred Alternative estimates the need as in Table 23. Please note PAL 1 is the EIA Phase 1 and PAL 2, 3 & 4 is the EIA Phase 2.

Table 23: Water Demand Calculations Summary (Zutari, Engineering Services Report, Revision I)

	Description	Units	PAL 1 Demand	PAL 2 Demand	PAL 3 Demand	PAL 4 Demand
Peak Water Demand Calculations	Total AADD	Kl/day	993	1483	1641	1724
	Instantaneous demand	l/sec	11	17	19	20
	Peak Factor (PF)		3.3	3.3	3.3	3.3

	Peak instantaneous demand (Qp) AADD	l/sec	39	57	63	66
	Consider 15% losses	l/sec	44	65	72	76
	Peak Fire Flow (Qf)	l/sec	215	215	215	215
	Total Peak Instantaneous Demand Q Q + Qf	**l/sec**	**297**	**337**	**350**	**357**

Water demand was broken down into potable and non-potable demands based on figures found in the CSIR Guidelines for Human Settlement Planning and Design ('The Red Book 2019') as indicated in Table 24. The split between non-potable and potable will be further refined during the detailed design process to follow.

Table 24: Water Demand Split Summary

	Description	**PAL 1 Demand**	**PAL 2 Demand**	**PAL 3 Demand**	**PAL 4 Demand**	**Unit**
TAADD	Indoor Water Demand (90% of TAADD-NP)	1030	1549	1717	1804	Kl/day
	Outdoor Water Demand (10% of TAADD-NP)	114	172	191	200	Kl/day
	Non-Potable Irrigation Water Demand (NP)	23	23	23	23	Kl/day
Indoor Water Demand (90% of TAADD)	Typical water use (Potable)	773	1162	1288	1353	Kl/day
	Toilet flushing (non-potable)	258	387	429	451	Kl/day
Irrigation Water Demand	Non-Potable Water Demand & Outdoor Demand	138	195	214	224	Kl/day
	Description	**PAL 1 Demand**	**PAL 2 Demand**	**PAL 3 Demand**	**PAL 4 Demand**	**Unit**
Indoor Water Demand (90% of TPADD)	Typical water use (potable)	1314	1975	2189	2300	Kl/day
	Toilet flushing (non-potable)	438	658	730	767	Kl/day

Biodigester Demand	Bio Digester (Non-Potable)	200	200	200	200	Kl/day
Total non-potable Irrigation demand	Non-Potable Water Demand & Outdoor Demand	234	332	364	381	Kl/day
Summary	Total Peak Potable Water Daily Demand	1314	1975	2189	2300	Kl/day
	Total Peak Non potable water Daily Demand	872	1191	1294	1347	Kl/day

Due to the current constraints in the municipal system alternative potable water sources will have to be considered for the CWA development in the short to medium term. In addition, consideration should be given to non-potable systems to reduce the demand for potable water.
The strategy for water supply to CWA is one of a phased approach and entails using ground water as a supply source in the short term up until municipal infrastructure can either supplement the groundwater supply or in the case of the Muldersvlei line be the sole source of supply. The strategy is illustrated in Figure 38.

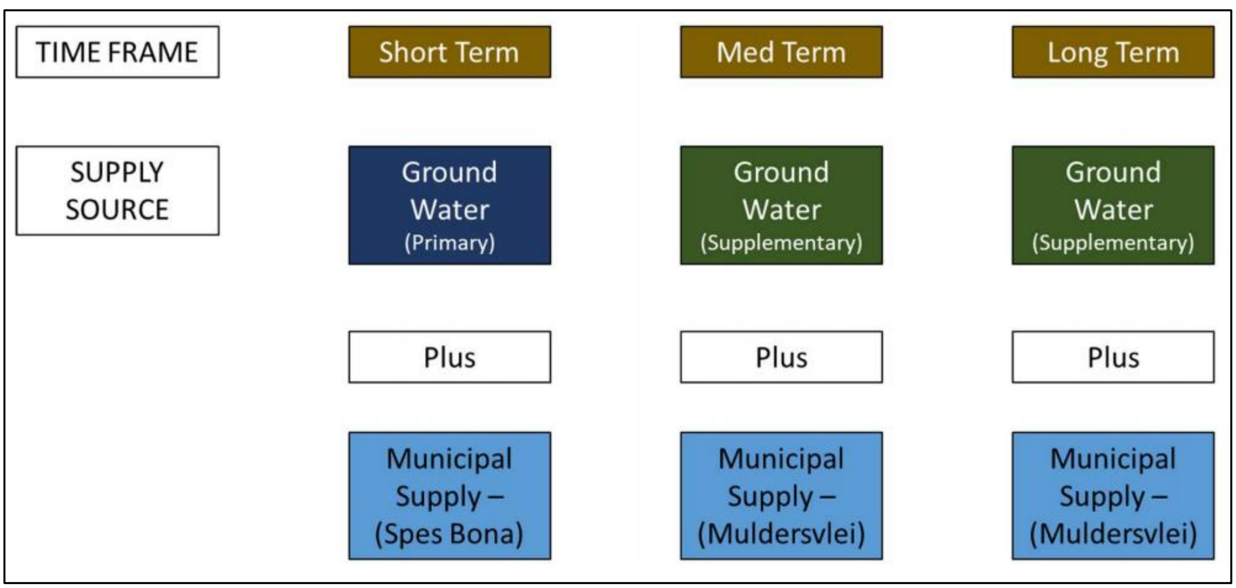


Figure 42:Potable Water Supply Strategy (Zutari, Engineering Services Report, Revision I)

Two potential production boreholes were developed on site (CWA_BH001 and CWA_BH002). Testing included 24hr yield testing and water quality testing by a SANAS accredited laboratory.

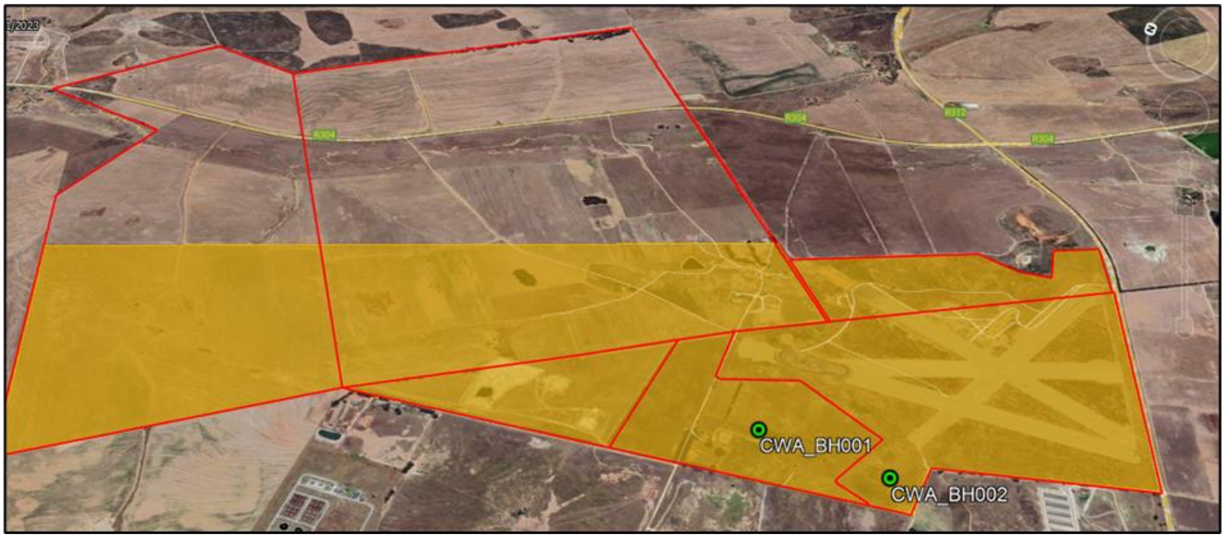


Figure 43:Two production boreholes on site (PHS Consulting, Oct 2023)

Possible sustainable yield from CWA_BH001 (100m deep) was established as 86,4m^3/day and from CWA_BH002 (100.4m deep) as 216m^3/day.

Water quality in CWA_BH001 is of "marginal" water quality for human consumption, with elevated turbidity levels related to high concentrations of iron and manganese in the groundwater. Groundwater from CWA_BH002 is of poor quality with elevated iron and manganese levels.

Further borehole development is required and has been commenced with.

6.9 Sewage Management and Treatment

The site is located on the urban edge and thus sewage services provision near the site is limited and existing services are located quite far.

The site falls into the catchment area serviced by the Fisantekraal WWTW, but there is at present no link/service to the Fisantekraal WWTW. Existing buildings on site make use of septic tanks.

The sewage flows for the proposed development have been determined and are shown in Table 25.

Table 25: Estimated sewage flows (Zutari, Engineering Services Report, Revision I)

Sewage Flow Calculations						
Land use	**Average Dry Weather Flow (ADWF)**	**Unit**	**PAL 1**	**PAL 2**	**PAL 3**	**PAL 4**
Business/Commercial	Based on Redbook 2019 AADD Method	KL/day	417	622	691	691
Yard Connection	Based on Redbook 2019 AADD Method	KL/day	8	8	11	12
Warehousing	Based on Redbook 2019 AADD Method	KL/day	29	90	96	96
Hotel	Based on Redbook 2019 AADD Method	KL/day	36	71	71	71
Park - Grounds Only	Based on Redbook 2019 AADD Method	KL/day	0	0	0	0
Wash Facility	Based on Redbook 2019 AADD Method	KL/day	0	0	0	0
Club - Buildings only	Based on Redbook 2019 AADD Method	KL/day	95	95	95	95
Industrial	Based on Redbook 2019 AADD Method	KL/day	29	29	29	29
Garage and filling station	Based on Redbook 2019 AADD Method	KL/day	10	10	10	10
Parking Grounds (car park)	Based on Redbook 2019 AADD Method	KL/day	0	0	0	21
Terminal Building	Based on Redbook 2019 AADD Method	KL/day	185	879	1103	1303
	Total ADWF	**Kℓ/day**	**809**	**1805**	**2107**	**2329**
	Instantaneous demand	ℓ/s	9	21	24	27
	Avg Peak Factor	-	Varies	Varies	Varies	Varies
	Instantaneous Peak Dry Weather Flow (IPDWF)	**ℓ/s**	14	22	24	25
	Stormwater Infiltration @ 30%	ℓ/s	Varies	Varies	Varies	Varies
	Instantaneous Peak Wet Weather Flow (IPWWF)	**ℓ/s**	**21**	**32**	**35**	**37**

An application was made to the City of Cape Town to determine if spare capacity exits in the municipal system to accept the sewage flows generated from the proposed CWA development, and even though capacity exists at the Fisantekraal WWTW to accept the flows, network coverage is limited and conveying the flows to the existing municipal pump station in Fisantekraal and then onward to the Fisantekraal WWTW cannot be achieved without network expansion towards the East.

Due to the limited network coverage, conveyance infrastructure must be implemented outside of the site boundary to convey the flows to the municipal wastewater treatment works at Fisantekraal.

Two options are contemplated to service the development:

Option 1 Construction of pumpstation and associated rising main to pump to Fisantekraal WWTW,

OR

Option 2: Construction of an on-site packaged Sewage Treatment Plant.

<u>Option 1: Pumpstation and rising main:</u>

Due to the proximity of the CWA Development to the Fisantekraal WWTW it is apparent that is advantageous to install a pumpstation and associated rising main that conveys the flows directly to Fisantekraal WWTW to the North rather than convey the flow to the south-west towards the municipal sewage network in Fisantekraal (Figure 44).

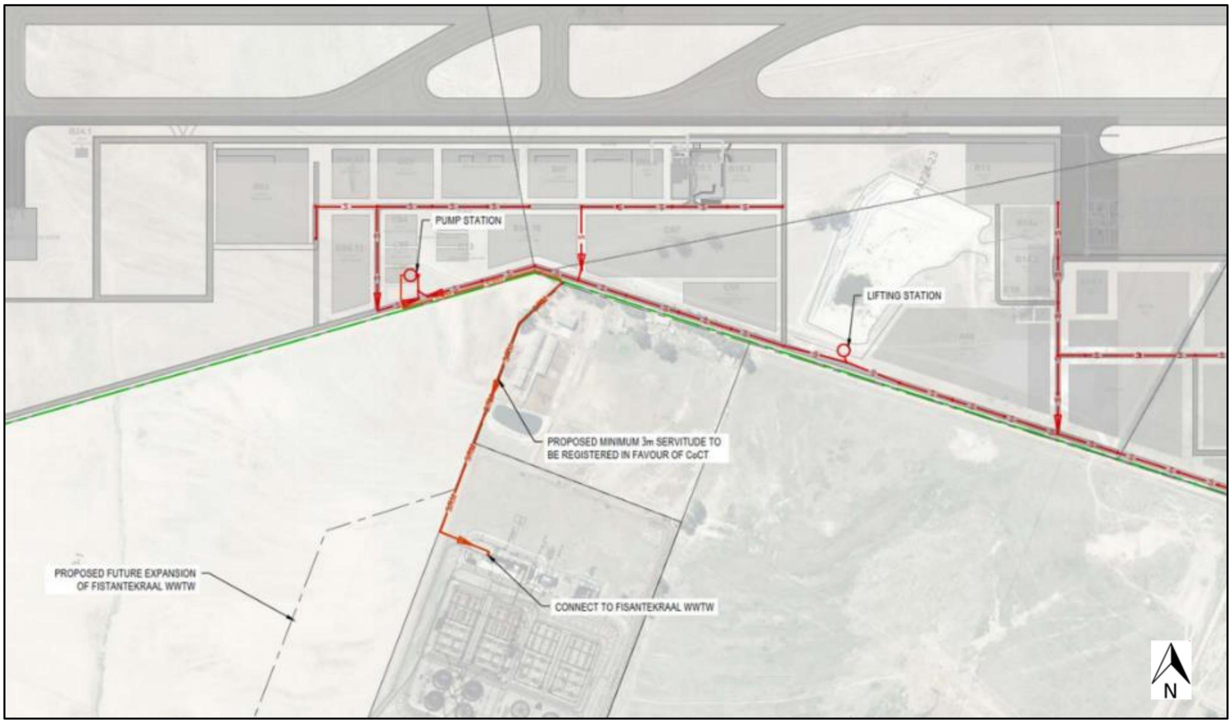


Figure 44: Option 1: Proposed route of sewage rising main (Zutari, Engineering Services Report, Revision I)

<u>Option 2 Construction of sewage treatment plant:</u>

This proposal entails the construction of an on-site sewage treatment plant. The intention is that the treated sewage is then re-used as non-potable water on the site for irrigation, toilet flushing or in the Biodigester.

The proposal for Option 2 entails the following:

- Internal sewer network to convey flow, and
- Package Sewage Treatment Plant

An internal sewer network will collect from the various buildings within the western precinct and convey it to a package treatment plant. The package treatment plant will treat to a quality that meets the applicable limits. The treated effluent will then be stored and reused on the site as non-potable water supply. A portion of the treated effluent will be disposed of on site.

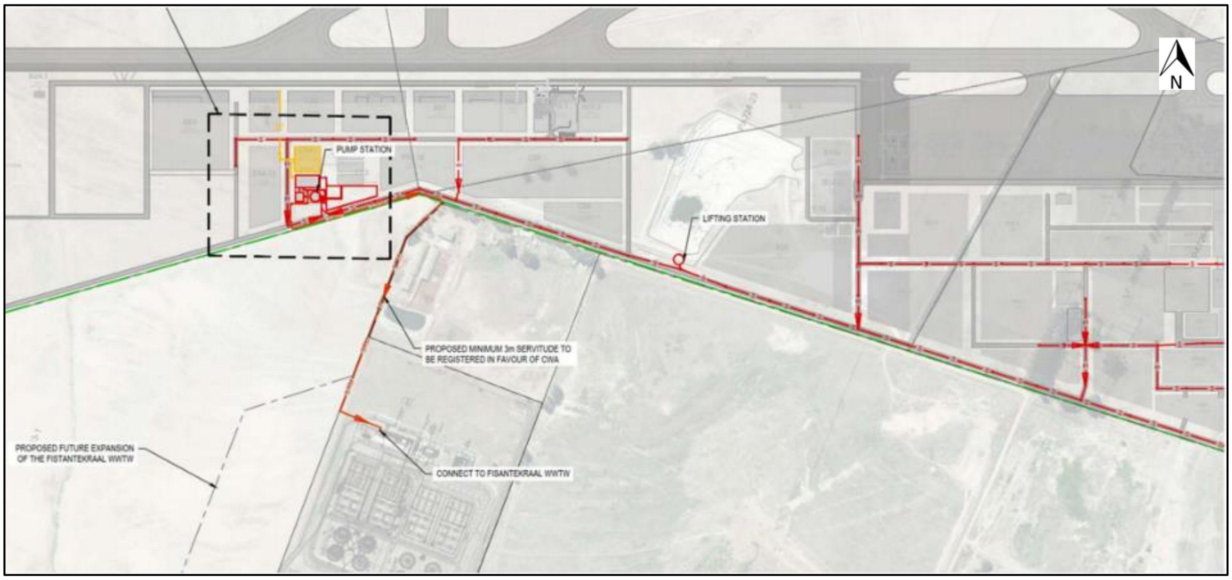


Figure 45: Option 1: Proposed route of sewage rising main and onsite treatment plant (Zutari, Engineering Services Report, Revision I)

Layout Option 1 was developed with the intention to connect to the Fisantekraal WWTW via a rising main.

Option 2 was developed with onsite treatment in mind, these on-site treatments could either be an Organica system, conventional membrane bioreactor or a more conventional activated sludge treatment.

6.10 Solid Waste Management

The site and its associated activities will generate waste at various stages of construction and operation.

Construction Waste can be divided into four categories (General Solid Waste, Organic Waste, Hazardous & Industrial Waste, and Sewage) and entails waste generated during the construction phase of the proposed development, namely: Site clearance & excavation activities; construction of airside infrastructure first followed by landside infrastructure and buildings; demolition of existing infrastructure and buildings; and maintenance work required (refer Figure 46) The types of waste, materials and sources of waste have been summarized as follows:

A. General Solid Waste - Soil / Sand, Concrete, Rock, Metals, Asphalt, Plastic, Wood, Bricks & masonry materials, Glass, Nails, Cement Bags etc.
B. Organic Waste - Topsoil, Alien clearing and indigenous or general vegetation removal etc.
C. Hazardous & Industrial Waste - Asbestos; old fuel storage infrastructure/ equipment, hydrocarbon waste etc.
D. Sewage (Hazardous) - Sewage; Lavatory Waste etc.

Operational waste can be divided into several main categories (General Solid Waste, Organic Waste, Hazardous & Industrial Waste and Sewage). Refer Figure 47. The expected volume of each waste type is not available at this time and specific service providers will be contracted in to assist, remove and dispose of waste types present onsite, where necessary. The types of waste generated during the Operational Phase can be summarised into the following waste types which includes the waste materials and source:

A. General Solid Waste - Plastic, Paper, Cardboard, Metal, Glass etc. (Some recyclable & some non – recyclable)

B. Organic Waste - Food waste, Garden waste from landscaping etc.

C. Hazardous & Industrial Waste - Used oils and fuels; Oil containing rags and materials; Paint, metal work debris, chemicals/ chemical residue; Solar panels, batteries; non-recyclable glass; tyres etc.

D. Sewage - Sewage; lavatory waste, wastewater etc.

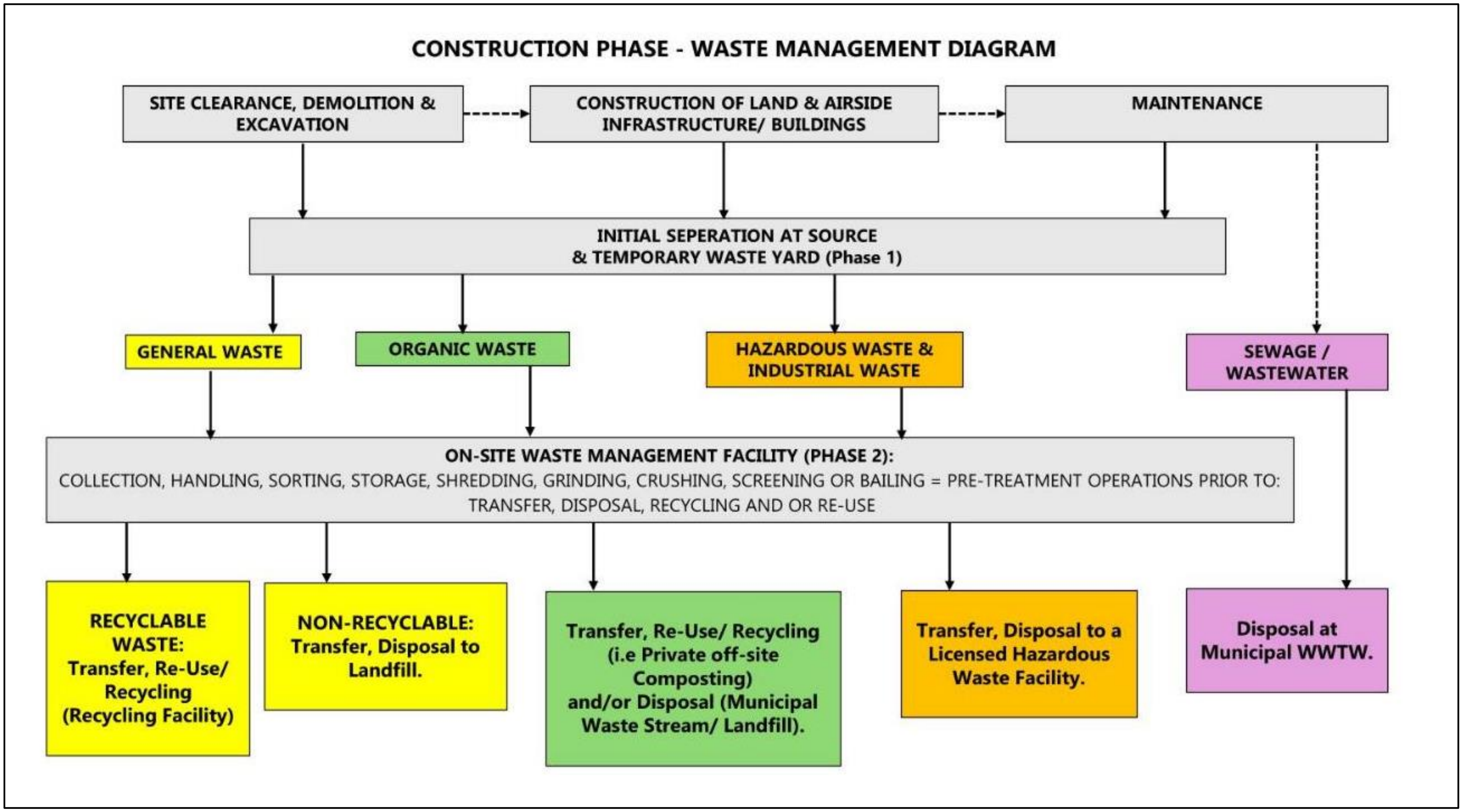


Figure 46: The lifecycle of the construction waste from the CWA (PHS Consulting, Sept 2024)

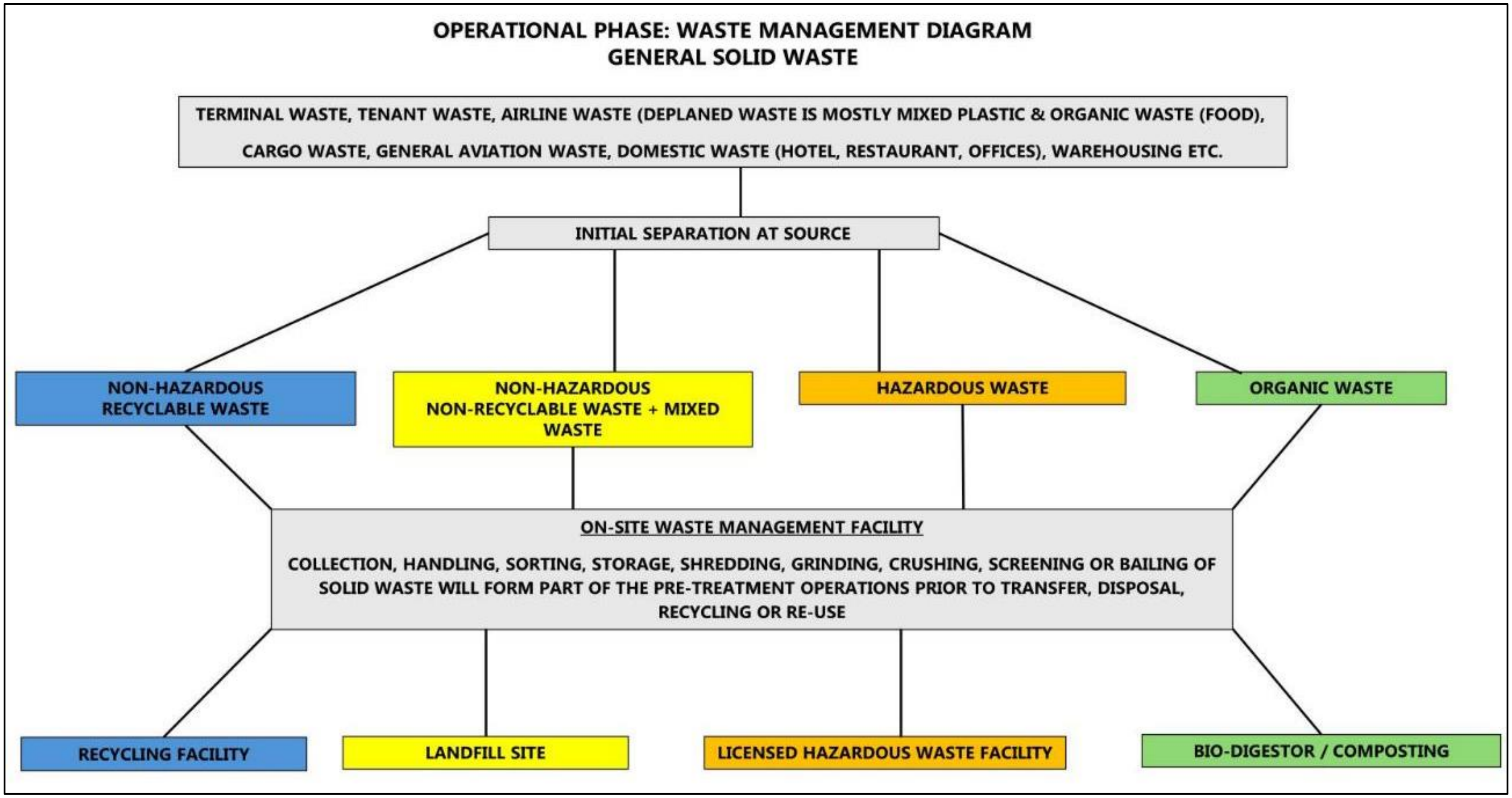


Figure 47: The lifecycle of operational general solid waste from CWA (PHS Consulting, Sept 2024)

It was clarified with DEA&DP: Waste Management that no Waste License application is required for the proposed project, in terms of the National Environmental Management: Waste Act (NEM: WA), 2008 (Act 59 of 2008), and therefor CWA will have to register and adhere in terms of the following Norms & Standards (N&S) for the proposed waste activities and the exceedance of the thresholds below:

- "National Norms and Standards for the Storage of Waste" (GN926 of 29 November 2013) should the facility have the capacity to store more than 80m³ for hazardous waste and/or 100m³ for general waste at any one time and for a period exceeding 90 days. (CWA 1 250m² waste facility)
- "National Norms and Standards for Sorting, Shredding, Grinding, Crushing, Screening, Chipping or Baling of General Waste" (GN1093 of 11 October 2017) if general waste is sorted, shredded, grinded, crushed, screened, chipped or baled in an operational area at the facility exceeding 1000m2. If the operational area does not exceed 1000m2, the facility needs to register in terms of GN1093 only and adhere to section 28 of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, and sections 16(1) and 16(3) of the NEM: WA. (CWA 1 250m² waste facility).
- National Norms and Standards for Organic Waste Composting (GN 561 in GG 44762 of 25 June 2021) read with GN 1757 in GG 45907 of 11 February 2022. The composting facility will process less than 10 tonnes per day of organic waste, therefore it will be registered in terms of the N&S and aligned with the requirements of applicable integrated waste management by-laws and comply with the principle of duty of care as per S28 of NEMA.
- The activity of anaerobic digestion (biodigester) resorts under the NEM: WA "National Norms and Standards for Organic Waste Treatment", published as GN. No. 1984 of 1 April 2022, and no longer requires an application for a waste management licence. Facilities that have the capacity to process more than 10 tonnes of organic waste per day need to register in terms of and adhere to GN No. 1984 (Chicken manure exceeds 50 tonnes per day plus the additional organic waste streams).
- GN No. 1984 above does not apply to any infectious animal waste, raw sewage or sewage sludge that does not meet the minimum quality standards for sludge as determined by the Department of Waste and Sanitation in their "National Norms and Standards for Domestic Waste and Sanitation Services", published as GN No. 982 of 8 September 2017. (The intent is to regard treated solids from the on-site WWTW as hazardous, to be removed form site, however if the minimum standards can be achieved it could be used in the bio-digester.) Please note it needs to adhere to the requirement for the submission of Standard Operating Procedures (SOP) in accordance with section 6.2 of GN No. 1984.
- DEA&DP: Waste Management noted the intent to use the digestate from the anaerobic digester as a liquid fertiliser. The Department requested that once available, the digestate be

analysed to determine its suitability as a liquid fertiliser, and that these results be made available to the Department, the DWS and the Western Cape Department of Agriculture.

- DEA&DP: Waste Management requires more information on the future biosolids resulting from the sewage package plant before a classification of the waste can be awarded. If the biosolids are regarded as hazardous it will be transported and disposed of at a hazardous waste facility. If not deemed hazardous it will be fed into the biodigester. Waste classification of the biosolids will also depend on an analysis provided on the chemical constituency of the biosolids, and depending on end use, the Department might require total concentration and leachable concentration tests to be conducted on the biosolids.

A Waste Management Plan (WMP) has been developed and is appended to the EMPr (Appendix 43), Please note the WMP is an evolving document that will be shaped by the EIA process and final detailed operational procedure will become clear during the design phases for the WMF.

6.11 Stormwater Management Strategy

The existing drainage layout can be seen in Figure 48 below.

The blue routes highlighted indicate the existing drainage routes. Attenuation pond 1 and attenuation pond 2 currently service the site.

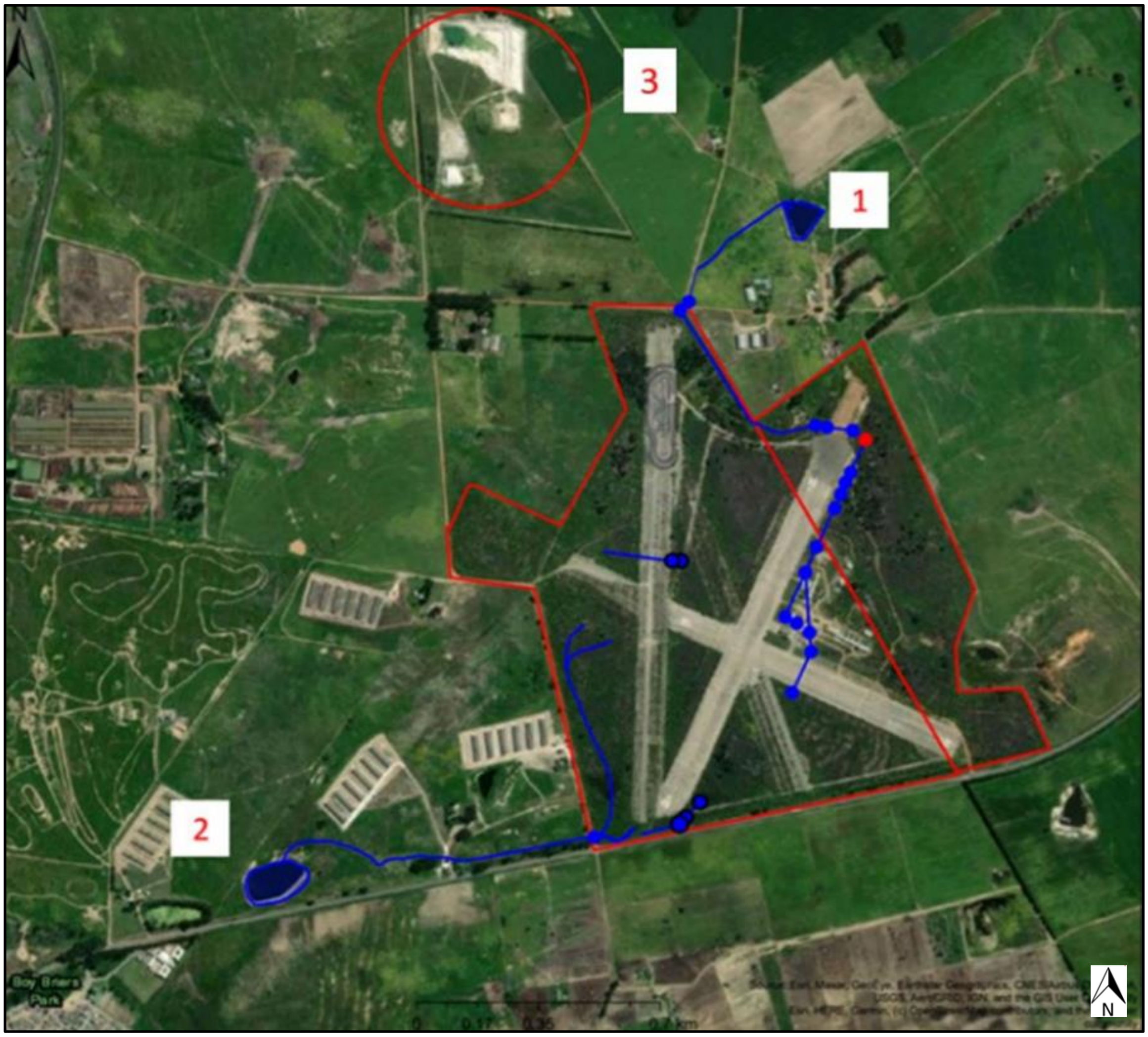


Figure 48: Existing stormwater drainage layout (Zutari, Engineering Services Report, Revision F)

A stormwater management plan has been developed for the proposed project (refer Figure 49 for layout) and is attached as Appendix 41 to this report.

The proposed stormwater drainage network is based on a dual stormwater system, consisting of a major and a minor network, conveying stormwater generated on site via pipes and overland flow routes into seven (7) dry attenuation ponds with engineered layerworks and one (1) wet detention pond, positioned at strategic locations along the proposed Cape Winelands Airport development site boundary.

The basic stormwater design principles used for the CWA site can be best described as follows:

- The natural drainage direction of stormwater of the site will remain unchanged as the site generally falls in a south to north direction with outfalls positioned strategically along the eastern and western boundaries.
- The minor system will comprise of open drains, an underground piped network complete with channels, inlet catchpits, oil separators, manholes and outlet structures sized to accommodate stormwater runoff from the roads, buildings, and other hard surfaced area for at least minor storm events up to the 1:5-year RI storm.
- The major system will comprise of roads and on-site overland flow paths which will operate in conjunction with the minor system to accommodate stormwater runoff from roofs and other hard surfaced areas for major storm events up to and including the 1:50-year RI storm.
  - The design levels allow for on-site overland flow routes in the event of a blockage or failure of the minor system.
- Where no on-site overland flow paths exist to accommodate run-off from major storm events, the underground piped network will be sized to accommodate run-off for major storm events (up to the 1:50 year).
- The overland flow routes on the Cape Winelands Airport site are designed to safely convey the 1:100-year storm event towards the ponds situated along the boundary of the site. From there formal overland escape routes, in the form of pond overflows, will be designed to convey peak runoff from the 1:100-year storm which cannot be handled by the above proposed stormwater system before discharging into the adjacent infrastructure.
- The proposed dry pond system takes into consideration the risk of birdstrikes and minimises attracting avifauna.

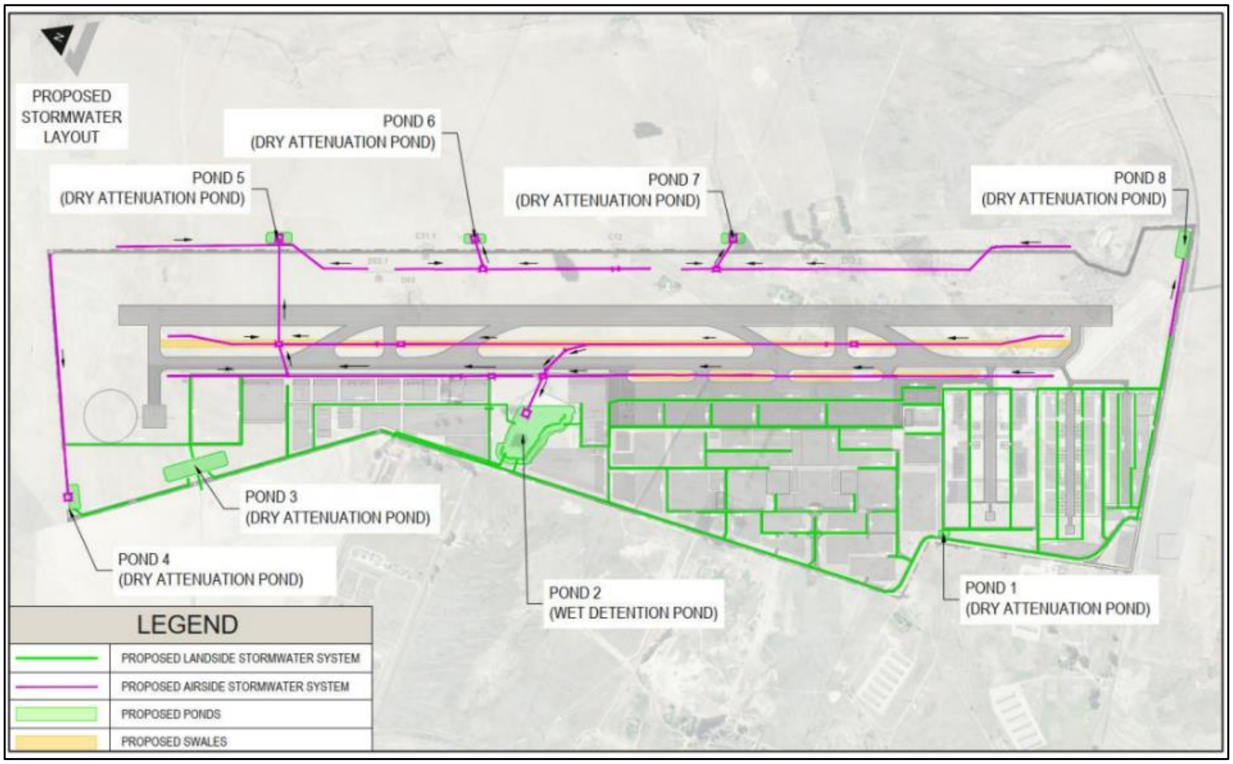


Figure 49: Proposed stormwater layout (Zutari, August 2024)

These ponds will be designed to attenuate up to the 1:50-year post development flows. Treatment of stormwater run-off conveyed to the ponds will mainly be achieved through the dry pond infiltration layerworks relying on filtration to reduce waterborne pollutant concentration through sedimentation, filtration, and plant uptake of nutrients.

The dry swales provide both stormwater treatment and conveyance functions, combining a bioretention system installed in the base of the swale which is designed to convey stormwater. The swale component provides pre-treatment of stormwater to remove coarse to medium sediments while the bioretention system removes finer particulates and associated contaminants. The swales also provide a form of flow retardation for frequent storm events and are particularly efficient at removing nutrients.

Stormwater runoff generated by the catchment areas situated to the West of the site, which is not infiltrated into the dry swales, will be conveyed to the wet detention pond (Pond 2 / Outfall 2) which is the previous quarry site. The wet detention pond will operate in a similar manner to the dry swales when it comes to treatment of runoff, however besides treatment, the wet detention pond will serve a key function for attenuation on the site.

The combined systems on site have been designed to attenuate up to and including the 1:50-year flood. The stormwater attenuation ponds, positioned strategically across the site, will each have dedicated variable outlet structures as well as overflows sized accordingly to convey the run-off from larger storms in excess of the 1:50 year event towards the overland escape routes as can be seen in Figure 50.

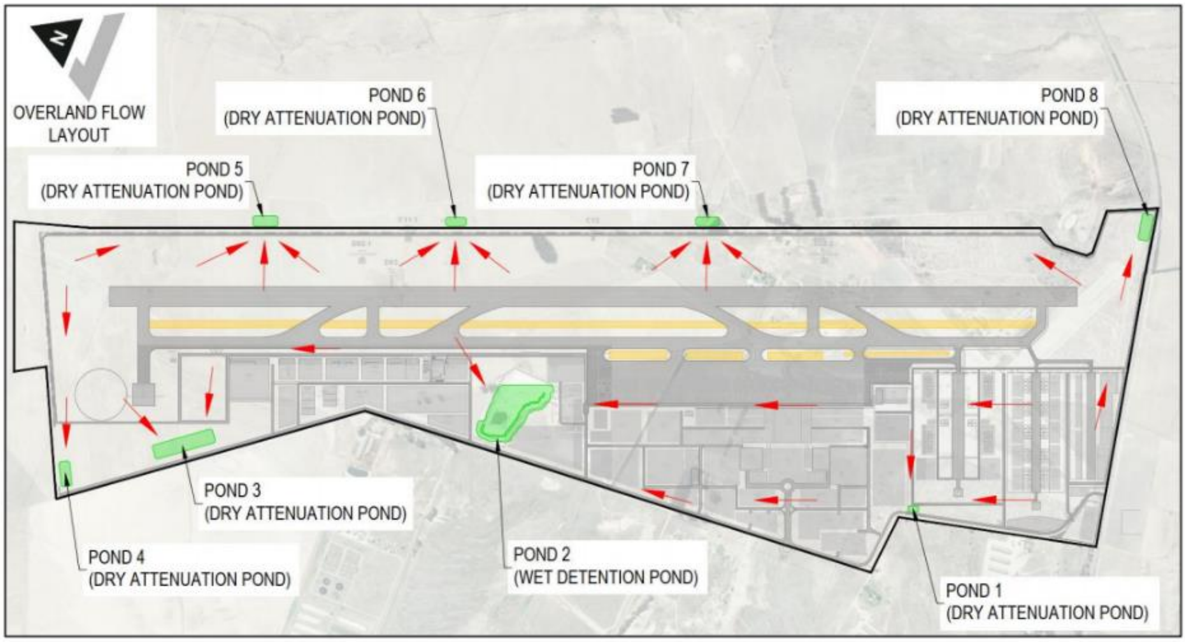


Figure 50: Overland Escape Routes

PCSWMM Simulations of the 1:100-year RI storm event have been modelled to ensure that no flooding occurs across the site and that the overland escape routes can convey the excess runoff away from critical infrastructure on the site towards the adjacent aquatic ecosystems namely the Mosselbank River and the Klapmuts River tributaries.

Maintenance and monitoring requirements for Dry Attenuation Ponds:

Table 26: Typical Operating and Maintenance activities for Dry Attenuation Ponds (Zutari, August 2024)

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter and debris	Monthly
	Manage vegetation	Monthly
	Inspect inlets, outlets, and overflows for blockages	Monthly
	Inspect inlets and basin for sediment accumulation. Determine appropriate frequencies.	Monthly, then as required
	Tidy dead vegetation before growth season	Annually
	Manage wetland plants in pools – where provided	Annually
Occasional maintenance	Reseed or replant in dilapidated areas	As required
	Prune and trim plants where necessary and remove cuttings	Every 2 years or as required
	Remove sediment from inlets, outlets and forebays	Annually, or as required
Remedial actions	Repair erosion or other damage	As required
	Repair or rehabilitate inlets, outlets, and overflows	As required
	Relevel uneven surfaces and reinstate design levels	As required
	Realign riprap, gabions, and/or Reno mattresses	As required

In addition to the items listed above, some comments regarding maintenance procedures are provided below:

- Litter clearing: A litter clean-up is to take place monthly or as required.
- Cleaning of kerbs and channels: Sand, litter and refuse should be removed from kerbs and channels monthly or as required.
- Cleaning of pipes: Refuse should be removed from pipes monthly. Sand and silt should also be removed by using high pressure jetting.
- Cleaning of covers and frames: The covers and frames should be inspected monthly and need to be replaced, repositioned, or repaired where necessary.
- Earth embankment inspection: Embankments should be inspected monthly or after each rain. If the embankment is compromised, it should be reshaped to tie in with the original slope.
- Headwalls inspection: The headwalls should be inspected monthly or after each rain. Any blockage should be removed, and the natural vegetation trimmed to allow free drainage of water

Maintenance and monitoring requirements for Dry swales:

Table 27: Typical Operating and Maintenance activities for Swales (Zutari, August 2024)

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter and debris	Monthly
	Manage vegetation, retain vegetation to design levels	Monthly
	Inspect inlets, outlets, and overflows for blockages	Monthly
	Inspect inlets and basin for sediment accumulation. Determine appropriate frequencies.	Monthly, then as required
	Tidy dead vegetation before growth season	Annually
	Manage wetland plants in pools – where provided	Annually
Occasional maintenance	Reseed or replant in dilapidated areas	As required
	Prune and trim plants where necessary and remove cuttings	Every 2 years or as required
	Remove sediment from inlets, outlets and forebays	Annually, or as required
Remedial actions	Repair erosion or other damage	As required
	Repair or rehabilitate inlets, outlets, and overflows	As required
	Relevel uneven surfaces and reinstate design levels	As required
	Realign Riprap, gabions, and/or Reno mattresses	As required

In addition to the items listed above, some comments regarding maintenance procedures are provided below:

- Litter clearing: A litter clean-up is to take place monthly or as required.
- Embankment inspection: Embankments should be inspected monthly or after each rain. If the embankment is compromised, it should be reshaped to tie in with the original slope.
- Cleaning of headwalls: Refuse should be removed from headwalls within the dry swale monthly. Sand and silt should also be removed by using high pressure jetting.
- Headwalls inspection: The headwalls should be inspected monthly or after each rain. Any blockage should be removed, and the natural vegetation trimmed to allow free drainage of water.

Maintenance and monitoring requirements for Wet Pond / Detention Basin:

Table 28: Typical Operating and Maintenance activities for Detention Basins (Zutari, August 2024)

Activity	Typical frequency
Remove litter and debris from Inlet and outlet structures	Monthly
Mow vegetation (Side slopes)	Monthly
Inspect inlets, outlets, and overflows for blockages	Monthly
Inspect inlet and forebay for sediment accumulation	Semi-Annually
Inspect for invasive vegetation	Semi-Annually
Manage wetland plants in pools – where provided	Annually
Check for signs of Hydrocarbon buildup and remove appropriately	Inspection
Prune and trim plants where necessary and remove cuttings	Every 2 years or as required
Remove sediment from inlets, outlets and forebays	Annually, or as required
Inspect for damage paying attention to the variable outlet control structure	Annually
Remove sediment from forebay	5 to 7 years or when 50% of forebay capacity is lost
Repair undercut or eroded areas	As required
Realign riprap, gabions, and/or Reno mattresses	As required

In addition to the items listed above, additional maintenance procedures are provided below:

- Irrigation system: It will take some time for the vegetation in the pond to be fully established. As such, it is proposed that an irrigation system or procedure be put in place to ensure the vegetation survive the initial dry seasons. Suitable inspections to identify potential faulty elements should be conducted on the irrigation system to ensure its proper functioning.
- Litter clearing: A litter clean-up is to take place monthly or as required.
- Alien and problem vegetation: It is proposed that the pond must be inspected for invasive alien vegetation routinely by the appointed landscaper. As far as possible all alien vegetation should be manually removed. Where manual removal is not possible, alien vegetation should be treated with an appropriate herbicide using the correct application method and to the manufacturer's directions and specifications. Herbicides should not be applied when conditions are windy, so as to avoid spray drift. No herbicides should be applied when rain is forecast within 2 days. Colour dyes should be used with the herbicides to clearly mark areas that have been treated, taking exceptional care when working near water. It must be recognized that under certain conditions some indigenous vegetation may become problematic and may require intervention.
- Cleaning of silt traps: The sedimentation forebay as well as the apron of the outlet headwalls must be inspected every six months, with one of the inspections taking place just before the first seasonal rains. These must be inspected for build-up of silt, dirt, mud, and similar material. All silt and other material must be removed and disposed of at a suitable landfill site. Care must be taken to ensure that no silt enters the stormwater system during the cleaning process.

6.12 External and Internal Road design

Future land use projections and approved future planned developments in the immediate surrounds of CWA results in a future road network.

Of the various planned north-south and east-west future roads, the road that will likely be constructed first is the future Class 2 Lucullus Road extension from the N1 linking to Lichtenberg Road. The functional class of the road will change to a Class 3 minor arterial north of Lichtenberg Road. All future planned roads will be City-owned.

The proposed expansion of CWA and the associated additional land will require the east-west links currently crossing the site and well as north of the site to be amended.

Planned roads infrastructure linked to the approved Bella Riva development (west of the CWA site) entails:

- Closure of minor Roads 6/8 and 59 in the east-west direction
- Use of Minor Road 6/8 (north south) - also known as Mellish Road - as access from Lichtenberg Road (R312) until signalisation is warranted/required. The proposed Lucullus Road northern extension will be required for this condition to be completed.

The Greenville Garden Cities development South of Lichtenberg Road is planned to be developed over multiple phases. To date the subdivisional planning for Phase 1 indicates the confirmed alignment of Lucullus Road onto Lichtenberg Road (R312).

Public Transport Network Planning is based on the long-term Integrated Public Transport Network (IPTN) plan for CoCT (next update scheduled for 2026) – Refer Figure 51.

The nearest MyCiTi trunk routes to the CWA are the Durbanville CBD and Kraaifontein area, with feeder services from Fisantekraal planned.

Golden Arrow Bus Services (GABS) and MBT services should be sufficient in terms of public transport demand until the IPTN plan is in place, and the Fisantekraal rail line may also provide commuter services in future.

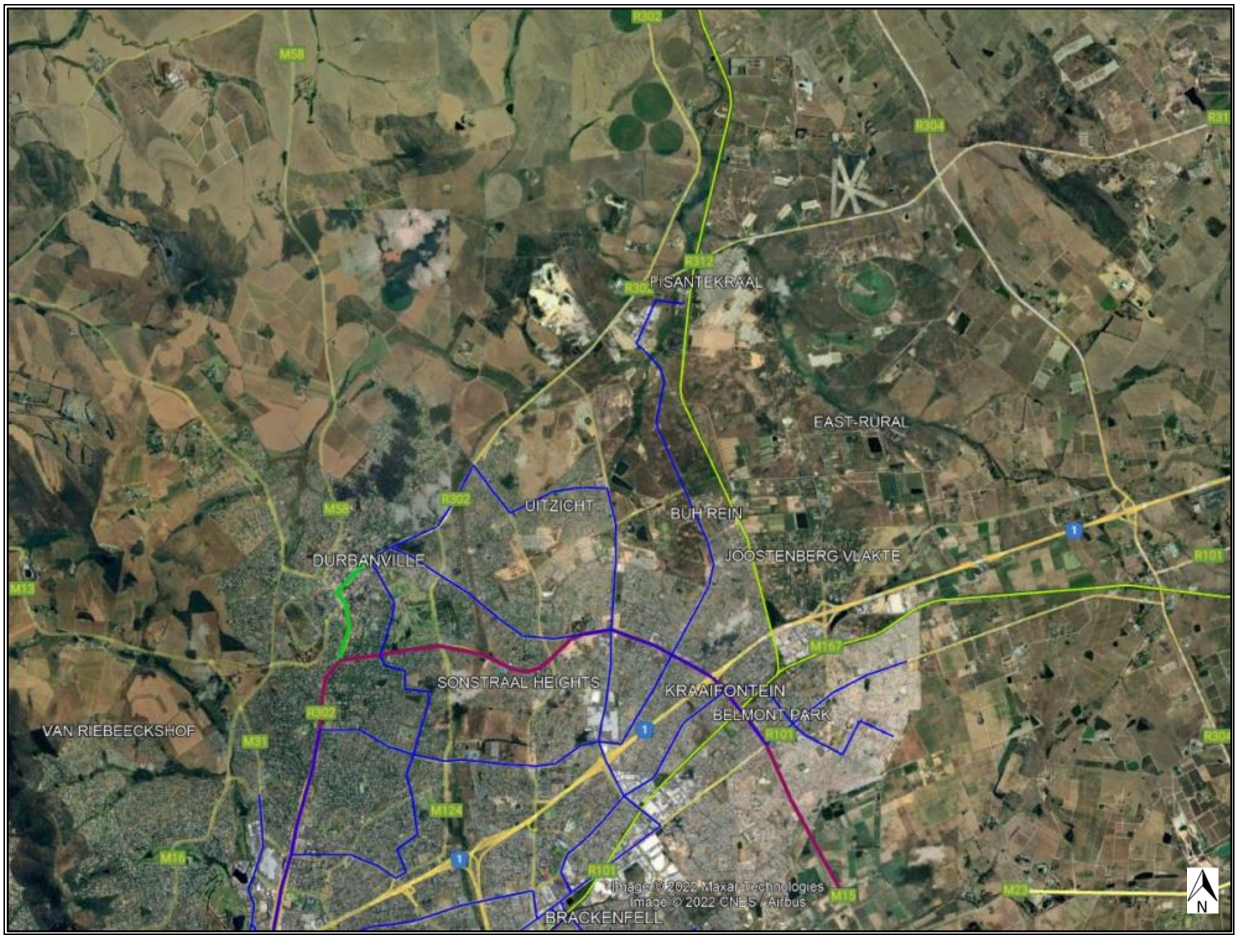


Figure 51: CoCT IPTN plan (ITS, Transport Scoping Report, Sept 2023)

In terms of Pedestrian and Cycle Network Planning, the long-term cycle route planning indicates that Lucullus Road is a proposed Class 2 cycle route (Refer Figure 52).

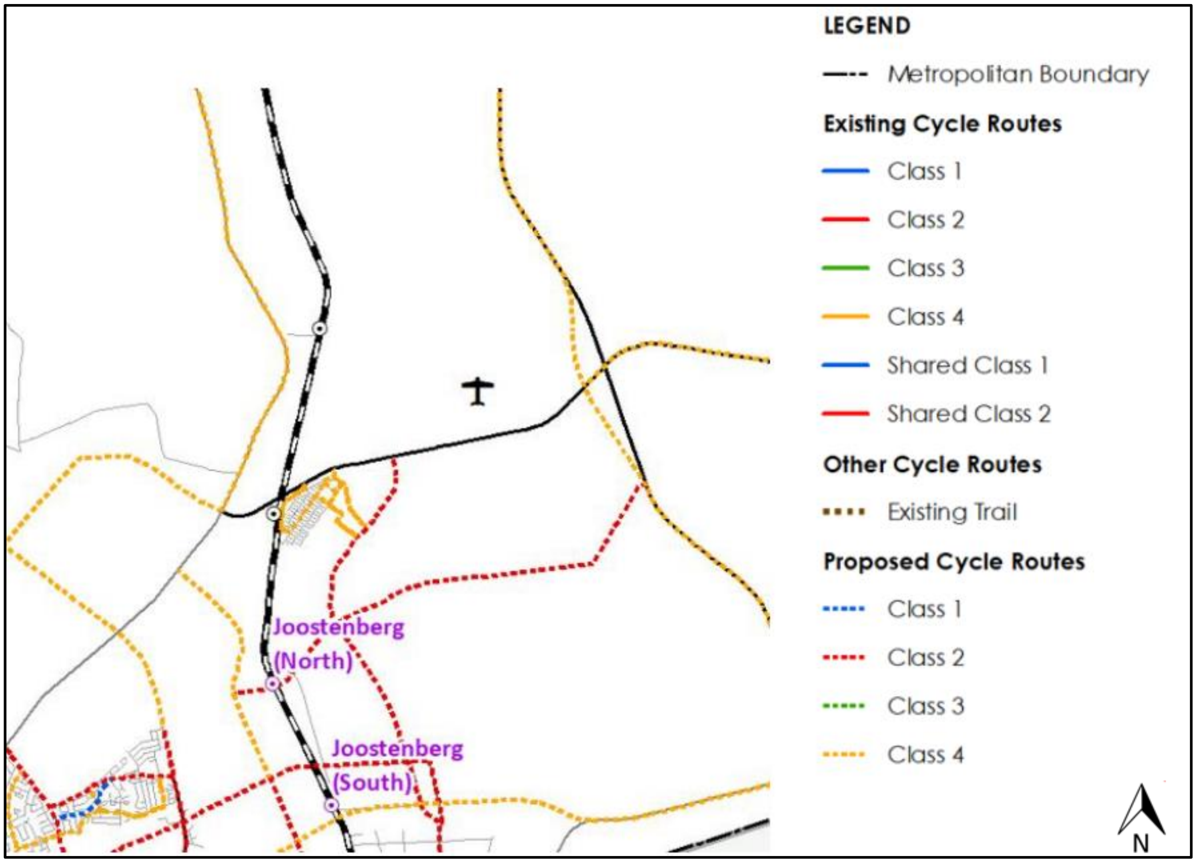


Figure 52: Cycle Route Planning (ITS, Transport Scoping Report, Sept 2023)

<u>Opportunities for CWA to Access the Road Network System:</u>

There are various access opportunities to the road network system available for the CWA West of the proposed new runway:

a) The existing Melish Road (OP 6/8) connection onto Lichtenberg Road,
b) The future Class 3 Lucullus Road extension, and
c) The future Class 3 Melish Road extension through Bella Riva.

Access for the CWA area East of the proposed new runway will access from Lichtenberg Road (R312).

Options developed based on variations in development timing/phasing (CWA and others), land ownership constraints and infrastructure costing are as follows (refer Figure 53):

1) Option 1: Access via Melish Road / Lichtenberg Road (R312) –
This option is deemed the most viable and requires Bella Riva estate to upgrade the road to acceptable standards and the extension of Lucullus Road once signal warrants are met, possibly making Mellish Road obsolete. Access from Lichtenberg Road should line up with the road network

planning for Greenville or vice versa, and access from the Class 2 Provincial Road will need to remain open to the public.

2) Option 2: Access via Melish Road / Klipheuwel Road (R302) - The proposed Class 3 route will become available to provide access to the CWA and could be an option if the Lucullus Road extension is not feasible in the short term.
3) Option 3: Access via Lucullus Road extension – this option is the preferred initial route, but would require co-operation and agreement between Bella Riva, CWA, and adjacent landowners.

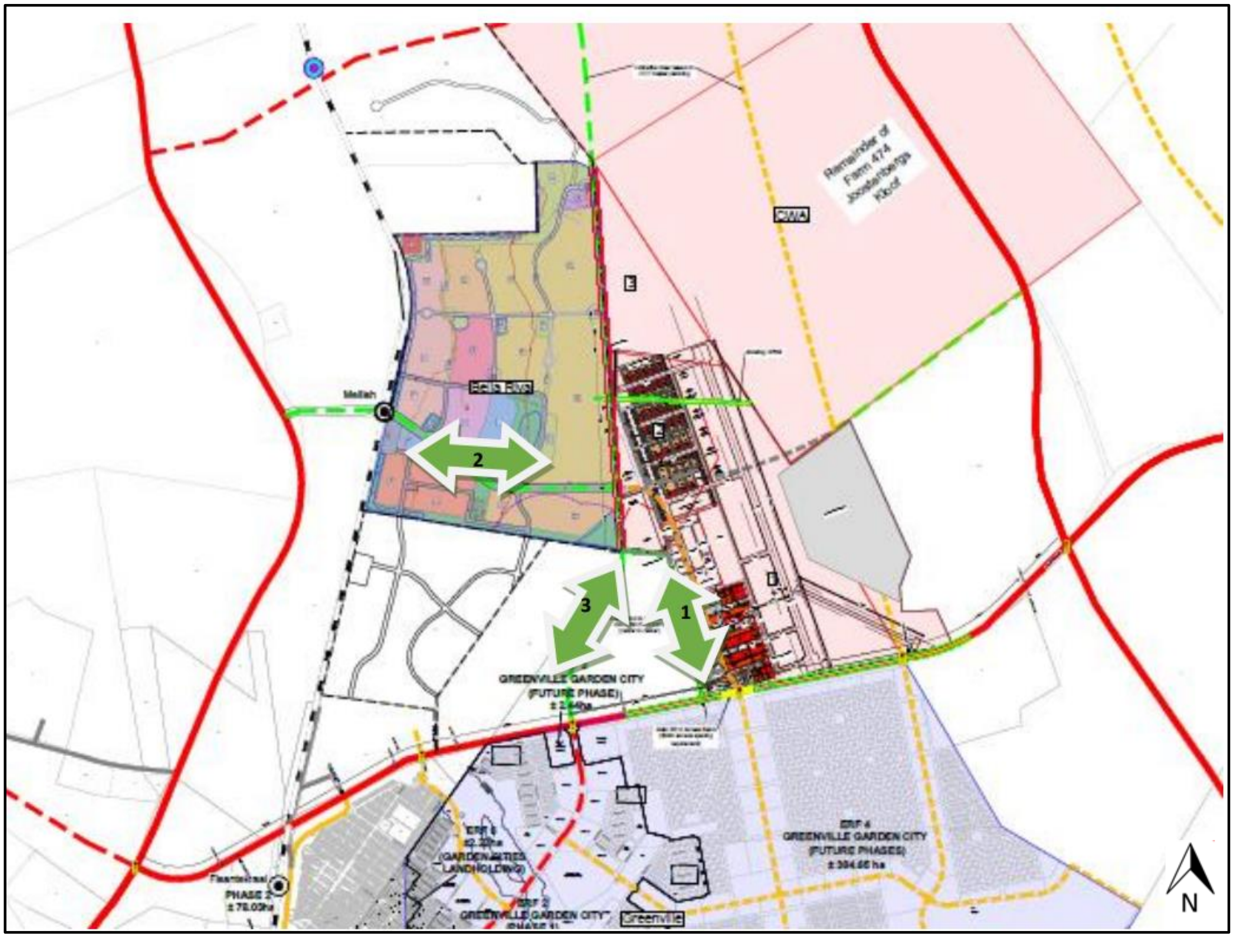


Figure 53: Site Access Options (ITS, Transport Scoping Report, Sept 2023)

It is envisaged that the phasing of the access will be:

1. Melish / Lichtenberg (interim main access)
2. Bella Riva Class 3
3. Lucullus Road

Estimated Vehicle Trip Generation:

The Weekday peak hour vehicle trip estimates were calculated for the proposed project.

Phase 1 weekday peak hour trip estimates (2028 scenario) are as follows:

- Weekday AM peak hour: 550 total (410 in / 140 out)
- Weekday PM peak hour: 825 total (425 in / 400 out)

Phase 2 weekday peak hour trip estimates (2050 scenario) are as follows:

- Weekday AM peak hour: 1 000 total (800 in / 200 out)
- Weekday PM peak hour: 1 650 total (850 in / 800 out)

Based on the estimated trip generation figures and the existence of multiple access points to the site, it is estimated that single-lane roads with dedicated turning lanes should be able to accommodate the vehicle demand. Multi-lane roads should be constructed for the main public circulation route for more ideal vehicular flow, and planning of road reserve should make allowance for dualling when necessary.

NOTE: The current traffic volumes obtained from SANRAL indicate that spare capacity on a link level is currently available along the R312 in the vicinity of the site and that there are no existing capacity constraints at the major intersections in the area, such as the existing side road stop controlled Klipheuwel Road and Lichtenberg Road intersection.

In terms of estimated trip distribution and assignment (refer Figure 54), it follows similar origin and destination patterns as the Cape Town International Airport (CTIA), though largely dependent on the completion of the major road upgrades in the area (i.e., the R300 northern extension and Lucullus Road south).

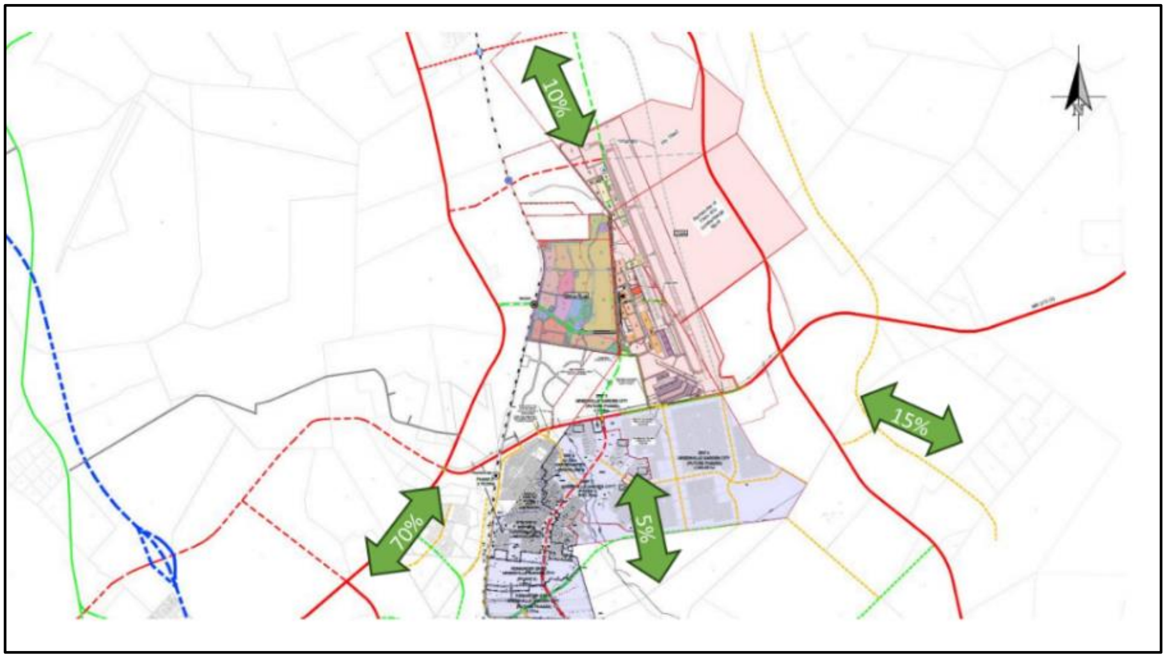


Figure 54: Estimated Trip Distribution Pattern (ITS, Transport Scoping Report, Sept 2023)

Public Transport

Public transport services should be developed to link to the CWA in future, including bus stops near the CWA, and allowing for a shuttle service between the CWA and the Fisantekraal commuter rail service. All public roads need to be designed to accommodate pedestrian and bicycle movements.

The Fisantekraal railway line does not currently provide commuter rail services but is identified in the CoCT long-term plan to be upgraded and may provide this service in future if demand warrants it. A shuttle service between the airport and the rail station could be established, but this service will be demand driven and phased with future development of the airport.

According to ITS "*addressing the public transport needs in the TIA for the CWA will be in line with the CCT Guidelines for the Public Transport Component of Transport Impacts Assessments. Engagement with the City's public transport directorate will be done to agree on public transport infrastructure requirements for the area and the airport. The outcome will be incorporated into the TIA".*

Cargo

Access for cargo will be along planned access routes for the east and west side of the CWA and includes the possibility to link to the rail service. Any movement of cargo between the East and West of the CWA site will be done internally via internal access roads, although the latest Transport Scoping report states that the most recent proposals exclude development on the East of the runway and the accommodation of linking the East and West of the site for transport of people and goods is therefore not applicable.

Site Circulation (Road Based Transport)

The preliminary concept includes primary and secondary roads, a separate one-way system for drop and go and access to the parkades.

Internal Road Requirements and parking

The internal main roads would ultimately have 2 lanes per direction, include controlled access points to restricted areas, and space for U-turns in front of any controlled access points (refer Figure 54).

The main road circulating adjacent to the terminals and parking areas should include dedicated public transport, e-hailing and passenger vehicle stop and go zones.

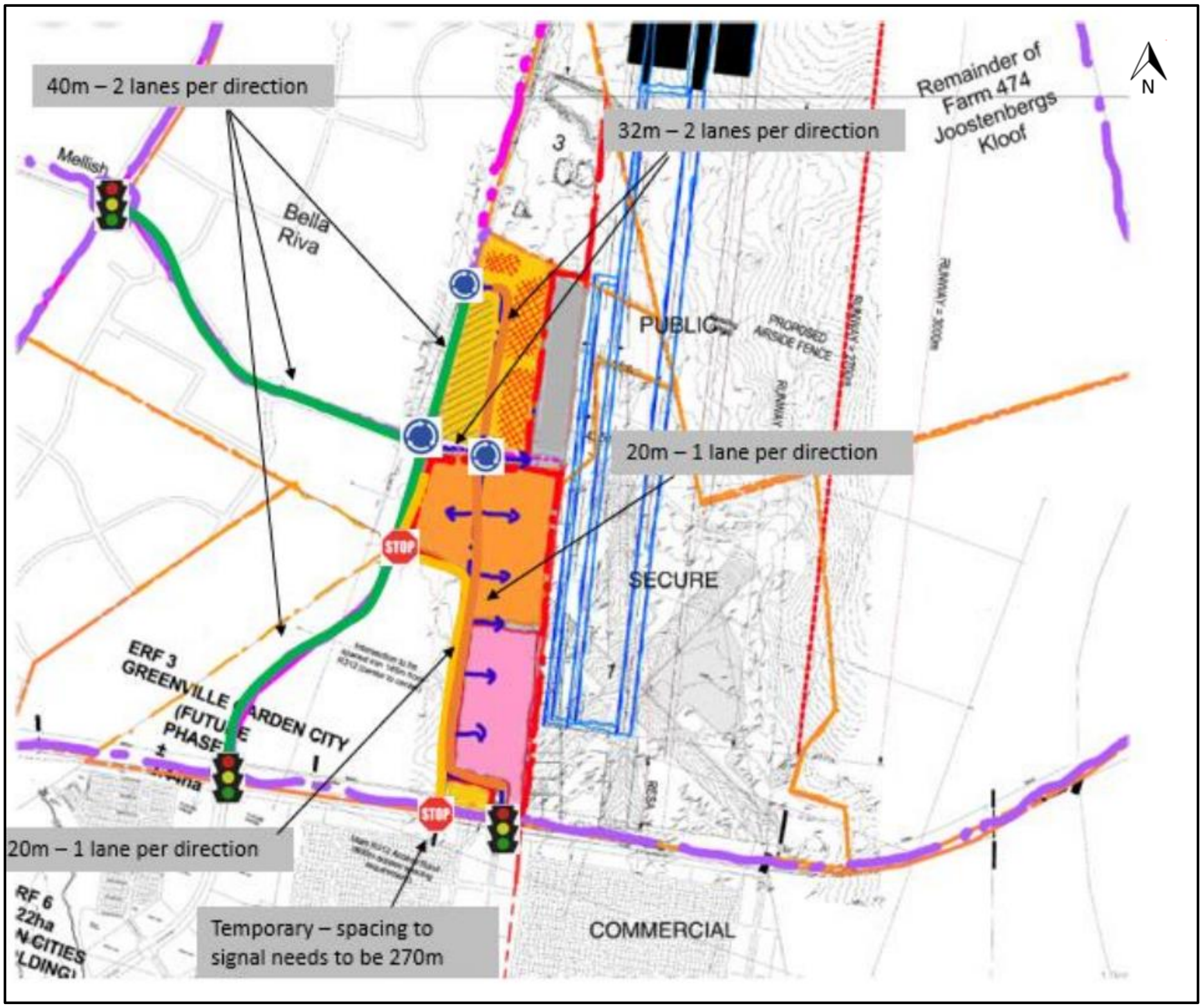


Figure 55: Conceptual design Internal Roads (ITS, Transport Scoping Report, Sept 2023)

A minimum of 1 300 parking bays should be provided for the Phase 1 based on the projected 2 million annual passengers. Phase 2 requirements can be established based on actual parking demand based on the Phase 1 scenario.

Parking within the FBO and hanger restricted areas can be based on projected number of employees, number of hanger spaces and specific tenant requirements.

6.13 Bulk Aviation Fuel Farm and Fuel facilities

CWA aims to be a reliever airport for CTIA in a complementary role within South Africa's network of airports and airfields. Supply of fuel is an integral part of this role and strategically enables CWA to become a valuable role-player within this industry.

Initial calculations based on the estimated fuel demand resulted in the identification of an aviation fuel depot with capacity of 2 000m^3 to ensure 7 days of buffer stock.

Preferably the fuel depot should be located as close as possible to the apron stands and include service roads for road tankers to limit interactions with and impact on airport traffic.

Makeup and design of proposed storage capacity (estimated 2 000m^3):

i. 10x 80m^3 horizontal tanks, and 3x 350m^3 vertical storage tanks containing Jet-A1,

ii. Avgas: 2x 30m^3 double walled horizontal tanks and the existing 28m^3 facility will be closed,

iii. Additional 46m^3 diesel storage for backup generators.

All tanks will be located within a concrete-bunded area for secondary containment, connected to oil-water separator. The site includes a dedicated bowser filling & testing facility (with pump and filters), administrative building, workshop, and hydrants and portable foam monitors.

The plane refuelling strategy allows for bowsers only at this stage, and for GA a kerbside refuelling strategy is proposed. One AVGAS 9m^3 tank will be located Airside at the clubhouse with a dispenser where small privately-owned planes can taxi to, park and refuel without the need to call on a bowser. A feeder pipeline for transporting fuel to the apron area is proposed in future, including hydrant pits.

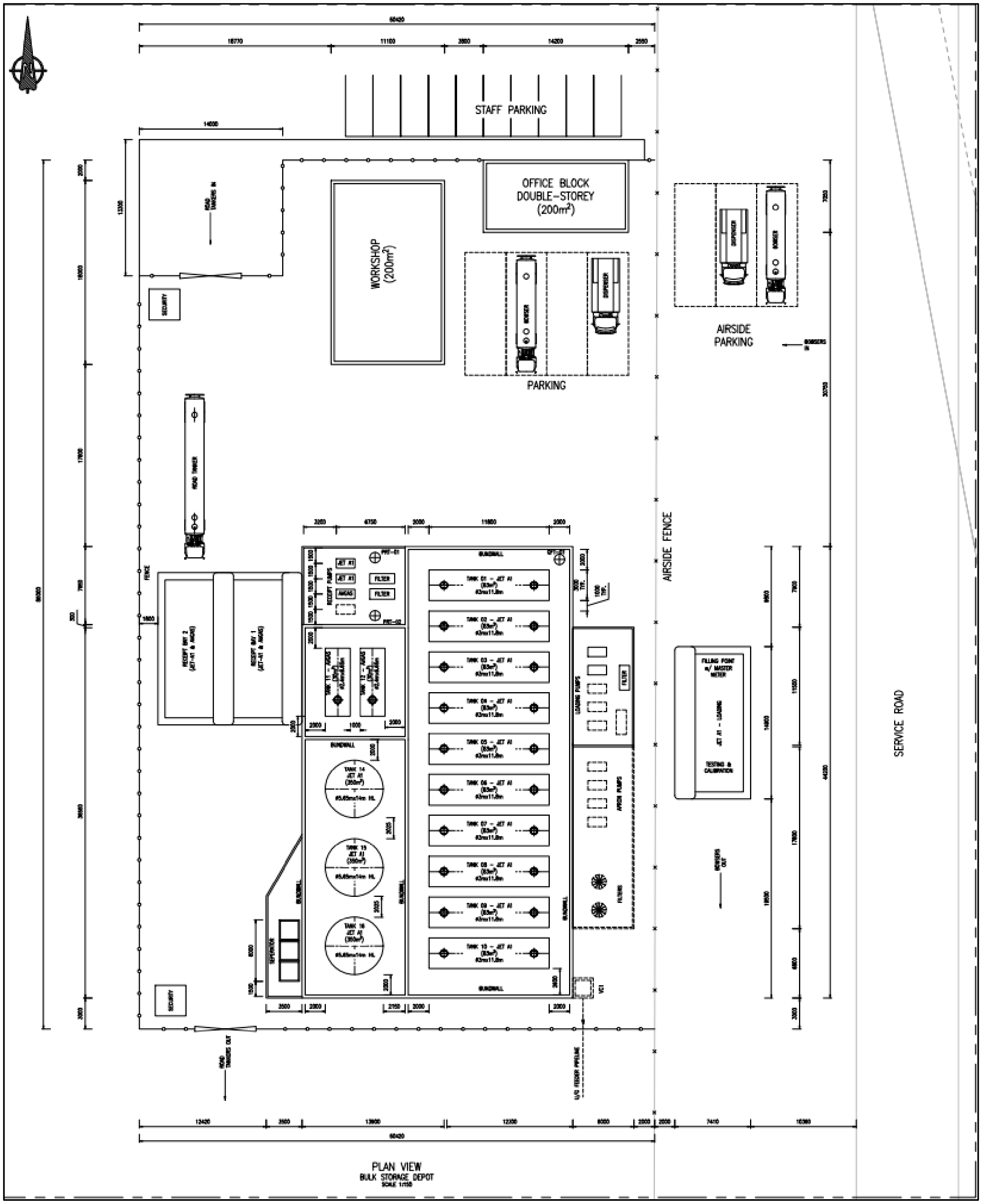


Figure 56: Proposed layout of Bulk aviation fuel farm (Kantey and Templar, Masterplan for Aircraft Refuelling Facilities; May 2023)

The concept design allows for 1 x 9m^3 double-walled horizontal tank (FireGuard or similar) located Airside with a dispenser where small privately-owned planes can taxy to, park and refuel without the need to call on a bowser truck.

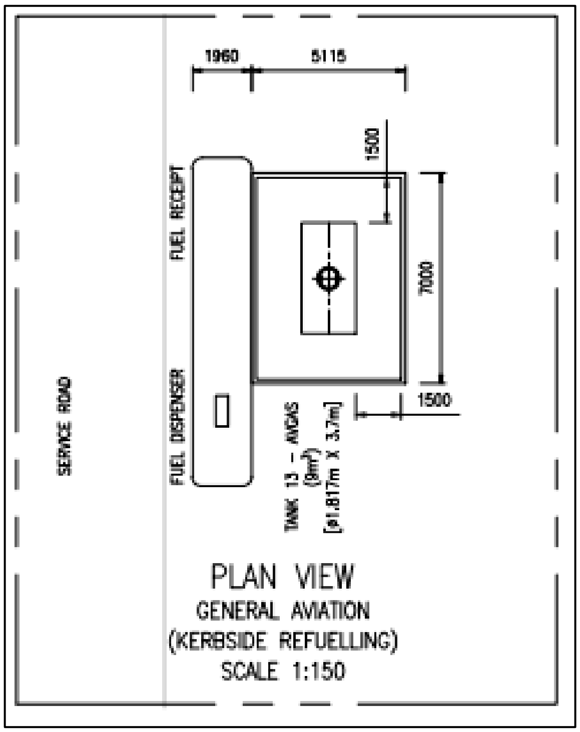


Figure 57: Proposed GA dispenser (Kantey and Templar, Masterplan for Aircraft Refuelling Facilities; May 2023)

The proposed development also includes a retail service station providing petrol and diesel. This facility would consist of 4x 23m^3 underground storage tanks with 2x islands, structural steel canopy with forecourt, small shop building and ablution facilities for staff.

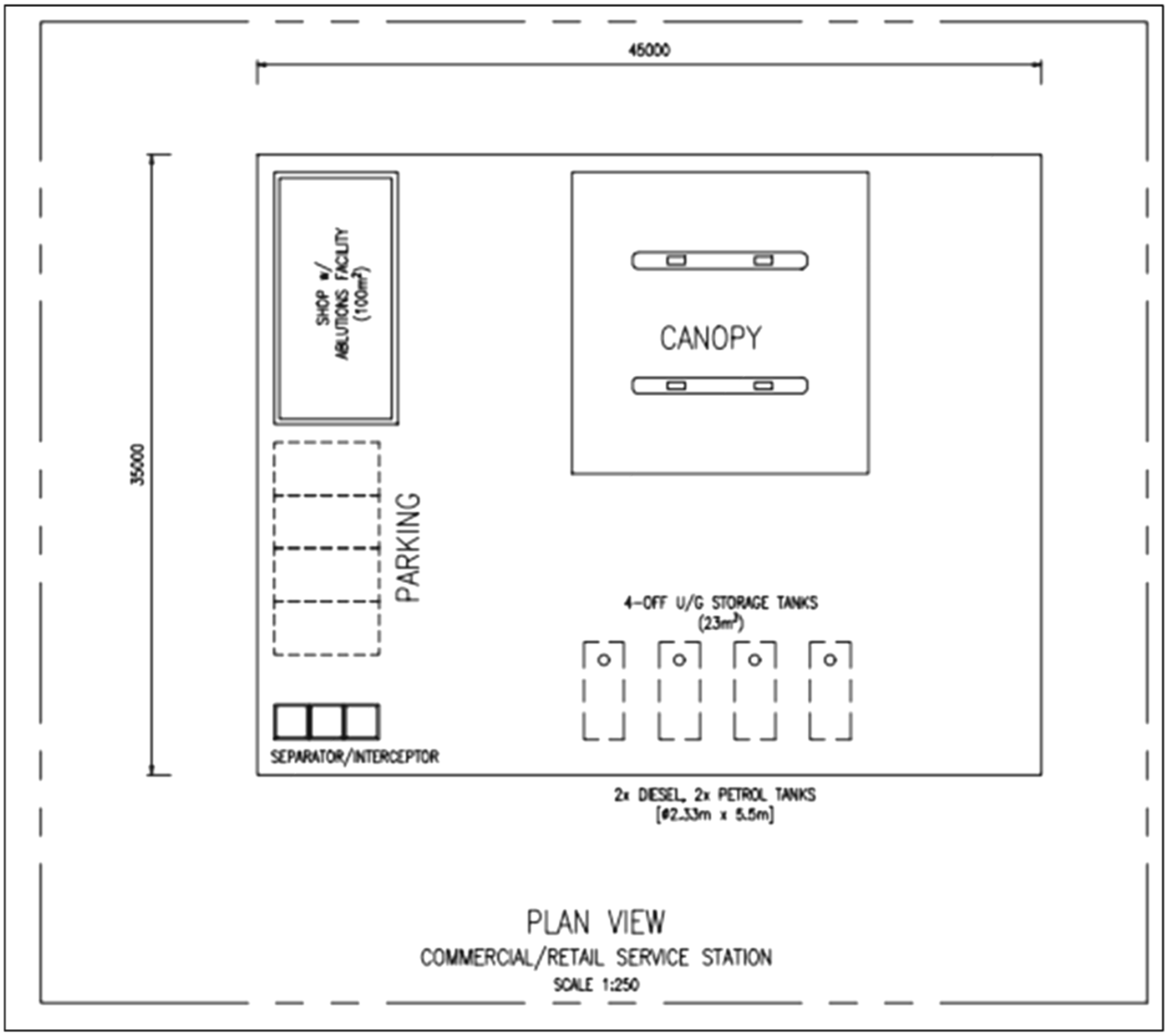


Figure 58: Retail service station proposed layout (Kantey and Templar, Masterplan for Aircraft Refuelling Facilities; May 2023)

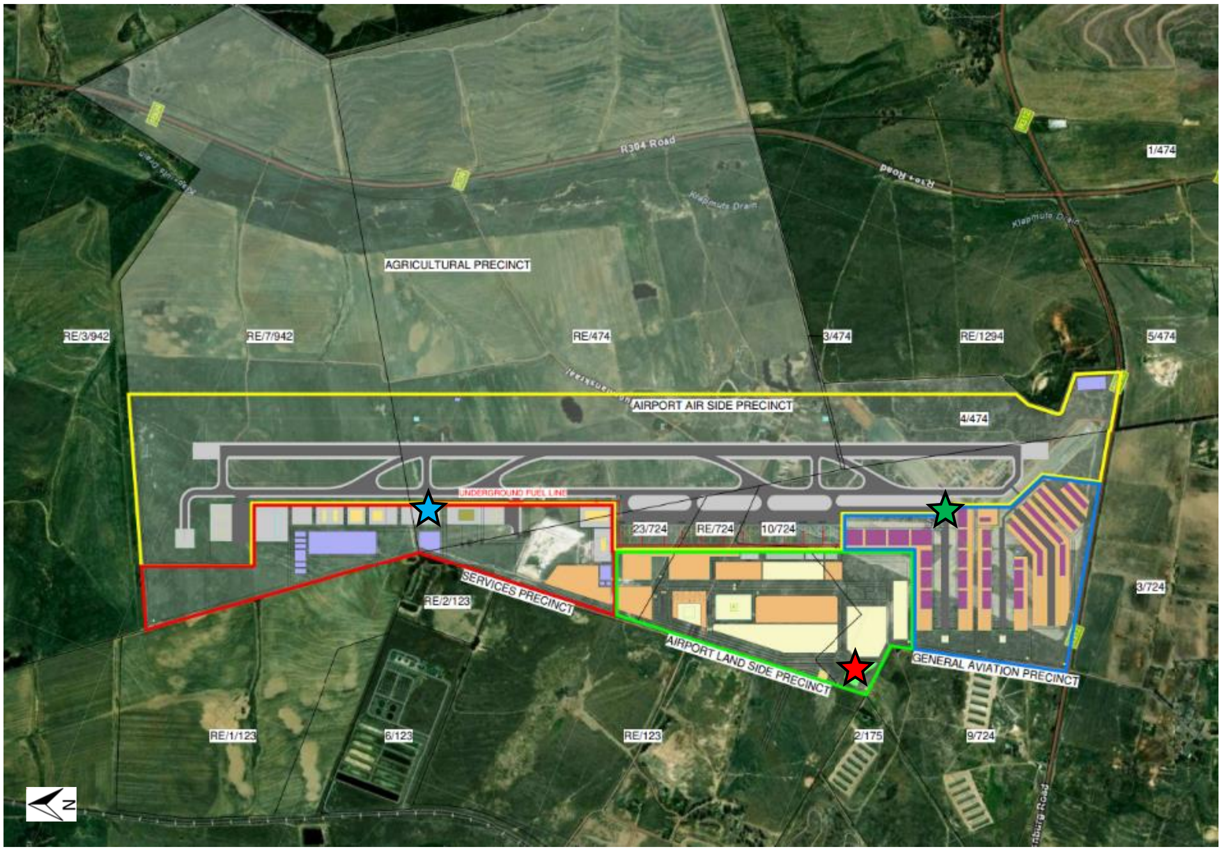


Figure 59: Proposed location of Bulk Fuel (blue star), AVGAS fuel (green star) and Retail Service Station (red star) – Refer SDP in Appendix 26

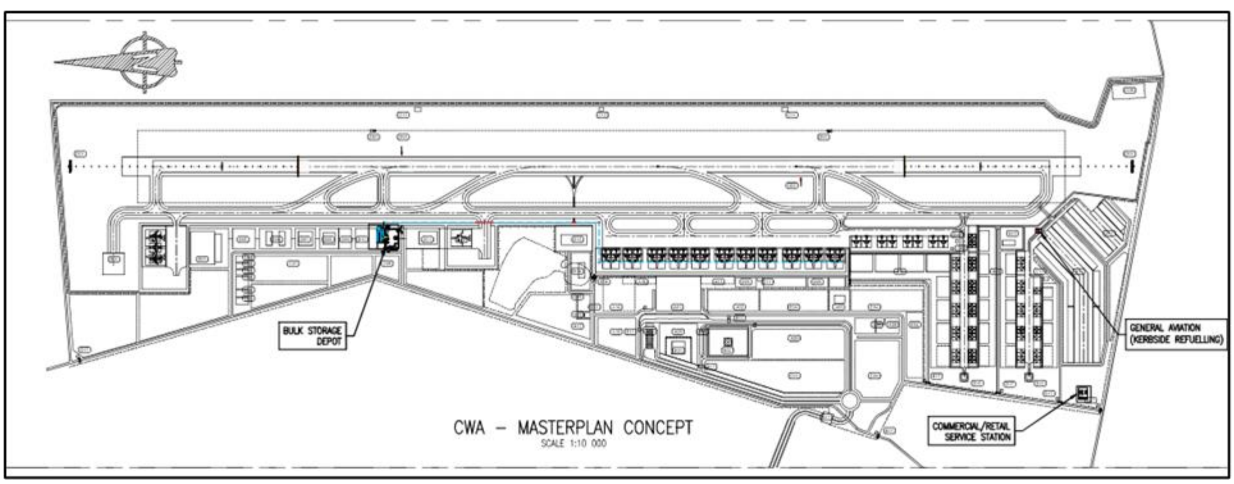


Figure 60: Proposed location of feeder fuel line from fuel farm indicated by light blue line (Kantey and Templar, March 2024)

6.15 Landscaping Design

A Landscaping design based on the SDP Phase 2 (Preferred Alternative 3) has been developed and include provisions for:

- Vineyard areas and trees.
- Setback of 20m from the runways and taxiways and limitations to species used based on 200mm to 300mm height restriction to comply with ICAO requirements.
- Set-back / buffer areas for the Localizers and Glidepath Antennas as per the FAA specification.
- Remainder of areas next to runways hydroseeded Fynbos with 700mm height restriction.
- Minimisation of perching opportunities for birds where possible.

Despite the risk of perching, trees are included in the design for aesthetic reasons, to function as wind breaks, mitigate the visual impacts, mitigate against heat island effects, and in general create a human living microclimate environment.

The proposed landscaping design will meet the following CoCT requirements:

1. The CoCT Landscape Plans Booklet 8 requires that all unshaded parking areas requires parking trees at a ratio of 1 Tree for every 2 Parking Bays. The Landscape Concept shows 1 Tree for every 3 Parking Bays.
2. In 2020 CoCT adopted the Green Infrastructure Programme – Tree Policy, with the aim to future proof the city from expected increase in the Heat Island temperatures due to global warming. It has been scientifically shown that trees in urban settings reduce the temperature in local microclimates and in general reduces temperatures of heat island effect across a city. With an Airport containing extensive unshaded hard surface areas, the expected local heat island temperature will be higher. Trees will mitigate this higher temperature values of the local heat island.

The irrigation design and planting plan incorporate water efficiency and possible reuse of treated effluent from the onsite wastewater treatment plant.

Figure 61: Proposed landscaping Plan (Planning Partners, September 2024)

7. OVERVIEW OF THE RECEIVING ENVIRONMENT

The DFFE Web Based Screening Tool requires that the proposed development area be screened against the mapped site sensitivities, the resultant site sensitivities be determined, and specialist reports required be determined.

7.1 Site Screening and sensitivity verification

The screening tool report was based on the placement of all seven the affected farm boundaries as the site footprint, and the placement of the development footprint within this site footprint. The **Infrastructure/Transport Services/Airport/Runways/Landing Strip/Helipad – Commercial sector** classification was chosen (refer to Appendix 2).

Figure 62: The site footprint forming the basis of the Screening Tool Report (PHS Consulting, May 2023)

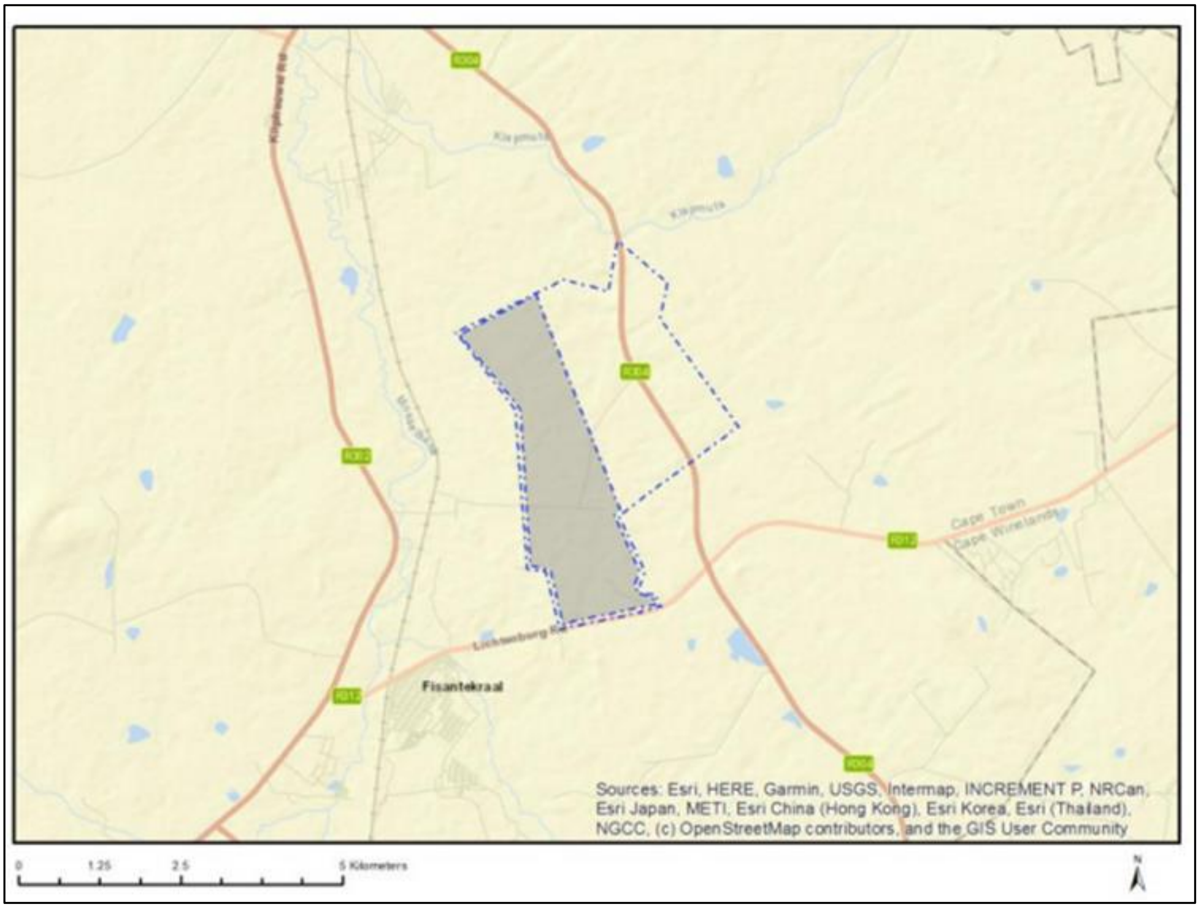


Figure 63: Site footprint (blue outline) and development footprint (grey shading) (PHS Consulting, May 2023)

According to the screening tool report there is an approved solar PV development approximately 21km from the site, but no intersections with EMF areas were found.

The following development incentives, restrictions, exclusions, or prohibitions apply to the site:

a) Strategic Transmission Corridor-Central corridor

The Strategic Environmental Assessment for Electricity Grid Infrastructure (EGI) identified 5 Strategic Transmission Corridors of strategic importance for the rollout of the supporting large scale electricity transmission and distribution infrastructure.

These corridors support areas where long term electricity grid infrastructure will be developed.

The site footprint lies within the Central corridor of the Strategic Transmission Corridor.

b) Strategic Gas Pipeline Corridors-Phase 1a & 1b: Saldanha to Ankerlig and Saldanha to Mossel Bay – the site footprint lies within the identified pipeline corridor.

The identification of possible gas pipeline corridors is linked to Offshore Oil and Gas Exploration and the need to develop a Phased Gas Pipeline Network. Operation Phakisa and the Department of Trade and Industry (DTI) argue that the development of gas could support South Africa's industrialisation because of competitively priced energy and a stable energy supply. The site lies within the 100km wide Phase 1a and 1b (Saldanha to Ankerlig and Mossel Bay) gas pipeline corridor.

According to the SEA (dated December 2019) negative mapping was developed as part of the strategic gas pipeline project to identify key environmental sensitivities and engineering constraints in terms of gas transmission pipeline infrastructure development.

Environmental sensitivities were regarded as environmentally sensitive features that may be negatively impacted by the gas pipeline development.

Engineering constraints are environmental features that are likely to impact upon the development of the physical gas pipeline infrastructure. These are features that developers preferably avoid when planning a gas pipeline development due to the increased cost of constructing and or maintaining the infrastructure in these areas.

The output of the Environmental Constraints mapping indicates areas to be avoided (Very High sensitivity), areas which are sensitive for various reasons (High-Medium sensitivity), and areas which demonstrate no or low sensitivity (Low sensitivity). The site lies within **very high to high environmental constraints sensitivity rating for gas pipeline development**.

Engineering constraints in the context of the SEA refers to technical challenges posed by the landscape and surrounding environment on the construction and operation of gas pipeline infrastructure. The mapping exercise was undertaken for the entire country and based on the best available data at a national scale. The identification of features and delineation of constraint level (sensitivity) for each engineering feature was done in consultation with engineering representatives from iGas and Transnet, as well as Eskom. Typical engineering related features include steep slopes, commercial forestry areas, coastal areas, and deep river gorges. Engineering constraints also include proximity to other linear infrastructure such as high voltage power lines and railway lines that present corrosion problems for the pipelines if they run parallel to this infrastructure for extended distances.

The site lies within **very high to high engineering constraints sensitivity rating**.

Based on the above it is unlikely that the site would be chosen for future gas pipeline construction because of the very high to high environmental constraints sensitivity rating and the very high to high engineering constraints sensitivity rating. Therefore, future gas pipeline development is not a constraint to the proposed project on this site.

The environmental sensitivity for the proposed site was determined and the required specialist studies listed.

Table 29: Proposed Development Area Environmental Sensitivity (PHS Consulting, May 2023)

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Agriculture Theme		X		
Animal Species Theme		X		
Aquatic Biodiversity Theme	X			
Archaeological and Cultural Heritage Theme				X
Civil Aviation Theme		X		
Defence Theme			X	
Palaeontology Theme				X
Plant Species Theme			X	
Terrestrial Biodiversity Theme	X			

The Screening tool listed the following required specialist studies:

1) Agricultural Impact Assessment
2) Archaeological and Cultural Heritage Impact Assessment
3) Palaeontology Impact Assessment
4) Terrestrial Biodiversity Impact Assessment
5) Aquatic Biodiversity Impact Assessment
6) Avian Impact Assessment
7) Civil Aviation Assessment
8) Defence Assessment
9) Noise Impact Assessment
10) Traffic Impact Assessment
11) Geotechnical Impact Assessment
12) Socio-economic Assessment
13) Plant Species Assessment

14) Animal Species Assessment

Civil aviation Assessment:

The DFFE Screening tool identified the proposed development area as a “high sensitive” civil aviation area.

The Protocol for The Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Civil Aviation Installations requires a Civil Aviation Compliance Statement for which NACO has been appointed.

The compliance statement must be concluded during the EIA phase of the application and must contain, as a minimum, the following information:

2.3.1. contact details of the environmental assessment practitioner or the specialist, their relevant qualifications and expertise in preparing the statement, and a CV;

2.3.2. a signed statement of independence by the environmental assessment practitioner or specialist;

2.3.3. a map showing the proposed development footprint (including supporting infrastructure) overlaid on the civil aviation sensitivity map generated by the screening tool;

2.3.4. a comment, in writing, from the South African Civil Aviation Authority (SACAA), which may include inputs from the Obstacle Evaluation Committee (OEC), if appropriate, confirming no unacceptable impact on civil aviation installations; and

2.3.5. should the comment from the SACAA indicate the need for further assessment, a copy of the assessment report and mitigation measures is to be attached to the compliance statement and incorporated into the Environmental Impact Assessment Report with mitigation and monitoring measures identified included in the EMPr. The assessment must be in accordance with the requirements stipulated by the SACAA.

The professional aviation specialists are of the opinion that the CWA proposed development can fit into the airspace, therefore this protocol can be concluded in step 2.3.4 if SACAA confirms that the proposed development will not result in unacceptable impacts. SACAA has been engaged on numerous occasions and positive comments have been received to date. Step 2.3.5 will only be conducted as part of the EIA phase, if further assessment work is requested by SACAA. The ToR for 2.3.5 will be determined at that point in time depending on the requirements set by SACAA. Any further assessment will be conducted by the appointed Civil Aviation specialist or sub-consultants with expertise in the field of aviation. The assessment will adhere to the requirements of the NEMA Regulations.

The progress to date includes:

- Engagement with SACAA – Various meetings with representatives from the South African Civil Aviation Authority (SACAA) have taken place to discuss and agree on the requirements for issuing a compliance statement. These meetings will continue and is regarded as essential to ensure that all necessary criteria and documentation are met before submission.

- Documentation Prepared - The following documents were completed for submission to SACAA:
  Synopses of the EIA process to date.
  The Airspace Concept of Operations (CONOPS) within the NASCOM ATM/CNS process.
  Baseline Assessment Report.
  Visualisation of FACT and FAWN combined operations
  Airspace and Capacity study
  CWA Alternate Airport study

Stakeholder Requirements - It has been confirmed that SACAA requires letters of support for the project from both the City of Cape Town and the Western Cape Province, which have been provided. Additionally, evidence of public consultation was provided to meet the compliance requirements.

All the specialist assessments listed by the Screening Tool will be conducted except for Defence:

The site rates as MEDIUM (refer Table 29) due to its proximity to a Military and Defence Site to the southwest of the site - the Goedverwacht communications base approximately 4km as the crow flies southwest of CWA.

ATNS has conducted an Obstacle Assessment Report (OLS) and in association with NACO, an Airspace CONOPS to understand the transition from CWA current uncontrolled airspace to a controlled airspace with instrument procedures in place.

The study confirms that the CWA and immediate surrounds are not used for any defence operations and that it is currently a private airport operating under a specific radar frequency. It further confirms that the proposed airspace procedures required for the expansion at CWA do not interfere with military airspace based on publicly available information. The study further indicated that there will not be a need for new communication system frequencies, and that frequency interference with existing defence installation and radar systems is unlikely.

Considering the proposed VHF Omnidirectional Range (VOR) and Very High Frequency Data Broadcast (VDB) proposed for the expansion of the CWA these mechanisms will only be beneficial for any defence installation if required. Although detail regarding SANDF and SAAF installations are not known to the public the intent is not to pinpoint or highlight is, but by knowing the dynamic of radar and the requirement for operational effectiveness preliminary assessment regarding the proposed CWA development indicated that it is highly likely that the proposed expansion will have a low impact on defence installations.

Based on the information obtained via the OLS and additional Airspace studies conducted as part of the proposed project, the EAP recommends that the rating be LOW and no further specialist studies required.

The SANDF, the SAAF and NASCOM are included as IAPs on the project and consultation on this position is ongoing in order to gather input regarding further requirements. During the pre-application and in-process Scoping report public participation, no comments were received that counters the EAP's position. The SANDF, the SAAF and NASCOM remain part of the consultation process at SACAA level.

The need for a Glint and Glare assessment with relation to the Solar PV was also identified and has been included in the POS for EIA.

The following additional specialist studies were commissioned by the applicant:

1) Air Quality Impact Assessment
2) Visual Impact Assessment
3) Geohydrology Impact Assessment
4) Archaeological Baseline Assessment

The following protocols were found to be applicable to the proposed development:

1) Site Sensitivity Verification Requirements Where a Specialist Assessment is Required but no Specific Assessment Protocol Has Been Prescribed (GN320 in GG43110 dated 20 March 2020).
2) Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Biodiversity (GN320 in GG43110 dated 20 March 2020) and Amendment to The Protocols for Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Animal and Plant Species in Terms of Sections 24(5)(A) and (H) and 44 of the National Environmental Management Act, 1998 (GN3717 in GG49028 dated 28 July 2023).
3) Protocol For the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Aquatic Biodiversity (GN320 in GG43110 dated 20 March 2020).
4) Protocol For the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Plant Species (GN1150 in GG43855 dated 30 October 2020).
5) Protocol For the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Animal Species (GN1150 in GG43855 dated 30 October 2020).
6) Amendments to the Protocols for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Animal and Plant Species (GN3717 in GG49028 dated 28 July 2023)
7) Protocol For the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Agricultural Resources (GN320 in GG43110 dated 20 March 2020).
8) Protocol For the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Avifaunal Species by Onshore Wind Energy Generation Facilities Where the Electricity Output Is 20 Megawatts or More (GN320 in GG43110 dated 20 March 2020).

9) Protocol For the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Civil Aviation Installations (GN320 in GG43110 dated 20 March 2020). Refer previous notes above.
10) Protocol For the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Defence Installations (GN320 in GG43110 dated 20 March 2020).
11) Protocol For Specialist Assessment and Minimum Report Content Requirements for Noise Impacts (GN320 in GG43110 dated 20 March 2020).

The section below provides an overview of the key characteristics of the biophysical, socio-economic, and cultural/historical heritage environment within the project and surrounding area. The description of the affected environment is/ will be drawn from:

- A range of available information sources which are referenced throughout.
- Specialist investigations aimed at the biophysical, socio-economic, and cultural / visual / heritage environments undertaken between 2021 and 2023.
- Various reports commissioned by the Applicant (fuel storage design; OLS and other technical design reports).

Post the public participation of the Pre-application and statutory Scoping reports the following additional specialist / technical studies and guidelines were commissioned:

1) Climate Change Impact Assessment
2) Terrestrial Biodiversity offset report
3) Freshwater offset report
4) Hydropedological study (required by DWS in support of WULA)
5) Glint and Glare study
6) Major Hazardous Installation risk assessment
7) Poultry Biohazard Assessment
8) Bird Strike Risk Assessment
9) Architectural Guideline
10) Outdoor Advertising Guideline

Any information provided by I&APs during future public participation will be included in future revisions of this report.

7.2 Geology, Topography, Geohydrology and Geotechnical conditions

7.2.1 Topography

The **topography** of the site and surrounds is characterised by typical grass-covered low-relief rolling hills with a typical on-site elevation between 90 - 130 m above mean sea level (mamsl). In this region, there is a low drainage density (Stapelberg, 2009) as natural slope surfaces rarely exceed 12°. Drainage channels and small tributaries occupy the lower-lying areas between the low-relief hills.

The current CWA site is characterised by generally flat terrain with little undulation, while the northern extent of the proposed expansion area is characterised by undulous terrain with rolling hills.

7.2.2 Geology

The **geology** of the proposed Cape Winelands Airport consists of shale of the Tygerberg Formation (Nt), which forms part of the Malmesbury Group and constitutes the basement rock of the area. Regionally the Malmesbury Group is overlain by different quaternary formations (Refer Table 30).

The bedrock in the region is shown to be predominantly Malmesbury Group (Nt) rocks; these are often associated with overlying ferricrete gravels/nodules. The Malmesbury Group rocks typically dip steeply to the northwest (Stapelberg, 2006). Rapid transitions occur within this unit between easy-weathering siltstone/phyllite to more competent greywacke/sandstone. This can lead to large differences in depth of weathering/depth and development of the soil profile over relatively short distances (Stapelberg, 2006).

Although intrusions of the Cape Granite Suite are not indicated, indications of minor intrusive, or fault-bounded bodies of granite occur in this region (Stapelberg, 2006). These are considered extensions/satellite intrusions of the Kuilsriver–Helderberg pluton.

A regional fault system (the Colenso Fault) is mapped along the northeastern boundary of the Cape Winelands Airport. This fault structure extends from Klapmuts in the Winelands to Langebaan on the West Coast. A geological cross section is presented in Figure 65.

The Colenso fault is also identified as a no-go area in the Geohydrological report and is indicated as a biophysical constraint in Appendix 26 Item 12. The fault is to the East of the proposed development site, partly in the agricultural precinct and across the R 304 from the proposed development, therefore not a direct constraint.

Table 30: Geological formations within the study area (GEOSS, Geohydrological Scoping Report, Sept 2023)

Code	Formation/Pluton	Group/Suite	Description
	Alluvium	Quaternary Group	Unconsolidated sand
Qgg	-		Gravelly clay/loam soil
Qg	-		Loam and sandy loam
Qf	-		Limestone and calcrete
Qs	Springfontyn Formation		Light grey to pale red sandy soil
Cpo	Populierbos Formation	Klipheuwel Group	Shale, mudstone and sandy shale, mainly reddish
Cm	Magrug Formation		Conglomerate, grit and sandstone, often reddish brown
Nf	Franschhoek Formation	Malmesbury Group	Grey, feldspathic conglomerate, grit and sandstone, with minor shale
Nt	Tygerberg Formation		Nt - Greywacke, phyllite and quartzitic sandstone, interbedded lava and tuff
Nm	Moorreesburg Formation		Greywacke and phyllite with beds and lenses of quartz schist, limestone and grit; quartz-sericite schist with occasional limestone lenses

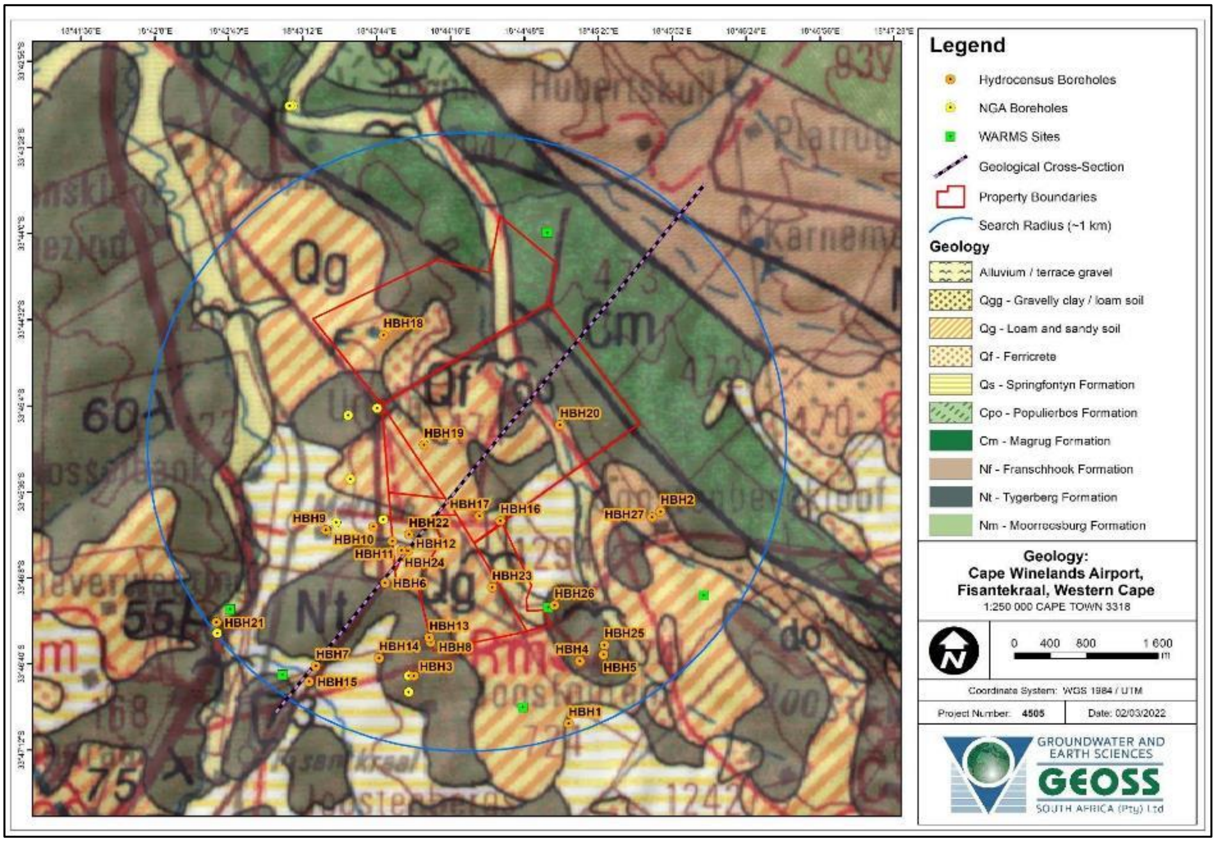


Figure 64: Geological setting of the area with the hydrocensus, NGA, WARMS borehole and cross-section line indicated (3318 – Cape Town) (GEOSS, Geohydrological Scoping Report, Sept 2023)

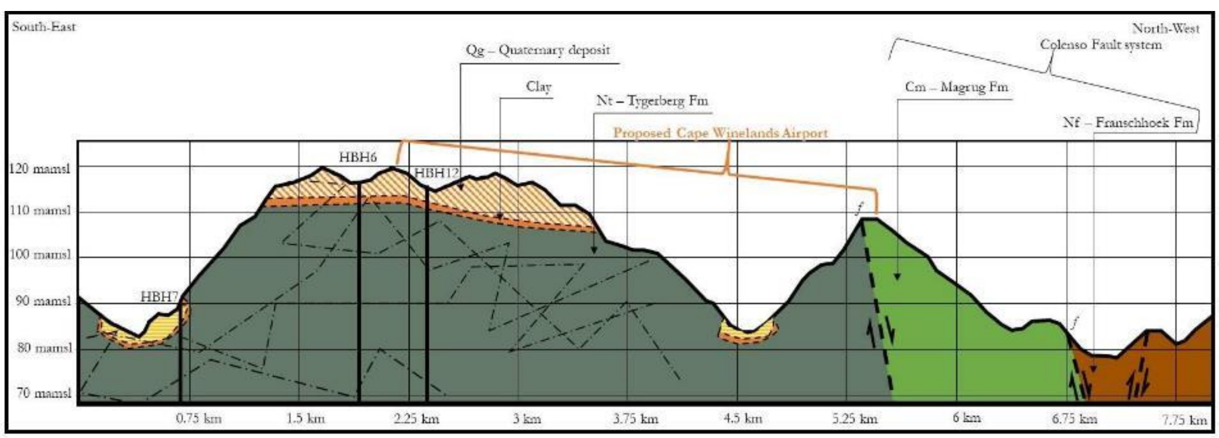


Figure 65: Schematic and conceptual south-west to north-east cross section (GEOSS, 2022) as indicated in Figure 64 – note Colenso Fault area (GEOSS, Geohydrological Scoping Report, Sept 2023)

7.2.3 Geohydrology

The **geohydrological** baseline study found that the site is underlain by alluvium, colluvium, and weathered bedrock of the Malmesbury Group and Cape Granite Suite (GEOSS, 2022b). A large geological structure, the Colenso Fault, is mapped on the north-eastern boundary of the Cape Winelands Airport.

The aquifer in the area is classified as a "fractured" aquifer with potential borehole yields between 0.5 – 5.0L/s (refer Figure 66).

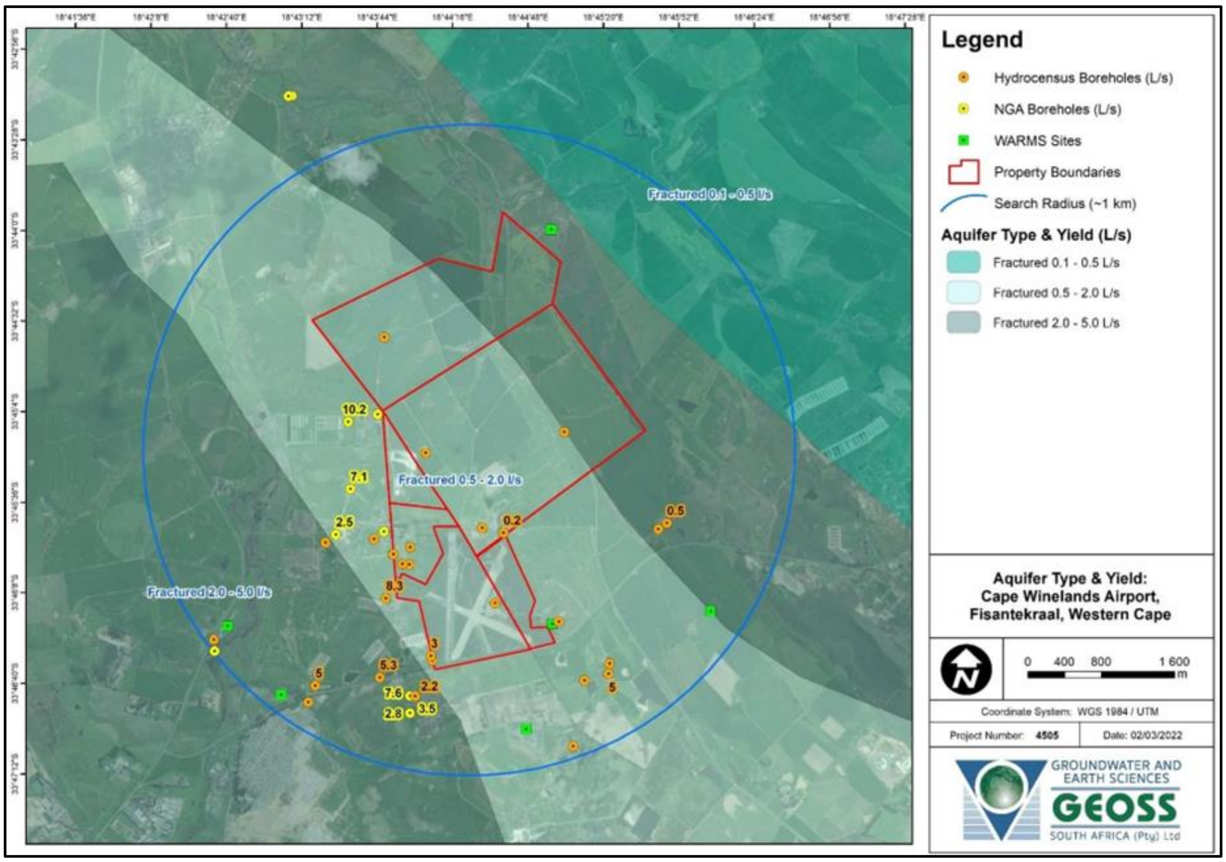


Figure 66: Regional aquifer yield (DWAF, 2002) and borehole yields (L/s) (GEOSS, Geohydrological Scoping Report, Sept 2023)

The groundwater quality of the area, based on one laboratory sample, hydrocensus data and the NGA data indicate that the EC ranges from 19.7mS/m to 632mS/m which means the groundwater quality ranges from "ideal" to "poor" (in terms of EC).

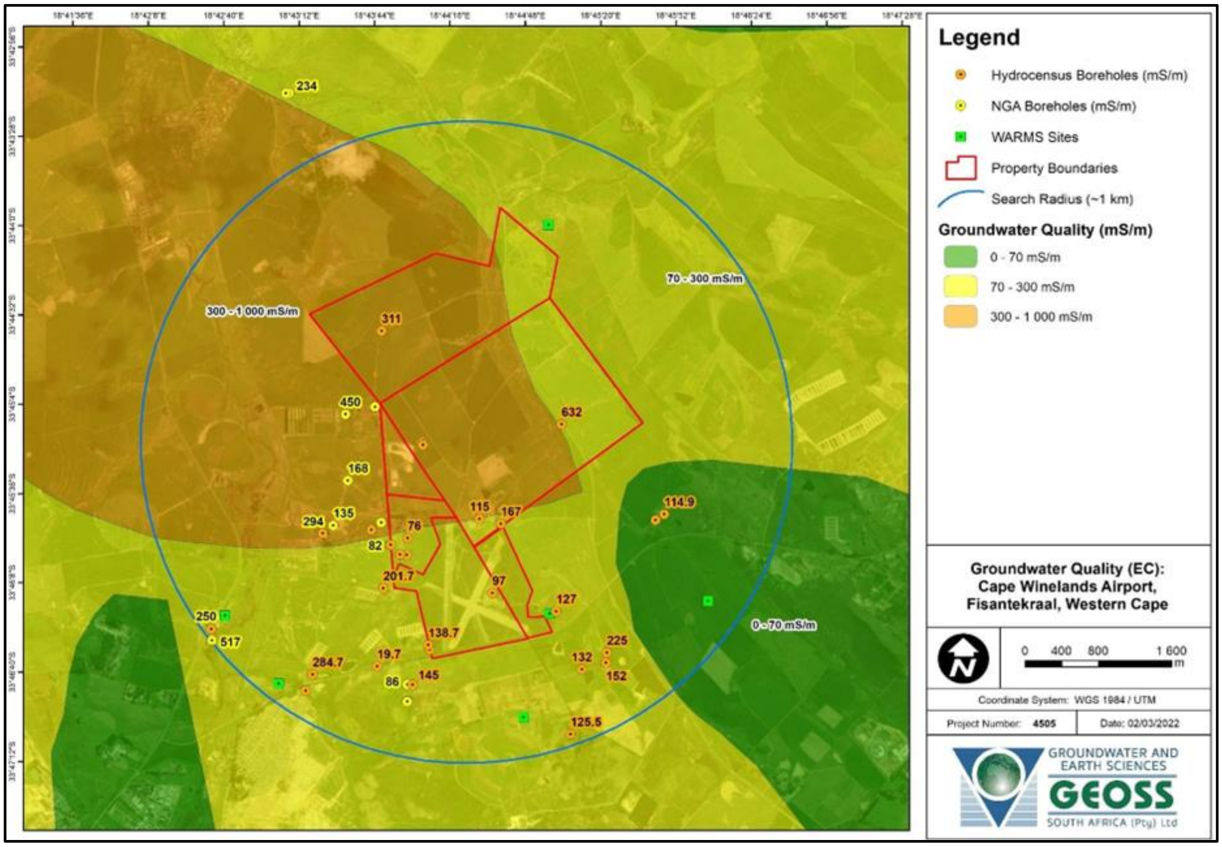


Figure 67: Regional groundwater quality (mS/m) from DWAF (2002) showing locations and EC value of boreholes (GEOSS, Geohydrological Scoping Report, Sept 2023)

During the hydrocensus it was found that there are other existing groundwater users in the surrounding area, and that most of the users abstract groundwater from the fractured aquifer. The water levels range from shallow to deep (from 1.24mbgl to 71mbgl). During the in-process Scoping Phase additional information was provided by adjacent landowners on their boreholes, leading to the update of the hydrocensus for the EIA Phase.

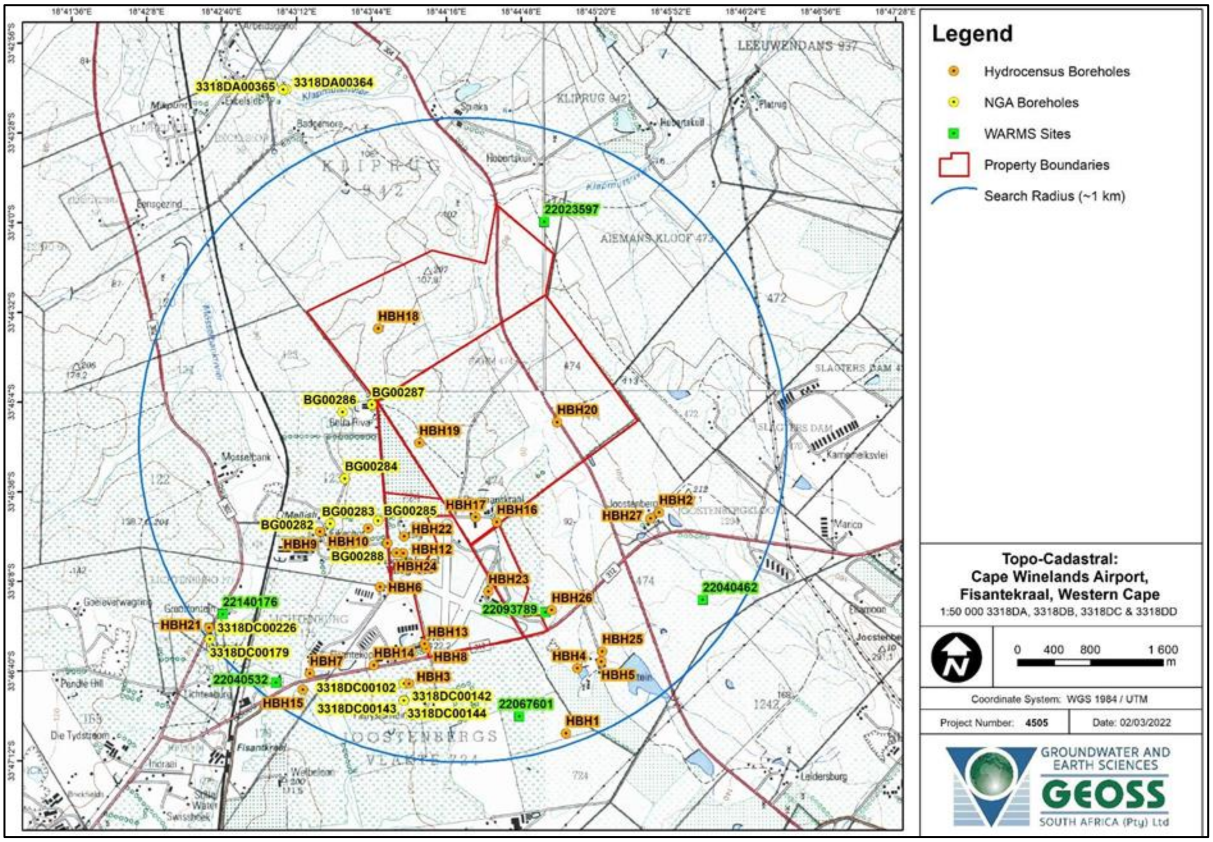


Figure 68: The study site with the property boundary, hydrocensus, NGA, and WARMS boreholes superimposed on a 1:50 000 scale topocadastral map (3318DA, 3318DB, 3318DC & 3318DD) (GEOSS, Geohydrological Scoping Report, Sept 2023)

The site has a low to low/medium vulnerability classification, which means that the susceptibility of the aquifer to contamination from anthropogenic activities is low to medium. This classification is because the Malmesbury Group rock weathers to a clay. Clays are typically associated with lower permeability, retarding the migration of potential contaminants, and offering protection to potentially underlying aquifers. The clay found underlying the site, does provide some degree of protection to the underlying fractured rock aquifer.

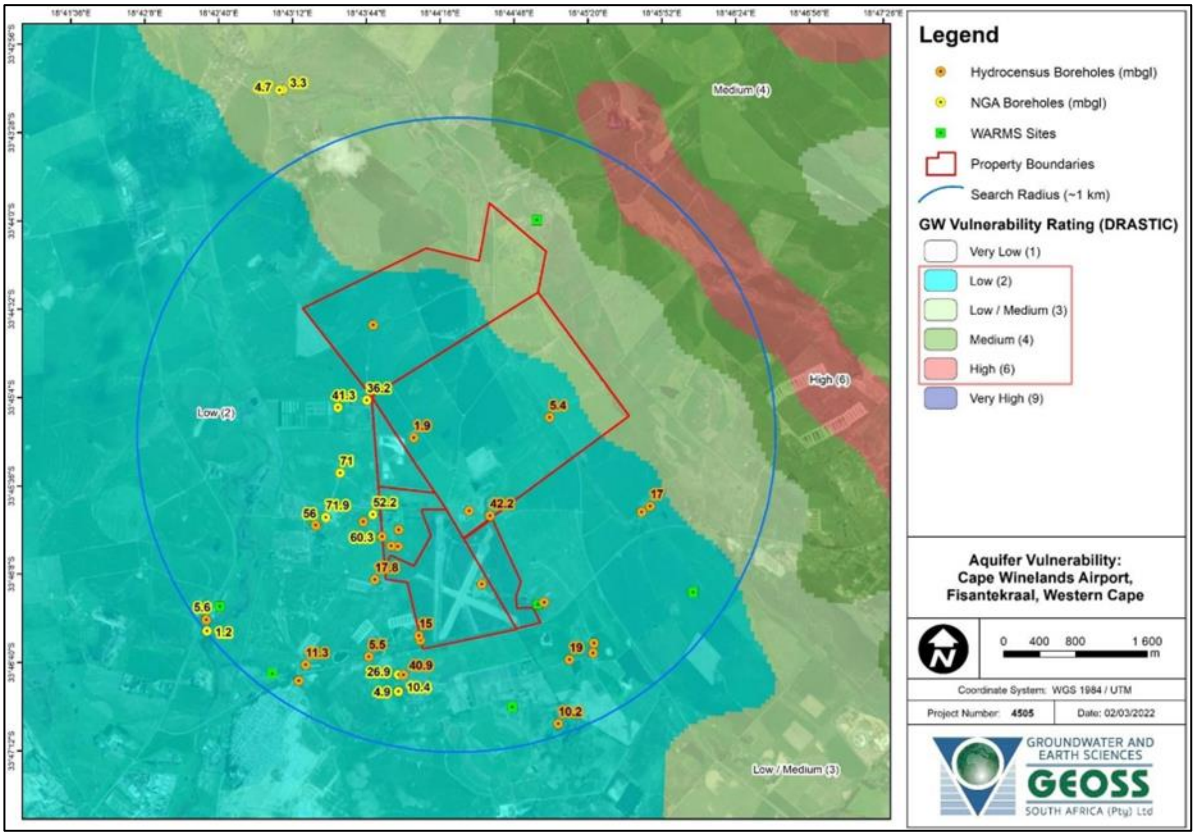


Figure 69: Regional groundwater vulnerability from Conrad and Munch (2007) showing locations and water levels of boreholes (GEOSS, Geohydrological Scoping Report, Sept 2023)

Aquifer vulnerability increases to the north-east where the Colenso Fault system is located (Figure 69). This area should be considered as a sensitive area in terms of groundwater.

Because there are other existing groundwater users and the proximity of the Colenso Fault to the CWA, a no-go area for high-risk activities is proposed for the north-eastern section of the study area, specifically for certain high-risk activities such as the aviation fuel farm, retail service station or other activities that are considered high risk to groundwater. This no-go area is visually illustrated in Appendix 26 Item 12.

7.2.4 Geotechnical conditions

The **geotechnical conditions** of the region were mapped at 1:50 000 scale by the Council for Geoscience (CGS) in 2006 (3318DC Bellville - Geotechnical Series), refer Figure 70. The geotechnical series provides an indication of the likely soil conditions and construction constraints at a particular location, for example, the soil beneath the site has been classified (according to the CGS) as ‘M8’, indicating that “*some precautionary measures needed to overcome engineering-geological problems*”. Potential problems/conditions that may be experienced with subsoils of this classification are shown in Table 31.

Table 31: Potential geotechnical constraints in the region of the site (after CGS, 2009) (GEOSS, Geotechnical Report, Sept 2023)

Geotechnical Condition/ Property	Description	Severity Class / Resulting Cost Implication
Permeability **(Map Code: Per)**	Permeability measures the flow of water through saturated soil. This is determined by the grain size and shape and the degree of compaction of the soil.	Low permeability (< 3 x 10cm/s)
Shallow water table **(Map Code: Sha)**	Water table occurring at shallow depth - often seasonal.	Moderate
Loose sand (consolidation) **(Map Code: Con)**	Material susceptible to excessive consolidation when used as foundation horizon. Non cohesive sands.	Low
Active clay **(Map Code: Act2-Act3)**	The degree of expansion experienced when dry clayey soils are moistened to full saturation. In addition to the activity, the clay horizon depth and thickness contribute towards determining the amount of surface movement (expansion/contraction).	The residual soils of the Tygerberg Formation may exhibit low to medium expansiveness. Medium cost implications may be incurred due to this type of material

The geotechnical baseline investigation involved undertaking a desk study, a site walk-over, an intrusive investigation (i.e., trial pit investigation), field and laboratory testing, and compilation and interpretation of the gathered data. A total of forty-six (46) trial pits were excavated and thirty-five (35) drop-weight cone penetrometer (DCP) tests were performed across the proposed CWA expansion site.

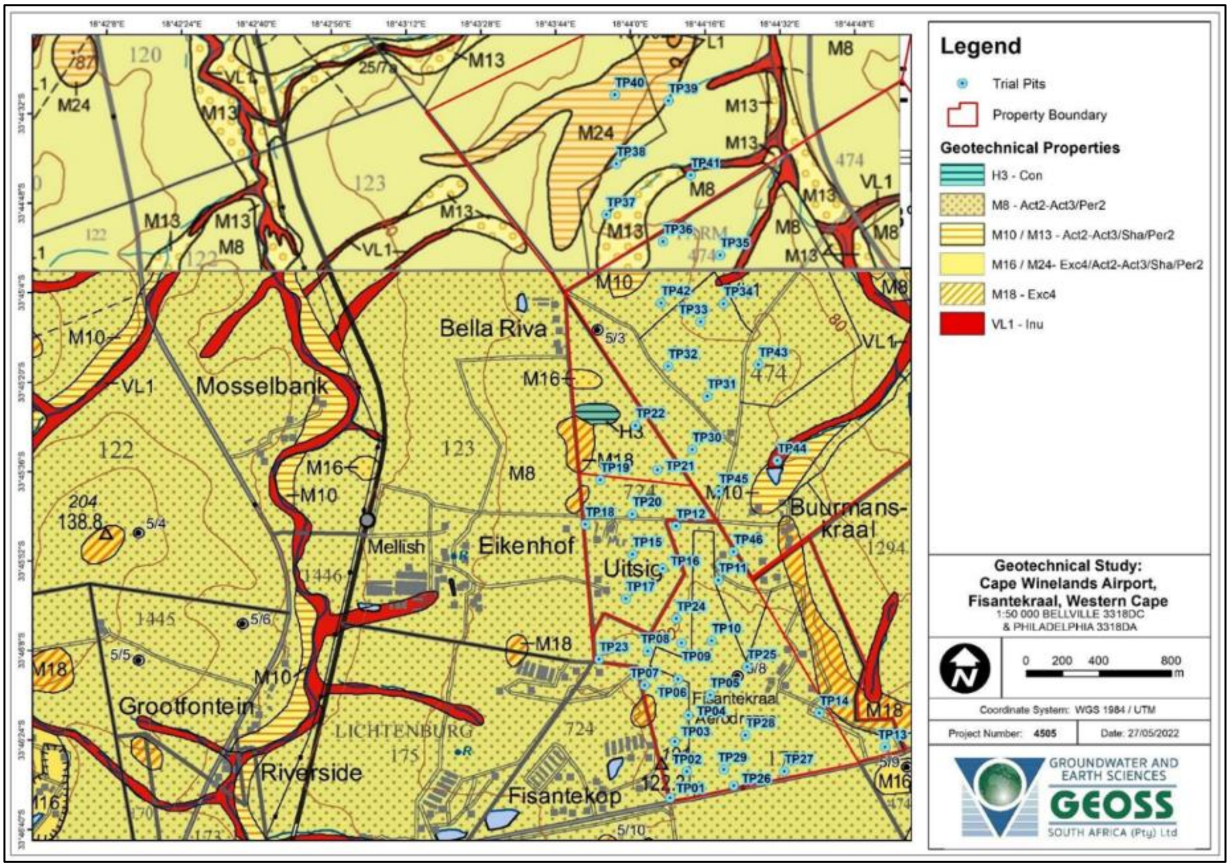


Figure 70: Large scale Geotechnical conditions of the site and surrounds showing the positions of the trial pits (3318DC – Bellville, GCS 2008) (GEOSS, Geotechnical Report, Sept 2023)

Five Geotechnical Zones were delineated based on the investigation results:

A – Residual materials derived from granitoid sources.

B – Residual Materials derived from pelitic sources.

C – Area falling within Zones A and B with residual soils exhibiting characteristics of potentially expansive materials, and/or soils that are prone to settlement.

D - Areas of relatively deep/thick transported aeolian sand.

E – Areas of surficial ferricrete and/or silcrete.

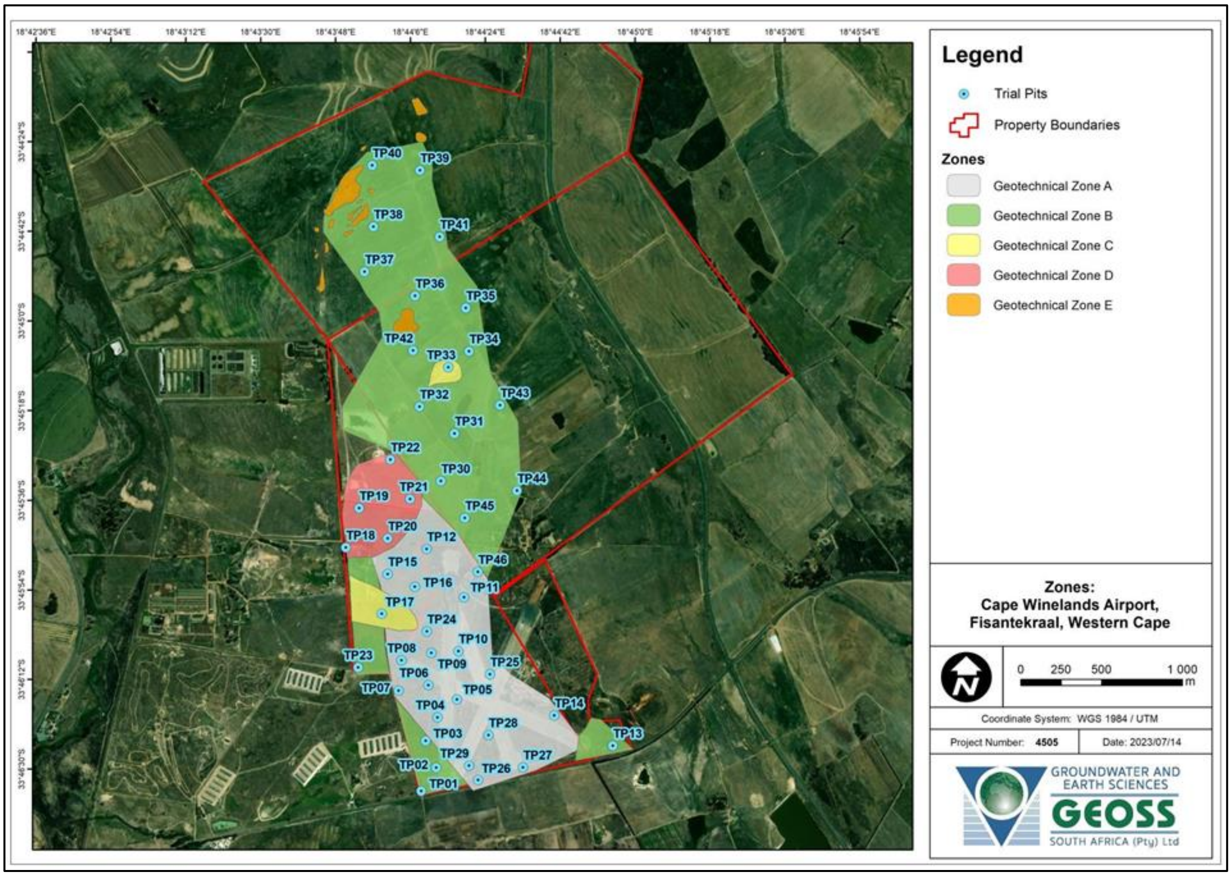


Figure 71: Aerial imagery showing interpreted Geotechnical Zone boundaries (GEOSS, Geotechnical Report, Sept 2023)

From a geotechnical standpoint, site development should proceed, but there are potential geotechnical challenges associated with the intended development:

- All materials encountered in the trial pits classified as soft to intermediate excavation, but the hardpan ferricrete horizons may require rock-breaking apparatus in areas of the site.
- A series of site-specific follow-up geotechnical investigations will be required prior to the construction of individual structures.
- In the case of structures with heavy structural loadings, where deeper foundations/piling are/is required, it would be prudent to consider a series of exploratory drilling as part of the site-specific investigations to determine whether core stones exist at depth, particularly in areas underlain by residual granitoids.
- A perched groundwater table was intersected on-site at between 0.85 and 1.4mbgl, so excavations deeper than 1.0mbgl will require battering to ensure safe working conditions. Final designs will have to cater for aggressive and corrosive groundwater and/or soil conditions and drainage precaution will be required. Four areas with perched water tables were identified in

test pit (TP) 14, TP 17, TP 25 and TP 33, at 1.5m below ground level (mbgl), 1.9mbgl, 0.9mbgl, and 1.4mbgl, respectively.

- The foundation solutions adopted for each structure on-site will depend on the cost of implementation, and the risk associated with the said solution.
- Due to the variation in topography within the northern extent of the property, considerable fill will be required.
- During construction, potential geotechnical variations in the subsurface should be inspected and approved by a suitably qualified professional.

7.2.5 Mining on P23 of Farm 724 and RE of Farm 474

The Uitsig quarry (described as Uitsig Clay Pit) with Mining Licence ML17/2001 is located on P23/724 and a portion of RE/474 and has been operational since 2003. The land and the mining right/ permit is owned by Corobrik (Pty) Ltd, and as part of the planned acquisition of the land for the proposed CWA expansion, a mine closure application has been lodged with DMRE by Corobrik (Pty) Ltd.

Mine closure planning involves planning effectively for the after-mining landscape – all activities required before, during and after the operating life of a mine that are needed to produce an acceptable landscape economically. The most important benefit of closure planning is identification of critical activities to achieve successful reclamation, and usually also identifies areas of needed research, planning constraints and opportunities.

The proposed mine closure application is in line with the approved EMP (dated 9 July 1998) and will also incorporate the possible future use of the quarry as a stormwater retention pond.

The mine closure application has completed the public participation phase with the draft BAR for the closure plan in process. The closure objectives align with CWA future use for quarry as per the closure application.

Figure 72: Location of quarry in relation to CWA proposed cadastrals (quarry indicated by blue arrow) (PHS Consulting, Oct 2023)

Figure 73: Photo of quarry (looking north-west) (Agri-informatics; Agro-Ecosystem Scoping report; September 2023)

7.3 Climate, Ambient Air Quality and Baseline Noise

7.3.1 Climate

The Fisantekraal area experiences a Mediterranean Climate with mild wet winters and warm dry summers. Figure 74 shows the monthly average air temperature and Figure 75 shows the monthly median rainfall and evaporation distribution for the Fisantekraal area (Schulze, 2009). The long term (1950 – 2000) mean annual precipitation for the Fisantekraal area is approximately 532mm/annum. The rainfall typically exceeds evaporation rates in the winter months between May and August, and mists are common in winter.

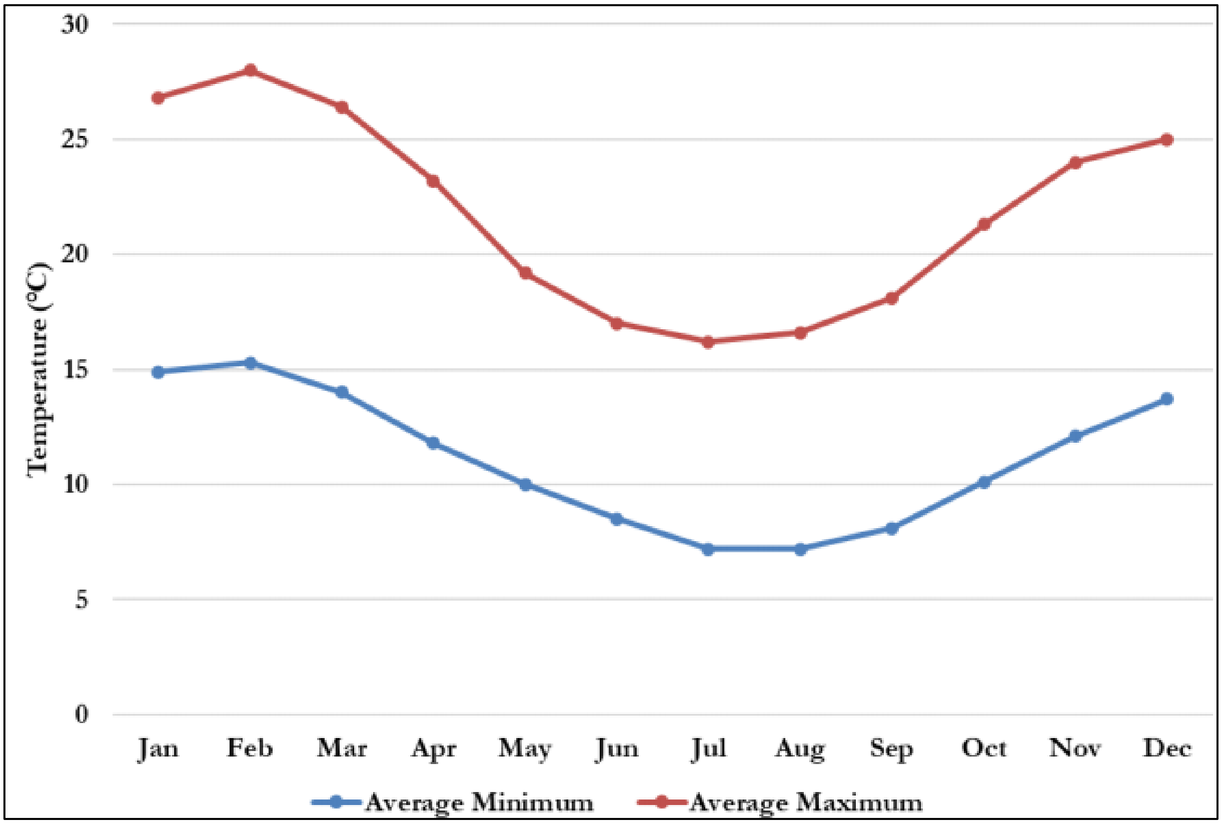


Figure 74: Monthly average air temperature for the Fisantekraal area (Schulze, 2009) (GEOSS, Geohydrological Scoping Report, Sept 2023)

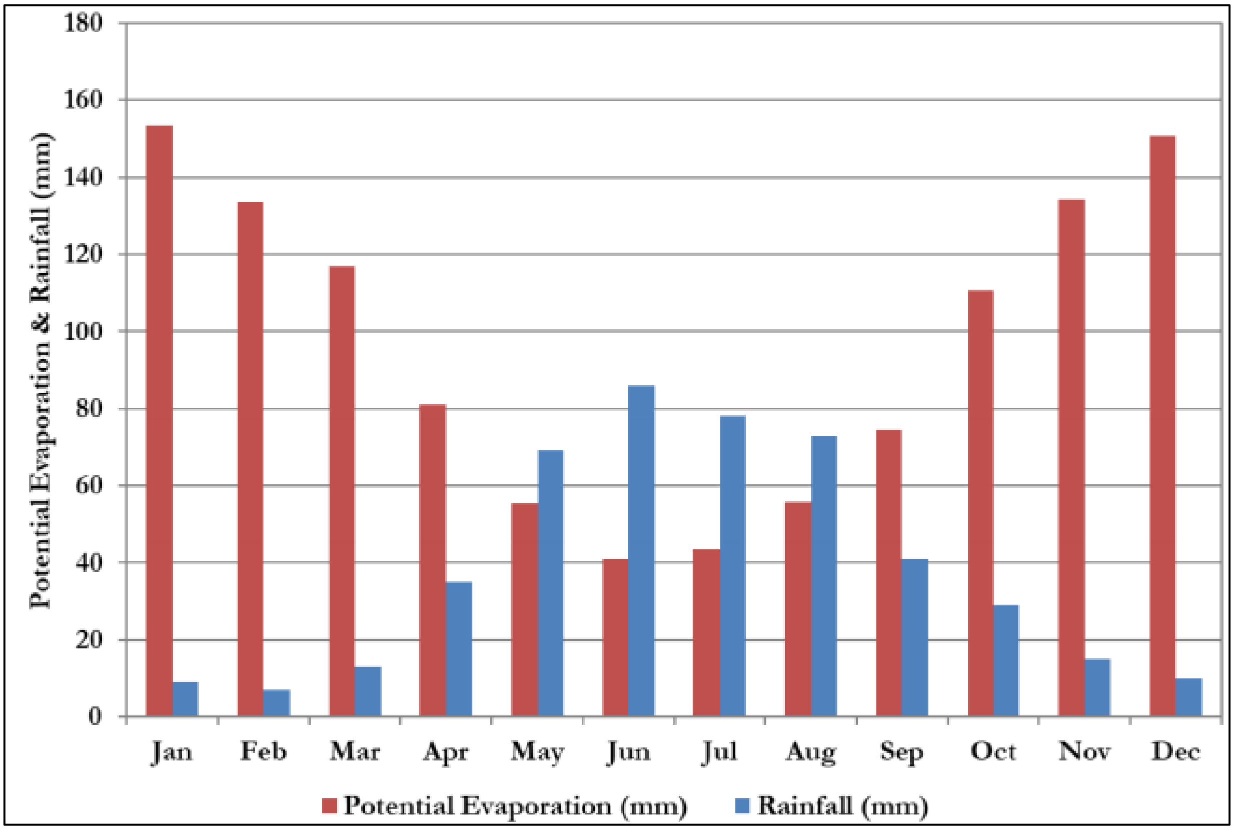


Figure 75: Monthly average air temperature for the Fisantekraal area (Schulze, 2009) (GEOSS, Geohydrological Scoping Report, Sept 2023)

At an elevation of only ±120m amsl and about 25km from the Atlantic coastline the climate is marginally maritime, i.e., mean temperature difference between hottest and coldest month is <10°C.

The average annual rainfall is 532mm, of which only 94mm (<20%) is summer rain between October to March. Four years (2016-2019) of hourly local meteorological data from the CTIA weather station was obtained. The full four-year data was used for the establishment of the local wind field.

The wind characteristics are illustrated with the aid of wind roses and wind speed frequency distribution charts. The wind rose is a diagram that illustrates the frequency of the wind speeds and directions. Wind roses were generated for 16 cardinal wind directions. The wind directions are shown as from where the wind blows; the wind classes are indicated by the coloured bars; the frequencies of occurrence of the wind are indicated by the dashed circles.

Figure 76 shows the wind roses and wind speed frequency distributions over 24 hours, daytime and night-time. Predominant winds are from the southerly direction, for both daytime and night-time. Moderate winds dominate during the daytime and light to moderate winds prevail at night-time, with average wind speeds are 6.28m/s and 4.58m/s for daytime and night-time respectively.

The wind roses and wind speed frequency distributions were also generated for winter and summer and is shown in Figure 77. Northerly and north-westerly winds predominate in winter, while in summer, southerly winds prevail. The wind speeds in summer are higher than that in winter - averaged wind speeds are 6.58m/s and 4.54m/s for summer and winter respectively.

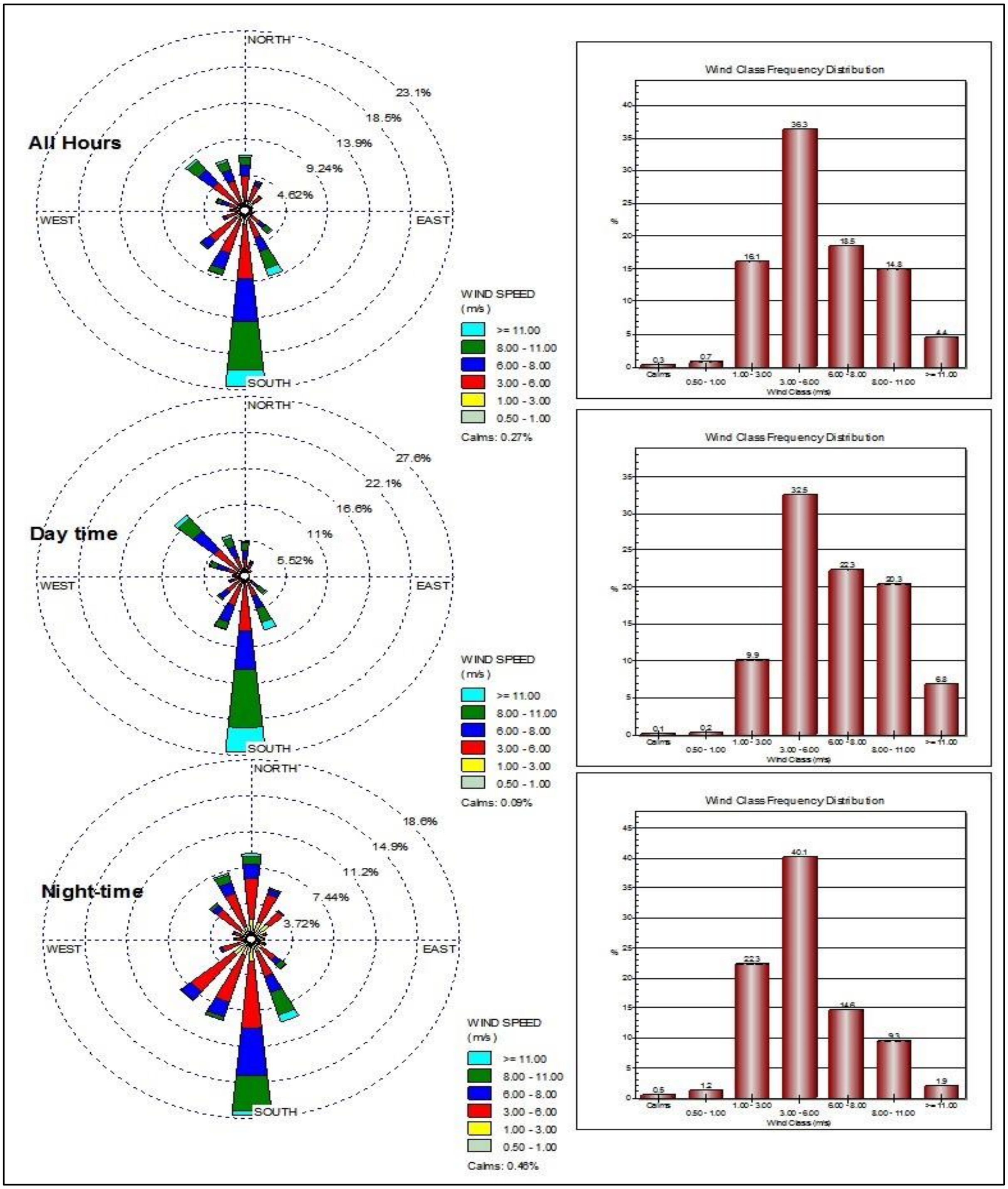


Figure 76: Wind Roses and Wind Speed Frequency Distribution: All-hours, Daytime and Nighttime (DDA, Baseline Air Quality Report, Oct 2023)

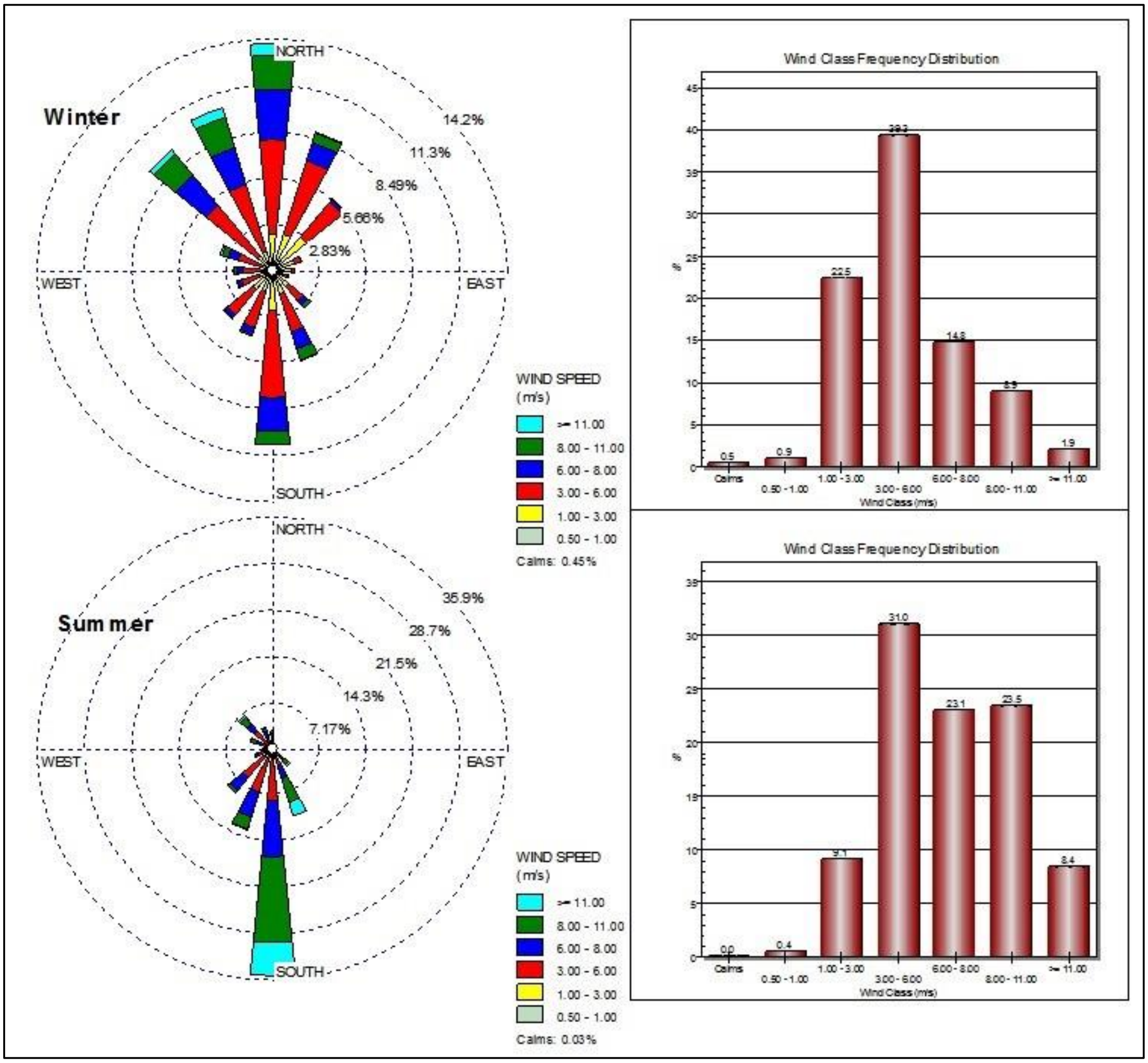


Figure 77: Wind Roses and Wind Speed Frequency Distribution: Winter and Summer (DDA, Baseline Air Quality Report, Oct 2023)

7.3.2 Ambient Air Quality

The Western Cape Province and the CoCT operate several ambient air quality monitoring stations in the region.

The stations closest to the project site include:

- The Wallacedene Station, located in Kraaifontein, approximately 10km South of the CWA;
- The Paarl Station, which is approximately 21km East of the CWA; and
- The Stellenbosch Station, which is approximately 22km to the southeast of the CWA.

The measured ambient concentrations from January 2019 to July 2022 from these stations are presented in Table 32, Table 33 and Table 34 below. Four air pollutants are monitored at the Wallacedene Station, i.e., SO_2, NO_2, O_3 and PM_{10}. The data availabilities range from 4.8% for NO_2 to 34.6% for SO_2. The measured average concentrations were below their respective National Air Quality Standards, except for SO_2, which exceeded the hourly standard at 5 instances. This, however, is within the 88 annual allowed exceedances of the hourly Air Quality Standard.

The Paarl Station is equipped to measure the ambient concentrations of SO_2, NO_2, NO, NOx, and CO. Based on the measured results, the ambient air quality in the Paarl area is good. The measured ambient concentrations were within the National Air Quality Standards, except for NO_2 and CO, which exceeded their guidelines but within the allowable annual number.

The station in Stellenbosch monitors 7 air pollutants, i.e., SO_2, NO_2, NO, NOx, O_3, $PM_{2.5}$ and PM_{10}. The measured average concentrations were below their respective National Air Quality Standards. The hourly and daily averaged levels for SO_2 were elevated at this station, but the number of exceedances were with the allowable annual number.

Table 32: Monitored Ambient Concentrations at Wallacedene Station (DDA, Baseline Air Quality Report, Oct 2023)

Wallacedene Station	**Ambient Concentration [a]**				
	SO_2 (ppb)		**NO_2 (ppb)**	**O_3 (ppb)**	**PM_{10} (µg/m^3)**
	1-Hour	24-Hour	1-Hour	8-Hour	24-Hour
Average	10.0	9.53	9.4	30.5	37.0
No. of Standard Exceedances	5	0	0	36	32
Data availability	35%	34%	5%	14%	27%

National Standard	134	48	106	61	75
Allowed Exceedances/year	88	4	88	11	4
[a.] Data period: 01/01/2019-30/06/2022.					

Table 33: Monitored Ambient Concentrations at Paarl Station (DDA, Baseline Air Quality Report, Oct 2023)

Paarl Station	**Ambient Concentrations [a]**					
	SO_2 (ppb)		**NO_2 (ppb)**	**CO (ppm)**	**NO (ppb)**	**NOx (ppb)**
	1-Hour	24-Hour	1-Hour	1-Hour	1-Hour	1-Hour
Average	9.4	11.0	13.0	4.1	17.7	30.1
No. of Standard Exceedances	0	0	2	81	-	-
Data availability (%)	63%	47%	66%	12%	63%	65%
National Standard	134	48	106	26	- [b]	- [b]
Allowed Exceedances/year	88	4	88	88	- [b]	- [b]
[a.] Data period: 01/01/2019-29/07/2022. [b.] No standards available.						

Table 34: Monitored Ambient Concentrations at Stellenbosch Station (DDA, Baseline Air Quality Report, Oct 2023)

Stellenbosch Station	**Ambient Concentrations [a]**							
	SO_2 (ppb)		**NO_2 (ppb)**	**O_3 (ppb)**	**$PM_{2.5}$ ($\mu g/m^3$)**	**PM_{10} ($\mu g/m^3$)**	**NO (ppb)**	**NOx (ppb)**
	1-Hour	24-Hour	1-Hour	8-Hour	1-Hour	1-Hour	1-Hour	1-Hour
Average	11.7	8.70	12.3	23.4	10.3	15.5	13.8	30.6
No. of Standard Exceedances	107	7	2	18	-	-	-	-
Data availability (%)	63%	43%	71%	63%	66%	62%	55%	51%

National Standard Allowed Exceedances/year	134	48	106	61	-	75	-	-
	88	4	88	11	-	4	-	-
[a.] Data period: 01/01/2019-29/07/2022.								

Existing emissions sources:

The CWA project site is located on the outskirts of the Cape Town Metropolitan. It is surrounded by farmlands. The main land uses in the area include agriculture and poultry farming, i.e., the County Fair Poultry Farm, which is located on the western border of the CWA.

The existing emission sources within the study area may be grouped into three categories:

1) Industrial Sources:

Industrial emissions mainly due to combustion installations contribute to the ambient levels of the primary pollutants, e.g., SO_2, NO_2, PM_{10} and CO. Based on a desktop review of the area, the following plants / factories within 5km of the project area were identified:

- Fisantekraal Wastewater Treatment Works, which is less than 1km away from the project site to the northwest;
- County Fair Primary Processing Plant is located approximately 2km South of the CWA;
- Claytile brick factory is located approximately 4km from the CWA to the southeast; and
- Clay Industry brick factory is located approximately 5km southwest of the CWA.

The existing operations at the CWA and the onsite GA fuel tank have a very small contribution on the air pollution emissions in the area and are considered insignificant.

2) Residential Sources:

Household fuel burning, mainly used for heating and cooking in informal areas, constitutes a source of emission. The common fuels used are coal, wood, and paraffin. The main pollutants emitted are the primary pollutants, such as sulphur dioxide, carbon monoxide nitrogen oxides, particulate matter, as well as hydrocarbons and volatile organic compounds. In addition to the above-mentioned air pollutants, coal burning emits heavy metals.

The main community in the project area is Fisantekraal, which is located approximately 2.5km to the southwest of the CWA. Local dwellings and farmhouses are sparsely located in the study area.

3) Vehicular Traffic

Vehicular traffic is also a source of air pollutant emissions. These emissions include primary pollutants from the vehicle exhausts, such as carbon monoxide, sulphur oxides, nitrogen oxides, as well as hydrocarbons. Fugitive dust emissions may also occur because of vehicle-entrained dust from road surfaces. The major routes in the area include R302, R304, R312 and the local road network.

Currently the existing traffic volumes on the main roads and the local road network are very small and are not expected to have a significant impact on the local air quality.

The sensitive receptors around the CWA include the local dwellings/farmhouses, the Klipheuwel community situated to the North of the airport and the Fisantekraal community towards the southwest. The Fisantekraal high school is located northeast of Fisantekraal, next to the R312 road. There are also various poultry farms around the project site. Some of the identified sensitive receptors are shown in Figure 78 below.

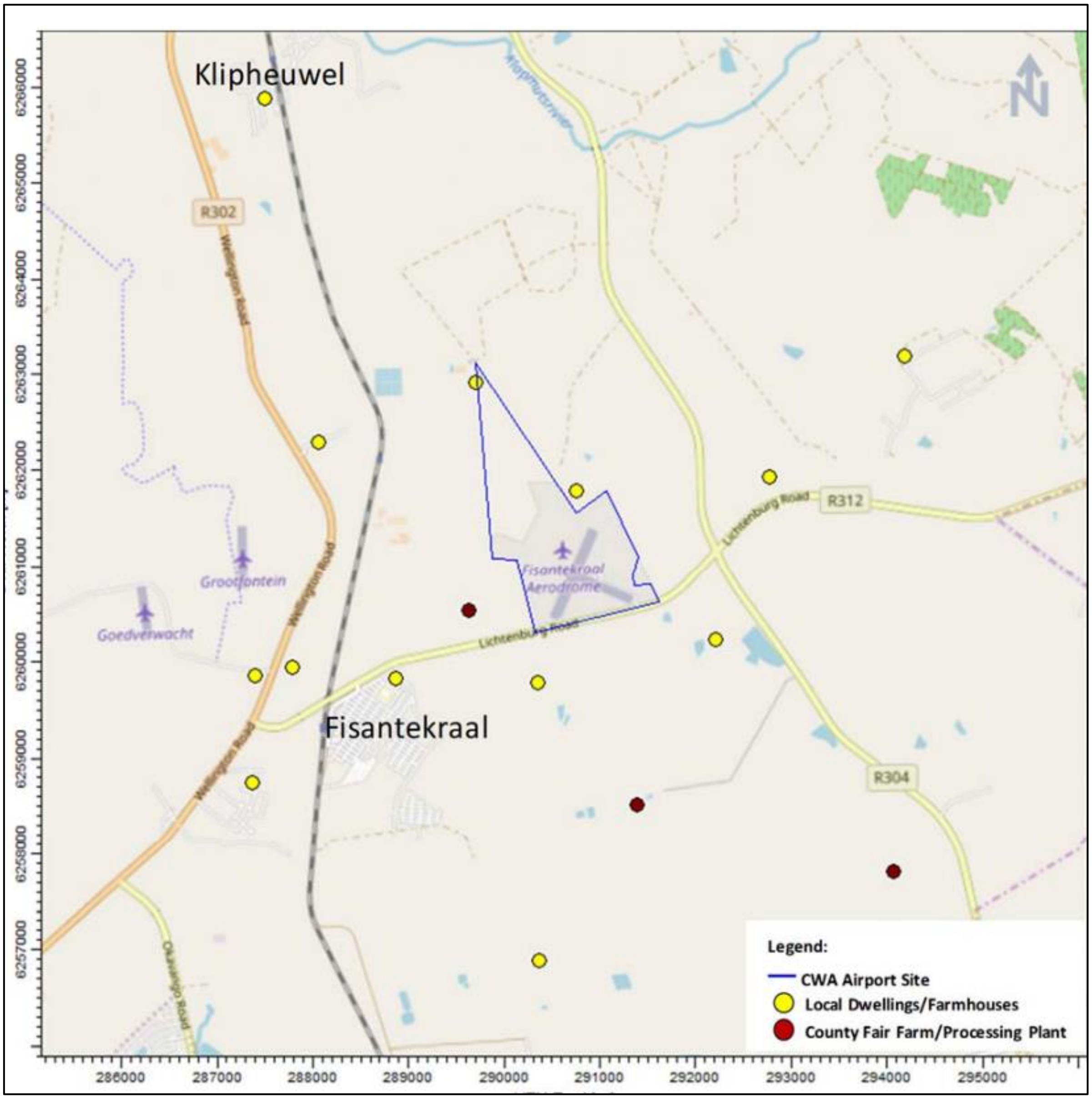


Figure 78: Sensitive Receptors identified around the CWA site (DDA, Baseline Air Quality Report, Oct 2023)

7.3.3 Baseline Noise

The baseline measurements were performed using two 01DB DUO sound level meters (SLM) at five selected measurement points (MP). One SLM was placed within the Fisantekraal community (MP04), and a continuous measurement was carried out from the 14th to the 22nd of April 2022.

The second SLM was used to measure intermittently the noise levels at the remaining four locations, i.e., at MP01, MP02, MP03 and MP05.

The locations of the monitoring points can be seen in Figure 79 and the coordinates of the monitoring points and monitoring dates are presented in Table 35.

MP01 was located within the current CWA site, while MP02 was situated outside the County Fair Poultry Farm, which is about 1km West of MP01. Point MP03 was placed outside the Fisantekraal High School and point MP05 at the Klipheuwel community, approximately 6.3km North of the airport site.

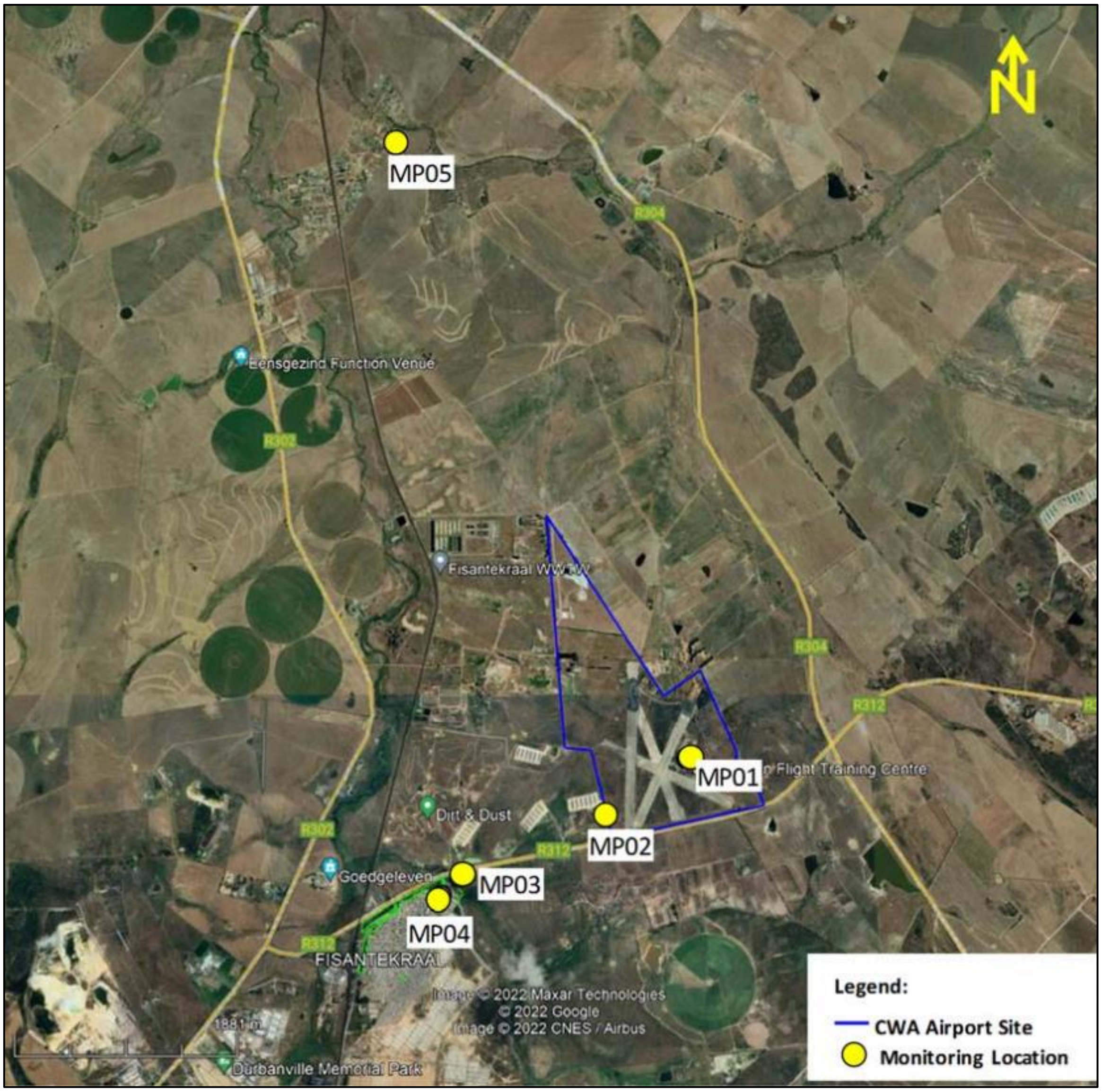


Figure 79: Noise Measurement Locations (DDA, Baseline Noise Report, Oct 2023)

Table 35: Monitoring Locations and Duration (DDA, Baseline Noise Report, Oct 2023)

No.	Monitoring Points	Location	Measurement Dates	GPS Locations
1	MP01	CWA site	17,28,29 April 2022	Latitude: -33.770491°, Longitude: 18.742614°
2	MP02	County Fair Poultry Farm	17,28,29 April 2022	Latitude: -33.774853°, Longitude: 18.735013°
3	MP03	Fisantekraal High School	17,29 April 2022	Latitude: -33.779473°, Longitude: 18.721387°
4	MP04	Fisantekraal community	14 to 22 April 2022	Latitude: -33.780760°, Longitude: 18.719803°
5	MP05	Klipheuwel community	17,28,29 April 2022	Latitude: -33.719528°, Longitude: 18.714040°.

Baseline noise monitoring established the following:

- *"The closest residential noise-sensitive receptors to the Cape Winelands Airport operations are the two residential communities of Fisantekraal, towards the west, and Klipheuwel, towards the north.*
- *The current noise levels at the Fisantekraal residential area exceed the SANS guideline levels for Urban Districts, with the main noise sources being human activities and vehicular traffic on the local road network. The daytime noise level were around 58 dB(A) and the night-time 49 dB(A).*
- *The current noise levels at the Klipheuwel residential area only reached 41 dB(A) and38 dB(A) during the day- and night-time respectively, which are well below the guideline levels for Suburban Districts with little road traffic. The main noise sources there are dogs barking and human activities.*
- *The current noise levels at the Fisantekraal High School, primarily due to the vehicular traffic on the R312, are currently equal to the guideline of 55 dB(A) for Urban Districts.*
- *The County Fair Poultry Farm is experiencing 54 dB(A) and 39 dB(A) during day- and night-time respectively on its boundary."*

7.4 Natural Systems and Biodiversity

Baseline investigations on Terrestrial and Aquatic Ecology identified development constraints which inform the proposed development and the required authorisation processes. These biophysical constraints are illustrated in Figure 80, with explanatory background text and individual mapping in the subsequent sections to follow. The combined biophysical constraints have been amended to include the Colenso fault geohydrological no-go area.

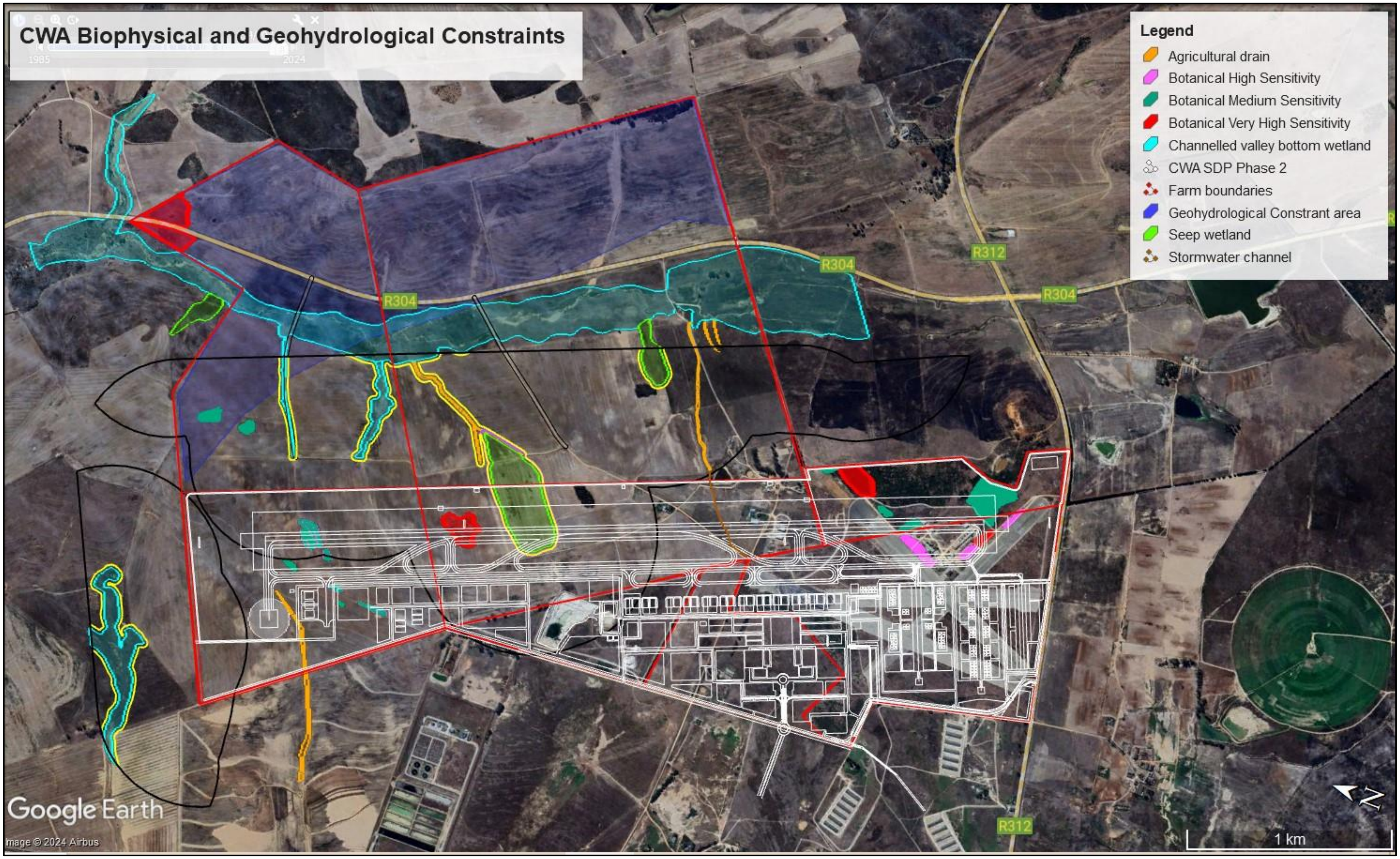


Figure 80: CWA Biophysical and Geohydrological Constraints (PHS Consulting, October 2024) – note: 15m construction and operational wetland buffer indicated by yellow outline; 500m ZoR indicated by black outline; 16m operational phase conservation buffer around seep wetland indicated by purple outline.

7.4.1 Botanical

According to the Botanical Scoping and Baseline reports *"the study area is part of the West Coast Renosterveld bioregion (Mucina & Rutherford 2006), and is part of the Fynbos biome, located within what is now known as the Core Region of the Greater Cape Floristic Region (GCFR; Manning & Goldblatt 2012). The GCFR is one of only six Floristic Regions in the world and is the only one largely confined to a single country. It is also by far the smallest floristic region, occupying only 0.2% of the world's land surface, and supporting about 11 500 plant species, over half of all the plant species in South Africa (on 12% of the land area). At least 70% of all the species in the Cape region do not occur elsewhere, and many have very small home ranges (these are known as narrow endemics). Many of the lowland habitats are under pressure from agriculture, urbanisation, and alien plants, and thus many of the range restricted species are also under severe threat of extinction, as habitat is reduced to extremely small fragments. Data from the nationwide plant Red Listing project indicate that 67% of the threatened plant species in the country occur only in the southwestern Cape, and these total over 1800 species (Raimondo et al 2009). It should thus be clear that the southwestern Cape is a major national and global conservation priority and is quite unlike anywhere else in the country in terms of the number of threatened plant species.*

The West Coast Renosterveld bioregion is characterised by relatively high winter rainfall, strong rainfall gradients, rich soils, low topographic diversity, large urban areas, intense agriculture and high levels of alien invasive vegetation. Due to this combination of factors the loss of natural vegetation in this bioregion has been extremely severe (>90% of original extent lost within the region), and the bioregion has an extremely high number of threatened plant species - and is in fact amongst the highest concentrations of threatened plant species anywhere on the planet (Raimondo et al 2009). The lowland regions of the Cape metropole (stretching from Atlantis in the north, southeast to near Somerset West), generally known as the Cape Flats, and biological diversity in this area is under enormous pressure. The area has been described as a "conservation mega-disaster" (Rebelo et al 2011), in terms of the number of severely threatened plants (some already extinct) and habitats within the area. The study area lies just outside the northeastern fringes of what is normally considered the "Cape Flats".

According to the SA Vegetation Map three different vegetation types would have occurred in the study area before human disturbance (see

Figure 81), although one of these (Cape Flats Sand Fynbos) would barely have been present on site.

Further to this ***"Swartland Shale Renosterveld*** *would have covered most of the site and is regarded as* ***Critically Endangered*** *on a national (DEA 2011; Skowno et al 2019) and regional basis (Holmes et al 2008). Less than 9% of its total original extent remains intact, less than 1% is conserved, and the national conservation target is 26% (Rouget et al 2004). The unit is known to support a very large number of plant Species of Conservation Concern (Raimondo et al 2009), many of them being bulbs (geophytes) or succulents and occurs on fertile shale derived soils in the lowland region from Piketberg to Somerset*

West. This vegetation type needs regular fire for optimal ecological functioning (Helme & Rebelo et al 2016).

***Swartland Silcrete Renosterveld** would have covered about 15% of the greater study area and is also regarded as **Critically Endangered** on a national basis (DEA 2011; Skowno et al 2019) and regional basis (Holmes et al 2008). Less than 10% of its total original extent remains intact, less than 1% is conserved, and the national conservation target is 26% (Rouget et al 2004). The unit is small in total extent (even prior to human influence) and is also known to support many plant Species of Conservation Concern (Raimondo et al 2009), and occurs on ferricrete (koffieklip) and silcrete outcrops in the lowland region from Piketberg to Somerset West. This vegetation type also needs regular fire for optimal ecological functioning (Helme & Rebelo et al 2016).*

*Cape Flats Sand Fynbos was barely present on site originally (*Figure 81*) but is also regarded as Critically Endangered on a national (DEA 2011; Skowno et al 2019) and regional basis (Holmes et al 2008). Less than 19% of its total original extent remains intact, less than 1% is conserved, and the national conservation target is 30% (Mucina & Rutherford 2006). The unit is also known to support a very large number of plant Species of Conservation Concern (Raimondo et al 2009) and occurs on acid sands on the lowlands between Atlantis and False Bay."*

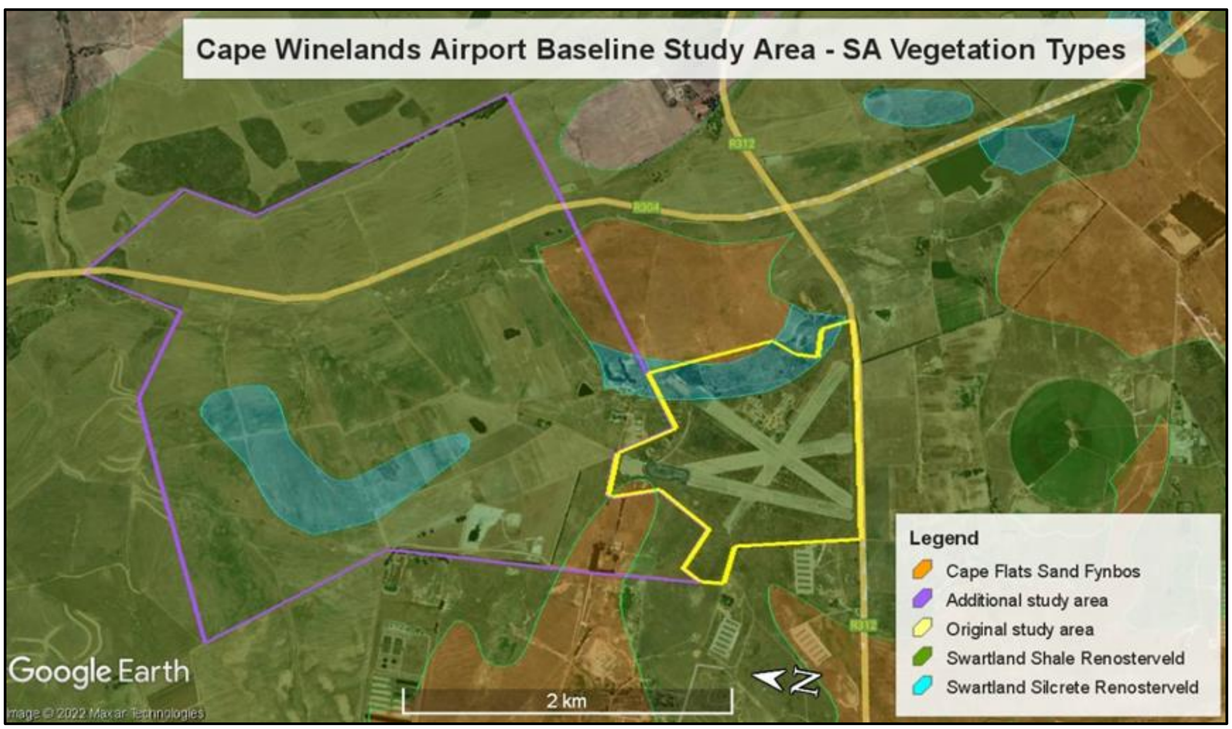


Figure 81: Extract of the SA Vegetation Map (Mucin & Rutherford 2012) showing three original different vegetation types, with Swartland Shale Renosterveld making up the bulk of the site (Nick Helme Botanical Surveys, Botanical Baseline report, August 2020)

There was (and still is, in the form of seedlings) a high to very high density of woody alien invasive vegetation in most of the original study area, comprising mostly *Acacia saligna* (Port Jackson), but also with occasional *Leptospermum laevigatum* (Australian myrtle), *Pinus* sp. (Pines) and *Eucalyptus* sp. (gums). Total woody alien invasive vegetation cover ranged from 50% to 100%, with an average overall of about 75%, prior to clearance of most of the original study area in late 2020 and early 2021. The biocontrol fungus has infected most of the Port Jackson and is reducing seed set and even killing some of the plants, but even if all above ground specimens are removed there is likely to be a massive seedbank that would germinate after fire or similar clearing (which has proven to be the case). Nearly all the dense woody alien invasive cover is a response to previous soil disturbance, which may have included cultivation, followed by ferricrete quarrying in places, and extensive disturbance associated with development and maintenance of the airport. Even the small areas seemingly not disturbed by any of the above have been invaded by aliens, simply because of seed dispersal.

As expected in such a disturbed area the understorey is also often dominated by alien invasive herbs and grasses, such as *Plantago lanceolata* (ribwort plantain), *Echium* spp. (Pattersons curse), *Erodium* spp. (cranesbill), *Lolium* spp. (ryegrass) and *Avena* (oats).

Surprisingly, most of the site has not been burnt in the last 14-25 years (as judged by the vegetation on site, and by historic satellite imagery going back to 2004), and much of the indigenous vegetation can thus be considered due or overdue for a fire, as Renosterveld is a fire driven vegetation type (Helme & Rebelo 2016), requiring fire once every 8-12 years for optimal ecological functioning. In the absence of fire for more than 15 or 20 years evident (above ground) plant species diversity can be expected to drop off quickly but can bounce back quite dramatically after a fire (from soil stored seedbanks).

There is no indigenous plant cover in the large, cultivated areas, comprising about 80% of the total study area.

Indigenous plant diversity is very low in the most disturbed parts of the original study area, and is low overall, compared to pristine Renosterveld, which would have at least 250 species in a site of this size (if pristine). However, the least disturbed areas of Medium, High and Very High sensitivity have increasingly high levels of indigenous plant diversity, with an overall total of about 50 species recorded in the original study area. An additional 30 plant species were recorded in the additional study area in March 2022, taking the site total up to about 80 plant species.

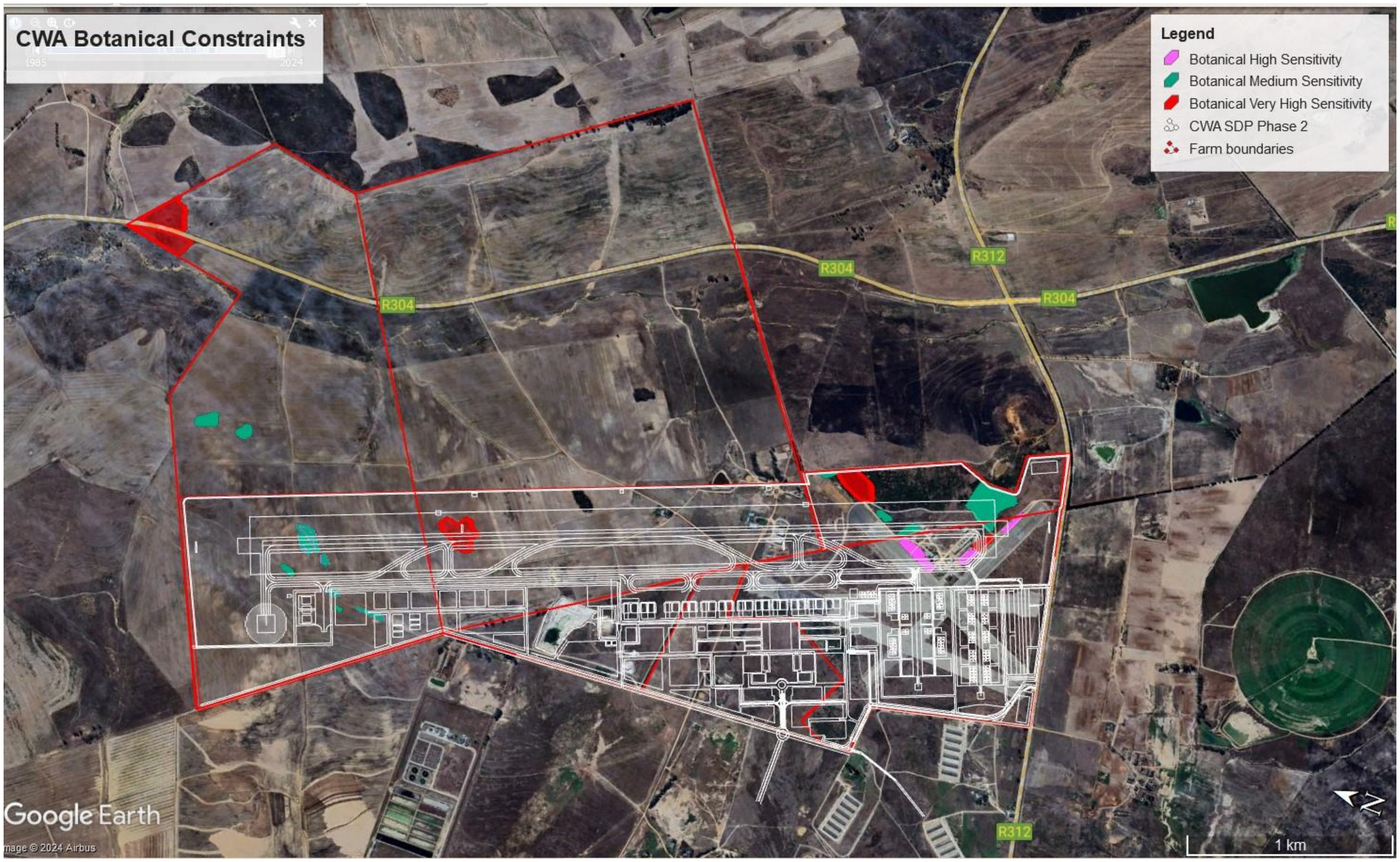


Figure 82: Botanical sensitivity map - All areas not shaded green, red or pink within the study area are of Low botanical sensitivity (PHS Consulting, Oct 2024)

7.4.2 Watercourses and Wetlands

The CWA site is located within Quaternary Catchment G21E in the Berg Water Management Area. The Mosselbank River is located West of the study area, and the Klapmutsrivier North of the site. Both rivers are considered largely modified.

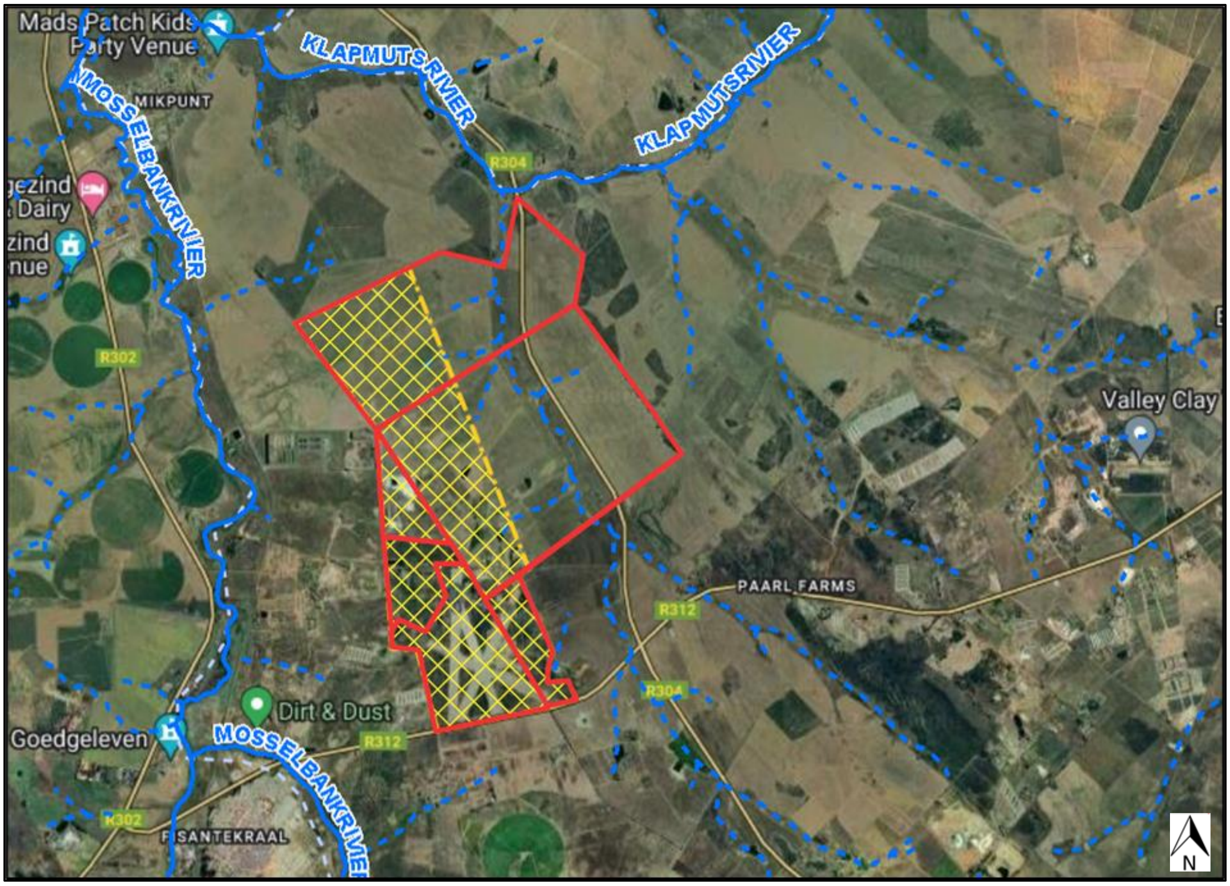


Figure 83: Development area (hatched yellow) and cadastrals (red outline) in relation to identified rivers and drainage lines in the area (PHS Consulting, CapeFarmMapper, Oct 2023)

A freshwater ecological site verification was undertaken for the site in 2022, and identified the following:

- A channelled valley bottom (CVB) wetland (hereafter referred to as CVB wetland 1) associated with the unnamed tributary of the Klapmuts River was identified bisecting the eastern portion of the study area, west of the R304;
- Two CVB wetlands (CVB wetlands 2 and 3) were identified within the northern portion of the study area and are linked to CVB wetland 1. The upper reach/western portions of the two CVB wetlands were also identified to encroach into the focus area;
- Another CVB wetland (CVB wetland 4) was identified North of the study area.

- Two seep wetlands were identified within the central western portion of the study area. One of these seep wetlands is directly linked to CVB wetland 1, while the other is indirectly linked via an agricultural drain;
- Several stormwater channels (some with concrete channels and others with excavated earth channels) and agricultural drains (usually with excavated earth channels) that convey surface water runoff (predominantly from the cultivated areas) into the identified freshwater systems, including into CVB wetland 1. It is possible that some of these agricultural drains may have functioned as natural watercourses in the past, but due to the high degree of land use transformation, agricultural activities and historical mining activities they now only function as drainage channels.
- Two artificial impoundments, one isolated and relic and the other connected to CVB wetland 1 via a stormwater channel and agricultural drain, and a quarry associated with historical open-pit clay mining activities were identified.

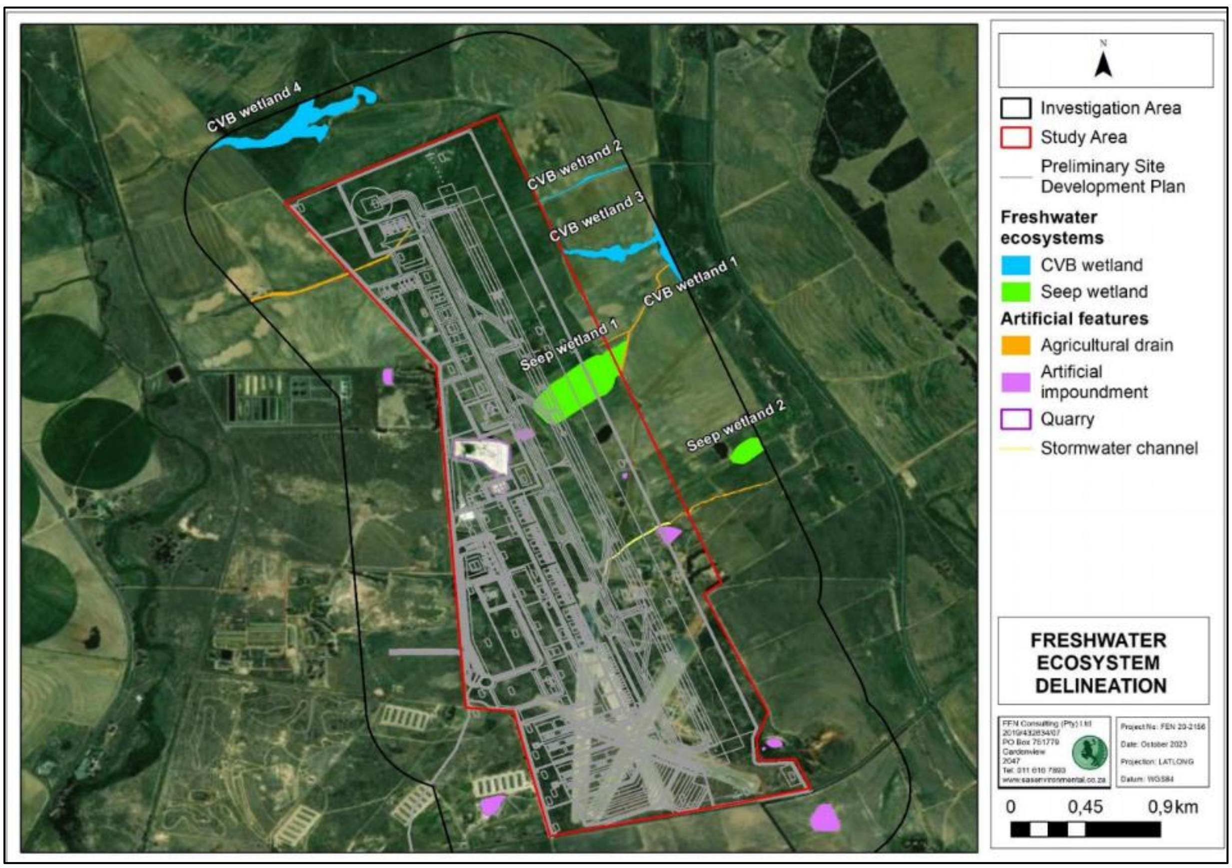


Figure 84: The delineated extent of the watercourses and artificial features associated with the study area and SDP (FEN, Freshwater Ecological Scoping Report, Sept 2023)

7.4.3 Hydropedology

The proposed development area is associated with a seep wetland as well as several additional watercourses which are located in close proximity to the proposed development footprint (Figure 85). The activities associated with the CWA development could potentially intercept subsurface flows and thus affect watercourse recharge. A Hydropedology Assessment was undertaken by the Zimpande Research Collaborative (ZRC) on request by DWS as part of the WULA specialist studies (Zimpande Research Collaborative, Hydropedological Assessment, June 2024). The hydropedology study included a desktop analysis, a field survey, sampling activities, and hydrological modelling. The purpose of this hydropedology study was to investigate the recharge mechanisms of these watercourses to ensure that development planning considers hydropedologically important areas.

The proposed development site was found to be primarily underlain by soils with secondary accumulations of powdery gypsum and layers cemented by silica. These soils are usually found in very dry conditions with high evaporation rates and are often associated with calcareous soils. In these soils, water does not drain deeply but easily infiltrates the sandy surface layers. As a result, water moves upward due to evapotranspiration, leading to a very slow recharge rate. Several dominant soil types were found to coincide with the proposed development site as depicted in Figure 85. The dominant soil types identified within the proposed development site were grouped according to their hydropedological responses as summarised below and illustrated in Figure 86:

Stagnating/Recharge (Slow) Soils: These soils exhibit rapid drainage and percolation of water in the topsoil. However, the presence of cemented layers leads to stagnation and shallow water tables. The primary flow path is slow vertical movement, with excess water rarely reaching the bottom of the soil profile, making upward flux for transpiration dominant.

Responsive (Shallow) Soils: These soils have limited depth and small storage capacity. They respond quickly to rain, generating overland flow when rainfall exceeds their storage capacity.

Interflow (Soil/Bedrock) Soils: These soils have hydromorphic features which indicate occasional water accumulation at the soil/bedrock interface with slow lateral water movement. Drainage could be limited by a shallow layer of impermeable rock.

Responsive saturated (Artificial impoundments): The identified saturated features were manmade water features.

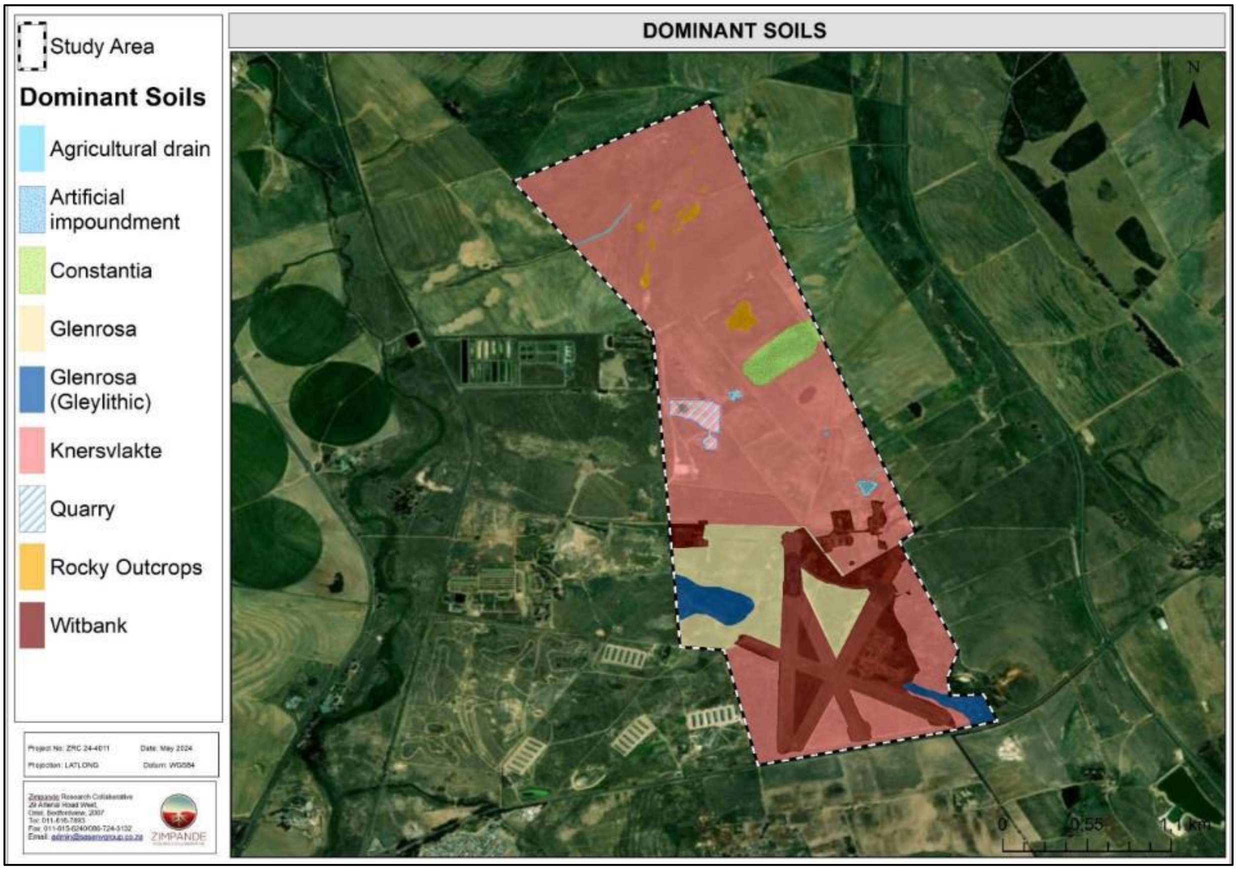


Figure 85: Map depicting spatial distribution of soils within the study area (Zimpande Research Collaborative, Hydropedological Assessment, June 2024).

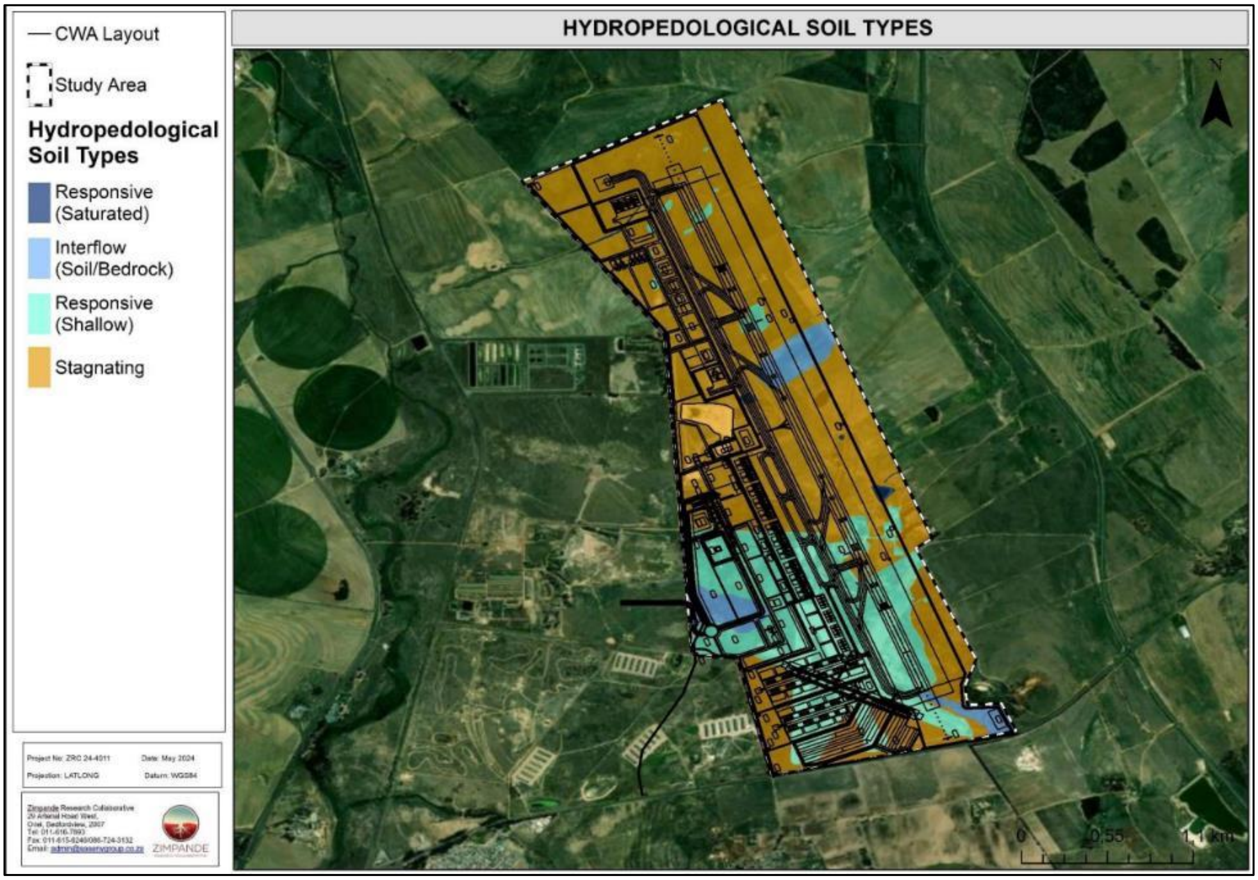


Figure 86: Map depicting hydrological soil types associated with the study area overlain by the proposed layout outline. (Zimpande Research Collaborative, Hydropedological Assessment, June 2024).

7.4.4 Faunal and Avifaunal

Large portions of the proposed CWA development area fall within Endangered Swartland Granite Renosterveld, while small western and eastern portions fall within the Critically Endangered Cape Flats Sand Fynbos and a small southern portion falls within the Critically Endangered Swartland Shale Renosterveld (refer to Figure 87).

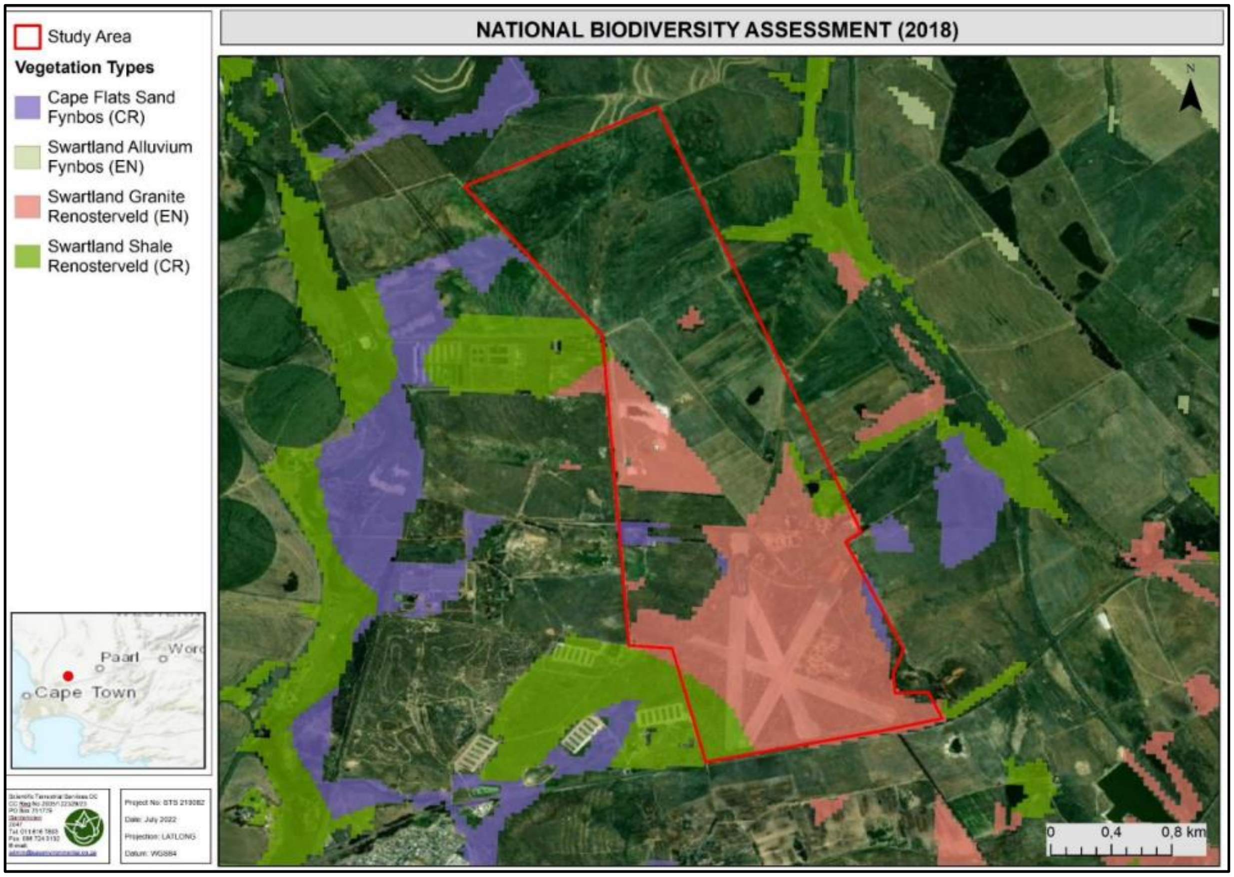


Figure 87: The study area located within critically endangered Cape Flats Sand Fynbos, Swartland Shale Renosterveld and the endangered Swartland Granite Renosterveld, according to the National Biodiversity Assessment (NBA, 2018) (STS, Faunal and Avifaunal Scoping, July 2023)

According to the Red List of Ecosystems dataset (2022), the southern and western portions of the study area is located within a threatened ecosystem - the Swartland Granite Renosterveld with an endangered threat status. Small, isolated patches of the study area is located within threatened ecosystems: Cape Flats Sand Fynbos (CFSF) and Swartland Shale Renosterveld (SSR), both of which are considered critically endangered (refer Figure 88).

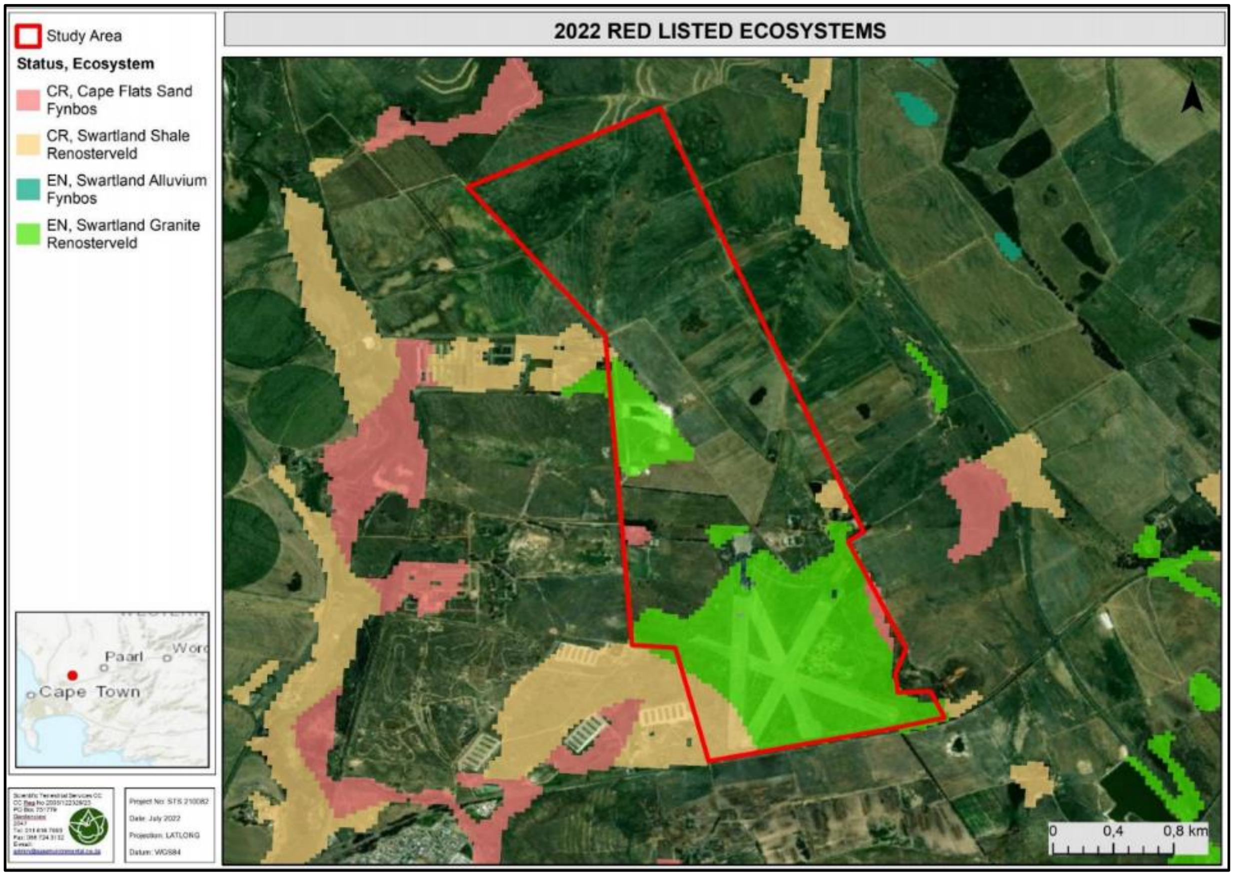


Figure 88: The remaining extent of the threatened ecosystems associated with the study area, based on the National Threatened Ecosystems (2022) (STS, Faunal and Avifaunal Scoping report, Part A, Oct 2023)

Three broad floral habitat units were identified for the study area:

1) Renosterveld Habitat: Alien Invasive Plant (AIP) infestation and edge effects have reduced the habitat potential for many fauna types, but remaining fragments are still offer habitat of varied structure and floral diversity suitable for many fauna due to its floral richness.
2) Freshwater Habitat: Consists of modified wetlands, artificial impoundments, a canalised watercourse and other ephemeral drainage features, plays an important role in supporting water dependant species, provides more opportunities in terms of foraging for many fauna and is an important corridor within the largely modified landscape.
3) Modified Habitat: Includes areas where vegetation is significantly degraded or entirely absent because of agriculture, households, and mining. Some pockets of severely invaded portions (by Port Jackson) provide valuable shelter for fauna, and some areas particularly abundant in avifauna. Forage potential for fauna and avifauna is anticipated to be intermittent within the habitat because of monoculture cultivation and the homogeneity of the remaining unit.

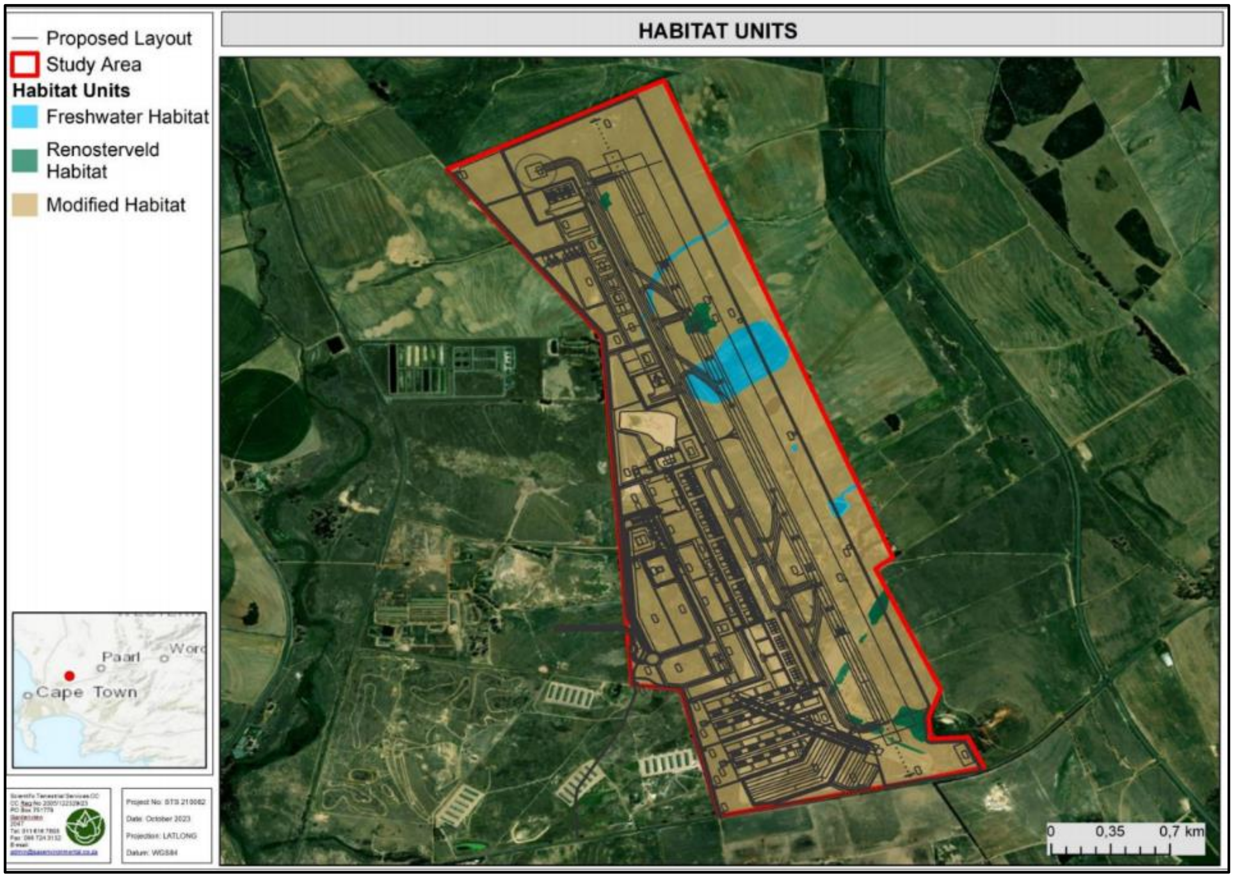


Figure 89: Habitat units encountered within the study and focus area (STS, Faunal and Avifaunal Scoping report, Oct 2023)

According to the South African Protected Areas Database (SAPAD, 2021), the South African Conservation Areas Database (SACAD, 2021)5 and the National Protected Areas Expansion Strategy (NPAES, 2009), the following protected areas are located within 10km of the study area (refer Figure 90):

- Joostenbergskloof Conservation area,
- Joostenberg Hill Conservation area,
- Botterblom Nature Reserve,
- Durbanville Nature Reserve,
- Uitkamp Wetland Nature Reserve,
- Joostenberg Private Nature Reserve (Informal),
- JN Briers Louw Nature Reserve (formal), and
- Cape Winelands Biosphere Reserve.

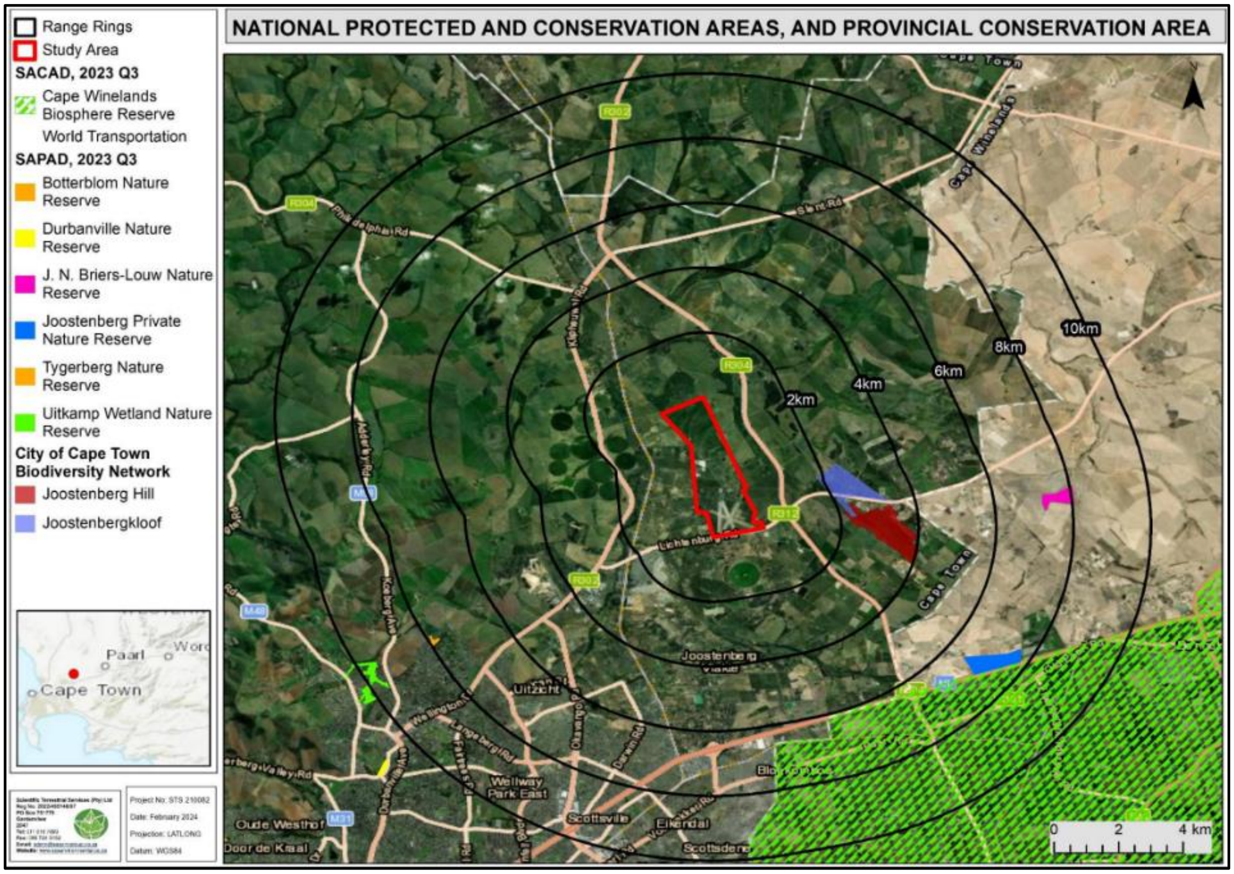


Figure 90: Protected and conservation areas located within a 10 km radius of the study area, (SAPAD, 2021; SACAD, 2021 and NPAES, 2009) (STS, Faunal and Avifaunal Scoping report, Part A, March 2024)

In terms of species diversity and habitat integrity mostly commonly occurring species were observed for the mammal, herpetofauna, invertebrate and avian assessment, and only SCC, *Grus paradiseus* (Blue crane) was observed.

The study area is largely cultivated land with reduced primary productivity and floral richness, and most secretive and rare fauna have emigrated to areas with more suitable natural vegetation. This results in a largely intermediate to moderately low diversity of mammals, invertebrates, herpetofauna and avifauna.

The remaining portions of Renosterveld habitat provided habitat for breeding and foraging for most common fauna and is the most valuable from a faunal perspective and considered of intermediate sensitivity.

The Freshwater habitat provides valuable habitat to water dependant species, and at the same time maintains ecological functions and faunal movement corridors, so is considered of intermediate sensitivity.

The Modified Habitat is considered of moderately low sensitivity, however, as it makes up largest part of the site it is anticipated to be utilized for foraging by most faunal species.

According to SAS the artificial impoundments and agricultural drains mapped by FEN (refer Figure 84) "*are not considered to be natural features, though the artificial impoundments will likely provide seasonal breeding localities for amphibians as well as a source of drinking water for other faunal species in the study area. The agricultural drains may be used by smaller species as movement corridors, though they are not considered of increased importance or sensitivity from a faunal perspective*."

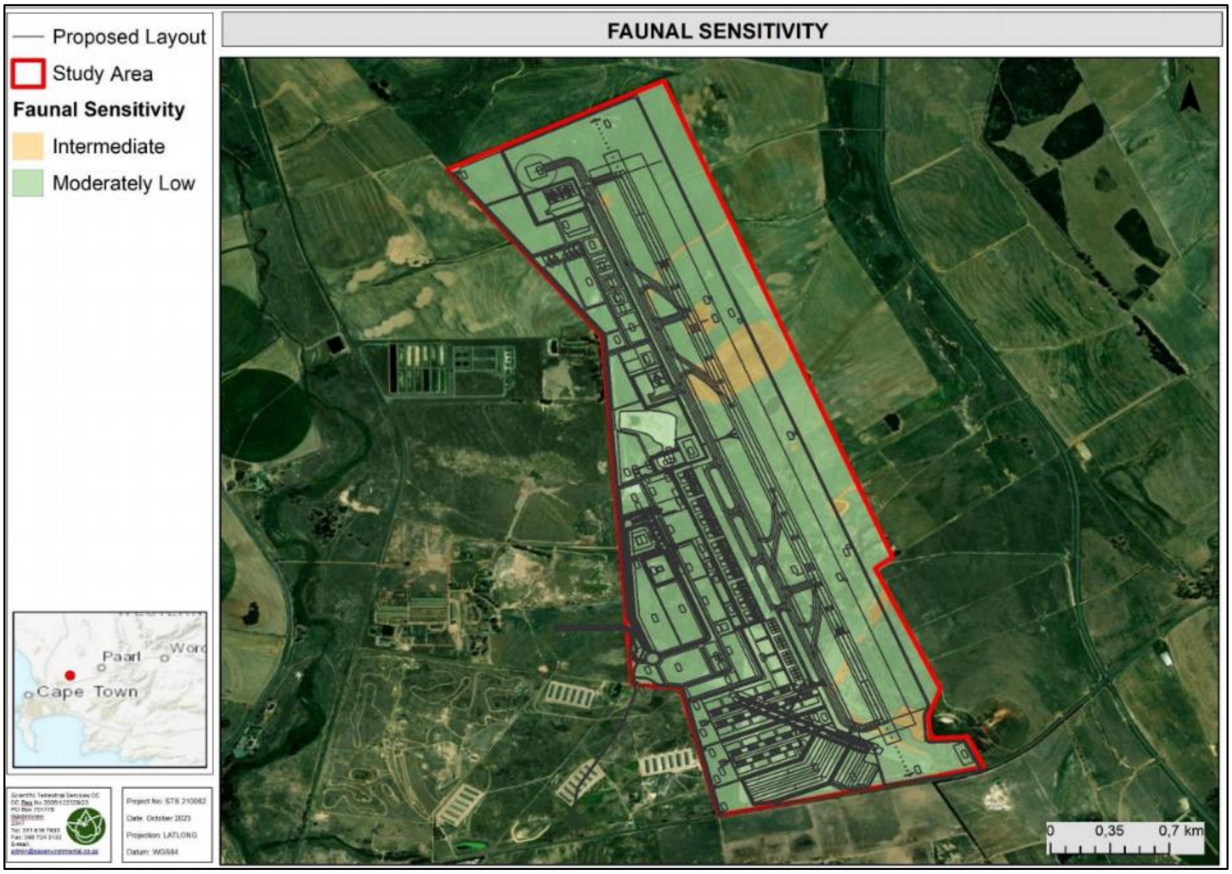


Figure 91: Faunal habitat sensitivity map for the study area (STS, Faunal and Avifaunal Scoping report, Part B, Oct 2023)

Conservation significance of the study area:

The results of the online National Web-Based Environmental Screening Tool (2023) indicate the Terrestrial Biodiversity Sensitivity Theme for the study to be of very high sensitivity due to '*the presence of CBA 1's, CBA 2's, critically endangered ecosystems, and an endangered ecosystem*'.

The National Web-Based Environmental Screening Tool (2023) also indicates that the Animal Species Theme for the southern parts of the study area was of high sensitivity whereas the remainder of the study area was of medium sensitivity, and several SCC potentially utilise the study area on a permanent or temporary basis.

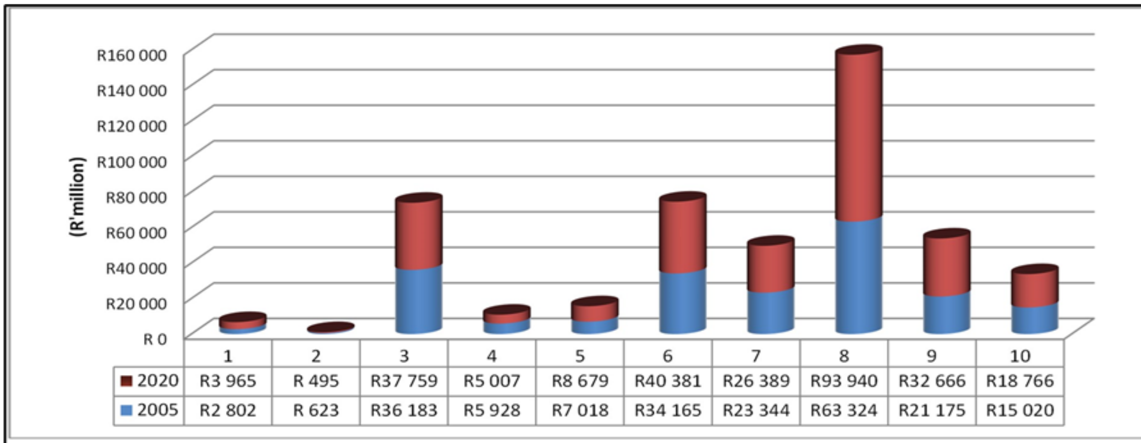
7.5 Socio-Economics

The CWA is in a rural area within the City of Cape Town Metro, which is the capitol city of the Western Cape Province, and acts as legislative capitol for South Africa. The CoCT consists of 116 wards, of which CWA is located within the Northern District's Ward 105.

Socio-Economic Overview of the City of Cape Town Municipality

According to the Socio-economic Scoping Report "*the CoCT economy contributed approximately 72% to the economy of the Western Cape Province in 2020. In terms of absolute numbers, the CoCT economy generated R268 048 million in GVA at constant prices relative to R372 308 million recorded for the Western Cape Province. The GVA contribution of the CoCT economy to the Western Cape Province decreased from 72,98% in 2005 to 72% in 2020. The CoCT economy grew off a solid base by 1,65% per annum from 2005 to 2020, or 27,89% over the 15 years despite the impact of the COVID-19 pandemic."*

Figure 92 indicates the sector contributions to the GVA of the CoCT economy for 2005 and 2020. Further to the above *"the largest sector of the CoCT economy was Finance, Insurance, Real Estate and Business Services sector, followed by Wholesale and Retail and Manufacturing. Combined, these three sectors contributed almost 64,20% of the total GVA generated by the CoCT economy in 2020, an increase of 0,65% from 2005. The Finance, Insurance, Real Estate and Business Service sector has remained the largest contributor to the CoCT GVA over the 15 years of the analysis. The Manufacturing sector's contribution decreased from 17,26% in 2005 to 14,09% in 2020, whereas Finance, Insurance, Real Estate and Business Services increased their contribution to GVA from 30,21% in 2005 to 35,05% in 2020. "*



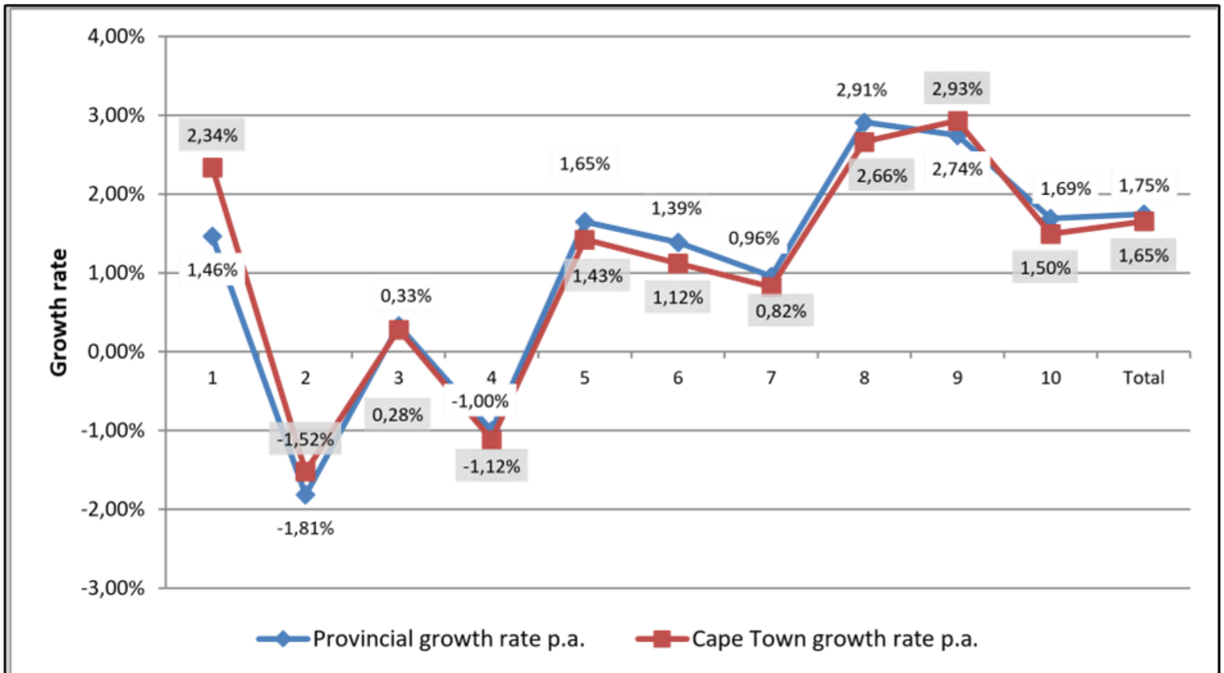
Legend:

1. Agriculture, hunting, forestry and fishing	6. Wholesale and retail
2 Mining and quarrying	7 Transport, storage and communication
3 Manufacturing	8 Finance, insurance, real estate and business services
4 Electricity, gas and water supply	9 Community, social and personal services
5 Construction	10 Government Services

Source: Adapted from data provided by Quantec Research, 2021

Figure 92: GVA contributions per sector for the CoCT economy in 2005 and 2020 (Multi-Purpose Business Solutions, Socio-Economic Scoping report, Sept 2023)

To understand whether sectors are contracting or growing, it is useful to consider the overall and annual growth rates and to compare those to the Western Cape Province within which the CoCT economy functions. Figure 93 indicates the annual compounded growth rates per economic sector for the CoCT and Western Cape Province from 2005 to 2020.



Legend:

1. Agriculture, hunting, forestry and fishing	6. Wholesale and retail
2 Mining and quarrying	7 Transport, storage and communication
3 Manufacturing	8 Finance, insurance, real estate and business services
4 Electricity, gas and water supply	9 Community, social and personal services
5 Construction	10 Government Services

Source: Adapted from data provided by Quantec Research, 2021 and own calculations

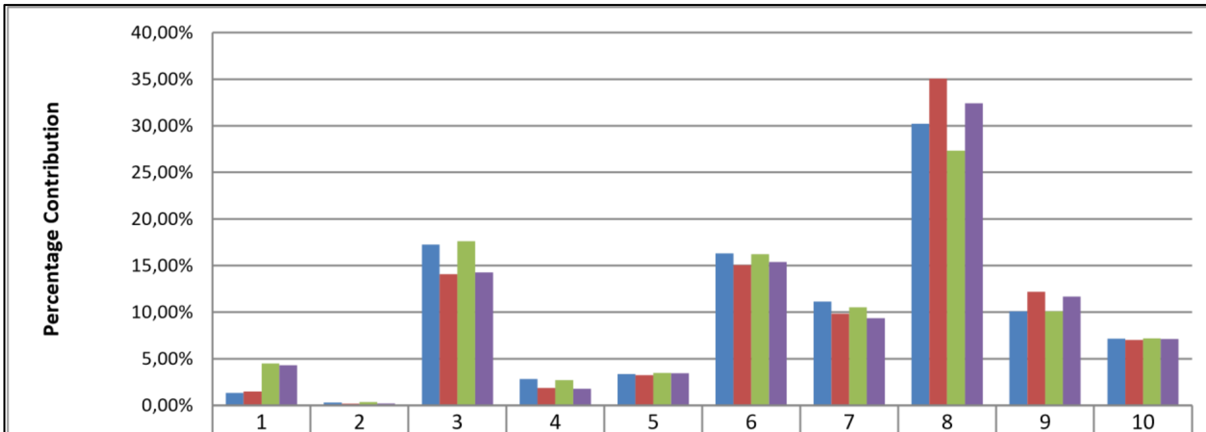
Figure 93: Annual nominal growth rates per economic sector for Cape Town and the Western Cape Province from 2005 to 2020 (Multi-Purpose Business Solutions, Socio-Economic Scoping report, Sept 2023)

The Western Cape Province and CoCT economies grew in nominal terms by 1,75% and 1,65% per annum respectively, from 2005 to 2020. The Agriculture, Hunting, Forestry and Fishing, and Community, Social and Personal Services sectors in the CoCT economy achieved higher growth rates than the province over the period 2005 to 2020.

The Agriculture, Hunting, Forestry and Fishing, Finance, Insurance, Real Estate and Business Services, and General Government sectors demonstrated the highest annual growth rates for the CoCT over the period 2005 to 2020. Although the Manufacturing sector grew only by 0,28% per annum between 2005 and 2020, its contribution to GVA declined by 18,41% from 2005 to 2020.

Sector analysis of GVA contributions

According to the Socio-Economic Scoping report Figure 94 indicates the contribution of each economic sector to the GVA of the CoCT and the Western Cape Province economy for 2005 and 2020. *An assessment of the larger sectors suggests that the contribution of several of the sectors (such as Wholesale and Retail and Transport, Storage and Communication) declined slightly in the CoCT economy from 2005 to 2020 in favour of Finance, Insurance, Real Estate and Business Services, which increased its contribution to GVA of the CoCT economy by 16.02% over the period, and Community, Social and Personal Services, which increased its contribution by 20.69%. The Manufacturing sector showed a decline in its contribution to GVA, i.e., 17,26% (2005) compared to 14,09% (2020). The contribution of the sectors to GVA in the CoCT and the Western Cape Province remained more or less in the same proportions whether the sector contribution increased or declined. This is to be expected since the CoCT contributes 72% to the GVA of the Western Cape Province.*



	1	2	3	4	5	6	7	8	9	10
Local 2005	1,34%	0,30%	17,26%	2,83%	3,35%	16,30%	11,14%	30,21%	10,10%	7,17%
Local 2020	1,48%	0,18%	14,09%	1,87%	3,24%	15,06%	9,84%	35,05%	12,19%	7,00%
Province 2005	4,49%	0,37%	17,61%	2,70%	3,49%	16,23%	10,51%	27,32%	10,09%	7,20%
Province 2020	4,31%	0,21%	14,27%	1,79%	3,44%	15,40%	9,35%	32,41%	11,68%	7,14%

Legend:

1. Agriculture, hunting, forestry and fishing	6. Wholesale and retail
2 Mining and quarrying	7 Transport, storage and communication
3 Manufacturing	8 Finance, insurance, real estate and business services
4 Electricity, gas and water supply	9 Community, social and personal services
5 Construction	10 Government Services

Source: Adapted from data provided by Quantec Research, 2021 and own calculations

Figure 94: Sector contributions to GVA for the CMA and Western Cape Provincial economies in 2005 and 2020 (Multi-Purpose Business Solutions, Socio-Economic Scoping report, Sept 2023)

A synopsis of the data presented in Figure 94 suggests that three sectors increased their contribution to GVA of the CoCT economy, while seven sectors indicated a declining contribution. The trend emerging across the province is similar with only two sectors increasing their GVA contribution to the provincial economy, i.e., Finance, insurance, real estate and business services and Community, social and personal services. The concern with this trend is the reduced employment levels within the more labour-intensive *sectors of the economy. A greater focus on sectors with a service orientation has emerged over the 15 years of the analysis, which are invariably low employment creators compared to construction and manufacturing.*

The assessment of GVA sector contributions to the CoCT together with the annual and period growth rates for 2005 and 2020 are indicated in

Table 36. *Among the 10 classified sectors, eight sectors indicated an annual increase in economic activity with the minor economic sectors of Mining and Quarrying and Electricity, Gas and Water Supply indicating a year-on-year decline from 2005 to 2020. The declining trend in the contribution of the Manufacturing sector to GVA (14,09% in 2020 versus 17,26% in 2005) is concerning due to the labour-intensive nature of the industries that generally form part of this sector. The analysis also demonstrates that the Manufacturing sector is declining in favour of increases in Finance, Insurance, Real Estate and Business Services and Community, Social and Personal Services, which alludes to a greater focus on service orientation.*

Table 36: Assessment of sector contributions to GVA in 2005 and 2020 and annual growth rates for the CMA economy (Multi-Purpose Business Solutions, Socio-Economic Scoping report, Nov 2023)

Economic sector (R'million)	Gross Value Added				Growth for Period	Annual Growth	Direction of growth
	2005	% of total	**2020**	% of total			
Agriculture, hunting, forestry and fishing	2 802	1,34%	3 965	1,48%	41,5%	2,34%	↑
Mining and Quarrying	623	0,30%	495	0,18%	-20,49%	-1,52%	↓
Manufacturing	36 183	17,26%	37 759	14,09%	4,36%	0,28%	↑
Electricity, gas and water supply	5 928	2,83%	5 007	1,87%	-15,53%	-1,12%	↓
Construction	7 018	3,35%	8 679	3,24%	23,66%	1,43%	↑
Wholesale and retail	34 165	16,30%	40 381	15,06%	18,19%	1,12%	↑
Transport, storage and communication	23 344	11,14%	26 389	9,84%	13,05%	0,82%	↑
Finance, insurance, real estate and business services	63 324	30,21%	93 940	35,05%	48,35%	2,66%	↑
General government	21 175	10,10%	32 666	12,19%	54,27%	2,93%	↑
Community, social and personal services	15 020	7,17%	18 766	7,00%	24,94%	1,50%	↑

Total	209 582	100%	268 048	100%	27,9%	1,65%	

Source: Adapted from data provided by Quantec Research, 2021 and own calculations

*The **primary sector** of the CoCT economy includes Agriculture, Hunting, Forestry and Fishing activity and Mining and Quarrying. The primary sector contributed 1,66% to the GVA of the CoCT economy in 2020, which is slightly up from 1,64% in 2005. Agriculture is the largest contributor to the GVA of the Primary sector with a sector contribution of 81,81% in 2005, increasing to 88,89% in 2020.*

*The **secondary sector** of the CoCT economy includes Manufacturing, Construction and Electricity, Gas and Water Supply. The secondary sector contributed 23,44% to the GVA of the CoCT economy in 2005, while the contribution to GVA decreased to 19,99% in 2020. The contribution of the Manufacturing sector to the secondary sector GVA decreased from 73,64% in 2005 to 73,39% in 2020.*

*The **tertiary sector** of the CoCT economy includes Trade, Repairs and Hospitality, Financial Institutions, Real Estate and Business Services; Community, Social and Personal Services; and Government Services. The tertiary sector contributed 74,92% to the GVA of the CoCT economy in 2005; this increased to 79,14% in 2020.*

Government Services are included as part of the tertiary sector for the analysis. The analysis suggests that the contribution of Government Services to the GVA of the tertiary sector increased from 13,48% in 2005 to 15,39% in 2020.

General employment trends:

A comparison of total employment indicates that the CoCT contributed 62,58% to total employment of the Western Cape Province in 2020, while overall employment increased by 33,01% between 2001 to 2020 in the CoCT economy.

The primary, secondary and tertiary sectors contributed 2,73%, 16,81% and 80,46% to total employment in the CoCT economy respectively, in 2020, while the Western Cape Province saw employment contributions of 10,08%, 15,54% and 74,39% from the primary, secondary and tertiary sectors, respectively.

The strong growth in the tertiary sector was offset by negative and low growth in employment in the primary and secondary sectors of the CoCT economy respectively. Strong employment growth was recorded in the tertiary sector with an increase of 44,93% over the period 2001 to 2020, or an annual compounded growth of 1,97% per annum. The Western Cape Province experienced similar trends, with a decline of 27,55% recorded for the primary sector and increases of 5,56% and 52,90% for the secondary and tertiary sectors, respectively.

In terms of employment growth by sector in the CoCT and specified periods pre-2008, 2008 - 2011 and post-2011, the tertiary sector shed the fewest number of jobs with a decline of 0,39% from 2008 to 2011

(Figure 95*). The secondary sector and primary sector of the economy shed jobs with declines of 16,21% and 9,01%, respectively, over the period 2008 to 2011. Post-2011, all three sectors clawed back all or some of the lost employment in the previous period, achieving an increase in employment of 13,89%, and 8,95% over the period 2012 to 2020 for the primary and tertiary sector, respectively. However, the secondary sector had not recovered all the employment lost during the recessionary period by 2020, which is a concern as stated previously, with specific reference to the labour-intensive industries.*

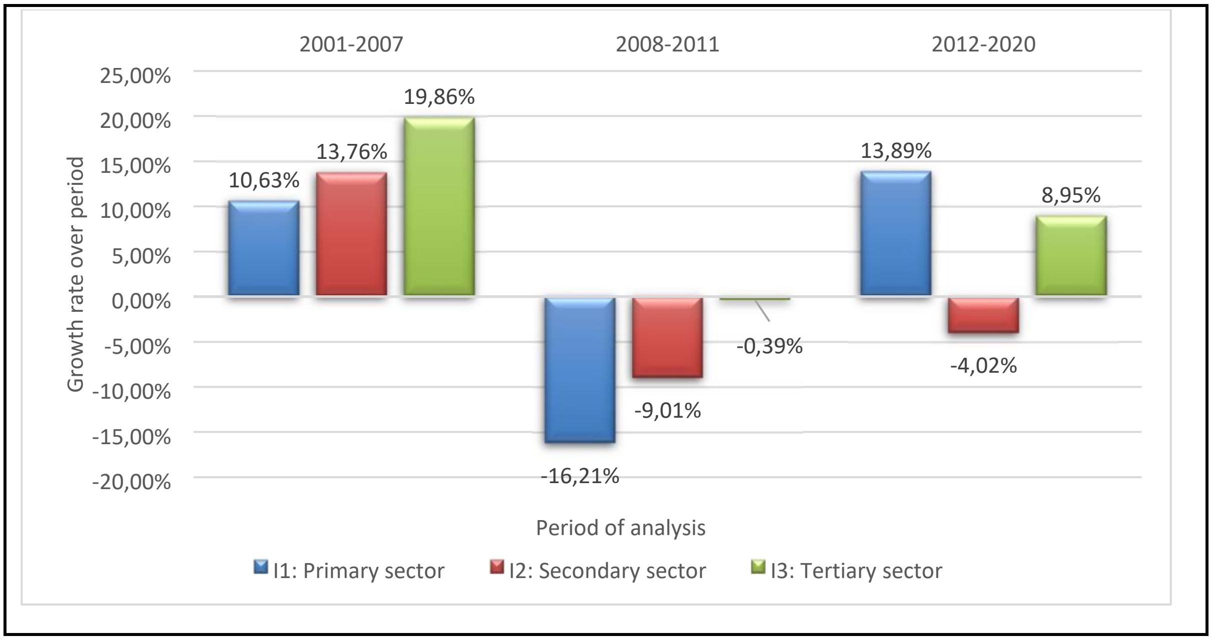


Figure 95: Employment growth in the CoCT for three specified periods (pre-recession, recession, and post-recession) from 2001 to 2020 (Multi-Purpose Business Solutions, Socio-Economic Scoping report, Sept 2023)

(Source: Quantec, 2021 and MPBS calculations)

The CWA development will specifically benefit the secondary and tertiary sectors of the Western Cape economy. However, all economic activities associated with the development during construction and operations impact the primary, secondary and tertiary sectors of the economy with a requirement for raw materials (e.g., sand mining), construction activity (e.g., bricks, cement, etc) and business services (e.g., professional services).

7.6 Heritage (Cultural, Archaeological and Visual)

Cultural:

According to the Heritage Baseline study the South African Air Force established the Fisantekraal airfield in 1943 already, and it was used by Lockheed Ventura bombers for anti-shipping and anti-submarine search and attack. This use continued until the war ended in 1945. After that period, it operated as an airfield under state control with facilities leased for private pilot training, until it was transferred into private ownership in 1993.

According to the Heritage Scoping report "*in 2020 Dr Stephen Townsend prepared a Heritage Statement and a NID submission made to HWC. In this it was noted that there are only four old structures at the northern end of the site which were built during WWII as part of the airport's defences and which have some interest as such (three are disused and derelict, one of which is no longer roofed; and the one building still in use was converted into two workers' dwellings some years ago). It appears that these four buildings and the landing-strips are all that remains from the initial WWII construction; these four and just one other, a large hangar at the centre of the site (removed before 1968), appear on the 1953 aerial photograph.*

He concluded that the airfield is an interesting relic of war-time need and the urgency of providing for defence of the coastline. He stated that the war-time airfield is incomplete and the site includes only four structures and the landing-strips of that defensive infrastructure. Further, the four structures are derelict and unused; and, more importantly have no special significance or meaning; and, this historical interest apart, the landing-strips have functional significance only. His report and NID submission were endorsed by HWC who agreed that no further heritage studies were required."

The baseline heritage assessment for the site identified the two homesteads on RE of Farm 474 and on RE of Farm 724 as already in existence in 1953 (refer Figure 96). Application will be made for the demolition of these buildings considering that it falls within the footprint of the proposed development.

Figure 96: 1953 aerial photograph showing the two farmsteads to the north of the airfield (Aikman Associates, Heritage Baseline Study, Oct 2023)

Archaeological:

According to the Archaeological Scoping report, "*surveys done within a 10km radius of the Cape Winelands Airport have revealed the following: Early Stone Age (ESA), Middle Stone Age (MSA) and Later Stone Age (LSA) resources have all been recorded in the Klipheuwel, Durbanville and Joostenburg area (Halkett & Hine; Kaplan 2019, 2018, 2012, 2006a, b, 2005, 2003a, b, 2004, 2002, 2001, 2000, 1999,). The Cultural Landscape is dominated by implements assigned to the ESA (handaxes, Large Cutting Tools (LCT), angular chunks, cleavers, choppers, cores and flakes made almost exclusively on round quartzite cobbles). In some areas very few/no archaeological remains have been found (Kaplan 2003b, 2001, c, d, e, 2002b). Most surveys have been undertaken in previously disturbed farmland and transformed landscape, within and on the edges of rapidly developing urban areas and gated estates.*

In every study conducted the remains have been graded a having low (Grade lllC) archaeological significance due to the isolated, disturbed and transformed context in which they have been found.

Therefor the area identified for upgrading and development of the Cape Winelands Airfield does not constitute a sensitive archaeological landscape. Apart from the existing CWA, almost the entire surrounding farms, including the recently acquired properties, have been fundamentally transformed by agriculture and its associated infrastructure.

Isolated ESA and MSA tools may likely be encountered in the surrounding agricultural lands, old excavations, and other disturbed areas, but these are not likely to be important (Not Conservation Worthy) or require any archaeological mitigation."

Existing Visual landscape

The area considered as the receiving environment was delineated as 5 to 10km around the proposed development site, but during fieldwork this area was confirmed as approximately 8km, as the receiving environment further than 8km will be negligibly affected by the proposed development in terms of visual and aesthetic considerations. The study area was further reduced to focus on the Zone of Potential Visual Influence (ZoVI) after viewshed and line of sight testing.

The topography of the study area is characterized by shallow river valleys and gently rolling hills, most of which are under cultivation, giving way to agri-industrial land uses further south and ultimately predominantly suburban areas within the urban edge of Durbanville. Topographic relief generally increases westward towards the Durbanville hills and decreases eastward into the sloping flats of the greater Mosselbank river valley and the Agterpaarl / Paardeberg Cultural Landscape.

The receiving environment generally enjoys long views towards Paardenberg (northeast), Paarl Mountain (East), Simonsberg (southeast) and the Boland Cape Fold range running from Somerset West northward in the distance. The southern portions of the receiving environment also enjoy distant views towards Table Mountain.

The are several bulk infrastructure features present in the study area - a few Eskom servitudes containing overhead powerlines, distribution lines, sub-stations and telecommunication infrastructure.

These and other infrastructural, industrial, and semi-industrial features contribute to visual clutter and discordant elements visible in the landscape, such as the masts of the Goedverwacht Radio Station, the Fisantekraal WWTW, various poultry batteries in the area (concentrated around Joostenbergkloof), the Durbanville Industrial Park, and mining-related land uses such as Apollo Bricks, industries such as Namchar and the local feedlots. These are generally concentrated along the parallel railway line and Klipheuwel road with Fisantekraal's expanding residential areas being the nearest in proximity to the subject site.

The predominant land use is agricultural, with areas of agri-industrial, peri-urban / industrial (concentrated along the Klipheuwel corridor) and urban/residential in the south (within the

Fisantekraal settlement and the Durbanville urban edge). The land use mix is typical of areas at the outskirts of the Cape Town Metro and associated with the Cape Winelands landscape.

Land uses within 5km of the project site includes the following:

- Agricultural activities surrounding the site, with areas that are more exclusively under cultivation located in the hinterland and within cultural landscape areas. Vineyards and wine estates are located on the slopes of the Durbanville Hills and foothills, while grazing and grain dominate the open fields to the west, east and north.
- Schools and community facilities are located within Fisantekraal.
- To the south and east of the subject site is the Joostenberg Vlakte, a semi-agricultural area that is characterized by large plots and smallholdings, equestrian farms, various guest houses and strong landscape and settlement patterns created by tree avenues.
- Along the Klipheuwel corridor, there are industrial, agri-industrial and mining activities.

In general land use intensifies and densifies southward and southwestward, with pockets of development within the agricultural landscape (such as the Durbanville industrial park and Fisantekraal residential area).

The landscape to the north and east of the subject site is more agricultural and rural (except for a concentration of agri-industry in the Joostenbergkloof area), while areas to the west tend to be more mixed. The study area receiving environment can be described as rural agricultural, containing isolated areas with land uses of mixed density and nature, and a band of peri-urban agricultural and industrial activity in the southwestern portions of the study area that have been earmarked for extensive future development.

Natural vegetation in the area has been modified and transformed completely through cultivation of the land and urban development. Remnant natural vegetation, if any, would typically be associated with the river valley bottoms in the study area. Local vegetation patterns are not uniform throughout the study area, given the wide range of land uses. Within the agricultural areas, vineyards and paddocks are sometimes framed by avenues of mature trees (typically beefwood, pines and Eucalyptus species). These avenues are often isolated and associated with farmsteads and yards/werf areas, or entrance roads.

The proposed development must be seen within the context of an area which is currently and will in future undergo significant development, which is most likely to intensify in the short, medium, and long term and supported and/or championed by the provincial, municipal and district policy frameworks.

According to the Northern District Plan, the study area forms part of the urban periphery of

CoCT where extensive low-density development is expanding the residential “hinterland”. This trend has been an increasing feature in the study area for several years, with the most rapid development happening over the past 10 years.

The Northern District plan also identifies the extension of the emerging industrial area at Fisantekraal as a major opportunity in the district to reinforce service industrial areas that are in proximity to activity routes and development routes, and to respond to the urgent need for centres of employment. Future development plans include extensive urban infill within the Northeastern Growth Corridor in Sub- district 3, which is located to the southwest and south of the subject site.

The vision is to establish a growth corridor along the Malmesbury rail line which is primarily focused on higher density integrated and inclusionary housing development, where adequate employment opportunities are identified as well as the required public infrastructure being developed simultaneously.

Figure 97 shows the proposed CWA expansion site in the context of approved future developments within the study area and immediate vicinity. The proposed Bella Riva development, the Fisantekraal industrial node, the high-density residential development within the urban edge and the Greenville Garden City development across the R312 will erode the rural agricultural landscape character within these parts of the receiving environment, and impact significantly on visual quality and coherence of the scenic routes and peripheral areas of the surrounding cultural landscapes.

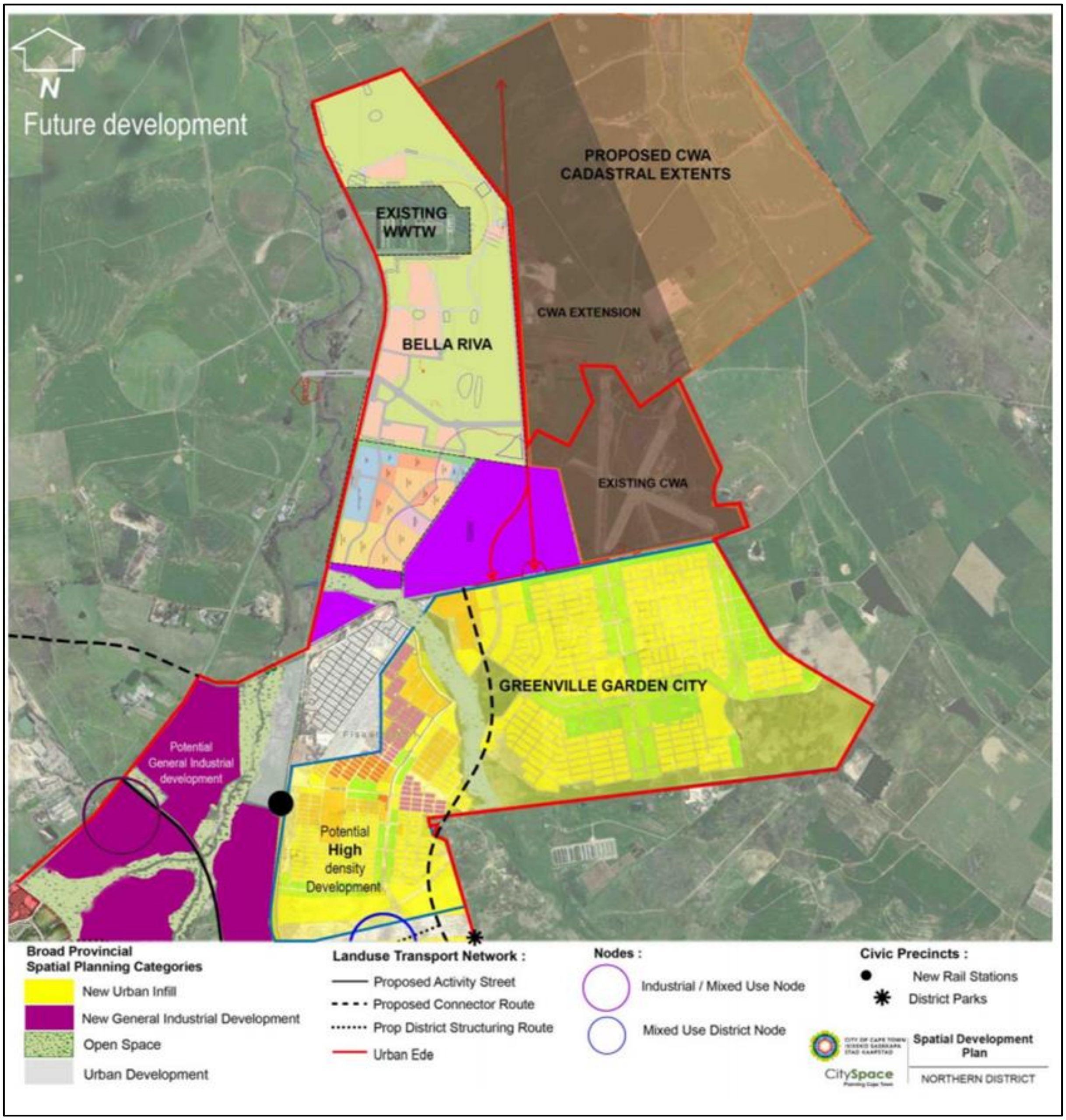


Figure 97: Map showing proposed future development in the study area (Filia Visual, Visual Scoping Report, Sept 2023)

Figure 98 indicates the possible subsequent changes to the extents and boundaries of the cultural landscapes, based on cumulative development and conurbation (merging of suburb areas) that will result in the transformation of these landscapes.

Their delineation on a map should therefore follow along the new urban edge to portray the reality on the ground more accurately. These observations place additional emphasis on the imperative for the CWA development to demonstrate a sensitive response to the visual resources and sensitive viewers outside of the urban edge within the (reduced) Cultural Landscape areas.

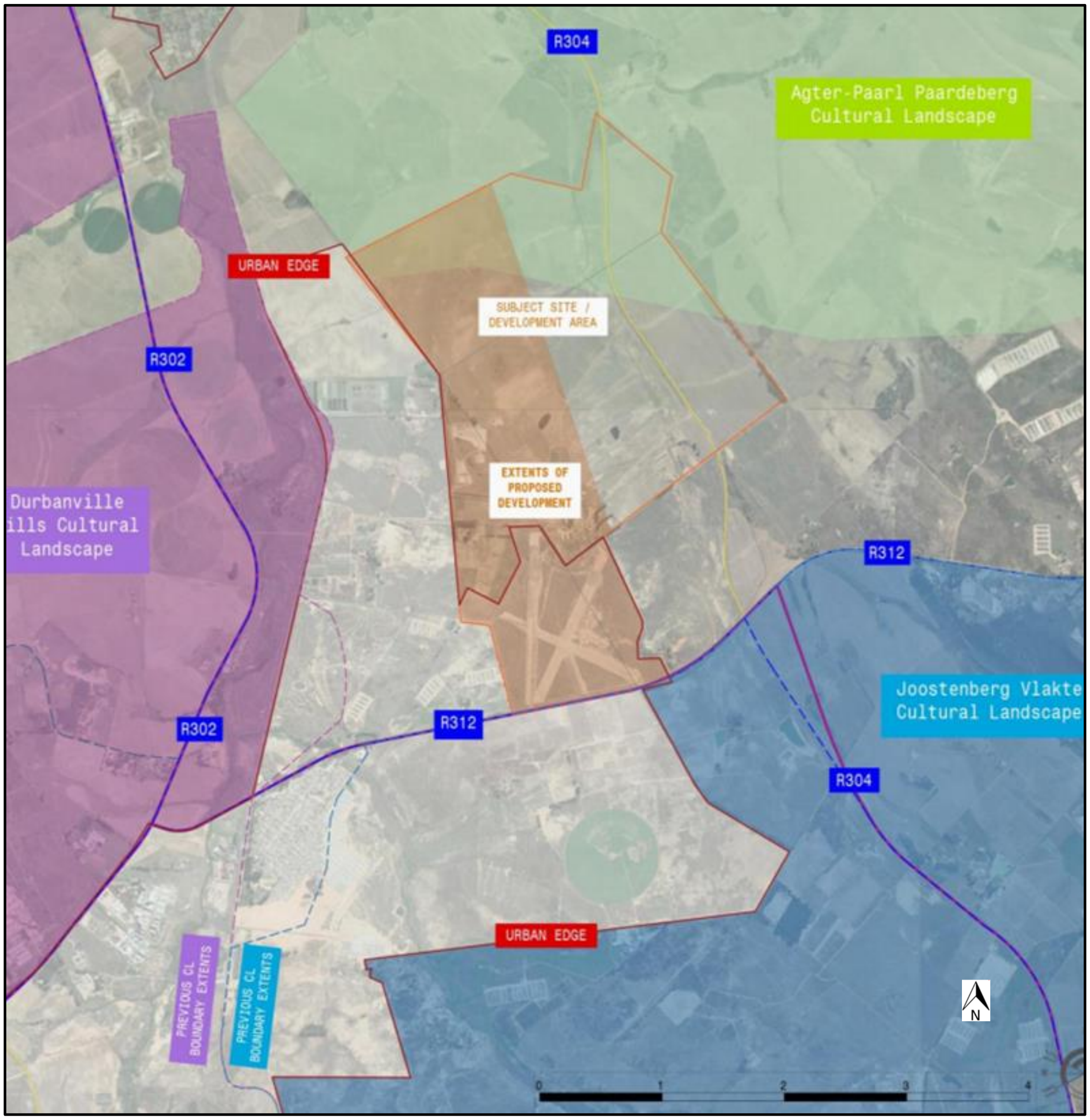


Figure 98: Possible effect of future developments on the extents of the cultural landscape layout in the study area (Filia Visual, Visual Scoping Report, Sept 2023)

Evaluation of the Visual resource in terms of Aesthetic value

According to the WCPSDF the Western Cape economy is founded on the province's unique asset base, which includes its varied scenic and cultural resources - attractions that make the Western Cape South Africa's premier tourism destination.

The **Aesthetic value of the Visual Resource** was rated in terms of the **Landscape Character**, the **Sense of Place** and the **Quality and Integrity of the landscape**.

Four areas were identified within the study area as areas that can be described together as **Landscape Character areas (LCA)**. This was based on topography, vegetation pattern (agriculture) and land use as primary informants, along with fieldwork observations and the existing classifications of relevant policy and planning documents.

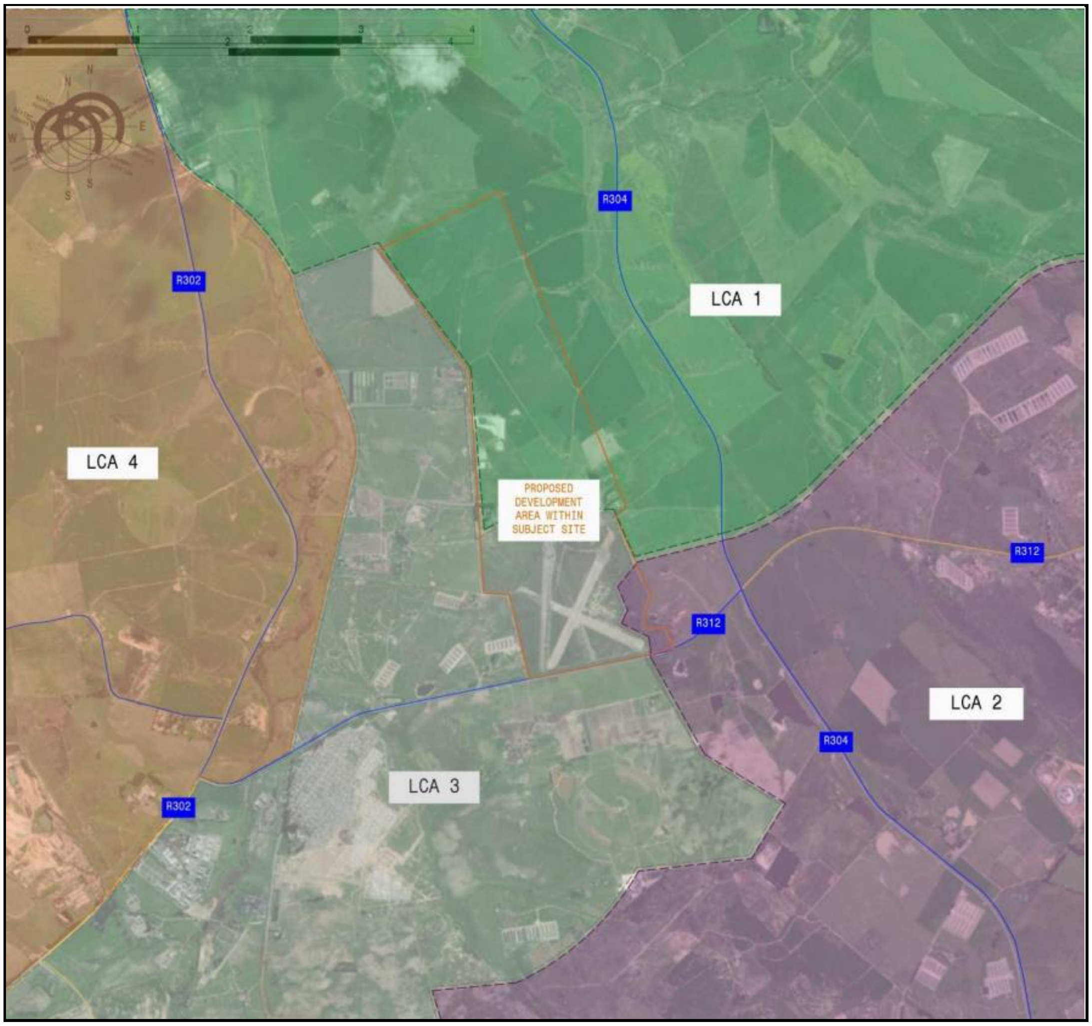


Figure 99: Graphic illustrating the Landscape Character areas in the receiving environment (Filia Visual, Visual Scoping Report, Sept 2023)

LCA 1: Landscape Character area 1 is situated to the north of the subject site and consists of a predominantly rural agricultural landscape of grazing and grain fields containing very few built elements and sparsely interspersed landscape elements (tree avenues associated with farm werf areas, property boundaries and limited copses of natural vegetation along river courses). Topographically, the LCA is comprised of low rolling hills and gently undulating fields, with long views towards the encircling mountains to the east. This LCA has a strong sense of place, being identified as the AgterPaarl / Paardeberg Cultural Landscape according to the Northern District plan.

LCA 2: The Joostenberg Vlakte Landscape character area is a semi-agricultural area characterized by large plots and smallholdings, equestrian farms, various guest houses and strong landscape and settlement patterns created by tree avenues. It is gently sloping, but generally flat topographically, with some intensification of topographical variance in the northeastern parts. Although not densely developed, views within the smallholding areas are typically near and generally limited to the foreground because of the amount of existing vegetation, buildings, and other visual obstructions. In the agricultural areas, topography becomes more variable, and elevated areas along the R304 and towards the east of the LCA open to long, dramatic vistas of the Simonsberg and Stellenbosch mountains in the south and the Peninsula Mountain range in the southwest. This LCA has a strong sense of place, being identified as a Cultural Landscape according to the Northern District plan.

LCA 3: Urban and suburban residential areas, peri-urban industrial areas (the Durbanville Industrial Park and local brick manufacturing plants), future high and medium density formal and informal residential areas and large tracts of undeveloped land are found within Landscape Character area 3. The visual quality of these areas is generally low, due to large portions being either environmentally degraded or because of the presence of discordant elements in the field of vision (including the local WWTW, Eskom transmission power line and substation infrastructure, developments under construction and industrial/semi-industrial activities along the Klipheuwel corridor and railway line).

LCA 4: Landscape Character area 4 contains the rural agricultural areas outside of the urban edge from the Groot Phesantekraal wine estate and upwards towards Spes Bona and extending to the areas east of Klipheuwel. This landscape comprises mostly of the Durbanville Hills Cultural Landscape. This area enjoys peripheral views onto the residential and industrial areas alongside in its southern parts but maintains long views over vineyards and the patchwork of crops towards the Boland Mountain range as a rule throughout. Dominated by agricultural land uses, the scenic quality of this area is notable, with pastoral agricultural scenes and an ever-changing seasonal colour palette, moving from an agricultural landscape dominated by viticulture in the south, to one of predominantly wheat and pasture in the North. Topography in this area consists of gently rolling hills and small shallow river valleys.

The Sense of Place is the unique quality or character of a place, whether natural, rural or urban and an important aspect of Sense of Place is the uniqueness and distinctiveness of a landscape.

The study area and receiving environment can be described as having a mixed landscape character and sense of place, which are generally identifiable as consistent with the boundaries of the LCA's.

- LCA 1, 2 and 4 retain predominantly rural and agricultural characteristics,
- LCA 3 is dominated by suburban and industrial developments and other land uses that generally erode scenic quality within the context of the Cape Winelands region's peri-urban areas.

Landscape Integrity refers to the intactness of the existing landscape, whether natural, rural or urban, and with an absence of intrusions or discordant structures.

i. LCA 3 can be described as having low to medium overall intactness,
ii. LCA 1 and 4 exhibit high overall intactness (containing very few intrusions, discordant structures and activities)
iii. and LCA 2 can be described as having medium overall intactness.

In summary, the Landscape quality and integrity is:

- High for LCA 1 and 4;
- Low to Medium for LCA 3;
- and Medium for LCA 2.

Aesthetic value can be defined as an emotional response that is derived from the experience of the environment and its natural and cultural attributes. In determining the quality of the visual resource both the objective and the subjective or aesthetic factors associated with the landscape are considered.

Table 37 & Table 38 summarises the Value of Visual Resource expressed as Scenic Quality per Landscape.

Table 37: Scenic Quality Evaluation Chart (Filia Visual, Visual Scoping Report, Sept 2023)

Landscape Character Area:	Landscape Character Area 1	Landscape Character Area 2	Landscape Character Area 3	Landscape Character Area 4
Landform	1	1	1	1
Vegetation and landcover	3	2	1	3
Water	3	0	0	3
Colour	3	2	1	4
Influence of adjacent scenery	5	3	3	3
Scarcity	3	2	0	3
Cultural modifications	1	-1	-2	-1
Visual Resource Quality	High	Moderate	Moderate and Low	High
Sense of Place	High	Moderate	Moderate to Low	High

Table 38: Value of the Visual Resource (Scenic Quality) (Filia Visual, Visual Scoping Report, Sept 2023)

Landscape Character Area	Rating	Value of Visual Resource
Landscape Character Area 1	A (19)	High
Landscape Character Area 2	C (9)	Low
Landscape Character Area 3	C (4)	Low
Landscape Character Area 4	B (16)	Moderate

Visual Absorption Capacity (VAC) refers to the ability of the RE to accommodate physical and visual changes without a concurrent transformation in its visual character and quality, or the loss of visual amenity (Table 39).

Table 39: Visual Absorption Capacity (Filia Visual, Visual Scoping Report, Sept 2023)

High	Moderate	Low
The receiving environment absorbs all or most of the proposed development successfully. • Limited views with low visual intrusion; • High compatibility with existing landscape character & built form etc. • Existing vegetation cover and/or structures such as buildings screens or conceals the majority of the proposed development. • Topography and terrain variability plays a role in absorbing visible elements. • The proposed development is a common sight within the LCA.	The receiving environment absorbs parts of the development successfully. • Views demonstrate moderate visual intrusion by the proposed development; • Proposed development is generally similar in nature (or presents an acceptable degree of change) to existing landscape character & built form. • A degree of visual screening is provided vegetation cover and/or structures such as buildings. • Topography and terrain variability may play a role in absorbing visible elements. • The proposed development is not unprecedented within the LCA.	The receiving environment cannot visually absorb the proposed development. • Proposal introduces a contrasting built form or dramatic change in landscape character. • Many key views demonstrate high visual intrusion. • Little or no visual screening is provided by vegetation cover and/or structures such as buildings. • Topography and terrain variability do not play a significant role in absorbing visible elements. • The proposed development is unprecedented within the LCA.
Landscape Character Area	**LCA**	**Visual Absorption Capacity**
Landscape Character Area 1	LCA 1	High to Moderate with aspects of Low
Landscape Character Area 2	LCA 2	Moderate to Low
Landscape Character Area 3	LCA 3	Moderate to Low
Landscape Character Area 4	LCA 4	Moderate to Low

7.7 Agriculture

The CWA site is bordered by the R312, with several agricultural activities towards the East and North.

According to the Agro-Ecosystem Scoping report, the entire study area is situated within Land Type Db 41 with prismacutanic, pedocutanic and/or gleycutanic diagnostic horizon dominant and the B horizons normally non-red. These are soils where the non-red B-horizon (subsoil) has a strongly to very strongly developed structure, usually also with a high clay content, making the soil mostly imperfectly to poorly drained and the strong structure in the subsoil places a restriction on root development. Because most of these soils have a sandier topsoil on a clay subsoil, they are usually sensitive to erosion due to poor management practices are applied (vegetation cover removed through overgrazing of natural veld or by cultivation).

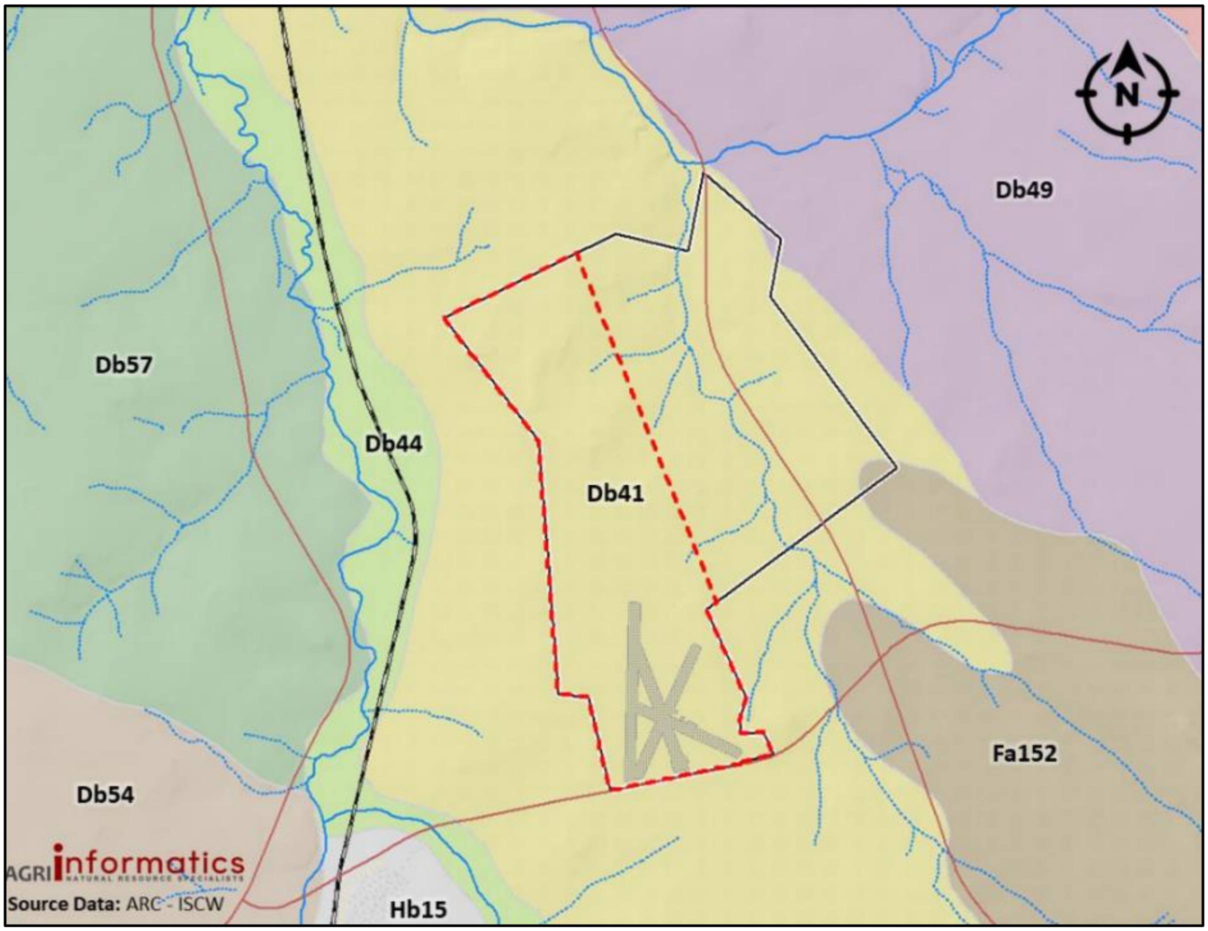


Figure 100: Land Types in the vicinity of the study area (Agri-Informatics; Agro-Ecosystem Scoping Report, Sept 2023)

According to the Land Type memoirs the distribution of soil forms per terrain unit for Land Type Db41 varies between 1, 3, 4 and 5 (refer Figure 101).

Table 40: Terrain units refer to 1: crest, 2: scarp (not present here), 3: mid slope, 4: foot slope and 5: valley bottom (Agri-Informatics; Agro-Ecosystem Scoping Report, Sept 2023

Soils per Terrain Unit											
1			3			4			5		
Soil Form	%	Depth	Soil Form	%	Depth	Soil Form	%	Depth	Soil Form	%	Depth
Rock	70		Es	25	300-600	Es	24	300-600	Es	60	300-600
Gs	15	300-500	Kd	10	600-1200	Kd	31	600-1200	Ss / Kd	40	300-500
			Ss / Kd	20	300-500	Ss / Kd	20	300-500			
			Kd	15	600-1200	Wa	10	800-1200			
			Ms	5	<300	Kd	15	600-1200			
			Wa	5	300-500	Ms	5	<300			
			Gs	5	300-500	Fw	4	900-1200			
			Cv	10	600-900	Wa	2	300-500			
			Sw/Ss	5	300-500						

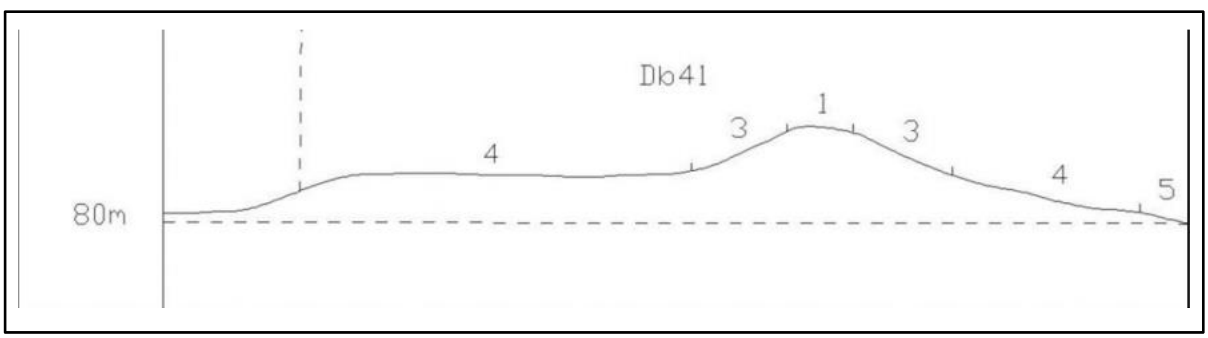


Figure 101: Typical terrain form of Land Type Db41 showing terrain units present (Agri-Informatics; Agro-Ecosystem Scoping Report, Sept 2023)

The reconnaissance soil survey that was conducted as part of this study (refer Figure 102), correlate with the Land Type information. Prismacutanic, pedocutanic and/or gleycutanic diagnostic horizons are dominant in large sections of the study area, with deep bleached or marginally yellow apedal sand also common in places.

Soil properties (depth, clay content, porosity, permeability, water retention capacity and general morphology) indicate of the soil suitability to produce crops under dryland (rainfed winter cereal) or irrigated (perennial fruit) conditions (Refer Table 41).

Table 41: Summary of the soil properties of the assessed profiles (Agri-Informatics; Agro-Ecosystem Scoping Report, Sept 2023)

Profile	Soil Form	Depth (cm)	Soil Suitability		Remarks
			Dryland	Irrigated	
1	Wa	30	Low	Very low	Deep clay deposit as C-Horizon
2	Wa	40	Low	Very Low	Deep clay deposit as C-Horizon
3	Wa	70	Medium	Low	Cemented E-horizon
4	Ct	90	Medium	Low	Gravelly (Fe-concretions) in B. Redox mottling in C-Horizon
5	Ct	60	Med low	Low	Redox mottling in C-Horizon (clay)
6	Fw	120+	Medium	Med low	Low water retention capacity
7	Fw	120+	Medium	Med low	Low water retention capacity
8	Oa	120	Med high	Medium	
9	Ct	120+	Med high	Medium	Fine gravel in subsoil & sandy topsoil
10	Es	50	Med high	Medium	Shallow sandy topsoil
11	Es	70	Med high	Med low	High gravel content (Fe-concretions) in E-horizon
12	Es	70	Med high	Med low	High gravel content (Fe-concretions) in E-horizon
13	Vf	70	Medium	Med low	Very hard/compacted subsoil
14	Cv	150	Med high	Medium	Moderate water retention capacity (Water table at 150 cm)
15	Es	60	Medium	Med low	Prismacutanic layer at 70-100 cm
16	Es	90	Med high	Med low	Hard/compacted subsoil
17	Es	70	Med high	Med low	Weathered (soft) shale in subsoil
18	Ct	60	Medium	Med low	C-material prismacutanic
19	Es	45	Med low	Low	Gleyed C-material
20	Es	55	Medium	Med low	Mod hard prismacutanic B transition to shale saprolite

21	Es	70	Med high	Medium	Hard well-developed prisms
22	Es	40	Med low	Low	Deep dense clay in subsoil
23	Lo	50	Med high	Medium	Soft plinthite transition to dense clay
24	Rock				Scattered rocky outcrops

The climate (temperate dry, hot summer; marginally maritime; average annual rainfall is 532mm) amounts to crop evaporation of 1178mm/annum (818mm during the summer months) which indicates a rainfall deficit in summer and implies that, for most perennial tree crops, irrigation of at least 5000m³/ha will be required during summer. Wine grapes will require approximately 3 000m³/ha.

The winter rainfall of 438mm is regarded as adequate for dry land (non-irrigated) winter cereal production, provided that the soil properties are sufficient to retain groundwater between rainfall events. The study area has very limited access to water that can be used for irrigation with most irrigation water coming from borehole supply.

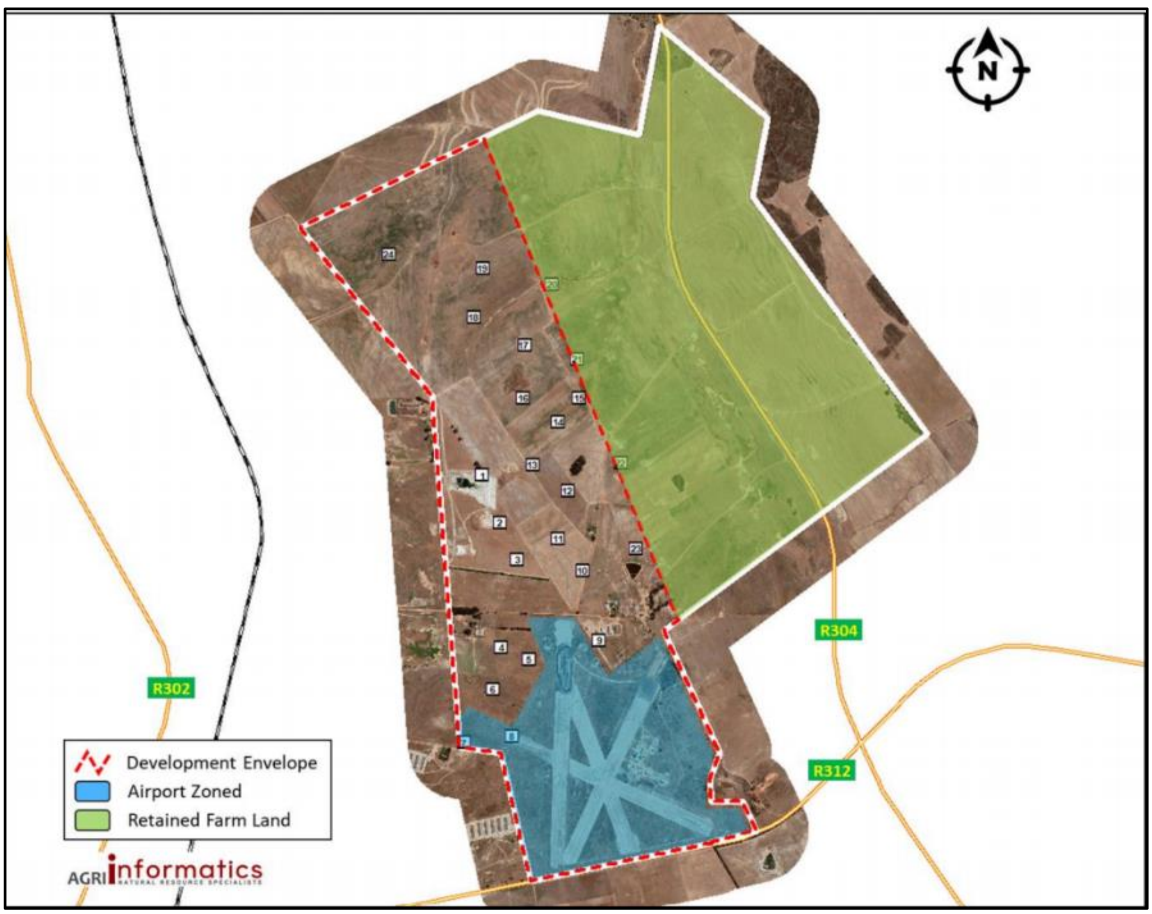


Figure 102: Soil profile pit positions used during the soil survey (Agri-Informatics; Agro-Ecosystem Scoping Report, Sept 2023)

Sheep farming is an important agricultural activity in the traditional wheat regions of the Western Cape, and in the High Rainfall Sowing homogeneous farming area (HFA).

According to Agri-Informatics it is done "*in a crop rotation system with wheat as cash crop and oats, barley or triticale used as pastures or cut for silage and fodder. Medics or lupins – depending on soil types - are also often incorporated in the crop rotation.*

A general ratio of 30:70 between cash crops and pastures/fallow land are mostly used. The grain stubble, plant rests and volunteer growth also provide important grazing for sheep in this system. A grazing capacity of 0.85 to 1.72 ewes/ha without supplementary feeding and 2.0 to 2.5 ewes/ha with supplementary feeding is proposed by Van Heerden & Ferreira (2008). Due to the low summer rainfall the availability of fodder during late summer and fall is very low and supplementary feeding is normally provided and often limits the feasible stock numbers on a farm during this period."

Further to this – "*at a conversion of 4 small stock units (SSU) per large stock unit (LSU) the grazing capacity of a medics/grain stubble system with supplementary feeding would imply 1.6 to 2 ha per cow (LSU). At these grazing capacities an estimated 290 small stock units or about 70 large stock units can theoretically be accommodated on the 575 ha cultivated fields of RE/474 and P7/942, being the only cultivated fields in the entire study area."*

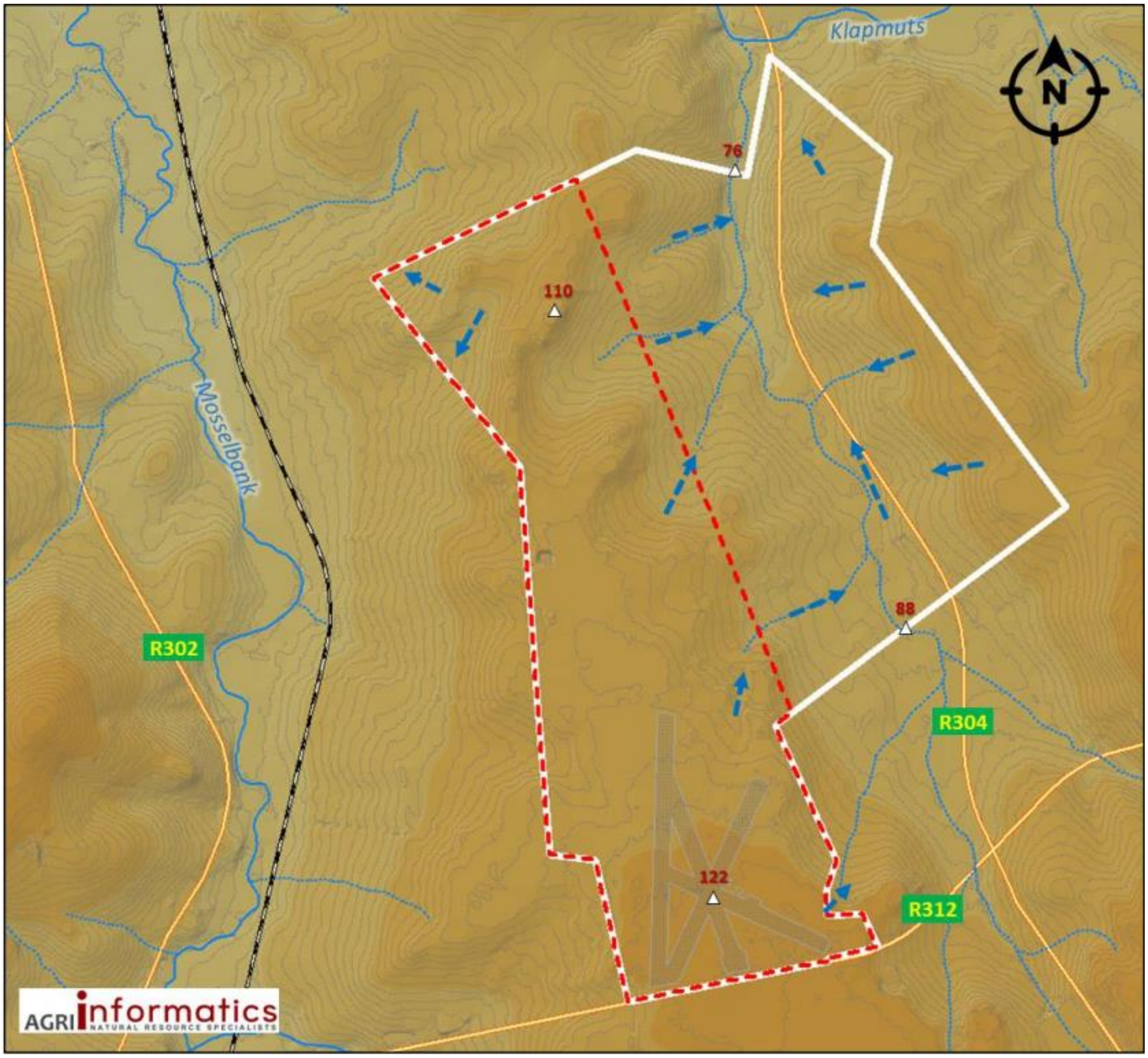


Figure 103: Relief and surface hydrology of the study area (Agri-Informatics; Agro-Ecosystem Scoping Report, Sept 2023)

The study area is situated in the southeastern corner of the Homogeneous Farming Area (HFA) known as the "High Rainfall Sowing Area" of the Swartland with a landscape almost fully converted to agriculture. Agricultural activity is mostly small grain production in combination with sheep and/or cattle farming, with no irrigation cultivation due to the limited irrigation water available in the area. Other farming activities in the vicinity includes Braam's feedlot and County Fair chicken farms.

Figure 104 illustrates the extent of the cultivated areas and other features within the study area and Table 42 provides a summary of the results.

Table 42: Areas per land use category within the study area (Agri-Informatics; Agro-Ecosystem Scoping Report, Sept 2023)

Land use category	Area (ha)
Airport Precinct	8.8
Airport_Zoned	101.6
Clay Quarry	3.9
Cultivated fields	575.0
Dam	0.7
Dam wall	0.5
Drainage areas	14.0
Eucalyptus plantation	1.4
Fall-Out Land	12.9
Fallow Land	52.0
Fallow/Grazing	36.2
Farmhouses	3.5
Farm road	1.5
Farm sheds	2.4
Gas facility	0.1
Horse Camps	19.0
Public road	3.0
Road primary	4.9
Rocky outcrops	6.7
Runways	38.7
Total	**886.8**

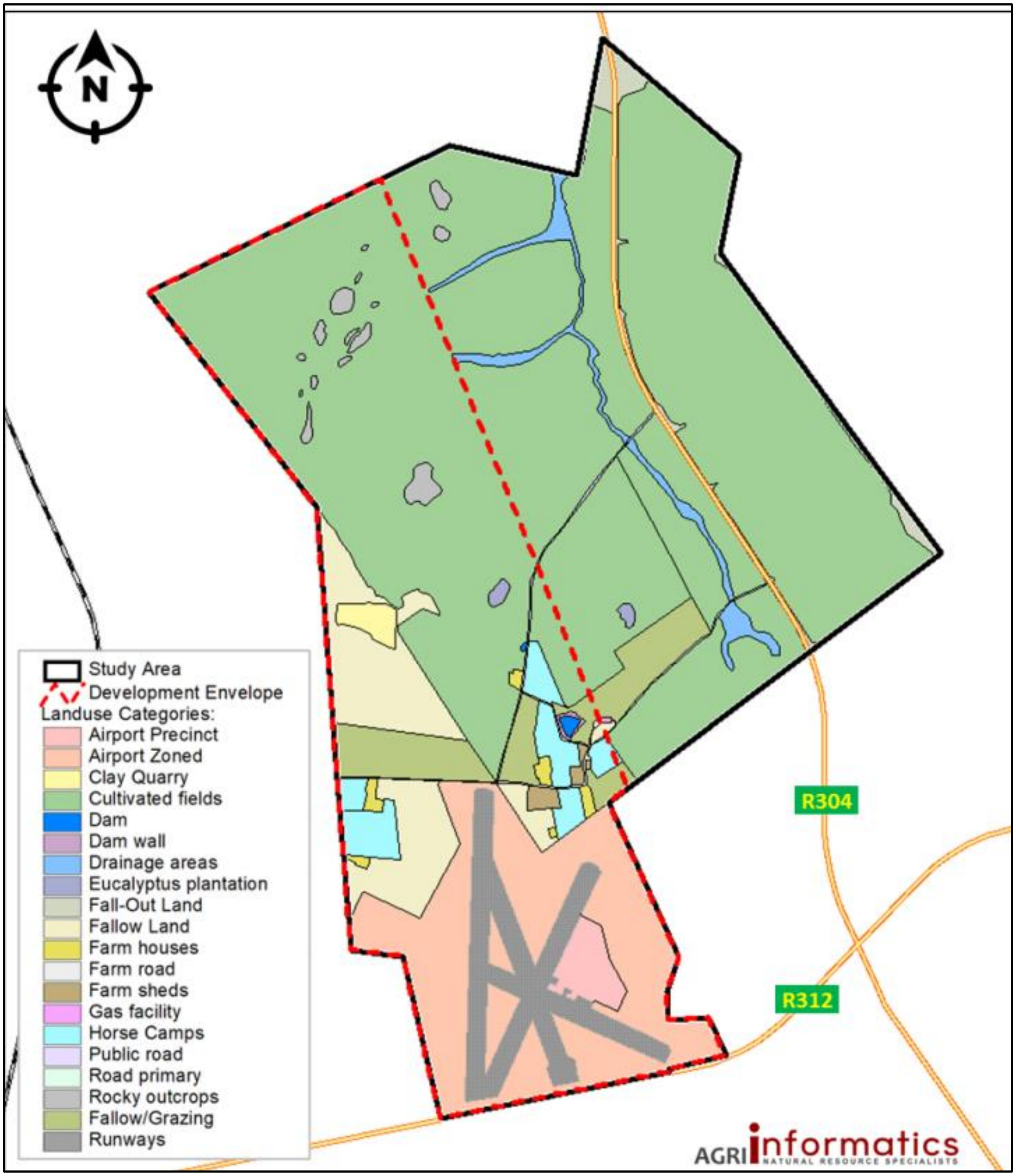


Figure 104: Land use classes of the study area (Agri-Informatics; Agro-Ecosystem Scoping Report, Sept 2023)

Table 43: Current zoning per land use parcel

Land use parcel	Current zoning	Agricultural activities (YES/NO)
P10/724	Transport Zoned (Current CWA land)	NO
P4/474	Transport Zoned (Current CWA land)	NO
P23/724	Mining (Clay Quarry)	NO
RE/724	Agricultural	YES - Land effectively only used for paddocks for horses
RE/474	Agricultural	YES - Production of small grain in combination with sheep and cattle. About 12ha has been arranged into horse paddocks.
P7/942	Agricultural	YES - Production of small grain in combination with sheep and cattle

NOTE: Areas excluded from rezoning for aviation use on RE/474 and P7/942 will remain agricultural with associated agricultural activities (refer Figure 4 in this report) except for areas designated for conservation or wetland offset.

Agro-ecosystem sensitivity is related to the agricultural potential. As previously stated, the potential for irrigated agriculture is regarded as very low. The potential for winter small grain production is regarded as high, subject to soil properties.

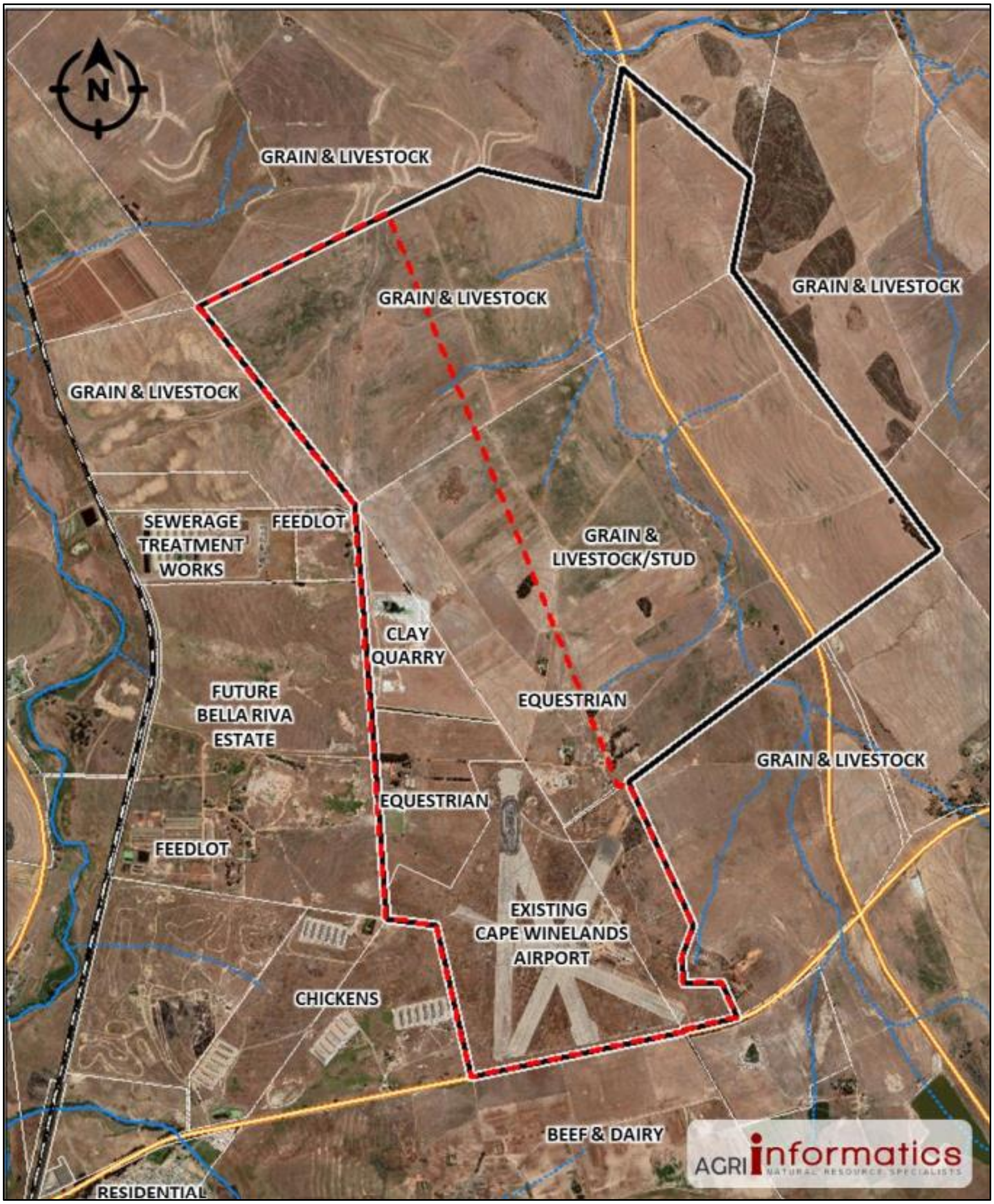


Figure 105: Spatial context of the study area and surrounding land use activities (Agri Informatics, August 2024)

In terms of livestock farming: "*At a conversion of 4 small stock units (SSU) per large stock unit (LSU) the grazing capacity of a lucerne/grain stubble system with supplementary feeding would imply 1.6 to 2* *ha per cow (LSU). At these grazing capacities an estimated 7000 small stock units or about 1750 large stock units can theoretically be accommodated within the entire study area*."

Stock theft does occur in the study area and is regarded as a constraint limiting small stock farming.

Dry summers and non-availability of irrigation water limits the agricultural potential of the study area in terms of perennial crops, but the adequate winter rainfall results in a high potential for winter cereal production, in combination with a livestock component. The soil properties of P23/724 (clay deposits) and RE/724 (deep sand with low water retention capacity), reduces the potential of these farm portions to medium-low only.

7.8 Civil Aviation, Obstacle Evaluation Survey and Airspace Concept of Operations

7.8.1 Civil Aviation

Current aviation activity at the airport consists of flight school operations and other unscheduled general aviation (GA) flights. These includes private owner-pilots and limited charter operations in light fixed-wing aircraft, as well as helicopters, gyrocopters, and microlights. All flights operate under visual flight rules (VFR) and make use of the runway 05-23 and 14-32 depending on wind conditions.

Flight activity at the airport averages approximately 100 air traffic movements (ATM; take-offs and landings) per day, varying with weather conditions, seasons, and day of the week. Table 44 below provides an overview of the aircraft types currently operating at the airport with some frequency, although all remain unscheduled.

Table 44: Overview of the aircraft types operating at the airport (NACO & ATNS; Civil Aviation Scoping Report, Sept 2023)

Aircraft Type	Seats	ICAO Code	Frequency
Diamond DA20-C1 Eclipse	2	A	Daily
Beechcraft K35 Bonanza	4	A	Seldom
Cessna 150	2	A	Daily
Cessna 172	4	A	Daily
Cessna 175	4	A	Weekly
Cessna 177 Cardinal	4	A	Weekly
Cessna 182	4	A	Weekly
Cessna 206	6	A	Weekly
Cessna 208	14	A	Monthly

Cessna 210	6	A	Monthly
Gyrocopter - Xenon	3	A	Daily
Kitplanes For Africa - Bushbaby	2	A	Weekly
Kitplanes For Africa - Safari	4	A	Weekly
Microlights	1-2	A	Monthly
Pilatus PC-12	9	A	Seldom
Piper Cherokee PA28-180	4	A	Daily
Piper PA-28 Warrior	2	A	Daily
Piper PA28R-200 Arrow	4	A	Daily
Piper PA34-200T Seneca II	6	A	Weekly
Piper PA38 Tomahawk	2	A	Daily
Piper Pawnee	2	A	Monthly
Piper Brave	2	A	Monthly
Piper Tripacer	4	A	Monthly
Sling 2	2	A	Weekly
Sling 4	4	A	Weekly
Sling TSI	4	A	Weekly

Other aviation-related activities taking place at the airport include the rental of hangar space for privately-owned aircraft and the sale of aviation gasoline (Avgas 100LL). There are currently 34 hangars on the site that are in use by various private aircraft owners, two flight schools (Cape Town Flight Training Centre and Aerosport) and small aircraft operators, such as a crop sprayer and aerial advertising firm. There are no military/defence-related activities taking place at the airport.

Meteorological conditions related to aviation –

The specific meteorological conditions of the site (key to aviation activities on site) are described in terms of **temperature, rainfall and wind** recorded between 1991 and 2020 and considered very reliable as it spans several decades of measurements.

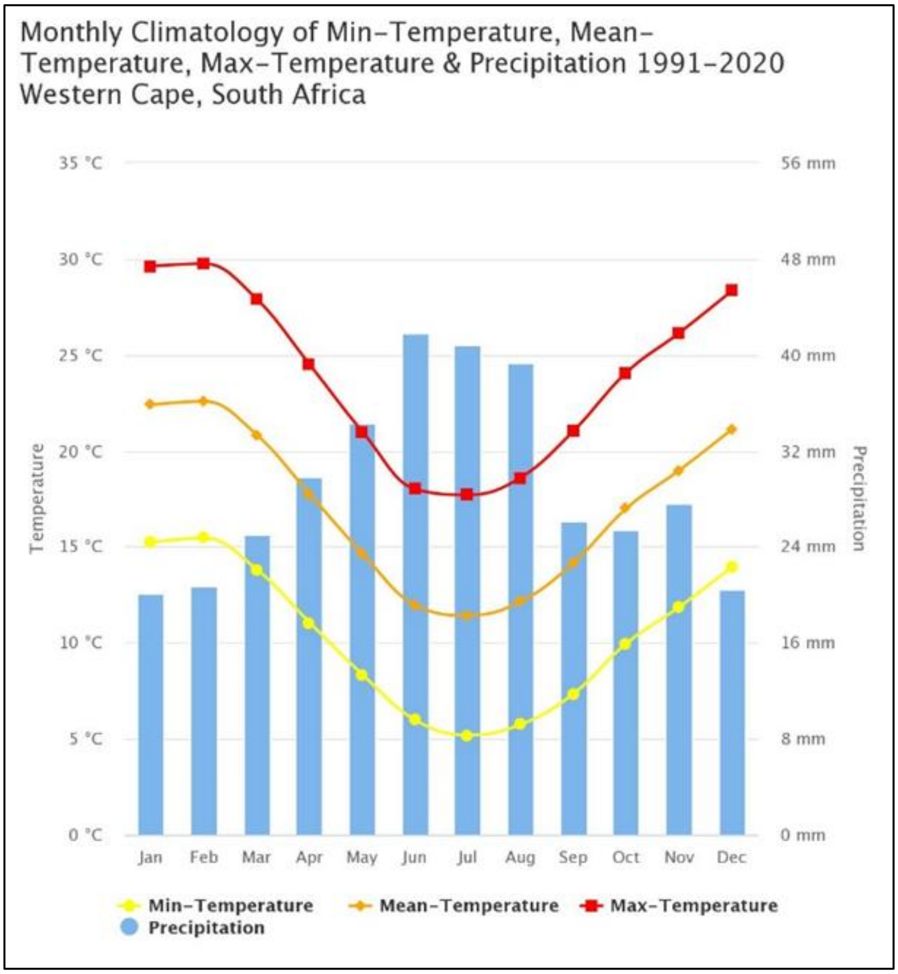


Figure 106: Minimum and maximum temperatures & precipitation in Western Cape (NACO & ATNS; Civil Aviation Scoping Report, Sept 2023)

According to the Civil Aviation Scoping Report *for the purposes of airport planning and design, the aerodrome reference **temperature** is defined by IACO as the monthly mean of the daily maximum for the hottest month of the year, where the hottest month is the month with the highest mean temperature. Based on this the aerodrome reference temperature was calculated to be 24.1 °C*.

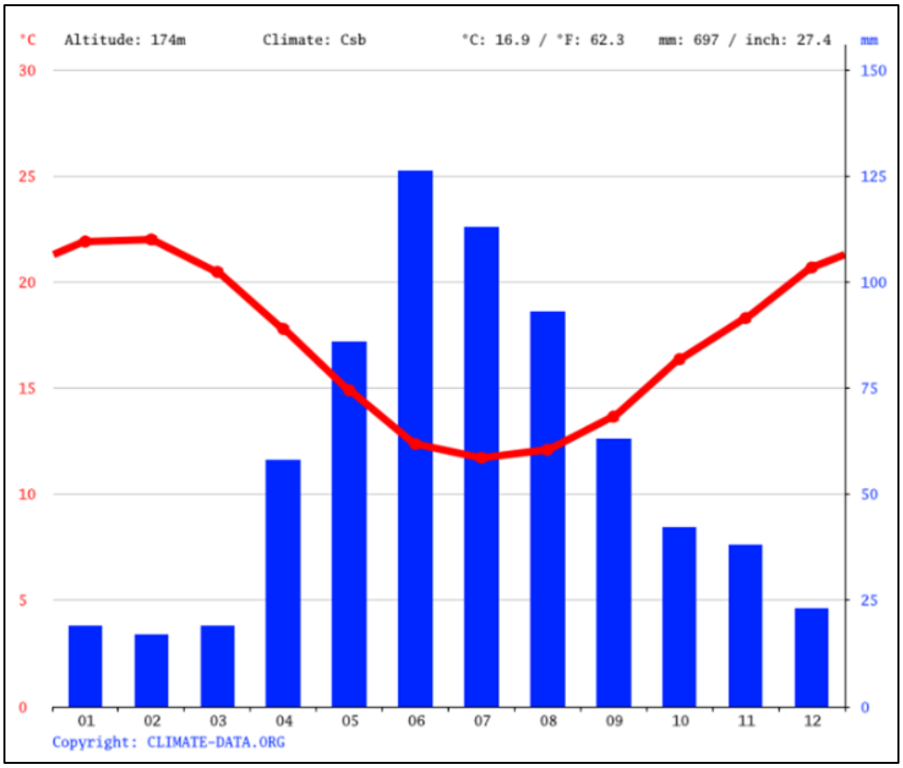


Figure 107: Illustration of monthly temperature and rainfall in Durbanville (NACO & ATNS; Civil Aviation Scoping Report, Sept 2023)

Rainfall data was based on 13 months ending March 2022, which illustrated that the overall rainfall trend at the site is relatively like the public domain data, with May, June, July, and August being the wettest months of the year.

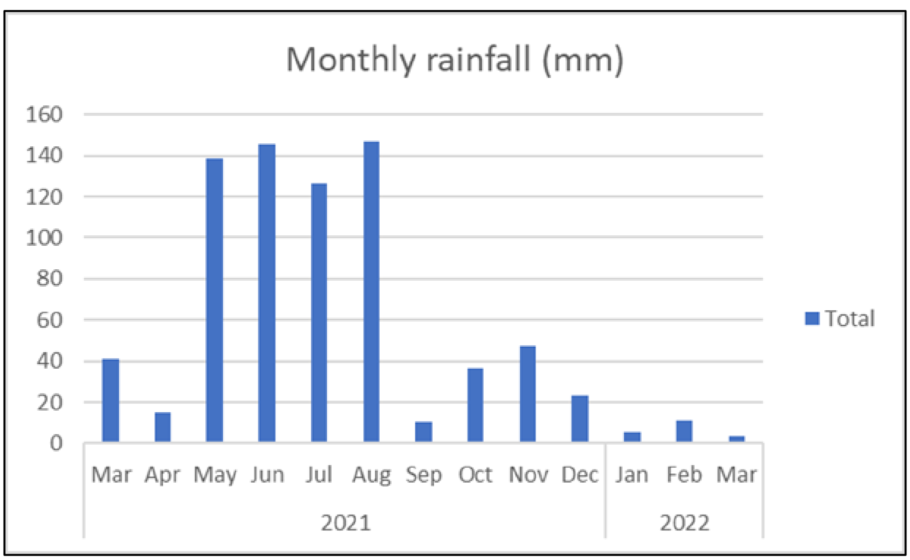


Figure 108: Illustration of monthly rainfall for 2021/2022 measured on the CWA site (NACO & ATNS; Civil Aviation Scoping Report, Sept 2023)

Wind direction and speed play an important role in the design of the runway orientation and the usability of the runway should be not less than 95%. Cross winds of a certain speeds as specified in the standards, will make the runway unusable for certain aircraft depending on their size.

The wind rose diagram in Figure 109 shows a more common wind speed of 5 to 10m/s in the Southeast direction and slightly stronger winds in the Northwest direction on less common occasions.

Figure 110 shows the wind distribution based on the wind data measured on site (source 4), and although the data set is limited to 13 months, a similar trend can be seen in terms of predominant direction, with some slight variation.

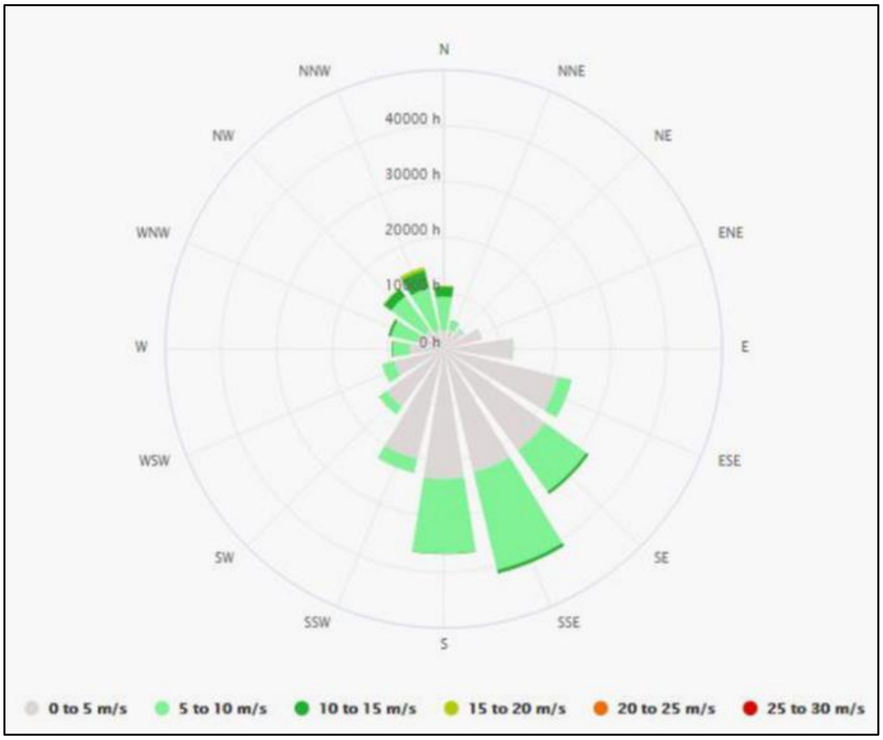


Figure 109: Wind rose of dataset source 2 site (NACO & ATNS; Civil Aviation Scoping Report, Sept 2023)

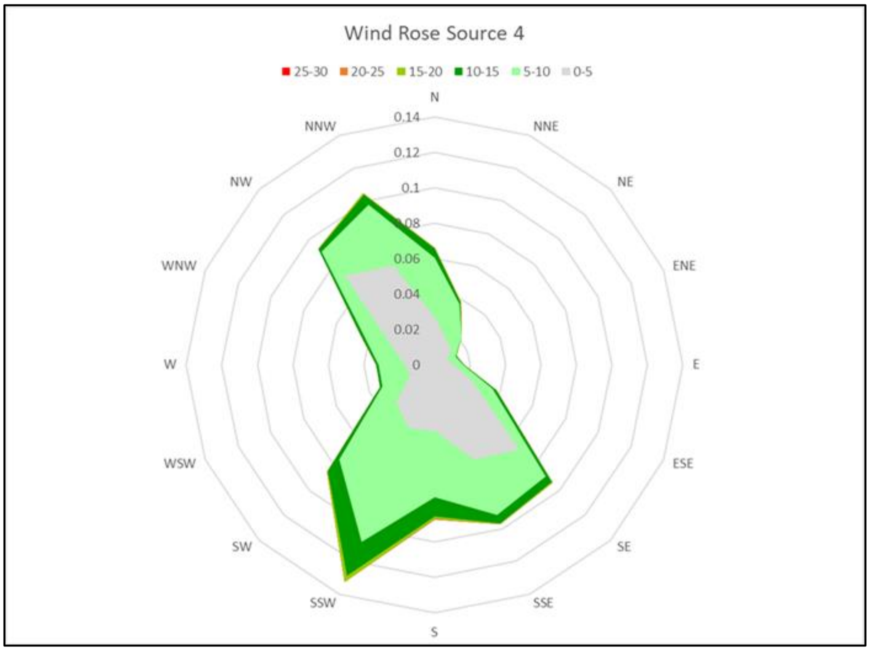


Figure 110: Wind rose of dataset source 4 site (NACO & ATNS; Civil Aviation Scoping Report, Sept 2023)

<u>Aerodromes</u>

Most of the airstrips located within the area suggest the usage of local farmers and / or wine producers in the area. The following 24 airports/helistops/airstrips have been noted in a 20nm (+/- 37 km) radius from Cape Winelands Airport:

Table 45: Aerodromes within 20 nautical miles radius from CWA (NACO & ATNS; Civil Aviation Scoping Report, Sept 2023)

#	Airport/Airstrip/Helistop	Distance from CWA	Surface, facilities and usage	Map Identifier
1.	Grootfontein	+/- 2nm	1 x Gravel/Hanger/Local Farmer	R 021
2.	Unknown airstrip (33°50'52.23"S 18°47'54.99"E)	+/- 5nm	2 x Gravel/Building/ Local Farmer	unknown
3.	Altona	+/- 6nm	1 x Gravel/No Facilities/ Local Farmer	Altona
4.	Coutermanskloof	+/- 8nm	1 x Gravel/No Facilities/ Local Business	R 022
5.	Wintervogel Flight Park	+/- 9nm	2 x Gravel/Frequency, Hangers & Buildings/ Local Farmers & Training	R 074

6.	Morningstar (WCMC Club)	+/- 9.6nm	1 x Asphalt/Frequency, Hangers & Buildings/ Local & Training	R 020
7.	De Waal	+/- 11nm	1 x Gravel/No Facilities/ Local Farmer	De Waal
8.	Klipvlei Airfield Park	+/- 12nm	1 x Gravel/No Facilities/ Local Farmer	Klipvlei Airfield Park
9.	Good Hope INTL	+/- 12.8nm	1 x Gravel/No Facilities/ Local Farmer	Good Hope INTL
10.	Stellenbosch	+/- 13 nm	1 x Asphalt/Frequency, Hangers & Buildings/ General Aviation & Training	FASH
11.	Netcare Blaauwberg Hospital Helistop	+/- 13nm	Helipad/No Facilities/Emergency Helicopters Only	298
12.	Air Force Base Ysterplaat	+/- 14nm	1 x Asphalt/Military Facilities/Military & State usage	FAYP
13.	Cape Town International Airport – ACSA	+/- 14nm	2 x Asphalt/All Commercial Facilities/ Commercial International usage	FACT
14.	Diemerskraal	+/- 14.7nm	1 x Gravel/Hangers & Buildings/Local Farmers & Training	R 039
15.	Paarl	+/- 14.8nm	1 x Gravel/No Facilities/ Local Farmers	FAPU
16.	Delta 2000	+/- 15nm	1 x Asphalt/Hangers/ Local Farmers	FADX
17.	Black River Helistop	+/- 15nm	Helipad/No Facilities/ Local Business use	394
18.	Paardeberg	+/- 16nm	1 x Gravel/No Facilities/ Local Farmers	Paardeberg
19.	WP OES	+/- 17nm	1 x Asphalt/Hangers/ Local Farmers	WP OES

20.	V&A Waterfront Helistop	+/- 17.5nm	Helipad/No Facilities/ Local Business use	225
21.	Robben Island Airstrip	+/- 18.9nm	Airstrip is closed	
22.	Vogel	+/- 19nm	1 x Gravel/No Facilities/ Local Farmers	Vogel
23.	Craigcor	+/- 20nm	1 x Gravel/No Facilities/ Local Farmers	Craigcor
24.	Swartdam	+/- 23nm	1 x Gravel/No Facilities/ Local Farmers	Swartdam

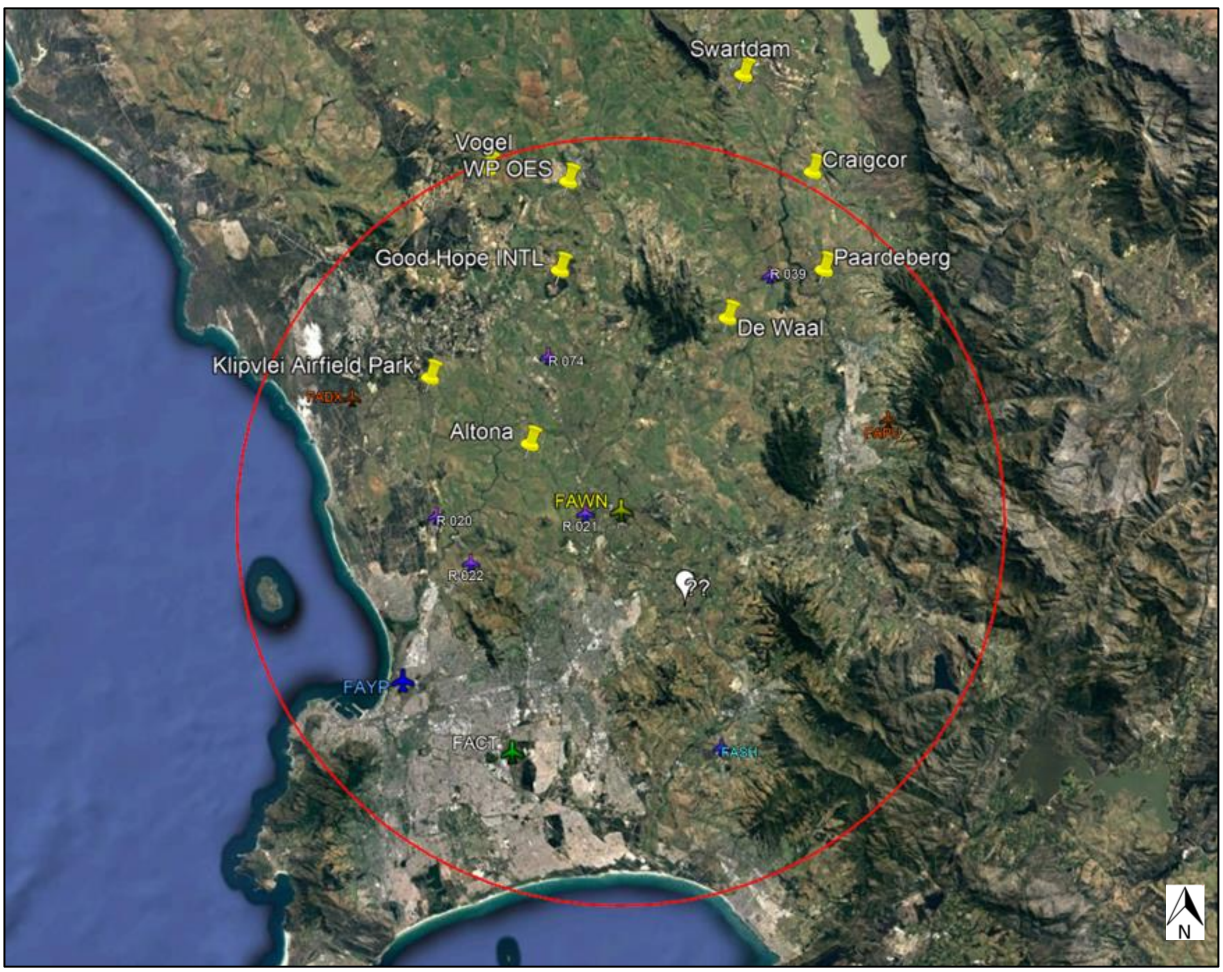


Figure 111: Aerodromes within a 20 nautical miles radius of Cape Winelands Airport site (NACO & ATNS; Civil Aviation Scoping Report, Sept 2023)

<u>Other civil aviation installations</u>

Other civil aviation installations nearby the airport site include the following navigational aids and surveillance equipment. Most of these installations are located at or close to CTIA.

Table 46: Communication, Navigational and Surveillance Equipment nearby the Cape Winelands Airport site (NACO & ATNS; Civil Aviation Scoping Report, Sept 2023)

#	Communication/Navigation/Surveillance Equipment	Distance from CWA	Map Identifier	Civilian (C) or Military (M)	Source of data
1.	Navigational Aid - NDB	+/- 10.4 nm	CB	C	SA-AIP
2.	Surveillance (Radar) - Cape Town S-Band 1 MSSR (+ PSR)	+/- 13 nm	SSR_1	C	ATNS
3.	Communication – 13 x Transmitters	+/-13.1 nm	FACT TX	C	ATNS
4.	Navigational Aid - VOR/DME	+/- 13.8 nm	CTV	C	SA-AIP
5.	Surveillance (Radar) - Cape Town S-Band 2 MSSR (+ PSR)	+/- 14 nm	SSR_2	C	ATNS
6.	Communication – 13 x Receivers	+/- 14.1 nm	FACT RX	C	ATNS
7.	Communication – 6 x Local Transceivers	+/- 14.2 nm	FACT SSS	C	ATNS
8.	Communication – 7 x Local Transceivers	+/- 14.3 nm	FACT TWR	C	ATNS
9.	Surveillance - Various Multilateration sites at CTIA	13 – 14.7 nm	FACT MLAT	C	ATNS
10.	Navigational Aid - VOR/DME	+/- 18.8 nm	RIV	M	SA-AIP

Note: RIV (10) and CB (1) navigational aids have been decommissioned.

In addition to the existing installations listed in Table 46, the following Wide Area Multilateration (WAM) antenna sites are planned to be implemented in the near future:

- GS04 Cape Town Old Radar Site
- GS05 Tygerberg
- GS07 Simonsberg
- GS08 Kanonkop
- GS09 Hawequas

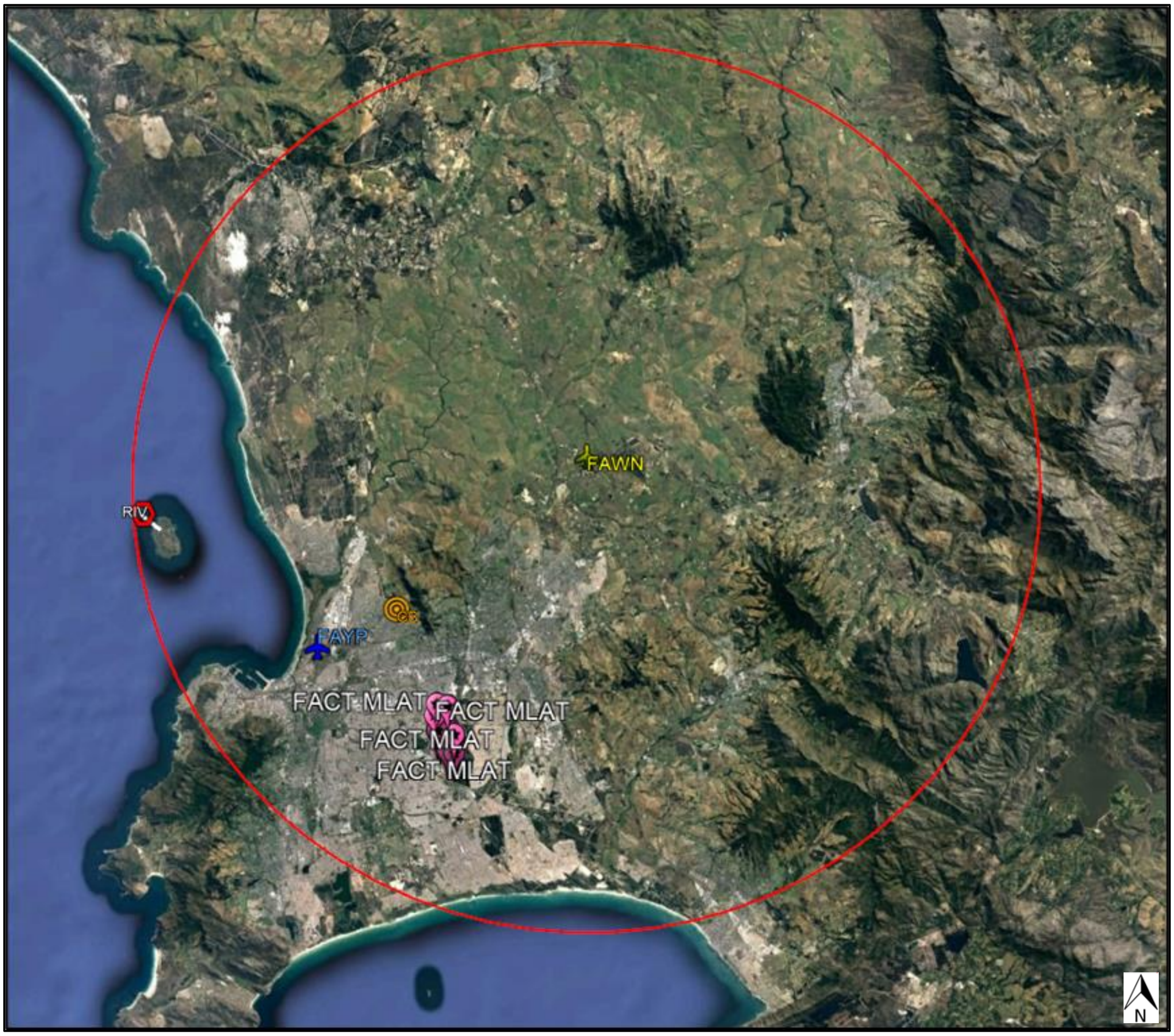


Figure 112: Other civil aviation installations within a 20 nautical miles radius of Cape Winelands Airport site (NACO & ATNS; Civil Aviation Scoping Report, Sept 2023)

<u>Airspace</u>

According to the Civil Aviation Scoping Report *the Cape Winelands Airport does not have any designated airspace and falls within the Cape Town Special Rules Area. This airspace is uncontrolled, Class G airspace. Traffic operating within a 5 nautical mile radius must broadcast their intentions on radio frequency 131.1MHz and the airport callsign is "Winelands Traffic". The Cape Winelands Airport is 399 feet above mean sea level. The joining altitude for air traffic is restricted to 2000 feet above mean sea level because of the Cape Town Terminal Control Area (TMA) A which starts from 2500 feet above sea level above Cape Winelands Airport.*

Nearby Cape Town International Airport (CTIA) operates commercial (passenger and freight), general aviation and training flights on its primary runway (01/19) and its secondary runway (16/34). The South

African Air Force (SAAF) operates military flights from Air Force Base Ysterplaat on its single runway (02/20)

The airspace above Cape Town has been developed predominantly to accommodate air traffic to and from CTIA. Other airspace in the vicinity is mostly associated with military and/or state flights, i.e., Ysterplaat, Langebaan, Overberg, etc.

According to the Civil Aviation Baseline and Scoping report "*it should be noted that Cape Town International Airport (FACT) is the main aerodrome in the vicinity of CWA. This airport currently operates two runways, runway 01-19 for both Instrument Flight Rule (IFR) and Visual Flight Rule (VFR) traffic, and runway 16-34 for VFR traffic and/or emergency traffic.*

According to a presentation by Airports Company South Africa (ACSA) to the Western Cape Parliamentary Committee for Finance, Economic Opportunities and Tourism on 11 September 2019, "environmental authorisation" for a new realigned runway had been obtained and construction was expected to start in early 2020. It is understood that this new realigned runway would have designation 18-36 and that the design of the runway, and associated flight procedures has not been completed to date."

The CTIA airspace is served by five inbound gates or feeder fixes (ERDAS, GETEN, ASPIK, EVUKI & KODES) and three outbound gates or feeder fixes (IMSOM, TETAN & OKTED). Seven inbound procedures and seven outbound procedures are divided between runway 01 and runway 19. Limited procedures are associated with the secondary runway 16/34. The withdrawal of RIV has suspended numerous procedures and may not be used within the CTIA airspace. The inbound/arrival procedures connect with a precision approach (Instrument Landing System (ILS) Category II) to accommodate instrument landings during adverse weather conditions on runway 01 or runway 19. Runway 01 also hosts a non-precision approach for less adverse but marginal weather conditions. Runways 16 and 34 do not have any associated approaches.

Cape Town airspace is divided into a control area (CTA), six terminal control areas (TMA A-F) and a control zone (CTR) protecting aircraft on the various procedures. During visual meteorologic conditions standard published visual flight rule routes will accommodate air traffic operating between Cape Town International and Cape Winelands Airport.

The Cape Winelands Airport has no instrument procedures serving the airport and therefore being referred to as a VFR airport allowing visual procedures for landing. Aircraft operating under instrument flight rules and during instrument meteorologic conditions will have to conduct an approach at CTIA and thereafter fly under special visual flight rules below cloud to Cape Winelands Airport. During visual met conditions an instrument flight may continue under visual flight rules after overflying Cape Winelands airport and/or reporting it in sight. Instrument flights departing from Cape Winelands will have to depart under visual conditions and request to join controlled airspace to acquire an instrument joining clearance from Cape Town Air Traffic Control.

7.8.2 Obstacle Evaluation Survey (OLS)

An evaluation of the natural and man-made constructions inside and outside the CWA boundary (Refer Appendix 18 Annex 14 Obstacle Evaluation Survey / OLS) was conducted to determine the limitations on the distance available for take-off and landing and on the range of meteorological conditions in which take-off and landing can be undertaken. Certain areas of the local airspace are regarded as integral parts of the aerodrome environment and the degree of freedom from obstacles in these areas is very important.

The survey included:

a. Any object that stands on, or stands above, the specified surface of an obstacle restriction area which comprises the runway strips, runway end safety areas, clearways and taxiway strips, and,
b. Any object that penetrates the ICAO Annex 14 Obstacle Limitation Surfaces (OLS), a series of surfaces that set the height limits of objects, around an aerodrome.

The purpose of the OLS is to define the volume of airspace that should be ideally kept free or safeguarded from obstacles, and to take the necessary measures to ensure the safety of aircraft, and thereby the passengers and crews aboard them, while taking-off or landing, or while flying in the vicinity of an airport. This is achieved by a process of checking proposed developments to:

- Protect the blocks of air through which aircraft fly, by preventing penetration of these surfaces' lower limits;
- Protect the integrity of radar and other electronic aids to air navigation, by preventing reflections and diffractions of the radio signals involved;
- Protect visual aids, such as Approach and Runway lighting, by preventing them from being obscured, or preventing the installation of other lights which could be confused for them.

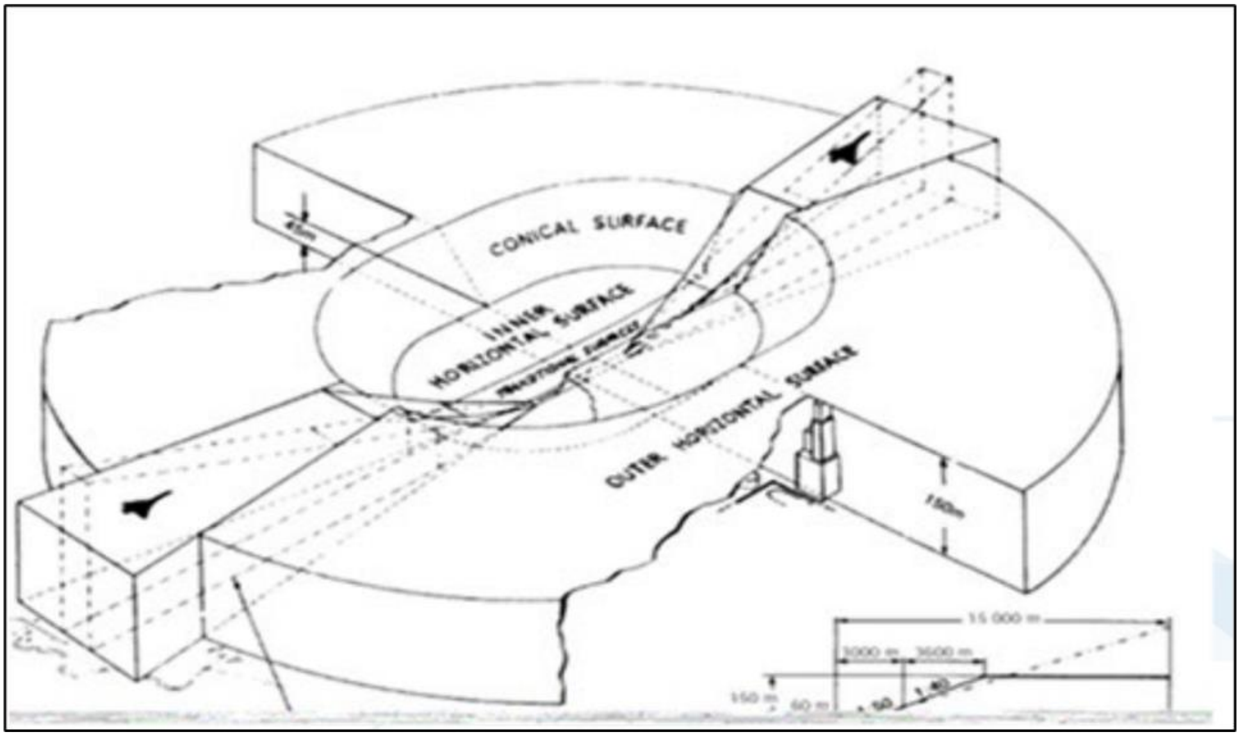


Figure 113: The Annex 14 volume 1 Obstacle Limitation Surfaces (OLS) protects aircraft for 15 KM radius around every aerodrome (ATNS, ICAO Amended Annex 14 OLS Report, Oct 2022)

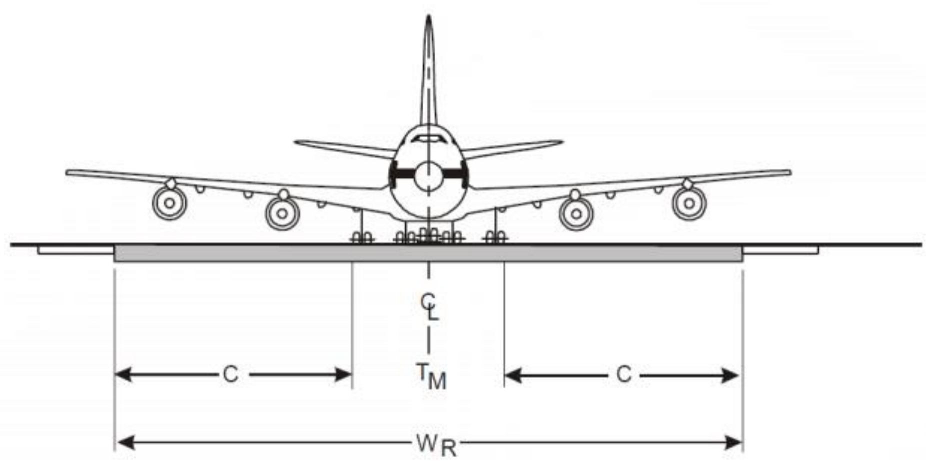
To determine the extent of the lateral, longitudinal, and sloping planes of the airspace and ground surfaces surrounding each runway that should be kept free of obstacles, a reference code is established. This code comprises of:

- A number determined by selecting the higher value of the declared TODA or ASDA.
- A letter which corresponds to the wingspan or main gear outer-wheel span, whichever is the more demanding, of the largest aircraft likely to be operating at the aerodrome.

Table 47: AERODROME REFERENCE CODES (ATNS, ICAO Amended Annex 14 OLS Report, Oct 2022)

Code element 1		Code element 2		
Code number (1)	Aeroplane reference field length (2)	Code letter (3)	Wingspan (4)	Outer main gear wheel span[a] (5)
1	Less than 800 m	A	Up to but not including 15 m	Up to but not including 4.5 m
2	800 m up to but not including 1 200 m	B	15 m up to but not including 24 m	4.5 m up to but not including 6 m
3	1 200 m up to but not including 1 800 m	C	24 m up to but not including 36 m	6 m up to but not including 9 m
4	1 800 m and over	D	36 m up to but not including 52 m	9 m up to but not including 14 m
		E	52 m up to but not including 65 m	9 m up to but not including 14 m
		F	65 m up to but not including 80 m	14 m up to but not including 16 m

a. Distance between the outside edges of the main gear wheels.



A runway is a rectangular area on a land aerodrome prepared for the landing and taking-off of aircraft. Separate criteria apply to a runway serving as a **visual runway** and to a runway serving as **an instrument runway.** The ability to meet the criteria will determine what length of runway may be declared for what purpose.

The length of runway provided is not directly determined by the Code. The aerodrome authority should declare distances for each runway direction. The declared distances are to be approved and promulgated by the RSA CAA.

Table 48: Runway widths for Paved and Unpaved (ATNS, ICAO Amended Annex 14 OLS Report, Oct 2022)

Code number	Code letter					
	A	B	C	D	E	F
1[a]	*18 m*	*18 m*	*23 m*	–	–	–
2[a]	*23 m*	*23 m*	*30 m*	–	–	–
3	*30 m*	*30 m*	*30 m*	*45 m*	–	–
4	–	–	*45 m*	*45 m*	*45 m*	*60 m*

a. The width of a precision approach runway should be not less than 30 m where the code number is 1 or 2.

The combinations of code numbers and letters for which widths are specified have been developed for typical aeroplane characteristics, and the width of a precision approach runway should be not less than 30m where the code number is 1 or 2.

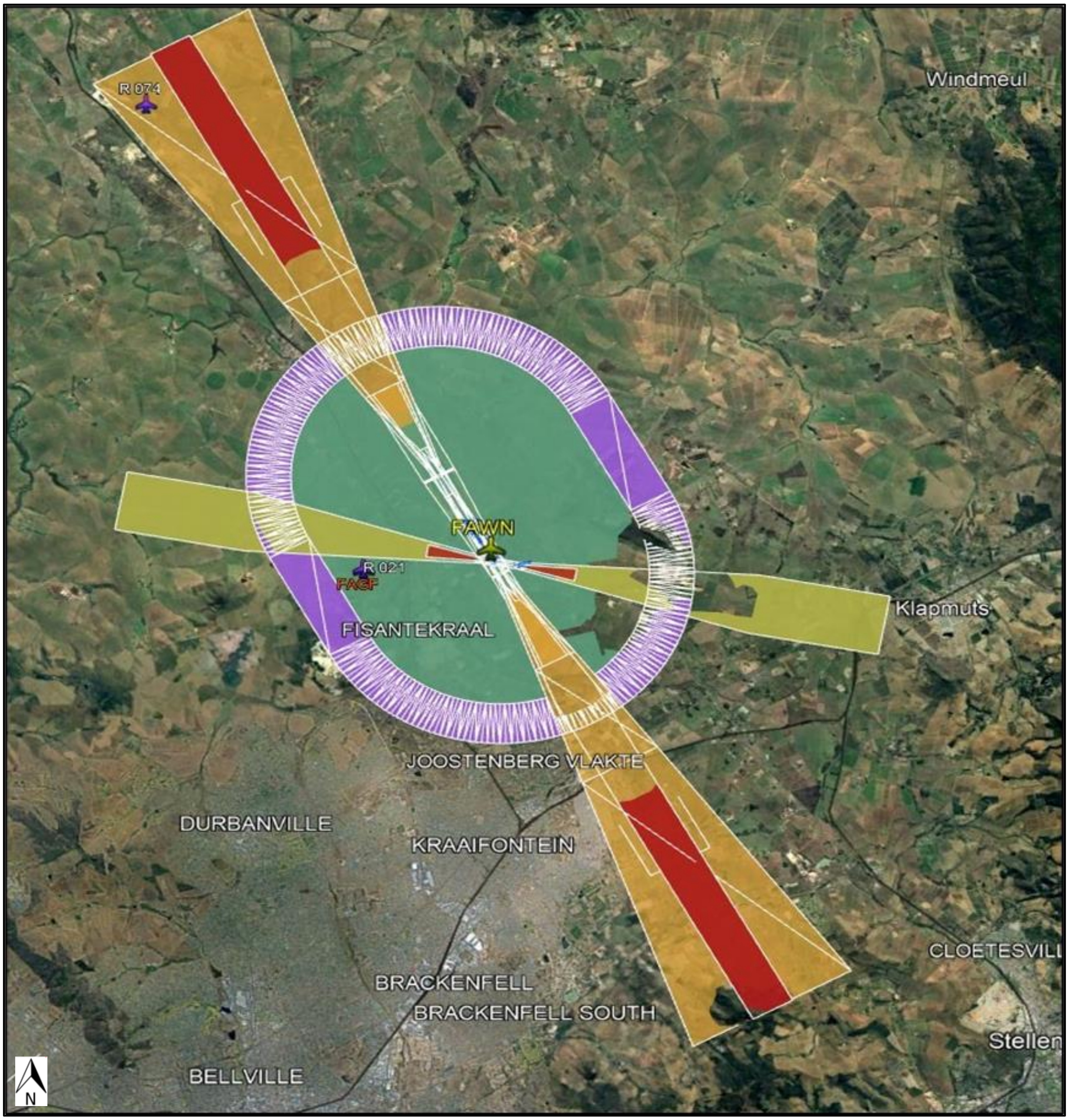


Figure 114: OLS area of survey (overlain onto Google Earth image) (ATNS, ICAO Amended Annex 14 OLS Report, Oct 2022)

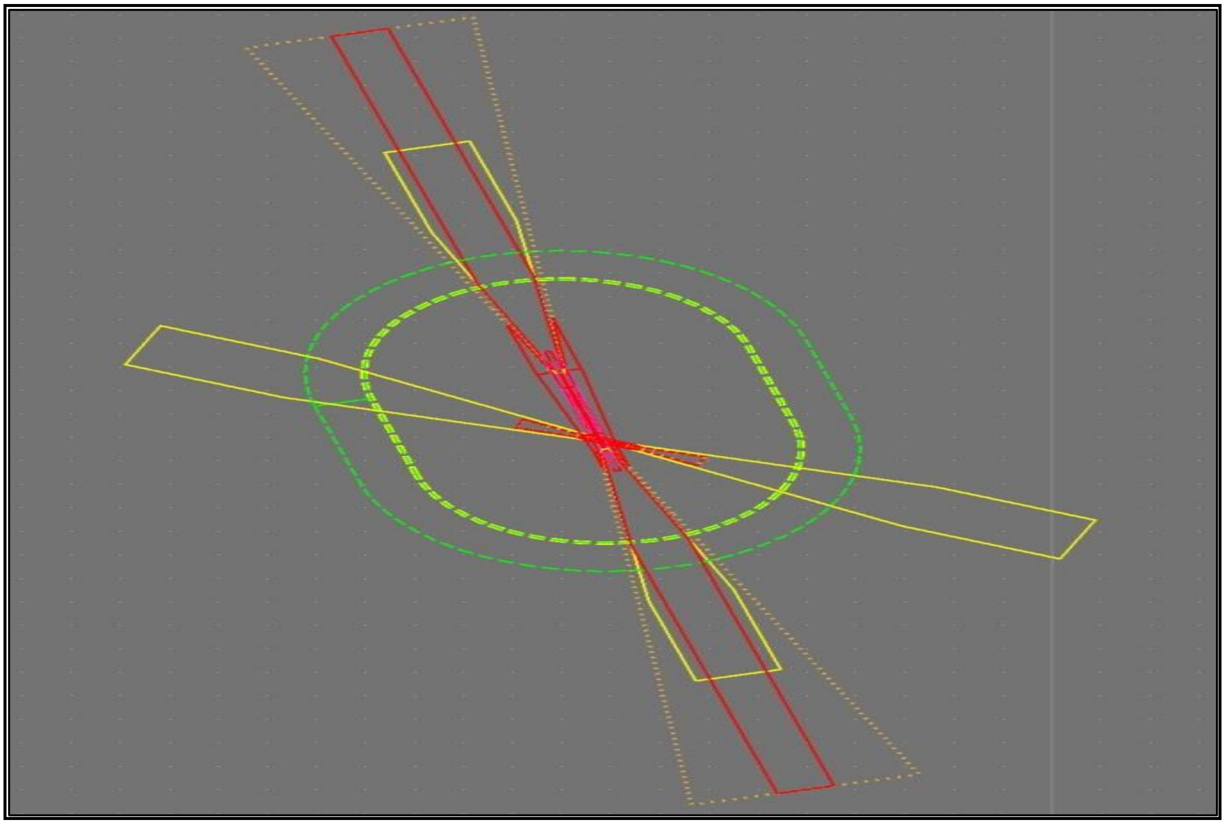


Figure 115: Annex 14 Obstacle Limitation Surfaces (OLS) at CWA (ATNS, ICAO Amended Annex 14 OLS Report, Oct 2022)

The PANS-OPS Obstacle Identification Surfaces (OIS) are generally above the Annex 14 OLS and are designed to safeguard an aircraft from collision with obstacles when the aircraft's flight may be guided solely by instruments in conditions of poor visibility.

Information on any new obstacle must include:

- The nature of the obstacle — for instance structure or machinery;
- Distance and bearing of the obstacle from the start of the take-off end of the runway, if the obstacle is within the take-off area, or the ARP;
- Height of the obstacle in relation to the aerodrome elevation; and
- If it is a temporary obstacle — the time it is an obstacle.

The marking and/or lighting of obstacles are intended to reduce hazards to aircraft by indicating the presence of the obstacles. It does not necessarily reduce operating limitations which may be imposed by an obstacle.

Aeronautical Ground Lighting (AGL) provides flight crew with location, orientation, and alignment information in adverse visibility conditions and at night. Precision Approach Path Indicator (PAPI), as used by the pilot during final approach to land, are normally installed on the left-hand side of the runway, viewed from the approach; a right-hand installation is permitted if it is not practicable to position them on the left or if a second set is required.

All structures and buildings in and around an airport, treated as an obstacle, should be clearly marked, and identified with day and night markings of buildings and obstacles.

The obstacles listed in Table 49 are not clear of the Annex-14 surfaces and need to be considered (in terms of Annex-14 Lighting and Marking) to ensure that the proposed/future procedures at Cape Winelands Airport will be addressed.

Table 49: Obstacles That Penetrate the ANNEX-14 Surfaces for CWA (ATNS, ICAO Amended Annex 14 OLS Report, Oct 2022)

SURFACE	TARGET	OBSTACLE	PENETRATION	LATITUDE	LONGITUDE	ELEVATION
Balked Landing	01	_RWY21 PP5	-15.043	S 33° 45' 32.9882''	E 018° 44' 10.2920''	124.161
Inner transitional	01	_HANGER_A1	-4.492	S 33° 46' 15.2485''	E 018° 44' 29.1453''	133.502
Inner transitional	01	_PP1	-9.011	S 33° 45' 54.6489''	E 018° 44' 22.1157''	126.789
Strip	01-19	_FUEL FARM	-10.055	S 33° 46' 15.8166''	E 018° 44' 31.0346''	130.433
Strip	01-19	_HANGER_2	-5.676	S 33° 46' 13.9655''	E 018° 44' 29.9791''	125.507
Strip	01-19	_HANGER_A1	-13.381	S 33° 46' 15.2485''	E 018° 44' 29.1453''	133.502
Strip	01-19	_MET STATION	-14.495	S 33° 46' 04.8552''	E 018° 44' 23.1048''	131.535
Strip	01-19	_PP1	-12.493	S 33° 45' 54.6489''	E 018° 44' 22.1157''	126.789
Strip	01-19	_PP2	-11.716	S 33° 45' 55.5070''	E 018° 44' 23.9162''	126.341
Strip	01-19	_RWY21 PP2	-12.826	S 33° 45' 34.6972''	E 018° 44' 18.0334''	121.635
Strip	01-19	_RWY21 PP3	-14.229	S 33° 45' 34.0683''	E 018° 44' 15.1213''	122.707
Strip	01-19	_RWY21 PP4	-15.732	S 33° 45' 33.5537''	E 018° 44' 12.8416''	123.945
Strip	01-19	_RWY21 PP5	-16.242	S 33° 45' 32.9882''	E 018° 44' 10.2920''	124.161
Strip	01-19	_RWY21_TREE1	-25.23	S 33° 45' 44.8538''	E 018° 44' 18.5602''	136.744
Strip	01-19	_T64_BLD	-7.88	S 33° 45' 53.9976''	E 018° 44' 22.6102''	122.033
Strip	01-19	_T65_BLD	-7.875	S 33° 45' 51.4390''	E 018° 44' 19.5945''	121.182

Strip	01-19	_TREE_1	-14.034	S 33° 46' 16.9969''	E 018° 44' 32.0501''	134.781
Strip	01-19	_TREE_2	-16.232	S 33° 46' 16.9874''	E 018° 44' 32.1565''	136.983
Strip	01-19	_WINDSOCK MID	-9.089	S 33° 46' 19.7678''	E 018° 44' 25.8315''	130.212
Transitional	01	_HANGER_3	-6.551	S 33° 46' 14.7972''	E 018° 44' 32.4135''	129.829
Transitional	01	_PP3	-10.472	S 33° 45' 55.9201''	E 018° 44' 25.9506''	126.209
Transitional	01	_RWY21 PP1	-4.867	S 33° 45' 35.3422''	E 018° 44' 20.9663''	119.841
Transitional	01	_TANK_2	-0.22	S 33° 46' 13.7969''	E 018° 44' 34.6868''	132.567
Transitional	01	_TREE_3	-8.038	S 33° 46' 17.0056''	E 018° 44' 34.0187''	135.272
Transitional	01	_WATER TANK	-2.685	S 33° 46' 11.0727''	E 018° 44' 32.7418''	130.280
Transitional	01	_HANGER_A4	-4.349	S 33° 46' 12.4504''	E 018° 44' 31.5988''	126.649
Transitional	01	_OFFICE	-5.433	S 33° 46' 11.9595''	E 018° 44' 31.7976''	128.865
Balked Landing	19	_PP1	-1.249	S 33° 45' 54.6489''	E 018° 44' 22.1157''	126.789
Balked Landing	19	_RWY21_TREE1	-21.698	S 33° 45' 44.8538''	E 018° 44' 18.5602''	136.744
TOFPA	19	_W_RESERVOIR	-3.994	S 33° 47' 33.2716''	E 018° 44' 46.1067''	151.944
Transitional	19	_HANGER_3	-6.551	S 33° 46' 14.7972''	E 018° 44' 32.4135''	129.829
Transitional	19	_PP3	-10.472	S 33° 45' 55.9201''	E 018° 44' 25.9506''	126.209
Transitional	19	_RWY21 PP1	-4.867	S 33° 45' 35.3422''	E 018° 44' 20.9663''	119.841
Transitional	19	_TANK_2	-0.22	S 33° 46' 13.7969''	E 018° 44' 34.6868''	132.567
Transitional	19	_TREE_3	-8.038	S 33° 46' 17.0056''	E 018° 44' 34.0187''	135.272

Transitional	19	_WATER TANK	-2.685	S 33° 46' 11.0727''	E 018° 44' 32.7418''	130.280
Transitional	19	_HANGER_A4	-4.349	S 33° 46' 12.4504''	E 018° 44' 31.5988''	126.649
Transitional	19	_OFFICE	-5.433	S 33° 46' 11.9595''	E 018° 44' 31.7976''	128.865
Take-off Climb	14	_RWY32_TREE4	-11.374	S 33° 46' 28.5783''	E 018° 44' 52.6322''	141.078
Take-off Climb	14	_RWY32_TREE5	-4.528	S 33° 46' 28.3862''	E 018° 44' 53.6418''	135.288
Take-off Climb	14	_RWY32_TREE6	-2.914	S 33° 46' 28.0738''	E 018° 44' 55.0798''	135.154
TOFPA	14	_RWY32 F1	-1.487	S 33° 46' 26.0294''	E 018° 44' 49.0623''	126.269
TOFPA	14	_RWY32_TREE2	-15.309	S 33° 46' 28.8997''	E 018° 44' 50.7390''	141.005
TOFPA	14	_RWY32_TREE3	-15.126	S 33° 46' 28.7279''	E 018° 44' 51.7451''	141.078
TOFPA	14	_RWY32_TREE4	-14.901	S 33° 46' 28.5783''	E 018° 44' 52.6322''	141.078
TOFPA	14	_RWY32_TREE5	-8.857	S 33° 46' 28.3862''	E 018° 44' 53.6418''	135.288
TOFPA	14	_RWY32_TREE6	-8.368	S 33° 46' 28.0738''	E 018° 44' 55.0798''	135.154
TOFPA	14	_RWY32_TREE1	-9.958	S 33° 46' 29.1705''	E 018° 44' 49.1117''	135.239
Strip	14-32	_RWY32 F1	-1.679	S 33° 46' 26.0294''	E 018° 44' 49.0623''	126.269
Transitional	14	_TREE_1	-2.608	S 33° 46' 16.9969''	E 018° 44' 32.0501''	134.781
Transitional	14	_TREE_2	-4.519	S 33° 46' 16.9874''	E 018° 44' 32.1565''	136.983
Transitional	14	_WINDSOCK MID	-0.394	S 33° 46' 19.7678''	E 018° 44' 25.8315''	130.212
Approach	32	_RWY32_TREE4	-11.374	S 33° 46' 28.5783''	E 018° 44' 52.6322''	141.078
Approach	32	_RWY32_TREE5	-4.528	S 33° 46' 28.3862''	E 018° 44' 53.6418''	135.288

Approach	32	_RWY32_TREE6	-2.914	S 33° 46' 28.0738''	E 018° 44' 55.0798''	135.154
Transitional	32	_RWY32_TREE2	-9.558	S 33° 46' 28.8997''	E 018° 44' 50.7390''	141.005
Transitional	32	_RWY32_TREE3	-12.119	S 33° 46' 28.7279''	E 018° 44' 51.7451''	141.078
Transitional	32	_TREE_1	-2.608	S 33° 46' 16.9969''	E 018° 44' 32.0501''	134.781
Transitional	32	_TREE_2	-4.519	S 33° 46' 16.9874''	E 018° 44' 32.1565''	136.983
Transitional	32	_WINDSOCK MID	-0.394	S 33° 46' 19.7678''	E 018° 44' 25.8315''	130.212
Inner Horizontal	FAWN	_RWY01_PYLON MID1	-6.241	S 33° 48' 03.3797''	E 018° 45' 25.0766''	145.591
Inner Horizontal	FAWN	_RWY01_PYLON MID2	-10.101	S 33° 48' 03.9818''	E 018° 45' 09.9010''	149.451
Inner Horizontal	FAWN	_RWY01_PYLON MID3	-7.808	S 33° 48' 04.5311''	E 018° 44' 56.6150''	147.158
Inner Horizontal	FAWN	_RWY32_TREE2	-1.655	S 33° 46' 28.8997''	E 018° 44' 50.7390''	141.005
Inner Horizontal	FAWN	_RWY32_TREE3	-1.728	S 33° 46' 28.7279''	E 018° 44' 51.7451''	141.078
Inner Horizontal	FAWN	_RWY32_TREE4	-1.728	S 33° 46' 28.5783''	E 018° 44' 52.6322''	141.078
Inner Horizontal	FAWN	_STEEL TANK	-3.989	S 33° 46' 48.8511''	E 018° 43' 58.7999''	143.339
Inner Horizontal	FAWN	_W_RESEVOIR	-12.594	S 33° 47' 33.2716''	E 018° 44' 46.1067''	151.944
Conical	FAWN	_TRANS_1 TWR	-83.139	S 33° 47' 21.1688''	E 018° 41' 46.3120''	247.647
Conical	FAWN	_TRANS_2 TWR	-87.374	S 33° 47' 14.2176''	E 018° 41' 41.2943''	254.510
Conical	FAWN	_TRANS_3 TWR	-81.581	S 33° 47' 18.4075''	E 018° 41' 32.9621''	260.895

7.8.3 Concept of Operations (CONOPS)

As previously discussed, at this stage there is no airspace assigned to CWA and only VFR operations take place at the airport, mostly for flight school and private aviation activities.

The Concept of Operations (CONOPS) outlines the seamless integration of the airspace around CWA with the existing controlled airspace around Cape Town, ensure safe, efficient, and harmonious air traffic management while accommodating the growing demand for air travel and aviation activities in the region, while always adhering to the South African National Airspace Masterplan (NAMP).

The NAMP is a comprehensive and strategic document developed by the SACAA that guides the development, management, and optimization of its entire airspace system, with the primary purpose to provide a long-term vision and framework for the safe, efficient, and sustainable use of the national airspace to meet current and future air traffic demand.

Surrounding civil aviation sites identified include many small aerodromes, as well as model aircraft sites, in the area near CWA, but the key aerodromes to be considered in the CONOPS are CTIA (FACT), Ysterplaat Airforce Base (FAYP) and Stellenbosch Airfield (FASH). During the in-process Scoping PPP the need to include Morningstar Airfield in the CONOPS was raised by I&APs and as a result the CONOPS was updated for the EIA Phase (refer updated CONOPS Appendix 19).

In terms of current airspace (refer Figure 116 to Figure 121) the TMA was determined for various scenarios.

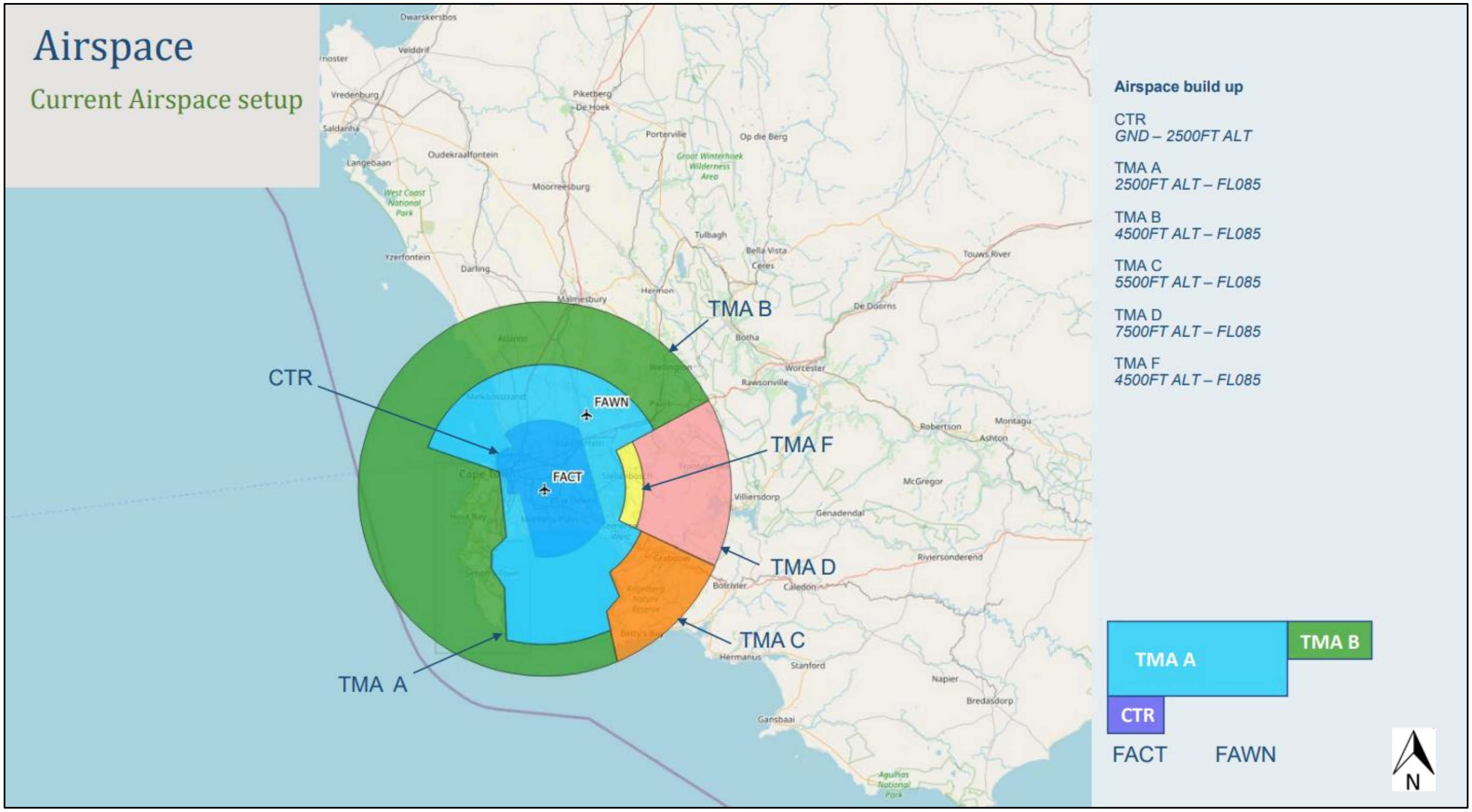


Figure 116: Current Airspace indicating CTR, TMA A, B, C, D, F (NACO, ATNS, NLR, CONOPS report, Oct 2022)

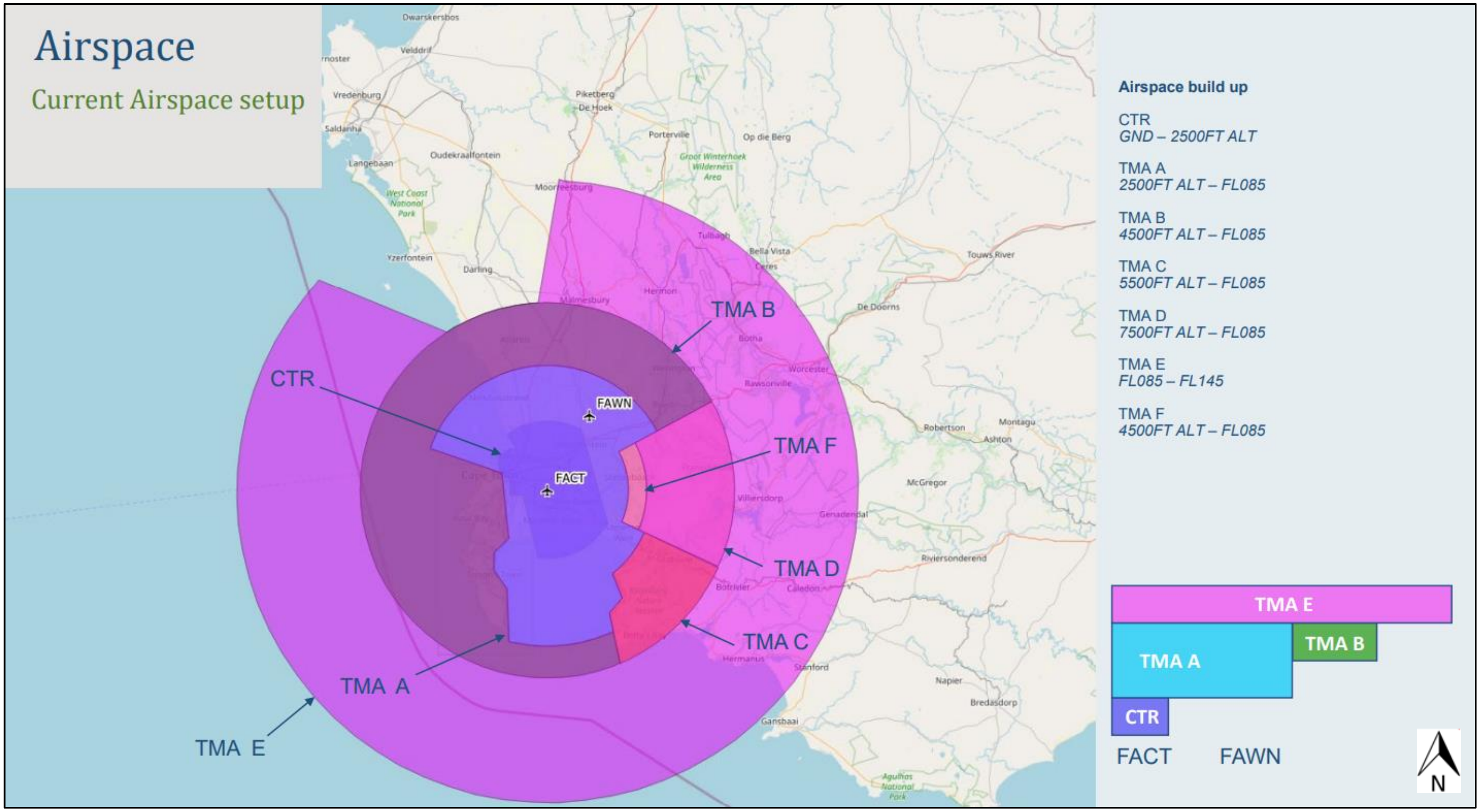


Figure 117: Current Airspace indicating TMA E in addition (NACO, ATNS, NLR, CONOPS report, Oct 2022)

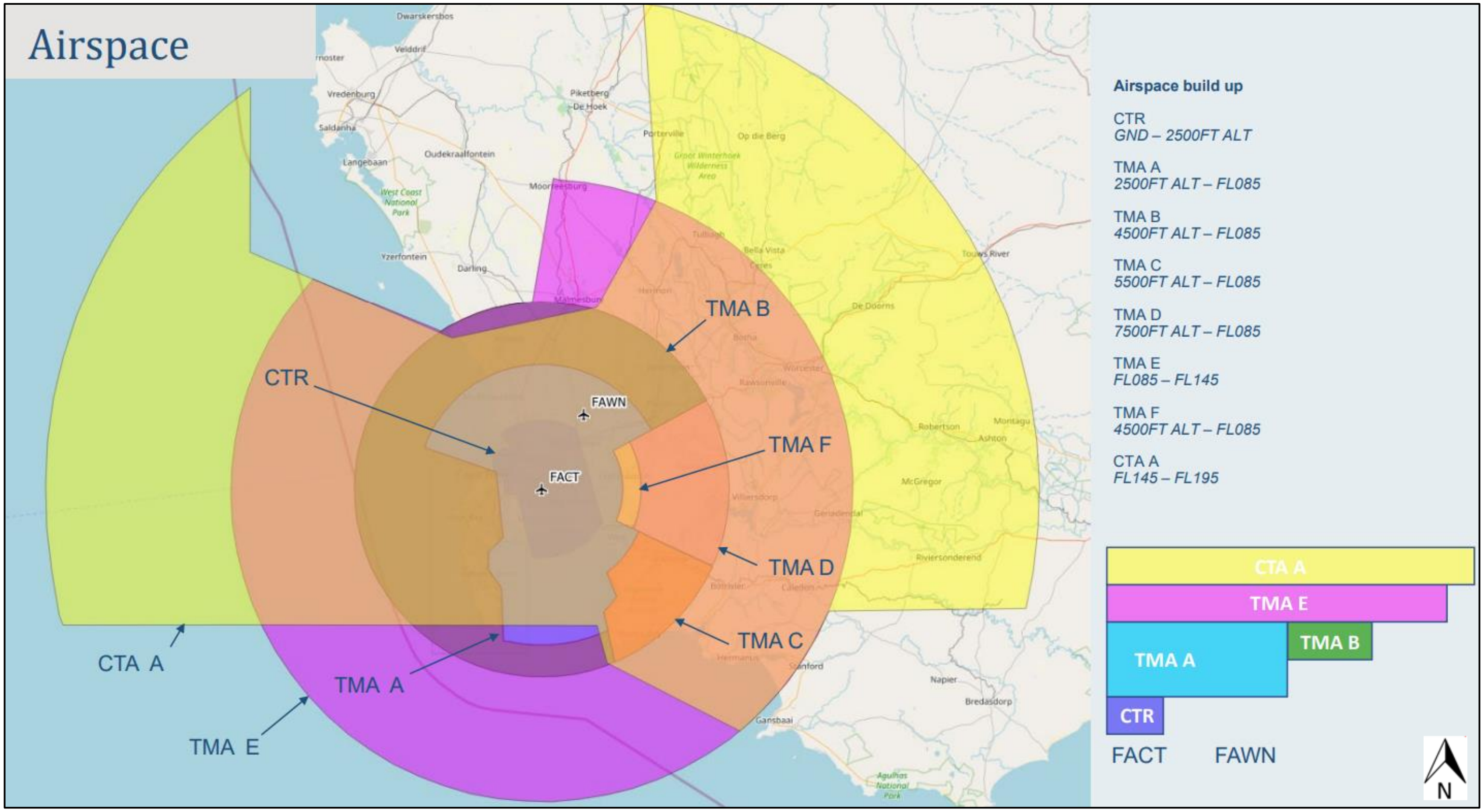


Figure 118: Current Airspace indicating CTA A in addition (NACO, ATNS, NLR, CONOPS report, Oct 2022)

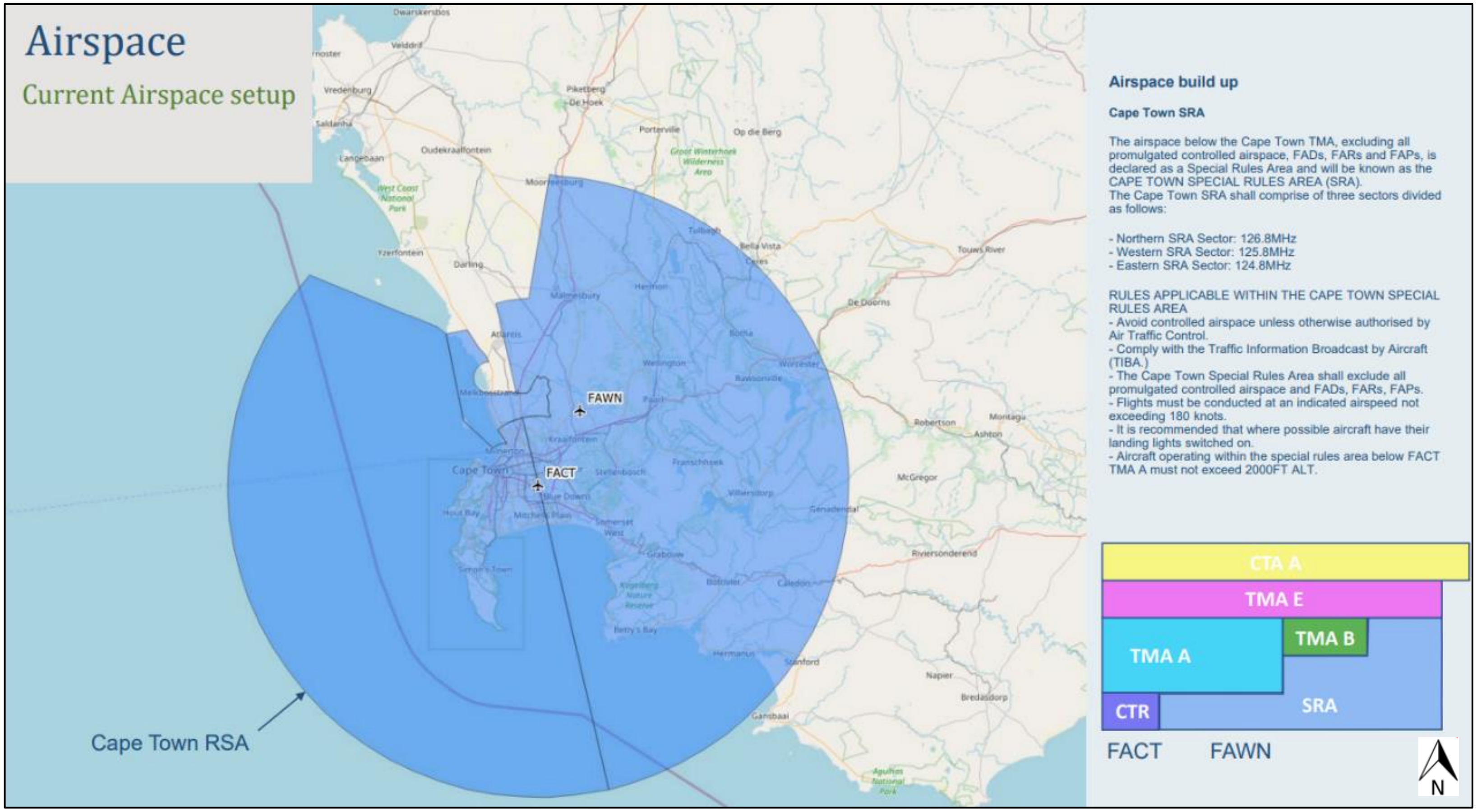


Figure 119:Current Airspace indicating Special Rules Area (NACO, ATNS, NLR, CONOPS report, Oct 2022)

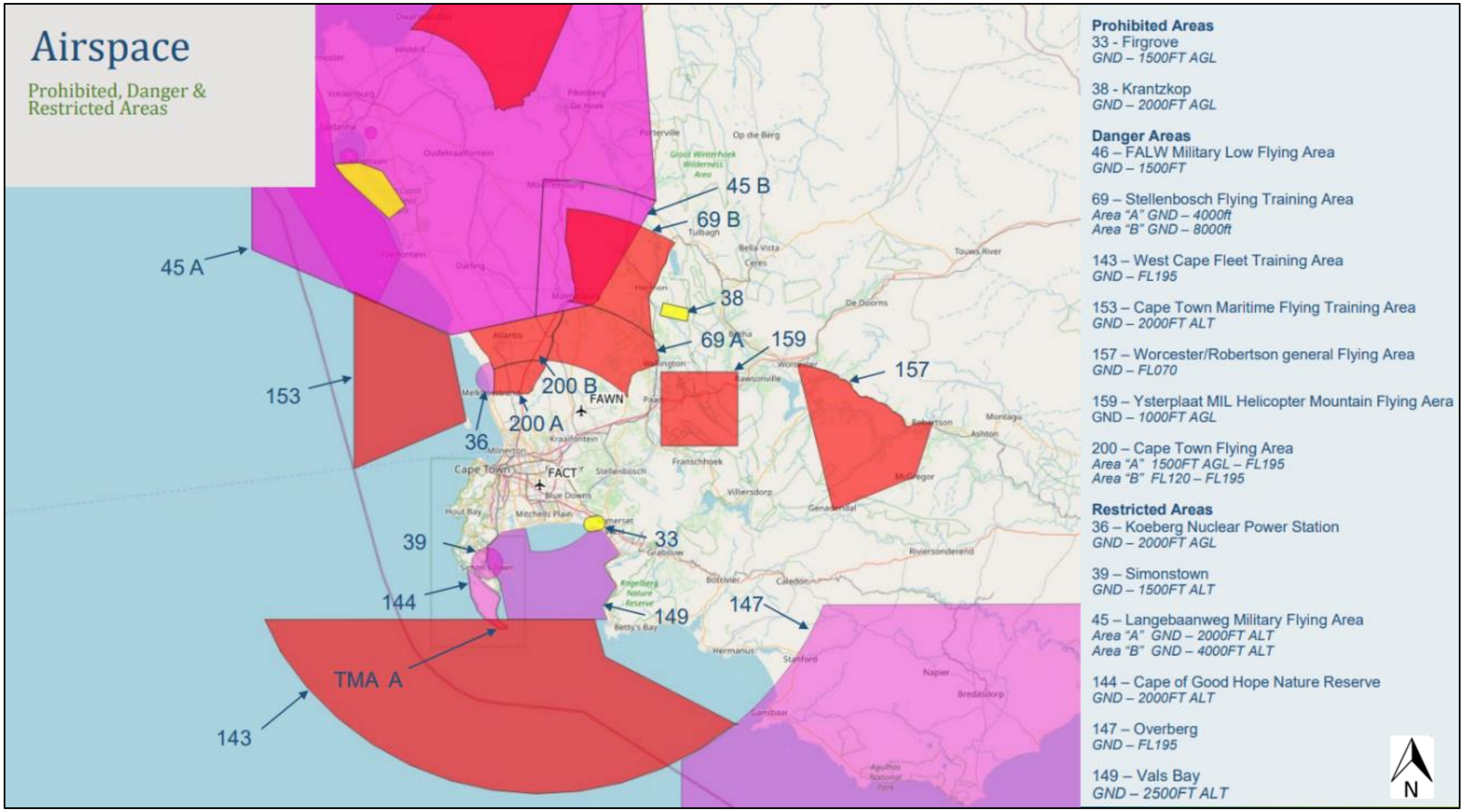


Figure 120: Current Airspace indicating Prohibited, Danger and Restricted Areas (NACO, ATNS, NLR, CONOPS report, Oct 2022)

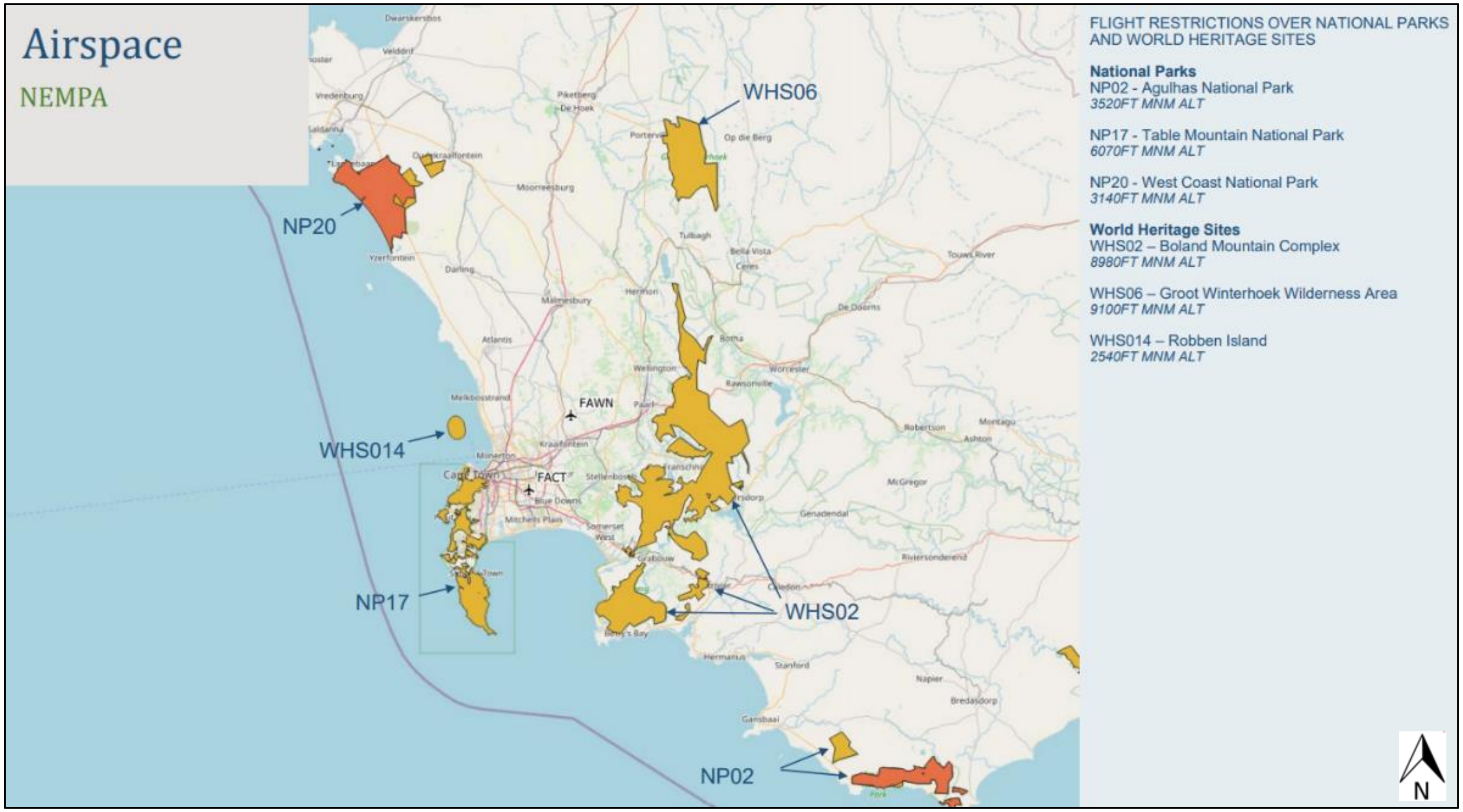


Figure 121: Current Airspace indicating NEMPA areas (NACO, ATNS, NLR, CONOPS report, Oct 2022)

The OLS report (as discussed in text above) identified 69 obstacles which penetrate the Annex 14 surfaces (refer Table 49).

Key aerodromes CTIA (FACT), Ysterplaat Airforce Base (FAYP), Morningstar Airfield (ZA-0120) and Stellenbosch Airfield (FASH):

a. Cape Town International Airport (FACT):

   CTIA is currently the primary international airport serving CoCT, handling international, regional, and domestic flights.

   The runway configuration consists out of one main runway 01/19 and one smaller cross runway 16/34.

RWY NR [-]	Dimensions [m]	Surface [-]
01/19	3201 x 61	Asphalt
16/34	1701 x 16	Asphalt

Figure 122: Aerial image of FACT and plan showing the two runways (NACO, ATNS, NLR, CONOPS report, Oct 2022)

b. Stellenbosch Aerodrome (FASH):

   The Aerodrome Stellenbosch is a small VFR airfield with only one runway 01/19, used by club members and for training.

Figure 123: Aerial image of FASH and plan showing the runway (NACO, ATNS, NLR, CONOPS report, Oct 2022)

c. Ysterplaat Airforce Base (FAYP)

The Airforce base is used mostly for maritime patrol, and in case of an emergency as there is no VFR or IFR procedures. It has only one main runway 02/20.

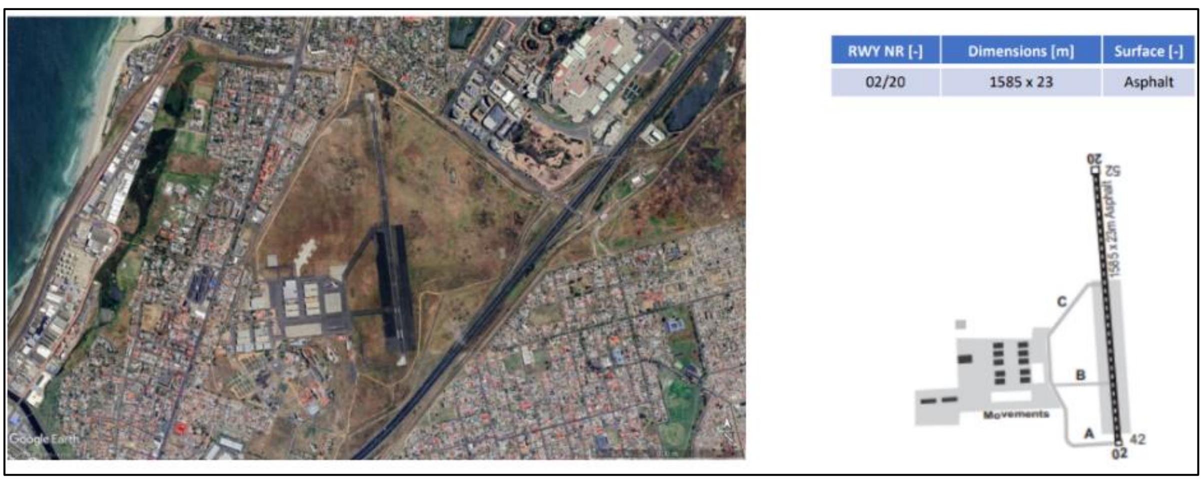


Figure 124: Aerial image of FAYP and plan showing the runway (NACO, ATNS, NLR, CONOPS report, Oct 2022)

d. Morningstar Airfield (ZA-0120)

Morningstar Airfield is a small VFR airfield located north of Cape Town along the West Coast. It is used by light aircraft for recreational, training and fire and rescue operations.

It has only one runway 02/20.

RWY NR [-]	Dimensions [m]	Surface [-]
02/20	645 length	Asphalt

Figure 125: Aerial image of ZA-0120 and plan showing the runway (NACO, ATNS, NLR, CONOPS report, Oct 2024)

Radio Model Aircraft sites

Existing Radio Model Aircraft sites in the vicinity of CWA were determined and are restricted to 400FT AGL, but Boland Model Aircraft Club occasionally operates at 1000FT AGL.

Figure 126: Regional image showing existing Radio Model Aircraft sites in the vicinity of CWA (NACO, ATNS, NLR, CONOPS report, Oct 2022)

Cape Town International Airport operations (FACT):

According to the CONOPS report Standard VFR traffic routes and operations for FACT include:

1. Departures and Arrivals via:
    1. Kenilworth
    2. Bottleray hills
    3. Coastwise
2. Compliance with the associated rules pertaining to VFR Traffic Routes.
3. No VFR traffic may approach from the North of FACT.

Figure 127 illustrates FACT traffic flow during runway 19 operation (Note: When the runway direction changes the routes also swop around to accommodate the traffic flows).

Due to the prevailing wind direction RWY 19 is mainly used.

According to the CONOPS report *inbound aircraft will follow its assigned STAR, and at a certain distance from the CTV VOR* (Refer blue circles Figure 128 *aircraft will turn to a heading of 010°.*

From there the aircraft will be vectored to RWY19, and depending on the weather the aircraft will:

- *Land visually (VMC) or*
- *Perform an ILS approach (IMC).*

Outbound aircraft will follow its assigned SID.

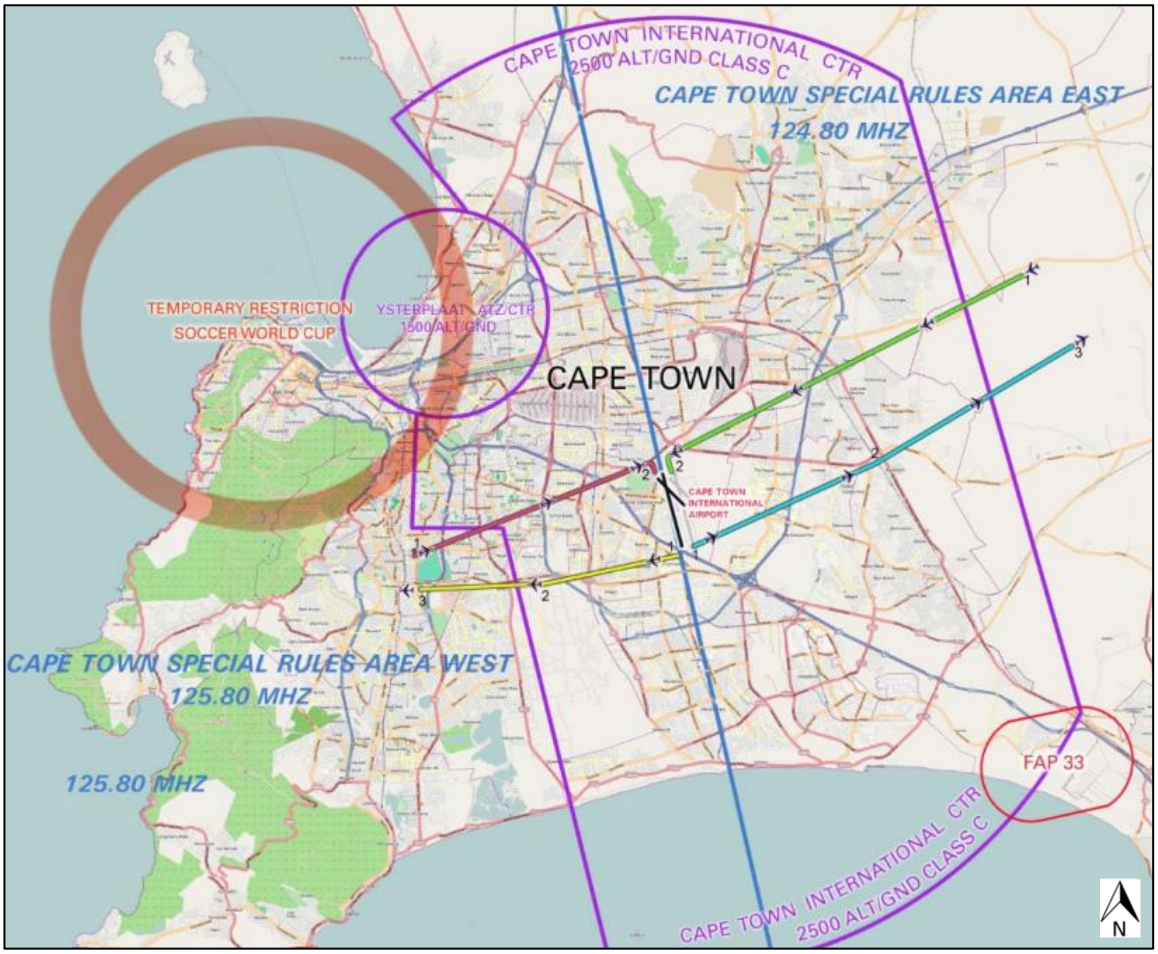


Figure 127: FACT traffic flow during runway 19 operation (NACO, ATNS, NLR, CONOPS report, Oct 2022)

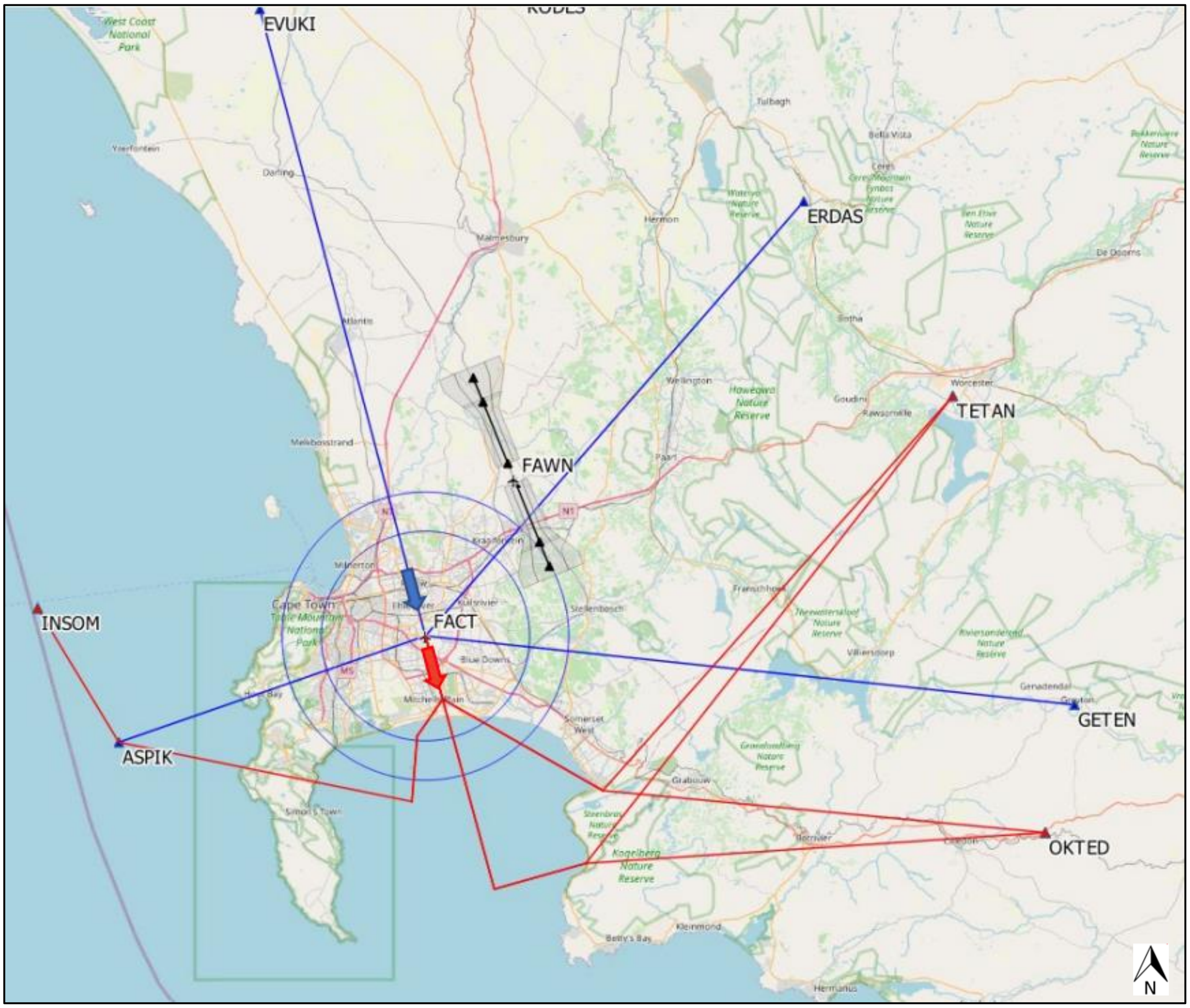


Figure 128: Schematic overview of the procedures for RWY 19 at FACT. Arrivals are shown in blue and departures in red (NACO, ATNS, NLR, CONOPS report, Oct 2022)

<u>Cape Winelands Airport operations (FAWN):</u>

According to the CONOPS report in terms of *procedural perspective the FAWN VFR traffic should not interfere with the FACT IFR traffic since the VFR operation is below the TMA A and outside the CTR of FACT. Local pilots operating from FAWN adhere to this, however, pilots who are not familiar at FAWN tend to fly at a higher altitude. Therefore, the crossing IFR traffic is instructed to fly at a higher altitude.*

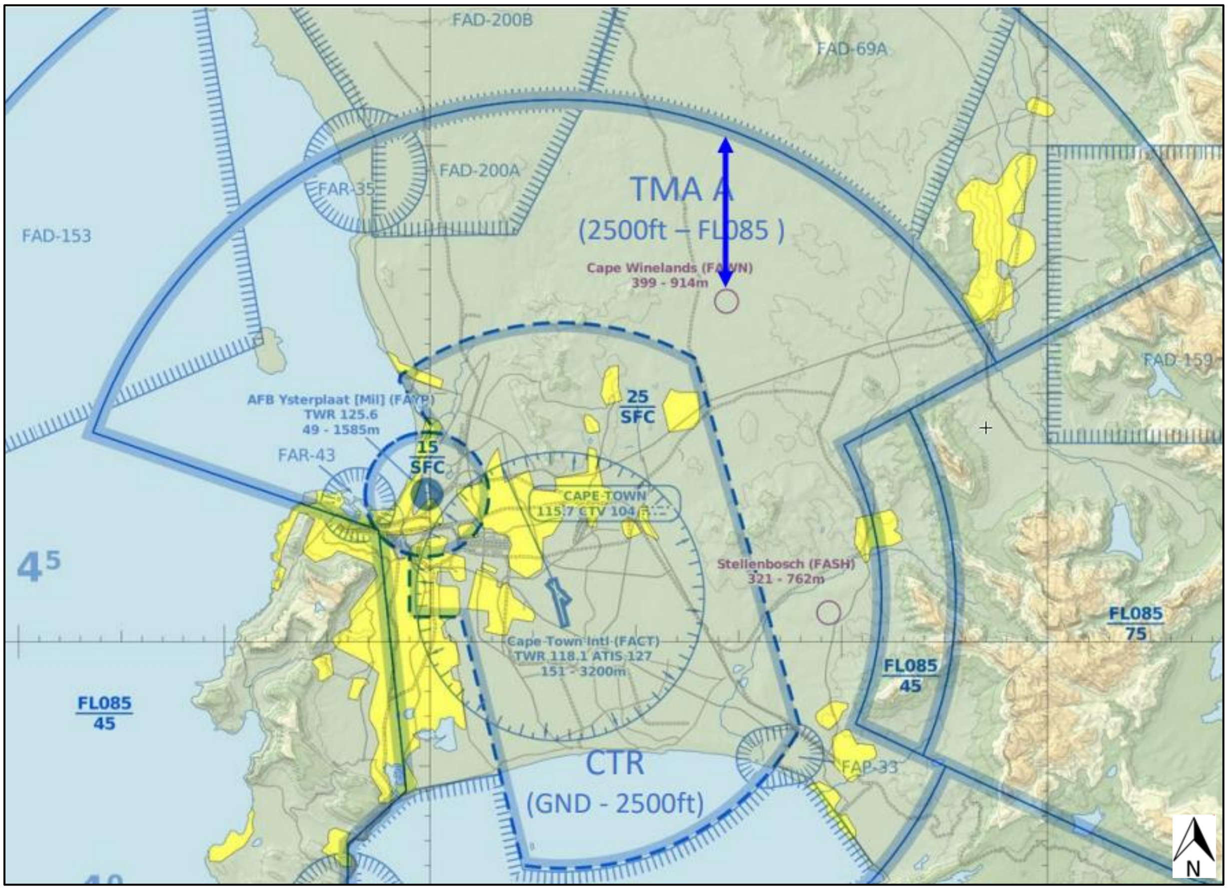


Figure 129: VFR aeronautical chart indicating FAWN (NACO, ATNS, NLR, CONOPS report, Oct 2022)

<u>Stellenbosch Aerodrome operations (FASH):</u>

According to the CONOPS report *FASH is considered a VFR airport with traffic from predominantly club members. VFR traffic operating at FASH is considered not to interfere with the FACT IFR traffic since it operates outside of controlled airspace in the FACT SRA.*

VFR traffic is considered mostly training flights between FASH and FAD69A and/or FAD-69B (Stellenbosch Flying Training Area).

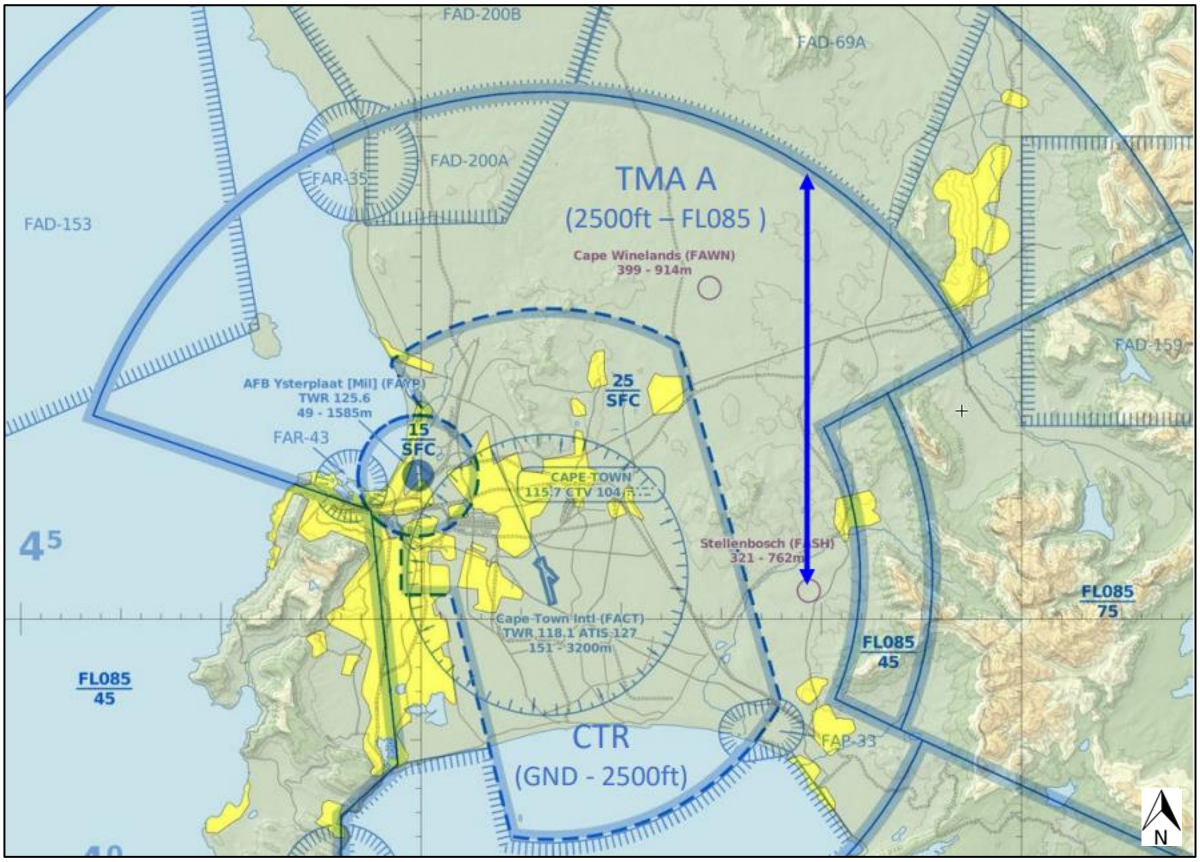


Figure 130: VFR aeronautical chart indicating FASH (NACO, ATNS, NLR, CONOPS report, Oct 2022)

<u>Ysterplaat Airforce Base operations (FAYP):</u>

According to the CONOPS report operations at FAYP consists mostly of Military/State traffic allowed to land and/or take-off at Ysterplaat. No IFR procedures exist and there are no published VFR procedures.

It is mostly VFR traffic operating within / through the Ysterplaat ATZ with on average 433 movements per month (landings, take offs, overflights, local flights).

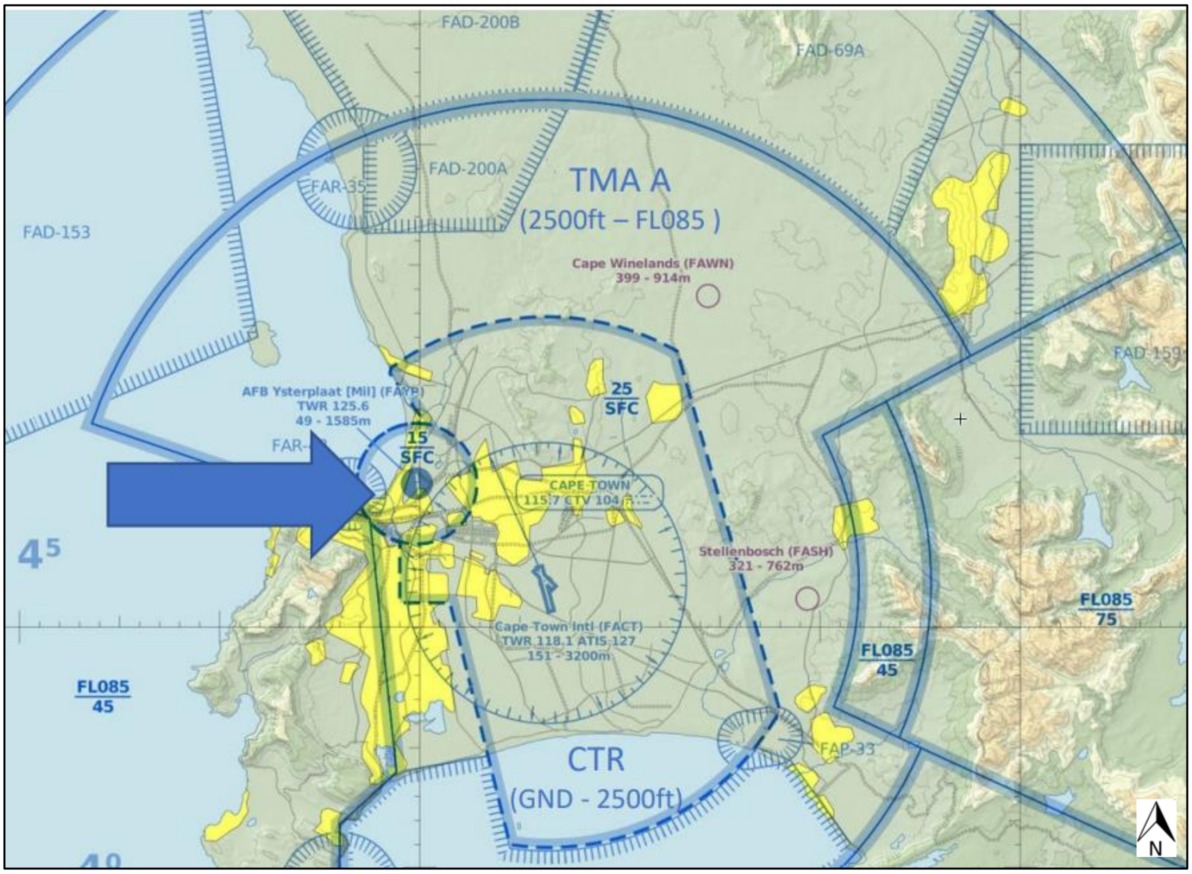


Figure 131: VFR aeronautical chart indicating Ysterplaat airspace (ATZ) (NACO, ATNS, NLR, CONOPS report, Oct 2022)

<u>Morningstar Airfield</u>

VFR traffic is predominantly from club members, and the VFR traffic operating at Morningstar is considered not to interfere with the FACT IFR traffic since it operates outside of controlled airspace in the FACT SRA.

VFR traffic is considered mostly recreational and training flights between Morningstar, FASH and FAD-69Aand/or FAD-69B (Stellenbosch Flying Training Area).

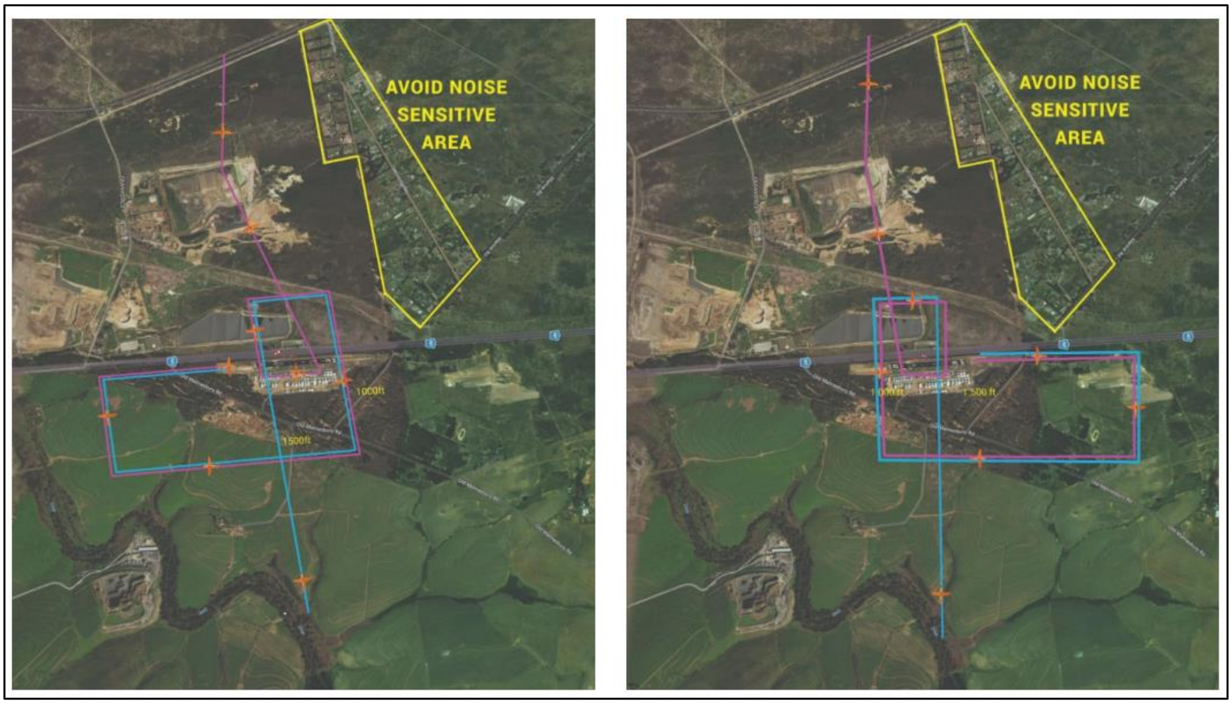


Figure 132: Charts indicating joining for Runway 02 (left) and 20 (right) - https://morningstarflyingclub.co.za/visiting-aircraft/ (NACO, ATNS, NLR, CONOPS report, Oct 2024)

VFR traffic plays a vital role in the Cape Town area, and Morningstar and FASH have extensive GA activities, including the number of active members, aircraft hangars, and training schools, necessitate a thorough reassessment of GA activity in the vicinity of CWA.

The CWA airspace design will incorporate a detailed assessment of these operations to accurately reflect their impact on safety and efficiency. This will involve a detailed traffic assessment, covering the nature of flights, aircraft types, flight durations, and traffic density. The airspace design will also include specific routing considerations for VFR traffic to ensure that VFR routes are planned alongside Instrument Flight Rules (IFR) routes to prevent congestion and maintain safety.

Indicative VFR traffic flows avoiding FAWN

The Airspace CONOPS aims to propose a comprehensive approach to flight operations at the airport, within the context of the existing situation and future developments, and within the context of its strategic objectives, the following operational requirements should be in place:

- Enable independent operations of FAWN and FACT,
- Minimize changes to the existing situation in the region,

- Minimize ATCO workload by simplifying ATC operations.

IFR flight procedures will have to be developed, along with ILS approach procedures to enable FAWN to serve as an alternate for FACT.

Proposed instrument flight procedures (RWY 01 & RWY 19) include:

- RNP approach procedures
- ILS approach procedures
- RNAV SIDs (standard instrument departure procedures)
- RNAV STARs (standard terminal arrival routes)

The FAWN IFR traffic can potentially merge with FACT IFR traffic, and the departures from FAWN can be merged into the SIDs originating from FACT, to allow the FACT operation and ATM system around it to function in principle as is, with no or minor adjustments towards the general concept of FACT.

A Total Airspace and Airport Modeler (TAAM) simulation of the proposed CONOPS will enable visualization and further analysis and allows analysis of current and future airspace operations.

According to the CONOPS report *the airspace must be (re-)designed to contain the procedures at FAWN, taking into account the required capacity, all the various traffic flows and the existing airspace around FACT. Many factors affect the airspace capacity and the impact each these factors could have is highly dependent of the local circumstances.*

As FAWN will be a Code 4E instrument approach runway Navigational Aid (Navaids) are considered for FAWN:

1. Instrument Landing System (ILS).
2. Ground-Based Augmentation System (GBAS).
3. Doppler Very High Frequency (VHF) Omni Directional Range (DVOR).
4. Distance Measurement Equipment (DME).

Added to the above is the need to develop visual aids for low visibility conditions and guidance for aircrafts (aeronautical ground lighting and signage).

A combination of digital and conventional ATM Solutions is proposed for FAWN:

- Wireless Telecommunications/Radio systems (VHF/UHF)
- The Voice Communication Control System (VCCS)
- Digital Voice Recording System (DVRS)
- Crash Alarm System (CAS)
- Dynamic Automatic Terminal Information Service (D-ATIS)
- Aeronautical Message Handling System (AMHS)

According to the CONOPS report *virtually all modern controlled airports are equipped with a staffed tower to provide air traffic services to operate and maintain arrival, departure and ground movement for commercial and non-commercial aircrafts. However, increasing pressure to reduce costs and modernize service is compelling Air Navigation Service Providers (ANSPs) to rethink the status quo and to explore new concepts for air traffic management (ATM), such as remote tower solutions (RTS).*

Local ATC will be required at FAWN to operate the proposed controlled airspace. This could be facilitated with a conventional physical tower, or remote tower solutions can be considered.

The SDP includes a 25m high camera tower (DCT) to service the main runway and a 20m high camera tower (DCT) to service the secondary runway and heliport.

A manned control tower (ATCT) is also included in the design. The tower is to be placed on the Operations Centre building and will be a total height of 40m above ground level. The structure will either be concrete or steel and be treated aesthetically to ensure that it fits into the architectural theme of the development.

An airport requires an air traffic control tower (ATCT) to allow the air traffic control officers (ATCOs) to primarily manage potential conflicts between aircraft and aircraft, and aircraft and ground vehicles. To achieve these objectives, it is obvious that the ATCO require line of sight (LoS) of the runways and taxiways. Furthermore, the ATCO ensures the movement of aircraft is safe and that such movements are optimized.

The ATCT will include a cabin which is an enclosed glass walled platform that is located at the highest point of the ATCT structure which will provide a 360° view to the ATCOs and will house some workstations, communication, and other equipment. An array of lightning masts, antennas and antenna masts & obstruction lights will be installed on top of the roof. Access to the cabin will be limited and strict security processes will be applied.

Coexistence of Cape Winelands Airport and Cape Town International Airport

According to the CONOPS report - *By implementing the identified strategies, CWA and CTIA can coexist harmoniously, each fulfilling its unique role in the aviation ecosystem while prioritizing safety, efficiency, and collaboration.*

The coexistence of Cape Winelands Airport and Cape Town International Airport will be achieved:

- *At a strategic level by means of defined design criteria observed at flight procedure design stage,*
- *Pre-tactically by means of demand and capacity balancing, and*
- *Tactically by means of the normal processes of*

    a. planning,

b. collaboration, and

c. effective airspace management.

The Alternate Aerodrome Feasibility Study by Munich Airport International GmbH (April 2024) (refer Appendix 23) analysed the general suitability of CWA as a destination alternate aerodrome for CTIA. **The study carried out confirms that CWA will be classified as an operational aerodrome by airlines, meeting all requirements of an operational aerodrome.** Besides CWA, only two South African airports provide a suitable destination alternate aerodrome for CTIA: Durban and OR Tambo Airport are able to handle all aircraft types flying to CTIA. However, the high elevation of OR Tambo Airport means that certain types of aircraft cannot take off with their maximum take-off weight. The proposed CWA fulfils all the requirements to be able to function as a destination alternate aerodrome for all aircraft types flying to CTIA. Based on the significant fuel saving for airlines, which result from planning CWA as destination alternate aerodrome for CTIA, the study concluded that CWA could be the preferred destination alternate for CTIA in the future.

8. ENVIRONMENTAL IMPACT ASSESSMENT

8.1. Introduction:

The Scoping phase identified and defined the issues and potential impacts that require additional investigation in the Impact Assessment phase. Impacts can be positive or negative and are where an aspect of the proposed development impacts on the receiving environment.

Issues and impacts identified in this report are mainly based on input from specialists' assessment of the baseline environment and the impacts of the proposed expansion of the CWA on that receiving environment. The public participation process that forms part of the EIA process also provides valuable additional input into both the quantification of the baseline environment and the potential impacts identified.

Based on this scoping of impacts, the Plan of Study (POS) for the Impact Assessment Phase could be determined, indicating which specialist assessments would be conducted to assess the issues raised.

8.1.1 Specialist Studies Undertaken

The following specialist studies were undertaken to assess baseline conditions and identify potential impacts: Agricultural Impact Assessment, Heritage Impact Assessment (including Visual, Cultural and Archaeological), Terrestrial Biodiversity Impact Assessment (including Faunal and Avifaunal), Aquatic Biodiversity Impact Assessment, Civil Aviation Assessment (including Concept of Operations and Obstacle Limitation Surface Assessment), Noise Impact Assessment, Traffic Impact Assessment, Socio-economic Impact Assessment, Botanical Impact Assessment, Agro-Ecosystem Assessment, Air Quality Impact Assessment and Geohydrological Impact Assessment.

Additional technical reports informing the project include Bulk Infrastructure Engineering (Sewer, Potable, and stormwater management), Bulk Electrical Engineering, Geotechnical Assessment, Architectural Guideline, Bulk Fuel Infrastructure, Outdoor Advertising Guideline, Hydropedological Assessment, Landscaping design, and Spatial and Land Use Planning.

Additional specialist and technical studies that formed part of the Plan of Study for EIA include the Major Hazard Installation (MHI) risk assessment, the Terrestrial and Freshwater Biodiversity offset reports, the Climate Change Impact Assessment, the Glint and Glare Assessment, Poultry Biosecurity and Health study, and an Airport Bird Hazard Risk Assessment. Three additional aviation studies were conducted to address specific IAP or aviation sector concerns (Airspace and Capacity Study Appendix 21; Visualization of FACT and FAWN combined operations Appendix 22; CWA Alternate Airport study Appendix 23). These 3 studies did not form part of the POS submitted with the final Scoping report to DEA&DP.

The WULA technical report is also appended to the EIAR to enable the two processes to run concurrent and to provide further technical information to I&APs. The WULA technical report is also reliant on specialist study input, and additional specialist reports (not already included in the IA report) are appended to the WULA technical report (Geohydrological study in support of the WULA).

For detail on report content and layout requirements refer to Table 139 in Section 10.3.2 of this report.

8.1.2 Alternatives assessed in the EIA

The alternatives identified during the Scoping Phase include:

In terms of alternative layout there are two runway alternatives:

- **Alternative 1 The No Go** with the development of the current CWA site within its current rights, and
- **Alternative 2 The Preferred Alternative** consisting of Phase 1 and 2 as detailed.

In Phase 1 two runways will be required:

A primary runway of 3.5km for scheduled air traffic and high-performance business jets.

A secondary cross runway of 700m for general aviation traffic and light aircraft operations during certain wind conditions.

In Phase 2 the secondary cross runway will be closed as the projected scheduled traffic increases and airspace safety, efficiency and capacity become key considerations. The timing of the closure of the secondary cross runway will be based on a multitude of factors and will follow a risk assessment, consultative process, and an assessment of market demand, ensuring that Phase 2 of the runway development is implemented at the appropriate time.

The preferred runway alternative entailed a rigorous process involving various technical determinants such as prevailing wind conditions, international design standards and guidelines, integration into the ATMS, topography of CWA's surroundings and topography on site, type and amount of air traffic to be served, including air traffic control aspects, and to align traffic patterns for proposed runway with existing traffic flow patterns.

Based on further studies and development of the SDP the 700m runway 14-32 was excluded from the Initial Preferred **Alternative 2** to result in the new **Preferred Alternative 3**.

Runway Alternative 3: "New Preferred Alternative":

Phase 1 of the Runway Development -

In Phase 1, the airport will comprise of one runway, which will be at an orientation of 01-19 and a length of 3.5km and will be constructed to serve up to Code 4F instrument operations.

This runway will be shared by all operators, including scheduled commercial as well as general aviation, where intersection take-off points will be introduced on the runway to improve efficiency for general aviation operations.

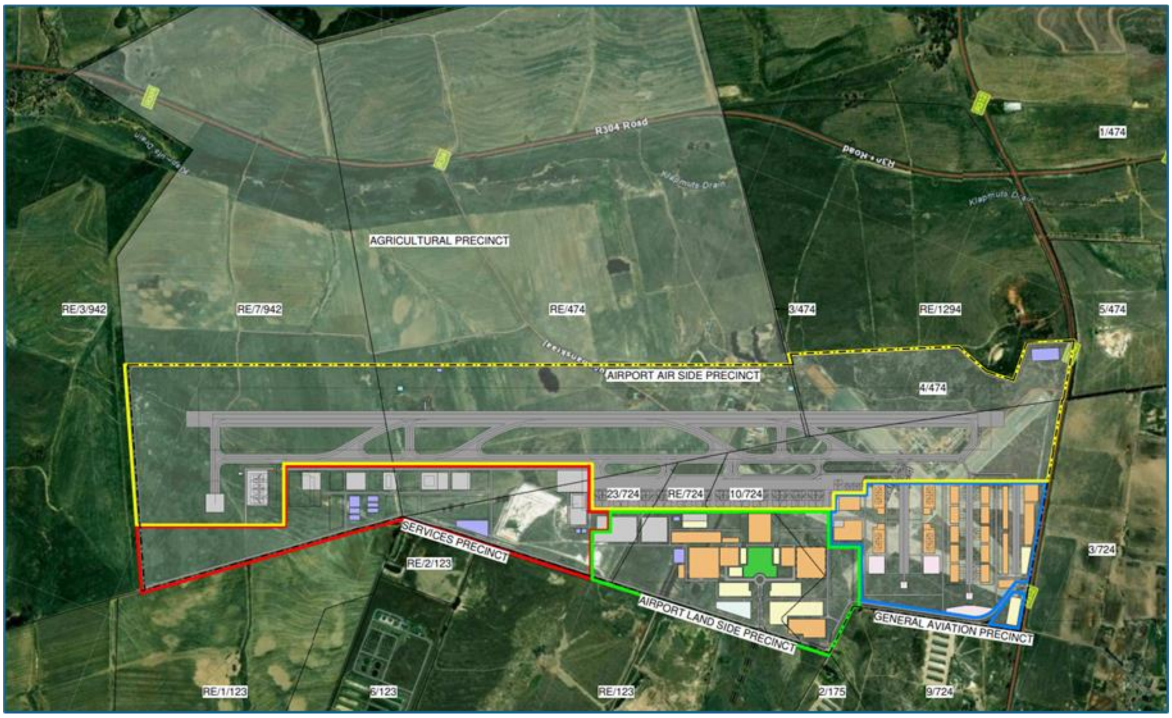


Figure 133: Phase 1 of proposed CWA development (CWA Ltd, August 2024)

Phase 2 of the Runway development -

In Phase 2 the airport development strategy is based on the continued development of the various precincts with the main runway shared by all operators, including scheduled commercial as well as general aviation.

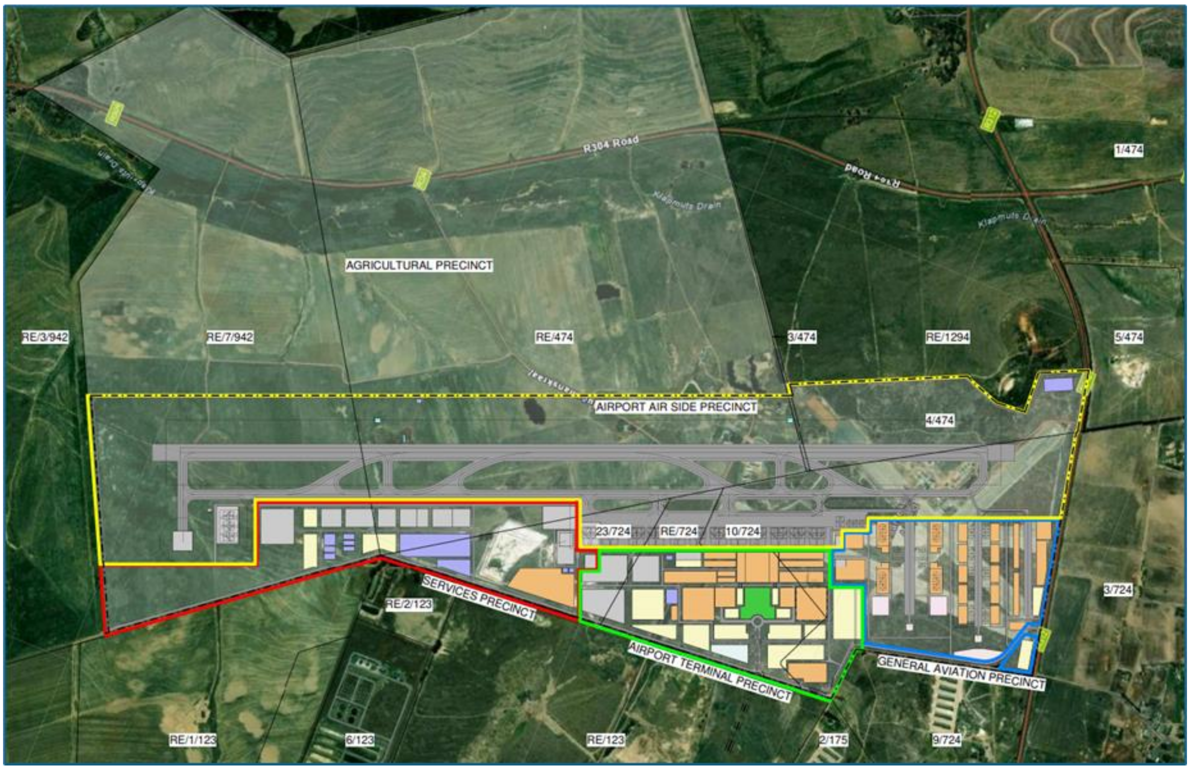


Figure 134: Phase 2 of proposed CWA development (CWA Ltd, August 2024)

The New Preferred Alternative 3 not only addresses the shortcomings of existing options but also presents a compelling case for achieving CWA's strategic objectives, offering substantial benefits to all stakeholders, and fostering regional development.

The decision to omit the short crosswind runway from the Cape Winelands Airport (CWA) plans is underpinned by a rigorous analysis that not only ensures the airport meets the necessary operational standards but also positions it to exceed the ICAO (International Civil Aviation Organization) 95% usability criterion. This criterion, which dictates that a runway should be aligned to allow safe aircraft operations at least 95% of the time under specific weather conditions, particularly wind, is crucial in runway design. However, the analysis at CWA indicates that the airport's main runway will surpass this standard, providing even greater operational reliability and efficiency:

1. **Prevailing Wind Patterns and Exceeding Usability Standards:** Wind data analysis specific to CWA’s location has shown that the main runway, as currently aligned, will be safely usable for a significantly higher percentage of time than the 95% threshold required by ICAO. This suggests that the crosswind component will be within acceptable limits well over 95% of the time, reducing the frequency of challenging crosswind landings and takeoffs. By optimizing the runway alignment with prevailing winds, CWA not only meets but exceeds the usability criterion, providing enhanced safety and operational continuity.
2. **Cost Efficiency with Superior Usability:** The enhanced usability of the main runway further justifies the decision to forego the additional crosswind runway. The substantial financial outlay required to construct and maintain a secondary runway is not warranted. The airport can thus allocate resources more effectively, ensuring that the infrastructure remains cost-efficient without compromising on safety or functionality.
3. **Space Optimization and Environmental Benefits:** By focusing on a single, highly efficient runway, CWA can better utilize its available land. The enhanced usability of the main runway reduces the necessity for additional land acquisition or development, preserving more of the surrounding environment. This decision also aligns with the airport’s environmental objectives, minimizing the impact of construction activities and reducing ongoing environmental disruption.
4. **Traffic Management and Airspace Simplification:** The superior usability of the main runway allows CWA to manage its air traffic more effectively, even during adverse weather conditions. With a runway that is operationally viable more than 95% of the time, the need for complex air traffic management systems to handle crosswind runway operations is diminished. This not only simplifies airspace management but also enhances the overall safety of flight operations.
5. **Advanced Aircraft Capabilities and Usability Excellence:** Modern aircraft are increasingly capable of handling a broader range of wind conditions, including stronger crosswinds. Given this technological advancement, the superior usability of the main runway at CWA ensures that even in less-than-ideal weather, operations can continue safely and efficiently. This further reduces the necessity for a secondary runway and emphasizes the reliability of the current runway configuration.
6. **Community and Environmental Impact Considerations:** By concentrating operations on one runway, the airport can better manage noise pollution, reduce construction-related disturbances, and decrease ongoing environmental impacts, such as emissions from

construction activities. This approach also allows for a more predictable and consistent flight path, which is beneficial for both noise management and safety.

7. **Improved Infrastructure Alignment with High Usability:** The alignment of airport infrastructure can be more efficiently planned. Buildings and other structures can be strategically positioned in parallel and perpendicular orientations to the main runway, optimizing both functionality and aesthetics. This superior usability ensures that the airport layout is not only practical but also future-proofed against changes in operational demand.
8. **Regulatory Compliance and Planning Efficiency:** One runway simplifies compliance with regulatory and planning requirements. The streamlined runway design reduces the complexity associated with obtaining approvals for additional runways, allowing CWA to proceed with development more quickly. This efficiency is particularly valuable in maintaining project timelines and minimizing delays.

The decision to omit the short crosswind runway from the Cape Winelands Airport (CWA) plans in no way, shape or form reduces its ability to serve the GA market. The first build, although a single runway, will provide adequate capacity to serve both GA and commercial scheduled services into the foreseeable procedures. The runway will be optimised in terms of the number of flights, arriving and departing, per hour. This will, amongst other, be enabled by way of Rapid Exit Taxiways (RET's) and allowance by way of operational procedures for GA aircraft to do intersection take-offs from the main runway. In addition, Cape Winelands Airport is and will continue working closely with the numerous smaller airfields in the area to provide continued capacity and growth for the GA fraternity.

NOTE: Due to the nature of the EIA process the current proposed SDP (Appendix 26) will highly likely evolve as part of the process and will be updated along with other preferred alternatives during the EIA Phase.

The technology alternatives to be assessed as part of the EIA process include:

- Technology related to Energy – Solar, Biodigester & wind energy vs Eskom supply –

The site currently contains an existing 66kVA Eskom supply; however, the intention is to reduce reliance on the Eskom as far as possible, and therefore renewable energy alternatives are being considered – specifically a biodigester plant, solar photo voltaic systems and/ or wind turbines (land or roof based). The provision of a completely off-the-grid source is intended as the ideal solution; the Eskom will serve as backup source in the event of plant-failure/maintenance operations or unfavourable weather conditions.

The provision of a completely off-the-grid source is intended as the ideal solution; the Eskom (coal-fired) mains source is intended and required as a backup source in the event of plant failure/maintenance operations or unfavourable weather conditions.

Three types of sustainable energy sources are considered, namely, (a) use of chicken manure/ sewage effluent in bio-digestor plant to run spare-ignition gas- engine generator sets, (b) photo-voltaic power supplies, including optional storage batteries, and (c) wind energy by turbine installation on roof or open land areas.

The initial assessed load of 5MVA has been evaluated by Eskom who have confirmed their capability to provide this load. This capacity is sufficient for the PAL1 stage. The final load required by the site will be determined during the operating and expansion phases of the Airport, as described for phases PAL2, PAL3 and PAL4. This increased load can be provided for using sustainable power systems, notably photo-voltaic power with battery storage. It is also noted that alternative sustainable sources including biodigester generator plant and wind-turbine systems, can be used to supplement battery energy storage for the intended continuous electrical loads above 5MVA. This will enable a final energy mix of 50% Eskom and 50% sustainable sources, with periods of off-grid power being used as far as possible.

CWA intends to generate electricity from a renewable source less than 100MW considering the available roof space and open areas proposed. The generation will be for private off-take and own use only. The operation will not feed power into the Eskom grid via a Renewable Energy IPP Procurement Programme (REIPPPP) bidding process. Therefore, the DEA&DP is the competent authority for authorisation in terms of NEMA.

<u>Biodigester Plant:</u>

The Cape Winelands Airport is in a semi-rural area hosting a multitude of intensive chicken farms. The chicken manure can be "harvested" at the various farms, ideally within a 50km radius for use at the plant. The planned plant can combine the treated CWA sewage effluent with the feed source chicken manure, resulting in a good quality sustainable source of fuel. The plant can provide 24/7/365 continuous electrical power for CWA.

- The feed stream will comprise approximately 30tons/day of chicken manure, treated effluent from the WWTW (200m3/day) or cultivated biomass / energy crop (15t/day).
- System designed to provide 1MW continuous power, at a cost/unit of electricity comparable to Eskom per-unit energy charges.
- The spark ignition engines provide the best fuel-economy and cost efficiency when run continuously at 100% load (i.e., 24/7/365)
- A single biogas fuelled engine should have an availability of around 93.5% (8200 Hours PA out of total of 8766 hours PA). A second engine can be used to provide the continuous backup if needed.
- The biodigester plant creates biogas which is accumulated into a (large) bladder system.
- The "waste" from the biodigester plant comprises "liquid fertilizer" which is planned to distribute to local farms within a 40km radius of the plant.
- The biodigester can be combined with other sources of waste, including food waste and non-hazardous sewage. Treated sewage, which is not regarded as hazardous waste, can be used in the biodigester. The treated sewage water is suitable for using to dilute the chicken waste (given that this is used for farm fertilizer) and there may be commonalities in the chicken manure biodigester plant.
- It is possible (in the future) to add other types of waste-stream sources, such as food-waste, into the biodigester plant.

<u>Photo-Voltaic Systems (Solar PV):</u>

According to SANDS The entire site comprises an ideal area for the creation of photo-voltaic (PV) power sources.

The following considerations will be applicable to the provision and installation of PV Power Sources:

- Given the primary function and usage of the site as an airport, any PV Power Source system will be subjected to a Glint and Glare Study to ensure the panels installed will have no impact on air traffic safety.
- CWA intends to generate electricity from photo-voltaic renewable sources of more than 20MW but less than 100MW considering the available roof space and open areas proposed.
- The fitment of PV Power Sources to airport service buildings plus and commercial buildings and parking facilities will present further opportunities for the fitting of PV Power Source Systems.
- The scope and sizes/areas of the commercial buildings and planned aircraft hangar facilities will provide significant further opportunities for the fitting of PV Power Source Systems as well. Refer Figure 32 to Figure 35 for visual detail.
- The PV Power Sources will be integrated onto the Site Micro-Grid electrical infrastructure using the planned medium voltage distribution network. This will enhance the capability of the PV Power Sources to provide power over the entire CWA Site Micro-Grid and will further lessen the impact of rolling cloud cover decreasing PV output.
- The Site Micro-Grid will be setup, controlled and managed such that the use of Secondary Backup and Primary non-renewable sources is minimized.

<u>Wind energy:</u>

Another sustainable power source to be considered is vertical wind turbines, mounted on the roofs of the various airside buildings. These are incorporated at the detailed design stage of each building, with sustainable power fed into the local microgrid electrical network and has the potential to complement the planned photo-voltaic systems. Other wind turbine applications (e.g. on the ground) and other new technology will continue to be investigated to ensure the best possible energy solution for self-generation.

<u>Eskom supply:</u>

The CWA site has an existing Eskom supply which will have to be expanded on.

The proposed new Eskom supply will entail the following:

- The bulk mains electrical supply will be connected to the Eskom Grid via an overhead 11,000Volt three phase connection.
- The connection will be completed using two feeders, providing a degree of redundancy to the mains supply; this is in accordance with good engineering practice, where critical systems are connected.
- The two feeders will be connected to their Fisantekraal Substation. The feeders will be routed to the site using 11,000Volt open-conductor cables fixed to gum-poles, with the final routing of the Eskom connection will be confirmed later.
- The bulk electricity supply will terminate within the Cape Winelands Airport site and this connection point will comprise an Eskom local substation, comprising the final overhead pole, overhead drop-out line-fuses, medium voltage 3-core cable connection to metering substation fitted with dual outgoing feeder connections. All this outdoor equipment to be housed in fenced/secure enclosure (likely 5000mm by 4000mm).

The Eskom supply will remain as backup supply on site to the solar/ biodigester/ wind energy supply.

- Technology related to Waste Management – Disposal to landfill vs Biodigester –

Waste generated from operations on site will include general and recyclable waste. Waste separation at source will allow disposal of recyclable waste to local transfer station or pickup by waste pickers on site.

General waste will be disposed to landfill (Vissershok landfill site) with transfer by road. Waste will be stored at a designated and managed point for a short period on site before collection and disposal to landfill.

The biodigester can be combined with other sources of waste, including general waste. The on-site source of general waste will feed directly into the biodigester and contribute to the generation of energy from waste. The biodigester plant creates biogas, and the "waste" from the biodigester plant comprises "liquid fertilizer" which could be distributed to local farms.

- Technology related to wastewater treatment and management – On site treatment vs Disposal to CoCT.

Due to the proximity of the CWA to the Fisantekraal WWTW an option would be to install a pumpstation and associated rising main that conveys the flows directly to Fisantekraal WWTW to the North. Another option entails the construction of an on-site wastewater treatment plant. The intention is that the treated effluent is then re-used as non-potable water on the site for irrigation, in the biodigester and toilet flushing.

An internal network will collect sewage from the various buildings within the western precinct and convey it to a package treatment plant. The wastewater treatment plant will treat to a quality that meets the applicable limits. The treated effluent will then be stored and reused on the site as non-potable water supply.

The biodigester can be combined with other sources of waste, including treated sewage. The treated sewage water could be suitable for using to dilute the chicken manure (given that this is used for farm fertilizer) and used to feed the biodigester plant.

Assessment of alternatives above are at the current CWA site as it is the only site / location alternative, and as the proposed project is for the expansion of the existing airport with existing aviation rights no activity alternative exists.

8.1.3 Impact Rating Methodology

The initial specialist input indicating opportunities and constraints for development on site formed the baseline information which was used by the planning team to inform the current development proposals. The specialists are provided with set criteria for undertaking their assessments, to allow for comparative assessment of all issues and impacts. These criteria are detailed in the Terms of Reference to each specialist.

These criteria are drawn from the EIA Regulations published by the Department of Environmental Affairs and Tourism (April 1998) in terms of the Environment Conservation Act, 1989 (Act No. 73 of 1989) and 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:** The specialist should 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.
- **Cumulative impact:** Consideration must be given to the extent of any cumulative 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) exists 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 specialist is 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 the “no-go” implication 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.

The EIA process is based on assessment of future impacts and consequences, therefor there is still possibility of uncertainties and unknown areas even though the scientific basis of the specialist studies is sound. Where unknowns and uncertainties exist, it will be indicated, and a conservative approach will be followed when assessing and determining the level of significance.

Table 50: Criteria for evaluation of impacts

CRITERIA	CATEGORY	DESCRIPTION
EXTENT or Spatial influence of impact	**Regional (R)**	Beyond 5km of the proposed development
	Local (L)	Within 5 km of the proposed development
	Site specific (SS)	On site or within 100 m of the site boundary.
MAGNITUDE of NEGATIVE IMPACT (at the indicated spatial scale)	**High (H)**	Bio-physical and/ or social functions and/ or processes are *severely* altered.
	Medium (M)	Bio-physical and/ or social functions and/ or processes are *notably* altered.
	Low(L)	Bio-physical and/ or social functions and/ or processes are *slightly* altered.
	Very Low (VL)	Bio-physical and/ or social functions and/ or processes are *negligibly* altered
	Zero (Z)	Bio-physical and/ or social functions and/ or processes remain *unaltered.*
MAGNITUDE of POSITIVE IMPACT (at the indicated spatial scale)	**High (H)**	Bio-physical and/ or social functions and/ or processes are *vastly* enhanced.
	Medium (M)	Bio-physical and/ or social functions and/ or processes are *notably* enhanced.
	Low(L)	Bio-physical and/ or social functions and/ or processes are *slightly* enhanced.
	Very Low (VL)	Bio-physical and/ or social functions and/ or processes are *negligibly* enhanced.

	Zero (Z)	Bio-physical and/ or social functions and/ or processes remain *unaltered.*
DURATION of impact	**Short Term (S)**	0-5 years (after construction).
	Medium Term (M)	5-15 years (after construction).
	Long Term (L)	More than 15 years (after construction).
PROBABILITY of occurrence	**Definite (D)**	>95% chance of the potential impact occurring.
	Probable (Pr)	20% - 95% chance of the potential impact occurring
	Possible (Po)	5% - 20% chance of the potential impact occurring
	Improbable (Im)	<5% chance of the potential impact occurring.
CONFIDENCE levels	**Certain (C)**	More than adequate amount of information and understanding of the bio-physical and/ or social functions and/ or processes that may potentially influence the impact.
	Sure (S)	Reasonable amount of information and understanding of the biophysical and/ or social functions and/ or processes that may potentially influence the impact.
	Unsure (U)	Limited amount of information and understanding of the bio-physical and/ or social function
DURATION of impact	**Short Term (S)**	0-5 years (after construction).
	Medium Term (M)	5-15 years (after construction).
	Long Term (L)	More than 15 years (after construction).

Table 51: Definition of significance ratings

SIGNIFICANCE RATINGS	LEVEL OF CRITERIA REQUIRED
High (H)	• High magnitude with a regional extent and long-term duration • High magnitude with either a regional extent and medium-term duration or a local extent and long-term duration • Medium magnitude with a regional extent and long-term duration.
Medium (M)	• High magnitude with a local extent and medium-term duration • High magnitude with a regional extent and short-term duration or a site-specific extent and long-term duration • High magnitude with either a local extent and short-term duration or a site-specific extent and medium-term duration • Medium magnitude with any combination of extent and duration except site specific and short term or regional and long term • Low magnitude with a regional extent and long-term duration.
Low (L)	• High magnitude with a site-specific extent and short-term duration • Medium magnitude with a site-specific extent and short-term duration • Low magnitude with any combination of extent and duration except site specific and short term • Very low magnitude with a regional extent and long-term duration.
Very low (VL)	• Low magnitude with a site-specific extent and short-term duration • Very low magnitude with any combination of extent and duration except regional and long term.
Neutral (N)	• Zero magnitude with any combination of extent and duration

8.2 Potential Waste Impacts

A Waste Management Plan was compiled to satisfy the requirements of NEM: WA (refer Appendix 43B) and contains the outline of waste streams identified for the Construction and Operational Phases for the proposed project, monitoring requirements, responsibilities associated with waste management on site and potential impacts. Refer Section 6.10 in this report for additional detail on the waste streams identified.

Table 52: Waste Types, Sources, Stream handling & Impact at the CWA (Waste Management Plan, Sept 2024)

Waste Type	Materials	Source	Recommended Stream Handling	Impact
Construction Phase				
General Waste	Soil / Sand, Concrete, Rock, Metals, Asphalt, Plastic, Wood, Bricks & masonry materials, Glass, Nails, Cement Bags etc.	Land clearing, Demolition & excavation; construction of runway new buildings & material; maintenance work.	**Re-use:** Keep topsoil; Cut and Fill with on-site material; Crushing and re-use for compaction **Recycle:** Sorting Metals and wood **Disposal Landfill:** Transfer disposal of unwanted	**Off-site:** Reduce landfill to 20%; large reduction of impact on landfill space, transport reduce traffic on roads and emissions **On-Site:** Initial mobile managed waste yard, later fixed managed WMF as per recommendations and N&S – Low impact
Organic Waste	Alien clearing and indigenous vegetation removal etc.	Land clearing & excavation.	**Re-use:** Shredding (chipper) biomass, mulch use to stabilise exposed sandy areas **Composting on-site:** Organics **Composting off-site:** Transfer excess	**Off-site:** Reduce landfill to 0% total reduction of impact on landfill space, transport reduce traffic on roads and emissions **On-Site:** Managed stabilisation reduces dust impact and composting for future landscaping as per recommendations and N&S – Very Low impact
Hazardous & Industrial Waste	Asbestos; old fuel storage infrastructure/ equipment, hydrocarbon waste etc.	Demolition, land clearing & excavation; maintenance work; accidental hydrocarbon spills and	**Specialized:** Safe handling, storage **Recycle:** Limited	**Off-Site:** No reduction in landfill unavoidable **On – site:** Low if specialized handling applies

		hydrocarbon waste from vehicle, equipment and machinery parts and servicing (oil cans, filters, rags etc).	**Disposal Landfill:** Licensed Hazardous Waste Facility.	
Sewage	Sewage; Lavatory Waste etc.	Existing infrastructure and portable toilets.	Initial phases **Disposal**: CoCT WWTW Later Phases **Re-use:** On-site treatment, use treated effluent **Disposal:** Hazardous bio-solids	**Off-site:** initial phase to CoCt WWTW, capacity exists **On-site:** Managed WWTW, reduce pressure on off-site infrastructure, positive use of wastewater as part of energy generation; Low impact if handled as per recommendations and N&S
Waste Type	**Materials**	**Source**	**Recommended Stream Handling Stream**	**Impact**
Operational Phase				
General Solid Waste	Plastic, Paper, Cardboard, Metal, Glass etc. (Some recyclable & some non – recyclable)	Terminal Waste, Tenant Waste, Airline Waste (Deplaned waste is mostly mixed), Cargo Waste, General Aviation Sector, Restaurants,	**Prevent:** Industry changes **Recycle:** Handling, Sorting, Storage, Shredding, Grinding, Crushing, Screening or Bailing prior to collection **None-Recycling:** Handling, Storage	**Off-site:** Reduce landfill to 50% large reduction of impact on landfill space, transport reduce traffic on roads and emissions. **On-site:** Fixed managed WMF as per recommendations and N&S – Low impact

		Hotel, Offices, Warehousing etc.	Transfer or Landfill Disposal	
Organic Waste	Garden waste from landscaping etc. Food waste	Terminal Waste, Tenant Waste, Arline Waste (Deplaned waste is mostly mixed), General Aviation Sector, Hotel, Residential etc.	**Re-use:** Shredding (chipper) biomass, mulch use to stabilize reduce moisture evaporation **Composting on-site:** Organics **Composting off-site:** Transfer excess **Treatment:** Biodigester	**Off-site:** Reduce landfill to 0% total reduction of impact on landfill space, transport reduce traffic on roads and emissions **On-Site:** Managed stabilization; composting for future landscaping; treatment to Biogas energy as per recommendations and N&S – Very Low impact
Hazardous and Industrial Waste	Used oils and fuels; Oil containing rags and materials; Paint, metal work debris, chemicals/ chemical residue; Solar panels, batteries; hydrocarbon waste etc.	Refuelling activities; Materials originating from aviation and vehicle maintenance; spills from training and emergency situations/ procedures etc.	**Specialized:** Safe handling, storage **Recycle:** Limited **Disposal Landfill:** Licensed Hazardous Waste Facility.	**Off-Site:** No reduction in landfill unavoidable **On – site:** Low if specialized handling applies
Sewage	Sewage; Lavatory Waste etc.	All onsite buildings; Aircrafts etc.	**Treatment:** on-site WWTW **Re-use:** use treated effluent in Biogas or irrigation or flushing of toilets	**Off-site:** CoCT WWTW, reduction by 90% **On-site:** Managed WWTW, reduce pressure on off-site

			Disposal: Hazardous bio-solids	infrastructure, positive use of wastewater as part of energy generation; Low impact if handled as per recommendations and N&S
Brine from Reverse Osmosis (RO) Plant	Brine	RO Plant for Potable Water.	**Disposal:** WWTW/ Landfill	**Off-site:** Low quantities **On-site:** Low quantities

Possible additional impacts were identified if large quantities of waste are self-managed on-site. The N&S provide clear guidance the designs and actions to apply but additional mitigation measures have been identified to reduce the impacts on and off site in Table 53.

Table 53: Impacts associated with an on-site Waste Management Facility

Impact		Activity	Proposed mitigation
1	Natural resource contamination	Natural areas located on the east of the airside precinct are separated from waste activities however, stormwater originating from the site could contain waste and can result in pollution or waste can be dispersed by wind into the natural areas	• Minimize the use of wash water onsite as far as possible by applying high pressure hoses. • The facility must be managed such that all runoff originating from the site is diverted into a stormwater control channel that contain detention and trapping facilities before it leaves the WMF. • All stormwater control channels in close proximity to WMF must be suitably lined to prevent seepage into groundwater. • The overflow of stormwater channels needs to be trapped and allowed to settle in a detention pond. • The nutrient rich stormwater originating from the composting and biodigester site must be trapped and used as a moisture additive within the composting facility to enhance the composting process. • No nutrient enriched water may be released offsite. • All stormwater infrastructure must be regularly inspected and serviced to ensure design capacity and integrity is maintained. • To ensure suitable stormwater control capacity is maintained onsite, stormwater channels must be kept free from silt. The stormwater control channels must be cleared of any sedimentation (if required) during the dry season.

			• All water that has entered the composting and biogas areas must be treated as leachate. • To prevent nutrient rich leachate from percolating into the ground, the land areas where composting are established should be compacted to ensure that the soil drainage is poor or virtually impervious. • All wind dispersed waste must be collected on a daily basis and taken to the WMF • The WMF must have closed containers to avoid wind dispersing waste
2	Generation of atmospheric emissions and odors	Waste trucks entering and exiting the WMF transport potentially foul-smelling material. In addition, active composting, organic or chicken manure piles emit volatile compounds.	• All trucks or vehicles transporting waste material will be required to secure and cover all loads with shade cloth to avoid debris or plastic etc. that can blow or fall on public roads or areas. • Composting operations should process organic material on the same day to avoid stagnant heaps. • Optimizing certain variables can minimize composting emissions. The carbon-nitrogen ratio, temperature, moisture content (at least 25%), aeration, and pH must be monitored by the facility manager on a weekly basis to ensure optimal organic matter breakdown without production of excessive atmospheric emissions or odors. • Manure from offsite supplier needs to be fed into the biodigester on the same day as delivery, logistic should be according to an accurate schedule, no delivery of manure can't be processed on the same day. • All storage and operating areas need to be contained in bunkers, lined and covered where required. • The WMF in the services precinct is located directly opposite the City of Cape Town Fisantekraal WWTW therefore part of a node already exposed to odors where residential development is not likely.
3	Soil Erosion	The increased bare, hardened and compacted surfaces associated with the facility results in	• Wherever possible, ensure that the WMF surface is covered by tar, concrete or paving and areas around the stormwater system vegetated as per landscape and SWMP.

		reduced surface roughness, increased run-off and increased erosion potential. Areas where stormwater runoff is concentrated are most likely to experience erosion.	• Establish and maintain suitable vegetation cover at all stormwater concentration points. These areas include road verges, the banks of stormwater channels, berms and other infrastructure that may increase surface runoff. • Should any erosion be detected, the ECO must identify the cause of such erosion and ensure that the most appropriate method of mitigation or stabilization is employed as soon as possible.
4	Generation of dust and noise	The movement of transport trucks to and from the facility will result in the generation of dust and noise.	• The level of dust and noise generated by WMF activities will be insignificant in the broader landscape, especially after the roads a surfaced. Nevertheless, it is recommended that working hours are restricted to 06:00 to 18:00 daily. • All transport vehicles and machinery/equipment used onsite must be regularly maintained and kept in good working order to prevent excessive noise. • It is recommended that a dustcart is available onsite to water down dusty roads not tarred, particularly during the dry summer months. • A suitable speed limit (40 – 60 km/h) must be enforced on all access roads. • Ensure compliance with the provisions as set out in the National Environmental Management: Air Quality Act (NEM: AQA), National Dust Control Regulations (Notice 827 of 2013) and Western Cape Noise Control Regulations (P.N. 200/2013).
5	Visual impacts	Given the location of the facility visual impacts are expected to be negligible.	• Scrape and sweep all areas where material is processed weekly to ensure that minimal waste material is present outside the contained areas
6	Consumption of resources (water)	Inefficient use of valuable freshwater for cleaning of waste bins and areas.	• Maintain all water infrastructure in a good working condition. • Use high pressure power hoses for cleaning. • Ensure that all taps remain closed when not in use. • Educate all employees on the importance of natural resources and wise water use practices. • Should any leaks occur, these must be reported immediately and repaired as soon as possible. • When emptying transport bins, ensure all material is removed manually as far as

			practicably possible to minimize the need for wash water.
7	Attraction Birds and Vermin.	Waste activities have the potential to attract flies.	With suitable management, this impact can be kept to a minimum. The flowing management measures should however continue to be followed: • All organic waste delivered to the site must be covered or worked immediately. • Apply roofs over waste areas to avoid attraction. • Apply containment of waste to avoid attraction. • Apply bait stations for organic pest control. • Correct management of pH and temperature within the composting rows will control the spread of pests and diseases as larva/eggs/worms/bacteria can't live at optimal composting temperatures. • Ensure that WMF does not have pooling or standing water
8	Leakage of potentially hazardous substances	Operation of trucks and machinery can result in leaking or spilling of fuel or oil which is hazardous for the environment.	• All transport vehicles and machinery must be confined to access roads and approved development footprints. • All transport vehicles and machinery/equipment used onsite must be regularly maintained and kept in good working order to prevent potential leaks.
9	Employment opportunities	The operation of the facility generates the opportunity to create additional direct and indirect employment opportunities.	• This is a positive impact. No mitigation required.

The potential impacts associated with the Alternative 1 (No Go), Alternative 2 and Alternative 3 were assessed and rated in Appendix 47.

8.3 Potential Geohydrological Impacts

8.3.1 Introduction, ToR and Methodology

The identification of potential impacts was based on the identification of potential sources of contamination (during construction and during operation) for the three Alternatives (No Go, Alternative 2 and Preferred Alternative 3).

The ToR for the study included:

- Apply the EIA assessment criteria to all the identified Alternatives,
- Consider the mitigation hierarchy to reduce development impacts and to control negative effects on the environment,
- Advise on environmental management principles to be adopted in the EMPr, inclusive of a groundwater monitoring plan,
- Identify and assess the risks of the development from a groundwater standpoint and apply the DWS Risk Assessment Matrix (2016).

The following issues raised during the pre-application Scoping Phase PPP were considered:

Potential for groundwater contamination and surface water quality impacts from stormwater ponds.

The following issues raised during the in-process Scoping Phase PPP were considered:

Risk of groundwater contamination / pollution risk associated with improper stormwater management; pollution risk associated with the onsite WWTW. Updated hydro census information required; risk of groundwater contamination; resource security; risk of over abstraction of groundwater; leaks and spills in fuel storage tanks resulting in groundwater contamination; impact of over abstraction on local habitats.

According to the report by GEOSS – "*Origins, operations and locations for contamination at civil airport sites around the globe have been summarised by Nunes et al. (2011). Where the origin refers to the process transporting the contaminant to the groundwater, the location indicates the physical place where the contaminants are generated/released; and the operation indicates the activity during which the contaminant is released into the environment. Nunes et al. (2011) compiled information from reports on airports where contamination had taken place. Nineteen (19) contaminants were assessed and divided into several origins. The origins included accidental release (Ac), surface release (S), atmospheric deposition (A), leaks (L), and surface runoff (R). It is clear that surface runoff appears to be the most widespread origin (reported for 17 of the contaminants), followed by surface releases (reported for 15 of the contaminants), and leaks (reported for 14 of the contaminants)".*

Table 54: Potential groundwater impact sources (GEOSS, Geohydrological IA, Sept 2024)

Origin	Location	Operations
Surface runoff	Runways, taxiways, aprons, roadways, maintenance areas, vehicle parking areas, hangars, workshops, and other paved areas	Refuelling, handling, parking of vehicles, maintenance of aircraft, vehicles and other equipment, drained by rainwater, pavement cleaning

Leaks from fuel storage and distribution	Fuel Farm	Refuelling on fuel farms and storage of other chemical substances (pesticides, lubricants, solvents, etc.)
Leaks from fuel storage and distribution	AVGAS storage area	Refuelling (hydrant systems) and storage of other chemical substances (solvents, antioxidants, etc.)
Leaks from fuel storage and distribution	Retail service station (petrol station)	Refuelling and storage of other chemical substances (lubricants and solvents)
Leaks from bulk fuel storage	Construction laydown areas, fuel farms, refuelling stations, fuel storage areas	Storage and refuelling on and around construction laydown areas, storage of large amounts of fuel.
Atmospheric deposition	Unpaved areas	Aircraft operations (engine starting, run-ups, testing, ground manoeuvring, take-off, and landing), handling vehicles and equipment, heating systems, and winter operations
Direct release	Unpaved areas, fire-fighting training areas, and storage facilities	Weed control, fire-fighting training, storage/ deposition of substances in unpaved/pervious areas
Accidental contamination (other origins)	Electrical substations, green areas, hangars, workshops, cargo terminal, and storage facilities	Leaks during operation or servicing of electrical substations, spills of pesticides, spills of chemical substances used in cleaning and maintenance of aircraft, handling vehicles and other equipment, spills from cargo

In addition to the potential pollution sources noted above, pollution sources with waste water treatment needs to be considered. These potential contamination sources include:

- storage of wastewater before treatment,
- storage of brine from treated potable water,
- storage of chemicals associated with WWTW, and
- irrigation of the landscape with treated wastewater.

The final potential pollution source that needs to be considered is the nearby biodigester. The biodigester in question will use chicken manure as a feedstock and “digestate’ from biodigesters can lead to nutrient pollution of surface and groundwater bodies if not properly managed.

The existence of preferential flow paths (boreholes, edges of buildings and/or conduits constructed for stormwater management and or reticulation of services that extend deeper into the ground) allow contamination from sources to infiltrate into the subsurface (soils and groundwater).

For a risk to groundwater to exist there must be a source (s), pathway(s) and receptor(s) - Receptors include the underlying aquifer and groundwater users, as well as on site workers via through dermal contact with contaminated soils or water.

Methodology:

The procedure adopted for this study involved a desktop study followed by a site visit. The initial desktop study involved obtaining and reviewing all relevant data for the project. This included reviewing relevant site plans, reports and geological maps of the area and analysing data from multiple groundwater databases, which included information on groundwater yield and quality.

A site visit was then conducted to collect additional data and verify as much of the existing data as possible. This included undertaking a hydrocensus and noting any subsurface conditions where possible. All collected data was analysed and interpreted to assess the potential risks associated with the intended site development as they pertain to groundwater.

The following assumptions and limitations are noted for this study:

- Available data was sourced from the relevant groundwater databases and sources. The aquifer vulnerability, yield and quality data is predominantly accurate, albeit mapped at a regional scale.
- At the time of the report issue, the available site development plans were not yet approved for development, resulting in a generalised recommendation for groundwater monitoring. Once the site is developed and the intricate details of the services are made available, a more detailed, standalone monitoring programme report will need to be developed.
- A further limitation was the temporal nature of the site visit. The field work was undertaken on a single day in January 2022 and does not account for the temporal variability of the water table, i.e. the shallow water table. This is not expected to alter the risk assessment for the site.
- It is possible that there are a greater number of groundwater users in the area than what has been reported in this study as not all groundwater use tends to be registered, particularly when small volumes are used for domestic purposes.
- We have assumed that the available published geological and hydrogeological data on which our study has been based, is accurate. The interpretation of the analysis results that have been presented here are based on standard rating tables.
- The hydrocensus data and chemistry data in this report is representative of the day and time on which it was collected. Seasonal variation can be expected for the water level and the water quality of the area; however, these variations are typically quite minor and will not change the conclusions in this report.
- During the baseline assessment, a single groundwater sample was collected from the study area which was initially deemed sufficient and for the purpose of this study. Subsequent

studies have analysed additional samples in the area and found that groundwater quality generally shows a limited spatial variability.

- The impact assessment has been based on information available at the time of report compilation, and the mitigation measures presented may need to be updated/reassessed once the final development plans are available.

Due to the minor differences for development Alternatives 2 and 3, the difference in impact to groundwater resources will be negligible. Therefore, the geohydrological impact assessment applies to both Alternatives 2 and 3.

8.3.2 Assessment of impacts: Construction Phase

Construction and Development - Table 55 presents a summary of possible impacts and proposed mitigation measures associated with on site development and construction of the proposed airport. Many of the risks related to construction are also applicable during the operational phase of the facility, therefore, the mitigation measures presented here should be kept in mind during operation of the facility. As a simple example, vehicles pose risk of fuel leakage which could potentially contaminate the subsoil and groundwater beneath the site and therefore, vehicles should be well maintained and parked in areas where risk for contamination is minimal, e.g. hard stand areas.

Surface Run-off -

Table 56 presents a summary of possible impacts and proposed mitigation measures for surface runoff caused by the development.

Table 55: Impact table for groundwater contamination because of construction of the facility (GEOSS, Geohydrological Impact Assessment, Sept 2024)

Potential impact on groundwater quality deterioration because of contamination by construction of the facility.		
Impact	**Description**	
Nature of Impact	Contamination of groundwater and surrounding environment due to the construction processes of the facility such as concrete batching, leading to a decrease in groundwater quality.	
Status of Impact	Negative	
Recommended mitigation measures	**Description**	
Impact avoidance/ Prevention/ Mitigation	Vehicles must be maintained regularly and kept in a good working order, and park on hardstand areas with appropriate drainage and catchment systems, where possible. Dirty water should be captured, to be re-used where possible. No dirty water is allowed to be discharged into the surrounding environment. Fuel spillages are deal with in more detail in subsequent tables, the mitigation measures should also be adopted here. Implement monthly groundwater quality monitoring during construction phase. Drip trays to be used under stationary vehicles and machinery where possible. A dewatering plan to be developed prior to construction (where required). Should this be required, the dewatering plan could be devised by a professional. It is important that if the water is to be released back into the environment, it should be done under the guidance of relevant regulations and supervised/monitored by an appropriately qualified professional.	
Assessment of impact	**Rating before mitigation**	**Rating after mitigation**
Extent of impact	Site Specific (SS)	Site Specific (SS)
Duration of impact	Short term (S)	Short term (S)
Magnitude of negative impact	Low (L)	Low (L)
Magnitude of positive impact	Zero (Z)	Zero (Z)
Intensity of impact	Destructive – Low (L)	Destructive – Low (L)
Probability of occurrence	Possible (Po)	Improbable (Im)

Significance	**Very Low (VL)**	**Very Low (VL)**
Confidence	Sure (S)	Sure (S)

Table 56: Impact table for contamination of groundwater because of surface runoff (GEOSS, Geohydrological Impact Assessment, Sept 2024)

Potential impact on groundwater quality deterioration because of surface runoff.		
Impact	**Description**	
Nature of Impact	Contamination of groundwater and surrounding environment due to contaminated stormwater emanating from the facility infiltrating into the groundwater, leading to a decrease in groundwater quality.	
Status of Impact	Negative	
Recommended mitigation measures	**Description**	
Impact avoidance/ Prevention/ Mitigation	Installation of appropriate stormwater systems with catch pits to isolate fuel and other contaminants. Properly designed stormwater management systems and is required. A stormwater management plan and system should address potential water quality concerns and associated water treatment. The water quality must meet relevant standards prior to discharge into the receiving environment; further the regulations indicated in the Water Act (as well as amendments) will need to be adhered to. An appropriate monitoring system within the stormwater reticulation could be considered, where applicable and possible, e.g. within separation/first flush chambers (for a more detailed description the reader is referred to CEDR, 2016). Petrol interceptors might be considered to mitigate the risks of contaminants draining into the environment.	
Assessment of impact	**Rating before mitigation**	**Rating after mitigation**
Extent of impact	Local (L)	Site Specific (SS)
Duration of impact	Long term (L)	Short term (S)
Magnitude of negative impact	Medium (M)	Low (L)
Magnitude of positive impact	Zero (Z)	Zero (Z)

Intensity of impact	Destructive – Medium (M)	Destructive – Low (L)
Probability of occurrence	Possible (Po)	Improbable (Im)
Significance	**Medium (M)**	**Very Low (VL)**
Confidence	Sure (S)	Sure (S)

8.3.3 Assessment of impacts: Operational Phase

Leaks from Storage and Distribution - Table 57 presents a summary of possible impacts and proposed mitigation measures for surface leaks for fuel storage and distribution.

Atmospheric Deposition - Table 58 presents a summary of possible impacts and proposed mitigation measures for surface leaks for atmospheric deposition which occur as a result of aircraft operations, which includes engine starting, testing, ground manoeuvring, take-off, landing, and run-ups.

Direct/Surface Release – Table 59 presents a summary of possible impacts and proposed mitigation measures for surface leaks for direct/surface release. Compounds incorporated in extinguishing agents used for extinguishing fires during emergencies have been associated with soil and groundwater contamination at firefighting training facilities, namely at Tyndall AFB and Wurtsmith AFB, both in the USA (Nunes, 2011). Based on discussions with the Airports Company of South Africa, fire and rescue training takes place on a monthly basis, during which live fires are extinguished. Depending on the quality and quantity of the waste generated from these training exercises, a Water Use License (WUL) may be required for storage and/or disposal of such wastes.

Accidental Release – Table 60 presents a summary of possible impacts and proposed mitigation measures for surface leaks for accidental release. Based on information compiled by Nunes (2011), the two main causes of accidental release of contaminants into the environment include electrical infrastructure (for example substations), and spills form containers of chemical substances. Capacitors are integral to electrical infrastructure; capacitors and dielectric fluid have been found to constitute the principal sources of polychlorinated biphenyls (PCBs) from electrical infrastructure (Nunes, 2011). Several studies have identified these compounds as being carcinogenic (Nunes, 2011; and references therein).

Energy Supply Biodigester – Table 61 highlights the risks identified for the establishment of a bio-digestor plant on the site to generate electricity as well as presents some mitigation measures to reduce the impacts anticipated with such an electricity generation plant. Bio-digestor makes use of chicken manure and wastewater harvested in the region to be processed through an anaerobic digestor to convert waste products to biogas and heat which can be used to generate electricity and/or reduce electricity requirements. This process generates digestates, which is a biproduct that can be used to fertilise crops and/or grassed areas on the site or in surrounding areas. Further, potential for contamination of groundwater exists during the operation of the facility where the digestate may leak and be transported to the groundwater.

Some elements contained in the digestate have potential to contaminate groundwater, nevertheless some studies have concluded relatively low potential for groundwater contamination exists for digestate used as fertiliser as compared to inorganic fertilisers (Tshikalange, et al., 2019). Other studies (e.g. Teglia et al., 2011) have indicated that "using organic residues on agricultural land can bring environmental impacts such as groundwater pollution or harmful gaseous emissions." Although not dealt with exhaustively, some of the "parameters presented… are predominantly influenced by the dose used on land and the period of application."

Energy Supply Solar PV – Table 62 indicates the risks associated with a solar photovoltaic facility for the generation of electricity for the proposed development. The main risk associated with the proposed solar voltaic facility is the cleaning of solar panels to ensure optimal energy generation.

Table 57: Impact table for contamination of groundwater because of leaks from fuel storage and distribution (GEOSS, Geohydrological Impact Assessment, Sept 2024)

Potential impact on groundwater quality deterioration because of leaks from fuel storage and distribution.	
Impact	**Description**
Nature of Impact	Containment, distribution and storage of fuel and other chemical substances (e.g. cleaning agents for apparatus associated with airport equipment used for operation/pesticides for vegetated areas).
Status of Impact	Negative
Recommended mitigation measures	**Description**

Impact avoidance/ Prevention/ Mitigation	Necessary levels of protection and monitoring will need to be installed on site to reduce the risk of contamination. Here we list some general recommendations for the storage and containment of petrol and diesel. Similar approaches may be required for different types of fuel required at the airport refuelling depot; however, this should be guided by relevant industry practises and international airport development guidelines. The mitigation measures listed below must be employed to ensure no contamination of the aquifer takes place. 40. Tanks must be double walled / "jacketed" i.e., possessing secondary containment to prevent tank content to release into surrounding soil and groundwater. The underground storage tank must have an internal leak detection monitoring system between the two walls to monitor for product leakage; 41. Fuel lines and sumps must be secondary contained where lines are joined. 42. The filling station must include the following design measures: **<u>Fuel Containment Area</u>** The containment slab must be graded to drain a catch-pit that is connected to discharge to the stormwater system via an oil separator while the surrounding paved surface areas must be graded to ensure rainwater runoff to the stormwater system. No washing in this area is allowed. **<u>Forecourt Area</u>** The forecourt area must be provided with its own set of catch pits that is connected to discharge to the sewer via a separate oil separator. Please note that the aforesaid areas (1 & 2 above) cannot be interconnected. The surface area of the forecourt must be graded to the abovementioned catch pits while the surrounding surface area graded to drain rainwater to the stormwater system. Washing of the forecourt surface is allowed in this instance. Additionally, the following mitigation is required which is associated with petrol filling station Underground Storage Tank (UST) and pipework installations (applicable for the construction and operation phase): **National Standards** 43. All containment manholes must be regularly inspected as part of the normal management procedures at the service station.

	44. The installation of Underground Storage Tanks (UST's) and associated pipework must be implemented in accordance with the relevant South African National Standards (SANS), specifically (not exclusive to) the following standards: **d) SANS 10089-3 (2010) (English): The petroleum industry Part 3: The installation, modification, and decommissioning of underground storage tanks, pumps/dispensers and pipework at service stations and consumer installations.** **e) SANS 10 400TT (Fire Protection) 53 Sections 1-6 (The application of the National Building Regulations-Installation of Liquid Fuel Dispensing Pumps and Tanks);** **f) SANS 10087-3 (2008) (English): The handling, storage, distribution and maintenance of liquefied petroleum gas in domestic, commercial, and industrial installations Part 3: Liquefied petroleum gas installations involving storage vessels of individual water capacity exceeding 500 L.** 45. The installation of the UST's and associated pipework must comply with the National Building Regulations and Standards Act No. 103 of 1977; 46. The installation must comply with local authority bylaws and all procedures and equipment used must be in accordance with the Occupational Health & Safety Act (No. 85 of 1993); 47. Upon completion of the UST installation, an engineer is to inspect and verify that the tanks and the associated infrastructure have been installed as per the design criteria described in the final BAR and to all required SABS / SANS standards and applicable legislation. A report thereafter, based on the engineer's findings, it to be submitted to the DEA & DP Land Management and Pollution Directorates for inspection and the City of Cape Town Municipality. 48. Any repair work required is to be conducted according to SABS 1535 (Glass-reinforced polyester-coated steel tanks, including jacketed tanks, for the underground storage of hydrocarbons and oxygenated solvents and intended for burial horizontally); **Installation of Underground Storage Tanks** 49. The USTs must be reliable in the event of heavy rains and flooding. UST manholes shall be impermeable and resistant to fuel, they shall consist of a heavy-duty cast-iron cover, which shall prevent damage from surface traffic; 50. Construction of a reinforced concrete slab over the USTs, its thickness and strength are to be determined by a qualified Engineer;

	51. The filler point and tank must be fitted with overfill protection. The critical level should be such that a space remains in the tank to accommodate the delivery hose volume (2%). Earthing and snap tight quick coupling is to be provided for loading of materials into tanks to minimise the risk of fires and prevent spillage and loss of materials; and 52. The USTs are to be fitted with a tank containment sump, fitted on top of the tank and a dispenser containment sump must be provided, fitted underneath the dispenser as containment. A Filler spill containment must also be provided for remote filler containment purposes; 53. The excavation must be protected against the ingress of surface run off water, and is to be kept reasonably free of sub-surface water by pumping out if necessary; 54. **The excavation must be lined with a HDPE liner or a suitable layer to prevent infiltration of product to the groundwater should a spill or leak occur (an impermeable liner);** 55. The UST is to be inspected before installation for damage, including factures or damage to coating work. 56. Leak and pressure tests must be conducted on tanks and pipelines to ensure integrity prior to operation and the inspection authority must issue pressure test certificates. 57. The UST must be buried 750mm below finished ground level in accordance with SANS 10089-3; 58. The local Fire Department must be informed two (2) working days before installation commences and to be called for inspection at the following stages: d) Installation of tank on clean sand bed before backfilling e) Witness pressure test (delivery lines 1000kPa, tank 35kPa); and f) Inspection of slab over tank before concreting; **Pipework** 59. Installation of associated pipe work. This shall include the installation of internationally approved non-corrosive pipework systems. All underground piping is to be Petrotechniks UPP Extra piping (nylon lined, 10 bar rated). Nextube Kableflex sleeving (oil industry green with a smooth internal bore) to be used as secondary containment. This is to limit the possibility of pipe failure due to corrosion; this being the most common cause of pipe failure before this system was introduced to South Africa. 60. All pipeline connections are to be housed within impermeable containment chambers. A leak detector on all submersible pumps that automatically checks the integrity of the pipework on the pressure side of the pump must be provided. Pipelines must not retain product after use and no joints are to be made underground. An

	emergency shut-off valve must be supplied between the supply pipeline and dispenser inlet. All pipes (vent, filler and delivery) are to slope back to the USTs so that fuel does not remain in the pipes; 61. Vent pipes to be fitted with “Fulcrum” vertical vent roses, or an approved equally equivalent market product replacement, that conforms to these standards. Confirmation of filler point and vent position to be made by an approved Engineer for safety distances required; 62. Vent pipes above ground are to be galvanised mild steel and are to be at least 1000mm above the roof height and away from any doors, windows, chimney openings and other sources of ignition; and the tank product lines must be pressure tested prior to commissioning; **Leak detection and monitoring required** 63. It is required to undertake integrity testing on Underground Storage Tanks (UST’s) and underground pipe integrity testing. The frequency of integrity testing should be as follows as outlined here. Tank and pipe integrity testing shall be carried out in the following instances: 64. Following installation of a new UST and associated underground pipework or following repair, maintenance or upgrade of an existing UST or underground pipework (or both). Testing shall be carried out prior to burial of the installation; 65. When ownership of the UST and associated underground pipework changes; 66. When leak detection monitoring methods that may be in place, such as Stock Inventory Reconciliation Analysis, Automatic Tank Gauging (with a reconciliation facility) or interstitial vapour or liquid monitoring of double-walled or jacketed steel tanks, indicate the possibility of a leak. In this instance, an investigation into the possible leak, including integrity testing in the final stages of the investigation, shall be used to track the reasons for a failure to reconcile; 67. Where continuous leak detection monitoring, such as Stock Inventory Reconciliation (SIR), is not carried out at a site. In this instance, UST and associated underground pipe integrity testing should be carried out every 2 years. If USTs and underground pipes do not operate with a continuous leak detection system, but do have cathodic protection installed, then this period may be extended to 10-year intervals. 68. USTs are to be fitted with a monitoring tube to allow for the monitoring of leaks through the tank surface; 69. Leak detectors are to be installed to the submersible pumps within UST manholes to ensure that there are no line leaks;

	70. A relatively inexpensive soil vapour monitoring installation must be installed which can be monitored on a frequent basis (monthly intervals) using a Photo Ionisation Detector (PID) e.g., Mini RAE 2000. 71. The installation of Soil Vapour Sampling Points will require the placement of a permeable coarse clean sand layer beneath the storage tanks for a vertical depth of approximately 0.5m to 1m in order to locate the vents in the 16 mm diameter monitoring pipe over portion of this depth 72. The Groundwater Monitoring Action Plan must be included as an Annexure to the approved EMP. 73. **Observation wells must be installed in the sand fill surrounding the underground storage tanks for regular monitoring purposes** 74. All containment manholes must be regularly inspected as part of the normal management procedures at the service station 75. Continuous electronic monitoring (CEM) of product must be carried out. Should discrepancies occur an alarm will be triggered and site management will review the finding and take appropriate action to rectify the situation as required. 76. **Should a leak be found or should the groundwater in the monitoring wells be found to be contaminated with hydrocarbons, a baseline Phase 1 Contamination Assessment should be undertaken and the site remediated in consultation with a contamination remediation consultant and the Authorities.** **Forecourt Dispensing Area** 77. Installation of pump islands in the forecourt area. The pumps are to be fitted with a Spill Containment Chamber; 78. Construction of a concrete bunded reinforced graded slab over the forecourt area, with positive falls towards a centrally located catch-pit/sump. The slabs thickness and strength are to be determined by a qualified Engineer. The centrally located catch-pit/sump shall drain into a pollution containment chamber i.e., an approved oil/water separator system. Once the wash water has passed through the system, the separated oil must be collected regularly by an approved waste contractor and removed to an approved hazardous waste disposal facility.	
Assessment of impact	**Rating before mitigation**	**Rating after mitigation**
Extent of impact	Local (L)	Site Specific (SS)
Duration of impact	Long term (L)	Short term (S)
Magnitude of negative impact	Medium (M)	Low (L)

Magnitude of positive impact	Zero (Z)	Zero (Z)
Intensity of impact	Destructive – Medium (M)	Destructive – Low (L)
Probability of occurrence	Possible (Po)	Improbable (Im)
Significance	**Medium (M)**	**Very Low (VL)**
Confidence	Sure (S)	Sure (S)

Table 58: Impact table for contamination of groundwater because of atmospheric deposition. (GEOSS, Geohydrological Impact Assessment, Sept 2024)

Potential impact on groundwater quality deterioration because of atmospheric deposition.		
Impact	**Description**	
Nature of Impact	Aircraft operations (engine starting, run-ups, testing, ground manoeuvring, take-off, and landing), handling vehicles and equipment, and heating and/or cooling systems.	
Status of Impact	Negative	
Recommended mitigation measures	**Description**	
Impact avoidance/ Prevention/ Mitigation	Where vehicles are required for airport operation, make use of electrical vehicles as opposed to conventional combustion engine powered vehicles. Reduce/minimise traffic requirements/ground support vehicles for aircraft operations where possible. Ensure vehicles are well-maintained and always parked on paved surfaces.	
Assessment of impact	**Rating before mitigation**	**Rating after mitigation**
Extent of impact	Local (L)	Site Specific (SS)
Duration of impact	Long term (L)	Short term (S)
Magnitude of negative impact	Low (L)	Low (L)
Magnitude of positive impact	Zero (Z)	Zero (Z)

Intensity of impact	Destructive – Low (L)	Destructive – Low (L)
Probability of occurrence	Possible (Po)	Improbable (Im)
Significance	**Low (L)**	**Very Low (VL)**
Confidence	Sure (S)	Sure (S)

Table 59: Impact table for contamination of groundwater because of direct release. (GEOSS, Geohydrological Impact Assessment, Sept 2024)

Potential impact on groundwater quality deterioration because of direct release.	
Impact	**Description**
Nature of Impact	Direct surface release of contaminants to the soil is that of airport rescue and firefighting (ARFF) training. During such training fires are started using oils, and other fuels (including metal, wood and other raw materials), to allow for emergency training of the fire and rescue staff to take place. Further, other than the fuels used to create fires for simulation purposes, the agents used to extinguish the fires consist primarily of foams with other additives to stabilise, ensure readiness, and allow for longevity of extinguishing agents. These additives contain perfluorochemicals (PFCs) that remain stable for long durations of time in the environment (Cheng et. al., 2009). The practises, protocols and equipment required for the safe and successful emergency operation of the facility will depend on the type of aircraft used at the airport and the scale of the airport.
Status of Impact	Negative
Recommended mitigation measures	**Description**
Impact avoidance/ Prevention/ Mitigation	For routine burns and training purposes, make use of biodegradable fuels, which once burned minimises the impact on the groundwater. Erect bunds on which training can take place to contain the waste from the fire residue as well as the extinguishing agents. The discharge generated by training exercises will need to be monitored and analysed for several chemical parameters (to be established once the composition of the extinguishing agents used on site are known) and will need to be disposed of or stored appropriately in accordance with the National Water Act (DWS, 1998) (and relevant amendments). It is likely that disposal and/or storage of the waste from training will give rise to the need for a Water Use License (WUL), depending on the waste composition, frequency of training and planned disposal of training residue.

Assessment of impact	Rating before mitigation	Rating after mitigation
Extent of impact	Local (L)	Site Specific (SS)
Duration of impact	Long term (L)	Long term (L)
Magnitude of negative impact	Low (L)	Low (L)
Magnitude of positive impact	Zero (Z)	Zero (Z)
Intensity of impact	Destructive – Medium (M)	Destructive – Low (L)
Probability of occurrence	Probable (Pr)	Improbable (Im)
Significance	**Low (L)**	**Low (L)**
Confidence	Sure (S)	Sure (S)

Table 60: Impact table for contamination of groundwater because of accidental release. (GEOSS, Geohydrological Impact Assessment, Sept 2024)

Potential impact on groundwater quality deterioration because of Accidental Release.	
Impact	**Description**
Nature of Impact	The origins of accidental releases of contaminants to the environment are electrical infrastructure (substations) and spillages by chemical storage facilities (Nunes, 2011).
Status of Impact	Negative
Recommended mitigation measures	**Description**
Impact avoidance/ Prevention/ Mitigation	Devise and design appropriate bunding for storage of chemical substances that are to be stored on site, as well as erecting the electrical infrastructure (where risk of contamination exists, i.e. substations) on appropriate bunding. Implement appropriate monitoring infrastructure, e.g. borehole monitoring around the sites where electrical

	infrastructure and chemicals are stored, to identify leakages and spillages from chemical storage facilities and electrical infrastructure.	
Assessment of impact	**Rating before mitigation**	**Rating after mitigation**
Extent of impact	Local (L)	Site Specific (SS)
Duration of impact	Long term (L)	Long term (L)
Magnitude of negative impact	Medium (M)	Low (L)
Magnitude of positive impact	Zero (Z)	Zero (Z)
Intensity of impact	Destructive – Medium (M)	Destructive – Low (L)
Probability of occurrence	Possible (Po)	Improbable (Im)
Significance	**Medium (M)**	**Low (L)**
Confidence	Sure (S)	Sure (S)

Table 61: Impact table for contamination of groundwater because of energy generation Biodigester (GEOSS, Geohydrological Impact Assessment, Sept 2024)

Potential impact on groundwater quality deterioration because of bio-digestor facilities for energy generation.	
Impact	**Description**
Nature of Impact	Digestate leakage/leaching from facility and potential accumulation of contaminants from application of digestate to land as fertiliser. Leakages of digestate from the facility itself.
Status of Impact	Negative
Recommended mitigation measures	**Description**

Impact avoidance/ Prevention/ Mitigation	Proper management and design of digestate application (i.e. use as fertiliser) to areas on the property and/or surrounding areas. Monitoring of the impacts on the groundwater will need to be implemented should this biproduct of the facility be used in this way. Ensure design of facility is appropriate, e.g. include bunding in high-risk areas or where applicable, instate appropriate monitoring around facility and along relevant points through the system.	
Assessment of impact	**Rating before mitigation**	**Rating after mitigation**
Extent of impact	Local (L)	Site Specific (SS)
Duration of impact	Long term (L)	Short term (S)
Magnitude of negative impact	Medium (M)	Very low (VL)
Magnitude of positive impact	Zero (Z)	Zero (Z)
Intensity of impact	Destructive – Medium (M)	Destructive – Low (L)
Probability of occurrence	Possible (Po)	Improbable (Im)
Significance	**Medium (M)**	**Very low (VL)**
Confidence	Sure (S)	Sure (S)

Table 62: Impact table for contamination of groundwater because of energy generation solar PV (GEOSS, Geohydrological Impact Assessment, Sept 2024)

Potential impact on groundwater quality deterioration because of the operation of photovoltaic solar facilities.	
Impact	**Description**
Nature of Impact	Use of cleaning agents to ensure maximal power generation from solar panels.
Status of Impact	Negative

Recommended mitigation measures	**Description**	
Impact avoidance/ Prevention/ Mitigation	Make use of biodegradable cleaning agents to ensure little to no impact on the quality of the groundwater is experienced.	
Assessment of impact	**Rating before mitigation**	**Rating after mitigation**
Extent of impact	Local (L)	Site Specific (SS)
Duration of impact	Long term (L)	Short term (S)
Magnitude of negative impact	Low (L)	Very Low (VL)
Magnitude of positive impact	Zero (Z)	Zero (Z)
Intensity of impact	Destructive – Low (L)	Destructive – Very Low (VL)
Probability of occurrence	Possible (Po)	Improbable (Im)
Significance	**Low (L)**	**Very low (VL)**
Confidence	Sure (S)	Sure (S)

Table 63: Impact table for depletion of the groundwater resource as a result of over-abstraction (GEOSS, Geohydrological Impact Assessment, Sept 2024)

Potential impact due to the depletion of groundwater resources as a result of over-abstraction.	
Impact	**Description**
Nature of Impact	Over-abstraction from the borehole would drop the regional groundwater level.
Status of Impact	Negative
Recommended mitigation measures	**Description**

Impact avoidance/ Prevention/ Mitigation	Groundwater abstraction volumes must be monitored. Water levels must be monitored and should not drop below the critical water level (refer to yield testing reports). Monitoring information must be assessed regularly (suggested monthly). If the water level in the boreholes drops below the dynamic water level. i.e. 72 mbgl for CWA_BH001. and 40 mbgl for CWA_BH002 abstraction will immediately be reduced by 10%. This would be for normal rainfall events. If a hydrological drought persists for more than two years, the water level can drop to above the critical water level i.e. 85 mgbl for CWA_BH001 and 61 mbgl for CWA_BH002. Monitoring will persist for 30 days. In the event of lowered levels persisting after the initial 10% reduction, further reductions in excess of 10% must be implemented and if the low levels persist for more than 60 days, abstraction must cease until the levels have been recovered. This process will continue until the water level in the borehole is stable. A formal groundwater management plan needs to be designed and implemented.	
Assessment of impact	**Rating before mitigation**	**Rating after mitigation**
Extent of impact	Local (L)	Site Specific (SS)
Duration of impact	Long term (L)	Short term (S)
Magnitude of negative impact	Medium (M)	Low (L)
Magnitude of positive impact	Zero (Z)	Zero (Z)
Intensity of impact	Destructive – Medium (M)	Destructive –Low (L)
Probability of occurrence	Definite (D)	Possible (Po)
Significance	**Medium (M)**	**Very Low (VL)**
Confidence	Sure (S)	Sure (S)

Table 64: Impact table for groundwater quality deterioration because of over-abstraction (GEOSS, Geohydrological Impact Assessment, Sept 2024)

Potential impact on groundwater quality deterioration as a result of over-abstraction

Impact	**Description**	
Nature of Impact	Exposure and oxidation of minerals through the lowering of the water table, with potential water quality impacts when water levels recover.	
Status of Impact	Negative	
Recommended mitigation measures	**Description**	
Impact avoidance/ Prevention/ Mitigation	Groundwater abstraction volumes must be monitored. Water levels must be monitored. Monitoring information must be assessed regularly (suggested quarterly). If an increase of 25% in electrical conductivity is observed, abstraction will immediately be reduced by 10%. Monitoring will persist after 30 days if the water quality of the borehole does not recover. In the event of poor quality persisting after the initial 10% reduction, further reductions in excess of 10% must be implemented and if quality continues to deteriorate for more than 60 days, abstraction must cease until the water quality has stabilised.	
Assessment of impact	**Rating before mitigation**	**Rating after mitigation**
Extent of impact	Local (L)	Site Specific (SS)
Duration of impact	Long term (L)	Short term (S)
Magnitude of negative impact	Medium (M)	Low (L)
Magnitude of positive impact	Zero (Z)	Zero (Z)
Intensity of impact	Destructive – Medium (M)	Destructive –Low (L)
Probability of occurrence	Improbable (Im)	Improbable (Im)
Significance	**Medium (M)**	**Very Low (VL)**
Confidence	Sure (S)	Sure (S)

Table 65: Impact table for groundwater quality deterioration as a result of wastewater storage (GEOSS, Geohydrological Impact Assessment, Sept 2024)

Potential impact on groundwater quality deterioration as a result wastewater storage before treatment		
Impact	**Description**	
Nature of Impact	Contamination of groundwater due to the cracking, leaking or overflow of the concrete ponds and/or pipelines within the WWTW and to and from inflow and outflow points, allowing the seepage of contaminants into the groundwater.	
Status of Impact	Negative	
Recommended mitigation measures	**Description**	
Impact avoidance/ Prevention/ Mitigation	Spillages or leakages from the WWTW could contaminate the surrounding non-perennial freshwater systems and groundwater in the area. Therefore, the effluent containment ponds should be appropriately lined to avoid discharge into the subsurface, and potentially groundwater. Solid waste should be stored on concrete bunded or lined surfaces and water drainage from the solid waste should be captured and returned to the WWTW. It is recommended that Groundwater Management Plan be implemented to ensure the groundwater quality is not affected by the operations of the WWTW. Monitoring of the WWTW infrastructure is required to ensure that there is no loss of water in the system; flow meters measuring influent and effluent must be installed, monitored and recorded. Regular internal and external inspections and auditing of the facility must take place to ensure the infrastructure is in good working order.	
Assessment of impact	**Rating before mitigation**	**Rating after mitigation**
Extent of impact	Site Specific (L)	Site Specific (SS)
Duration of impact	Long term (L)	Short term (S)
Magnitude of negative impact	Medium (M)	Low (L)
Magnitude of positive impact	Zero (Z)	Zero (Z)

Intensity of impact	Destructive – Medium (M)	Destructive –Low (L)
Probability of occurrence	Possible (Po)	Improbable (Im)
Significance	**Medium (M)**	**Very Low (VL)**
Confidence	Sure (S)	Sure (S)

Table 66: Impact table for groundwater quality deterioration because of brine storage (GEOSS, Geohydrological Impact Assessment, Sept 2024)

Potential impact on groundwater quality deterioration as a result waste water storage before treatment		
Impact	**Description**	
Nature of Impact	Contamination of groundwater due to the cracking, leaking or overflow of the concrete ponds and/or pipelines containing brine from treated potable water, allowing the seepage of contaminants into the groundwater.	
Status of Impact	Negative	
Recommended mitigation measures	**Description**	
Impact avoidance/ Prevention/ Mitigation	Spillages or leakages from the brine ponds could contaminate the groundwater in the area. Therefore, the brine containment ponds should be appropriately lined with additional bunding structures to avoid discharge into the subsurface, and potentially groundwater. It is recommended that Groundwater Management Plan be implemented to ensure the groundwater quality is not affected by the operations of the brine ponds Regular internal and external inspections and auditing of the facility must take place to ensure the infrastructure is in good working order.	
Assessment of impact	**Rating before mitigation**	**Rating after mitigation**
Extent of impact	Site Specific (L)	Site Specific (SS)
Duration of impact	Long term (L)	Short term (S)

Magnitude of negative impact	Medium (M)	Low (L)
Magnitude of positive impact	Zero (Z)	Zero (Z)
Intensity of impact	Destructive – Medium (M)	Destructive –Low (L)
Probability of occurrence	Possible (Po)	Improbable (Im)
Significance	**Medium (M)**	**Very Low (VL)**
Confidence	Sure (S)	Sure (S)

Table 67: Impact table for groundwater quality deterioration because of chemical storage associated with WWTW (GEOSS, Geohydrological Impact Assessment, Sept 2024)

Potential impact on groundwater quality deterioration as a result waste water storage before treatment	
Impact	**Description**
Nature of Impact	Contamination of groundwater due to the leaking or spilling of containers storing chemicals associated with the WWTW, allowing the seepage of contaminants into the groundwater.
Status of Impact	Negative
Recommended mitigation measures	**Description**
Impact avoidance/ Prevention/ Mitigation	Spillages or leakages from the WWTW chemical storage areas could contaminate the groundwater in the area. Therefore, the chemical storage areas should be appropriately lined with additional bunding structures to avoid discharge into the subsurface, and potentially groundwater. It is recommended that Groundwater Management Plan be implemented to ensure the groundwater quality is not affected by the operations of the WWTW. Monitoring of the WWTW infrastructure is required to ensure that there is no loss of water in the system; flow meters measuring influent and effluent must be installed, monitored and recorded.

	Regular internal and external inspections and auditing of the facility must take place to ensure the infrastructure is in good working order.	
Assessment of impact	**Rating before mitigation**	**Rating after mitigation**
Extent of impact	Site Specific (L)	Site Specific (SS)
Duration of impact	Long term (L)	Short term (S)
Magnitude of negative impact	Medium (M)	Low (L)
Magnitude of positive impact	Zero (Z)	Zero (Z)
Intensity of impact	Destructive – Medium (M)	Destructive –Low (L)
Probability of occurrence	Possible (Po)	Improbable (Im)
Significance	**Medium (M)**	**Very Low (VL)**
Confidence	Sure (S)	Sure (S)

Table 68: Impact table for groundwater quality deterioration because of irrigation with the treated sewage effluent (GEOSS, Geohydrological Impact Assessment, Sept 2024)

Potential impact on groundwater quality deterioration as a result waste water storage before treatment	
Impact	**Description**
Nature of Impact	Contamination of groundwater due to irrigation with poorly treated waste water effluent (TSE)

Status of Impact	Negative	
Recommended mitigation measures	**Description**	
Impact avoidance/ Prevention/ Mitigation	Contaminated water used to irrigate the demarcated fields could contaminate the groundwater in the area. The WWTW needs to ensure that the water released into the environment is within the limits of the General Authorisation. Monthly monitoring of the quality of the treated effluent must take place to ensure that quality objectives are reached. It is recommended that Groundwater Management Plan be implemented to ensure the groundwater quality is not negatively affected by the irrigation with treated effluent.	
Assessment of impact	**Rating before mitigation**	**Rating after mitigation**
Extent of impact	Local (L)	Site Specific (SS)
Duration of impact	Long term (L)	Short term (S)
Magnitude of negative impact	Medium (M)	Low (L)
Magnitude of positive impact	Zero (Z)	Zero (Z)
Intensity of impact	Destructive – Medium (M)	Destructive –Low (L)
Probability of occurrence	Possible (Po)	Improbable (Im)
Significance	**Medium (M)**	**Very Low (VL)**
Confidence	Sure (S)	Sure (S)

8.3.4 The No Go Alternative

Development alternative 1 (also referred to as the no-go option) would entail the preservation of the site as is and no further development. Current aviation activity at the airport consists of flight school operations and other unscheduled general aviation (GA) flights. These includes private owner-pilots and limited charter operations in light fixed-wing aircraft, as well as helicopters, gyrocopters and micro flights. Flight activity at the airport currently averages ±100 air traffic movements (ATM; take-offs and landings) per day, varying with weather conditions, seasons and days of the week (NACO, 2023). Consequently, the following risks exist for the existing development:

A) Surface Runoff

Table 69 presents a summary of possible impacts and proposed mitigation measures for surface runoff caused by the development.

B) Leaks from Storage and Distribution

Table 70 presents a summary of possible impacts and proposed mitigation measures for surface leaks for fuel storage and distribution

C) Atmospheric Deposition

Table 71 presents a summary of possible impacts and proposed mitigation measures for atmospheric deposition which occurs because of aircraft operations, which includes engine starting, testing, ground manoeuvring, take-off, landing, and run-ups.

D) Direct/Surface Release

Table 72 & Table 73 present a summary of possible impacts and proposed mitigation measures for surface leaks for direct/surface release (direct and accidental).

Table 69: Impact table for contamination of groundwater because of surface runoff (GEOSS, Sept 2024)

Potential impact on groundwater quality deterioration because of surface runoff.		
Impact	**Description**	
Nature of Impact	Contamination of groundwater and surrounding environment due to contaminated stormwater emanating from the facility infiltrating into the groundwater, leading to a decrease in groundwater quality.	
Status of Impact	Negative	
Recommended mitigation measures	**Description**	
Impact avoidance/ Prevention/ Mitigation	Ensure that the current stormwater management systems are equipped with catch pits to isolate fuel and other contaminants. Properly designed stormwater management systems are required. A stormwater management plan and system should address potential water quality concerns and associated water treatment. The water quality must meet relevant standards prior to discharging into the receiving environment; further the regulations indicated in the Water Act (as well as amendments) will need to be adhered to. An appropriate monitoring system within the stormwater reticulation could be considered, where applicable and possible, e.g. within separation/first flush chambers (for a more detailed description the reader is referred to CEDR, 2016). Petrol interceptors might be considered to mitigate the risks of contaminants draining into the environment.	
Assessment of impact	**Rating before mitigation**	**Rating after mitigation**
Extent of impact	Local (L)	Site Specific (SS)
Duration of impact	Long term (L)	Short term (S)
Magnitude of negative impact	Medium (M)	Low (L)
Magnitude of positive impact	Zero (Z)	Zero (Z)
Intensity of impact	Destructive – Medium (M)	Destructive – Low (L)
Probability of occurrence	Possible (Po)	Improbable (Im)
Significance	**Low (L)**	**Very Low (VL)**

Confidence	Sure (S)	Sure (S)

Table 70: Impact table for contamination of groundwater because of leaks from fuel storage and distribution (GEOSS: Sept 2024)

Potential impact on groundwater quality deterioration because of leaks from fuel storage and distribution.	
Impact	**Description**
Nature of Impact	Containment, distribution and storage of fuel and other chemical substances (e.g. cleaning agents for apparatus associated with airport equipment used for operation/pesticides for vegetated areas).
Status of Impact	Negative
Recommended mitigation measures	**Description**

<table>
<tr>
<td>Impact avoidance/ Prevention/ Mitigation</td>
<td>
Necessary levels of protection and monitoring will need to be installed on site to reduce the risk of contamination. Here we list some general recommendations for the storage and containment of petrol and diesel. Similar approaches may be required for different types of fuel required at the airport refuelling depot; however, this should be guided by relevant industry practises and international airport development guidelines.
The mitigation measures listed below must be employed to ensure no contamination of the aquifer takes place.

Tanks must be double walled / “jacketed” i.e., possessing secondary containment to prevent tank content to release into surrounding soil and groundwater. The underground storage tank must have an internal leak detection monitoring system between the two walls to monitor for product leakage;
Fuel lines and sumps must be secondary contained where lines are joined.
The filling station must include the following design measures:

<u>Fuel Containment Area</u>
The containment slab must be graded to drain a catch-pit that is connected to discharge to the stormwater system via an oil separator while the surrounding paved surface areas must be graded to ensure rainwater runoff to the stormwater system. No washing in this area is allowed.
<u>Forecourt Area</u>
The forecourt area must be provided with its own set of catch pits that is connected to discharge to the sewer via a separate oil separator. Please note that the aforesaid areas (1 & 2 above) cannot be interconnected. The surface area of the forecourt must be graded to the abovementioned catch pits while the surrounding surface area graded to drain rainwater to the stormwater system. Washing of the forecourt surface is allowed in this instance.
Additionally, the following mitigation is required which is associated with petrol filling station Underground Storage Tank (UST) and pipework installations (applicable for the construction and operation phase):
National Standards
<ol start="4">
All containment manholes must be regularly inspected as part of the normal management procedures at the service station.

</td>
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</table>

	5. The installation of Underground Storage Tanks (UST's) and associated pipework must be implemented in accordance with the relevant South African National Standards (SANS), specifically (not exclusive to) the following standards: **a) SANS 10089-3 (2010) (English): The petroleum industry Part 3: The installation, modification, and decommissioning of underground storage tanks, pumps/dispensers and pipework at service stations and consumer installations.** **b) SANS 10 400TT (Fire Protection) 53 Sections 1-6 (The application of the National Building Regulations- Installation of Liquid Fuel Dispensing Pumps and Tanks);** **c) SANS 10087-3 (2008) (English): The handling, storage, distribution and maintenance of liquefied petroleum gas in domestic, commercial, and industrial installations Part 3: Liquefied petroleum gas installations involving storage vessels of individual water capacity exceeding 500 L.** 6. The installation of the UST's and associated pipework must comply with the National Building Regulations and Standards Act No. 103 of 1977; 7. The installation must comply with local authority bylaws and all procedures and equipment used must be in accordance with the Occupational Health & Safety Act (No. 85 of 1993); 8. Upon completion of the UST installation, an engineer is to inspect and verify that the tanks and the associated infrastructure have been installed as per the design criteria described in the final BAR and to all required SABS / SANS standards and applicable legislation. A report thereafter, based on the engineer's findings, it to be submitted to the DEA & DP Land Management and Pollution Directorates for inspection and the City of Cape Town Municipality. 9. Any repair work required is to be conducted according to SABS 1535 (Glass-reinforced polyester-coated steel tanks, including jacketed tanks, for the underground storage of hydrocarbons and oxygenated solvents and intended for burial horizontally); **Installation of Underground Storage Tanks** 10. The USTs must be reliable in the event of heavy rains and flooding. UST manholes shall be impermeable and resistant to fuel, they shall consist of a heavy-duty cast-iron cover, which shall prevent damage from surface traffic; 11. Construction of a reinforced concrete slab over the USTs, its thickness and strength are to be determined by a qualified Engineer;

	13. The filler point and tank must be fitted with overfill protection. The critical level should be such that a space remains in the tank to accommodate the delivery hose volume (2%). Earthing and snap tight quick coupling is to be provided for loading of materials into tanks to minimise the risk of fires and prevent spillage and loss of materials; and The USTs are to be fitted with a tank containment sump, fitted on top of the tank and a dispenser containment sump must be provided, fitted underneath the dispenser as containment. A Filler spill containment must also be provided for remote filler containment purposes; 14. The excavation must be protected against the ingress of surface run off water, and is to be kept reasonably free of sub-surface water by pumping out if necessary; 15. **The excavation must be lined with a HDPE liner or a suitable layer to prevent infiltration of product to the groundwater should a spill or leak occur (an impermeable liner);** 16. The UST is to be inspected before installation for damage, including factures or damage to coating work. 17. Leak and pressure tests must be conducted on tanks and pipelines to ensure integrity prior to operation and the inspection authority must issue pressure test certificates. 18. The UST must be buried 750mm below finished ground level in accordance with SANS 10089-3; 19. The local Fire Department must be informed two (2) working days before installation commences and to be called for inspection at the following stages: a) Installation of tank on clean sand bed before backfilling b) Witness pressure test (delivery lines 1000kPa, tank 35kPa); and c) Inspection of slab over tank before concreting; **Pipework** 20. Installation of associated pipe work. This shall include the installation of internationally approved non-corrosive pipework systems. All underground piping is to be Petrotechniks UPP Extra piping (nylon lined, 10 bar rated). Nextube Kableflex sleeving (oil industry green with a smooth internal bore) to be used as secondary containment. This is to limit the possibility of pipe failure due to corrosion; this being the most common cause of pipe failure before this system was introduced to South Africa. 21. All pipeline connections are to be housed within impermeable containment chambers. A leak detector on all submersible pumps that automatically checks the integrity of the pipework on the pressure side of the pump must be provided. Pipelines must not retain product after use and no joints are to be made underground. An emergency shut-off valve must be supplied between the supply pipeline and dispenser inlet. All pipes (vent, filler and delivery) are to slope back to the USTs so that fuel does not remain in the pipes;

	22. Vent pipes to be fitted with "Fulcrum" vertical vent roses, or an approved equally equivalent market product replacement, that conforms to these standards. Confirmation of filler point and vent position to be made by an approved Engineer for safety distances required; 23. Vent pipes above ground are to be galvanised mild steel and are to be at least 1000mm above the roof height and away from any doors, windows, chimney openings and other sources of ignition; and the tank product lines must be pressure tested prior to commissioning; **Leak detection and monitoring required** 24. It is required to undertake integrity testing on Underground Storage Tanks (UST's) and underground pipe integrity testing. The frequency of integrity testing should be as follows as outlined here. Tank and pipe integrity testing shall be carried out in the following instances: 25. Following installation of a new UST and associated underground pipework or following repair, maintenance or upgrade of an existing UST or underground pipework (or both). Testing shall be carried out prior to burial of the installation; 26. When ownership of the UST and associated underground pipework changes; 27. When leak detection monitoring methods that may be in place, such as Stock Inventory Reconciliation Analysis, Automatic Tank Gauging (with a reconciliation facility) or interstitial vapour or liquid monitoring of double-walled or jacketed steel tanks, indicate the possibility of a leak. In this instance, an investigation into the possible leak, including integrity testing in the final stages of the investigation, shall be used to track the reasons for a failure to reconcile; 28. Where continuous leak detection monitoring, such as Stock Inventory Reconciliation (SIR), is not carried out at a site. In this instance, UST and associated underground pipe integrity testing should be carried out every 2 years. If USTs and underground pipes do not operate with a continuous leak detection system, but do have cathodic protection installed, then this period may be extended to 10-year intervals. 29. USTs are to be fitted with a monitoring tube to allow for the monitoring of leaks through the tank surface; 30. Leak detectors are to be installed to the submersible pumps within UST manholes to ensure that there are no line leaks; 31. A relatively inexpensive soil vapour monitoring installation must be installed which can be monitored on a frequent basis (monthly intervals) using a Photo Ionisation Detector (PID) e.g., Mini RAE 2000.

	32. The installation of Soil Vapour Sampling Points will require the placement of a permeable coarse clean sand layer beneath the storage tanks for a vertical depth of approximately 0.5m to 1m in order to locate the vents in the 16 mm diameter monitoring pipe over portion of this depth 33. The Groundwater Monitoring Action Plan must be included as an Annexure to the approved EMP. 34. **Observation wells must be installed in the sand fill surrounding the underground storage tanks for regular monitoring purposes** 35. All containment manholes must be regularly inspected as part of the normal management procedures at the service station 36. Continuous electronic monitoring (CEM) of product must be carried out. Should discrepancies occur an alarm will be triggered and site management will review the finding and take appropriate action to rectify the situation as required. 37. **Should a leak be found or should the groundwater in the monitoring wells be found to be contaminated with hydrocarbons, a baseline Phase 1 Contamination Assessment should be undertaken and the site remediated in consultation with a contamination remediation consultant and the Authorities.** **Forecourt Dispensing Area** 38. Installation of pump islands in the forecourt area. The pumps are to be fitted with a Spill Containment Chamber; 39. Construction of a concrete bunded reinforced graded slab over the forecourt area, with positive falls towards a centrally located catch-pit/sump. The slabs thickness and strength are to be determined by a qualified Engineer. The centrally located catch-pit/sump shall drain into a pollution containment chamber i.e., an approved oil/water separator system. Once the wash water has passed through the system, the separated oil must be collected regularly by an approved waste contractor and removed to an approved hazardous waste disposal facility.

Assessment of impact	**Rating before mitigation**	**Rating after mitigation**
Extent of impact	Local (L)	Site Specific (SS)
Duration of impact	Long term (L)	Short term (S)
Magnitude of negative impact	Medium (M)	Low (L)

Magnitude of positive impact	Zero (Z)	Zero (Z)
Intensity of impact	Destructive – Medium (M)	Destructive – Low (L)
Probability of occurrence	Possible (Po)	Improbable (Im)
Significance	**Medium (M)**	**Very Low (VL)**
Confidence	Sure (S)	Sure (S)

Table 71: Impact table for contamination of groundwater because of atmospheric deposition (GEOSS; Sept 2024)

Potential impact on groundwater quality deterioration because of atmospheric deposition.		
Impact	**Description**	
Nature of Impact	Aircraft operations (engine starting, run-ups, testing, ground manoeuvring, take-off, and landing), handling vehicles and equipment, and heating and/or cooling systems.	
Status of Impact	Negative	
Recommended mitigation measures	**Description**	
Impact avoidance/ Prevention/ Mitigation	Where vehicles are required for airport operation, make use of electrical vehicles as opposed to conventional combustion engine powered vehicles. Reduce/minimise traffic requirements/ground support vehicles for aircraft operations where possible. Ensure vehicles are well-maintained and always parked on paved surfaces.	
Assessment of impact	**Rating before mitigation**	**Rating after mitigation**
Extent of impact	Local (L)	Site Specific (SS)
Duration of impact	Long term (L)	Short term (S)
Magnitude of negative impact	Low (L)	Low (L)
Magnitude of positive impact	Zero (Z)	Zero (Z)
Intensity of impact	Destructive – Low (L)	Destructive – Low (L)
Probability of occurrence	Possible (Po)	Improbable (Im)
Significance	**Low (L)**	**Very Low (VL)**
Confidence	Sure (S)	Sure (S)

Table 72: Impact table for contamination of groundwater because of Direct Release (GEOSS; Sept 2024)

Potential impact on groundwater quality deterioration because of direct release.		
Impact	**Description**	
Nature of Impact	Direct surface release of contaminants to the soil is that of airport rescue and firefighting (ARFF) training. During such training fires are started using oils, and other fuels (including metal, wood and other raw materials), to allow for emergency training of the fire and rescue staff to take place. Further, other than the fuels used to create fires for simulation purposes, the agents used to extinguish the fires consist primarily of foams with other additives to stabilise, ensure readiness, and allow for longevity of extinguishing agents. These additives contain perfluorochemicals (PFCs) that remain stable for long durations of time in the environment (Cheng et. al., 2009). The practises, protocols and equipment required for the safe and successful emergency operation of the facility will depend on the type of aircraft used at the airport and the scale of the airport.	
Status of Impact	Negative	
Recommended mitigation measures	**Description**	
Impact avoidance/ Prevention/ Mitigation	For routine burns and training purposes, make use of biodegradable fuels, which once burned minimises the impact on the groundwater. Erect bunds on which training can take place to contain the waste from the fire residue as well as the extinguishing agents. The discharge generated by training exercises should be monitored and analysed for several chemical parameters (to be established once the composition of the extinguishing agents used on site are known) and must be disposed of or stored appropriately in accordance with the National Water Act (DWS, 1998) (and relevant amendments).	
Assessment of impact	**Rating before mitigation**	**Rating after mitigation**
Extent of impact	Local (L)	Site Specific (SS)
Duration of impact	Long term (L)	Long term (L)
Magnitude of negative impact	Low (L)	Low (L)
Magnitude of positive impact	Zero (Z)	Zero (Z)

Intensity of impact	Destructive – Medium (M)	Destructive – Low (L)
Probability of occurrence	Probable (Pr)	Improbable (Im)
Significance	**Low (L)**	**Low (L)**
Confidence	Sure (S)	Sure (S)

Table 73: Impact table for contamination of groundwater because of Accidental Release (GEOSS; Sept 2024)

Potential impact on groundwater quality deterioration because of Accidental Release.		
Impact	**Description**	
Nature of Impact	The origins of accidental releases of contaminants to the environment are electrical infrastructure (substations) and spillages by chemical storage facilities (Nunes, 2011).	
Status of Impact	Negative	
Recommended mitigation measures	**Description**	
Impact avoidance/ Prevention/ Mitigation	Ensure that the construction and design of the bunding for storage of chemical substances that are stored on site is appropriate. Ensure that existing electrical infrastructure (where risk of contamination exists, i.e. substations) is located on appropriate bunding. Implement appropriate monitoring infrastructure, e.g. borehole monitoring around the sites where electrical infrastructure and chemicals are stored, to identify leakages and spillages from chemical storage facilities and electrical infrastructure.	
Assessment of impact	**Rating before mitigation**	**Rating after mitigation**
Extent of impact	Local (L)	Site Specific (SS)
Duration of impact	Long term (L)	Long term (L)
Magnitude of negative impact	Medium (M)	Low (L)

Magnitude of positive impact	Zero (Z)	Zero (Z)
Intensity of impact	Destructive – Medium (M)	Destructive – Low (L)
Probability of occurrence	Possible (Po)	Improbable (Im)
Significance	**Low (L)**	**Very Low (VL)**
Confidence	Sure (S)	Sure (S)

8.3.5 Assessment of Impacts: Cumulative Impacts

During the course of this assessment, it appears that the majority of water users in the area utilise the underlying groundwater resource for agricultural purposes. Further to this, no developments similar to the CWA are present within the region. The developments of interest that were noted include the County Fair chicken farm and the Fisantekraal Wastewater Treatment Works. Each individual impact was assessed with regards to its potential cumulative impact when considered along with the other developments.

Table 74: Cumulative impacts in relation to other regional developments (GEOSS, Geohydrological Impact Assessment; Sept 2024)

Type of cumulative impact	Significance rating before mitigation	Significance rating after mitigation
Construction and Development	Very Low (VL)	Very Low (VL)
Surface Run-off	Medium (M)	Medium (M)
Leaks Storage and Distribution	Medium (M)	Medium (M)
Atmospheric Deposition	Low (L)	Very Low (VL)
Direct/Surface Release	Low (L)	Low (L)
Accidental Release	Medium (M)	Low (L)
Energy Supply	Medium (M)	Very Low (VL)
Groundwater resource depletion as a result of over-abstraction	High (H)	Low (L)
Groundwater quality deterioration as a result of over-abstraction	High (H)	Low (L)
Storage of wastewater before treatment	Medium (M)	Very Low (VL)
Storage of brine from treated potable water	Medium (M)	Very Low (VL)
Storage of chemicals associated with WWTW	Medium (M)	Very Low (VL)
Irrigation of the landscape with treated wastewater	Medium (M)	Very Low (VL)

8.3.6 Mitigation measures: Potential Geohydrological Impacts

Construction of the facility:

- Vehicles must be maintained regularly and kept in a good working order, and park on hardstand areas with appropriate drainage and catchment systems, where possible.
- Dirty water should be captured, to be re-used where possible. No dirty water is allowed to be discharged into the surrounding environment.
- Implement monthly groundwater quality monitoring during construction phase.
- Drip trays to be used under stationary vehicles and machinery where possible.
- A dewatering plan to be developed prior to construction (where required). Should this be required, the dewatering plan could be devised by a professional. It is important that if the water is to be released back into the environment, it should be done under the guidance of relevant regulations and supervised/monitored by an appropriately qualified professional.

Surface runoff:

- Installation of appropriate stormwater systems with catch pits to isolate fuel and other contaminants.
- A stormwater management plan and system should address potential water quality concerns and associated water treatment. The water quality must meet relevant standards prior to discharge into the receiving environment; further the regulations indicated in the Water Act (as well as amendments) will need to be adhered to.
- An appropriate monitoring system within the stormwater reticulation could be considered, where applicable and possible, e.g. within separation/first flush chambers.
- Petrol interceptors might be considered to mitigate the risks of contaminants draining into the environment.

Leaks from fuel storage and distribution:

- Tanks must be double walled / “jacketed” i.e., possessing secondary containment to prevent tank content to release into surrounding soil and groundwater. The underground storage tank must have an internal leak detection monitoring system between the two walls to monitor for product leakage;
- Fuel lines and sumps must be secondary contained where lines are joined.
- The filling station must include the following design measures:
- Fuel Containment Area
    - The containment slab must be graded to drain a catch-pit that is connected to discharge to the stormwater system via an oil separator while the surrounding paved surface areas must be graded to ensure rainwater runoff to the stormwater system. No washing in this area is allowed
- Forecourt Area
    - The forecourt area must be provided with its own set of catch pits that is connected to discharge to the sewer via a separate oil separator. Please note that the aforesaid areas (1 & 2 above) cannot be interconnected. The surface area of the forecourt must be graded to the abovementioned catch pits while the surrounding surface area

graded to drain rainwater to the stormwater system. Washing of the forecourt surface is allowed in this instance.

- Additionally, the following mitigation is required which is associated with petrol filling station Underground Storage Tank (UST) and pipework installations (applicable for the construction and operation phase):

National Standards

- All containment manholes must be regularly inspected as part of the normal management procedures at the service station.
- The installation of Underground Storage Tanks (UST's) and associated pipework must be implemented in accordance with the relevant South African National Standards (SANS), specifically (not exclusive to) the following standards:

a) SANS 10089-3 (2010) (English): The petroleum industry Part 3: The installation, modification, and decommissioning of underground storage tanks, pumps/dispensers and pipework at service stations and consumer installations.

b) SANS 10 400TT (Fire Protection) 53 Sections 1-6 (The application of the National Building Regulations-Installation of Liquid Fuel Dispensing Pumps and Tanks);

c) SANS 10087-3 (2008) (English): The handling, storage, distribution and maintenance of liquefied petroleum gas in domestic, commercial, and industrial installations Part 3: Liquefied petroleum gas installations involving storage vessels of individual water capacity exceeding 500 L.

- The installation of the UST's and associated pipework must comply with the National Building Regulations and Standards Act No. 103 of 1977;
- The installation must comply with local authority bylaws and all procedures and equipment used must be in accordance with the Occupational Health & Safety Act (No. 85 of 1993);
- Upon completion of the UST installation, an engineer is to inspect and verify that the tanks and the associated infrastructure have been installed as per the design criteria described in the final BAR and to all required SABS/SANS standards and applicable legislation. A report thereafter, based on the engineer's findings, it to be submitted to the DEA & DP Land Management and Pollution Directorates for inspection and the City of Cape Town Municipality.
- Any repair work required is to be conducted according to SABS 1535 (Glass-reinforced polyester-coated steel tanks, including jacketed tanks, for the underground storage of hydrocarbons and oxygenated solvents and intended for burial horizontally);

Installation of Underground Storage Tanks

- The USTs must be reliable in the event of heavy rains and flooding. UST manholes shall be impermeable and resistant to fuel, they shall consist of a heavy-duty cast-iron cover, which shall prevent damage from surface traffic;
- Construction of a reinforced concrete slab over the USTs, its thickness and strength are to be determined by a qualified Engineer;

- The filler point and tank must be fitted with overfill protection. The critical level should be such that a space remains in the tank to accommodate the delivery hose volume (2%). Earthing and snap tight quick coupling is
- The USTs are to be fitted with a tank containment sump, fitted on top of the tank and a dispenser containment to be provided for loading of materials into tanks to minimise the risk of fires and prevent spillage and loss of materials; and sump must be provided, fitted underneath the dispenser as containment. A Filler spill containment must also be provided for remote filler containment purposes;
- The excavation must be protected against the ingress of surface run off water, and is to be kept reasonably free of sub-surface water by pumping out if necessary;
- The excavation must be lined with a HDPE liner or a suitable layer to prevent infiltration of product to the groundwater should a spill or leak occur (an impermeable liner);
- The UST is to be inspected before installation for damage, including factures or damage to coating work.
- Leak and pressure tests must be conducted on tanks and pipelines to ensure integrity prior to operation and the inspection authority must issue pressure test certificates.
- The UST must be buried 750mm below finished ground level in accordance with SANS 10089-3;
- The local Fire Department must be informed two (2) working days before installation commences and to be called for inspection at the following stages:

a) Installation of tank on clean sand bed before backfilling

b) Witness pressure test (delivery lines 1000kPa, tank 35kPa); and

c) Inspection of slab over tank before concreting;

Pipework

- Installation of associated pipe work. This shall include the installation of internationally approved non-corrosive pipework systems. All underground piping is to be Petrotechniks UPP Extra piping (nylon lined, 10 bar rated). Nextube Kableflex sleeving (oil industry green with a smooth internal bore) to be used as secondary containment. This is to limit the possibility of pipe failure due to corrosion; this being the most common cause of pipe failure before this system was introduced to South Africa.
- All pipeline connections are to be housed within impermeable containment chambers. A leak detector on all submersible pumps that automatically checks the integrity of the pipework on the pressure side of the pump must be provided. Pipelines must not retain product after use and no joints are to be made underground. An emergency shut-off valve must be supplied between the supply pipeline and dispenser inlet. All pipes (vent, filler and delivery) are to slope back to the USTs so that fuel does not remain in the pipes;
- Vent pipes to be fitted with "Fulcrum" vertical vent roses, or an approved equally equivalent market product replacement, that conforms to these standards. Confirmation of filler point and vent position to be made by an approved Engineer for safety distances required;
- Vent pipes above ground are to be galvanised mild steel and are to be at least 1000mm above the roof height and away from any doors, windows, chimney openings and other sources of ignition; and the tank product lines must be pressure tested prior to commissioning;

Leak detection and monitoring required

- It is required to undertake integrity testing on Underground Storage Tanks (UST's) and underground pipe integrity testing. The frequency of integrity testing should be as follows as outlined here. Tank and pipe integrity testing shall be carried out in the following instances:
- Following installation of a new UST and associated underground pipework or following repair, maintenance or upgrade of an existing UST or underground pipework (or both). Testing shall be carried out prior to burial of the installation;
- When ownership of the UST and associated underground pipework changes;
- When leak detection monitoring methods that may be in place, such as Stock Inventory Reconciliation Analysis, Automatic Tank Gauging (with a reconciliation facility) or interstitial vapour or liquid monitoring of double-walled or jacketed steel tanks, indicate the possibility of a leak. In this instance, an investigation into the possible leak, including integrity testing in the final stages of the investigation, shall be used to track the reasons for a failure to reconcile;
- Where continuous leak detection monitoring, such as Stock Inventory Reconciliation (SIR), is not carried out at a site. In this instance, UST and associated underground pipe integrity testing should be carried out every 2 years. If USTs and underground pipes do not operate with a continuous leak detection system, but do have cathodic protection installed, then this period may be extended to 10-year intervals.
- USTs are to be fitted with a monitoring tube to allow for the monitoring of leaks through the tank surface;
- Leak detectors are to be installed to the submersible pumps within UST manholes to ensure that there are no line leaks;
- A relatively inexpensive soil vapour monitoring installation must be installed which can be monitored on a frequent basis (monthly intervals) using a Photo Ionisation Detector (PID) e.g., Mini RAE 2000.
- The installation of Soil Vapour Sampling Points will require the placement of a permeable coarse clean sand layer beneath the storage tanks for a vertical depth of approximately 0.5m to 1m in order to locate the vents in the 16 mm diameter monitoring pipe over portion of this depth
- The Groundwater Monitoring Action Plan must be included as an Annexure to the approved EMP.
- Observation wells must be installed in the sand fill surrounding the underground storage tanks for regular monitoring purposes
- All containment manholes must be regularly inspected as part of the normal management procedures at the service station
- Continuous electronic monitoring (CEM) of product must be carried out. Should discrepancies occur an alarm will be triggered and site management will review the finding and take appropriate action to rectify the situation as required.
- Should a leak be found or should the groundwater in the monitoring wells be found to be contaminated with hydrocarbons, a baseline Phase 1 Contamination Assessment should be undertaken and the site remediated in consultation with a contamination remediation consultant and the Authorities.

Forecourt Dispensing Area

- Installation of pump islands in the forecourt area. The pumps are to be fitted with a Spill Containment Chamber;
- Construction of a concrete bunded reinforced graded slab over the forecourt area, with positive falls towards a centrally located catch-pit/sump. The slabs thickness and strength are to be determined by a qualified Engineer. The centrally located catch-pit/sump shall drain into a pollution containment chamber i.e., an approved oil/water separator system. Once the wash water has passed through the system, the separated oil must be collected regularly by an approved waste contractor and removed to an approved hazardous waste disposal facility.

Atmospheric deposition:

Where vehicles are required for airport operation, make use of electrical vehicles as opposed to conventional combustion engine powered vehicles. Reduce/minimise traffic requirements/ground support vehicles for aircraft operations where possible.

Direct Release:

- For routine burns and training purposes, make use of biodegradable fuels, which once burn minimise the impact on the groundwater.
- Erect bunds on which training can take place to contain the waste from the fire residue as well as the extinguishing agents.
- The discharge generated by training exercises will need to be monitored and analysed for several chemical parameters (to be established once the composition of the extinguishing agents used on site are known) and will need to be disposed of or stored appropriately in accordance with the National Water Act (DWS, 1998) (and relevant amendments).
- It is likely that disposal and/or storage of the waste from training will give rise to the need for a Water Use License (WUL), depending on the waste composition, frequency of training and planned disposal of training residue.

Accidental Release:

- Devise and design appropriate bunding for storage of chemical substances that are to be stored on site, as well as erecting the electrical infrastructure (where risk of contamination exists, i.e. substations) on appropriate bunding.
- Implement appropriate monitoring infrastructure, e.g. borehole monitoring around the sites where electrical infrastructure and chemicals are stored, to identify leakages and spillages from chemical storage facilities and electrical infrastructure.

Biodigester facilities for energy generation:

- Proper management and design of digestate application (i.e. use as fertiliser) to areas on the property and/or surrounding areas.
- Monitoring of the impacts on the groundwater will need to be implemented should this biproduct of the facility be used in this way.
- Ensure design of facility is appropriate, e.g. include bunding in high-risk areas or where applicable, instate appropriate monitoring around facility and along relevant points through the system.

Photovoltaic solar facilities:

Make use of biodegradable cleaning agents to ensure little to no impact on the quality of the groundwater is experienced.

Over-abstraction of groundwater:

- Groundwater abstraction volumes must be monitored.
- Water levels must be monitored and should not drop below the critical water level (refer to yield testing reports).
- Monitoring information must be assessed regularly (suggested monthly). If the water level in the boreholes drops below the dynamic water level. i.e. 72mbgl for CWA_BH001. and 40mbgl for CWA_BH002 abstraction will immediately be reduced by 10%. This would be for normal rainfall events. If a hydrological drought persists for more than two years, the water level can drop to above the critical water level i.e. 85 mgbl for CWA_BH001 and 61 mbgl for CWA_BH002. Monitoring will persist for 30 days. In the event of lowered levels persisting after the initial 10% reduction, further reductions in excess of 10% must be implemented and if the low levels persist for more than 60 days, abstraction must cease until the levels have been recovered. This process will continue until the water level in the borehole is stable.
- A formal groundwater management plan needs to be designed and implemented.

Groundwater quality deterioration because of wastewater storage:

- Spillages or leakages from the WWTW could contaminate the surrounding non-perennial freshwater systems and groundwater in the area. Therefore, the effluent containment ponds should be appropriately lined to avoid discharge into the subsurface, and potentially groundwater.
- Solid waste should be stored on concrete bunded or lined surfaces and water drainage from the solid waste should be captured and returned to the WWTW.
- It is recommended that Groundwater Management Plan be implemented to ensure the groundwater quality is not affected by the operations of the WWTW.
- Monitoring of the WWTW infrastructure is required to ensure that there is no loss of water in the system; flow meters measuring influent and effluent must be installed, monitored and recorded.
- Regular internal and external inspections and auditing of the facility must take place to ensure the infrastructure is in good working order

Groundwater quality deterioration because of brine storage:

- Spillages or leakages from the brine ponds could contaminate the groundwater in the area. Therefore, the brine containment ponds should be appropriately lined with additional bunding structures to avoid discharge into the subsurface, and potentially groundwater.
- It is recommended that Groundwater Management Plan be implemented to ensure the groundwater quality is not affected by the operations of the brine ponds.
- Regular internal and external inspections and auditing of the facility must take place to ensure the infrastructure is in good working order.

Groundwater quality deterioration because of chemical storage associated with WWTW:

- The chemical storage areas should be appropriately lined with additional bunding structures to avoid discharge into the subsurface, and potentially groundwater.

- It is recommended that Groundwater Management Plan be implemented to ensure the groundwater quality is not affected by the operations of the WWTW.
- Monitoring of the WWTW infrastructure is required to ensure that there is no loss of water in the system; flow meters measuring influent and effluent must be installed, monitored and recorded.
- Regular internal and external inspections and auditing of the facility must take place to ensure the infrastructure is in good working order.

Groundwater quality deterioration because of result of irrigation with the treated sewage effluent:

- Contaminated water used to irrigate the demarcated fields could contaminate the groundwater in the area. The WWTW needs to ensure that the water released into the environment is within the limits of the General Authorisation.
- Monthly monitoring of the quality of the treated effluent must take place to ensure that quality objectives are reached.
- It is recommended that Groundwater Management Plan be implemented to ensure the groundwater quality is not negatively affected by the irrigation with treated effluen

8.3.7. Monitoring Requirements: Potential Geohydrological Impacts

- Implement monthly groundwater quality monitoring during construction phase.
- An appropriate monitoring system within the stormwater reticulation could be considered, where applicable and possible, e.g. within separation/first flush chambers.
- Monitoring of the impacts on the groundwater will need to be implemented should the digestate of the Biodigester be used for irrigation.
- Groundwater abstraction volumes must be monitored.
- Groundwater levels must be monitored and should not drop below the critical water level
- Monitoring information must be assessed regularly (suggested monthly). If the water level in the boreholes drops below the dynamic water level. i.e. 72mbgl for CWA_BH001. and 40mbgl for CWA_BH002 abstraction will immediately be reduced by 10%. This would be for normal rainfall events. If a hydrological drought persists for more than two years, the water level can drop to above the critical water level i.e. 85mgbl for CWA_BH001 and 61mbgl for CWA_BH002. Monitoring will persist for 30 days. In the event of lowered levels persisting after the initial 10% reduction, further reductions in excess of 10% must be implemented and if the low levels persist for more than 60 days, abstraction must cease until the levels have been recovered. This process will continue until the water level in the borehole is stable.
- A formal groundwater management plan needs to be designed and implemented.
- It is recommended that Groundwater Management Plan be implemented to ensure the groundwater quality is not affected by the operations of the WWTW.
- Monitoring of the WWTW infrastructure is required to ensure that there is no loss of water in the system; flow meters measuring influent and effluent must be installed, monitored and recorded.
- Regular internal and external inspections and auditing of the facility must take place to ensure the infrastructure is in good working order.

- It is recommended that Groundwater Management Plan be implemented to ensure the groundwater quality is not affected by the operations of the WWTW.
- Monitoring of the WWTW infrastructure is required to ensure that there is no loss of water in the system; flow meters measuring influent and effluent must be installed, monitored and recorded.
- Regular internal and external inspections and auditing of the facility must take place to ensure the infrastructure is in good working order.
- Monthly monitoring of the quality of the treated effluent must take place to ensure that quality objectives are reached.
- It is recommended that a Groundwater Management Plan be implemented to ensure the groundwater quality is not negatively affected by the irrigation with treated effluent
- Groundwater monitoring Plan:

It is recommended that a number of groundwater sites should be monitored at the proposed site during the construction and development phases on site. This will allow for monitoring of the groundwater quality and groundwater levels across the site. Monitoring sites need to be strategically placed, typically in the vicinity and downgradient of high-risk activities.

Groundwater flow in the area generally mimics the topography, flowing towards topographical lows. It is recommended that a number of local monitoring sites be located across the site to identify any potential impact of the proposed land uses. The additional suggested monitoring sites are presented in Table 75 and illustrated in Figure 135.

Table 75: Proposed groundwater monitoring sites (GEOSS, Geohydrological Impact Assessment, Sept 2024)

Site_ID	Latitude (DD, WGS84)	Longitude (DD, WGS84)	Location	Depth (mbgl)
CWA_BH001	-33.76452	18.73271	Existing borehole	100.0
CWA_BH002	-33.76876	18.732067	Existing borehole	100.4
MBH1	-33.748832	18.727907	Proximal to the WWTW	Until the clay layer/bedrock is reached
MBH2	-33.751598	18.729944	Proximal to the Biogas plant and fuel farm	Until the clay layer/bedrock is reached
MBH3	-33.753503	18.732373	Proximal to the Biogas plant and fuel farm	Until the clay layer/bedrock is reached
MBH4	-33.755629	18.730166	Proximal to the stormwater retention pond (quarry)	Until the clay layer/bedrock is reached
MBH5	-33.755713	18.736537	Airside activities	Until the clay layer/bedrock is reached
MBH6	-33.760356	18.734556	Airside activities	Until the clay layer/bedrock is reached

MBH7	-33.761442	18.730469	Proximal to the Energy Centre	Until the clay layer/bedrock is reached
MBH8	-33.764807	18.730847	Proximal to the retail service station	Until the clay layer/bedrock is reached
MBH9	-33.769336	18.731523	Boundary of the CWA, to screen potential contaminants upgradient of neighbour	Until the clay layer/bedrock is reached
MBH10	-33.773944	18.735199	Boundary of the CWA, to screen potential contaminants upgradient of neighbour	Until the clay layer/bedrock is reached
MBH11	-33.772721	18.747079	Airside activities	Until the clay layer/bedrock is reached
MBH12	-33.763444	18.742089	Airside activities	Until the clay layer/bedrock is reached

The drilling of boreholes should be supervised by a hydrogeologist and drill samples should be collected every 1m and logged. Additional information should also be collected such as the depth of water strikes, associated water strike yields and groundwater quality. This is crucial information for the optimal design of the boreholes. The driller should be supervised to ensure all site requirements are met.

Groundwater level and quality monitoring should be measured per borehole:

- A dip meter can be used to measure the water level below the top of the borehole collar/casing height (mbch). The height of the collar/casing height must then also be measured (m). The water level (metres below ground level (mbgl)) can then be calculated by subtracting the collar/casing height from the water level (mbch). The value must be recorded along with the date and time of measurement.
- It is recommended that the monitoring wells be purged prior to sampling. A low volume sampling pump can be used, or the site can be bailed and allowed to recover prior to sample collection. When using a low volume sampling pump, the groundwater should be pumped through a flow-through cell until field chemistry parameters have stabilised.
    - Samples must be collected in an appropriate sampling container and preserved in the correct manner prior to submission to an accredited laboratory for the analysis parameters.
    - Monthly water level measurements must be taken to determine seasonal fluctuation. Water quality on site should be monitored on a quarterly basis for the first year, after which the frequency can be reduced based on the first year's monitoring results.
    - Groundwater monitoring needs to target the risk of the activity, i.e. organic and microbiological parameters need to be determined based on the activity monitored.

Table 76: Proposed groundwater monitoring parameters and their recommended frequency

Parameter	Frequency*
Groundwater Level	Monthly
pH	Quarterly
Electrical conductivity (EC)	Quarterly
Total Dissolved Solids (TDS)	Quarterly
Inorganic parameters: K, Cl, NO_3, NH_4, P, Na, Ca, HCO_3	Quarterly
Metals: Fe, Mn, Al, Ti, Cr, Cd, Pb, Ni	Quarterly
Total Organic Carbon (TOC)	Quarterly
Biological Oxygen Demand (BOD)	Quarterly
Chemical Oxygen Demand (COD)	Quarterly
Heterotrophic Plate Count	Quarterly
Total Coliforms	Quarterly
E. coli	Quarterly
BTEX	Quarterly
Gasoline Range Organics (GROs)	Quarterly
Total Petroleum Hydrocarbons (TPH)	Quarterly

** Frequency of chemistry sampling may be revised after one year of data has been collected but level monitoring should continue on a monthly basis*

The groundwater monitoring network will consists of:

- Regional monitoring boreholes: To monitor the regional groundwater quality, e.g. of the fractured bedrock aquifer. These boreholes should ideally be monitored prior to the commencement of construction to establish baseline conditions.
- Local monitoring boreholes: These boreholes are required specifically to monitor the groundwater surrounding high-risk facilities (e.g. firefighting training areas, fuel farms, chemical storage facilities etc). The design and position of these boreholes will

need to be established once the positions of the high-risk facilities are finalised and the final site development plan is made available. Importantly, any planned development of groundwater production boreholes could be appropriately designed to serve for both groundwater production and monitoring purposes.

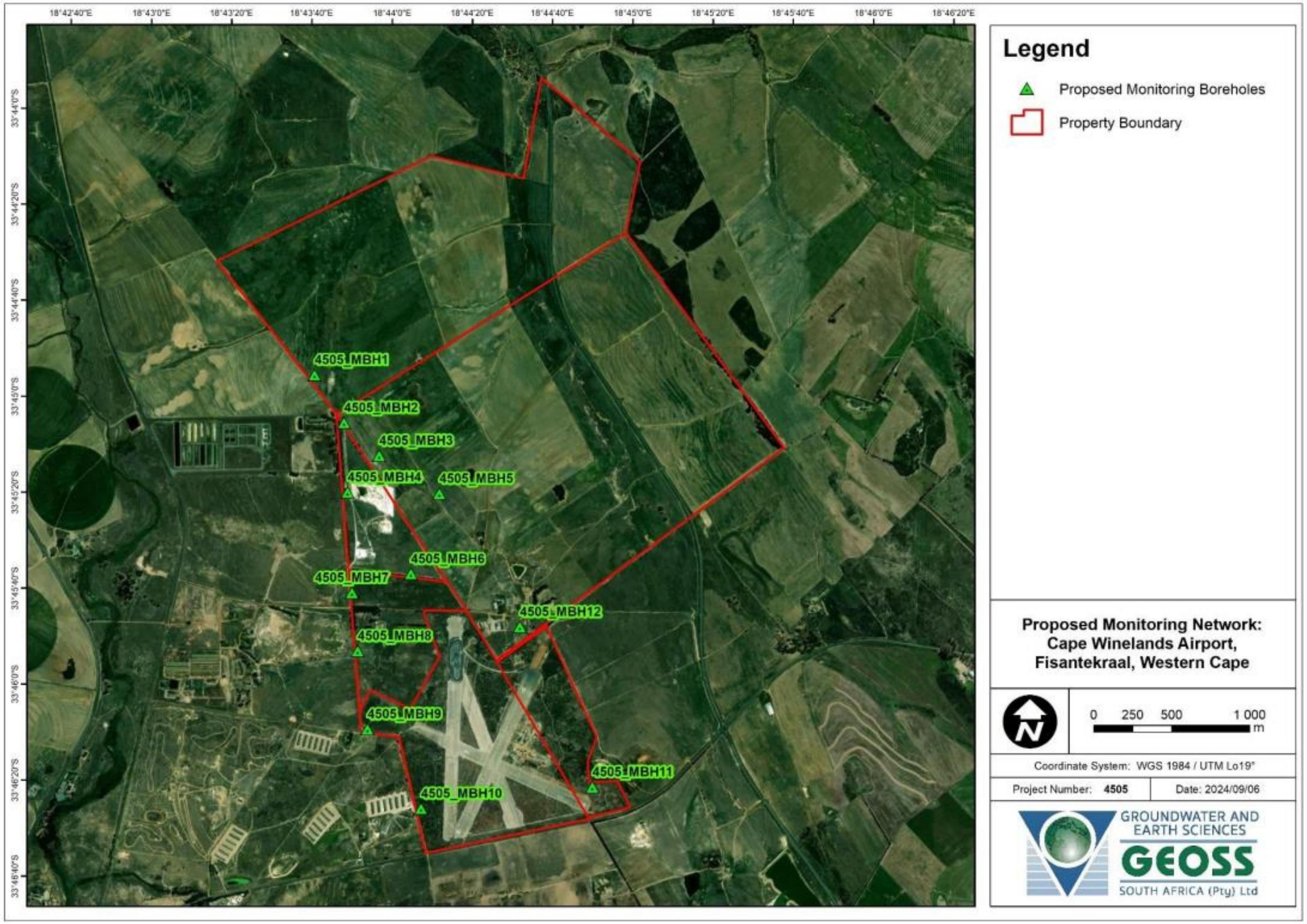

Figure 135 : Proposed groundwater monitoring locations across the Cape Winelands Airport development (GEOSS, Geohydrological Impact Assessment, Sept 2024)

8.4 Potential Air Quality Impacts

8.4.1 Introduction, ToR and Methodology

Existing emission sources (industrial, residential and vehicular) and sensitive receptors were identified in the Baseline Air Quality Report. It was found that the existing operations at the CWA and the onsite fuel tank have a very small contribution on the air pollution emissions in the area and are considered insignificant, and the air quality in the immediate vicinity of the CWA is very good with very low concentrations of all the relevant air pollutants pertaining to the airport operations.

The terms of reference of the Atmospheric Impact Report were:

- Identify and describe the existing air quality of the project area, including climatic patterns and features (i.e. the baseline);
- Identify existing significant sources of air pollution in the area;
- Identify potential receptors;
- Define applicable legislative requirements regarding any permit applications required;
- Identify potential impacts of the proposed project on air quality;
- Assess the impacts of air pollution on the surrounding communities and the environment, using the prescribed impact assessment methodology. Include, where possible, an estimation of worst-case scenarios, such as unfavourable meteorological conditions (e.g. windy days);
- Identify and assess potential cumulative ecological impacts resulting from the proposed development, with the proposed and existing developments in the surrounding area;
- Recommend practicable mitigation measures to avoid and/or minimise/reduce impacts and enhance benefits, and;
- Recommend and draft a monitoring campaign to ensure the correct implementation and adequacy of any recommenced mitigation and management measures, if applicable.

The following issues raised during the pre-application Scoping Phase PPP were considered:

Increased air pollution resulting from proposed development activities; Health risk (humans and animals) related to dust, and particulate matter released during construction activities as well as aircraft emissions during the operational phase; Increased health risks resulting from air pollution will place increased strain on local public health services; Negative impact of air pollution on property values and house sales; Incomplete air quality assessment.

The following issues raised during the in-process Scoping Phase PPP were considered:

Decreased air quality impacting health of local inhabitants; air pollution in Mikpunt; incomplete air quality assessment; air pollution risks posed by the biodigester; air pollution resulting from emissions escaping. from fuel storage tanks; proximity to the community of Fisantekraal; increased carbon emissions associated with proposed development.

Assumptions and limitations:

- The construction phase emissions were determined, and the impact was assessed qualitatively. During the construction phase, the main pollutant of concern is dust. The exhaust emissions from the construction vehicle exhausts were not assessed due to their very limited quantity and their local and temporal nature.

- The air emissions for the criteria air pollutants (i.e. CO, NO_2, SO_2, PM10 and PM2.5) from the aircraft and the road traffic were quantified and modelled.
- The aircraft emissions of the current scenario were based on the aircraft movement forecasts.
- As a worst-case scenario, for the determination of the NO_2 levels, the Tier 1 approach was adopted, which entails the complete conversion of NO_x to NO_2.
- In addition to the airport-related vehicular traffic on the approach roadways to the airport, the vehicular traffic on the main arterial roads immediately adjacent to the airport was included in the assessment of the three operational scenarios, in order to assess the resulting cumulative concentrations.

Methodology Overview:

The present study comprises the following main components:

- Baseline characterisation.
- Emissions inventory compilation; • Air pollution dispersion simulation; and
- Impacts assessment.

8.4.2 Assessment of impacts: Construction Phase

During construction, the main air pollutant of concern is dust. Dust will be generated during the land clearing, site preparations and levelling, bulk earthworks, such as cut and fill operations to the East of the existing runways, material loading and hauling, travelling on unpaved roads and wind erosion from exposed areas. The dust is expected to settle to the ground near the sources due to gravity in a matter of a few hours and can cause a nuisance to the receptors in close proximity to the sources. The effects of dust include visual soiling of clean surfaces, such as cars, windowsills and household washing. The airborne dust can also have an effect on visibility in the immediate vicinity of the source, which may affect potential aircraft operations during the construction phase.

The sensitivity in the immediate vicinity of the site is considered low, since there are no existing residential areas bordering the CWA airport site. The closest community is that of Fisantekraal, which is situated more than 1km away, towards the south-west.

The exhaust emissions from the truck movements and equipment at the site are expected to marginally increase air pollution concentrations, primarily within the site. At the existing communities around the airport site, these increases are expected to be negligible. Therefore, the expected impact of the vehicle and equipment exhaust emissions during construction is insignificant.

During construction the dust deposition is expected to increase in close proximity to the various construction activities, i.e. within 300m from the working face. Therefore, the extent of the impact is considered to be contained primarily within the site boundaries and set to local (1). The duration of the main construction activities may take up to 2 years, and as such was set to short-term (1). The total dust deposition beyond a 200m zone from the airport site is expected to be well below the DEA guideline of 600mg/m^2/day for residential areas, such that the intensity rating was considered to be medium (2). The significance of the unmitigated impact is anticipated to be VERY LOW.

With the implementation of the mitigation measures, the impact is expected to be INSIGNIFICANT.

Table 77: Construction Air Quality Impact Ratings

Ambient Air Quality	**Extent**	**Intensity**	**Duraon**	**Consequence**	**Probability**	**Significance**	**Status**	**Confidence**
Without Mitigation	Local	Low	Short term	**Very Low**	Probable	**VERY LOW**	**– ve**	High
	1	1	1	**3**				
Ambient Air Quality	**Extent**	**Intensity**	**Duraon**	**Consequence**	**Probability**	**Significance**	**Status**	**Confidence**
With Mitigation	Local	Low	Short term	**Very Low**	Possible	**INSIGNIFICANT**	**– ve**	
	1	1	1	**3**				

8.4.3 Assessment of impacts: Operational Phase

The resulting air pollution levels around the Cape Winelands Airport due to the airport operations were simulated with the use of the US FAA's AEDT model, which utilises the USEPA AERMOD model for the for the dispersion calculations. The resulting air pollution contours and air quality impacts were estimated for the following scenarios:

Scenario 1: Existing runway setup under full utilisation (No-Go Alternative) – refer Section 8.4.4;

Scenario 2: Operations on the new runway 01/19 in the operational year;

Scenario 3: Operations on the new runway 01/19 at full capacity.

Scenario 2: New Runway 01/19 in Operational Year

With the introduction of the new runway, the air quality impact zones during the operational year will be reduced in size, compared to Scenario 1. In addition, these zones will also follow a more north-westerly and south-easterly direction, in line with the new runway. All of the air pollutant levels outside the airport site boundaries were found to be very low. The air pollution concentrations due to the airport operations at the Fisantekraal community, but also at the new developments West and South of the airport, are expected to be very low and well within the air quality standards.

The overall air quality impact for Scenario 2 is of VERY LOW significance (Table 78). Similar to Scenario 1, a mitigation version of the impact ratings was not produced for the operational impact ratings of Scenario 2. However, the most suitable and cost-effective mitigation measures should be investigated, and an acceptable implementation timeframe should be established before the new runway reaches its capacity.

Table 78: Air Quality Impact Ratings: Scenario 2 (New Runway 01/19 at Operational Year)

Ambient Air Quality	**Extent**	**Intensity**	**Duration**	**Consequence**	**Probability**	**Significance**	**Status**	**Confidence**
Without Mitigation	Local 1	Low 1	Long term 3	**Low** **5**	Possible	**VERY LOW**	**– ve**	High

Scenario 3: New Runway 01/19 at Full Capacity

The contour concentration figures were not generated for the new runway for the operational year (Scenario 2), since the emissions were very low, and Scenario 3 is considered the worst-case for the new runway.

Figure 136 shows the 1hr concentration isopleths of the maximum expected concentrations of CO, for Scenario 3. As can be seen, the 1hr CO concentration was well below the guideline of 30,000µg/m^3. The predicted maximum 1hr CO concentrations were approximately 3,500µg/m^3.

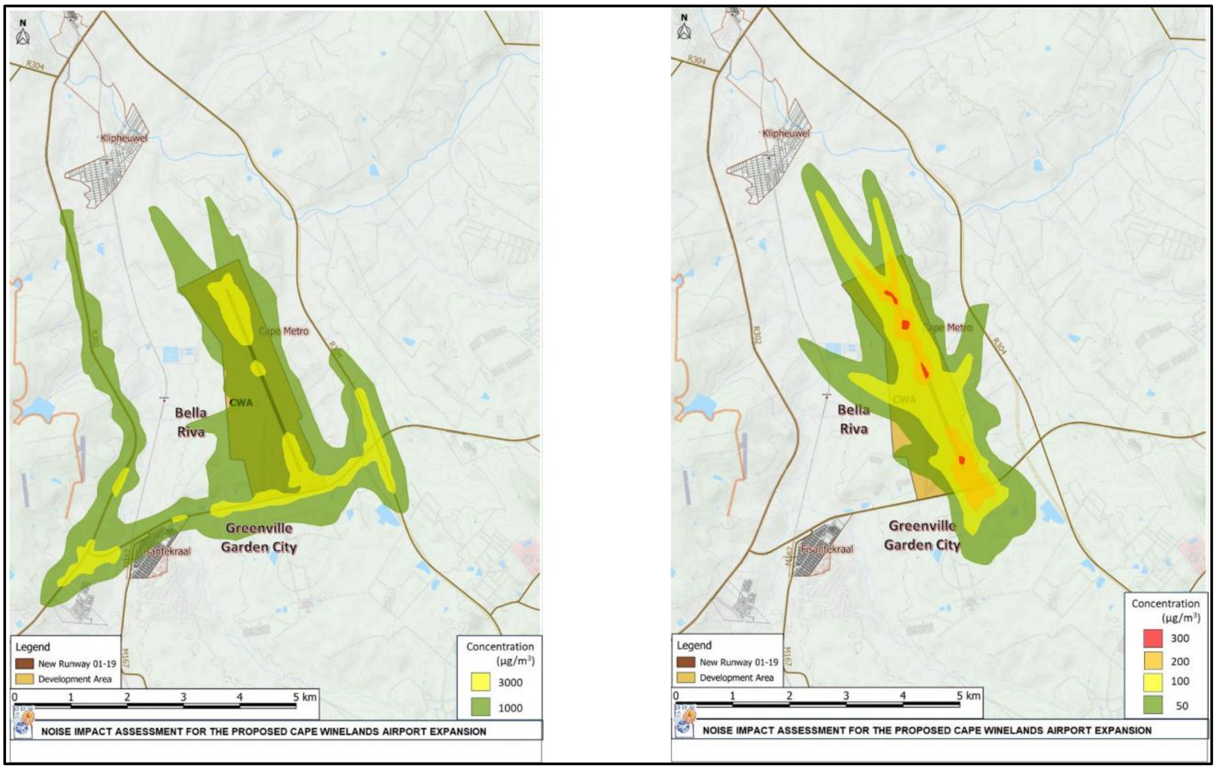

Figure 136: Scenario 3: CO 1hr Maximum Concentrations (Guideline 30,000µg/m^3) – image on left; Scenario 3: NO_2 1hr Maximum Concentrations (Guideline 200µg/m^3) - image on right (Air Quality Impact Assessment, Nov 2024)

The ground-level 1hr and annual maximum concentrations of NO_2 are depicted in Figures 136 and 137. The 1hr guideline of 200µg/m^3 was exceeded in a small area South and North of the runway. However, the exceedance number per year was only 2 and below the allowable exceedances of 88 per year. The maximum annual NO_2 concentrations were well within the guideline of 40µg/m^3.

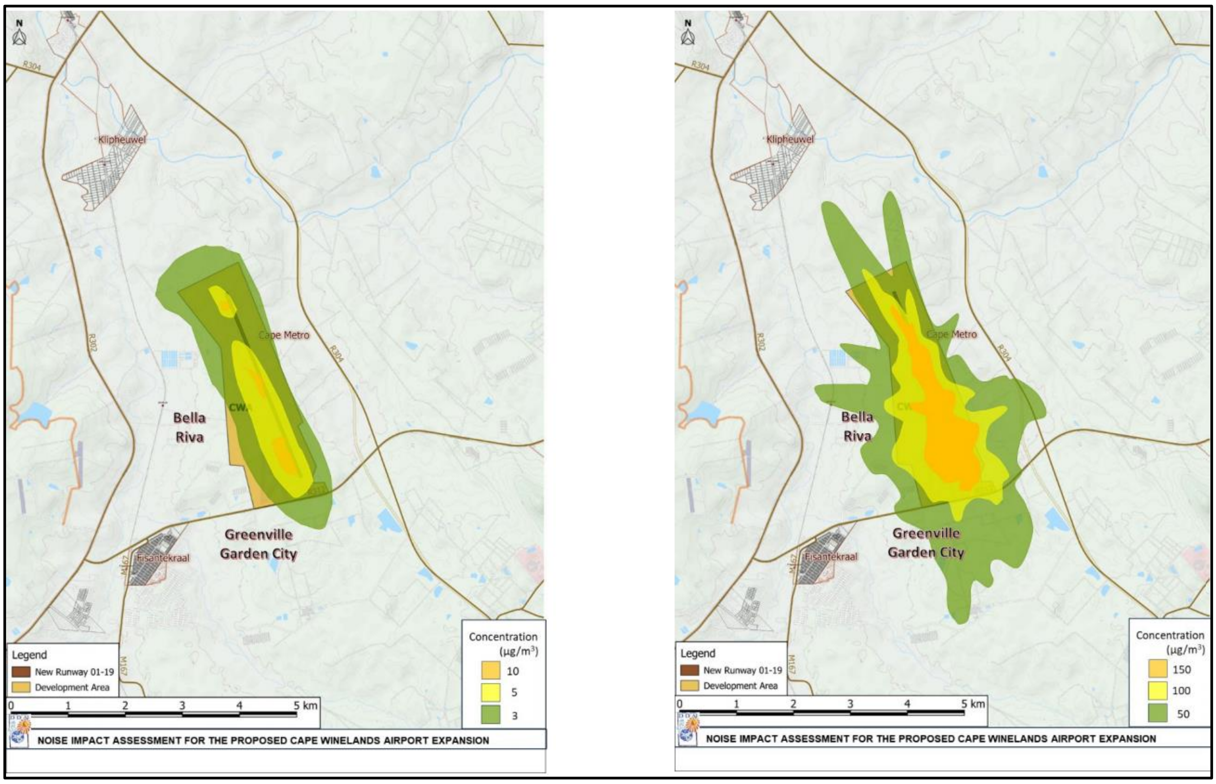

Figure 137: Scenario 3: NO_2 Maximum Annual Concentrations (Guideline 40 µg/m^3) – image on left; Scenario 3: SO_2 1hr Maximum Concentrations (Guideline 350 µg/m^3) – image on right (Air Quality Impact Assessment, Nov 2024)

The maximum ground-level SO_2 concentrations are shown in Figures 137 and Figure 138 for the 1hr and annual averaging periods respectively. The 1hr guideline of 350µg/m^3 was not exceeded anywhere on or off-site. The maximum annual concentrations were also well within the annual guideline of 50µg/m^3 with the maximum reaching approximately 5µg/m^3, within the site.

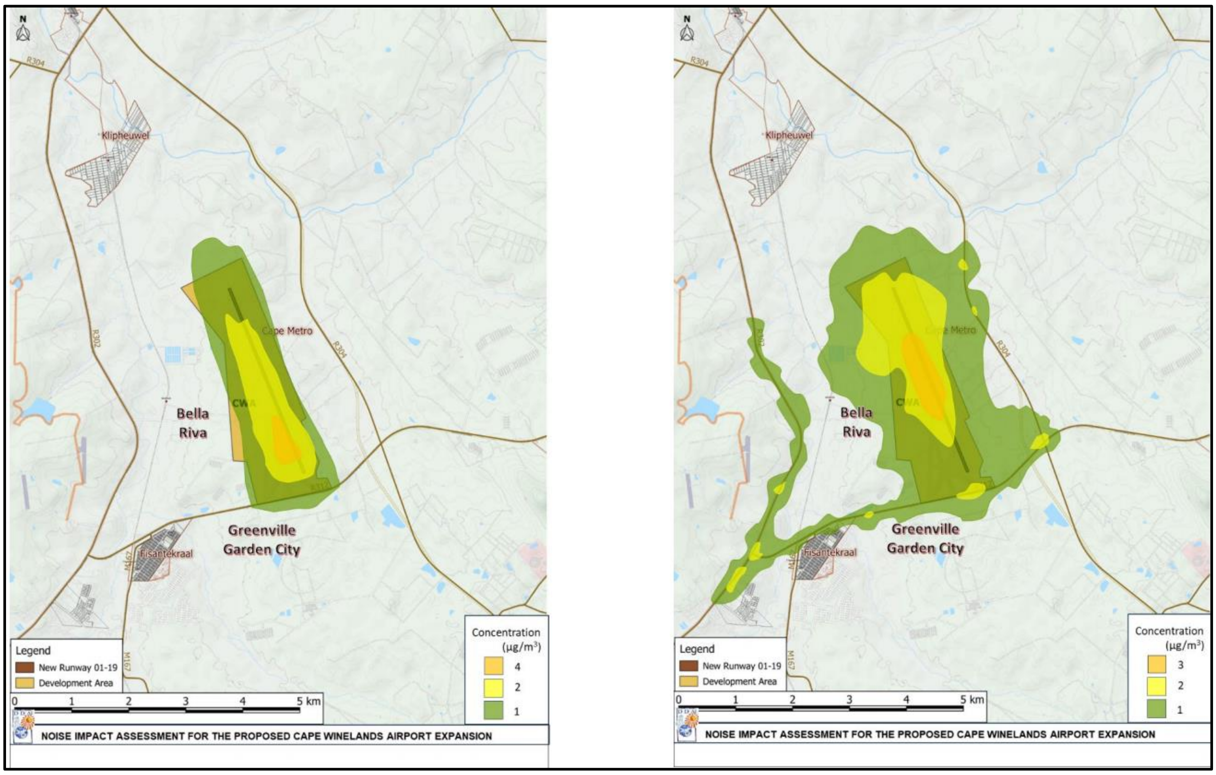

Figure 138: Scenario 3: SO_2 Maximum Annual Concentrations (Guideline 50µg/m3) – image on left; Scenario 3: PM10 24hr Maximum Concentrations (Guideline 75µg/m^3) – image on right (Air Quality Impact Assessment, Nov 2024)

The maximum 1hr ground-level PM10 concentrations are shown in Figure 138. It can be seen that these concentrations were well below their respective guidelines on-site, as well as in all the residential areas around the airport.

The maximum 1hr PM2.5 ground-level concentrations are shown in Figure 139. It is evident that the maximum 1hr concentrations in the surrounding residential areas were well within the 40µg/m^3 guideline and are expected to be below 1µg/m^3 due to the airport operations.

Modelled Concentrations at Sensitive Receptors

The modelled concentrations at the additional discrete receptors, placed within the residential areas around the airport indicate that the maxima for all pollutants and receptor points in the surrounding communities were well below their respective guidelines.

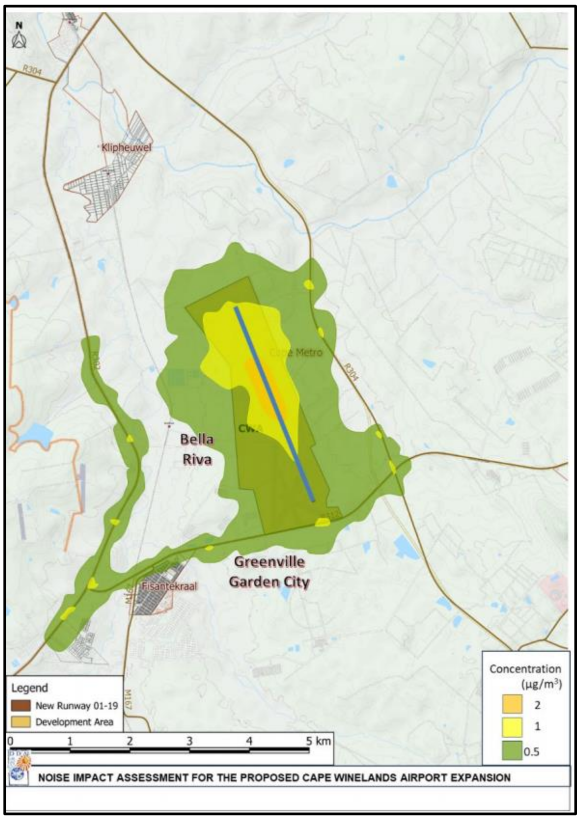

Figure 139: Scenario 3: PM2.5 24hr Maximum Concentrations (Guideline 40µg/m³) (Air Quality Impact Assessment, Nov 2024)

The air quality impact zones for the new runway at full capacity will extend beyond the airport site boundaries in a north-westerly and south-easterly direction. The air pollutant levels, however, will be within their respective air quality standards, except for the highest maximum 1hr NO_2 concentrations within small areas North and South of the runway.

Even though the maximum 1hr NO_2 concentrations exceeded the 1hr standard, the frequency of exceedances was below 10 per year, which is within the allowed number of exceedances of 88 times, as specified by the South African legislation.

The air pollutant levels at the identified community receptors, including at Fisantekraal and Klipheuwel were found to be well within the standards.

Table 79 shows the overall air quality impact for Scenario 3, which is of LOW significance.

Table 79: Air Quality Impact Ratings: Scenario 3 (New Runway 01/19 at Full Capacity)

Ambient Air Quality	**Extent**	**Intensity**	**Duration**	**Consequence**	**Probability**	**Significance**	**Status**	**Confidence**
Without Mitigation	Local 1	Low 1	Long-term 3	**Low** **5**	Probable	**LOW**	**– ve**	High

Assuming that some of the mitigation measures will be implemented before the airport capacity is reached, the resulting overall impact with mitigation for Scenario 3 would be expected to be slightly lower than the unmitigated one. However, the overall significance rating would not change.

8.4.4 The No Go Alternative (Scenario 1)

Based on the modelling results for the existing situation under full capacity (Scenario 1), the ground level concentrations of all pollutants are expected to exceed their respective guidelines outside the CWA airport site boundaries.

Figure 140 shows the maximum 1hr concentration isopleths of CO, resulting from the airport operations for the existing runways at full capacity. These maxima represent the highest estimated concentrations that result from all four years of hourly emissions and meteorological condition combinations, thus representing the worst-case concentrations that may be expected around the airport. From these maximum 1hr CO concentrations, there were no exceedances of the 30,000µg/m^3 CO guideline.

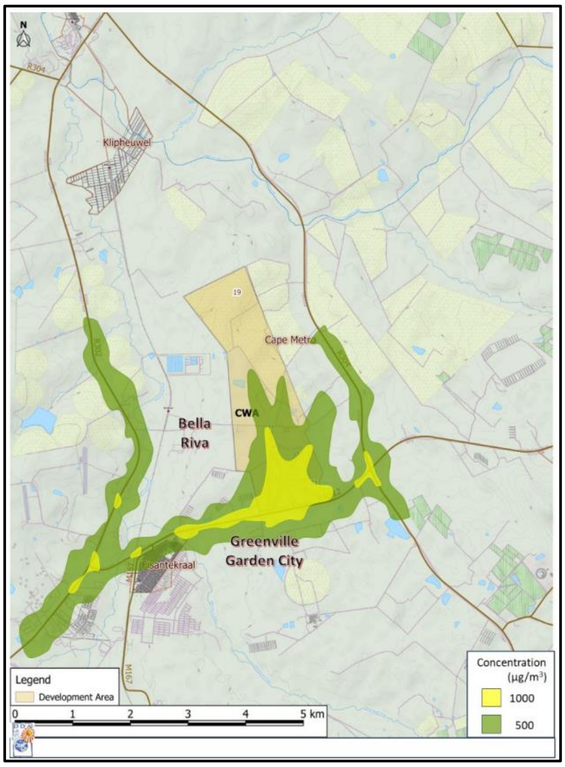

Figure 140: Scenario 1: CO 1hr Maximum Concentrations (Guideline 30,000µg/m^3) (Air Quality Impact Assessment, Nov 2024)

The maximum 1hr ground level NO_2 concentrations are depicted in Figure 141. The 1hr guideline value of 200µg/m^3 was only exceeded within a very small area immediately South of the runways. However, the frequency of exceedance was well below the guideline of 88 times per annum.

The maximum annual NO_2 concentrations were below the guideline of 40µg/m^3 within the airport site boundaries and well below the guideline in all of the communities around the airport (see Figure 142).

It should be noted that the highest maximum 1hr NO_2 concentrations at some small areas around the site exceeded the 1hr guideline value. However, the frequency of exceedances was below 3 per year, which is well below the 88 times per annum permissible by the South African legislation.

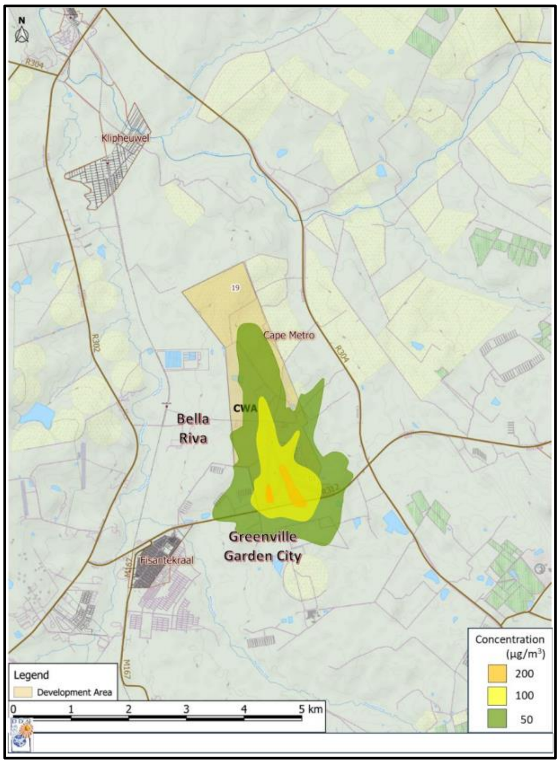

Figure 141: Scenario 1: NO_2 1hr Maximum Concentrations (Guideline value: 200µg/m^3) (Air Quality Impact Assessment, Nov 2024)

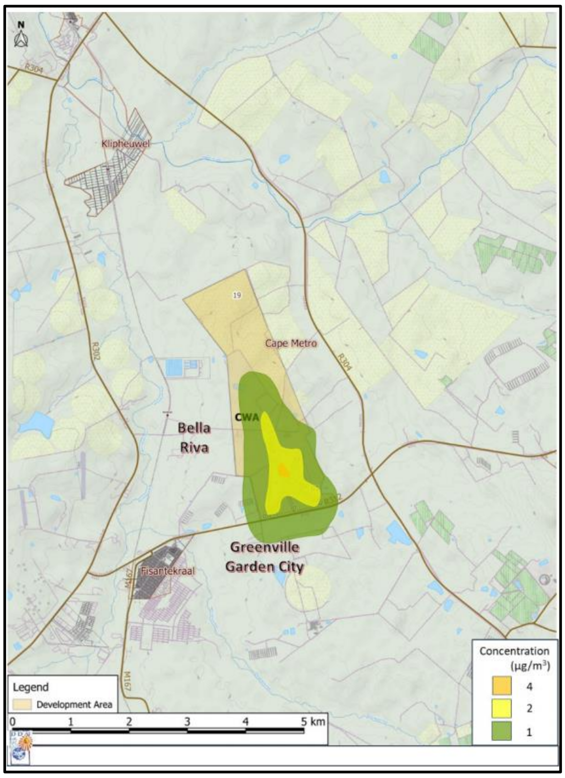

Figure 142: Scenario 1: NO_2 Maximum Annual Concentrations (Guideline 40µg/m^3) (Air Quality Impact Assessment, Nov 2024)

The SO_2 concentrations (Figures 143 and 144) indicate the maximum 1hr concentrations did not reach the guideline level of 350µg/m^3 in any of the areas within or outside the airport site. The annual maximum concentrations of SO_2 were well within the guideline of 50µg/m^3 within the site, as well as outside its boundaries.

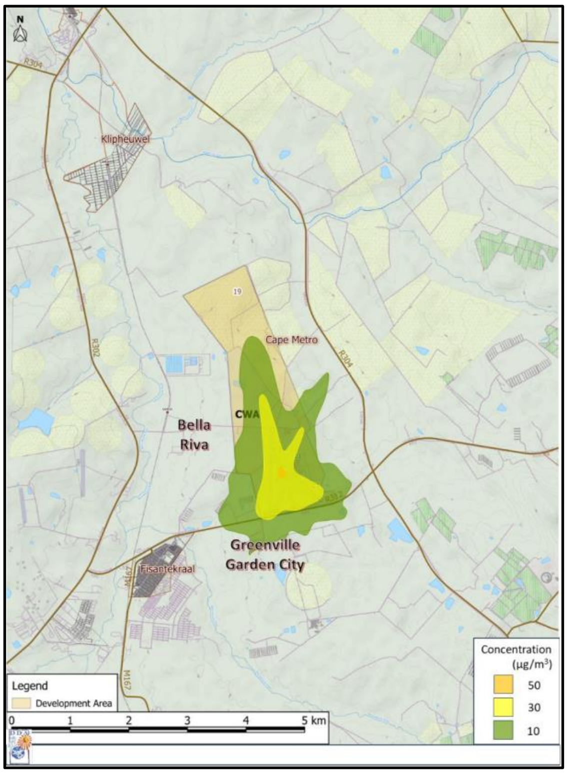

Figure 143: Scenario 1: SO_2 1hr Maximum Concentrations (Guideline value: 350µg/m^3) (Air Quality Impact Assessment, Nov 2024)

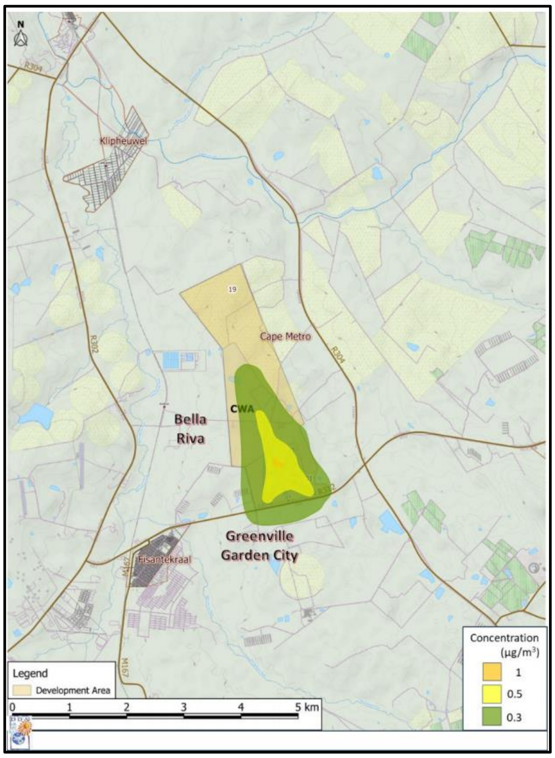

Figure 144: Scenario 1: SO_2 Maximum Annual Concentrations (Guideline:50µg/m^3) (Air Quality Impact Assessment, Nov 2024)

The 1hr PM10 ground-level maximum concentrations are shown in Figure 145. The maximum concentrations for both averaging periods were well within their respective guidelines.

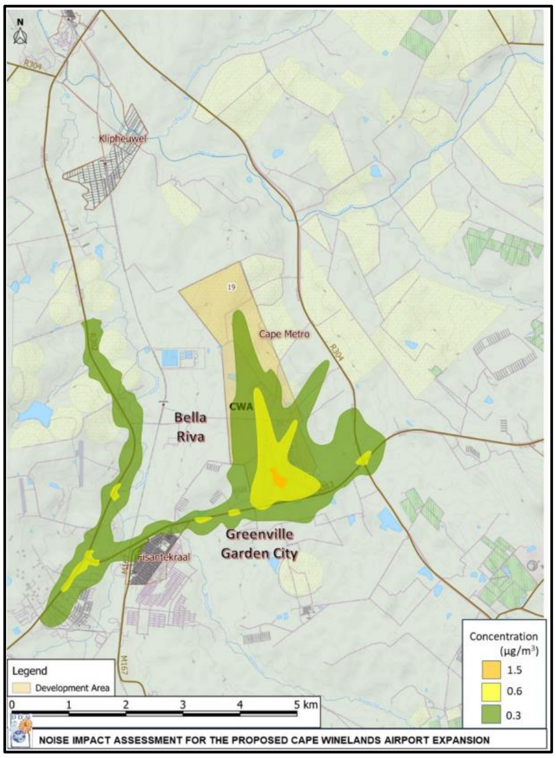

Figure 145: Scenario 1: PM10 24-hr Maximum Concentrations (Guideline 120µg/m3) (Air Quality Impact Assessment, Nov 2024)

The maximum 1hr PM2.5 ground-level concentrations are shown in Figure 146 below. Similarly to the PM10, they were well within their 1hr and annual guideline of 60 µg/m^3.

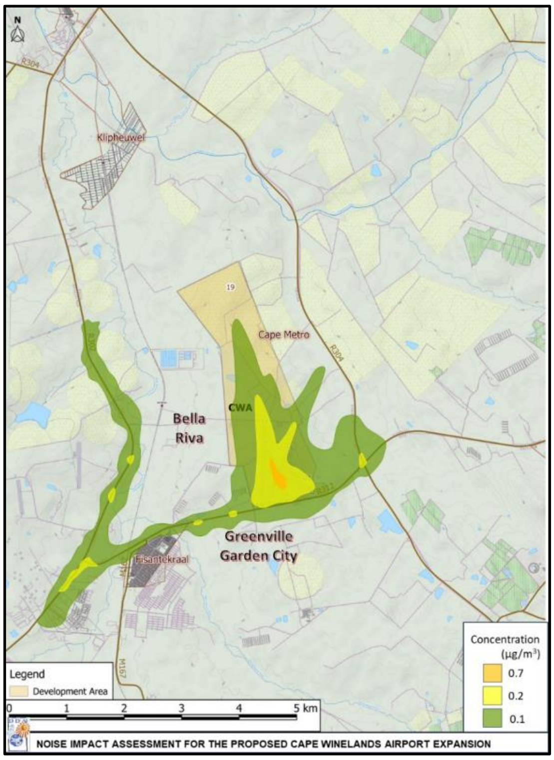

Figure 146: Scenario 1: PM2.5 24hr Maximum Concentrations (Guideline 60µg/m³) (Air Quality Impact Assessment, Nov 2024)

Modelled Concentrations at Sensitive Receptors

Additional discrete receptors were placed within the residential areas around the airport. From the modelled concentrations at these receptors for the existing situation, i.e. Scenario 1, it can be seen that for all of the selected receptor locations, the maximum concentrations of all pollutants and time averages are below their respective guidelines.

Currently, the sensitivity of the area in the immediate vicinity of the site is considered low, due to the fact that the closest community, Fisantekraal, is situated more than 1km away.

However, as indicted in previous sections, in the near future two residential areas are planned to be developed immediately south and towards the west of the airport. Once these communities are established, the sensitivity of the area would be considered moderate, assuming appropriate buffer zones will be established, primarily due to noise impact concerns.

Based on the modelling results for Scenario 1, the existing air pollution intensity due the airport's operations is considered to be low. The extent of the impact is mostly limited to the airport site, with two small areas extending towards the west and south of the site. The overall impact rating for Scenario 1 was found to be of VERY LOW significance and is summarised in Table 80.

Table 80: Air Quality Impact Ratings: Scenario 1 (No-Go Alternative)

Ambient Air Quality	**Extent**	**Intensity**	**Duration**	**Consequence**	**Probability**	**Significance**	**Status**	**Confidence**
Without Mitigation	Local 1	Low 1	Longterm 3	**Low** **5**	Probable	**LOW**	**– ve**	High

8.4.5 Mitigation measures: Potential Air Quality Impacts

Construction Phase:

Even though, under hot and windy summer conditions the generated dust may blow off site, it is unlikely to create nuisance at Fisantekraal. Dust suppression measures, however, are recommended in order to reduce any possible impacts. For the mitigated impact, it is assumed that the "good practice" dust suppression measures will be adopted, such as:

- Apply wet suppression on the main site roads.
- Implement a speed limit of 30km/hour on unpaved roads on site.
- Give preference to routes away from the western site boundary.
- Reduce the frequency of disturbance of stockpiles.

Operational Phase:

Scenario 1: Existing Runway System at Full Utilisation (No-Go Alternative)

In line with the ICAO emission reduction action plans and best practices with respect to airport-related air quality, the following "best practice" emission mitigation measures could be investigated for implementation for Scenario 1:

- Implementation of measures to decrease the queuing lines.
- Minimisation of the waiting time for parking.
- Examination of permitting aircraft taxiing at higher speeds.
- Limitation of the length of the course of taxiing.
- Utilisation of aircraft-serving equipment with "cleaner" technology.

It should be noted that the identification of the most suitable and cost-effective mitigation measures, together with a realistic time schedule for their application, can only be a result of consultations between the various stakeholders associated with all the airport operations. As such, a mitigation version of the impact ratings was not produced for the operational impact ratings of the No-Go Alternative.

Scenario 2: Operations on the new runway 01/19 in the operational year

The most suitable and cost-effective mitigation measures should be investigated, and an acceptable implementation timeframe should be established before the new runway reaches its capacity.

Scenario 3: Operations on the new runway 01/19 at full capacity

A number of mitigation measures should be considered for implementation in consultation with the various stakeholders associated with all the airport operations. In addition, in line with the noise impact recommendations, the airport-compatible land-use planning immediately South of the new runway would be recommended. As such, the identified potential mitigation measures are:

- Encourage airport-compatible land-use planning.
- Implement measures to decrease the queuing lines.
- Limit the length of the course of taxiing.
- Shutting down as many engines as possible when idling and taxiing.
- Reduce reverse thrust use during landing.
- Utilise aircraft-serving equipment with “cleaner” technology.
- Investigate the provision of electricity at terminal gates, so as to minimise use of the APUs and GSE as much as possible.

8.4.6 Monitoring Requirements: Potential Air Quality Impacts

Construction Phase:

Dust monitoring along the western, southern and northern boundaries of the site is recommended to be conducted monthly during construction and to be reported quarterly to the authorities.

Operational Phase:

It is recommended that a continuous air quality monitoring station is established at the northern CWA site boundary. The air pollutants to be monitored are SO_2, NO_x, PM10 and Benzene. The monitoring results should be reported to the authorities on a biannual basis.

8.5 Potential Noise Impacts

8.5.1 Introduction, ToR and Methodology

Noise has been identified as one of the most significant environmental aspects of an airport.

Further assessment required an integrated noise model based on current and future projected air traffic simulation figures to base the impact assessment on. A construction scenario noise model for the construction phase of the project was also modelled.

The proposed Terms of Reference for the noise impact assessment were:

- Define and describe the baseline noise conditions around the airport;
- Provide an overview of relevant legislation, standards, guidelines and policies, including international standards and policies (such as the ICAO), regarding the reduction of aircraft noise at source, the noise surrounding airports, comparable land use planning and limitations

on land use and requirements for noise mitigation, including aircraft noise abatement procedures, and compensation;

- Identify the noise-sensitive receptors, such as schools, hospitals, places of worship, etc. in the area that may be affected;
- Use the Integrated Noise Model or its successor, which was developed by the Federal Aviation Administration, as defined in SANS 10117, to determine and map the future noise contours (representing the average and maximum noise levels) associated with the proposed project;
- Assess the impacts of the noise on surrounding communities and the environment, using the prescribed impact assessment methodology;
- Identify and describe potential cumulative impacts resulting from the proposed project in relation to proposed and existing developments in the surrounding area;
- Recommend mitigation measures to minimise/reduce impacts and enhance benefits. Assess the effectiveness of proposed mitigation measures using the prescribed impact assessment methodology;
- Recommend and draft a monitoring campaign to ensure the correct implementation and adequacy of recommenced mitigation and management measures, if applicable; and
- Assist the Environmental Assessment Practitioner (EAP) in addressing any relevant comments raised by stakeholders.

Methodology Overview

For the aircraft noise calculations, the Aviation Environmental Design Tool (AEDT) from the US Federal Aviation Administration (FAA) was utilised. AEDT is a software system that models aircraft performance in space and time for the estimation of fuel consumption, emissions, noise and air quality consequences. AEDT consolidates the modelling of these environmental impacts in a single tool and is used for assessing each of these specific environmental impacts. AEDT is designed to model individual studies, ranging in scope from a single flight at an airport to scenarios at the regional, national, and global levels.

The AEDT is the successor of the INM model, which is specified in the SANS 10117-2008 Code for the calculation of aircraft noise in South Africa.

The AEDT model utilizes flight track information, aircraft fleet mix, standard and user-defined aircraft profiles and terrain as inputs. The AEDT model produces equivalent continuous Day-Night rang level L_{Rdn} exposure contours that are used for land use compatibility maps. The AEDT includes built-in tools for comparing contours and utilities that facilitate easy export to commercial Geographic Information Systems. The model also calculates predicted noise at specific sites, such as hospitals, schools or other sensitive locations.

The flight paths' input into the AEDT model was provided by Royal HaskoningDHV (Pty) Ltd, operating as NACO, in terms of the current annual hourly aircraft traffic movements (ATM), as well as the future predicted aircraft movements on busy days for the future scenarios of the existing airport and the new runway.

The following SANS codes relating to noise were taken into consideration for the noise impact assessment:

- SANS 10103 (for land use planning, annoyance and speech communication);
- SANS 10328 (for the methods for environmental noise impact assessment).

The operational scenarios modelled in the study were:

Scenario 1: Existing runways at full capacity;

Scenario 2: New runway during its first operational year; and

Scenario 3: New runway at full capacity.

For the assessment of the existing runways (RNW 01/19, 03/21, 05/23 and 14/32), the typical busy day at full utilisation was used, which is expected to generate a total of 301 air traffic movements (ATM). The maximum capacity of 208 ATM per busy day for the new runway was used for the assessment of the maximum impact of the new runway.

The following issues raised during the pre-application Scoping Phase PPP were considered:

Availability of noise cones; Noise pollution due to construction activities and ongoing air traffic; Impacts on the health and well-being of residents; Impacts on property values and house sales; Effects on wildlife, livestock and pets; Land use & development impacts and restrictions in relation to the development's noise cones; The cumulative noise impact of CTIA and CWA; Cumulative noise impact from the proposed development and existing sources; Social impacts (e.g. disruptions at schools); Impacts on tourism; Ecosystem impacts.

The following issues raised during the in-process Scoping Phase PPP were considered:

Residential areas are within flight paths of planes; concerns related to planes' operating hours; noise impacts on animals, people, and ecosystems; impacts on property values; impact on noise-sensitive receptors such as schools in vicinity of CWA; concerns related to noise associated with increased heavy vehicle traffic; noise impacts within Mikpunt and Fisantekraal; impact of noise on existing and approved land use rights.

<u>Assumptions:</u>

For the construction phase assessment as a worst-case scenario in the present study, it was assumed that approximately 50 truckloads per day are to be utilised. It was also assumed, as a worst-case scenario, that all the equipment would be operated simultaneously at the construction site

The modelled noise levels for each operational scenario assumed no mitigation measures are implemented and thus represent the worst-case scenario.

8.5.2 Assessment of Impacts: Construction Phase

The construction phase of the proposed development is expected to take between 2 and 3 years. During this phase, the construction of the runway (Runway 01/19) will take place, as well as the associated infrastructure and facilities. The working hours for the construction activities are expected to be from 07h00 to 18h00.

The typical construction phase will likely consist of the following:

- Establishment of the construction camp and site preparation works;
- Initiation of the main civil and electrical works;
- Major civil and electrical works;
- Commissioning of Runway 01-19.

The typical large equipment that is generally utilised during such construction will be the main contributor to the noise generation, and trucks with a capacity of $15m^3$ are expected to be employed to transport the required fill materials to the site, which is estimated at 50 truckloads per day. This will result in approximately 7 trucks per hour entering and leaving the site over a period of one year. It is expected that the fill delivery trucks would approach the construction site, making use of the R312, R304 and R302, which are provincial roads designed to carry this type of traffic. This number of vehicles is considered very low compared to the average daily traffic that is currently on these roads. As such, their contribution to the ambient noise environment around these roads is considered low.

The general construction activities of the proposed runway and infrastructure are likely to increase the local noise levels temporarily during the construction period.

The following parameters and assumptions were used in the calculations:

- Average height of noise sources: 2m.
- Construction operating hours: 24hr (used as a worst-case scenario).
- No noise barriers in place.
- Construction site equipment operated simultaneously at the construction site.

The noise levels in the table below were estimated without any barrier effects, such as from local ground elevations, temporary barriers and possible earth piles, and can thus be considered a worst-case scenario.

Table 81: Construction Noise at Various Distances from the Construction Face (Noise Impact Assessment; October 2024)

Receptor	Modelled	Modelled
Distance	**Day**	**Night**
(m)	**(db(A))**	**(db(A))**
100	60.1	64.2
200	57.2	59.3
400	45.3	47.1
1,000	36.1	39

8.5.3 Assessment of Impacts: Operational Phase (Scenario 1, 2 and 3)

The noise from the airport operations at the CWA were simulated with the use of the US FAA's AEDT model, which is used by the civilian aviation community for evaluating aircraft noise impacts in the vicinity of airports. The latitude and longitude co-ordinates of the airport's existing and new runway were entered into the model, together with the elevation data of the surrounding areas.

The Airspace Concept of Operations (CONOPS), the fight paths and busy day aircraft operations were provided by Royal HaskoningDHV (Pty) Ltd (operating as NACO), the Netherlands Airport Consultants (NLR) and the Air Traffic and Navigation Services SOC Ltd (ATNS).

Based on the operations simulation data, the aircraft movements were allocated for each hour of the day and night. The summary of the aircraft movements per hour indicate that no nighttime operations are scheduled, and most of the movements take place between 09h00 and 16h00.

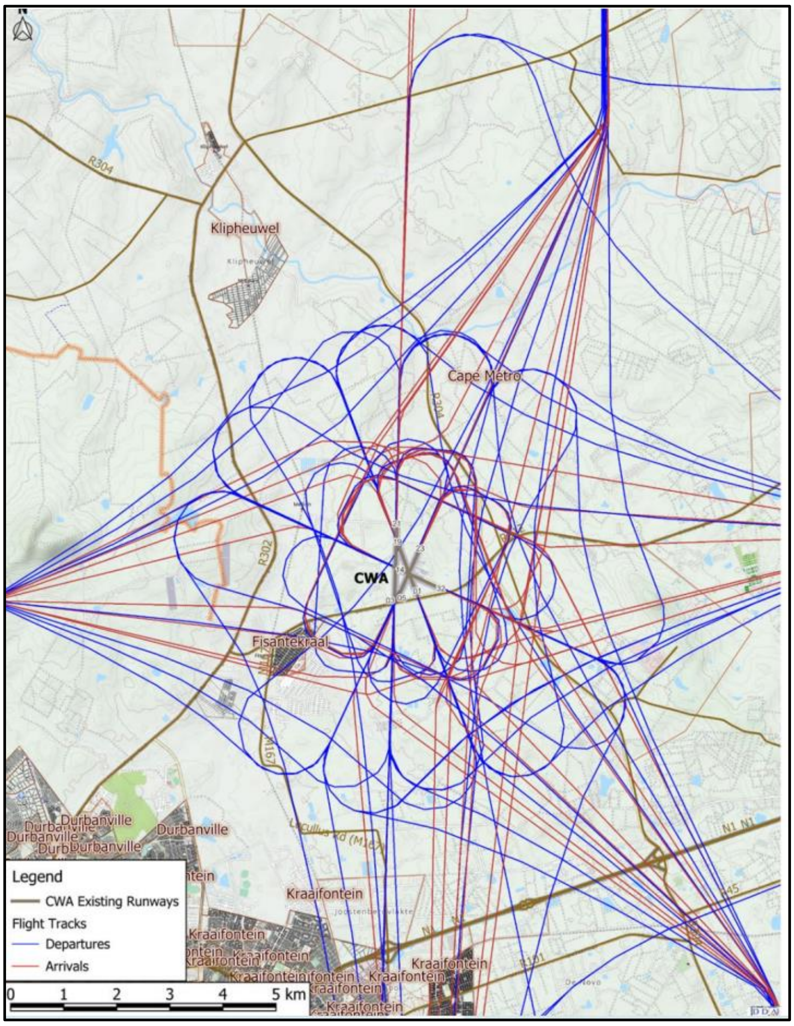

Figure 147: Current Runway System Flight Paths (Noise Impact Assessment; Oct 2024)

The busy day operations for the new runway 01/19 during the opening year (Scenario 2) will be reduced to only 29 per day, and large aircraft, such as the Boeing 737-800, will have only 2 movements per day.

The air traffic in the opening year will depend on several factors, including the phased construction and rollout of general aviation hangar facilities, which are yet to be finalized. Initially, a rapid increase in general aviation traffic is anticipated as development aligns with market demand. This growth is expected to continue over time, eventually reaching the maximum traffic levels outlined in Scenario 3.

However, the peak general aviation traffic under Scenario 3 will not exceed the current maximum operational capacity of Scenario 1, the No-Go Alternative. As such, at any given moment in time after the opening year of the new runway, the noise levels due to the general aviation operations will always be lower than those with the existing operations at full capacity. For Scenario 3, i.e. for the new runway 01/19 under full utilisation, the total number of operations for the typical busy day is 208 per day. The large aircrafts, which will be predominantly utilised, are the Boeing 737-800 and the Boeing 777-200 ER, accounting for 20% of the total daily movements.

For the new runway under full utilisation, most of the daily movements will take place between 08h00 and 18h00, and there will be three night-time operations. These night-time operations are programmed to take place before 11h00.

Table 82: Current Runway System at Full Utilisation (Scenario 1) (Noise Impact Assessment; October 2024)

Aircraft ID	Aircraft Model	Operations			
		Runway 01-19, 32-14, 05-23			
		Arr.	Circ	Dep.	Total
C172	CESSNA 172R	100	0	100	157
DHC6QP	DASH 6/PT6A-27 RAISBECK QUIET PROP MOD	0	0	0	43
P28A	PIPER WARRIOR PA-28-161	0	101	0	101
Grand Total (24-hour)		100	101	100	301
Aircraft ID	**Aircraft Model**		**Operations**		
			Runway 03-21		
		Arr.	**Circ.**	**Dep.**	**Total**
C172	CESSNA 172R	78	0	79	157
DHC6QP	DASH 6/PT6A-27 RAISBECK QUIET PROP MOD	22	0	21	43
P28A	PIPER WARRIOR PA-28-161	0	101	0	101
Grand Total (24-hour)		100	101	100	301

Table 83: New Runway at Opening Year (Scenario 2) (Noise Impact Assessment; October 2024)

Aircraft ID	Aircraft Model	Opening Year Operations Runway 01-19			
		Arr.	Circ.	Dep.	Total
C172	CESSNA 172R	7	0	5	12
DHC6-3	DeHavilland DHC-6-300 Twin Otter	3	0	4	7
B737-8	Boeing 737-800 Series	2	0	2	4
P28A	PIPER WARRIOR PA-28-161	0	6	0	6
Grand Total (24-hour)		12	6	11	29

Table 84: New Runway System at Full Utilisation (Scenario 3) (Noise Impact Assessment; October 2024)

Aircraft ID	Aircraft Model	Full Capacity Operations Runway 01-19			
		Arr.	Circ.	Dep.	Total
A330-3	Airbus A330-300 Series	1	0	1	2
B737-3	Boeing 737-300 Series	2	0	2	4
B737-4	Boeing 737-400 Series	1	0	0	1
B737-8	Boeing 737-800 Series	13	0	14	27
B777-2ER	Boeing 777-200-ER	9	0	9	18
CL601	Bombardier Challenger 601	1	0	1	2
CNA172	CESSNA 172R	27	0	22	49
DHC6-3	DeHavilland DHC-6-300 Twin Otter	12	0	12	24
DHC8Q-4	Bombardier de Havilland Dash 8 Q400	2	0	2	4
EMB120	Embraer EMB120 Brasilia	4	0	4	8
ERJ145	Embraer ERJ145	16	0	16	32
GULF4-SP	Gulfstream IV-SP	8	0	8	16
PA28	PIPER WARRIOR PA-28-161	0	21	0	21
Total (24-hour)		96	21	91	208

Table 85: New Runway 01/19 Operations per Hour (Scenario 2 & 3) (Noise Impact Assessment; October 2024)

Hour	Operations				Operations			
	Scenario 2				Scenario 3			
	Arrival	Circuit	Departure	Total	Arrival	Circuit	Departure	Total
0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	5	5
7	0	0	0	0	1	0	1	2
8	0	0	1	1	5	0	8	13
9	3	1	0	4	11	3	4	18
10	2	0	2	4	8	0	10	18
11	3	0	1	4	13	0	9	22
12	1	0	1	2	6	0	5	11
13	0	2	0	2	4	8	2	14
14	1	1	2	4	11	4	8	23
15	0	2	1	3	4	6	9	19
16	2	0	1	3	16	0	9	25
17	0	0	1	1	3	0	8	11
18	0	0	1	1	4	0	6	10
Hour	Operations				Operations			
	Scenario 2				Scenario 3			
	Arrival	Circuit	Departure	Total	Arrival	Circuit	Departure	Total
19	0	0	0	0	3	0	2	5
20	0	0	0	0	4	0	3	7

21	0	0	0	0	1	0	1	2
22	0	0	0	0	2	0	1	3
23	0	0	0	0	0	0	0	0
Grand Total (24-hour)	12	6	11	29	96	21	91	208

Note: Hour values are rounded to the closest integer.

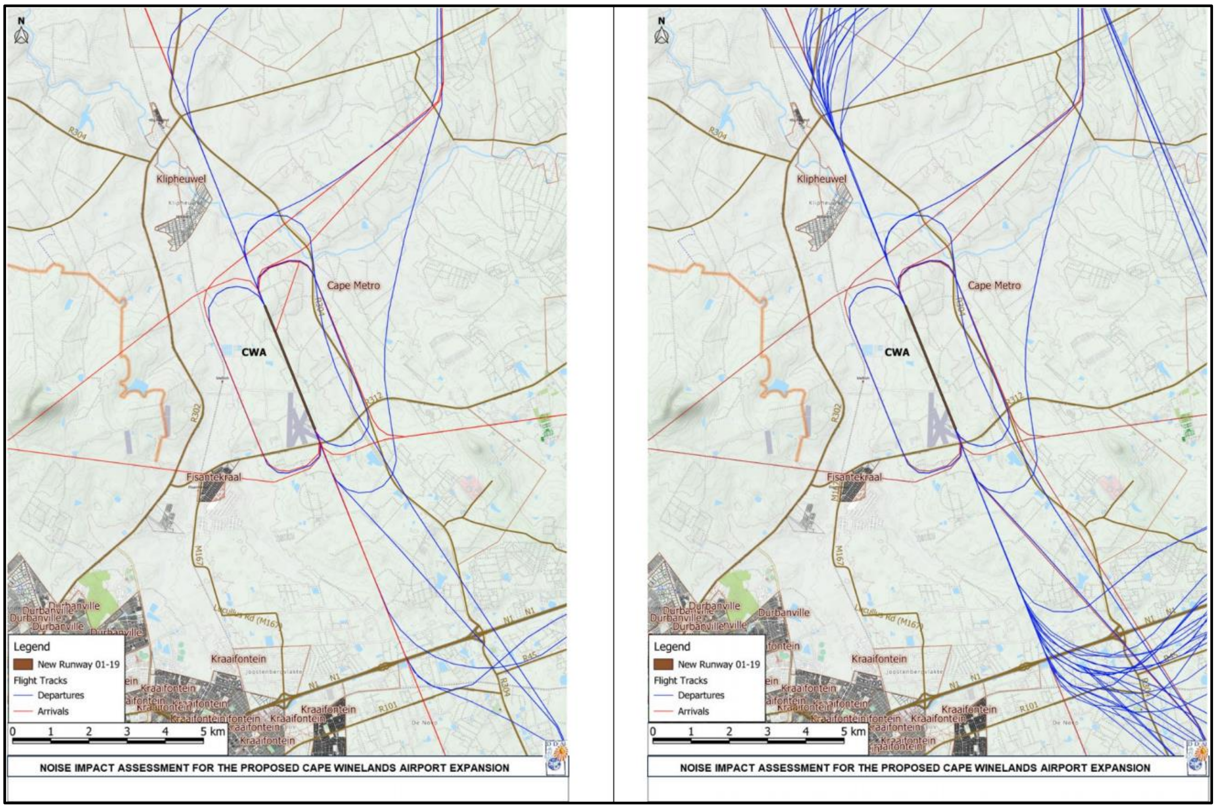

Figure 148: New Runway 01/19 Flight Paths at Operational Year (Scenario 2) - image on left; and New Runway 01/19 Flight Paths at Full Utilisation (Scenario 3) - image on right (Noise Impact Assessment; October 2024)

The districts map was updated to include all developments around CWA and discrete receptors, and these areas were then allocated the appropriate district noise level guideline LRdn, as indicated in SANS 10103. These guideline levels were used for the calculation of the exceedances generated by the aircraft operations in the surrounding areas.

Based on the noise modelling methodology and input data outlined in the sections above, the resulting noise levels for each study scenario were estimated. It should be noted that the modelled noise levels assume no mitigation measures are implemented and thus represent the worst-case scenario.

The modelled operational scenarios were:

Scenario 1: Existing operations at full capacity (No-Go Alternative);

Scenario 2: New runway in operational year; and

Scenario 3: New runway at full capacity.

Scenario 1:

Figure 149 shows the day-night noise rating level L_{Rdn} noise contours, resulting from the current airport operations. The areas that the various contour zones encompass within each day-night noise rating level can be seen in the table below. The total area affected by noise levels higher than 55dB(A) is 2.47km^2. A small portion of this contour extends beyond the R312 towards the south, within the Greenville Garden City. As can be seen, for Scenario 1, the 60dB(A) zone is completely contained within the airport site.

Table 86: Scenario 1: Area under LRdn Contours (Noise Impact Assessment; October 2024)

	Within L_{Rdn} Noise Contour dB(A)					
	55-60	**60-65**	**65-70**	**70-75**	**75-80**	**>80**
Area (km^2)	2.47	0.77	0.25	0.02	0.00	0.00

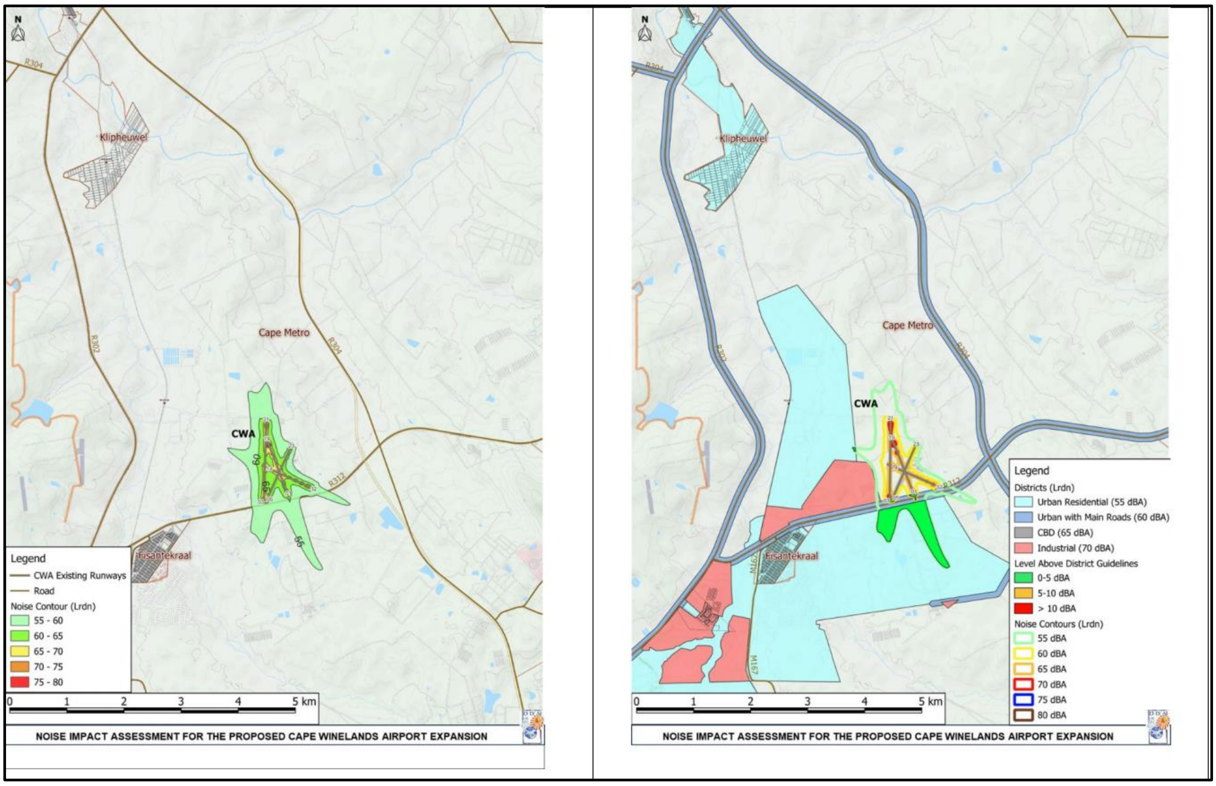

Figure 149: Scenario 1: Day-Night Noise Rating Level (LRdn) – image on left; Scenario 1: Day-Night Noise Rating Level (LRdn) above the SANS 10103 District Guidelines – image on right (Noise Impact Assessment; October 2024)

The table below shows the areas that are encompassed by the 'Number Above' contours for the 70dB(A) LAmax events. The contour with more than 30 LAmax events above 70dB(A) is 8.6km^2, and a large portion of this area extends beyond the airport site boundaries into the Bella Riva development and primarily into the Greenville Garden City.

Table 87: Scenario 1: Zones with Number of Events above 70 dB(A) LAmax (Noise Impact Assessment; October 2024)

Day-Night	
Events N70	**Area (km²)**
5 - 10	19.60
10 - 20	16.80
20 - 30	9.71
30 - 50	5.90
> 50	2.73

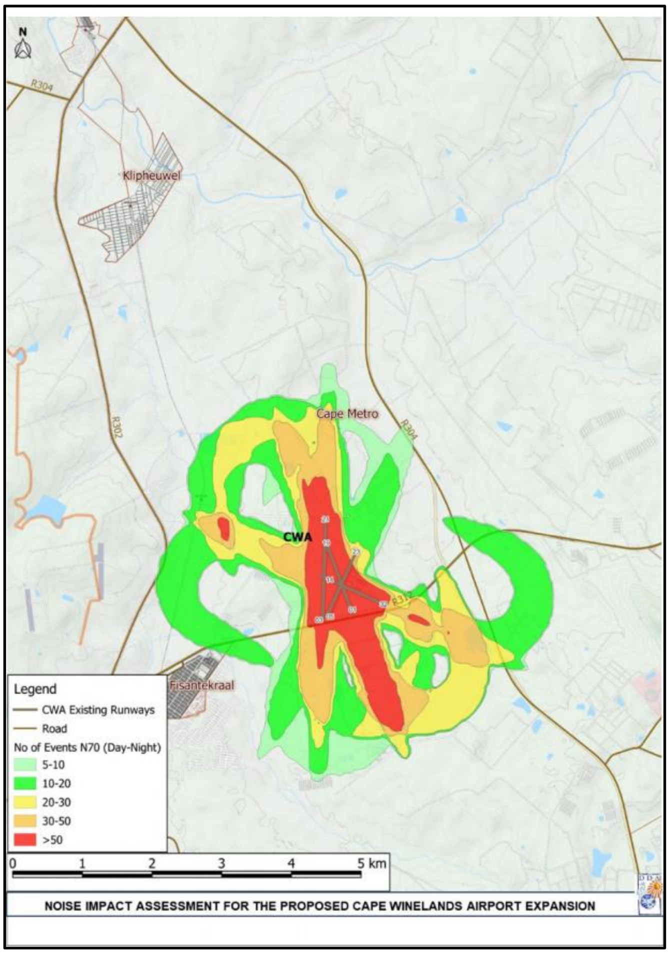

Figure 150: Scenario 1: Day-Night N70 Contours (Noise Impact Assessment; October 2024)

Scenario 2: New Runway in Operational Year

Figure 151 shows the day-night noise rating level L_{Rdn} noise contours, resulting from the new runway 01/19 during the operational year. It is evident that the 55dB(A) contour will be contained within the development area of the airport site.

The areas which the various contour zones encompass under each day-night noise rating level can be seen in the table below. During the operational year, the area with L_{Rdn} 55dB(A) will only be 1.44km^2 and will not extend into the proposed residential areas west and South of the airport. As such, there was no figure generated for the overlapping of the L_{Rdn} noise contours over the various districts.

Table 88: Scenario 2: Area under LRdn Contours (Noise Impact Assessment; October 2024)

	Within L_{Rdn} Noise Contour dB(A)					
	55-60	**60-65**	**65-70**	**70-75**	**75-80**	**>80**
Area (km^2)	1.44	0.51	0.15	0.03	0.00	0.00

Figure 151 depicts the 24-hour N70 contours for Scenario 2. These contours illustrate the locations and the number of events that exceed the 70dB(A) L_{Amax} over the 24-hour period, with the new runway 01/19 during its operational year. It is evident that the contour of the aircraft operations that exceed 10 events will be contained within the airport site and only 5 to 10 events per day will exceed the 70dB(A) L_{Amax} outside the air airport's site boundary towards the South.

The table below for Scenario 2 shows the areas that are encompassed by the 'Number Above' contours for the 70dB(A) L_{Amax} events. The 10-20 events area covers 4.5km^2, which is much smaller than the same area for Scenario 1, which is 16.8km^2.

Table 89: Scenario 2: Zones with Number of Events above 70dB(A) LAmax (Noise Impact Assessment; October 2024)

Day-Night	
Events N70	**Area (km2)**
5 - 10	7.33
10 - 15	2.68
15 - 20	1.78
20 - 25	0.11

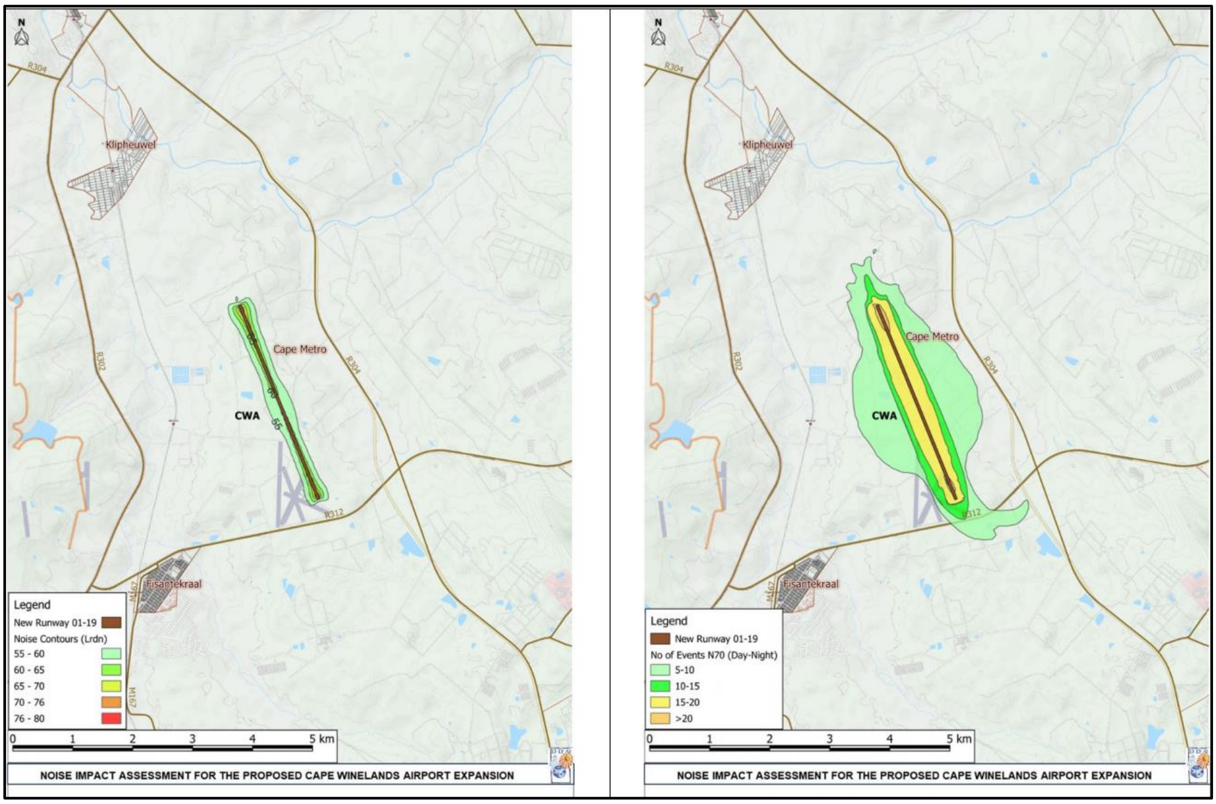

Figure 151: Scenario 2: Day-Night Noise Rating Level (LRdn) – image on left; Scenario 2: Day-Night N70 Contours – image on right (Noise Impact Assessment; October 2024)

<u>Scenario 3: New Runway at Full Capacity</u>

Figure 152 shows the day-night noise rating level noise contours (L_{Rdn}) resulting from the new runway 01/19 operating at maximum capacity. It is evident that the impact zones, when this capacity is reached, will extend beyond the development area boundaries, primarily towards the north and the South, but also towards the West and East.

The length of the 55dB(A) impact zone will reach 4km North from the airport's northern site boundary, in a north-north-westerly direction and reach the Klipheuwel residential area. However, the 55dB(A) contour will not overlap the above-mentioned residential area but will be outside its eastern boundary. This contour, north and east of the airport, will be situated over only agricultural land. It should be noted that the community around the Mikpunt train station is considered as part of the general Klipheuwel area and will also fall outside the 55dB(A) noise contour.

Towards the West, the 55dB(A) contour will reach the Bella Riva residential development, extending approximately 300m within Bella Riva, measured from its eastern further most point. This zone will follow the orientation of the new 01/19 runway.

South of the airport, the 55dB(A) noise contour will extend less, reaching a distance of 3.3km. This zone will overlap the Greenville Garden City area covering approximately 1.03km^2. For this scenario, there is small area of 0.11km^2 within the Greenville Garden City area and immediately South of the runway, where the noise levels will be between 60dB(A) and 63dB(A).

Table 90: Scenario 3: Area under LRdn Contours (Noise Impact Assessment; October 2024)

	Within L_{Rdn} Noise Contour dB(A)					
	55-60	**60-65**	**65-70**	**70-75**	**75-80**	**>80**
Area (km^2)	10.30	3.81	1.60	0.63	0.23	0.00

The figure below shows the 24hour and night only N70 contours for Scenario 3 respectively.

These contours illustrate the locations and the number of events that exceed the 70dB(A) L_{Amax} over the relevant period, with the operations under Scenario 3.

As can be seen, most of the Bella Riva area will fall within the 10-20 events contour. Most of the Greenville Garden City area will also be within the same contour. However, the later area will have certain portions of it within the 20-30, 30-50, as well as greater than 50 events during the daytime.

A portion of the Klipheuwel residential area was found to be within the 5-10 events contour but outside the 20-30 events contour.

The number of events that exceed the 70dB(A) LAmax during nighttime, i.e. between 22h00 and 06h00, are expected to be only 3, and as can be seen, their zone of influence is primarily around the northern section of the new runway and is contained by the airport development site.

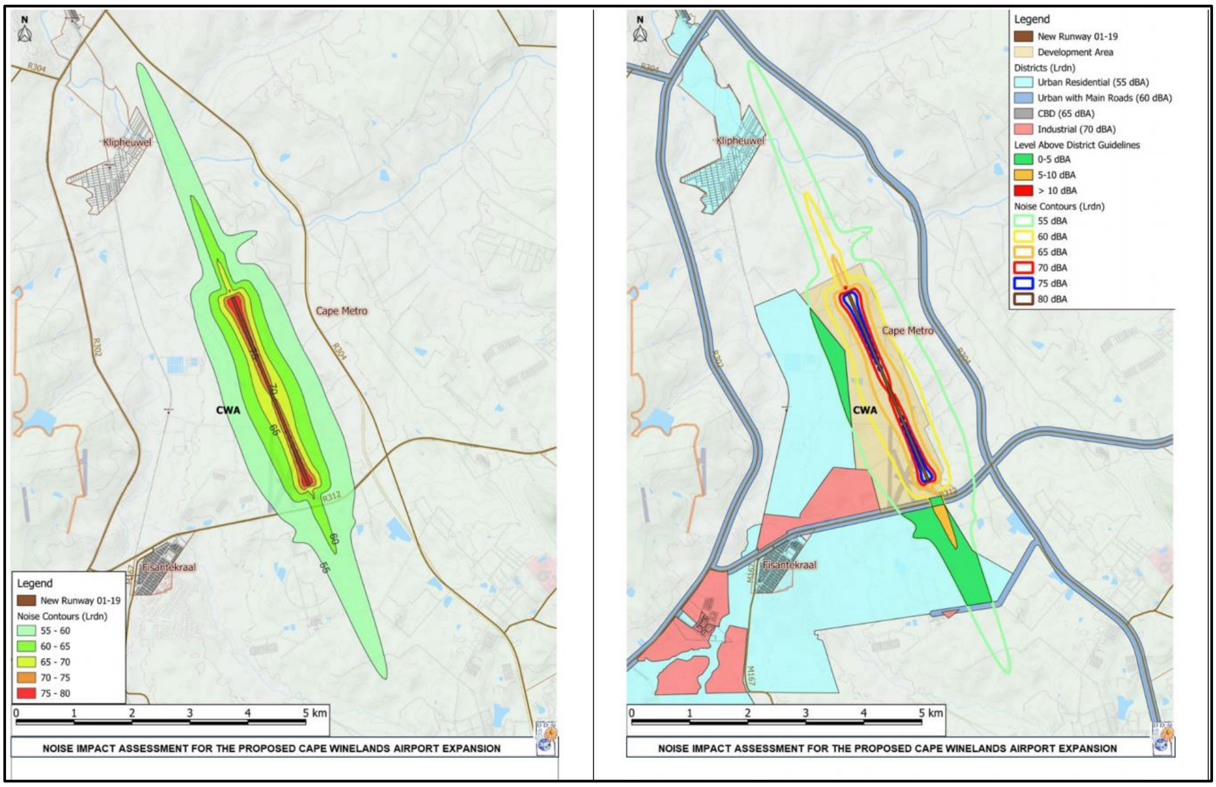

Figure 152: Scenario 3: Day-Night Noise Rating Level (LRdn) – image on left; Scenario 3: Day-Night Noise Rating Level (LRdn) above the SANS 10103 District Guidelines – image on right (Noise Impact Assessment; October 2024)

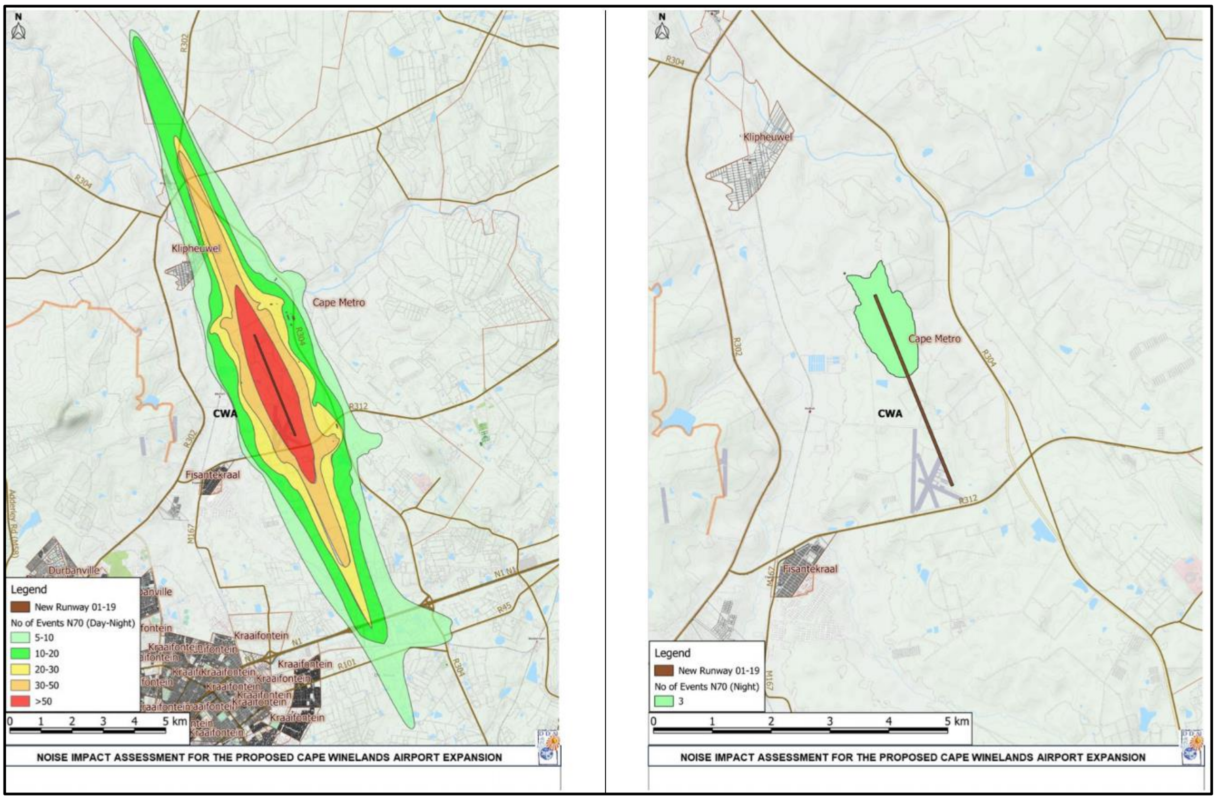

Figure 153: Scenario 3: Day-Night N70 Contours – image on left; Scenario 3: Night N70 Contours – image on right (Noise Impact Assessment; October 2024)

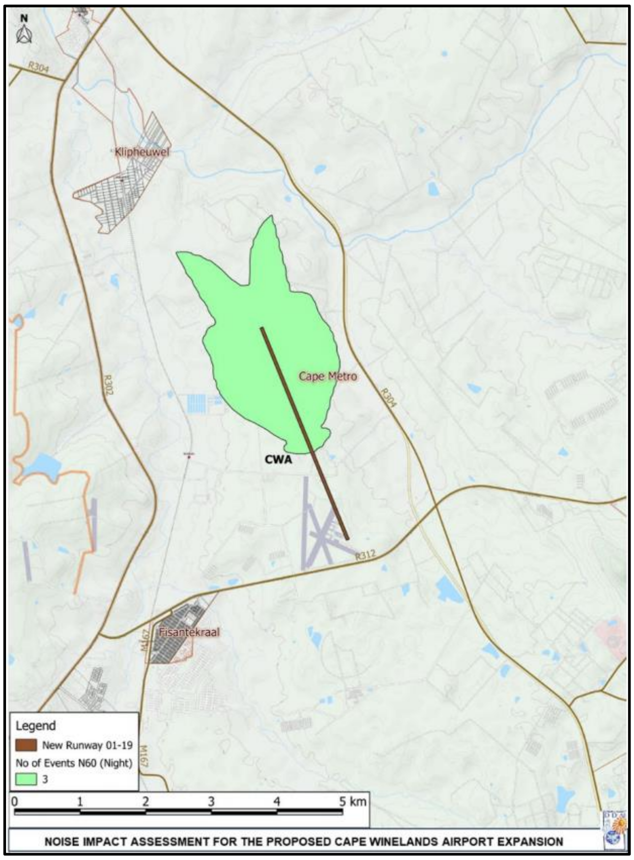

Figure 154: Scenario 3: Night N60 Contours (Noise Impact Assessment; October 2024)

Noise at discrete receptors:

From the noise levels at these receptors and residential areas, it is evident that the schools identified (R04, R25 and R27) will be outside the 50dBA zone for all three scenarios. In addition, the SANS 10103 district guidelines for Urban Residential areas are not exceeded for any of the three scenarios. The exceptions are one small area on the eastern side of Bella Riva for Scenario 3, as well as an area immediately South of the airport for Scenario 1 and Scenario 3 (R21).

For the receptors further away from the airport, the only other exception is a farmhouse (R28), which is situated on the eastern side of Klipheuwel. The L_{Rdn} during the opening year will reach 44dBA and will gradually increase to reach 58dBA under Scenario 3.

The table below summarises for each scenario the total overlapping areas between the noise contours and the proposed developments around the airport outside its boundaries. As can be seen, the total overlap area will be reduced from Scenario 1 (No-Go Alternative) once the new runway is introduced and will reach a maximum total area of 1.52km^2 when the new runway reaches its capacity, i.e. Scenario 3.

Table 91: Noise Contours Overlap with Proposed Development Beyond the Airport Boundary (Noise Impact Assessment; October 2024)

	Noise Zone L_{Rdn} (dBA)						
	55-60	**60-65**	**65-70**	**70-75**	**75-80**	**>80**	**Total**
Scenario 1 (km^2)	0.44	-	-	-	-	-	0.44
Scenario 2 (km^2)	-	-	-	-	-	-	-
Scenario 3 (km^2)	1.40*	0.11	-	-	-	-	1.52

8.5.4 Mitigation Measures: Potential Noise Impacts

Construction Phase:

With regard to the construction operations, the following general measures are considered essential and should be adhered to:

- Limit the night-time construction activities;
- Avoid night-time construction activities on the property to the west of the airport boundary (earthworks), which are closer to the Fisantekraal residential area

Operational Phase:

The fact that the proposed residential developments of Bella Riva and the Greenville Garden City are in the design phase could provide an opportunity to consider and implement appropriate mitigation measures, considering the areas of impact in each development.

Additional noise abatement procedures for the aircraft operations are not required for the operational year of the new runway. However, consideration of such measures and operations should be initiated before the full capacity of the new runway is reached, based on the noise monitoring around the airport and noise modelling of the applicable mitigation measures.

8.5.5 Monitoring Requirements: Potential Noise Impacts

Construction Phase

- Noise monitoring should be conducted during the construction phase of the new airport and runway.
- This monitoring is to be carried out in accordance with the methods stipulated in the SANS 10103:2008 Code of Practice and the current Western Cape Noise Control Regulations.
- Two points should be used for the noise monitoring locations, positioned on the inside of the airport boundary. These locations should cover the area close to the entry point of the trucks to the site and the community closest to the construction activities. These locations should be finalised once the construction plan and schedule are determined.
- The monitoring should be conducted every three months during construction and monthly during the period when night-time construction will be taking place.
- Three-monthly reports should be submitted to the authorities, including a brief assessment indicating if any construction-specific noise exceedances above baseline and SANS district guidelines are taking place. In the event of exceeding noise guidelines, appropriate site- and operation-specific noise mitigation measures should be investigated and implemented.

Operational Phase:

- Three permanent noise monitoring terminals should be established before or by the operational year of the new airport and runway.
    - The first of these terminals should be established at the Klipheuwel area, preferably close to its southeastern boundary.
    - The second should be positioned within the Greenville Garden City Development, in line with the new runway 01/19 and the third on the eastern side of the Bella Riva development.
- A summary of the noise monitoring results should be reported on a quarterly basis to the appropriate authorities. These reports should contain, but not be limited to the:
    - 24-hour equivalent continuous A-weighted sound pressure level, LAeq,T;
    - equivalent continuous day-night rating level, LRdn;
    - equivalent continuous day and night rating levels, LRd and LRn ;
    - maximum A-weighted level, LAmax;
    - percentile levels Ln;
    - number of exceedances above 70 dB(A) and 60 dB(A) of the LAmax and SEL.

- A noise complaints registry should be established and connected with the noise monitoring system, in order to provide the capability for correlation of the complaints with the actual measured levels, as well as the aircraft-related operational data.
- The complaints and relevant aircraft-related operational data should be included in the quarterly report to the authorities.

8.6 Potential Botanical Impacts

8.6.1 Introduction, ToR and Methodology

TOR

The objective of the study was to assess the impacts associated with the proposed development alternatives in terms of Botanical:

- Apply the EIA assessment criteria to all the identified Alternatives,
- Identify the likely direct, indirect, and cumulative impacts of the proposed project and the No Go (No development) alternative on the terrestrial ecology of the site,
- Consider the mitigation hierarchy to reduce development impacts and to control negative effects on the environment,
- Identify any Fatal Flaws and/or any significant impacts that may require biodiversity offsets to mitigate unavoidable residual impacts and provide an outline of what these offsets may involve,
- Provide mitigation measures to avoid or reduce impacts to below the limits of acceptable change, including layout change and requirements for ongoing ecological management of key areas,
- Where Search and Rescue is stipulated, the manner in which it will be conducted, the parties involved and the time periods for the Search and Rescue to be included,
- Advise on environmental management principles to be adopted in the EMPr.

The following issues raised by I&APs during the pre-application Scoping Phase PPP were considered: Reduction in endangered species habitat; Edge effects on adjacent ecosystems; Applicability and feasibility of offsets; Habitat loss and biodiversity loss; Maintenance of indigenous landscaping.

The following issues raised by I&APs during the in-process Scoping Phase PPP were considered: Impact of the development on existing conservation areas; applicability of biodiversity offsets; impact of the airport on local conservation efforts.

LIMITATIONS, ASSUMPTIONS AND METHODOLOGY

The site was initially visited on 7 August 2020, and then again in September 2021 (original study areas only) and March 2022 (additional study areas only), with some areas visited again in June 2024. The first two site visits were within the optimal winter – spring flowering season in this winter rainfall area, and all the likely geophytes were thus evident, and most but perhaps not all the possible annuals were evident and identifiable, whilst all perennial plants were identifiable. The seasonal constraints on the accuracy of the botanical findings were thus minimal. The March 2022 site visit was in the dry season, and thus although there were significant seasonal constraints on species observations, the focus was on habitat integrity, and the seasonal constraints were less important. Numerous perennials were anyway identifiable in the two small areas with natural vegetation during the March site visit, allowing for an accurate assessment of habitat sensitivity. Most of the agricultural precinct was not surveyed, except for the northern corner (surveyed Mar 2022), as this was not confirmed as being part of the study area until late in this EIA process (2024). The author has undertaken extensive work within the region, which facilitates the making of local and regional comparisons and inferences of habitat quality and conservation value. Key constraints possibly compromising the botanical findings were the lack of recent fire (<15 years) throughout most of the study area, with the result that some species may have been dormant or confined to underground seedbanks (and thus missed during the surveys), and the dense alien invasive vegetation throughout most of the site during the initial survey in 2020, which made it difficult to physically see into or easily enter many areas, and also made the interpretation of satellite imagery less accurate than usual. Confidence in the accuracy of the initial findings was deemed to be medium to high in 2020, but is now high, as a result of the alien vegetation management undertaken since 2019, and the two subsequent site visits. It is noted that a number of plant Species of Conservation Concern (both individuals and species) may have been missed due to the reasons outlined above, and this may have resulted in an underestimate of the actual botanical sensitivity of those areas. Various transects within the study area were walked, and all available tracks were driven, during which all plants and animals on site were noted. Satellite imagery dated January 2023 (and earlier, including July 2009 and July 2020) was used to help inform this assessment, and for mapping.

The botanical sensitivity of a site is a product of plant species diversity, plant community composition, rarity of habitat, degree and type of habitat degradation, rarity of species, ecological viability and connectivity, restorability of habitat, vulnerability to impacts, and reversibility of threats.

As there is no significant difference between Alternatives 2 and 3 in terms of development footprints within any areas of botanical sensitivity they can be considered as identical for purposes of this assessment, and the assessed footprint is as shown in Figure 1. The exact definition of the No Go (Alternative 1) is not known in terms of impact on vegetation but is assumed to mean ongoing activity on the current footprints, current levels of disturbance to vegetation (including mowing of areas around hangars, random dumping and excavation), little or no alien invasive vegetation management, no ecologically based fire management or controlled burns, no rehabilitation programs and no biodiversity offset.

It is assumed that all natural and partly natural vegetation within the proposed development footprint hard surfaced area (all white outlined areas in Figure 1) will be permanently lost during the construction phase. It is also assumed that open space areas between the runways and taxiways will be grassed and regularly mown (for fire risk, visibility and safety), and will be of no future botanical conservation significance, as most of these areas are currently all heavily disturbed agricultural areas with low rehabilitation potential.

It is assumed that all mitigation required in terms of this study will be included in any Environmental Authorisation and timeously and adequately implemented.

8.6.2 Assessment of impacts: Construction Phase

In terms of this assessment the proposed development" means either Alternative 2 or 3.

The main construction phase botanical impact of the proposed development is loss and degradation of the remaining natural and partly natural vegetation in some of the development footprints (refer Figure 155 - Figure 157).

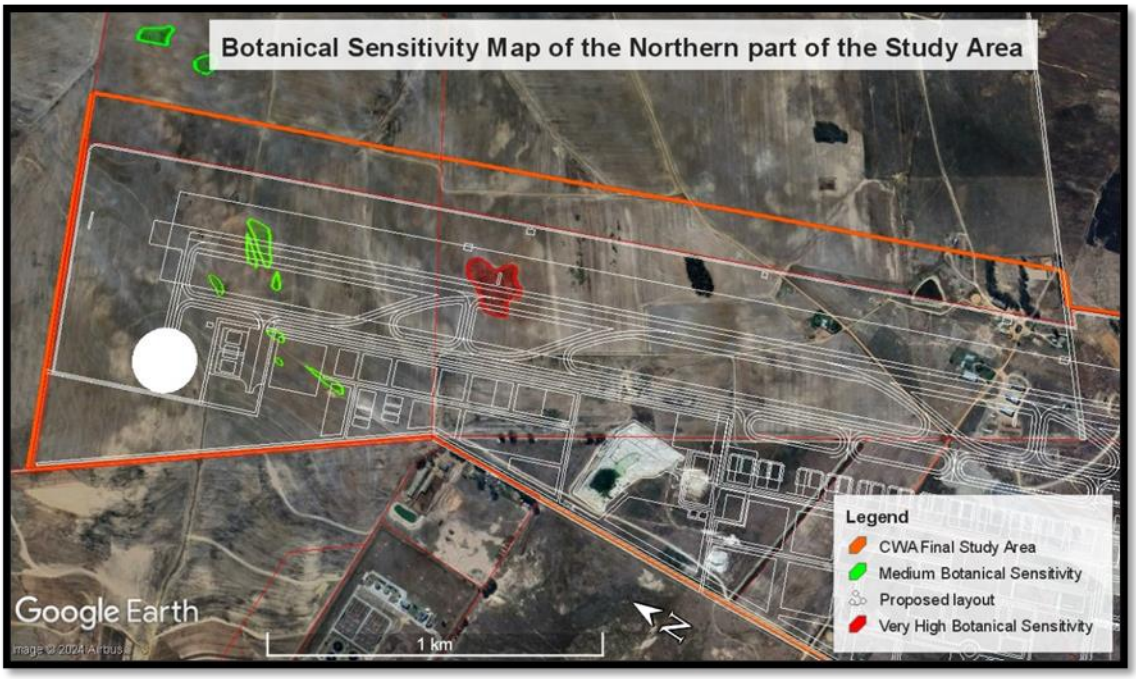

Figure 155: Botanical sensitivity map for the northern part of the study area. All areas not shaded green or red within the study area are of Low botanical sensitivity (Botanical IA, Sept 2024)

It is likely that about 1.0ha of the 1.6ha patch of Very High sensitivity in the North will be lost, along with the two associated plant Species of Conservation Concern in this area. About 1.3ha of High sensitivity vegetation will be lost, and about 2.7ha of Medium sensitivity vegetation will be lost. Thus, a total of about 5ha of vegetation of some sensitivity will be lost, with all the rest being of Low sensitivity (generally heavily disturbed or cultivated).

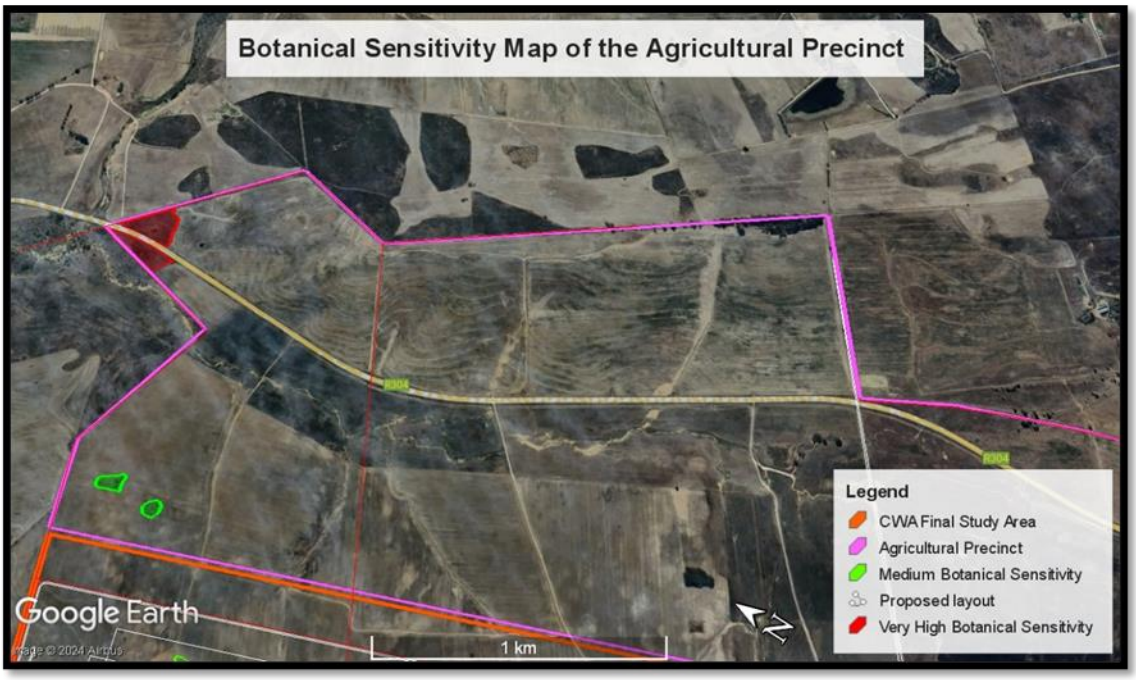

Figure 156: Botanical sensitivity map for agricultural precinct part of the latest study area. All areas not shaded green or red within the precinct are of Low botanical sensitivity (Botanical IA, Sept 2024)

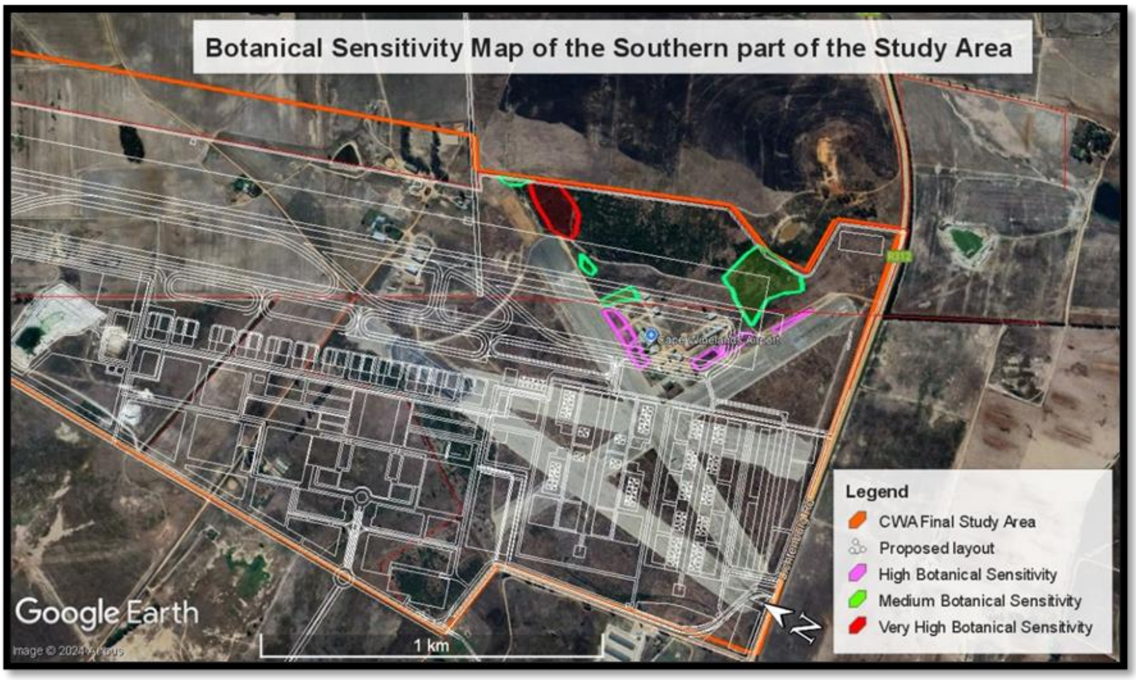

Figure 157: Botanical sensitivity map for the southern part of the study area. All areas within the study area not shaded green, red or pink are of Low sensitivity (Botanical IA, Sept 2024)

Only three of the 25 recorded plant Species of Conservation Concern in the study (and Agricultural Precinct) area will be lost to the proposed development footprint, one of which already seems to be extinct on the site (*Leucospermum grandiflorum*).

The overall botanical construction phase impact of the proposed development is likely to be Medium – High negative before mitigation, driven mainly by the partial loss of a 1.6ha patch of Very High sensitivity Swartland Silcrete Renosterveld (Critically Endangered), and the two associated plant

Species of Conservation Concern in this area. This impact is largely unavoidable, other than by runway layout alteration. After mitigation this could be reduced to an acceptable Medium negative level, or even Low negative, if adequate ecological management of the priority remaining natural areas is implemented, along with an appropriate biodiversity offset.

Table 92: Summary table for construction phase botanical impacts associated with the proposed development (Alternative 2 and 3).

Development Alternative	Extent of impact	Duration of impact	Intensity	Probability of impact	Irreplaceable loss of biodiversity	Significance before mitigation	Significance after mitigation
Proposed infrastructure	Local and regional	Permanent and temporary to long term	High to Low	Definite	High	**Medium to High -ve**	**Low to Medium -ve**

The primary construction phase impacts of the proposed development would be a permanent to a long-term loss of partly natural vegetation in about 5ha of Medium, High and Very High sensitivity habitat, plus loss of site populations of at least two extant plant Species of Conservation Concern (and a possible third locally extinct one).

8.6.3 Assessment of Impacts: Operational Phase

Operational phase impacts will take effect as soon as the partly natural vegetation on the site is lost or disturbed, and will persist in perpetuity, or as long as the area is not rehabilitated (to approximately the current state). Operational phase impacts include reduction of the current low - moderate levels of ecological connectivity across the study area, and associated habitat fragmentation.

The airside open space areas will need to be brushcut and mown to various heights (from 200mm to 700mm), to comply with safety regulations, and also to minimise potential bird-strikes. This regular mowing will obviously have a negative physical effect on the plants, but most of them should survive, although they will remain stunted, and may not flower or set seed, depending on the timing of the mowing.

The Landscape Concept Plan (Planning Partners 2024) indicates that a suitably low growing (depending on location) mix of indigenous annuals, vygies, herbs and low shrubs will be hydroseeded and planted in most of the airside open areas. If this is even partly successful it could actually enhance the current low indigenous plant diversity in these areas.

Once construction is completed the overall change in ecological connectivity is likely to be Low to Medium negative on a regional scale.

Some fire related changes are likely, but assessing these is difficult, as the No Go implies very infrequent fires, which may also be the case going forward, unless managed and mitigated (in the conservation worthy areas at least). Post mitigation, and with proper fire management being implemented in the conservation areas, the operational phase impact of this should be Low positive.

Overall, the operational phase botanical impacts of the proposed development are likely to be Low to Medium negative at a local scale, before mitigation, and Neutral to Low negative after mitigation.

Table 93: Summary table for operational phase botanical impacts associated with the proposed development (Alternative 2 and 3).

Development Alternative	Extent of impact	Duration of impact	Intensity	Probability of impact	Irreplaceable loss of biodiversity	Significance before mitigation	Significance after mitigation
Proposed development	Local and regional	Permanent	Low to Medium	Likely	Very Low	**Low to Medium -ve**	**Neutral to Low -ve**

8.6.4 The No Go Alternative

The No Go alternative (Alternative 1) is likely to have a Low negative botanical impact, but with a low degree of certainty, with **construction phase impacts** arising from mowing, some new building, and possible random excavation and dumping.

Table 94: Summary table for construction phase botanical impacts associated with the No Go alternative.

Development Alternative	Extent of impact	Duration of impact	Intensity	Probability of impact	Irreplaceable loss of biodiversity	Significance before mitigation	Significance after mitigation
No Go	Local	Unknown and variable	Low negative	Unknown	Possible	**Low negative**	**Low negative**

The No Go alternative would possibly have a slightly lower indirect (**operational phase**) ecological impact than the proposed development and is likely to be Low negative (before and after mitigation). Impacts would be expected from unmanaged alien invasive vegetation, lack of ecological fire management and ongoing mowing.

Table 95: Summary table for operational phase botanical impacts associated with the No Go alternative.

Development Alternative	Extent of impact	Duration of impact	Intensity	Probability of impact	Irreplaceable loss of biodiversity	Significance before mitigation	Significance after mitigation
No Go	Local and regional	Permanent	Low	Likely	Low	**Low negative**	**Low negative**

The No Go alternative (continuation of the *status quo)* on site would have clearly lower construction phase botanical impacts (Low negative) than the proposed development (Alts 2 & 3) and would thus technically probably be the slightly preferred alternative from an ecological perspective. However, at the operational phase of the proposed development some positive impacts could be realised on the remaining conservation worthy areas, and via the required biodiversity offset, and thus the development alternatives would have a more positive botanical impact than the No Go at this stage.

No biodiversity offset would be implemented in the No Go alternative, which thus means that the very positive impacts of this aspect would not be realised. This is an important difference, as the implementation of an appropriate biodiversity offset would be very positive for Renosterveld conservation in the region.

The status quo, prior to the CWA taking over the site, was unmanaged, dense alien invasive vegetation, in all areas except those actively used or bordering the airfield, and this was clearly having a negative botanical impact, as was the mowing of the grassy areas around the hangars (notably the loss of the *Leucospermum grandiflorum*).

The No Go alternative is difficult to assess, as future land management in the area is hard to predict, but no direct loss of Very High sensitivity areas is likely, and most of the Medium and High sensitivity areas could be assumed to be likely to persist, but perhaps with no alien invasive plant management. Overall botanical impact is likely to be Low to Medium negative, depending on various factors.

8.6.5 Cumulative Impacts

The cumulative botanical impacts are in many ways equivalent to the regional ecological impacts, in that the vegetation type/s likely to be impacted by the proposed development have been, and will continue to be, impacted by numerous developments and other factors (the cumulative impacts) within the region. The primary cumulative impacts in the region are loss of natural vegetation and threatened plant species to ongoing agriculture, urban development and alien plant invasion (Mucina & Rutherford 2012; Helme & Rebelo 2016).

The overall cumulative ecological impacts of the proposed development at the local scale are likely to be **Low to Medium negative prior to mitigation**, given the fairly small area of High or Very High sensitivity vegetation to be impacted (<3ha). After mitigation, and with implementation of an appropriate offset, and on-site management of the remaining conservation worthy areas, this could be reduced to **Neutral or even Low positive**.

8.6.6 Positive Impacts

No significant positive ecological impacts of the proposed development are likely during either the construction or the operational phase in the absence of mitigation. However, the alien invasive vegetation management already undertaken on site has had a minor positive impact and will hopefully continue (and will be included in the EMPr for both the primary project area and the Agricultural Precinct). If the required environmental management of the natural areas on site is properly implemented, and if the required biodiversity offset is secured, then the proposed development could have a notable positive botanical impact on a regional scale (in contrast to the No Go alternative), even taking into account the loss of patches of sensitive habitat on site.

8.6.7 Mitigation Measures: Potential Botanical Impacts

The following mitigation is considered feasible, reasonable and essential, and is factored into the Botanical assessment:

- All Very High, High and Medium sensitivity areas (Figure 155 - Figure 157) that do not fall within the authorised development (construction) footprint should be conserved as part of any redevelopment of this site (no development and no infrastructure through these areas), and ideally they would also all be ecologically connected via rehabilitated Low sensitivity areas – but the feasibility of this is not known at present (although the Landscaping Plan shows that most of these areas will be at least partly rehabilitated with indigenous Renosterveld and Sand Fynbos plant mixes). From a botanical perspective most of these areas would be ecologically viable, especially if connected by ecological corridors. Key ecological management interventions required are ongoing alien invasive vegetation management (pre and post burn) and management burns in the appropriate autumn season (once every 8-12 years).
- Two of the Very High sensitivity areas are within the Agricultural Precinct, as is a significant part of the one (that supports the CR *Leucadendron verticillatum*) just east of the main runway.
- All authorised hard infrastructure bordering on any of the mapped areas of Very High, High and Medium sensitivity botanical areas must be surveyed and fenced off prior to any site preparation, clearing or construction. These sensitive areas may not be disturbed in any way during the construction process. Fences should be marked with signage every 15m indicating that these are No Go areas, and all contractors must be made aware of such, starting with and including in their contract quotation requests.
- No perimeter service road may cross or disturb the mapped area of Very High sensitivity east of the main runway, as shown in some of the most recent plans. This road must be rerouted east of this Very High sensitivity area, and final plans should be amended to show that this has been implemented.
- An EMPr for the remaining conservation worthy areas on site (all remaining areas of Very High, High and Medium botanical sensitivity, including all such areas within the Agricultural Precinct) should be drawn up, with input from the botanist, and management of these areas could be outsourced provided that the applicant covers all ongoing management costs.
- All invasive alien vegetation in the conservation areas on site must be removed within one year of any project approval, using appropriate methodology (see Martens *et al* 2021), by qualified personnel. Ongoing annual alien vegetation removal must be undertaken.
- No spraying of herbicide should be undertaken in any conservation areas.
- Once all alien invasive vegetation has been removed from the conservation areas all these areas must be subject to planned (controlled) burn regimes, as this vegetation needs fire for optimal ecological functioning. The two Very High sensitivity areas are the priority areas for ecological burns, which must be undertaken in the period February to March. These burns should be professionally managed.
- Prior to the controlled burn firebreaks should be brushcut by hand around the perimeter of the sensitive areas (not within them) using handheld brushcutters.
- The botanically sensitive areas will need to be burnt every 8-12 years for optimum ecological functioning.

- The Very High sensitivity areas falling within the Agricultural Precinct must be fenced off and excluded from grazing and trampling by livestock (especially cattle). This must be done within 60 days of authorisation, or sooner if possible (subject to landowner negotiation).
- The condition of all Very High, High and Medium sensitivity areas (Agricultural Precinct and on site) should be monitored every year by a suitably competent botanist (or CoCT Environmental Management Dept.), and they should make recommendations for any management changes or actions (alien clearing, lack of fire, etc.) that are needed in order to achieve optimal ecological functioning in these areas.
- Most of the low and medium significance occurrences of plant SoCC within the proposed development footprint (as well as some of the high significance species) can be successfully translocated, and this should thus be done by experienced Search and Rescue contractors prior to any site development, with the assumption that the receiving areas will be properly managed in perpetuity as plant conservation areas. This must be done in consultation with the botanical specialist and can proceed prior to any authorisation (provided all necessary permits and permissions are obtained).
- A plant Search and Rescue plan should be prepared by the appointed S&R contractor, the EAP and the botanist, and should outline who needs to do the work, when seed, sods and cuttings need to be collected, how they should be stored, how much should be collected, how receiving sites should be identified and prepared, and how and when the planting out should be undertaken. Guidelines on ongoing maintenance of these areas must also be included.
- Large scale Search and Rescue of plant material from all Medium, High and Very High sensitivity areas within the development and clearing footprints must be undertaken prior to any development or disturbance of these areas and outlined as part of an EMPr for the site. Receiving areas should ideally be located within the greater study area (provided that land tenure and funding for conservation is secure in these areas) and should be areas that support some natural vegetation remnants, but that require rehabilitation intervention. This must be overseen by the botanical consultant.
- Given the Endangered and Critically Endangered status of the underlying habitats, and the level of impact (Medium – High negative before mitigation) it is required that any mapped areas of remnant habitat that are lost to development should be offset by formalised conservation of high conservation priority examples of the same habitat in the region, at the appropriate ratios (as per Dept. of Forestry, Fisheries & Environment offset guidelines, 2022). A specialist terrestrial biodiversity offset report has been completed (M. Botha 2024) and found that a terrestrial biodiversity offset of at least 77ha is required (plus ongoing environmental management budget for this).
- The applicant, or their appointed management authority, must provide all necessary funding for all required ecological management of the site (airport site and conservation areas in Agricultural Precinct), and for the chosen and agreed biodiversity offset, in perpetuity.
- The botanist provided input into the Landscaping Plan for the site, which includes a significant indigenous Sand Fynbos and Renosterveld appropriate plant component, in an attempt to maximise biodiversity rehabilitation, whilst adhering to the required airport safety guidelines.

Areas that will not be hardened surfaces and that would benefit from rehabilitation should be hydroseeded with appropriate seed mixes, at the appropriate time (late autumn).

8.6.8 Mitigation measures: The Biodiversity offset

The proposed development of the expanded CWA requires removal of indigenous vegetation of more than 20ha. This indigenous vegetation to be removed is classified as critically endangered (Cape Flats Sand Fynbos and Swartland Shale Renosterveld) and endangered (Swartland Granite Renosterveld).

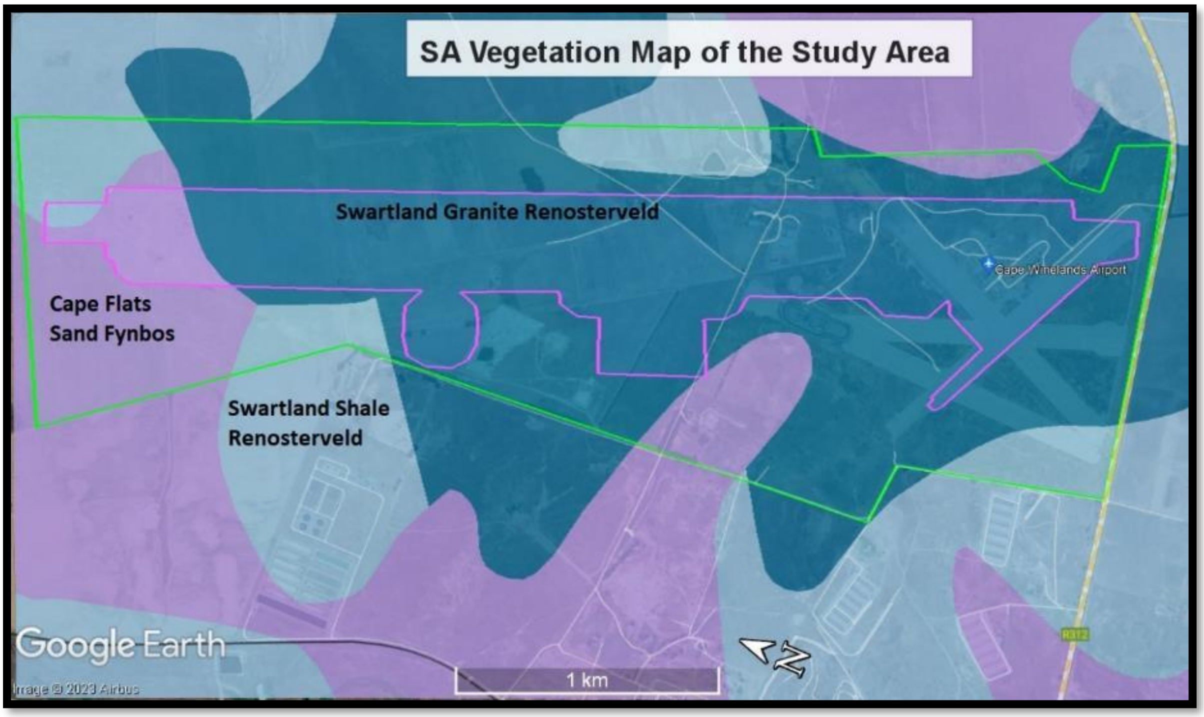

Figure 158: Extract of the SA Vegetation Map (Mucin & Rutherford 2012) showing that three different vegetation types would originally have occurred in the primary study area (excluding the Agricultural Precinct), with Swartland Granite Renosterveld making up the bulk of the site. The green polygon is the study area, and the pink polygon is the airside development footprint (Botanical IA, Sept 2024)

The Botanical Baseline Assessment verified the on-site situation and found that only minor fragments of indigenous vegetation remain on site, and these have been assessed in terms of their sensitivity (Refer Figure 155 - Figure 157).

About 93% of the study area and about 88% of the proposed development area has been heavily disturbed and degraded over a long period of time, and negligible indigenous vegetation is found in these areas. These areas are now regarded of Low botanical sensitivity and present no significant botanical constraints to development.

Two patches of Very High botanical sensitivity have been identified in the study area, each of about 1.6ha in extent (refer red polygons in Figure 155 - Figure 157). The northern one (Swartland Silcrete Renosterveld) is located within the proposed development area, whilst the southern one (Swartland Shale Renosterveld) is just outside the development area. A third patch is within the Agricultural precinct.

The vegetation loss is due to the placement and design of the proposed runway 01-19 which has been determined through a rigorous process involving various technical determinants such as prevailing wind conditions, international design standards and guidelines, integration into the ATMS, topography of CWA's surroundings and topography on site, type and amount of air traffic to be served, including air traffic control aspects, and to align traffic patterns for proposed runway with existing traffic flow patterns. (refer section 8.3.2 this report). There is no possible avoidance of the removal of these areas of vegetation through the Mitigation hierarchy and the only remaining step is Terrestrial/ Biodiversity offset.

If these mapped areas of remnant habitat are lost to development, they should be offset by formalised conservation of high conservation priority examples of the same habitat in the region, at minimum ratios of 20:1 (for non-pristine habitat) and 30:1 (for better quality examples; as per Dept. of Forestry, Fisheries & Environment offset guidelines, 2022).

Preliminary estimates suggest that the 1.6ha of Very High sensitivity vegetation (partly degraded) will need to be offset at a ratio of at least 20:1, and the 2.3ha of Medium sensitivity at a ratio of about 10:1, and the 1.3ha of High sensitivity vegetation at about 15:1. This means that a total offset of about 75ha (plus ongoing environmental management budget for this) might be required to help mitigate the unavoidable residual botanical impacts of the loss of natural habitat on site.

The biodiversity offset process enables protection and appropriate management of ecosystems and species, and in the long term contribute to the expansion of South Africa's protected area network.

Biodiversity offsets are the final option in the mitigation hierarchy, after the prevention of degradation and loss have been considered, impact minimisation and rehabilitation considered.

In determining possible offset areas, the following was considered:

- Ecological equivalence (like-for-like) is the preferred offset type.
- Residual impacts on irreplaceable biodiversity cannot be offset.
- Biodiversity offset interventions must be additional to, or over and above, biodiversity conservation measures that are already required by law, or that would have occurred had the biodiversity offset not taken place.
- The quality and quantity of residual impacts on biodiversity must be considered in decision making involving biodiversity offsetting.
- Biodiversity offsets should embody the ecosystems approach and promote connectivity in the wider landscape.
- Biodiversity offsets must result in long-term security and management of priority biodiversity.
- Biodiversity offset design must be defensible and transparent.
- Offsets must follow a risk averse and cautious approach.
- Offsets must be fair and equitable.
- Implementation of a biodiversity offset should preferably take place before the impacts of the activity occur, or as soon thereafter as reasonable and feasible.
- Biodiversity offsets must be measurable, auditable, and enforceable.

The biodiversity offsetting process involved the following steps:

- Identifying the need for a biodiversity offset.
- Selecting a biodiversity offset site.
- Securing the biodiversity offset site.
- Preparing a Biodiversity Offset Report and Management Plan.

- Preparing biodiversity offset conditions for the EA.
- Concluding a Biodiversity Offset Implementation Agreement with the landowner and the managing agent.

Summary of the criteria for the biodiversity offset is that the site(s) need to:

- secure at least 77ha of Swartland Renosterveld, on shale, or granite or silcrete.
- include options for rehabilitation of degraded ecosystems and be able to receive species from Search and Rescue operations.
- create corridors or expand existing conserved areas where at all possible
- house viable populations of *Leucadendron verticilatum*, *Podalyria microphylla*, *Ficinia sp nov*., and preferably as many of the other Endangered species impacted.
- Be able to be declared as a protected area in perpetuity and be effectively managed.

Consultation with a biodiversity offset specialist and CapeNature enabled the proposed offset agreement. To date a Letter of intent has been signed between CWA and the landowners of a suitable site, and a Funding agreement to cover management liability is being negotiated with a responsible Non-profit NPO. Details of these agreements will be shared with DEA&DP.

<u>Assumptions and Limitations of the Terrestrial offset:</u>

- The direct and indirect impacts are adequately mapped and assessed by the specialists, and that no cryptic species worthy of separate offset measures will be impacted.
- As with most major complex, highly contingent infrastructure projects, there have been numerous changes to layouts and footprints. This includes minor elements (such as perimeter security roads) that may marginally impact on sensitive features. It was assumed that the final layout plan and clearing accords with the Spatial Development Plan version 13 as of 22 August 2024 and that no material impacts eventualise.
- There is no realistic chance for restoration of the renosterveld and sand plain fynbos ecosystems adjacent to the runway, the RESA and other operational features of the airport. While some individuals of CR species may persist, the ecosystem that supports their populations in the long term will be lost. This is a risk averse and precautionary approach to offset calculation.
- This study only investigates the terrestrial ecosystem impacts – the wetland impacts and offset are subject to a separate analysis and proposal (FEN 2024). Where possible and prudent, the two offset processes have been developed in cognisance of each other.
- No faunal impacts were assessed or proposed to require offset-type mitigation.
- As with most offset studies, the final choice of site and securing of an implementation partner is subject to multiple contingent factors, including successful authorisation and surviving of any legal challenge. While the site options and implementation arrangements proposed have every chance of being successful secured and concluded, they cannot be guaranteed. For this and other reasons, it is strongly advised that any authorisation include carefully crafted conditions to ensure the ultimate success of offset mitigation herein.

8.6.9 Monitoring Requirements: Potential Botanical Impacts

- The condition of all Very High, High and Medium sensitivity areas (Agricultural Precinct and on site) should be monitored every year by a suitably competent botanist (or CoCT Environmental Management Dept.), and they should make recommendations for any management changes or actions (alien clearing, lack of fire, etc.) that are needed in order to achieve optimal ecological functioning in these areas.
- The successful implementation and management of the Terrestrial offset should be monitored by the CA on a regular basis.

8.7 Potential Freshwater Ecological Impacts

8.7.1 Introduction, ToR and Methodology

The following points highlight the envisaged additions to the detailed Scoping Phase Freshwater Ecological report that has been included in the EIA Phase Freshwater Ecological report:

- Apply the EIA assessment criteria to all the identified Alternatives,
- Determination and designation of appropriate conservation buffers applied to the Mapped freshwater ecosystems using the “Preliminary guideline for the determination of buffer zones for rivers, wetlands and estuaries” as developed by Macfarlane et al. (2015);
- Consider the mitigation hierarchy to reduce development impacts and to control negative effects on the environment,
- Anticipated impacts on the freshwater ecosystems will be assessed according to the EIA impact assessment methodology as provided by the EAP as well as the DWS Risk Assessment Matrix (2016),
- Applicable mitigation measures will be refined,
- Recommendations for the Environmental Management Programme (EMPr) or conditions to be included in the Environmental Authorisation will be made; and
- A statement regarding the acceptability of the proposed development from a freshwater context will be provided.

A freshwater offset is considered for the loss of 6,74ha (mostly seep wetland 1) freshwater habitat, and guidance and stipulations provided by DWS. The offset report has been developed in conjunction with DWS and is included as mitigation under section 9.7.6 of this report.

The following issues raised during the pre-application Scoping Phase PPP have been considered:

Disruption of ecosystem balance; Applicability and feasibility of offsets; Habitat loss and biodiversity loss; Water quality impacts.

The following issues raised during the in-process Scoping Phase PPP have been considered:

Impact of the development on existing conservation areas; applicability of biodiversity offsets; impact of the airport on local conservation efforts.

Based on the SDP for the proposed development the following should be considered:

- The runway, roads and associated open space areas (if applicable), as well as the service infrastructure (sewer pipelines, bulk water pipeline, stormwater infrastructure, etc.) encroach into the 32m NEMA ZoR of the seep wetland 1;
- The maintenance road and two fences will traverse the seep wetland 1 and CVB wetlands 2 and 3;
- The crossway runway associated with Phase 2 of Alternative 2 is located outside the 32m NEMA ZoR of all freshwater ecosystems associated with the proposed CWA development and was therefore not assessed; and
- Seep wetland 2 and CVB wetland 1 and 4 are located outside the 32m NEMA ZoR, are expected to be impacted to a limited degree, and are therefore not assessed as part of the impact assessment.

The colour scheme presented in Table 96 (below) was used to clarify the hierarchy of magnitude for the various activities and aspects relating to the proposed CWA development. The more severe (orange to red) coloured cells were used to focus the overall consideration of risk and to focus the development of mitigatory recommendations to ensure that opportunities are presented to reduce the impacts as far as possible.

Table 96: Colour scale used to qualify the hierarchy of magnitude for the various activities and aspects relating to each proposed impact.

Zero	Very Low	Low	Moderate	High

<u>Assumptions and limitations applicable to the Freshwater Ecological Impact Assessment (Sept 2024):</u>

- The ground-truthing and delineation of the freshwater ecosystem boundaries and the assessment thereof is confined to two site visits undertaken on 17 January 2022 and the 25 April 2022. All freshwater ecosystems identified within the investigation area were delineated in fulfilment of Government Notice 4167 of the NWA using various desktop methods including use of topographic maps, historical and current digital satellite imagery and aerial photographs. Where possible (based on accessibility – fencing of private properties upstream and downstream of various freshwater ecosystems) the freshwater ecosystems were ground-truthed and on-site delineations were undertaken outside of the road servitude. The general surroundings and existing land uses were also considered as part of the assessment;

- Due to the high levels of invasion by predominantly the alien tree species *Acacia saligna* within the southern portion of the study area and ongoing agricultural activities within the northern portion of the study area, and various other current and historical disturbances, the identification and delineation of the freshwater ecosystems within the study area proved challenging, particularly the identification of the outer boundary/temporary zones (in cases of wetlands) in presently cultivated areas. As such, vegetation could not be used as a reliable delineation indicator of freshwater ecosystems within the study area. Thus, ground-truthing methods relied heavily upon using terrain units such as topography/elevation to determine in which parts of the landscape the freshwater ecosystem was most likely to occur;

- The identification and delineation of the freshwater ecosystems, as provided in this report, are considered accurate taking into consideration the site conditions at the time of assessment (i.e., disturbances to soil and vegetation, high levels of invasion and agricultural disturbances in the area, seasonal variation and changes to the pattern, flow and timing of water within the freshwater ecosystems). It is acknowledged, however, that this timing of the site assessment is not ideal, and would have been more appropriate during the wet winter period;
- Global Positioning System (GPS) technology is inherently somewhat inaccurate and some inaccuracies due to the use of handheld GPS instrumentation may occur, however, the delineations as provided in this report are deemed accurate enough to fulfil the authorisation requirements as well as implementation of the mitigation measures provided;
- Freshwater ecosystem and terrestrial zones create transitional areas where an ecotone is formed as vegetation species change from terrestrial to obligate/facultative species. Within this transition zone, some variation of opinion on the freshwater resource boundaries may occur, however, if the Department of Water Affairs and Forestry (DWAF) (2008) method is followed, all assessors should get largely similar results; and
- With ecology being dynamic and complex, certain aspects (some of which may be important) may have been overlooked, especially given the disturbed nature of the study area. The study area has undergone significant anthropogenic influences as a result of historical mining and agricultural activities and most currently activities associated with the existing airport, which have altered the natural soil profiles and vegetation composition. The freshwater ecosystem delineation as presented in this report is, however, regarded as the best estimate of the boundaries based on the site conditions present at the time of the site visit and are deemed appropriately accurate to guide any future development plans.

<u>Assumptions and limitations applicable to the Freshwater offset report (Sept 2024):</u>

- It was assumed that the proponent will receive authorisation from the relevant provincial and/or national authorities (including the Department of Water and Sanitation (DWS), and/or the Western Cape Department of Environmental Affairs and Development Planning (DEA&DP)) for the proposed CWA development. The provided WRMP does not seek to replace the Environmental Management Programme (EMPr) but has rather been designed in a manner that supports the EMPr through specific guidance of rehabilitation, monitoring and management of the offset areas. The WRMP however does not address mitigation measures required for the proposed CWA development;
- With regards to freshwater ecosystems and their delineation:

  - The ground-truthing and delineation of the freshwater ecosystem boundaries and the assessment thereof at the study area as part of the freshwater assessment, was confined to two site visits undertaken on the 17th of January 2022 and the 25th of April 2022 (Scoping Report dated 2024 – FEN, 2024);

  - Global Positioning System (GPS) technology is inherently somewhat inaccurate and some inaccuracies due to the use of handheld GPS instrumentation may occur, however, the delineations as provided in this report are deemed accurate enough to fulfil the authorisation requirements as well as implementation of the mitigation measures provided;

- Freshwater ecosystems and terrestrial zones create transitional areas where an ecotone is formed as vegetation species change from terrestrial to obligate/facultative species. Within this transition zone, some variation of opinion on the freshwater ecosystem boundaries may occur. However, if the DWAF (2008) method is followed, all assessors should get largely similar results;

- With ecology being dynamic and complex, certain aspects (some of which may be important) may have been overlooked. However, it is expected that the proposed development activities have been accurately assessed and considered, based on the field observations and the consideration of existing studies and monitoring data in terms of wetland ecology;

- The assessment of the freshwater ecosystems for offsetting purposes was confined to one of the three identified target recipient sites due to the significantly higher likelihood of rehabilitation success of the target recipient site. The assessment of the target recipient site was limited to a single site visit undertaken during April 2024;

- Use was made of aerial photographs, digital satellite imagery as well as provincial and national wetland databases to identify areas of interest prior to the field survey of both the study and recipient target offset areas. Although all possible measures were undertaken to ensure all freshwater ecosystems and drainage features were assessed and delineated, some features may have been overlooked;

- Based on the desktop assessment, it is clear that historical anthropogenic aspects (including extensive agricultural activities etc.) have impacted the hydrology, geomorphology and vegetation structure of the wetlands. Despite this, the wetland delineations are fairly accurate given these limitations;

- All effort was made to understand the requirements for offset as best possible, however information on Critical Biodiversity Areas (CBAs) and on specific species of concern is often not available. Thus, best professional knowledge and best technological solutions, with special mention of GIS were used to best understand these aspects;
- The WRMP provided in this report is intended to provide a general direction for which the proponent can achieve the desired ecological state of the acquired offset area in the future. The strategy thus provides high-level context and principles for which implemented actions must adhere to. In-depth rehabilitation (including alien and invasive plant (AIP) control, earthwork activity plans, etc.) will need to be developed (at the appropriate time) under the guide of suitably trained specialists;
- As much effort as possible was made to liaise with relevant stakeholders and obtain indications of willingness to take part in the initiative, within budget constraints and within timeframes;
- This wetland offset study focuses on the high-level planning and overall wetland offset requirements, in addition to a high-level rehabilitation plan to be implemented at the target offset area; and

- A risk assessment was conducted for the wetlands associated with the target offset area.

8.7.2 Assessment of Impacts: Construction Phase

- Impact 1: Modification of the seep wetland 1 and CVB wetland 2 and 3's hydrological functioning and water quality:

Site clearing activities and related earthworks associated with the proposed CWA development may result in habitat loss, alteration of hydrological and geomorphological processes and water quality impacts of the wetlands through sedimentation and pollution and the loss of wetland vegetation. The increased impermeable surfaces due to the presence of hardened surfaces as a result of the proposed CWA development which will release stormwater into the seep wetland 1 and CVB wetlands 2 and 3 via stormwater attenuation ponds and surface runoff, may result in an increased catchment yield and altered flow regime, leading to changed hydrological zonation. Similarly, the construction of the maintenance road and fences which will traverse the above-mentioned wetlands may also lead to changed hydrological zonation due to the fragmentation of the wetlands.

Table 97 below summarises the activities and potential impacts during the construction phase.

Table 97: Activities and potential impacts during the construction phase

Construction phase
Site preparation prior to construction activities, involving vehicular movement (transportation of construction materials) and associated disturbances to soil.
Removal of topsoil and vegetation and creation of topsoil stockpiles, and increased likelihood of dust generation due to exposed soil.
Movement of construction equipment and personnel within the seep wetland 1 and potentially CVB wetland 3.
Earthworks involving removal of topsoil and creation of soil stockpiles for the construction of activities related to the runway and related infrastructure and service infrastructure within 32m of the delineated extent of the wetlands.
Groundbreaking including excavation and stockpiling of soil for the construction of stormwater infrastructure within 32m of the seep wetland 1 and potentially CVB wetland 3.
Groundbreaking: installation of service infrastructure within the 32m NEMA ZoR of the seep wetland 1 and potentially CVB wetland 2 and 3.
Potential mixing and casting of concrete/ asphalt for runway within the 32m NEMA ZoR of the seep wetland 1.
Construction of maintenance road and fences through the wetlands.

- Impact 2: Changes to the geomorphological processes (sediment balance, erosion and sedimentation)

The activities associated with the proposed CWA development may result in the disturbance of geomorphological processes of the seep wetland 1 and CVB wetlands 2 and 3 through the removal of vegetation and topsoil during the construction phase, and earth works for the construction of service infrastructure and runway, resulting in altered runoff patterns and increased erosion and sedimentation of freshwater habitat. This in turn has the potential to impact on wetland habitat, zonation and species composition as well as goods and services provision.

Table 98 summarises the activities and potential impacts during the construction phase.

Table 98: Activities register leading to changes to the geomorphological processes and sedimentation during the construction phase

Construction phase
Site preparation prior to construction activities, involving vehicular movement (transportation of construction materials) and associated disturbances to soil.
Removal of vegetation within the development footprint and seep wetland 1 resulting in increased sediment loads into the seep and CVB wetlands and potential for headcut erosion and smothering of wetland habitat.
Earth works involving excavation and creation of soil stockpiles for the construction service infrastructure, stormwater attenuation ponds, runway and maintenance road and fences within the 32m NEMA ZoR of the seep wetland 1 and CVB wetlands 2 and 3.

- Impact 3: Wetland habitat loss, altered wetland habitat and impacts to biota

Disturbances of soil and removal of vegetation during site preparation, and the construction phase of the proposed CWA development may result in increased AIP proliferation, and in turn to altered wetland habitat. The construction of the runway and related infrastructure including the stormwater attenuation ponds may result in the loss of 6.74ha of wetland habitat of seep wetland 1. Similarly, the construction of the maintenance road and fences which will traverse the seep and CVB wetlands may result in the fragmentation of wetland habitat. Asphalt, concrete and cement-related mortars can be toxic to aquatic / wetland life, thus asphalt and concrete works and runoff from the construction site (if unmitigated) may lead to a reduced ability of the freshwater features to support biodiversity. Table 99 summarises the activities and potential impacts during the construction phase.

Table 99: Activities register leading to wetland loss, changes in wetland habitat and impacts to biota during the construction phase

Construction phase
Site preparation prior to construction activities, involving vehicular movement (transportation of construction materials) and associated disturbances to soil.
Removal of topsoil and creation of topsoil stockpiles.
Earthworks involving excavation and creation of soil stockpiles for the construction of the runway, service infrastructure, stormwater attenuation ponds, maintenance road and fences within the 32m NEMA ZoR of the seep wetland 1 and potentially CVB wetland 3.
Potential mixing and casting of asphalt and concrete for the runway associated with the proposed CWA development within the 32m NEMA ZoR of the seep wetland 1.
Loss (6.74ha) of seep wetland 1 habitat and ecoservices because of the construction of the proposed CWA development.

A summary of the outcome of the impact assessment is provided in Table 100 below. All mitigation measures as stipulated in the RAM are deemed applicable for the post-mitigation scoring. It should be noted that no additional impacts are anticipated for the No-Go Alternative 1 of the CWA development and as such it has not been included in the below discussions

Table 100: Summary scores rated for unmitigated and mitigated phases as it relates to seep wetland 1 and CVB wetlands 2 and 3.

UNMANAGED								MANAGED							
Extent	Duration	Intensity	Magnitude	Probability	Status	Confidence	Significance	Extent	Duration	Intensity	Magnitude	Probability	Status	Confidence	Significance
CONSTRUCTION PHASE: Site preparation, removal of topsoil and creation of stockpiles and earthworks, groundworks and removal of vegetation															
Impact on hydrological function and water quality															
Local	Short term	Low	Medium	Probable	**Neg (-)**	**High**	**Moderate**	Site specific	Short term	Low	Medium	Probable	**Neg (-)**	**High**	**Low**
Impact to geomorphological processes (sediment balance, erosion and sedimentation)															
Site specific	Short term	Low	Low	Probable	**Neg (-)**	**High**	**Very low**	Site specific	Short term	Low	Low	Probable	**Neg (-)**	**High**	**Very low**
Wetland habitat loss (seep wetland 1), altered wetland habitat and impacts to biota															
Local	Short term	High	High	Definite	**Neg (-)**	**High**	**Moderate**	Local	Short term	Medium	Medium	Definite	**Neg (-)**	**High**	**Moderate**
CONSTRUCTION PHASE: Earthworks and construction and installation of the maintenance road and fences															
Impact on hydrological function and water quality															
Site specific	Short term	Low	Medium	Probable	**Neg (-)**	**High**	**Low**	Site specific	Short term	Low	Low	Possible	**Neg (-)**	**High**	**Very low**
Impact to geomorphological processes (sediment balance, erosion and sedimentation)															
Site specific	Short term	Low	Medium	Probable	**Neg (-)**	**High**	**Low**	Site specific	Short term	Low	Low	Possible	**Neg (-)**	**High**	**Very low**
Altered wetland habitat and impacts to biota															
Site specific	Short term	Low	Medium	Probabl e	**Neg (-)**	**High**	**Low**	Site specific	Short term	Low	Low	Possible	**Neg (-)**	**High**	**Very low**

CONSTRUCTION PHASE: Potential mixing and casting of concrete/ asphalt for runway within the 32 m NEMA ZoR of the seep wetland 1															
Impact on hydrological function and water quality															
Site specific	Short term	Medium	Medium	Probable	**Neg (-)**	**High**	**Low**	Site specific	Short term	Medium	Low	Improbable	**Neg (-)**	**High**	**Very low**
Altered wetland habitat and impacts to biota															
Site specific	Short term	Medium	Medium	Probable	**Neg (-)**	**High**	**Low**	Site specific	Short term	Medium	Low	Improbable	**Neg (-)**	**High**	**Very low**
CONSTRUCTION PHASE: Loss (6.74 ha) of seep wetland 1 habitat and ecoservices because of the construction of the proposed CWA development.															
Altered wetland habitat and impacts to biota															
Local	Long term	High	High	Definite	**Neg (-)**	**High**	**High**	Site specific	Long term	High	High	Definite	**Neg (-)**	**High**	**Moderate**
OPERATIONAL PHASE: Operation of the runway and related infrastructure (including stormwater attenuation ponds)															
Impact on hydrological function and water quality (on seep wetland 1)															
Site specific	Long term	High	Medium	Probable	**Neg (-)**	**High**	**Moderate**	Site specific	Long term	Medium	Medium	Probable	**Neg (-)**	**High**	**Moderate**
Impact to geomorphological processes (sediment balance, erosion and sedimentation) (on seep wetland 1)															
Site specific	Long term	High	Medium	Probable	**Neg (-)**	**High**	**Moderate**	Site specific	Long term	Medium	Medium	Probable	**Neg (-)**	**High**	**Moderate**
Wetland habitat loss, altered wetland habitat and impacts to biota (on seep wetland 1)															
Local	Long term	High	High	Definite	**Neg (-)**	**High**	**High**	Local	Long term	Medium	Medium	Definite	**Neg (-)**	**High**	**Moderate**
Impact on hydrological function and water quality (on CVB wetlands 2 and 3)															
Site specific	Long term	Low	Low	Probable	**Neg (-)**	**High**	**Low**	Site specific	Long term	Low	Very Low	Probable	**Neg (-)**	**High**	**Very low**

Impact to geomorphological processes (sediment balance, erosion and sedimentation) (on CVB wetlands 2 and 3)															
Site specific	Long term	Low	Low	Probable	**Neg (-)**	**High**	**Low**	Site specific	Long term	Low	Very Low	Probable	**Neg (-)**	**High**	**Very low**
Altered wetland habitat and impacts to biota (to CVB wetlands 2 and 3)															
Site specific	Long term	Low	Low	Probable	**Neg (-)**	**High**	**Low**	Site specific	Long term	Low	Very Low	Possible	**Neg (-)**	**High**	**Very low**
OPERATIONAL PHASE: Operation of the maintenance road and fences and maintenance of service infrastructure															
Impact on hydrological function and water quality															
Site specific	Long term	Low	Low	Definite	**Neg (-)**	**High**	**Low**	Site specific	Long term	Low	Very Low	Probable	**Neg (-)**	**High**	**Very low**
Altered wetland habitat and impacts to biota															
Site specific	Long term	Low	Low	Definite	**Neg (-)**	**High**	**Low**	Site specific	Long term	Low	Very Low	Possible	**Neg (-)**	**High**	**Very low**
OPERATIONAL PHASE: Operation of the stormwater attenuation ponds and release of hydrocarbons into the wetlands from attenuation ponds and surrounding landscape															
Impact on hydrological function and water quality															
Local	Long term	Low	Medium	Definite	**Neg (-)**	**High**	**Moderate**	Local	Long term	Low	Low	Probable	**Neg (-)**	**High**	**Low**
Impact to geomorphological processes (sediment balance, erosion and sedimentation)															
Local	Long term	Low	Medium	Definite	**Neg (-)**	**High**	**Moderate**	Local	Long term	Low	Very Low	Probable	**Neg (-)**	**High**	**Very low**

Altered wetland habitat and impacts to biota													
Local	Long term	Low	Medium	Definite	**Neg (-)**	**High**	**Moderate**	Local	Long term	Low	Low	Probable	**Neg (-)**	**High**	**Low**
OPERATIONAL PHASE: Anthropogenic disturbance including noise and physical degradation of wetland habitat reducing available feeding, drinking, breeding & migratory habitat to biota associated with CVB wetlands 2 and 3													
Altered wetland habitat and impacts to biota													
Site specific	Long term	Low	Low	Definite	**Neg (-)**	**High**	**Low**	Site specific	Long term	Low	Very Low	Probable	**Neg (-)**	**High**	**Very low**

8.7.3 Assessment of Impacts: Operational Phase

- Impact 1: Modification of the seep wetland 1 and CVB wetland 2 and 3's hydrological functioning and water quality:

Table 101: Activities and potential impacts during the construction phase

Operational phase
Operation of stormwater attenuation ponds and discharge of attenuated stormwater from the proposed CWA development into the seep wetland 1 and CVB wetland 3 via stormwater attenuation ponds within the study area.
Operation of the runway and service infrastructure potentially releasing hydrocarbons from the internal road network and runway entering the wetlands through stormwater run-off.
Operation of the maintenance road and fences through the seep wetland 1 and CVB wetlands 2 and 3.
Operational phase
Potential indiscriminate movement of vehicles within the wetlands for inspections/ maintenance.

- Impact 2: Changes to the geomorphological processes (sediment balance, erosion and sedimentation)

Table 102: Activities register leading to changes to the geomorphological processes and sedimentation.

Operational phase
Operation of the stormwater attenuation ponds responsible for the alteration of the sediment load as a result of water and sediment release into the wetlands via stormwater releases. Hardened surfaces and diffuse stormwater runoff may also affect sediment balance in the landscape.
Potential indiscriminate movement of vehicles within the wetlands for inspections/ maintenance.

- Impact 3: Wetland habitat loss, altered wetland habitat and impacts to biota

Table 103: Activities register leading to wetland loss, changes in wetland habitat and impacts to biota

Operational phase
Operation of the proposed CWA development including the related infrastructure, stormwater attenuation ponds, roads, service infrastructure and associated open space areas.

Anthropogenic disturbance including noise and physical degradation of wetland habitat reducing available feeding, drinking, breeding and migratory habitat to biota associated with the CVB wetlands 2 and 3.
Potential hydrocarbons from the hangars, workshops, internal road network and runway entering the wetlands through stormwater run-off.

A summary of the outcome of the impact assessment is provided in Table 104. All mitigation measures as stipulated in the RAM are deemed applicable for the post-mitigation scoring. It should be noted that no additional impacts are anticipated for the no-go Alternative 1 of the CWA development and as such it has not been included in the below discussions.

Table 104: Summary scores rated for unmitigated and mitigated phases as it relates to seep wetland 1 and CVB wetlands 2 and 3

UNMANAGED								MANAGED							
Extent	**Duration**	**Intensity**	**Magnitude**	**Probability**	**Status**	**Confidence**	**Significance**	**Extent**	**Duration**	**Intensity**	**Magnitude**	**Probability**	**Status**	**Confidence**	**Significance**
Local	Short term	High	High	Definite	**Neg (-)**	**High**	**Moderate**	Local	Short term	Medium	Medium	Definite	**Neg (-)**	**High**	**Moderate**
OPERATIONAL PHASE: Operation of the runway and related infrastructure (including stormwater attenuation ponds)															
Impact on hydrological function and water quality (on seep wetland 1)															
Site specific	Long term	High	Medium	Probable	**Neg (-)**	**High**	**Moderate**	Site specific	Long term	Medium	Medium	Probable	**Neg (-)**	**High**	**Moderate**
Impact to geomorphological processes (sediment balance, erosion and sedimentation) (on seep wetland 1)															
Site specific	Long term	High	Medium	Probable	**Neg (-)**	**High**	**Moderate**	Site specific	Long term	Medium	Medium	Probable	**Neg (-)**	**High**	**Moderate**
Wetland habitat loss, altered wetland habitat and impacts to biota (on seep wetland 1)															
Local	Long term	High	High	Definite	**Neg (-)**	**High**	**High**	Local	Long term	Medium	Medium	Definite	**Neg (-)**	**High**	**Moderate**
Impact on hydrological function and water quality (on CVB wetlands 2 and 3)															
Site specific	Long term	Low	Low	Probable	**Neg (-)**	**High**	**Low**	Site specific	Long term	Low	Very Low	Probable	**Neg (-)**	**High**	**Very low**
Impact to geomorphological processes (sediment balance, erosion and sedimentation) (on CVB wetlands 2 and 3)															
Site specific	Long term	Low	Low	Probable	**Neg (-)**	**High**	**Low**	Site specific	Long term	Low	Very Low	Probable	**Neg (-)**	**High**	**Very low**
Altered wetland habitat and impacts to biota (to CVB wetlands 2 and 3)															

Site specific	Long term	Low	Low	Probable	**Neg (-)**	**High**	**Low**	Site specific	Long term	Low	Very Low	Possible	**Neg (-)**	**High**	**Very low**
OPERATIONAL PHASE: Operation of the maintenance road and fences and maintenance of service infrastructure															
Impact on hydrological function and water quality															
Site specific	Long term	Low	Low	Definite	**Neg (-)**	**High**	**Low**	Site specific	Long term	Low	Very Low	Probable	**Neg (-)**	**High**	**Very low**
Altered wetland habitat and impacts to biota															
Site specific	Long term	Low	Low	Definite	**Neg (-)**	**High**	**Low**	Site specific	Long term	Low	Very Low	Possible	**Neg (-)**	**High**	**Very low**
OPERATIONAL PHASE: Operation of the stormwater attenuation ponds and release of hydrocarbons into the wetlands from attenuation ponds and surrounding landscape															
Impact on hydrological function and water quality															
Local	Long term	Low	Medium	Definite	**Neg (-)**	**High**	**Moderate**	Local	Long term	Low	Low	Probable	**Neg (-)**	**High**	**Low**
Impact to geomorphological processes (sediment balance, erosion and sedimentation)															
Local	Long term	Low	Medium	Definite	**Neg (-)**	**High**	**Moderate**	Local	Long term	Low	Very Low	Probable	**Neg (-)**	**High**	**Very low**
Altered wetland habitat and impacts to biota															
Local	Long term	Low	Medium	Definite	**Neg (-)**	**High**	**Moderate**	Local	Long term	Low	Low	Probable	**Neg (-)**	**High**	**Low**
OPERATIONAL PHASE: Anthropogenic disturbance including noise and physical degradation of wetland habitat reducing available feeding, drinking, breeding and migratory habitat to biota associated with the CVB wetlands 2 and 3															
Altered wetland habitat and impacts to biota															
Site specific	Long term	Low	Low	Definite	**Neg (-)**	**High**	**Low**	Site specific	Long term	Low	Very Low	Probable	**Neg (-)**	**High**	**Very low**

Cumulative Impacts

Freshwater ecosystems within the Cape Town region and the broader Western Cape region are under continued and increasing threat due to a variety of factors primarily related to changes in landuse which, in the long term, may prove to be unsustainable. The predominant landuse and economic activity in the wider area is commercial agriculture. This has resulted in degradation of freshwater features due to land transformation and resultant disturbance to surrounding freshwater features through proliferation of AIPs, as well as physical transformation of freshwater ecosystems, primarily in the form of impoundments and other artificial structures (such as stormwater drains) that have been developed along most of the drainage lines in the area. Increasing urbanisation and continued urban sprawl, including within the greater area in which the CWA development is proposed to be located, are further contributing to the cumulative impacts to freshwater ecosystems in the area.

The stormwater impoundments exert various types of impacts, including freshwater habitat transformation, hydrological impacts, as well as hydromorphological impacts. Other factors such as existing linear infrastructure (roads and railways), urban expansion as well as climate change also exert impacts on the freshwater ecosystems in the wider area. Considering that the development of the CWA will impact freshwater ecosystems located on the development site (i.e. resulting in the loss of 6.74ha of wetland habitat of seep wetland 1), and potentially those located downgradient of, and adjacent to the study area, thereby potentially resulting in a cumulative impact on the freshwater ecosystems and associated biodiversity it supports. The operation of the CWA and stormwater related impacts associated with the proposed development will cumulatively add to the existing water quality and sediment issues currently experienced by the freshwater ecosystems. The implementation of control measures to avoid impacts where possible will either reduce the scale and intensity of such a cumulative impact, or under a best-case scenario will negate the creation of a cumulative impact. A freshwater offset is being investigated for the 6.74ha loss of freshwater habitat associated with the seep wetland 1, as per consultation between the proponent and the DWS, and guidance and stipulations provided by the DWS in this regard. The offset investigation will assist in the positive cumulative impacts on the freshwater ecosystems within the broader region of the proposed CWA development.

The loss of an area of wetland in the study area, if not offset, will contribute to the cumulative loss of wetland habitat within a local catchment context. Although not regionally significant and limited in extent in a regional context, any loss of wetland habitat is significant and accordingly the loss of wetland habitat of the western portion of the seep wetland 1 in the study area needs to be offset according to the relevant hectare equivalents to ensure that no nett loss of wetland habitat and functionality occurs. For the remainder of the seep wetland 1 and the CVB wetlands 2 and 3 within the investigation area, the impacts associated with the proposed CWA development are unlikely to contribute significantly to the cumulative effect on the loss of wetland habitat within the local catchment or the region provided that cognisant, well-planned design is implemented. The PES and ecoservice provision of the freshwater ecosystems has to be maintained or improved were feasibly possible, as per the REC and RMO.

While the development of an airport may bring economic benefits, the significance of climate change impacts on wetland ecology should not be overlooked, as these ecosystems provide ecological services such as flood regulation, water purification, and biodiversity support, which are important for maintaining overall environmental health and resilience. Climate change is anticipated to have several impacts on wetland ecology in the Western Cape, South Africa, including in the local region of the proposed CWA development. These impacts may include:

- Changes in precipitation patterns: Climate change could alter precipitation patterns, leading to changes in water availability in wetlands. Some areas may experience increased rainfall, leading to flooding and changes in hydrology, while others may face drought conditions, resulting in reduced water levels;
- Temperature increases: Rising temperatures could affect wetland ecosystems by altering the physiology and behaviour of species that inhabit them. Increased temperatures can also lead to changes in water temperature, affecting aquatic species' breeding, migration patterns, and overall health;
- Extreme weather events: Climate change is expected to increase the frequency and intensity of extreme weather events such as storms, hurricanes, and heatwaves. These events can cause physical damage to wetland habitats, disrupt ecosystem functions, and lead to loss of biodiversity; and
- Changes in vegetation composition: Altered environmental conditions may result in shifts in vegetation composition within wetlands. Some species may thrive under new conditions, while others may struggle to adapt or face local extinction.

While the above potential impact associated with climate change are acknowledged, it is considered unlikely that the proposed CWA development will contribute significantly to impacts of climate change on the ecology of the freshwater ecosystems identified to be associated with the CWA development.

Therefore, an impact assessment of cumulative effects is not included in the Freshwater Ecological Impact Assessment report.

Nevertheless, control measures that could be implemented to address these climate change impacts include:

- Wetland restoration and conservation: Protecting and restoring wetland habitats can help mitigate the effects of climate change by preserving ecosystem services, enhancing biodiversity, and providing natural buffers against extreme weather events; and
- Water management: Implementing sustainable water management practices can help maintain water levels in wetlands, particularly during periods of drought. This may include water conservation measures, watershed management, and the restoration of natural hydrological processes to as close as possible mimic the natural pattern, flow and timing of water in the landscape, where possible.

Incorporating wetlands and biodiversity resource management considerations into development planning can bolster climate change resilience by fostering natural buffers and enhancing ecosystem services. By implementing these mitigation measures, stakeholders can work to minimize the adverse effects of climate change on wetland ecology and promote the long-term sustainability of these ecosystems.

8.7.4 The No Go Alternative

A summary of the outcome of the construction and operational impact assessment is provided in. All mitigation measures as stipulated in the RAM are deemed applicable for the post-mitigation scoring. It should be noted that no additional impacts are anticipated for the no-go alternative of the CWA development and as such, have not been included in the impact assessment.

8.7.5 Mitigation Measures: Potential Freshwater Ecological Impacts

<u>Key control measures that must be implemented include:</u>

- Construction work, particularly of works within the 15m construction conservation buffer of the wetlands, must as far as possible be restricted to the dry, summer season. CVB wetlands 2 and 3 and the remainder of seep wetland 1 where development will not occur, and the wetlands' 15m construction phase conservation buffers must be marked as a no-go area during the construction phase of the proposed development;
- Sediment trapping devices must be utilised downgradient of where works are to be undertaken within seep wetland 1 and upgradient of CVB wetland 3;
- Under no circumstances must linear infrastructure be trenched within the CVB wetlands 2 and 3 or their conservation buffer;
- Any fences that are to traverse the CVB wetlands 2 and 3 must be installed in such a way that hydropedological processes are not impeded within these systems. It is recommended that the erection of fence posts within the CVB wetlands 2 and 3 are avoided;
- Stormwater attenuation ponds must be designed and landscaped in accordance with the Concept Stormwater Management Plan (Zutari, 2024b) with input from a Landscape and Open Space Planning consultant and freshwater ecologist and all stormwater infrastructure are to be incorporated into the final Stormwater Management Plan. The stormwater infrastructure is to be maintained in accordance with the management plan as described in the Concept Stormwater Management Plan (Zutari, 2024b);
- For the construction of the maintenance road along the eastern boundary of the study area, culverts must be installed to allow the passage of water from the upgradient portions of the CVB wetlands 2 and 3 to the downgradient portions. Any disturbed areas within these wetlands must be rehabilitated on completion of construction of the road. Cobbles are to be placed downgradient of the maintenance road to trap sediment and reduce flow velocity of surface water entering the wetlands. The maintenance road should ideally avoid seep wetland 1 and circumvent it to avoid further fragmentation of the wetland. Should this not be possible, the road must be designed in such a manner as to allow hydraulic and hydropedological process connectivity in the landscape while also allowing fauna to traverse the roadway;
- Disturbed areas, particularly associated with the CVB wetlands 2 and 3 with regards to the maintenance road and fences that will traverse these wetlands must be rehabilitated once construction activities have ceased;
- Control measures related to trenching and stockpiling activities must be strictly implemented;
- A monitoring programme must be implemented to detect and prevent the pollution of soils, surface water and groundwater;

- Wetlands that will potentially be impacted by the proposed CWA development must be monitored to ensure that the PES drivers and receptors are maintained, and where possible improved, in accordance with the REC and RMO. An offset plan is being compiled by FEN Consulting which will outline an appropriate monitoring approach;
- Jet fuel and other potential hazardous chemicals must be stored in a manner that reduces the potential for spills;
- An emergency spill protocol must be compiled and is to be maintained for the CWA, especially for potential spills on the runways, aprons, roads, etc. to prevent the pollutants from being transported via stormwater infrastructure into the downgradient wetlands;
- A Service Infrastructure Management Plan is to be compiled which details the frequency in which service infrastructure, particularly the sewer and water treatment plants, bio-digester and sewer conveyance infrastructure must be serviced. This will assist in the prevention of leakages and bursting of the sewer infrastructure; and
- An emergency plan must be compiled to ensure a quick response and attendance to the matter in case of a leakage or bursting of a pipeline or overtopping of sewage at the treatment plant

<u>Control measures developed in response to the DWS risk assessment (Construction Phase):</u>

- Access to the site must be from existing access roads as far as feasible to avoid indiscriminate driving through the freshwater ecosystems;
- The 15m construction conservation buffer around the freshwater ecosystems must be implemented for the duration of the construction works where development will not occur to mitigate edge effects. The freshwater ecosystems and the respective conservation buffers must be clearly demarcated using a suitable barrier or material by an Environmental Control Officer (ECO) and marked as ‘no-go’ areas. Only authorised construction personnel may be permitted to enter these ‘no-go’ areas as part of the clearing activities, where required, to prevent excessive compaction of the soil within the freshwater ecosystems;

Figure 159: Example of a barrier fence used to demarcate the no -go area around the freshwater ecosystems and the 15m construction conservation buffer (FEN: Sept 2024)

- Contractor laydown areas, vehicle re-fuelling areas and material storage facilities to remain outside of the respective conservation buffers of the freshwater ecosystems and preferably the 32m NEMA ZoR. A designated contractor laydown area must be approved by an independent ECO prior to use;
- Stockpiles must be placed outside the delineated freshwater ecosystems and 32m thereof;

- Site clearing activities (including for contractor laydown areas) are to remain within the authorised footprint and vegetation clearing is to be limited to what is absolutely essential within that active footprint;
- Avoid unnecessary trampling of vegetation irrespective of the vegetation being associated with the freshwater ecosystems or the surrounding terrestrial area;
- Retain as much indigenous vegetation as possible (wetland and terrestrial);
- Dust suppression measures must be implemented throughout construction to prevent excessive dust which may smother freshwater vegetation;
- No indiscriminate movement of vehicles through the freshwater ecosystems may be permitted.
- All vehicles must remain outside the conservation buffers, unless required as part of a specific construction activity for a short period of time. This should also be limited to the drier summer season, where possible;
- Control alien vegetation, specifically invasive and pioneer species which may find a niche to encroach disturbed areas. Ensure AIP species are managed post construction until suitable basal cover is achieved;
- Once all vegetation clearing is completed all vegetation and any removed excess material must be disposed of at a licensed refuse facility and may not be mulched or burned on site; and
- In all events all machinery and vehicles used during construction must be maintained to prevent oil leaks. If breakdowns occur these must be towed offsite site to the designated areas/workshops. The proposed will ensure that incidental oil spills and leakage are minimised onsite and thus limit any opportunities of water contamination and water quality deterioration.
- All construction personnel, vehicles and construction work must be confined to the boundaries of the development footprint and no edge effects must occur. This is of particular importance at seep wetland 1;
- During the excavation and trenching activities, any soil/sediment or silt removed from the freshwater ecosystems may be temporarily stockpiled outside the freshwater ecosystems if construction activities are confined to the dry summer months;
- Excavated materials may not be contaminated (with hydrocarbons, fuel, etc.). It must be ensured that the minimum surface area is taken up, and the stockpiles may not exceed 2m in height;
- Mixture of the lower and upper layers of the excavated soil should be kept to a minimum, so as for later usage as backfill material;
- All exposed soils must be protected for the duration of the construction phase with a suitable geotextile (e.g. Geojute or hessian sheeting) to prevent erosion and sedimentation;
- Any AIPs within the study area (including the linear infrastructure footprints) must ideally be removed prior to soil stripping to reduce seed loads within the topsoil (which will be used to revegetate post construction). This will assist in reducing the long-term AIP management requirements;
- Dust suppression techniques must be implemented throughout the construction phase to ensure dust does not impact the CVB or seep wetlands, which could affect turbidity of the water and impact on wetland vegetation;

- With the exception of the infrastructure as described in this report (the potable water and stormwater infrastructure along the eastern boundary of the runway), no pipelines may traverse any of the freshwater ecosystems. Should additional freshwater ecosystem crossings be considered, the DWS Risk Assessment must be updated to account for these activities.
- Water and and stormwater pipelines to be trenched in the freshwater ecosystems must be installed during the drier summer months to prevent water quality impacts to the freshwater ecosystems;
- Unused excavated soil/sediment must be utilised as part of the open space areas (if applicable) or be removed from site to a registered landfill;
- The soil surrounding the linear infrastructure, particularly within 15m of the freshwater ecosystems must be suitably loosened on completion of construction activities and revegetated to prevent erosion;
- In addition to the above, with regards to excavation and soil compaction activities regarding trenching for the linear infrastructure within the 15m construction conservation buffer of the freshwater ecosystems
- Stockpiling of removed materials may only be temporary (i.e. may only be stockpiled during the period of construction at a particular site) and must be disposed of at a registered waste disposal facility. Soil must be stockpiled on the upgradient side of the trench to avoid sedimentation of the downgradient areas;

Figure 160: Excavation for trenching with stockpiles alongside (FEN; Sept 2024)

- Trenches must be backfilled as soon as the infrastructure has been installed in any given section to reduce potential erosion of exposed soil;
- Material used as bedding material (at the bottom of the excavated trench) must be stockpiled outside of the freshwater ecosystems. Once the trench has been excavated, the bedding material must directly be placed within the trench rather than stockpiling it alongside the trench;
- No stormwater generated during construction may be directly released into the freshwater environment;
- It is considered imperative that all excavation activities be undertaken during the drier summer months to limit surface water contamination and the need for any surface water diversion during the construction works (diverting the flow of water through a pipe was not included as part of this risk assessment);
- Construction activities are only allowed in the development footprint. Refer to Activity 1 control measure 2. As far as possible, physical movement in the freshwater ecosystems by personnel must be limited; and

- Under no circumstances must linear infrastructure be trenched within the CVB wetlands 2 and 3 or their conservation buffer. Updated design plans (Zutari, 2024a) indicate that the layout of the linear infrastructure avoids wetlands.
- A 5m RoW for linear developments is considered as part of the RAM. This is of particular relevance to the installation of the water pipeline, fences and maintenance road along the eastern boundary of the study area.

Control measures specific to asphalt / concrete works:

- Asphalt, concrete and cement-related mortars can be toxic to aquatic life. Proper handling and disposal should minimise or eliminate discharges into the wetlands. High alkalinity associated with cement can dramatically affect and contaminate both soil and ground water. The following measures must be adhered to:
- Fresh asphalt, concrete and cement mortar must not be mixed near the wetlands' habitat. Mixing of cement may be done within the construction camp, on an impervious surface only, and must be within a lined, bound or bunded portable mixer. Consideration must be given to the use of ready mix concrete;
- No mixed concrete maybe deposited directly onto the ground within the wetlands or associated wetland habitat, outside of the designated area (i.e. fence traversing the seep wetland 1 and CVB wetlands 2 and 3). Any areas that require manual application of cement require that mixed cement be placed on a batter board or other suitable platform/mixing tray until it is deposited;
- A washout area must be designated outside of the wetlands, and wash water must be treated on-site or discharged to a suitable sanitation system;
- At no point may batter boards/mixing trays or cement trucks be rinsed off on site and runoff water be allowed into the freshwater ecosystems;
- Cement bags (if any) must be disposed of in the demarcated hazardous waste receptacles and the used bags must be disposed of through the hazardous substance waste stream; and
- Spilled or excess concrete must be disposed of at a suitable landfill site. Chain of custody documentation must be provided.

Control measures specific to the construction of stormwater infrastructure:

- All attenuation facilities must be constructed through excavation of the in-situ material, sloped to a ratio not steeper than 3:1 and lined with rocks and cobbles to assist with energy dissipation and prevent sedimentation and erosion as well as improve the aesthetic appeal of the attenuation ponds;
- Attenuation ponds must be vegetated with indigenous obligate and facultative species suitable for seasonal saturation with input from a suitably qualified avifaunal specialist. Given the nature of the development, vegetating the dry attenuation ponds may not be possible. This will assist with energy dissipation and prevent sedimentation and erosion as well as improve habitat provision;

Figure 161: Examples of swales utilised for conveyance of stormwater (FEN: Sept 2024)

- Cobbles must be placed on all outlet structures and indigenous vegetation established to bind the soil of the bed, to prevent erosion and assist with energy dissipation. This will also promote diffuse flow and decrease the velocity of water released downgradient towards seep wetland 1 and CVB wetland 3. The Stormwater Management Plan compiled by Zutari (2024b) is to be updated to include input from a Landscape and Open Space Planning consultant and freshwater ecologist to determine the system characteristics required to prevent excessive erosion of the downgradient seep and CVB wetland whilst also limiting the creation of habitat for birds which provide a safety risk for aircraft. The design and operation must prevent erosion and/or gully formation as this will have an impact on the water dispersal into and across the seep wetland 1 and CVB wetland, which could potentially reduce the extent and functionality of the wetland systems in the long-term;
- All materials used to construct the attenuation ponds must not generate toxic leachates or lead to significant changes in pH or dissolved salt concentrations;
- No plastic lining may be used as part of the attenuation pond construction as this has various ecological impacts;
- It is recommended that the attenuation ponds be vegetated with indigenous wetland and / or riparian vegetation (with input from a suitably qualified avifaunal specialist) to assist with water polishing, trapping nutrients and hydrocarbons from the proposed CWA development before this is released into the surrounding environment;
- With regards to concrete works for the outlet structures (including concrete aprons, reno mattresses, gabions, headwalls, etc., as applicable), see control measures related to concrete works of Activity 4 and 5 above. These must ideally be constructed during the drier summer months to reduce the impact on water quality of the seep wetland 1;
- Litter traps must be installed at all the outlet structures to prevent any litter from entering the freshwater ecosystems;
- Sediment trapping devices must be utilised downgradient of where works are to be undertaken within seep wetland 1 and upgradient of the CVB wetland 3;
- All soil compacted within the wetlands as a result of construction equipment must be loosened prior to revegetation with suitable indigenous species;
- Suitable dust management practices must be implemented for the duration of construction;
- It is highly recommended that construction work for the linear infrastructure is undertaken in the drier, summer period to avoid excess sediment entering the receiving freshwater ecosystems;
- Refer to control measure 1 of Activity 1 regarding movement in the freshwater ecosystems.

- Careful planning of all construction equipment must be undertaken beforehand to ensure that the minimum impact on the freshwater ecosystems occur;
- Any fences that are to traverse the CVB wetlands 2 and 3 (if applicable) must be installed in such a way that hydropedological processes are not impeded within these systems. It is recommended that the erection of fence posts within the CVB wetlands 2 and 3 are avoided; and
- For the construction of the maintenance road along the eastern boundary of the study area, culverts must be installed to allow the passage of water from the upgradient portions of the CVB wetlands 2 and 3 to the downgradient portions. Any disturbed areas within these wetlands must be rehabilitated on completion of construction of the road. The maintenance road should ideally avoid seep wetland 1 and circumvent it to avoid further fragmentation of the wetland. Should this not be possible, the road must be designed in such a manner as to allow hydraulic and hydropedological process connectivity in the landscape while also allowing fauna to traverse the roadway;
- It is also highly recommended that cobbles be placed downgradient of the road to trap sediment and reduce flow velocity of surface water entering the wetlands.

Control measures developed in response to the DWS risk assessment (Operational Phase):

- Implement a monitoring programme to detect and prevent the pollution of soils, surface water and groundwater;
- Monitor wetlands that will potentially be impacted by the proposed CWA development to ensure that the PES drivers and receptors are maintained, and where possible improved, in accordance with the REC and RMO. An offset plan is being compiled by FEN Consulting which will outline an appropriate monitoring approach;
- A Service Infrastructure Management Plan should be compiled which details the frequency in which service infrastructure, particularly the sewer and water treatment plants, bio-digester and sewer conveyance infrastructure must be serviced. For example, it is recommended that the integrity of the sewer infrastructure and treatment plants be tested at least once every five years or more often should there be any sign of a leak;
- An emergency plan must be compiled to ensure a quick response and attendance to the matter in case of a leakage or bursting of a pipeline or overtopping of sewage at the treatment plant and/or biodigester;
- Jet fuel and other potential hazardous chemicals must be stored in a manner that reduces the potential for spills; and
- An emergency spill protocol must be compiled and is to be maintained for the CWA, especially for potential spills on the runways, aprons, roads, etc. to prevent the pollutants from being transported via stormwater infrastructure into the downgradient wetlands.
- Regular inspection of the stormwater outlet structures must be undertaken (specifically after large storm events) to monitor the occurrence of erosion. If erosion has occurred, it must immediately be rehabilitated through stabilisation of the embankments and revegetation, where applicable;
- All pipelines and attenuation ponds must be regularly cleaned, and all outlet structures (if any) checked to ensure there is no debris / blockages;

- The likelihood of erosion at the discharge points can be reduced provided that a higher surface roughness is implemented in the area from the discharge points down to the delineated freshwater ecosystems, allowing for water to enter the seep wetland 1, CVB wetland 3 and the surrounding environment at a lower velocity. This can be achieved through the placement of cobbles and ensuring that the area surrounding each discharge point is suitably vegetated; No development within the 15m and 16m operational phase conservation buffer of the CVB wetlands 2 and 3 and seep wetland 1, respectively, may be undertaken (refer Figure 162)

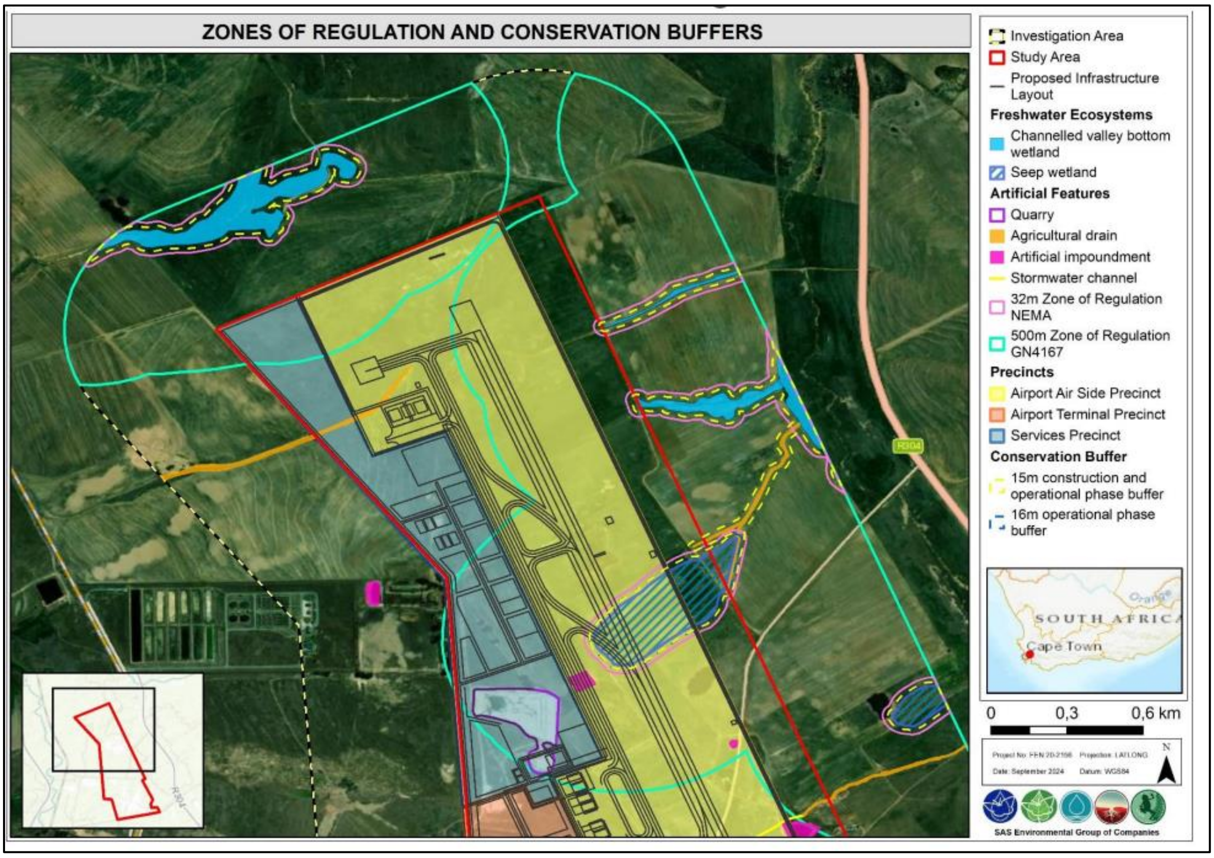

Figure 162: Conservation buffers associated with the mapped freshwater systems (FEN; Freshwater Ecological IA; Sept 2024)

- The proposed stormwater infrastructure must be incorporated into a suitable and site-specific Stormwater Management Plan (e.g. as compiled by Zutari, 2024b) and the stormwater infrastructure are to be maintained as per the requirements of the Concept Stormwater Management Plan (Zutari, 2024b).
- It must be ensured that regular maintenance takes place to prevent failure of any infrastructure associated with the proposed CWA development;
- Only existing roadways should be utilised during maintenance and repairs to avoid indiscriminate movement of vehicles within the wetlands;
- Should repair of the sewer infrastructure be required to address a leak, control measures relating to trenching and stockpiling must be implemented depending upon the location of the leak;

- With regards to maintenance activities for roads, fences and service infrastructure refer to applicable measures in Construction Phase control measures.
- No vehicles are permitted to enter the freshwater ecosystems. Any maintenance works must be undertaken by foot, or the relevant authorisations obtained beforehand.

General construction management and good housekeeping practices (FEN IA report Sept 2024):

Latent and general impacts which may affect the freshwater ecosystem ecology and biodiversity will

include any activities which take place in close proximity to the proposed servitude that may impact on the receiving environment. Mitigation measures for these impacts are highlighted below and are relevant to the freshwater ecosystem identified in this report:

Development footprint

- All development footprint areas should remain as small as possible and should only encroach into the freshwater ecosystem if considered absolutely essential;
- The boundaries of footprint areas, including contractor laydown areas, are to be clearly defined and it should be ensured that all activities remain within defined footprint areas. Edge effects will need to be extremely carefully controlled;
- Planning of temporary roads and access routes should avoid freshwater ecosystem areas and be restricted to existing or pre-approved access roads and should not traverse the freshwater ecosystem;
- Appropriate sanitary facilities must be provided for the life of the repair and maintenance phase and all waste removed to an appropriate waste facility;
- All hazardous chemicals as well as stockpiles should be stored on bunded surfaces and have facilities constructed to control runoff from these areas;
- It must be ensured that all hazardous storage containers and storage areas comply with the relevant SABS standards to prevent leakage;
- No fires should be permitted in or near the construction area; and
- Ensuring that an adequate number of waste and “spill” bins are provided will also prevent litter and ensure the proper disposal of waste and spills.

Vehicle access

- All vehicles must be regularly inspected for leaks. Re-fuelling must take place on a sealed surface area to prevent ingress of hydrocarbons into the topsoil;
- In the event of a vehicle breakdown, maintenance of vehicles must take place with care and the recollection of spillage should be practised near the surface area to prevent ingress of hydrocarbons into topsoil and subsequent habitat loss; and
- All spills should they occur, should be immediately cleaned up and treated accordingly.

Vegetation

- Proliferation of alien and invasive species is expected within any disturbed areas. Whilst not considered severe at this time, the vegetation component within the freshwater ecosystem environment is already transformed. However, alien invasive species are opportunistic, and where disturbances do occur, they will promulgate; therefore, these species should be eradicated and controlled to prevent their spread beyond the project footprint. Alien plant seed dispersal within the top layers of the soil within footprint areas, that will have an impact on future rehabilitation, has to be controlled;

- Removal of the alien and weed species encountered within the freshwater ecosystem must take place in order to comply with existing legislation (amendments to the regulations under the Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983) and Section 28 of the National Environmental Management Act, 1998 (Act No. 107 of 1998); and
- Species-specific and area-specific eradication recommendations:
  - Footprint areas should be kept as small as possible when removing alien plant species; and
  - No vehicles should be allowed to drive through designated sensitive freshwater ecosystems areas during the eradication of alien and weed species.

Operation of the borehole

- Abstraction volumes must be monitored and recorded at suitable intervals (e.g. monthly) to ensure that abstraction volume (from what is approved by the DWS) is not exceeded;
- Groundwater abstraction must not drop below the critical water level (still to be determined). The management objective should be to maintain the groundwater level at or near the dynamic water level (still to be determined) to avoid the development of a cone of depression in the local landscape and significant impacts to the freshwater ecosystems within the study and investigation areas;
- Should it be observed that abstraction have dropped below the critical water level or if a water quality change has been observed, the relevant DWS compliance officer should be informed to discuss and develop a new abstraction plan that can sustain the aquifer; and
- During maintenance activities, particular care should be taken with regards to vehicle and spill management.

Solar PV facilities:

- Maintenance activities associated with the PV facility must be confined to the developed footprint of the PV facility and development footprint;
- Under no circumstances may waste (including grey water from the washing of the PV panels) be discarded in the surrounding environment. Suitable waste management practices must be implemented;
- BESS infrastructure (if any) must be regularly inspected and must be operated in line with applicable SANS standards (e.g. SANS 56005:2022 Ed 1 and SANS 62133-2:2022 Ed 1 as issued in Schedule B1 of GN 1427 of 18 November 2022, as issued in terms of section 24(1)(a) of the Standards Act (act 8 of 2008)); and
- Monitoring for the establishment for AIP species must be undertaken, specifically in the PV panel array footprint in the south-eastern portion of the study area. Should AIP species be identified, they must be removed and disposed of at a licenced waste management facility.

Soils

- Sheet runoff from compacted areas should be slowed down by the strategic placement of berms;

- It is considered ideal that activities occur within the current season (low rainfall) to minimise impacts of sedimentation;
- As much vegetation growth as possible (of indigenous floral species) should be encouraged to protect soils;
- Temporary stockpiling of excavated material from trenches can be retained alongside trenches, as required for backfilling. Any soil to be stockpiled for longer than a month should be moved to a designated stockpile area, as approved by the ECO;
- All soils compacted during the repair and maintenance phase should be ripped and profiled; and
- A monitoring plan for the development and the immediate zone of influence should be implemented to prevent erosion and incision.

Rehabilitation

- Construction rubble must be collected and disposed of at a suitable landfill site; and
- All alien vegetation in the footprint area, as well as the immediate vicinity of the proposed work area, should be removed.

8.7.6 Mitigation Measures: The Freshwater offset

During the offset initiative preparation, it was determined that 6.74ha (total loss of 7.44ha which includes the indirect impacts) of wetland habitat would be lost due to the proposed CWA development. This loss translates into a residual impact of 3.97 functional hectare equivalents (HaE) and 13 habitat HaE of wetland to meet the no net loss objective. The assessment of these impacts highlighted the need for an on-site wetland offset to ensure that the ecological balance of the area is maintained.

The remaining seep wetland habitat (3.68ha) in the eastern part of the study area along with a channelled valley bottom (CVB) wetland (36.2ha) further East of the study area into which the seep wetland drains (via an agricultural drain), have been identified as suitable for rehabilitation and offset purposes (refer Freshwater Offset proposal Appendix 8. The offset strategy has been designed to compensate for the residual loss of wetland habitat, ensuring no net loss of wetland functionality. The target offset area will contribute 4.1 functional HaE and 30.5 habitat HaE, adequately offsetting the impacts of the proposed CWA development. The suitability of these systems is further reinforced by the significant potential for ecological restoration through targeted rehabilitation activities, particularly given their current status as largely to seriously modified wetlands.

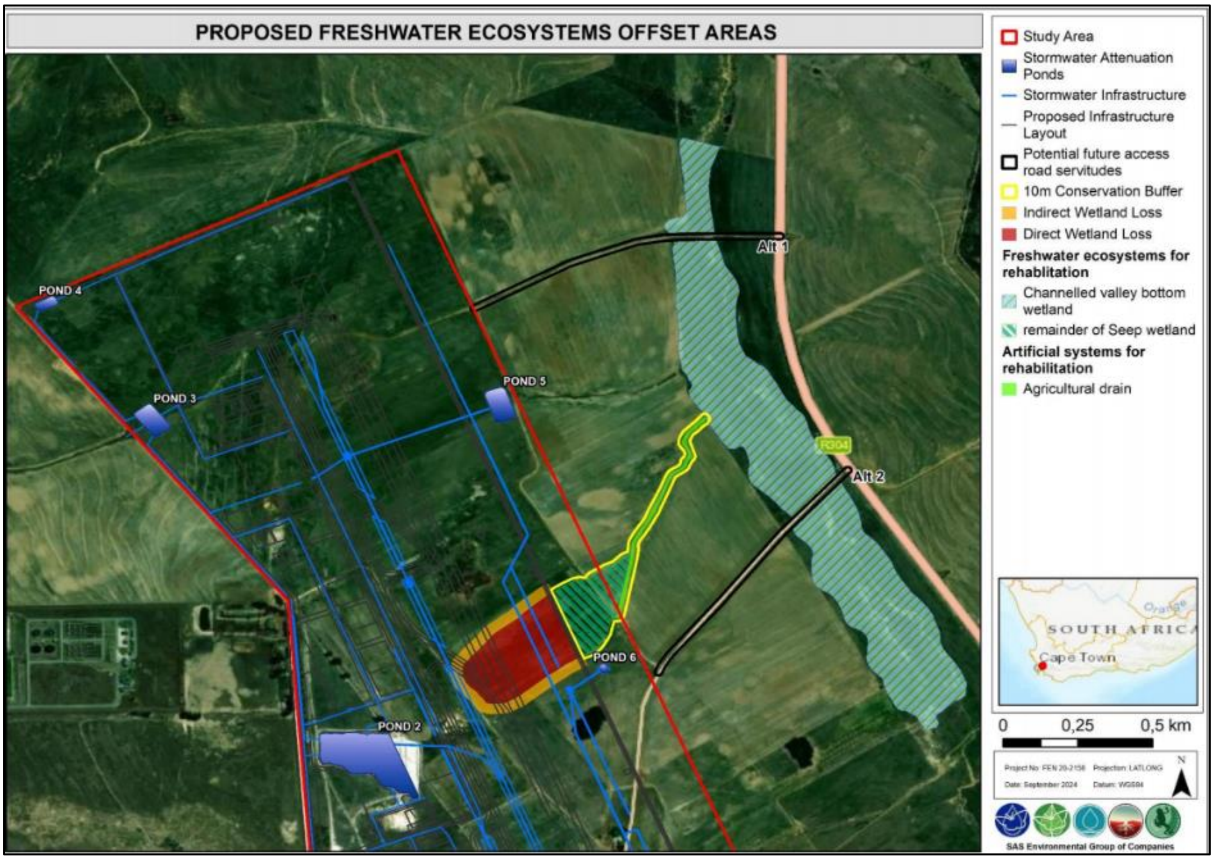

Figure 163: Extent of wetland to be lost (7.44ha) vs identified wetland areas to be rehabilitated (FEN, September 2024)

The Freshwater offset proposal also includes rehabilitation of the remainder of the mapped freshwater features on the site. The proposed rehabilitation plan focuses on restoring the hydrological regime drivers and geomorphological processes of the wetlands to ensure that ecological functions required to maintain a balanced ecosystem is supported. This is particularly of importance considering the extensive erosion that is evident in the CVB wetland. This will include:

- Removal of alien vegetation
- Removal of dumped waste from the CVB wetland,
- Land surface modification to facilitate natural water flow, and the
- Planting of native vegetation to stabilize the soil and enhance wetland functionality. This includes a 10m rehabilitation buffer around the seep wetland and agricultural drain.

The agricultural drain connecting the seep wetland to the CVB wetland is also earmarked for rehabilitation as efforts to remedy the CVB wetland may be futile if the erosion present in the agricultural drain is not addressed as well. Refer Appendix 8 for the Freshwater Offset proposal.

Mitigation measures related to the freshwater ecosystems of the target offset areas to be implemented during the rehabilitation of the wetlands:

- The AIPs found within the study area and target offset area must be removed during the initial phases of the rehabilitation of the target offset area, which includes:
  - The target offset area must be monitored for alien and invasive vegetation encroachment and all alien vegetation/weeds must be removed. Annual follow up should be undertaken

for at least 3 years post construction to prevent further spread of AIPs in the target offset area; and
- Where applicable for the eradication of AIPs, care should be taken with the choice of herbicide to ensure that no additional impact and loss of indigenous plant species occurs due to the herbicide used and water contamination is avoided

- Following completion of the construction activities associated with the CWA development, particularly given the increased risk of runoff, headcut erosion is of concern. Extensive headcut erosion is prevalent within the agricultural drain and CVB wetland, which if left unmanaged, such erosion will result in increased wetland habitat loss. It is thus imperative that headcuts and associated gullies be remediated (when/if the need arises). This will involve:
  - Resloping and re-grading the outer perimeter of the agricultural drain to a maximum of a 1:3.5 slope thereby creating a gradual slope which will improve flow patterns within the agricultural drain; and
  - Resloping and re-grading the outer perimeter of the CVB wetland in portions to a maximum of a 1:4 slope thereby creating a gradual slope towards the boundary of the CVB wetland area and creating temporary and seasonal wetland zones.
- Rehabilitation of natural flow paths can be achieved through the following:
  - The construction of bioswales at stormwater exits to support downgradient wetland areas (more specifically the seep wetland) with water released in an attenuated and polished manner;
  - Modify the land surface particularly within the vicinity of the CVB wetland and agricultural drain to create a gentle slope that facilitates natural water flow into and through the CVB wetland to encourage spreading of flow and infiltration; and
  - Plant native vegetation that is adapted to local hydrological conditions in the seep wetland, CVB wetland and agricultural drain. Vegetation can help slow down water flow, increase infiltration, and reduce erosion. A suitably trained specialist should be consulted to guide on species selection and species propagation and planting techniques.
- Appropriate stormwater management can be used to recharge the remaining seep wetland.
  - Considering the type of development (runway) and the bird strike potential, the stormwater management plan (Zutari, 2024) makes provision for dry attenuation ponds and dry swales, which does not support the ecological requirements of freshwater ecosystems' flora and fauna. As per Zutari (2024), stormwater from the study area will be treated via an infiltration process and only during a stormwater event larger than a 1 in 50-year event will stormwater be released into the remainder of the seep wetland as overland flow;
  - Ensure stormwater and associated runoff does not create erosive supercritical flows that would otherwise alter the natural hydrological regime, particularly considering the above; and
  - Design stormwater management infrastructure to mimic natural hydrological processes as far as possible; for example, ensure outlets at the dry swales are equipped with flow dissipating structures such as cobbles.

8.7.7 Monitoring Requirements: Potential Freshwater Ecological Impacts

- A monitoring programme must be implemented to detect and prevent the pollution of soils, surface water and groundwater;
- Monitoring of the implementation and management of the Freshwater offset plan
- Implement a monitoring programme to detect and prevent the pollution of soils, surface water and groundwater;
- Monitor wetlands that will potentially be impacted by the proposed CWA development to ensure that the PES drivers and receptors are maintained, and where possible improved, in accordance with the REC and RMO.
- Monitoring for the establishment for AIP species must be undertaken, specifically in the PV panel array footprint in the south-eastern portion of the study area.
- A monitoring plan for the development and the immediate zone of influence should be implemented to prevent erosion and incision.
- Regular inspection of the stormwater outlet structures must be undertaken (specifically after large storm events) to monitor the occurrence of erosion. If erosion has occurred, it must immediately be rehabilitated through stabilisation of the embankments and revegetation, where applicable.

<u>Long-term monitoring and maintenance related to the offset areas:</u>

- Establish a monitoring program to regularly check water quality and hydrological parameters.
- Maintenance plans should be in place to address any issues that arise, e.g., blockages in stormwater infrastructure or changes in vegetation health, etc. The monitoring program is to include wetland health and driver and receptor monitoring to ensure the maintenance and where possible improvement of wetland condition, particularly after the implementation of the offset activities; and
- Develop an adaptive management plan that allows for adjustments in key areas (e.g., stormwater management practices, AIP or erosion control, etc.) based on monitoring results and changing environmental conditions.
- To ensure the accurate gathering of data, the following techniques and guidelines should be followed:
  - Site walk through surveys should be applied as the preferred method of monitoring (at specified frequencies) with specific focus on:
    - Erosion monitoring (for the duration of the raining season);
    - Sedimentation (for the duration of the raining season);
    - Alien and invasive vegetation proliferation (at the start and end of the growing season).
  - General habitat unit overviews as well as specific monitoring of wetland integrity (utilising wetland tools such as WET-Health and WET-Ecoservices), drivers and functionality should be undertaken;
  - All data gathered should be measurable (qualitative and quantitative);
  - Monitoring actions should be repeatable;
  - Data should be auditable; and

  - Reports should present and interpret the data obtained.
- The monitoring plan comprises but is not limited to the following:
  - Identification of areas of concern. These are areas that are affected by disturbances such as:
    - Erosion;
    - Waste dumping;
    - Alien vegetation species encroachment;
    - Soil compaction;
  - Ensuring that the management/rehabilitation measures as stipulated in Sections 7 and 8 of the Freshwater offset report are adhered to;
  - A list of all alien vegetation species must be compiled as well as possible control methods such as manual, chemical or mechanical;
  - Gathering all equipment required for the monitoring process; and
  - Compiling a monitoring report.
  - A fixed-point monitoring method should be implemented to ensure repeatability of assessments for better comparison.

Table 105: Monitoring actions associated with the rehabilitation plan for the wetland habitat (FEN, Freshwater offset, Sept 2024)

Aspect	ID	Offset/ Rehabilitation Measure	Responsible	Implementation Timeframe	Monitoring Methods	Performance Indicators
		Planning				
Authorisations	1.	Ensure that all required licences and permits have been obtained before the start of rehabilitation.	➢ Implementing Agent	➢ Prior to the commencement of rehabilitation activities.	➢ Keep record of all permits, licences and authorisations.	➢ Required licences/ permits on file.
Site Establishment and Access Control	2.	Only undertake the rehabilitation works and the reinstatement of wetland habitat towards the end of the construction of the proposed CWA development. Dust generated from the construction works may smother new re-instated vegetation, specifically saplings and smaller species (e.g. *Isolepis* spp).			➢ Visual inspection.	➢ Limited rehabilitation works during construction of the proposed CWA development.
	3.	Implement access control for the potential recipient areas for all vehicles to ensure that no unauthorised persons are onsite.				➢ Access control is limited to the required vehicles and persons on site.
	4.	Clearly demarcate wetland zone boundaries with temporary fencing or similar in or near areas of active work. No personnel or vehicles are to be permitted to enter demarcated wetland zones unless essential.				➢ Rehabilitation areas demarcated. ➢ Access to demarcated wetland areas restricted.
	5.	Demarcate each rehabilitation area with danger tape prior to commencing rehabilitation activities, in order to control access and ensure that rehabilitation activities occur in the correct area. At no point should construction equipment extend past the designated construction site (unless for the required rehabilitation works). Demarcating rehabilitation areas must also ensure access to the rehabilitated wetlands by resident cattle is prohibited.				

	6.	Place adequate signage (in the appropriate languages commonly spoken in the area) around the planned rehabilitation areas.				➢ Signage is present.
	7.	Locate dedicated rehabilitation camp, laydown areas and parking areas for vehicles away from all identified sensitive areas.				➢ No camps, laydown areas, parking areas in sensitive areas.
	8.	Plan and demarcate all access roads to the relevant rehabilitation areas. Use of existing roads must be favoured.				➢ No evidence of tracks in sensitive areas.
Indigenous Plant Harvesting and Propagation	9.	Reinstate indigenous wetland species within the wetland habitat and the newly reinstated wetland areas (and agricultural drain) as part of the proposed rehabilitation plans. As such, make plans for where the species are to be sourced and include budgetary allowances for the purchasing of various species.	➢ Implementing Agent/ Contractor	➢ Throughout rehabilitation.	➢ Visual inspection of safely transporting and revegetating propagules and seeds, if and where required.	➢ Indigenous wetland species reinstated. ➢ Species sourced locally from nurseries such as Cape Flats LIFE.
	10.	Obtain indigenous plant species from a nursery such as the Cape Flats LIFE (plant list available in Appendix I).				
	11.	Secure the availability of species before rehabilitation activities commence to ensure that plants are ready and available for revegetation, so as not to leave areas exposed and vulnerable to erosion and incision.				Sufficient quantity of seeds and propagules secured prior to commencement of revegetation. Suitable service provider appointed, if necessary.
	12.	Consider utilizing seeds and cuttings from indigenous vegetation found within the areas to be rehabilitated for revegetation. Removing entire plants from the CVB wetland is prohibited, considering that very few native vegetation remains in the wetland.				

Alien and Invasive Plants	13.	Ensure that AIP control planning takes place prior to commencement of other rehabilitation activities. Due to the extent of AIP proliferation within the potential recipient sites, it is suggested that AIP clearing takes place concurrently with the other rehabilitation measures outlined in this report.	➢ Contractor	➢ Prior to revegetation.	➢ No revegetation prior to AIP clearing.	➢ Date of commencement of initial AIP clearing.
	14.	Establish a period contract to allow for annual maintenance and removal of newly germinated plants for a minimum period of three years following rehabilitation. Long-term AIP control must be secured, as the success of the entire program will depend on it.		➢ Prior to rehabilitation.	-	➢ Record of contract.
Rehabilitation Plans	15.	Cost calculations must be performed for each area and addressed according to priority.		➢ Prior to commencement with rehabilitation.		➢ Rehabilitation cost calculated. ➢ Timetables created.
	16.	Create timetables for the control operations. Care must also be taken to include time when operations fall behind due to unfavourable weather conditions or labour strikes.				
	17.	Divide the areas to be cleared into specific control areas through the use of man-made or natural boundaries to specify specific areas e.g. roads, fences. Each area must be numbered to simplify record keeping.			➢ Visual inspection	➢ Areas divided into manageable sections.
Rehabilitation Plans	18.	Should the Contractor and/or the Implementing Agent not have the expertise to identify and mark the AIPs, it is the responsibility of the Contractor or Implementing Agent to appoint a suitably qualified botanist to assist.	➢ Contractor / Implementing Agent	➢ Throughout rehabilitation.	➢ Botanist appointed, if required.	-
	19.	Schedule all wetland rehabilitation work (Section 8.3 of the report) to commence during the drier summer season to limit the impact on the wetlands. Timeframes must thus be properly		➢ Prior to commencement of rehabilitation.	➢ Schedule only reflects rehabilitation during	➢ Record of schedule.

		planned. This is also applicable to the agricultural drain.			drier summer months.	
	20.	Make water available for irrigation purposes for the first season after indigenous vegetation has been planted. It is recommended that all planted specimens be watered during the first summer.		➢ Throughout rehabilitation, after revegetating, as and when required.	➢ Visual inspection of rehabilitated areas.	➢ Record of plant survivors.
	21.	Re-sloping the CVB wetland and agricultural drain to ensure that the systems are free draining, and that no concentration or artificial ponding of flow occurs that encourages foraging by larger bird (high-risk bird strike) species		➢ Throughout rehabilitation and throughout the life of the project	➢ Avifaunal monitoring of rehabilitated areas	➢ No evidence of open area ponding and of high-risk bird strike species
Unplanned Fire Management	22.	Unplanned fires can occur within the potential recipient sites and surrounds, particularly during summer. Thus, preventative measures should be implemented by the Implementing Agent in order to reduce the likelihood of fires. This includes: ➢ Restricted access to vulnerable areas; and ➢ Awareness - Contractors working on site must be made aware of how their actions may result in the ignition of wild fires and must be adequately prepared to suppress any fires that may start whilst they are working. Informational signage around the recipient site should be erected to promote vigilance and reporting of veldfires, and to indicate that no fires are to be permitted outside of designated burn sites, if any. Such burn sites must not be within the delineated wetland boundaries.		➢ Throughout rehabilitation.	➢ Visual inspection restricted areas. ➢ Inspect attendance register for training sessions.	➢ Restricted access areas implemented. ➢ Record of environmental awareness training. ➢ Number of fire incidents.

General						
Good housekeeping	23.	Provide suitable ablution facilities for all personnel.	➢ Implementing Agent/ Contractor	➢ Prior to commencement of rehabilitation. ➢ Throughout rehabilitation.	➢ Visual inspections. ➢ Record of waste disposal.	➢ Number of incidents of staff not using facilities. ➢ Number of pollution incidents.
	24.	Clear waste and litter and dispose thereof at a registered and approved disposal site.				
	25.	Provide suitable general waste receptacles.				
	26.	Prohibit the dumping of waste or litter within the offset site and all watercourses. Any waste noted must be cleared immediately.				
AIP Clearing						
Chemical Control as part of Initial Control	27.	Control dense seedling growth with knapsack sprayers with a flat fan nozzle.	➢ Contractor	➢ Throughout rehabilitation and AIP clearing.	➢ Visual inspection of areas where chemical control is applied. ➢ Visual inspection of content of herbicides used in chemical control.	➢ Incidence of use of herbicide with Glyphosate, Diquat and Paraquat.
	28.	Chemical control will entail limited usage of registered herbicides for a specific species, and one must adhere to the measurements on the product label.				
	29.	Use suitable dye to limit over- or under spray of areas.				
	30.	Take care as to not exceed label instructions of herbicides containing Glyphosate, Diquat and Paraquat within the identified watercourses associated with the rehabilitation area as these herbicides can have negative impacts on surrounding flora and fauna. These chemicals may only be used in the terrestrial zone of the rehabilitation areas.				
Species	31.	Hand pull seedlings. No herbicide is needed.				

Specific Treatment – Port Jackson	32.	Lop/ prune young plants and treat them by means of a foliar spray of 50ml of Triclopyr Ester* mixed with 10l of water. Apply at a rate of 3 l/ha. Use of these listed chemical treatments should occur after or during the mechanical removal process.			➢ Visual inspection.	➢ Appropriate treatment implemented.
	33.	First cut adult plants down to a stump and frill them before treating with 300ml of Triclopyr Amine salt* mixed in 10 l of water and applied at a rate of 1.5 l/ha. Additionally, a Triclopyr Ester* solution can also be applied to approximately 0.6m length of stump. Use of these listed chemical treatments should occur after or during the mechanical removal process.				
	34.	Transport all branches that have been mechanically removed off site to a designated dumping facility. Cut branches should not be left in stockpiles as the seeds will likely germinate.	➢ Contractor	➢ Throughout rehabilitation and AIP clearing.	➢ Record of disposal.	➢ No removed branches observed on site.
Species Specific Treatment – Kikuyu Grass	35.	Use an herbicide with active ingredient Glyphosate*, dalapon or haloxyfop-P methyl ester. Spray plants during their active growing season (autumn). It is to be noted that Glyphosate* or haloxyfop herbicides may not be used within the watercourses where water is free flowing as it is known to be toxic to aquatic life. Use of these listed chemical treatments should occur after or during the mechanical removal process. *Note: Haloxyfop-P Methyl Ester is deemed to have a minimal environmental impact (although on an acute basis is toxic to aquatic life) and is not expected to leach into groundwater. Furthermore, it has been identified to degrade in soils under normal environmental conditions*[1].			➢ Visual inspection of areas where chemical control is applied. ➢ Visual inspection of content of herbicides used in chemical control.	➢ Incidence of use of herbicide with Glyphosate, Diquat and Paraquat.

Species Specific Treatment – Patterson's Curse	36.	Hand pull plants. No herbicide is needed; however, chemical control can be used with active ingredients chlorsulfuron, mesulfuron methyl, triasulfuron or Glyphosate* to control seed sets during the flowering season. Use of these listed chemical treatments should occur after or during the mechanical removal process.			➢ Visual inspection.	➢ Appropriate treatment implemented.
Follow-up AIP treatment	37.	Follow-up control is essential to control alien saplings, seedlings and coppice regrowth to achieve and sustain the progress that was made in the initial phase. If the follow up control phase is neglected, the alien infestation will become worse and denser than before the eradication process started.	➢ Implementing Agent/ Contractor	-	-	-
	38.	Conduct follow-ups for a minimum of three (3) times a year during the growing season (September – April) for the first three (3) years and thereafter a minimum period of four (4) years on an annual basis to ensure that new AIP infestation does not occur within the rehabilitated areas, after which the follow-up period should be reassessed based on the need.		➢ 3 times yearly for the first 3 years. ➢ Annually for a minimum of 4 years thereafter.	➢ Visual inspection.	➢ Record of follow ups implemented.
	39.	Undertake an annual assessment before mobilisation of the clearing crew to determine equipment and personnel requirements to secure the necessary funding.	➢ Implementing Agent/ Contractor	➢ Annually.	➢ Assessment undertaken.	➢ Number of equipment and personnel available for follow up control.
	40.	After initial control operations, dense regrowth may arise as new regrowth will sprout in the form of stump coppice, seedlings and root suckers. The following should therefore be applied: Plants that are less than 1m in height must be controlled by foliar application; and Areas with dense seedlings should not be uprooted or hoed out, as these areas will result in		➢ As and when required.	➢ Visual inspection.	Record of alien vegetation removed. Correct clearing method implemented.

		soil disturbance and will in return promote flushes and germination of alien seedling growth.				
Site Specific Rehabilitation						
General	41.	No construction equipment or personnel may enter the wetlands to be rehabilitated, unless authorised as part of the rehabilitation interventions. The remaining extent of the portions of the wetlands to be rehabilitated are to be pegged by a suitably qualified freshwater ecologist or ECO (although fencing is preferred). Construction equipment is allowed in the area designated for the CVB wetland and agricultural drain's rehabilitation (during reshaping only), and this is to be limited to the Western Cape summer period.	➢ Contractor	➢ Throughout rehabilitation.	➢ Visual inspection.	➢ No unauthorized access in wetlands.
	42.	Do not store any equipment within the delineated wetlands while not in use. Any designated storage and parking bays must be located no closer than 32m of the envisaged extent of the wetlands.				➢ No stationary equipment in wetlands.
	43.	Should the ECO not have the relevant expertise, it is recommended that the rehabilitation be overseen by a suitably qualified wetland specialist to ensure maximum service provision is achieved over the long-term in terms of hydrology, geomorphology, water quality and biota.			➢ Wetland specialist appointed, if required.	-

Earthworks	44.	Conduct all rehabilitation work during the drier summer months leading up to the rainy season (November to May) to reduce contamination of surface water and ensure maximum survival of new plant species (see section below of re-vegetation). Some watering of plants during the first dry season may be necessary to ensure survival.	➢ Implementing Agent / Contractor	➢ Throughout rehabilitation.	➢ Visual inspection.	➢ Rehabilitation confined to summer months.
	45.	Keep footprint areas for equipment as small as possible to reduce unnecessary disturbances of soils and vegetation.				➢ Size of disturbed areas.
	46.	Any topsoil moved should be stockpiled and re-instated as indigenous vegetation seeds will be present within the soil. Topsoil will have a high density of alien invasive seeds which will need to be controlled into the operational phase. Where possible, topsoil stockpiles should be covered to prevent birds from foraging for unearthed invertebrates.				➢ Topsoil stored correctly.
	47.	All excess material removed as part of the rehabilitation activities that cannot be reused on site must be removed from site. At no point may this material be disposed on site or within any of the other freshwater ecosystems identified within the surrounding area.				➢ Excess material disposed of properly and at suitable waste management facilities.
	48.	Install sediment traps downstream of rehabilitation works to prevent sedimentation of downstream areas and to contain spillage from contaminating the downstream reach of the CVB wetland.	➢ Implementing Agent / Contractor	➢ Prior to commencement of earthworks.	➢ Visual inspection.	➢ Little to no sediment observed in downstream freshwater ecosystems.
Machinery and vehicle management	49.	Where possible, utilize existing roads. Keep vehicular disturbance footprint as small as possible when accessing the rehabilitation sites.		➢ Throughout rehabilitation.		➢ Vehicle access limited to what is essential.
	50.	Limit construction equipment within the freshwater ecosystems to what is essential.				

	51.	Undertake regular maintenance of vehicles and machinery to identify and repair minor leaks and prevent equipment failures.	➢ Weekly during rehabilitation works.		➢ Leaks and spillages reported to ECO.
	52.	Refuelling must take place outside of the delineated wetlands and 32m NEMA ZoR and must take place on a sealed surface area to prevent ingress of hydrocarbons into the topsoil.	➢ Throughout rehabilitation.	➢ Visual inspection.	➢ No refuelling in close proximity to freshwater ecosystems.
	53.	Maintain all machinery and vehicles used during rehabilitation to prevent oil leaks.			➢ Little to no hydrocarbon or oil spillage.
	54.	Undertake any on-site refuelling and maintenance of vehicles and machinery in designated areas (preferably at the construction site camp) and away from the watercourses. Install oil traps and line these areas with an impermeable surface.			
	55.	Use appropriately sized drip trays for all refuelling and/or repairs done on machinery. Ensure that drip trays are strategically placed for capture any spillage of fuel, oil, etc.			
	56.	Immediately clean up any spills through containment and removal of free product. Appropriately dispose of contaminated soil.	➢ Upon observation of spills.		➢ Safety disposal slips indicating quantity and location where contaminated soils were disposed of.
	57.	If breakdowns occur these must be towed offsite to the designated areas/workshops. This will ensure that incidental oil spills and leakage are minimised onsite and thus limit any opportunities of water contamination and water quality deterioration.	➢ As and when required.		-

Vegetation clearance	58.	In order to construct the proposed CWA development, vegetation will need to be cleared within and surrounding the seep wetland in the eastern portion of the study area. With the exception of suitable wetland vegetation that can be reused during rehabilitation, all vegetation removed (especially since many of the current vegetation is identified as AIP) must be disposed of at a suitable disposal facility.		➢ Prior to commencement of rehabilitation activities.		➢ Vegetation disposed of at a suitable disposal facility.
Erosion Prevention and Topsoil Management	59.	Inspect rehabilitated areas for erosion.		➢ Weekly during rehabilitation activities. ➢ After every major rainstorm and/ flood for the first wet season post rehabilitation.		➢ ECO report provides feedback on erosion.
	60.	Immediately rehabilitate any area where active erosion is observed in such a way as to ensure that the surface hydrology of the area is re-instated to conditions which are as natural as possible.	➢ Implementing Agent / Contractor	➢ Upon observation of erosion.	➢ Visual inspection.	➢ Visual surface erosion cleared.
	61.	Actions to be taken to prevent any further erosion from occurring within the rehabilitated areas are as follows (to be implemented as and when required): ➢ Re-vegetating the disturbed and rehabilitated areas (see below); ➢ Stabilise the soil through the use of geotextiles, especially effective with growing vegetation; and ➢ Apply a layer of mulch to the rehabilitated areas to allow the soil				
		to slowly soak up the water and reduce the impact of rain on bare soil.				

Waste management	62.	Remove all litter observed in the wetlands and the agricultural drain and dispose thereof at an appropriately licensed waste management facility.	➢ Contractor	➢ Upon observation of waste.		Waste disposed of properly and at a suitable waste management facility. Waste management included in ECO reports.
Indigenous Species Revegetation	63.	Planting must start as soon as possible after site preparations (resloping) have been concluded to minimise the duration of bare ground being exposed which could lead to erosion and sedimentation of the area, and to establish ecological habitats. Furthermore, all disturbed areas as part of the rehabilitation, as well as where AIPs have been removed should also be re-instated with native vegetation.		➢ After AIP removal and site preparations.		Record of commencement of revegetation. Photographic record of revegetation.
	64.	Re-instate native vegetation in late autumn (April). This will ensure that vegetation is allowed to become established prior to the onset of the winter rains, and prior to the onset of the dry summer period, which will maximize growth and early establishment.				
	65.	Appoint a suitably qualified botanist to assist with re-vegetation, should the Contractor not have the relevant expertise on planting of specimens.			➢ Botanist appointed, if required.	-
Monitoring						
Administrative and Financial Monitoring	66.	Develop detailed budgets prior to the implementation of the program. This will include that all expenditure is accounted for and audited annually in accordance with the Public Finance Management Act, 1999 (Act No 1 of 1999).	➢ Contractor	➢ Prior to commencement of rehabilitation.	-	➢ Record of approved budget.

	67.	Monitor compliance with all relevant legislation (as outlined in this report, and any additional Acts which may be relevant in terms of corporate governance) and include this as part of the auditors' Terms of Reference.	➢ Subcontracted auditor	➢ Prior to and throughout rehabilitation.	➢ Compliance against EA and WULA conditions.	➢ Record of non-compliances.
	68.	Regular communication with all stakeholders must take place.	➢ Implementing Agent	➢ Throughout the life of the project.	➢ Stakeholders' communication maintained.	➢ Record of communication with stakeholders.
Wetland Health	69.	Monitor all wetland areas earmarked for conservation and rehabilitation annually during the winter period.	➢ Implementing Agent / suitably appointed contractor	➢ Annually for the first three years post rehabilitation.	➢ PES of systems maintained/ improved.	➢ Annual monitoring report compiled. ➢ Condition of the wetlands have not degraded since initial rehabilitation efforts have concluded.
AIP control	70.	Take a baseline assessment capturing densities and species of AIPs prior to the initial AIP clearing.	➢ Contractor	➢ Prior to AIP clearing.	➢ Screen the entire rehabilitation area(s). ➢ Log locations of any newly coppiced species to be treated/removed.	➢ Baseline report compiled.
	71.	Re-record AIP densities after the initial clearing, including all methods and chemicals used.		➢ After initial AIP clearing.		➢ Report compiled.
	72.	To ensure long-term maintenance measures are effective, quarterly assess and record densities and locations of newly coppiced AIPs during the first year post rehabilitation and annually during the growing season for the second and third year. Annual reports should include information from before and after mobilisation of follow-up clearing teams.		➢ For four years post AIP clearing.		Quarterly report during first year of rehabilitation. Annual reports during the following three years post AIP clearing.

Re-vegetation	73.	Monitor the areas revegetated to ensure plant survival and ensure that no AIPs are outcompeting native species. Compile the following reports: ➢ Compile a report listing existing species as well as any endangered species that may need to be rescued prior to rehabilitation. Appoint a suitable botanist to assist, should the Contractor not have the expertise to undertake this list. ➢ Compile monthly reports for 6 months after the re-instatement. ➢ Compile annual reports during each growing season, for at least 3 years post rehabilitation.		➢ Prior to rehabilitation activities. ➢ Monthly for 6 months after reinstatement of vegetation. ➢ Annually during the growing season for at least three years post rehabilitation.	➢ Visual inspection	➢ Reports compiled.

***Note: This monitoring plan must be implemented by a competent person and submit the findings to the responsible authority for evaluation.**

8.8 Potential Hydropedological Impacts

8.8.1 Introduction, Terms of Reference and Methodology

The objective of this study was to:

- Define the identified soil types and map them according to their hydropedological characteristics;
- Investigate the hydropedological drivers of the watercourses;
- Present a conceptual hydropedological model to assist in understanding water movement in the landscape;
- Determine the risk of the proposed activities on the watercourses;
- Quantify the hydropedological losses;
- Determine a suitable scientific buffer to minimise impact on wetland and avoid a change of PES/EIS class and functionality; and
- Present mitigation measures.

The Hydropedological Assessment undertaken by the Zimpande Research Collaborative included a desktop analysis, a field survey, sampling activities, and hydrological modelling. Soil samples were taken from various representative points to understand the wetland recharge mechanisms and predict the hydropedological impacts of the proposed development. Data collected from the field and lab were used in hydrological models to quantify key hydrological processes and assess the effects of the planned developments.

Conceptual Models and Implications:

Conceptual models were developed to analyse the flow paths of water and how the project might disrupt these paths in the landscape, affecting recharge mechanisms.

Quantification of Hydropedological Fluxes:

The SWAT+ (v 1.2.3) model was used to model and quantify the hydropedological changes expected due to the proposed development, focusing particularly on lateral flow. This quantification was conducted at three different scales: basin scale, landscape unit scale, and hydrological response unit scale (

Table 106 -

Table 108).

8.8.2 Assessment of Impacts: Construction Phase

The potential impacts from the proposed CWA development will likely pertain to the impacts experienced once the land is excavated during the construction of foundations for the proposed development:

- Sealed surfaces post-construction could alter the natural flow of water in the study area, potentially leading to increased erosion and sedimentation in lower-lying areas if not managed properly.
- Reduced infiltration due to sealed surface may necessitate the channelisation of water into stormwater structures and discharge into downstream watercourse or lower lying areas in the landscapes.
- Encroachment on interflow soils may disrupt wetland recharge mechanisms, affecting subsurface processes and ecological state.
- Downstream streams are ephemeral and likely recharged mainly by overland flow and direct precipitation over short periods. As such the contribution of interflow soils to these downstream watercourses is likely limited.

The hydropedological analysis at the **basin scale** shows a slight increase in streamflow and surface runoff, each by 10.55% and 10.99% respectively, although these constitute less than 15% of the water balance. This change is not expected to significantly alter the timing or pattern of water flow, minimizing impacts on instream functionality. Simulations also indicate decreases in lateral flow and percolation by 2.21% and 5.62% respectively, largely due to flow path disruptions and sealed surfaces from proposed development. Evapotranspiration remains the largest water loss, accounting for over 79% of the water balance, highlighting its critical role in local water dynamics. While there is a slight increase in profile water at this scale, changes in hydropedological processes are predicted to have minimal impact on wetland conditions, with no more than one PES class change expected (

Table 106).

At the **landscape unit (hillslope) scale**, streamflow and surface runoff show a modest increase of 6.17% and 6.52% respectively, comprising only 13% of the water balance, attributed to new impervious surfaces and redirected water flow through stormwater channels due to proposed development. Lateral flow and percolation decrease by approximately 2.8% and 3.7% respectively, with minimal impact on the water balance due to the absence of interflow soils. Evapotranspiration remains the dominant water loss at 78.53%, with local rainfall crucial for wetland dynamics. While there is a slight decrease in profile water at this scale, changes in hydropedological processes are predicted to have minimal impact on wetland conditions, with no more than one PES class change expected (Table 107).

At the **hydrological response unit scale**, site clearing, and surface infrastructure establishment are expected to reduce evapotranspiration and increase direct evaporation from bare soil. Evapotranspiration is the dominant water outflow mechanism, accounting for approximately 78.71% of the water balance. Post-development, streamflow and surface runoff are projected to increase by approximately 13.62% and 14.26% respectively, due to impervious surfaces and low soil storage capacity. Effective management through a Stormwater Management Plan can mitigate altered water movement patterns. Lateral flow shows minimal change with a loss of about 0.4%, while percolation decreases by 4.35%. Post-development, there is a slight increase in available profile water, indicating higher moisture levels. Overall, the hydropedological processes are predicted to remain largely unmodified in the post development scenario, and the functionality of the wetlands identified within the catchment area will likely remain unchanged if stormwater is managed effectively (

Table 108).

Table 106: Summary of the water balance pre- and post-development at Basin scale (Zimpande Research Collaborative, Hydropedological Assessment, June 2024)

	Before	% of WB	After	% of WB	Change	Weighted Loss	Anticipated PES/EIS Change
Rainfall	623,2843		623,2842				Limited with no more than one PES class change predicted.
Streamflow	79,9027	12,8196	88,2567	14,1599	10,4551	1,4804	
Surface runoff	76,6931	12,3047	85,1181	13,6564	10,9853	1,5002	
Lateral flow	3,2097	0,5150	3,1386	0,5036	-2,2148	-0,0112	
Percolation	6,2647	1,0051	5,9124	0,9486	-5,6230	-0,0533	
ET	504,1576	80,8873	494,5141	79,3401	-1,9128	-1,5176	
eCanopy	5,7670	7,2176	5,7557	6,5215	-0,1968	-0,0128	
Transpiration	44,0300	7,0642	43,9645	7,0537	-0,1488	-0,0105	
Evaporation	454,3605	72,8978	444,7939	71,3629	-2,1055	-1,5025	
ET0	1576,6309		1611,1848				
Profile available water	1,1765		1,0837		-7,8899		
Topsoil available water	9,8895		9,4766		-4,1748		

Table 107: Summary of the water balance pre- and post-development at Landscape Unit scale (Zimpande Research Collaborative, Hydropedological Assessment, June 2024).

	Before	% of WB	After	% of WB	Change	Weighted Loss	Anticipated PES/EIS Change
Rainfall	623,2850		623,2838				Limited with no more than one PES class change predicted.
Streamflow	81,2817	13,0409	86,3035	13,8466	6,1783	0,8555	
Surface runoff	78,3146	12,5648	83,4218	13,3842	6,5213	0,8728	
Lateral flow	2,9670	0,4760	2,8817	0,4623	-2,8767	-0,0133	
Percolation	5,8488	0,9384	5,6287	0,9031	-3,7628	-0,0340	
ET	497,4307	79,8079	489,4732	78,5314	-1,5997	-1,2563	
eCanopy	5,2834	6,5001	5,3189	6,1630	0,6719	0,0414	
Transpiration	37,9979	6,0964	38,2837	6,1423	0,7523	0,0462	
Evaporation	454,1495	72,8639	445,8706	71,5357	-1,8229	-1,3041	
ET0	1576,6309		1611,1848				
Profile available water	1,1293		1,0550		-6,5771		
Topsoil available water	9,5294		9,2791		-2,6265		

Table 108: Summary of the water balance pre- and post-development at HRU scale (Zimpande Research Collaborative, Hydropedological Assessment, June 2024).

	Before	% of WB	After	% of WB	Change	Weighted Loss	Anticipated PES/EIS Change
Rainfall	623,2841		623,2841				No Change anticipated.
Streamflow	67,3854	10,8113	76,5647	12,2841	13,6220	1,6733	
Surface runoff	64,2743	10,3122	73,4410	11,7829	14,2618	1,6805	
Lateral flow	3,1111	0,4991	3,1237	0,5012	0,4049	0,0020	
Percolation	5,6349	0,9041	5,3896	0,8647	-4,3519	-0,0376	
ET	502,2760	80,5854	477,0062	76,5311	-5,0311	-3,8503	
eCanopy	5,9388	8,8132	6,5827	8,5975	10,8422	0,9322	
Transpiration	35,6774	5,7241	42,8946	6,8820	20,2289	1,3922	
Evaporation	460,6597	73,9085	427,5289	68,5929	-7,1920	-4,9332	
ET0	1576,6309		1576,6309				
Profile available water	1,2272		1,2425		1,2470		
Topsoil available water	9,1629		8,9367		-2,4678		

8.8.3 Assessment of Impacts: Operational Phase

Overall, the hydropedological processes are predicted to remain largely unmodified in the post development scenario, and the functionality of the wetlands identified within the catchment area will likely remain unchanged if stormwater is managed effectively.

8.8.4 Mitigation Measures: Hydropedological Impacts

A scientifically derived buffer was initially developed to ensure that appropriate consideration of the potential impact on the interflow soils (Constantia) associated with the Seep Wetland 1.

The buffer was developed to minimise impact in line with the mitigation hierarchy.

The approach to the development of the scientific buffer considered the following:

- The hydropedologically important soils;
- Anticipated losses of lateral flows based on the SWAT+ Model;
- Edge effect of the proposed development; and
- The catchment area of the impact wetland.

However, given the geometric requirements of the airport and associated runway complex, complete avoidance of Seep Wetland 1, the associated interflow soils and the scientific buffer is not practical. A Freshwater offset is currently being considered to compensate for the loss of wetland habitat and functionality. Offset consideration is being done in consultation with the DWS.

Although the overall hydropedological impacts identified are anticipated to be minimal, mitigation measures and recommendations have been compiled and these include but are not limited to (Zimpande Research Collaborative, Hydropedological Assessment, June 2024):

- All development footprint areas should remain within the demarcated areas as far as possible, and disturbance of soil profiles must be limited to what is essential with a compact footprint;
- Subsurface lateral flow of water through the landscape (under seep wetlands and interflow soils) must be taken into account and buildings/structures should accommodate waterproofing and water management structures to divert laterally seeping water away from foundations into the gardens or storm water structures.
- Increased surface sealing as a result of the proposed development will result in decreased infiltration as bulk of the stormwater from sealed or paved surfaces are generally discharged in stormwater systems. The exception to this is where runoff is localised and directed to unsealed surfaces or adjacent watercourses in an attenuated manner;
- Water from clean water diversion structures should be discharged back into the adjacent wetland features in an attenuated manner; and
- Implementation of strict erosion control measures to limit loss of soil and sedimentation of the watercourse within the proposed development footprint;
- Only the designated access routes are to be used to reduce any unnecessary compaction.

8.9 Potential Terrestrial Ecological Impacts

8.9.1 Introduction, Terms of Reference and Methodology

The objective of the study was the identification of environmental activities, aspects and Fauna and Avifaunal impacts in relation to the proposed project:

- Apply the EIA assessment criteria to all the identified Alternatives. This is supported by the identification of receptors and resources, which allows for an understanding of the impact pathway and an assessment of the sensitivity to change. The significance of the impact is then assessed by rating each variable numerically according to defined criteria.
- Consider the mitigation hierarchy to reduce development impacts and to control negative effects on the environment,
- Recommendations will be developed to address and mitigate impacts associated with the proposed project,
- Advise on environmental management principles to be adopted in the EMPr.

The following issues raised during the pre-application Scoping Phase PPP was considered:

Noise impacts on wildlife in the region; Biohazards such as the introduction of invasive species; Displacement of animals (wildlife and domestic); Traffic-Related Fauna Collisions; Increased stray animals; Disruption of ecosystem balance; Concerns for avian and amphibian species; Reduction in endangered species habitat; Edge effects on adjacent ecosystems; Applicability and feasibility of offsets; Habitat loss and biodiversity loss; The impact of light pollution on fauna and flora; Spread of infectious diseases; Impacts on animal health, behaviour, and productivity.

The following issues raised during the in-process Scoping Phase PPP was considered:

Risk of birds and wildlife strikes; general pollution risks; threats to wildlife habitats; concerns for avian and amphibian species; consideration of endangered species in surrounding area; endangered species habitat reduction; edge effects; traffic related faunal collisions; impact of the development on existing conservation areas; applicability of biodiversity offsets; impact of the airport on local conservation efforts; solar panels potentially attracting birds; risk of bird strikes associated with wind turbines.

Three layout alternatives were considered:

The proposed ‘no-go’ Alternative 1 will not result in any additional impacts to faunal species and habitat identified within the study area, and as such, have not been included in the impact assessment. Due to the similarity in the layout of the preferred Alternative 3 and the Alternative 2 and considering that the layout alternatives will remain within the footprint of the study area, the anticipated impact of both alternatives on faunal species and their respective habitats are considered similar. As such, the Impact Assessment was conducted considering both layout alternatives.

Assumptions and Limitations:

The following assumptions and limitations are applicable to the Faunal and Avifaunal assessment:

- The biodiversity desktop assessment is confined to the study area and does not include detailed results of the adjacent properties, although the sensitivity of surrounding areas has been included on the relevant maps;
- It is important to note that although all data sources used provide useful and often verifiable, high-quality data, the various databases used do not always provide an entirely accurate indication of the actual site characteristics within the study area at the scale required to inform an environmental process. However, this information is useful as background information to the study and, based on the desktop results; sufficient decision making can take place with regards to the proposed development; and
- Field assessments were undertaken during summer from the 14th to the 16th February 2022 and also during winter from the 16th and 17 of August 2022. The field assessments aimed to determine the ecological status of the entire study area and to “ground-truth” the results of the desktop assessment (as presented in Parts B and C).

The following assumptions and limitations are specific to the Faunal Assessment:

- The Faunal Assessment is confined to the study area and does not include the neighbouring and adjacent properties. However, the entire study area was considered for this assessment. The immediate surroundings were also included in the desktop analysis of which the results are presented in Part A: Section 3;
- With ecology being dynamic and complex, some aspects (some of which may be important) may have been overlooked. It is, however, expected that most faunal communities have been accurately assessed and as such the information provided herein is considered sufficient to allow informed decision making to take place and facilitate integrated environmental management;
- Distinguishing habitat units is largely dependent of floral species composition and structure, however, habitats herein were based on perceived faunal usage and structure and are deemed suitable for the purposes of this study;

- Due to the nature and habits of most faunal taxa, it is unlikely that all species would have been observed during a field assessment of limited duration (during the dry season). Therefore, site observations were compared with literature studies where necessary.

The following assumptions and limitations are specific to the Avifaunal report:

- The Avifaunal Verification is confined to the study area and does not include the neighbouring and adjacent properties. During the investigation particular attention was paid to the areas where future developments are being considered. However, the entire study area was considered for this assessment. The immediate surroundings were also included in the desktop analysis of which the results are presented in Part A: Section 3;
- The site investigation was restricted to the proposed study area. No buffers around the proposed study area were investigated on foot but avian habitat adjacent the proposed infrastructure was considered due to avian movement habits;
- With ecology being dynamic and complex, some aspects (some of which may be important) may have been overlooked. It is, however, expected that most avifaunal communities have been accurately assessed and considered;
- Due to the nature and habits of most avifaunal species and their often wide ranging habits or migration patterns, it is unlikely that all species would have been observed during a site assessment of limited duration. Therefore, site observations were compared with literature studies where necessary; and
- The data presented in this report are based on field assessments, undertaken during summer (14th to the 16th of February 2022) and winter (16th and 17 of August 2022).

However, on-site data were significantly augmented with all available desktop data, and the findings of this assessment are considered to be an accurate reflection of the ecological characteristics of the study area.

8.9.2 Assessment of Impacts: Construction Phase

<u>Faunal Impact Assessment:</u>

Listed below are the perceived impacts which faunal species within the study area will be subjected to / threatened by because of the construction of the Cape Winelands Airport:

- Loss of habitat due to vegetation clearance activities;
- Displacement of species from the footprint areas during construction activities;
- Potential increased mortalities due to human – wildlife conflict as well as faunal species collisions with construction vehicles;
- Potential poaching/snaring by staff / construction personnel;
- Loss of habitat connectivity and movement corridors within the landscape;
- Increased noise pollution from machinery during the construction phase; and
- Increased light pollution.

The tables below provide the findings of the impact assessment undertaken with reference to the perceived impacts prior to the implementation of mitigation measures and following the implementation of mitigation measures. The mitigated results of the impact assessment have been calculated on the premise that all mitigation measures as stipulated in this report are adhered to and implemented. Should such actions not be adhered to, post-mitigation impact scores will likely increase.

The impact assessment has been divided between impacts on 1) faunal habitat and diversity

(both direct and indirect impacts considered), and 2) faunal SCC and their associated habitat.

Table 109: Construction Phase impacts on faunal habitat, diversity, and SCC from the proposed development.

Habitat Unit / Aspect	UNMITIGATED						Significance	MITIGATED					Significance
	Impact Negative (-) / Positive (+)	Extent	Magnitude	Duration	Probability	Confidence		Extent	Magnitude	Duration	Probability	Confidence	
IMPACT ON FAUNAL HABITAT AND DIVERSITY													
Renosterveld Habitat	-	Local	Medium	Short Term	Definite	Certain	**Medium**	Site Specific	Medium	Short Term	Definite	Certain	**Low**
Freshwater Habitat	-	Local	Medium	Short Term	Definite	Certain	**Medium**	Site Specific	Medium	Short Term	Definite	Certain	**Low**
Modified Habitat	-	Local	Medium	Short Term	Definite	Certain	**Medium**	Site Specific	Medium	Short Term	Definite	Certain	**Low**
Artificial Impoundments	-	Site Specific	Medium	Short Term	Definite	Certain	**Low**	Site Specific	Medium	Short Term	Definite	Certain	**Low**
Agricultural Drains	-	Site Specific	Low	Short Term	Definite	Certain	**Very Low**	Site Specific	Low	Short Term	Definite	Certain	**Very Low**
IMPACT ON FAUNAL SCC AND THEIR HABITAT													
Renosterveld Habitat	-	Site Specific	Medium	Short Term	Definite	Certain	**Low**	Site Specific	Low	Short Term	Definite	Certain	**Very Low**
Freshwater Habitat	-	Site Specific	Low	Short Term	Definite	Certain	**Very Low**	Site Specific	Low	Short Term	Definite	Certain	**Very Low**
Modified Habitat	-	Site Specific	Medium	Short Term	Definite	Certain	**Low**	Site Specific	Low	Short Term	Definite	Certain	**Very Low**
Artificial Impoundments	-	Site Specific	Low	Short Term	Definite	Certain	**Very Low**	Site Specific	Low	Short Term	Definite	Certain	**Very Low**
Agricultural Drains	-	Site Specific	Low	Short Term	Definite	Certain	**Very Low**	Site Specific	Low	Short Term	Definite	Certain	**Very Low**

Avifaunal Impact Assessment:

There are several key ecological impacts on avifaunal assemblages within the study area that may potentially occur in relation to the proposed project components, specifically:

- Direct loss of avifaunal habitat;
- Decreased avifaunal abundances and species richness;
- Increased anthropogenic movement;
- Potential for bird strikes;
- Altered avifaunal movement patterns;
- Loss of avifaunal SCC habitat and possible SCC occurrence both within the study area and in the surrounding habitats;
- Altered biotic integrity and disturbance to ecosystem function; and
- Altered water quality.

The tables below provide the findings of the impact assessment undertaken with reference to the perceived impacts prior to the implementation of mitigation measures and following the implementation of mitigation measures. The mitigated results of the impact assessment have been calculated on the premise that all mitigation measures as stipulated in this report are adhered to and implemented. Should such actions not be adhered to, post-mitigation impact scores will likely increase.

The impact assessment has been divided between impacts on 1) avifaunal habitat and diversity (both direct and indirect impacts considered), and 2) avifaunal SCC and their associated habitat.

Table 110: Construction Phase impacts on avifaunal habitat, diversity, and SCC from the proposed development.

Habitat Unit / Aspect	UNMITIGATED						Significance	MITIGATED					Significance
	Impact Negative (-) / Positive (+)	Extent	Magnitude	Duration	Probability	Confidence		Extent	Magnitude	Duration	Probability	Confidence	
IMPACT ON AVIFAUNAL HABITAT AND DIVERSITY													
Renosterveld Habitat	-	Local	Medium	Short Term	Definite	Certain	**Medium**	Site Specific	Medium	Short Term	Definite	Certain	**Low**
Freshwater Habitat	-	Local	Medium	Short Term	Definite	Certain	**Medium**	Site Specific	Medium	Short Term	Definite	Certain	**Low**
Modified Habitat	-	Local	Medium	Short Term	Definite	Certain	**Medium**	Site Specific	Medium	Short Term	Definite	Certain	**Low**
Artificial Impoundments	-	Local	Medium	Short Term	Definite	Certain	**Medium**	Site Specific	Medium	Short Term	Definite	Certain	**Low**
Agricultural Drains	-	Site Specific	Low	Short Term	Definite	Certain	**Very Low**	Site Specific	Low	Short Term	Definite	Certain	**Very Low**
IMPACT ON AVIFAUNAL SCC AND THEIR HABITAT													
Renosterveld Habitat	-	Local	Medium	Short Term	Definite	Certain	**Medium**	Site Specific	Low	Short Term	Definite	Certain	**Very Low**
Freshwater Habitat	-	Local	Medium	Short Term	Definite	Certain	**Medium**	Site Specific	Low	Short Term	Definite	Certain	**Very Low**
Modified Habitat	-	Regional	Medium	Short Term	Definite	Certain	**Medium**	Local	Medium	Short Term	Definite	Certain	**Medium**
Artificial Impoundments	-	Local	Medium	Short Term	Definite	Certain	**Medium**	Site Specific	Low	Short Term	Definite	Certain	**Very Low**
Agricultural Drains	-	Site Specific	Low	Short Term	Definite	Certain	**Very Low**	Site Specific	Low	Short Term	Definite	Certain	**Very Low**

8.9.3 Assessment of Impacts: Operational Phase

Faunal Impact Assessment:

- Potential increased mortalities due to human – wildlife conflict as well as faunal species collisions with operational vehicles;
- Increased noise pollution from aircraft during the operational phase; and
- Increased light pollution, notably during the operational phase of the airport.

Avifaunal Impact Assessment:

- Increased anthropogenic movement;
- Potential for bird strikes;
- Altered avifaunal movement patterns;
- Loss of avifaunal SCC habitat and possible SCC occurrence both within the study area and in the surrounding habitats;
- Altered biotic integrity and disturbance to ecosystem function; and
- Altered water quality.

Table 111: Operational Phase impacts on faunal habitat, diversity, and SCC from the proposed development.

Habitat Unit / Aspect	UNMITIGATED						Significance	MITIGATED					Significance
	Impact Negative (-) / Positive (+)	Extent	Magnitude	Duration	Probability	Confidence		Extent	Magnitude	Duration	Probability	Confidence	
IMPACT ON FAUNAL HABITAT AND DIVERSITY													
Renosterveld Habitat	-	Site Specific	Low	Long Term	Definite	Certain	**Low**	Site Specific	Very Low	Long Term	Definite	Certain	**Very Low**
Freshwater Habitat	-	Site Specific	Low	Long Term	Definite	Certain	**Low**	Site Specific	Very Low	Long Term	Definite	Certain	**Very Low**
Modified Habitat	-	Site Specific	Low	Long Term	Definite	Certain	**Low**	Site Specific	Very Low	Long Term	Definite	Certain	**Very Low**
Artificial Impoundments	-	Site Specific	Low	Long Term	Definite	Certain	**Low**	Site Specific	Very Low	Long Term	Definite	Certain	**Very Low**
Agricultural Drains	-	Site Specific	Low	Long Term	Definite	Certain	**Low**	Site Specific	Very Low	Long Term	Definite	Certain	**Very Low**
Noise Impacts	-	Local	Medium	Long Term	Definite	Certain	**Medium**	Local	Medium	Long Term	Definite	Certain	**Medium**
IMPACT ON FAUNAL SCC AND THEIR HABITAT													
Renosterveld Habitat	-	Site Specific	Low	Long Term	Definite	Certain	**Low**	Site Specific	Very Low	Long Term	Definite	Certain	**Very Low**
Freshwater Habitat	-	Site Specific	Low	Long Term	Definite	Certain	**Low**	Site Specific	Very Low	Long Term	Definite	Certain	**Very Low**
Modified Habitat	-	Site Specific	Low	Long Term	Definite	Certain	**Low**	Site Specific	Very Low	Long Term	Definite	Certain	**Very Low**

Artificial Impoundments	-	Site Specific	Low	Long Term	Definite	Certain	**Low**	Site Specific	Very Low	Long Term	Definite	Certain	**Very Low**
Agricultural Drains	-	Site Specific	Low	Long Term	Definite	Certain	**Low**	Site Specific	Very Low	Long Term	Definite	Certain	**Very Low**
Noise Impacts	-	Local	Medium	Long Term	Definite	Certain	**Medium**	Local	Medium	Long Term	Definite	Certain	**Medium**

8.9.4 The No- Go Alternative

The proposed ‘no-go’ Alternative 1 will not result in any additional impacts to faunal species and habitat identified within the study area, and as such, have not been included in the impact assessment.

8.9.5 Assessment of Impacts: Residual and Cumulative Impacts

Residual Impacts

- Even with extensive mitigation, residual impacts on the receiving faunal ecological environment are likely. The following points highlight the key residual impacts that have been identified. It should be noted, however, that some of these impacts are, to a degree, already present as a result of the current farming activities.
- Continued degradation of natural habitat adjacent to the airport structures as a result of edge effects and operational requirements (cutting back of vegetation adjacent to runways etc);
- Altered faunal species habitat, diversity, movement patterns and breeding opportunities;
- Potential decrease of faunal abundance in the local area;
- Further habitat fragmentation/degradation as a result of AIP proliferation in the adjacent and undeveloped areas;
- Disturbed areas are highly unlikely to be rehabilitated to baseline levels of ecological functioning and loss of faunal habitat and species diversity may be long term; and
- Permanent loss of potential habitat for faunal SCC in the study area.

Cumulative Impacts:

The study area is located within a region which has already been subjected to extensive land transformation and habitat degradation, stemming from agricultural activities, urban/peri-urban development as well as extensive alien plant proliferation. Such activities have already resulted in a notable cumulative loss of habitat within the region. The proposed development will however likely add to long term cumulative impacts, as once developed, rehabilitation/restoration of habitats (should the airport ever close) is unlikely. The increased traffic, notably air traffic will however add to the cumulative noise impacts for the region and may result in further displacement of noise sensitive species.

8.9.6 Mitigation Measures: Potential Terrestrial Ecological Impacts

Mitigation Measures for Impacts on Faunal Species during Construction Phase:

- The development footprint should be demarcated, and it should be ensured that no development related activities take place outside of the demarcated footprint;
- Faunal habitat beyond the demarcated area should not be cleared or altered, except as needed for safety reasons around taxiways and runways as per the Bird and Wildlife Hazard Management Plan for the airport;
- Site clearance activities should take place in a phase manner, starting from the south moving northwards, or centrally moving outwards, so that faunal species can flee ahead of clearance activities into adjacent habitat and not get trapped in centralised, remnant patches;
- Construction personnel are to be educated about the various faunal species in the area, particularly about venomous spiders, snakes and scorpions. None of these or other species are to be killed or injured by construction personnel. Should any of these species be encountered, these species are to be safely and carefully relocated to the surrounding natural habitat adjacent the development site, should they not move off on their own;
- The contact details of a suitably qualified snake handler be made available to construction teams should a venomous snake be encountered that needs removal. Alternatively, it is recommended that a member of the construction team be trained to handle and remove snakes through a recognised snake handling course;
- Sound environmental management practices should be adhered to at all times;
- Alien plant species should be suitably managed and no further spread of alien plants should be allowed;
- No illicit fires must be allowed during the construction phase;
- External lighting should be kept to a minimum with downward and inward facing lights being used. Yellow or red fluorescent lights are preferable, while the use of bright white or LED lights should be avoided. Lighting used must be kept to minimum, but in allowance with the required health and safety requirement for nighttime operations;
- Noise must be kept to acceptable levels as per the environmental norms and standards for noise mitigation as stipulated within the noise specialist report;
- No hunting, trapping or collecting of faunal species is to be allowed, other than for rescue and relocation purposes. Setting of snares by personnel is to be prohibited; and

- Suitable measures must be put in place to ensure that no sediment runoff from cleared areas enters any downstream/downslope habitat units which may lead to altered habitat conditions.

Mitigation Measures for Impacts on Faunal Species during Operational Phase:

- No further development related activities are to take place outside of the demarcated footprint unless duly authorised by the competent authority;
- Faunal habitat beyond the demarcated area should not be cleared or altered, except as needed for safety reasons around taxiways and runways as per the Bird and Wildlife Hazard Management Plan for the airport;
- Operational personnel are to be educated about the various faunal species in the area, particularly about venomous spiders, snakes and scorpions. None of these or other species are to be killed or injured by personnel. Should any of these species be encountered, these species are to be safely and carefully relocated to the surrounding natural habitat adjacent the development site, should they not move off on their own;
- The contact details of a suitably qualified snake handler be made available to construction teams should a venomous snake be encountered that needs removal. Alternatively, it is recommended that a member of the operational team be trained to handle and remove snakes through a recognised snake handling course;
- Sound environmental management practices should be adhered to at all times;
- Alien plant species should be suitably managed and no further spread of alien plants should be allowed;
- No illicit fires are to be allowed during the construction phase;
- Whilst it is accepted that there will likely be significant external lighting during the operational phase, it is still recommended that the amount of light be minimised as far as possible (notably outward shining/emitted light), and that downward and inward facing lights be used wherever possible, but within legislated operational health and safety guidelines/requirements. Yellow or red fluorescent lights are preferable for building and perimeter lighting, whilst the use of bright white or LED lights should only be used as and where necessary for apron lighting (or as required by operational health and safety for airport operations). Lighting used must be kept to minimum, but in allowance with the required health and safety requirement for airport operations;
- Noise levels must be suitably managed in line with the norms and standards for airports operations. It is however acknowledged that the larger aircraft will generate noise levels beyond the recommended health and safety guidelines, and that these unfortunately cannot, at this point in time, be reduced due to the nature of turbine jet engines;
- Stormwater is to be suitably controlled and discharge points monitored for erosion; and
- No hunting, trapping, or setting of snares by personnel is to be allowed. Suitable fines/disciplinary actions for such must be made known and implemented.

Mitigation Measures for Impacts on Avifaunal Species during Construction Phase:

- The development footprint should be demarcated, and it should be ensured that no development related activities take place outside of the demarcated footprint;
- Avifaunal habitat beyond the demarcated area should not be cleared or altered, except as needed for safety reasons around taxiways and runways;
- Site clearance activities should take place in a phase manner, starting from the south moving northwards, or centrally moving outwards, so that avifaunal species can flee ahead of clearance activities into adjacent habitat and not get trapped in centralised, remnant patches;
- Sound environmental management practices should be adhered to at all times;
- Alien plant species should be suitably managed and no further spread of alien plants should be allowed;
- No illicit fires must be allowed during the construction phase;
- Stormwater/attenuation pond surfaces should be closed off to prevent avifauna from congregating to these areas, notably waterfowl and larger bird species which pose a risk to aircraft;
- As far as possible, vegetation clearance should take place during the winter months, outside of the breeding/nesting periods of avifaunal species;
- Noise must be kept to acceptable levels as per the environmental norms and standards for noise mitigation as stipulated within the noise specialist report; and
- No hunting, trapping or collecting of avifaunal species is to be allowed. Setting of snares by personnel for ground dwelling birds is to be prohibited.

Mitigation Measures for Impacts on Avifaunal Species during Operational Phase:

- No further development related activities are to take place outside of the demarcated footprint unless duly authorised by the competent authority;
- Avifaunal habitat beyond the demarcated area should not be cleared or altered, except as needed for safety reasons around taxiways and runways and as per the Bird and Wildlife Hazard Management Plan for the airport;
- Sound environmental management practices should be adhered to at all times;
- Stormwater /attenuation ponds must be monitored and covers/screens of these features repaired if damaged. If leaks appear or ponding at the outlets is evident, this must be rectified to avoid attracting waterfowl or larger avifauna such as herons etc which pose a risk to aircraft
- Noise levels must be suitably managed in line with the norms and standards for airports operations. It is however acknowledged that the larger aircraft will generate noise levels beyond the recommended health and safety guidelines, and that these unfortunately cannot, at this point in time, be reduced due to the nature of turbine jet engines;
- Reactive control measures should be investigated and where needed implemented to manage birds and other wildlife at the airport. Such includes dispersal measures (sirens, lasers, pyrotechnics, and Border Collies) and removal measures (live capture, nest removal etc) as and where feasible/needed; and
- Buildings, structures and landscaped gardens may provide artificial nesting/habitat for avifaunal species and increases their potential activity around the airport. Methods to reduce available shelter include: 1) Exclusion measures such as spikes, netting, panelling on ledges

and holes around buildings to assist in prevention of birds taking residence, 2) Nest removal and 3) Cutting / mowing of vegetation where needed (this may however attract a different assemblage of avifauna which selects for such areas). As such, vegetation clearance should be done in line with the recommendations as per the Bird and Wildlife Hazard Management Plan for the airport.

8.9.7 Monitoring Requirements: Potential Terrestrial Ecological Impacts

Operational Phase Faunal monitoring:

- Stormwater is to be suitably controlled, and discharge points monitored for erosion.

Operational Phase Avifaunal monitoring:

- Stormwater /attenuation ponds must be monitored and covers/screens of these features repaired if damaged.

8.10 Potential Socio-economic Impacts

8.10.1 Introduction, Terms of Reference and Methodology

The Socio-Economic Impact Assessment includes the following:

- Description and understanding of the nature and scope of the proposed project, location, layout, etc.;
- An overview of the economic development patterns in the City of Cape Town Metropolitan Area;
- A socio-demographic and -economic profile of the population (and communities) residing within specified concentric zones from the site;
- Place the envisaged project in the context of spatial planning regulations and other guideline documents and assess the fit from an economic perspective;
- Identify possible social and economic impacts / consequences / implications associated with the proposed development;
- Ascertain the overall monetary benefits, i.e. Gross Value Added (GVA) and job creation potential on the Western Cape Province economy during the construction and operational phases; and
- Proposals for a framework for monitoring and evaluation of the socio-economic impacts.

The approach for assessing the socio-economic impacts of the proposed development is based on evaluating a project's financial feasibility and long-term viability, as long-term positive economic impacts can only flow from a financially sustainable or viable project. It must also fit and demonstrate compatibility with economic and integrated planning for the area, which also covers spatial planning. These hurdles are a critical aspect of economic desirability, which ensures that the proposed development complements economic planning as reflected in spatial development planning and the local economic development plans and strategies for the area.

It is important to illustrate whether the project fits with planning frameworks and is desirable from a societal cost-benefit perspective (concerning the assessment of social impacts). The Need and Desirability Guidelines (Republic of South Africa, 2014) also apply to the economic and social justification for the development proposed in the particular location. In addition, adherence to Appendix 6 of the NEMA Regulations and alignment with existing guidelines are essential (Annexure B). Given the nature of the proposed activities and the importance of the project for direct investment in the Cape Town Metropolitan Area (CMA), monitoring and evaluation throughout construction and operations are essential. Both the envisaged positive and potential negative impacts need to be monitored through an inclusive and credible process, with a broad framework outlined in the report.

The analysis of primary inputs includes information collected from interviews with key stakeholders and/or representatives of stakeholder groups that are affected directly or indirectly by the proposed development. Secondary sources (including reports and publications) are consulted to inform the independent socio-economic assessment and complement the primary research. The approach to addressing comments from stakeholder groups and Interest and Affected Parties (I&APs) is to include relevant inputs from the environmental process and assess the inputs from a socio-economic perspective. Where applicable, I&APs will be identified for further consultation to obtain additional information for inclusion. These parties may include, but are not limited to, the local authority, landowners, surrounding landowners, local business associations (where applicable), e community leaders and representatives, interest groups, etc. The study area for the socio-economic impact assessment is defined as concentric zones that include all sub-places (communities) within 10km and 20km from the development site.

Assumptions and Limitations:

The following assumptions were used for calculations related to employment and economic income during construction:

- The structure and composition of the Western Cape economy will remain unchanged. This is necessary to enable the use of multiplier analyses.
- No significant political or other administrative changes will take place on a national or provincial level.
- An initial construction period of 4 years and additional construction during operations were used to assess employment during construction.
- Only total labour demand is considered; no race, gender or skill level is considered; and
- An assumed import leakage of 20% for construction.

Several limitations were identified during the study:

- Due to the reclassification of employment categories in the 2011 Census, no comparative assessment is possible with the 2001 Census.
- Comparing the population figures for the 2001 and 2011 Census is impossible as different categories were considered for various demographic items in the 2011 Census.
- The data provided in reports prepared by Statistics SA and the data extracted from a detailed assessment of enumeration areas and sub-places do not correspond or are missing.
- Although the 2022 Census high-level results have been released, many issues have arisen which doubt the credibility and validity of the 2022 Census. The large undercount of 30%, way above any acceptable norm, does not provide any confidence in the results and much criticism has been levelled at the methodology and other matters. We used the outdated 2011 Census, in the absence of any credible information to provide some demographic and socio-economic context, but this is not plausible.
- Given the lack of detailed information on the potential revenue of the proposed development, it is impossible to quantify the potential contribution toward the local economy once all the envisaged components are complete and operating.

8.10.2 Assessment of Impacts: Construction Phase

The negative qualitative impacts during construction mostly relate to large construction vehicles on access roads, noise and dust, an influx of job seekers, crime, and 'incoming' construction workers that may impact local communities. Potential positive impacts include temporary employment opportunities and a contribution towards the local economy, with specific reference to the construction, retail, and services sectors and industries. Note that the impacts are based on an initial construction period of 4 years for Phase 1, although there will be additional construction in Phase 2 (no clear timeframes).

- Vehicular traffic due to construction activities - The movement of large construction vehicles will affect traffic flows and residents along the access routes.

The Transport Impact Assessment concluded that the impact would be low negative compared to other future developments in the area, which could contribute to a medium negative cumulative impact.

- Nuisance factors (dust and noise) - Construction activities will create dust and noise at the development site that could affect nearby receptors.

The Noise Impact Assessment concluded that the significance of the unmitigated impact is anticipated to be VERY LOW. For a short duration, when the working face is closest to the Fisantekraal community towards the site's western boundary, this impact may be LOW. With mitigation measures, the noise impact during construction is anticipated to be insignificant. The Air Quality Impact Assessment (DDA Environmental Engineers, 2024a) concluded that the expected impact of the vehicle and equipment exhaust emissions is considered to be insignificant. The total dust deposition beyond a 200 m zone from the site is expected to be well below the DEA guideline of $600mg/m^2/day$ for residential areas, resulting in an insignificant impact after mitigation. Based on these reports, the residual impact related to nuisance factors will be very low negative for Alternative 1, and low negative for Alternatives 2 and 3. Nearby developments could contribute to a medium negative cumulative impact for Alternatives 2 and 3.

- Influx of job seekers - An influx of job seekers will lead to competition with local residents for employment opportunities.

The residual impact will be very low negative for Alternative 1, and low negative for Alternatives 2 and 3. Nearby developments could contribute to a medium negative cumulative impact for Alternatives 2 and 3.

- Impact of construction workers on local communities - Incoming construction workers can disrupt family structures and social networks in local communities.

The residual impact will be very low negative for Alternative 1, and low negative for Alternatives 2 and 3. Nearby developments could contribute to a medium negative cumulative impact for Alternatives 2 and 3.

- Increase in local crime - The presence of construction activities and workers may increase criminal activities in the surrounding area.

The residual impact on local crime will be very low negative for Alternative 1, and low negative for Alternatives 2 and 3. Nearby developments could contribute to a medium negative cumulative impact for Alternatives 2 and 3.

8.10.3 Assessment of Impacts: Operational Phase

The most significant concerns for the operational phase relate to the sense of place, traffic, noise, and air pollution, the risk of crime and informal settlements, and the impact on surrounding communities, business operations, and land values.

- Increased vehicular traffic - The transport, commercial and service activities will increase vehicular movement along the access routes.

The Transport Impact Assessment concluded that the impact of the CWA will be low negative for Phase 1; an updated TIA would be required for the future phases

- Sense of place - The proposed development will impact the sense of place for surrounding land users.

The Visual Impact Assessment concluded that the proposed CWA development (Alternative 3) would have a moderate negative visual impact after mitigation for lights and a low negative for site-specific visual impacts and scenic routes and cultural landscapes. The Air Quality Impact Assessment found that the overall impact with mitigation for Scenario 3 would be expected to be slightly lower than the unmitigated one, but the overall significance rating would not change. The Assessment also recommended that a continuous air quality monitoring station is established at the northern CWA site boundary to monitor SO2, NOx, PM10 and benzene, with biannual reporting to the authorities.

Together with other specialist reports, the residual impact on the sense of place is believed to be very low negative for Alternative 1 and medium negative for Alternatives 2 and 3. Together with the Greenville Garden City and Bella Riva developments, the CWA expansion would contribute to a high negative cumulative impact on the sense of place.

- Increase in local crime - The presence of transport and commercial activities may contribute to an increase in local crime.

The residual impact will be very low negative for Alternative 1, and low negative for Alternatives 2 and 3. The site is far from the CTIA, but nearby developments (particularly Greenville Garden City and Bella Riva) could contribute to a medium negative cumulative impact for Alternatives 2 and 3.

- Risk of informal settlements - Large developments may attract jobseekers who settle on nearby vacant land in anticipation of employment.

The residual impact will be very low negative for Alternative 1, and low negative for Alternatives 2 and 3. Nearby developments (particularly Greenville Garden City and Bella Riva) could contribute to a medium negative cumulative impact for Alternatives 2 and 3.

- Impact on nearby farming and business operations - A large airport may impact current and future farming and business operations in the area.

The residual impact will be very low negative for Alternative 1, and low negative for Alternatives 2 and 3. Nearby developments could contribute to a medium negative cumulative impact for Alternatives 2 and 3.

- Impact on surrounding property values (residential) - A new development may affect the current and future perceived value of properties in the surrounding area.

The impact is unavoidable but can be partially managed if visual, noise and traffic concerns are effectively mitigated. For residential properties, the residual impact will be very low negative for Alternative 1, and low negative for Alternatives 2 and 3.

- Bulk infrastructure requirements - Bulk infrastructure services are to be supplied by the Developer but require sufficient local capacity.

The engineering reports indicate that potable water, sewage and electricity services are available in the area, and that there is sufficient capacity to accommodate the proposed CWA development if the Developer provides the necessary infrastructure and network connections. The residual impact will be very low negative for Alternative 1, and low negative for Alternatives 2 and 3. The site is far from the CTIA, but nearby developments (particularly Greenville Garden City and Bella Riva) could contribute to a medium negative cumulative impact.

8.10.4 The No- Go Alternative

The Runway Alternatives Report (Cape Winelands Aero, 2023) concluded that the No-Go (Alternative 1) does not allow CWA to meet its strategic and business objectives, nor the opportunity to offer a tremendous value proposition to the region, stakeholders, customers and nearby communities.

Impacts associated with Alternative 1 are discussed under sections 8.8.2.and 8.8.3.

8.10.5 Assessment of Impacts: Cumulative Impacts

Cumulative impacts refer to any other developments as well as existing activities within the immediate area that could compound any positive or negative impacts associated with the proposed development. This usually refers to similar developments, such as the proposed upgrades at CTIA, which is too far away to have a cumulative impact, except for the provision of transport infrastructure. However, several other nearby developments are in the planning or construction stages, such as Graanendal, Greenville Garden City, Buh-Rein Estate and Darwin Road, that could have a cumulative impact. The potential negative impacts would be compounded if additional sense of place, traffic, infrastructure requirements, crime and nuisance factors. Similarly, other developments in the Fisantekraal area could compound employment and economic income benefits.

- Ongoing and approved developments in the area will increase the number of construction vehicles along the access routes, in particular Bella Riva.
- Additional construction activities in the immediate area (particularly Garden City and Bella Riva) will compound the nuisance factors if they coincide or overlap with construction at the CWA site
- Given the high unemployment levels in the nearby communities, construction projects in the area will attract job seekers. More casual workers will be attracted to the area if multiple developments' construction phases overlap.
- If the construction phase of the CWA expansion overlaps with other developments, a large number of construction workers may interact with the local communities.
- Given the high unemployment rate in the Fisantekraal area, construction activities are likely to attract criminals in search of easy targets. Each additional development project will contribute to the risk of criminal activities, but effective security measures should confine these problems to site-specific events with less cumulative impact.

- Similar projects in the Cape Metropole area would act synergistically to create more demand for supplies and services, which, due to the multiplier effect, would act as a catalyst for further economic growth and employment.
- Similar projects (in particular, the proposed improvements at CTIA) would create more supply in the transport sector and demand for associated supplies and services in the CMA.
- Further development and densification along the Darwin corridor are already underway and will generate significant additional traffic on the access routes.
- Together with the proposed expansion at CTIA, more aircraft will pass over the Northern District residential areas, impacting their sense of place.
- Other industrial or residential developments nearby could have a cumulative impact in attracting criminals in search of easy targets
- Other industrial or residential developments in the area could have a cumulative impact in attracting jobseekers that erect informal structures due to a lack of nearby housing.
- Other industrial developments in the immediate area could compound any negative impacts on surrounding land users.
- On the other hand, several large-scale developments in the area could increase the perceived value of undeveloped properties within the urban edge, particularly those that could form part of a future airport precinct.
- Other developments near the CWA will increase the local demand for bulk services
- The CTIA expansion may act synergistically to create more demand for airport-related supplies and services and stimulate further economic growth in the CMA. However, it is more likely that existing and new businesses closer to CWA will have a cumulative impact in creating new opportunities in the goods and services industries within the Northern District.
- Other development projects in the CMA could act synergistically to create more demand for supplies and services and thus catalyse further economic growth in the area.
- Other development projects would further enhance the rate base of the City of Cape Town.

8.10.6 Mitigation Measures: Potential Socio-Economic Impacts

<u>Pre-construction Phase:</u>

Procurement Strategy that includes the following and applies to the project:

- Initiate the activity during the first phase of the development;
- The strategy is the responsibility of the contractor(s) collectively under the guidance of the Municipality;
- Focus on opportunities for local labour in the surrounding areas and businesses as a priority. Contractors are required to indicate the geographical location of sub-contractors (businesses) and local labour; and
- Local contractors invited to tender for work in the context of the terms and conditions included in RFP documentation, which would include skills development, on-site training, gender equality, etc.

Pre-construction & Construction Phase

Communication Protocols that address directly and indirectly affected residents and surrounding landowners, with specific reference to activities, timelines and intended impacts related to the construction phase and all related activities associated with the implementation of the project (i.e. during the operational phase).

- Objectives

- To orientate, generate awareness and gain positive attitudes among stakeholders as far as possible; and

- To engage and inform stakeholders of progress regarding all phases of construction.

- Target audience

- Property owners and users of the land portions directly surrounding the proposed activity; and

- Other stakeholders and property owners that may be affected.

- Major types of messages

- Inform directly affected residents on the periphery of the development site and others that would frequent the area;

- The commencement date for construction activities related to the project;

- Duration and extent of the construction activities and details of individual construction activities;

- Progress updates, including any delays in a construction-related activity; and

- Introduce appropriate signage to warn persons frequenting the area and those residing adjacent to the development area.

Construction phase:

- Nuisance factors (dust and noise) - Dust and noise emissions during the construction period should be minimised through a Construction Environmental Management Plan (CEMP).
- Influx of job seekers, impact on local communities - Contractors need to employ people from the immediate area whenever possible
- Increase in local crime -Co-operation between the Developer and contractors is essential to ensure that the area around the proposed development remains secured during construction. On-site security measures, such as perimeter fencing, controlled access and security guards and patrols will minimise the risk.

Operational phase:

- Sense of place, residential property values - Implement recommendations by relevant specialists to mitigate negative impacts related to visual, traffic, noise, air pollution.
- Local crime - Co-operation between Developers and contractors and on-site security measures.

- Informal settlements - Formal housing could address the area's housing needs, eliminating the need for informal structures. Private landowners should ensure that unauthorised land settlements are dealt with by the authorities.
- Nearby farming and business operations - Refer to mitigating measures relevant specialists proposed (in particular agro-ecosystem, noise and air pollution).

8.10.7 Monitoring Requirements: Potential Socio-Economic Impacts

An essential component of determining the success of a project from a socio-economic perspective entails monitoring, reviewing and evaluating processes to assess the adherence to socio-economic obligations. Continuous and periodic monitoring and evaluation are required to ensure the achievement of milestones and the overall success of achieving the socio-economic objectives envisaged for the Project. The following activities are geared towards achieving acceptable and ongoing monitoring standards:

1. Regular field visits to the project and stakeholders benefiting from the project

2. A review after the first six months after implementation to assess the overall progress and achievement of the objectives and milestones related to the specified targets of employment, skills development, small business development and capacity building.

In order to monitor the performance related to the achievement of the socio-economic development obligations, the contractor should record and report progress with agreed socio-economic obligations. Typical reporting information should include:

- Actual total expenditure on Total Procurement;
- Actual total expenditure on Procurement of Materials;
- Actual total expenditure on Sub-contracting;
- Actual total employment categorised according to standard Occupational Categories; and
- Actual total payroll

The successful implementation and development of the proposed project will ultimately be assessed on the contribution the project makes during construction and operations to the social development and economic goals of employment creation, skills development and training, small business development and capacity building in the area. The following Key Performance Areas (KPAs) are outcomes based on the scope of social engagement activities:

- Procurement from, or sub-contracting to local enterprises;
- Procurement from, or sub-contracting to enterprises from outside the local area;
- Procurement of local materials / resources;
- Procurement of materials from outside the CMA;
- Recruitment process that promotes gender equality

8.11 Potential Heritage Impacts (Cultural, Archaeological and Visual)

The objective is to assess the possible impacts associated with the proposed development on heritage resources. It includes submission of a NID to HWC and incorporates findings from the Visual Assessment and the Archaeological Assessment. The Heritage Impact Assessment incorporates information on historical development, identified heritage resources within the study area and assess possible impacts associated with the proposed development within this context:

- The identification and mapping of all heritage resources in the study area,
- An assessment of the significance of such resources in terms of the heritage assessment criteria set out in regulations,
- An assessment of the impact of the development on such heritage resources,
- An evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development.

The following issues raised during the pre-application Scoping Phase PPP has been considered:

Need for a heritage impact assessment; Impacts on the cultural landscape; Disruption of the scenic beauty of the area; Tourism appeal of the broader area, Potential impact on nearby heritage resources including heritage value of surrounding farms; Heritage significance of the existing airport; Development pressure on the surrounding landscape.

The Visual assessment includes the potential impacts on scenic routes, other protected resources, and local receptors, with specific reference to visual impact on the cultural landscape. The Visual Impact Assessment is aided by 3D terrain modelling and graphic simulations of the proposed development, as necessary. Key visual concerns to be addressed in the VIA include:

a) Effect on Protected landscapes and scenic resources, with specific reference to:

- Effect on the visual amenity of Scenic routes,
- Effect on the landscape character and sense of place of the surrounding Cultural Landscapes.

b) Effect on sensitive receptors with specific reference to:

- Sensitive receptors viewing the proposed development from within the surrounding Cultural Landscapes,
- Sensitive receptors travelling on Scenic routes,
- Sensitive receptors viewing the proposed development from within areas around the subject site that are expected to experience Moderate and High Visual Exposure.

The following issues raised during the pre-application Scoping Phase PPP have been considered:

Visual and Aesthetic Impacts in the rural/scenic landscape.

The Archaeological Scoping report made the following recommendations:

1. No archaeological mitigation is needed prior to construction excavations commencing.

2. No further archaeological mitigation is required

8.11.1 Archaeological Assessment

The Archaeological Scoping report found the project does not pose a significant threat to local **archaeological heritage resources** and that the proposed development area is not a sensitive or threatened archaeological landscape. It is estimated that the properties that have been acquired have been irrevocably transformed by agricultural activity over the last 300 years and from an archaeological perspective it can be concluded that although isolated MSA and LSA stone tools may be exposed below the topsoils during preparation of the site for development, the significance is likely to be **Low**. No Impact Assessment was undertaken for the proposed project.

8.11.2 Cultural Impact Assessment

8.11.2.1 Introduction, Terms of Reference and Methodology

Cultural significance can be defined as: aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value of significance. The national estate includes, inter alia, places, buildings, and structures of cultural significance; historical settlements and townscapes; and landscapes and natural features of cultural significance (NHRA).

8.11.2.2 Assessment of Impacts

None of the farmsteads in the study area appears to be of aesthetic, historical or architectural significance although they contain structures older than 60 years. The only listed farmstead of significance in the area is Groot Phesantekraal which lies well to the West of the study area. It is possible that the poor soils here could only support cereal crops and the rearing of livestock unlike the richer soils closer to Durbanville that could support grapes and wine making as at Diemersdal, Meerendal and Altydgedacht for example. Although two of the structures in the study area are older than 60 years neither of them is of aesthetic significance nor conservation worthy.

The NHRA specifically refers to social and economic development. In addition, Section 38(3)(d) of the NHRA requires that the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development should be evaluated.

Capital investment in the airport expansion is estimated to be of the order of R7Billion. The proposed passenger terminal is designed to accommodate 5.2million passengers per year. The developers have stated that their aim is for the airport to be more than just an aviation hub. It will be used as a driver of regional economic development and local community inclusion.

The proposed CWA It will reduce airline fuel costs and emissions, improve the business case for air travel, and drive economic growth in the region. It will also provide additional capacity, improve redundancy, reduce inefficiencies at Cape Town International Airport, and make air travel more affordable and accessible. Its proximity offers airlines a more viable alternate airport for diversion planning, alleviating the need to carry an excessive amount of fuel for long-haul flights.

By reducing the fuel burden by up to 10,000kg per flight, the airport will reduce fuel consumption and carbon emissions. Independent estimates suggest that the airport will collectively save airlines millions of kilograms of fuel and boost cargo-carrying capabilities, demonstrating its immense potential to promote a more environmentally responsible aviation sector.

The City of Cape Town's rates income will be dramatically increased.

As set out above these extremely sustainable social and economic benefits outweigh the impacts the development on heritage resources.

8.11.3. Visual Impact Assessment

8.11.3.1. Introduction, Terms of Reference and Methodology

The Visual Impact Assessment determines the potential Visual Impacts of the proposed development on the visual and scenic environment. This includes the potential impacts on scenic routes, protected (de jure or de facto) scenic resources, and visual receptors. The VIA makes specific reference to Visual Impact on the Cultural Landscape.

The existing project information, reports and studies comprising the project history were consulted during the Initiation stage, and on an ad-hoc basis as project information was updated. A desktop survey using digital topographical survey maps and available GIS databases was undertaken to describe the site setting, identify landform, landscape, and built form patterns of the Receiving Environment, and to situate the proposed development in the spatial planning policy context of the Receiving Environment. Aerial photography from a variety of sources as well as freely available digital elevation models (Google Earth and the QGIS6) were used to assist in this part of the study. 3D models and fieldwork supported Line of sight (LoS) testing and visibility analysis. Following the desktop study, a site visit was undertaken to confirm land use, assess the landscape character, identify sensitive receptors and conduct fieldwork. This included the capture of site photographs from and toward key views and viewers. Impact assessment is aided by 3D modelling and graphic simulations of the proposed development, as necessary. The VIA report has been drafted to communicate the findings of the desktop study, the site visits and the visual analysis; impact assessment is undertaken using PHS's proprietary impact assessment methodology, as well as Filia Visual's standard VIA methodology.

The basic components comprising an accepted methodology for visual studies includes:

- Identification of landscape types, landscape character and sense of place, generally based on geology, landforms, vegetation cover and land use patterns;
- Identification of viewsheds, and view catchment areas, generally based on topography;
- Identification of important viewpoints and view corridors within the affected environment, including sensitive receptors;
- Indication of distance radii from the proposed project to the various viewpoints and receptors;
- Determination of the visual absorption capacity (VAC) of the landscape, usually based on vegetation cover or urban fabric in the area;
- Determination of the relative visibility, or visual intrusion, of the proposed project.
- Determination of the relative compatibility or conflict of the project with the surroundings;
- A comparison of the existing situation with the probable effect of the proposed project, through visual simulation, generally using photomontages, as necessary.

The suggested Methodology (Oberholzer, 2005) for a Level 4 Assessment is listed below:

- Identification of issues raised in scoping phase, and site visit;
- Description of the Receiving Environment and the proposed project;
- Establishment of view catchment area, view corridors, viewpoints and receptors;
- Indication of potential visual impacts using established criteria;
- Inclusion of potential lighting impacts at night;
- Description of alternatives, mitigation measures and monitoring programmes;
- 3D modelling and simulations, with and without mitigation (to be undertaken during the Impact Assessment stage in Phase 2).

<u>Assumptions and Limitations:</u>

The following assumptions and limitations apply to this report:

- The author assumes that where information is supplied by others, this information is correct and up to date unless otherwise stated by the client, project team or source. No responsibility is accepted by Filia Visual for incomplete or inaccurate data supplied by others;
- Filia Visual's assessment of the significance of impacts of the proposed project on the Receiving Environment has assumed that the activities will be confined to the areas for which impacts have been anticipated;
- Where detailed information is not available, the precautionary principle, i.e., a conservative approach that overstates negative impacts and understates benefits, has been adopted;
- It is assumed that any Public Participation or formal commenting and objections processes undertaken by others has identified and incorporated all relevant concerns and comments of stakeholders;
- Filia Visual assumes that the applicant will in good faith implement the mitigation measures identified in this report and elsewhere. In this regard, it is assumed that the applicant will commit sufficient resources and employ suitably qualified personnel to undertake such mitigation;
- It is assumed that the 3D model is an accurate enough approximation of the proposal's built envelope.
- Viewshed analysis is based on the available Digital Elevation/Surface Model datasets available (SRTMGL1 V003 from NASA Shuttle Radar Topography Mission Global 1 arc second – 30m). It should be noted that viewshed analyses are not absolute indicators of either visibility of the level of significance (magnitude) of the impact in the view, but a statement of the fact of potential visibility. Visual analysis using the available Digital Elevation/Surface Models as a dataset only establish the lines of sight (LoS) between the observer and the proposed development and does not consider trees, buildings and other visual barriers that constitute solid protrusions. Empirical testing to consider the visibility of view-limiting structures within urban space (be it a city or Cultural Landscape), requires either a precise Digital Surface Model (DSM, with raster resolution at most 2 x 2 m (Hlavatá and Oťaheľ 2010])), or on-site LoS testing supported by 3D modeling. LiDAR (Light Detection and Ranging) improves the accuracy of viewsheds and visibility analyses by including these elements, especially for visual studies conducted in urban areas. South Africa does not have LiDAR data available and analysis using LiDAR data could not inform this report. However, the assumption is that the GIS Viewshed and LoS methods of analysis employed in this report will satisfy the requirements of the brief.
- The Coordinate system used is the Pseudo Mercator (EPSG: 3857).

- Additionally, readers should note that the aim of photography and photomontage in visual studies is to represent the Receiving Environment under consideration and the proposed development, both as accurately as is practical. However, two-dimensional photographic images and photomontages alone cannot capture or reflect the complexity underlying the visual experience and should therefore be considered an approximation of the three-dimensional visual experiences that an observer would receive in the field (The Landscape Institute, 2011).
- Please note that simulations and 3D models overlaid on to the site model do not indicate site clearance or removal of vegetation. The impression of visual absorption capacity will therefore be higher than that of the actual development.
- This study assumes that the development proposal will not be amended significantly after the issue of this report, and that any guidelines or recommendations will be interpreted in a way not significantly deviating from the interpretation of this study.
- Finally, when determining the significance of the visual impact of the Proposed development (with mitigation), the assumption is that the mitigation measures proposed will be correctly and effectively implemented and managed throughout the life of the project.
- It is noted that the EIA must address the potential impacts of the runway at maximum operational capacity, i.e., operations and impact beyond the 2050 traffic levels. The author assumes that the same standard will be applied to the development of the Commercial component, to have the maximum development rights approved during the current approvals process.
- The project information notes that Construction will be undertaken as and when capacity is needed/market demands dictate within the 2027 – 2050 time period. While Phase 1 (Planning Activity Level 1, which includes the Civils work and the establishment of the majority of the service infrastructure) is estimated to last approximately 3 years (2029 – 2032), it can only be assumed that the remainder of the Planning Activity Level (PAL) will be interspersed between 2032 and 2050. For the purposes of Impact Assessment, it is therefore assumed that there will be periods of more and less intensive construction activities on site on an ad-hoc basis for a total period of 18 years.

Notwithstanding the above, these assumptions and limitations will not compromise the overall findings of this report.

8.11.3.2. Assessment of Impacts: Potential Visual Impacts for Alternative 2

The impact assessment findings for the Initial Preferred alternative were similar enough to those of the New Preferred Alternative so as not to warrant their inclusion in the Visual Impact Assessment report as a separate set of Impact Assessment Tables.

8.11.3.3. Assessment of Impacts: Potential Visual Impacts for Alternative 3

The Impact Assessment tables show Impact Significance prior to the application of mitigation measures as well as the predicted Impact Significance after the implementation of mitigation measures.

Table 112: Visual Impact Assessment Preferred Alternative 3 (Filia Visual; September 2024)

Visual Impact Assesment for:	*Potential effect and/or intrusion on protected landscapes or scenic resources; and potential effect of change to the visual character of the area: Visibility of sources of light at night (for sensitive receptors) within LCA 4 (within the Durbanville Hills CL and the Koeberg/Swartland Farms CL).*			
Metric	Code	Score	Code	Score
Nature of the impact	Effects of the visibility of point sources of lights at night from the vantage point of sensitive receptors within the surrounding Cultural Landscape: Durbanville Hills & Koeberg/Swartland Farms (up to 10km); the R302 Scenic Route and the Spes Bona Road. Effect of the visibility of lights at night (incl. point sources, as well as skyglow, glare and light trespass) on the visual character and sense of place of the RE at night (within LCA 4) within +-3km (incl. affected portions of the R302 Scenic Route and Spes Bona Road)			
Gegree of Confidence	Unsure (U)		Sure (S) or Certain (C)	
Stage	Construction		Operational	
Extent	L	2	R	3
Duration	L	4	Permanent	5
Intensity (Magnitude)	L	3	L	3
Benign/destructive	Destructive		Destructive	
Probability	Po	2	Pr	3
Status of the impact	Negative		Negative	
Significance (No mitigation)	18		33	
Summary:	**Low** negative visual impact		**Moderate / Medium** negative visual impact	
Significance (With mitigation)	*10*		*30*	
Summary:	**Very Low** negative visual impact		**Low** negative visual impact	

Visual Impact Assesment for:	*<u>Potential effect and/or intrusion on protected landscapes or scenic resources; and potential effect of change to the visual character of the area:</u> Visibility of sources of light at night (for sensitive receptors) within LCA 1 (within the Agter-Paarl Paardeberg CL).*			
Metric	Code	Score	Code	Score
Nature of the impact	Effects of the visibility of point sources of lights at night from the vantage point of sensitive receptors within the surrounding Cultural Landscape: Agter-Paarl Paardeberg (up to 10km) Effects of brightening of the R304 scenic route envelope/corridor that runs through the eastern parts of the site. Effect of the visibility of lights at night (incl. point sources, as well as skyglow, glare and light trespass) on the visual character and sense of place of the RE at night (within LCA 2 & 3) within +-3km of the eastern boundary of the portion of the CWA that is earmarked for development.			
Gegree of Confidence	Unsure (U)		Sure (S) or Certain (C)	
Stage	Construction		Operational	
Extent	L	2	R	3
Duration	L	4	Permanent	5
Intensity (Magnitude)	L	3	M	4
Benign/destructive	Destructive		Destructive	
Probability	Po	2	Pr	3
Status of the impact	Negative		Negative	
Significance (No mitigation)	18		36	
Summary:	**Low** negative visual impact		**Moderate / Medium** negative visual impact	
Significance (With mitigation)	*10*		*33*	
Summary:	**Very Low** negative visual impact		**Moderate / Medium** negative visual impact	

Visual Impact Assesment for:	*Potential effect and/or intrusion on protected landscapes or scenic resources; and potential effect of change to the visual character of the area:* *Transformation of land use and site character: New buildings, structures and service infrastructure visible within a previously predominantly rural agricultural landscape.* *Transformation of land uses within the site boundaries from an existing airfield and farmland (mostly undeveloped) into a regional airport including a commercial component (mostly developed).* *Total clearance of the developable areas of the subject site during construction phase (bulk earthworks).*			
Metric	Code	Score	Code	Score
Nature of the impact	Loss of rural characteristics of the portion of the Agter-Paarl Paardeberg Cultural Landscape affected by the proposed development within the subject site (e.g. farmland, landscape patterns, farm werfs etc.) Loss of visual amenity of the transformed (but undeveloped) areas of Agricultural Significance affected by the proposed development within the site. Transformation/evolution of the visual & landscape character of subject site areas that are outside of the designated Urban Development Edge and that are located within Discouraged Growth Areas. Transformation/loss of vegetation within the Green Infrastructure Network Iincl. the Terrestrial CBA area in the south eastern corner. Change of land use and character of the site itself: Effects of increase of visible elements of urbanity (fences, walls, buildings, lights, signage etc.) within the subject site. Clearance of vegetation and loss of characteristic vegetation patterns (such as mature, established tree avenues).			
Gegree of Confidence	Unsure (U)		Certain (C)	
Stage	Construction		Operational	
Extent	SS	1	SS	1
Duration	Permanent	5	L	4
Intensity (Magnitude)	H	5	H	5
Benign/destructive	Destructive		Destructive	
Probability	D	5	Pr	3
Status of the impact	Negative		Negative (with scope for Positive enhancement)	
Significance (No mitigation)	55		30	
Summary:	**Moderate / Medium** negative visual impact		**Low** negative visual impact	
Significance (With mitigation)	*55*		*27*	
Summary:	**Moderate / Medium** negative visual impact		**Low** negative visual impact *(with scope for Positive Enhancement)*	

Visual Impact Assesment for:	*Potential effect on the visual amenity of Scenic routes: The R312 Lichtenburg Road Scenic Route (Route 31; SR1: Scenic drive envelope, Gateway Point and view corridors as scenic resources).*			
Metric	Code	Score	Code	Score
Nature of the impact	Loss of visual & landscape characteristics of the R312 Scenic Route and Gateway point. Transformation of parts of the Scenic Route envelope towards greater urbanity/industrial area aesthetic (primarily due to edge conditions and visibility/proximity/visual intrusion of buildings). Obstruction or restriction of key views. Possible negative effects on the visual and landscape character of the scenic drive envelope (e.g Outdoor advertising, Billboards, inappropriate fencing, road verge and/or edge conditions etc.) Construction Phase Activities*.			
Gegree of Confidence	Unsure (U)		Certain (C)	
Stage	Construction		Operational	
Extent	SS	1	L	2
Duration	S	2	L	4
Intensity (Magnitude)	M	4	H	5
Benign/destructive	Destructive		Destructive	
Probability	Pr	3	Pr	3
Status of the impact	Negative		Negative (with scope for Positive enhancement)	
Significance (No mitigation)	21		33	
Summary:	**Low** negative visual impact		**Moderate / Medium** negative visual impact	
Significance (With mitigation)	*12*		*20*	
Summary:	**Very Low** negative visual impact		**Low** negative visual impact *(with scope for Positive Enhancement)*	

Visual Impact Assesment for:	*<u>Potential effect on the landscape character and sense of place of:</u> the Agter-Paarl Paardeberg Cultural Landscape (LCA 1 - areas not within the property boundary).* *<u>Potential effect on the scenic amenity of:</u> the portion of the R304 Provincial Scenic Route (between the R312 Lichtenburg Road crossing and its intersection with Slent Road near Klipheuwel) that bisects the subject site, but lies eastward and outside of the portion of the CWA that is earmarked for development.*			
Metric	Code	Score	Code	Score
Nature of the impact	Potential effect on sensitive receptors located within the Cultural Landscape and/or travelling on the Scenic route such as: - Interruption of key views, vistas or view corridors; - Visibility of large or numerous builidngs and/or infrastructure within the landscape; - Increase of discordant elements and visual clutter visible in the landscape (decrease in Landscape Quality and Integrity); - Transformation of visible parts of the rural agricultural hinterland into more urbanised/developed areas; - Desensitisation of sensitive viewers. Subsequent evolution/erosion/loss of visual and landscape characteristics that maintain the particular landscape character and sense of place experiences valued by viewers within Cultural Landscapes and travelling on Scenic routes. Construction Phase Activities*.			
Gegree of Confidence	Unsure (U)		Certain (C)	
Stage	Construction		Operational	
Extent	L	2	L	2
Duration	M	3	L	4
Intensity (Magnitude)	M	4	H	5
Benign/destructive	Destructive		Destructive	
Probability	Pr	3	Pr	3
Status of the impact	Negative		Negative	
Significance (No mitigation)	27		33	
Summary:	**Low** negative visual impact		**Moderate / Medium** negative visual impact	
Significance (With mitigation)	*24*		*30*	
Summary:	**Low** negative visual impact		**Low** negative visual impact	

Visual Impact Assesment for:	*Potential effect on the landscape character and sense of place of:* the Durbanville Hills CL (extents of the Cultural Landscape as modified in Fig.50) and the Koeberg/Swartland Farms CL (both within LCA4). *Potential effect on the scenic amenity of:* R302 Klipheuwel road Scenic Route (Route 30b; SR1) and the Spes Bona Road.			
Metric	Code	Score	Code	Score
Nature of the impact	Potential effect on sensitive receptors located within the Cultural Landscape and/or travelling on the Scenic route such as: - Interruption of key views, vistas or view corridors; - Visibility of large or numerous builidngs and/or infrastructure within the landscape; - Increase of discordant elements and visual clutter visible in the landscape (decrease in Landscape Quality and integrity); - Transformation of visible parts of the rural agricultural hinterland into more urbanised/developed areas; - Desensitisation of sensitive viewers. Subsequent evolution/erosion/loss of visual and landscape characteristics that maintain the particular landscape character and sense of place experiences valued by viewers within Cultural Landscapes and travelling on Scenic routes. Construction Phase Activities*.			
Gegree of Confidence	Unsure (U)		Certain (C)	
Stage	Construction		Operational	
Extent	L	2	L	2
Duration	L	4	L	4
Intensity (Magnitude)	L	3	L	3
Benign/destructive	Destructive		Destructive	
Probability	Pr	3	Pr	3
Status of the impact	Negative		Negative	
Significance (No mitigation)	27		27	
Summary:	**Low** negative visual impact		**Low** negative visual impact	
Significance (With mitigation)	*24*		*16*	
Summary:	**Low** negative visual impact		**Low** negative visual impact	

Visual Impact Assesment for:	*Potential effect on the landscape character and sense of place of:* *the Joostenberg Vlakte Cultural Landscape (extents of the Cultural Landscape as modified in Fig.50) also referred to as LCA 2).* *Potential effect on the scenic amenity of:* *the R304 (S1: between the N1 and the crossing with the R312 Lichtenburg Road).*			
Metric	Code	Score	Code	Score
Nature of the impact	Potential effect on sensitive receptors located within the Cultural Landscape and/or travelling on the Scenic route such as: - Interruption of key views, vistas or view corridors; - Visibility of large or numerous builidngs and/or infrastructure within the landscape; - Increase of discordant elements and visual clutter visible in the landscape (decrease in Landscape Quality and integrity); - Transformation of visible parts of the rural agricultural hinterland into more urbanised/developed areas; - Desensitisation of sensitive viewers. Subsequent evolution/erosion/loss of visual and landscape characteristics that maintain the particular landscape character and sense of place experiences valued by viewers within Cultural Landscapes and travelling on Scenic routes. Construction Phase Activities*.			
Gegree of Confidence	Unsure (U)		Certain (C)	
Stage	Construction		Operational	
Extent	L	2	L	2
Duration	L	4	L	4
Intensity (Magnitude)	VL	2	VL	2
Benign/destructive	Destructive		Destructive	
Probability	Po	2	Po	2
Status of the impact	Negative		Negative	
Significance (No mitigation)	16		16	
Summary:	**Low** negative visual impact		**Low** negative visual impact	
Significance (With mitigation)	*14*		*14*	
Summary:	**Low** negative visual impact		**Low** negative visual impact	

8.11.3.4 Cumulative Impacts

- The proposed development will result in an overall increase in developed land and conditions of urbanity within the Northern District of the City of Cape Town (Sub-district 4 Agricultural/Rural Hinterland). These impacts are considered Cumulative in the context of the 2023 Urban Development Edge (UDE) revision in the MSDF, as well as the future development earmarked for neighbouring and nearby properties:
    a. It will result in a starker transition between the developed and rural agricultural landscape, as the UDE fills in to the west and south of the subject site.
    b. From elevated views especially, the proposed development will add to the compounded visual effect of densification and infill development in the area (inside the urban edge).
        i. It should be noted that this trend is supported by local and regional planning policy.
    c. The proposed CWA will also result in the de-facto incremental movement of the UDE outward to the north and the east (outside of the designated Urban Development Edge).
        i. The proposed runway, visible infrastructure and airport buildings will be visible from within the Areas of agricultural Significance, the Cultural Landscapes and Scenic routes that encircle the site from the south west, all the way through the west, the north west, the north, the north east, the east and the south east.
        ii. Portions of the proposed development will result in the loss of uninterrupted scenic views of the rural agricultural hinterland within the Agter-Paarl Paardeberg Cultural Landscape; mapped areas of Critical Biodiversity; elements that define the structure of the landscape of the Receiving environment (farm werfs and mature existing tree avenues) and the baseline condition of very low light conditions at night.

- The primary direction of the scenic view of the Gateway point along the R312 is directed southwest, meaning that it will be the future Greenville Garden City development that must find a way to maintain long views towards Table Mountain, not the proposed CWA which is on the right-hand side of the road.
    a. The proposed CWA development will however make a significant contribution to the cumulative visual impact on the visual character of the Scenic Route within the Scenic Route envelope. The height, distance and massing of buildings as well as the treatment of the boundary interface and the verge landscaping will determine what kind of character the landscape adopts in the future, whether scenic quality is maintained, and whether or not the characteristic long views towards the encircling landscapes (and landmark topographical features) remain important in the view frame.
    b. There is the possibility of positive cumulative visual impacts, if the undeveloped areas of the subject site are not degraded, and are managed actively to maintain scenic quality. To achieve this, the proposed CWA development must consistently find ways to protect and enhance the

capacity of the urban hinterland to continue to "provide a certain quality" to the adjacent urban environment (Northern District Plan, 2023, p. 32).

- Visual impacts associated with the construction phase(s) will have an overall negative effect on the way that the receiving environment is perceived and valued.
    a. The sensitivity or visual receptors will be reduced over time as scenic conditions within the site and the Receiving Environment are eroded, especially along the R312 Scenic route within the Immediate Foreground Distance zone, where High visual Exposure is predicted.
    b. While the affected in terms of the scenic route, the Cultural landscape character and the experience of visual receptors. This is because of the level of unmitigated change that construction phase activities will bring about, which are most often noticeable and intense considering the scale of the proposed development. The potential visual impacts of construction plant and machinery (such as cranes and large trucks) as well as construction phase activities (bulk earthworks, excavations and concrete frame constructions before façade finishes) are generally high.

- The visual impacts of lights at night will be a notable Cumulative visual impact of the proposed CWA development.
    a. This is due to the amount, brightness, complexity and overall ubiquity of a range of different kinds of light sources that will be visible at night (static, dynamic (moving) and intermittent (flashing)).
    b. For viewers within the urban areas, the effects of skyglow and light trespass will be cumulative upon the existing high levels of light pollution that the Durbanville and Fisantekraal area experiences at night.
    c. For the R312 scenic route, the night-time character of the RE from the point of view of the viewer will be lost / transform entirely from the baseline if the proposed perimeter lighting and outdoor advertising and signage proposals are implemented.
    d. For viewers located within the surrounding Cultural Landscapes (i.e., viewing the night sky and surrounding night-time landscapes from the surrounding rural areas), the visual impacts of light at night will be the most obvious.
        i. Point sources of light (such as the lights atop the ATCT, the apron lights, the lights of airplanes etc.) will be visible especially from the Agter-Paarl Paardenberg CL;
        ii. Point sources of light and skyglow/light trespass will also be visible from the Koeberg/Swartland farms CL and the Durbanville Hills CL (although these lights will be visible across urban and urbanizing areas in the foreground – truly a cumulative effect upon existing light pollution).
        iii. The Joostenberg Vlakte CL contains the highest density of residents (highly sensitive visual receptors), who will experience less visibility of point sources of light (due to the high level of existing vegetation patterns that screen line of sight) but will experience increased levels of light pollution in the form of sky-glow and light trespass at night as a result of the proposed development.

- There is also a distinct possibility that effect of the proposed CWA development on the R312 Scenic route can result in a positive cumulative visual impact (after the construction phase and establishment phase), when the landscapes are established (e.g. upgrades to the public realm, well-maintained development interface, continuity of legibility in terms of the features that define the structure of the landscape such as tree avenues, wide verges and long views).
- The increase in air traffic and the upgrade of the existing airport to accommodate larger types of aircraft will result in a concomitant increase in the regularity and visibility of aircraft in the sky within the Receiving environment, which can be seen as a Cumulative visual impact.
- The ad-hoc/market responsive nature of the development strategy and the resultant proposed length of time of the Construction phase(s) will result in Construction Phase impacts overlapping significantly with Operational phase impacts, to the extent that it may be difficult to distinguish between them. These can be considered Cumulative upon one another.
- The proposed CWA development may contribute cumulatively to the removal of the mapped Gateway point for the R312 Lichtenburg Road outward towards the East. A new threshold point may emerge, one that has a greater focus “outward” towards the rural Hinterland than “inward” towards the built-up areas within the new UDE.
    a. At this interface (and along all of its proposed development edges) the Cape Winelands airport has the potential to contribute positively to how the public values the remaining Cultural Landscape areas.

8.11.3.5 The No Go Alternative

The overall visual impact significance score for the No-Go Alternative is 0 (No Significance / neutral).

The impact does not influence the proposed development or the Receiving Environment.

Table 113: Visual Impact Assessment No Go Alternative (Filia Visual; September 2024)

Visual Impact Assessment for:	*The "Do Nothing" Alternative, in which the current rights of the existing airport would remain in place and no additional development would occur. No visual impacts anticipated as a result of activities.*			
Metric	Code	Score	Code	Score
Nature of the impact	No change to the status quo within the subject site.			
Degree of Confidence	Sure (S)			
Stage	n/a			
Extent	SS		1	
Duration	Permanent		5	
Intensity (Magnitude)	Z		0	
Benign/destructive	Benign			
Probability	None		0	
Status of the impact	Neutral			
Significance (No mitigation)	0			
Summary:	**No Significance** / neutral visual impact			
Significance (With mitigation)	*n/a*			
Summary:	*n/a*			

8.11.3.6 Mitigation Measures: Potential Visual Impacts

Mitigation measures for design phase(s)

The following recommendations, management actions and mitigation measures are included here to provide guidance regarding specific aspects of the development proposal that have bearing on visual impact within this Receiving Environment

Outdoor Signage

The subject site is located within and alongside areas of maximum control in terms of the Policy Framework for Outdoor Advertising and Signage in Cape Town, 2013; and the Outdoor Advertising By Law, 2023. Enforcement of the By Law and Policy guidelines are especially important to reduce the impact of possibly inappropriate signage along the Scenic Drive. According to the Policy, the City will discourage large intrusive billboards in rural or natural landscapes, and encourage creative locality bound signs which are sensitive to natural and Cultural Landscapes in non-urban settings.

i. In general, the development proposal (including all future SDP plans to be submitted) must comply with the Outdoor Advertising and Signage Policy and By-law in all respects.

ii. Specifically, the development proposal (including all future SDP plans to be submitted) must demonstrate that all outdoor advertising signs and other signage (external advertising, direction signs and/or outdoor display) do not impact negatively on visual corridors, Cultural Landscapes and Scenic Routes.

iii. No signage, lettering or outdoor advertising (within the proposed development or on the perimeter) may be installed higher than the average building height, or the overall height restriction for the development, whichever is the lesser.

a. The illuminated 1st party logo sign proposed to be mounted on the ATC tower is not supported.

iv. Outdoor signage and (especially) outdoor advertising must be kept to a minimum throughout the development. This is especially important to protect the R312 Scenic Route's view corridor, the remnant Landscape Character of the Receiving Environment, and the views of sensitive viewers within the Cultural Landscapes and travelling on the scenic Routes surrounding the subject site.

a. The 1st Party Sign at the entrance to the Cape Winelands Airport must adhere to the Principles and Placement contained in the CWA Outdoor Advertising Guidelines for 1st Party Signage (which are generally supported form a Visual Impact management point of view).

b. 3rd Party Outdoor Advertising Signage should be restricted along the perimeter of the property boundaries and should not be permitted if visible from within the surrounding Cultural Landscapes or from Scenic Routes.

c. No outdoor signage or 3rd Party Outdoor Advertising Signage should be allowed to be erected along any of the edges of the Airport Airside Precinct, or anywhere within the Agricultural Precinct (i.e., within view of the R304 or the R312).

d. No outdoor signage or 3rd Party Outdoor Advertising Signage (including freestanding outdoor billboards and digital screens) should be allowed within the 30m Visual buffer zone or within the 100m Signage buffer zone.

e. No 3rd Part advertising signage should be visible from the R312 Gateway point.

v. Signage on building facades must be sensitively placed and sized to cater for views within the proposed development.

a. No 3rd Party Outdoor Advertising Signage should be allowed on building facades visible from the R312 or R304.

b. No signage or lettering on building facades should be legible to viewers located outside of the Foreground Distance zone of the sign (i.e., signage should not be particularly noticeable for viewers located more than +-800m away.).

Fencing, Walls and Boundary interfaces

The proposed development must comply with the Boundary Walls and Fences Policy of the City of Cape Town, 2009 in all respects. Other policy relating to fencing and boundary treatment are the Heritage and Scenic Resource: Inventory and Policy Framework for the Western Cape (Respect the landscape setting and gateway qualities of scenic routes by ensuring appropriate design of road verges and fences); and the Western Cape Land Use Planning Guidelines for Rural Areas, 2019.

i. The plan, typical details and sections called for in 7.3.1.(a)iii.g.in the Visual IA should show height of wall/fencing, material & construction method, any accessories (such as lights, security apparatus, wildlife bridges, signage etc.) and distances from roads and road verges.

ii. Boundary walls, fencing and gateways should be in keeping generally with a visually neutral architectural character, designed simply, and remain visually permeable as far as possible.

iii. High, solid or palisade-type walling, and any form of precast panel type fencing is inappropriate and should be avoided.

iv. Low walling where used should be plastered /painted with earth tones, in line with the approved general materials and finishes recommendations contained in the Architectural Guidelines (see 7.3.1.(a)i) in the Visual IA).

v. Where security fencing is required, it should be screened with trees or hedging.

Lighting

The following recommendations deal with all general and outdoor lighting and sources of light. Light pollution should be kept to an absolute minimum throughout the development, and exterior lighting must be limited to areas where this is necessary for utility, safety and security.

The goal should be to keep the ambient light levels within the immediate Receiving Environment low, given the proposed development's proximity to a rural landscape that is a protected area, and the surrounding Cultural Landscapes. Exterior lighting (and therefore any visible light sources) must be carefully directed away from sensitive receptors identified in this VIA (Scenic routes, and viewers within the Cultural Landscape and nearby residential areas/homesteads).

In principle, lighting in the development should:

- Only be on when needed for active use;
- Only light the area that needs it;
- Be no brighter than necessary;
- Minimize blue light emissions;
- Be fully shielded (pointing downward) as far as possible.

The negative impacts of night lighting should be mitigated in the following ways:

i. Install light fixtures that provide precisely directed illumination to reduce light "spillage" beyond the immediate surrounds of the light source, including interior or undercover lighting sources;

ii. Façade lighting to be limited to accents and features, avoiding large parts of the exterior of buildings to be lit from any side, but especially not the facades facing the R312 scenic route, nearby homes and any of the Cultural Landscapes surrounding.

iii. Pedestrian pathways, parking areas and vehicular roads should be lit with low level 'bollard' type lights or post lights (maximum 3m tall) that are fully shielded (pointing downward). Fully shielded fixtures minimize skyglow, glare and light trespass.

iv. No "always-on" security flood lights, naked or exposed peripheral/boundary lighting or uncovered luminaires of any kind should be visible from public roads, the Scenic route, surrounding residential areas or the Cultural Landscapes that surround the site.

v. Security lighting should be activated on movement as far as possible.

vi. The 6m perimeter lighting proposed to encircle the development periphery is not supported. Future SDP plans must include a lighting proposal as called for in 7.3.1 (b) iv.) in the Visual IA.

vii. Light emitting diodes ("LEDs") are appropriate for outdoor lighting. If it is necessary to use white light, low-colour-temperature LED lighting should be used on the condition that the brightness can be dimmed when they aren't needed for active use (for example: to light empty parking lots etc.)

viii. Because blue light brightens the night sky more than any other color of light (International Dark Sky Association, 2021), it's important to minimize the amount emitted. The proposed development should use warm light sources (lower color temperatures) for outdoor lighting: a maximum of 3000 Kelvins is recommended.

It may not be possible for parts of the proposed development to adhere to the above mitigation measures in every part of the development, given the specialized lighting that would be necessary at an airport.

ix. This risk can be managed through the submission of the detailed Lighting proposal at SDP stage (see 7.3.1 (b) iv in Visual IA). This will allow the CA and/or the visual specialist to be provided with sufficient information during the future approvals process so that visual impacts associated with the direct and indirect visibility of lighting can be avoided, reduced or mitigated wherever possible when this detailed information is available.

x. In the absence of specific South African or municipal guidelines, compliance with the International Dark Sky Association (IDA) Criteria for Community-Friendly Outdoor Lighting is called for. It may therefore be necessary for an Overall Lighting Report to be called for at the Land Use Planning Approval stage, to be prepared by a suitably qualified electrical engineer.

a. The purpose of this report would be to provide a demonstration sketch of the illumination conditions generated by the various light sources within the CWA development.

b. The proposed CWA development does not exist in a vacuum, but within a complex “transitional” receiving environment that has a lot of variability in terms of light sources and overall lighting conditions at night along its different edges. The CA may therefore require some kind of simulation overlaying contextual graphics (site photographs, 3D model or aerial imagery), which is not within the visual specialist’s expertise to generate.

Materials and finishes

The following recommendations deal with the choices of materials and finishes specified for the construction of visible elements within the proposed CWA development; and include considerations regarding aspects such as colour, texture, brightness, reflectivity.

i. Roof and facade materials must be neither bright nor light. The appropriate colour range is achieved by increasing the shade (black) and tone (grey) of the desired colour palette. This darkens the original hue while making the chosen colour appear more subtle and less intense.

a. All roof material finishes should be located on the cool colour spectrum (e.g. the hues of blue, charcoal, grey, green etc.) and should be visually recessive.

b. All façade material finishes should be visually recessive, and contrast minimally with roof material finishes.

c. White, cream, beige and similarly light colours are not appropriate for roofs and facades.

ii. The use of a range of colours within an approved palette (to be determined as part of the Architectural Guidelines) is recommended for roof and facade materials and finishes. This prevents the development from appearing as a solid and/or overly uniform roofscape typical of newly established developments, especially from views at a higher elevation.

iii. Where tenants or future potential developers within the various precincts of the CWA require the specification of bright colours in line with their branding (which are often on the warm colour spectrum) on exterior portions of buildings, the following:

a. These areas must not cover more than 25% of the building façade.

b. The placement of these portions of allowable colour must be located sensitively so as not to negatively affect views from the surrounding cultural Landscapes and scenic routes.

c. Roof colour should always conform to the overall material palette of the rest of the development, to ensure that views from higher elevations experience a measure of uniformity in the roofscape, within a range of appropriate colours.

Landscape

It is unreasonable to expect views of proposed buildings and other visible elements to be screened from the public view entirely. A certain amount of visual exposure is inevitable, and arguably appropriate (depending on the nature of the proposed development). Additionally, trees are simply not capable of completely screening views to buildings (which in the case of the CWA, are often as tall as 20m), nor does a fully screened building equal successfully mitigated (or positive) visual impact. In some environments, a proliferation of trees within a landscape may not increase contextual fit.

However, the visibility of buildings and other discordant visible elements must not come at the expense of visual resources (e.g., the visual amenity of the Cultural Landscape and Scenic routes) or be to the detriment of the Receiving Environment. The installation of trees and other landscape elements such as planted berms and areas of soft landscaping serve to screen, soften and increase the contextual fit of new developments within their receiving environments.

The following recommendations deal with design decisions associated with the specification and installation of landscape-related aspects within the proposed CWA development that have an influence on visual impact management. The following mitigation measures should be used to assess the compliance of the future Master Landscape Plan and SDP Landscape Plans and Guidelines:

i. If 10% or more of the total number of trees proposed in the Landscape Concept Plan are removed from the proposal, this should be considered a substantial change, and the input of a suitably qualified visual specialist must be sought out (in the form of a Visual statement).

ii. Tree avenues are an appropriate screening and scaling tool to be used within the proposed development, and the Landscape Architect/s must select a variety of species carefully to ensure that there is a measure of continuity within the soft landscaping of the proposed development with the planting patterns of the receiving environment.

iii. Establish new tree avenues with suitable species to enhance cultural landscape features lost through the development to reinforce or replace traditional patterns of planting where appropriate with suitable species.

iv. Screening with trees and soft landscaping (especially on public road verges) should include areas of higher density (where it is necessary to break up the bulk and mass or horizontality of the buildings, limit the visual impact of signage, or screen views into parking lots and back of house areas), as well as areas where tree planting may be less dense (to allow view corridors and glimpses into the proposed development).

v. The timing of landscape installation:

a. The soft landscaping along all public road verges (and especially trees that play a role in screening the development from the R312) must be specified in the phase 1 SDP and implemented along with the first phase of the development, and as early in the construction process as possible or feasible.

b. All other trees must be planted along with their associated phases, and as early in the construction process as possible. This phased tree planting strategy is the substance of the Tree planting plan.

i. The implication of the above recommendation is that the irrigation system design, supply, powering and storage of irrigation water must be developed and functional to the point that it will be able to supply sufficient irrigation water to the newly installed trees at the time of their installation (during Phase 1 and/or whenever a new phase of the proposed development is implemented along with its landscape and trees).

ii. The design team (Landscape Architect and/or Engineer) must therefore provide the CA with sufficient detail to demonstrate that the irrigation requirements for proposed trees will be met through rainwater harvesting, borehole supply or similar; and storage capacity must be indicated on the appropriate Landscape Plans. Ideally, the stormwater attenuation ponds should be integrated into the system of rainwater storage and re-use for irrigation purposes.

Correct management and specification are key to ensuring successful mitigation that depends on screening visible elements of a development with trees. The key to the successfully establishment of trees for screening (at least in the Western Cape) is not their size or maturity at installation, rather it is the provision of ideal growing conditions from the point of installation onward – with specific reference to soil conditioning and irrigation supply. The following Tree specification and irrigation design guidelines must be adopted and displayed on all future Landscape Plans:

vi. The landscape establishment phase (i.e., the time period after which a Landscape Contractor is employed to maintain and monitor a newly installed landscape after practical completion) must not be less than 24 months in duration.

vii. The irrigation supply of trees should be maintained consistently throughout the year (i.e., during the establishment period, as well as on a permanent basis after establishment, and during the operational phase of the development).

viii. Soil moisture content in the root ball must be consistent, i.e., trees may not be allowed to dry out during the Western Cape summer months or become waterlogged during the wet winter months. This requires rainfall responsive irrigation source and supply design, as well as adjustable irrigation supply management technologies.

ix. Irrigation design must provide dedicated lines for the irrigation of trees, and these dedicated lines must be programmed to supply water to trees on their own regime.

x. Slower, more frequent soaking watering regimes should be preferred for trees over large quantities infrequently over short periods of time.

xi. The recommended guideline for watering trees is a minimum of 40 to 50L per week.

xii. A very important aspect of the watering regime is consistency. Once planted, the irrigation cycle should not be allowed to cease (in the summer months especially), and the irrigation regime must maintain a +-7day cycle at the least.

xiii. Soil samples must be taken prior to the specification and design of the irrigation system and the tree holes to ensure that soil conditioning is responsive to site-specific conditions.

xiv. If the soil is at all sandy, it is strongly recommended that Zeoplant moisture retention granules or a similar product is specified to reduce fluctuations in the soil moisture content of the root balls of trees.

xv. The root balls of trees must also receive adequate aeration, and compaction of root zones must be avoided.

xvi. Trees in the parking lots will experience far more extreme growing conditions than those on the road verges and cannot be expected to offer significant screening functionality. Nevertheless, they must receive the same treatment as that of the trees on road verges or within the open landscape.

xvii. The Landscape Architect must therefore ensure that trees in parking lots are given adequate space, irrigation, aeration and soil conditioning to ensure their survival and successful establishment.

The CA should not allow any further development to encroach on the Agricultural Areas of Significance or the Agter-Paarl Paardeberg Cultural Landscape east or north of the subject site. The preservation and enhancement of the remainder of the subject site as untransformed farmland will serve to offset the visual intrusion along this eastern edge somewhat by maintaining the landscape as a container for the proposed development.

xviii. It is recommended that the remainder of the Agricultural Precinct retains its agricultural land uses, and should be actively farmed, if possible, to maintain its Agricultural character.

<u>Mitigation Measures to be included in the EMPr:</u>

a. General

i. A suitably qualified Environmental Control Officer (ECO) must be appointed to ensure that all visual related aspects are adequately mitigated and monitored for the duration of the construction phase. The ECO officer must be qualified to monitor and enforce visual impact related management and mitigation measures.

ii. The ECO must monitor use of light and levels of light pollution by means of regular spot-checks, to be included in monthly compliance reporting.

iii. At the end of a construction phase, a lighting audit must be undertaken by the ECO to ensure that conditions regarding the management of lighting impacts at night have been met.

iv. In order to minimise the probability of negative community responses, a competent staff member should be appointed at the beginning of the operational phase, to be responsible for handling any complaints or concerns received by any I&AP's (and any other affected neighbours).

b. Soil disturbance and revegetation

The Civils construction phase that includes bulk earthworks, road building and stormwater infrastructure installation will see the vast majority of this disturbance to the existing soil and vegetation cover of the site. This implies that the entire area will either be developed or need to be revegetated/planted as per the approved Landscape Master Plan and/or approved Landscape plan (whichever is relevant at the time of disturbance).

i. Areas disturbed (for any reason) must be revegetated (or planted as per the approved Landscape Master Plan) within a maximum of 1 year after the disturbance occurs.

a. The only circumstances under which delay may be tolerated are:

i. If the area to be revegetated/planted is still an active construction site;

ii. If the revegetation/planting must happen during a particular season to await optimal planting conditions. In these cases, revegetation/planting must occur in the first of such season after the delay.

b. The ECO must report on disturbed areas and revegetation.

ii. All embankments must be appropriately stabilized and revegetated to match the existing/surrounding natural vegetation.

iii. Rehabilitation/revegetation must be handled in accordance with the recommendations of the botanist or other suitably qualified specialist, and under the supervision of the ECO.

iv. During excavation activities, topsoil must be stockpiled separately from other material. The mixture of the lower and upper layers of the excavated soil must be kept to a minimum, so as for later use as backfill or rehabilitation material after construction has commenced.

v. Exposed soils must be protected from wind and water erosion (using tarpaulins or a suitable geotextile) for the duration of the construction phase.

vi. Ongoing monitoring for the establishment of alien and invasive vegetation species must be undertaken periodically (during construction, and at least once a year thereafter) within and around the subject site.

a. Should alien and invasive plant species be identified, they must be removed and disposed of as per the development's alien and invasive species control plan (and/or the relevant legislation and guidance from a suitably qualified specialist)

<u>Construction Phase mitigation Measures</u>

a. General Construction Phase mitigation measures:

i. All construction site offices, lay down areas, storage areas and active construction activities must be screened from public view by appropriate hoarding and/or screening.

ii. Construction fencing/hoarding and signage must adhere to local policy relating to signage and ensure that no views to scenic routes are impacted by large or numerous construction signage.

iii. All contractors and sub-contractors on site must submit a Temporary fencing, hoarding and screening protocol for active construction sites to the ECO for monitoring. iv. All contractors and sub-contractors on site must submit a dust and mud control protocol for active construction sites to the ECO for monitoring.

v. Site offices, storage and lay down areas, loading areas and similar temporary infrastructure should be situated centrally on the subject site and avoid any areas visible from the Scenic route.

> a. Construction site offices, lay down areas and storage areas must be placed at least 500m away from the R312, and at least 100m away from all other property edges.
>
> b. Appropriate fencing must be erected along the Scenic route to screen the construction site from commuters on the R312.
>
> c. These visual screens must be maintained so that they do not become the source of the visual impact.

vi. It is inevitable that waste will be generated during construction. The following is recommended:

> a. The applicant must ensure that sufficient on-site waste management measures are in place to prevent any escape of waste, litter and packaging materials etc. into the surrounding landscape.
>
> b. A weekly litter patrol must be included in the Construction activities on site and monitored for compliance by the ECO.

vii. No construction phase activities may be undertaken within the Agricultural Precinct.

viii. Construction activities must be limited to daylight hours to prevent visual impact of lights at night. Construction activities should not be undertaken at night unless unavoidable.

ix. Dust management, waste management, the placement of screens and hoarding, as well as the location and management of access points to the site must be proactively managed to reduce visual clutter and limit visual impacts associated with construction activity before, during and after each phase of the construction process (demolition, excavation, project execution, close-out etc., establishment, etc.)

x. All site operatives must receive training in awareness of the issues of fires, litter, and contaminants. No fires are to be allowed on site; no litter and no contaminants to be allowed to enter the surrounding environment by any means. These substances may include amongst other things, diesel, curing compounds, shutter oil and cement. Utilization of such substances should be controlled on site, especially in close proximity to the riverine environment, and guidelines should be included in the EMPr.

xi. For the duration of the civils contract, the contract time should be kept to a minimum.

xii. No construction activities should be allowed to be undertaken at night, so as to manage the duration and visual impact of construction lights' visibility at night.

a. If construction during the night-time hours is unavoidable, the following should apply:

i. No floodlights should be permitted.

ii. Only the construction activity should be lit- not the entire construction area.

iii. Construction lighting should not be "always-on" – and should be turned off when active construction activity is not being undertaken.

iv. The management of construction light impacts at night must be monitored by the ECO and included in compliance reporting.

xiii. Public road junctions should have good sightlines, traffic control measures, wayfinding signage, and dust control measures in place.

xiv. The construction project management team must enforce dust and mud control measures and protocols at construction site entrances. This is especially important for construction entrances that deliver construction vehicle traffic onto the R312 Scenic Route, where poor management of dust and mud will have a negative impact on the visual amenity of the scenic route.

xv. Ensure that no views from R312 or R304 are negatively impacted by large or numerous construction signage, fencing or hoarding.

xvi. Dust and debris control must also be implemented to minimize the impacts on the local roads, residents and neighbouring properties. Where necessary, access routes and the site itself should have an effective dust suppression management programme applied, such as the use of non-polluting chemicals that will retain moisture in the exposed site surfaces

8.11.3.7 Monitoring requirements: Potential Visual Impacts

- A suitably qualified Environmental Control Officer (ECO) must be appointed in order to ensure that all visual related aspects are adequately mitigated and monitored for the duration of the construction phase. The ECO officer must be qualified to monitor and enforce visual impact related management and mitigation measures.
- Ongoing monitoring for the establishment of alien and invasive vegetation species must be undertaken periodically (during construction, and at least once a year thereafter) within and around the subject site.

a. Should alien and invasive plant species be identified, they must be removed and disposed of as per the development's alien and invasive species control plan (and/or the relevant legislation and guidance from a suitably qualified specialist).

- All contractors and sub-contractors on site must submit a Temporary fencing, hoarding and screening protocol for active construction sites to the ECO for monitoring.
- All contractors and sub-contractors on site must submit a dust and mud control protocol for active construction sites to the ECO for monitoring.
- A weekly litter patrol must be included in the Construction activities on site and monitored for compliance by the ECO.
- The management of construction light impacts at night must be monitored by the ECO and included in compliance reporting.

8.12 Potential Agro-Ecosystem Impacts

8.12.1 Introduction, Terms of Reference and Methodology

The objective was to conduct an Agricultural -Ecosystem Impact Assessment regarding impacts on agricultural resources on the properties and sites identified for the new CWA facility:

- Apply the EIA assessment criteria to all the identified Alternatives,
- Consider the mitigation hierarchy to reduce development impacts and to control negative effects on the environment,
- Consider specific actions to limit and restrict the loss or degradation of soil, suitable run-off and soil erosion control measures and infrastructure,
- Consider the specific means on how the release of run-off water into existing streams should be controlled,
- Advise on environmental management principles to be adopted in the EMPr,
- Agricultural use after the airport development.

The following issues raised during the pre-application Scoping Phase PPP were considered:

Land conversion from agriculture to airport and associated activities; Decrease in average farming income; Devaluation of agricultural land; Impacts on food production and associated local economy in the area; Displacement of valuable agricultural land and community livelihoods; As farms surround the Airport, plant diseases and animal infections can lead to reduced agricultural productivity, affecting food security; As the rural nature of the area is phased out, the farms will eventually be forced to close down, reducing food security and jobs; Impacts on small scale and subsistence farmers; Impacts on nearby poultry facilities which supply affordable protein.

The following issues raised during the in-process Scoping Phase PPP were considered:

Airspace restrictions & increased air traffic impacting agricultural aviation needs; communication and coordination between commercial and agricultural aviation; proximity of proposed development to existing laying farm.

No specific knowledge gaps that could have a material impact on the outcome and findings of this study were identified.

8.12.2 Assessment of Impacts

Change in Productivity

Loss of productive land

The proposed CWA infrastructure will occupy approximately 275ha of land currently zoned for Agriculture. The loss of cultivated fields amounts to 168ha, of which only ±60% (100ha) are being cultivated per year, due to the crop rotation system followed. At an average wheat yield of 4.0 t/ha, that loss of productive land relates to a reduction of 400tons in production or ±0.03% of the wheat production of the Western Cape, which was estimated at 1 260 000tons in 2021/22.

Impact on Food Security

Four dimensions in food security can be identified, namely:

- Availability
- Access
- Food safety and nutritional value
- Stability of supply

The potential negative impact of the proposed CWA development on food security, relates to the reduction in the area that can be used for food production and therefore mainly affects only one of the dimensions – availability.

The contribution of wheat production to South Africa's food security is not limited by a lack of arable land, as only ±560 000ha are currently used for production, compared to around 2 000 000ha of four decades ago. Despite the drastic reduction in area planted, since 1990, the national production has remained stable at 1.5million to 2.1million tons per annum, due to higher yield levels. In the Western Cape, the area under production effectively increased by ±50 000ha over the past decade, mainly driven by a conversion from barley to wheat.

Food security in terms of wheat supply is further supported by imports from various countries across the world, which mitigates climatic and political risk factors.

As stated above the loss of productively cultivated land to accommodate the airport will result in a reduction of wheat production of an estimated 400ton. The potential loss of 400tons of wheat is equal to 0.01% of the national wheat consumption, 0.02% of the national wheat production and 0.03% of the Western Cape's wheat production. While this loss of production is not negligible its impact on food security is.

While difficult to quantify at this stage, it can be expected that the new Cape Winelands Airport can support food security by its contribution to access to food, through its role in food distribution logistics as well as job creation that will lead to wider food affordability.

Loss of farming infrastructure

The proposed airport development intersects with existing farm infrastructure, including a farm dam, sheds and farmhouses.

Change in Employment

The conversion of the land is expected to reduce the employment from 20 to 12 permanent opportunities. It can be expected that the job opportunities created by the proposed airport and related facilities will render this loss insignificant.

Possible Long-Term Benefits

The only direct long-term benefits of the proposed rezoning to the current farming operation is:

- A capital injection into the remainder of the farm;
- Improved security in the area.

Additional Environmental Impacts

Other potential impacts on agricultural resources, relates to stipulations of the Conservation of Agricultural Resources Act, CARA Act 43 of 1983. In the case of the CWA development the following are applicable:

- Possible soil degradation by wind and/or water erosion;
- Impact on vleis, marshes, water sponges and water courses;
- Impact on the flow pattern of run-off water.

The airport development will introduce vast areas of hard surfacing in the form of runways, taxiways, aprons, parking areas and rooftops, which will prevent infiltration of rainfall and introduce run-off with severe water erosion consequences on adjacent farmland. However, it can be expected that the engineering design will consider this and design the required infrastructure for the detention and controlled release of storm water. Such release into existing drainage channels could still impact on the flow pattern of run-off water and also impact on downstream vleis, marshes, water sponges and water courses.

As some parts of the proposed development envelope intersects with very sandy soils at the surface layer, wind erosion could occur during construction if not considered and controlled.

8.12.3 Assessment of Impacts: Cumulative Impacts

Other developments

Other developments in the general vicinity of the CWA includes the Bella Riva mixed-use development, the Greenville Garden Cities future phases and other developments within the N1 corridor between Paarl and Cape Town. The specific footprints of these developments have not been researched by this study, but it can be assumed that it also intersects with productive agricultural land in places, which will contribute to the cumulative impact – i.e. reduction in arable land – induced by the CWA in conjunction with these developments.

Climate change

While climate change predictions for the Western Cape vary depending on the assumed scenarios and models used, it mostly correlates in terms of key trends, which includes:

- Temperature increases
- Changes in precipitation patterns – seasonality and likely reductions in rainfall
- Increased extreme weather events

- Sea level rise

Sea level rise can be disregarded in the context of CWA, but temperature increases, reduction in rainfall patterns and extreme weather events can have significant implications for dryland (rain-fed) agriculture. The following main predictions are made for the Western Cape (CSAG, 2022):

- Temperature trends of +0.1°C/decade.
- Rainfall trends vary and is not significant ($p<0.05$) for many zones. More significant drying trends occur in some of the interior zones.
- Trends in potential evapotranspiration (PET) are consistently significantly positive, driven by consistently positive and significant temperature trends. Trends in PET are highest in the most southern and the most western zones, while being strongest in spring (September-November) and summer (December-February).

Contrary to these trends, the precipitation trend for the Swartland and Boland areas (including the CWA study area), during the winter grain growing season (May to October), appears positive.

Increased rainfall can raise the risk for overly wet and waterlogged conditions during the growing season, but this can be mitigated by appropriate agronomic practices (i.e. ridging). Therefore, in these production areas a higher rainfall generally results in higher yields.

The impact of the proposed CWA development on the reduction in cultivated area and grain production can therefore be partly or fully mitigated by a higher winter rainfall as predicted by climate change trends.

8.12.4 The No Go Alternative

The No Go Alternative refers to the scenario where future development is done within existing development rights. No farmland or land zoned for agriculture will be transformed in this alternative and thus there will be no impact on the agro-ecosystem.

8.12.5 Mitigation measures: Potential Agro-Ecosystem Impacts

<u>Impact Mitigation through Micro-siting</u>

While micro-siting is more relevant in the case of the footprint of renewable energy structures, it is noteworthy that the development proposal is very compact and land efficient and the latest development plan has significantly reduced the impact on the productive farmland. It is also clearly demarcated and fenced which will minimize disturbance to the agricultural activities on the remainder of the farmland.

<u>Mitigation measures to be included in EMPr:</u>

- The loss of productive farmland is regarded as inevitable but further loss of productive farmland should be prevented, by clear demarcation of the development envelope during the construction phase, while no vehicle or other activity should be allowed outside of the demarcated area.

- Soil erosion by wind, during construction, should be mitigated by minimizing bare soil surfaces without adequate protection, either by applying a mulch cover or wetting the surface or similar action.
- Suitable run-off and soil erosion control measures and infrastructure should be designed and implemented to limit and restrict the loss or degradation of soil.
- The release of run-off water into existing streams should be controlled to minimize impact on vleis, marshes, water sponges and water courses. This activity may include a permitting application to the DWS.

8.13 Potential Civil Aviation Impacts

8.13.1 Introduction, Terms of reference and Methodology

The objective is to identify potential impacts the proposed development might have on the receiving environment in terms of civil aviation activities, infrastructure, and installations. The Civil Aviation Impact Assessment will assess the impacts of the proposed development in terms of:

- Obstacle Limitation Services (OLS),
- Airspace,
- Noise,
- Ground Transportation,
- Socio-economic in terms of direct environment, the wider region, and the aviation industry.

The development of an Airspace CONOPS forms part of the Aviation Specialist Studies in support of the Environmental Impact Assessment for the Cape Winelands Airport. The CONOPS Report focuses on the proposed changes to the status quo that may be required to facilitate the development of the airport. It presents the proposed concept of operations for the airspace and is intended as a basis for further stakeholder engagement and a starting point for the airspace and flight procedure design process. During the in-process Scoping PPP the need to include Morningstar Airfield in the CONOPS was raised by I&APs and as a result the CONOPS was updated for the EIA Phase.

Two sets of survey information were received from the client: a topographical survey of the existing ground surrounding the development, and a survey of all the potential obstacles in and around the development:

a) Topographical survey data of the area was received in the form of LiDAR (Light Detection and Ranging) data. The LiDAR data covered the area relevant to the Conical Surface and included most of the obstacles.
b) The obstacles were surveyed by ATNS on 4th of October 2022. NACO received the data from the client in the form of the OLS report prepared by ATNS. The surveyed obstacles from Section 2.5.5 Table 12 of the ATNS OLS report was used for the task.

The OLS, terrain and obstacles are visualised on 3 layout drawings, with the OLS specifically created for Runway 01-19:

1) Obstacle Limitation Surfaces (OLS) – The drawing shows the configuration of the OLS (Approach, Transitional, Take-off climb, Inner horizontal, Conical and Outer horizontal surfaces) plotted against a satellite image of the area. Refer Figure 145 and Appendix 20.

2) Obstacle Limitation Surfaces (OLS) - This drawing is to understand the maximum height available for development in the area covered by the OLS. Refer Figure 146 and Appendix 20.

3) ATNS Obstacle penetrations - The drawing shows a zoomed in area of the OLS which covers all the obstacles surveyed by ATNS, their number, name, coordinates, elevation, and OLS penetration. Refer Figure 147 and Appendix 20.

The Annex 14 OLS investigates the influence of identified obstacles on existing or future instrument procedures and Annex 14 surfaces.

The DFFE Screening tool identified the proposed development area as a "high sensitive" civil aviation area. The Protocol for The Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Civil Aviation Installations requires a Civil Aviation Compliance Statement for which NACO has been appointed.

8.13.2 Assessment of Impacts

The main areas of impact related to the civil aviation activities:

1) The Annex 14 Obstacle Assessment Report conducted for the proposed development identified potential obstacles within the 10km radius of the site (refer Section 7.8.2. of this report and Table 49). The nature of the obstacle and its location relative to the surface origin, the extended centreline of the runway or normal approach and departure paths and to existing obstructions, the amount by which the surface is infringed, the volume and type of air traffic at the aerodrome; and the instrument approach procedures published for the aerodrome will inform the way forward.

2) The Obstacle Limitation Surfaces report in Appendix 20 (Visualisation of Development Heights Available in the vicinity of CWA) provides information on the maximum permissible development heights in the surrounding areas, at specific distances from the runway. The model uses the approach surface and the take-off climb surface.

Figure 164: Runway 01-19 Obstacle Limitation Surfaces (OLS) (NACO, August 2024) indicating take-off surface in blue and approach surface in red shows the configuration of the OLS (Approach, Transitional, Take-off climb, Inner horizontal, Conical and Outer horizontal surfaces) plotted against a satellite image of the area. Take-off surface (in blue) is approximately 298m to the North and 314m to the South. Approach surface (in red) is approximately 272m towards the South and 256m towards the North.

Figure 165: Runway 01-19 Obstacle Limitation Surfaces (OLS) - Zone Categories (NACO, August 2024) illustrates the maximum height available for development in the area covered by the OLS. The drawing shows a colour-coded heat map which indicates the zoning categories. Each zoning category is assigned a colour and stipulates the maximum development height within the area of the assigned

colour. The image shows that the maximum development height available towards the South varies from approximately 3m to 38m towards the South and 3m to 164m towards the North.

This limitation of building heights of developments located in proximity to the airport flight paths to the North and South of the runway alignment should be considered in future Development Frameworks and will result in height restrictions imposed in respect of future development.

Figure 166: Runway 01-19 ATNS Obstacle penetrations (NACO, 2024)illustrates a zoomed in area of the Annex 14 OLS which covers all the obstacles surveyed by ATNS. Each obstacle has been plotted on the drawing according to the obstacle coordinates. The plotted obstacles have been named according to the obstacle number. The obstacles plotted on the drawing can be matched to the obstacle number on the Table 49.

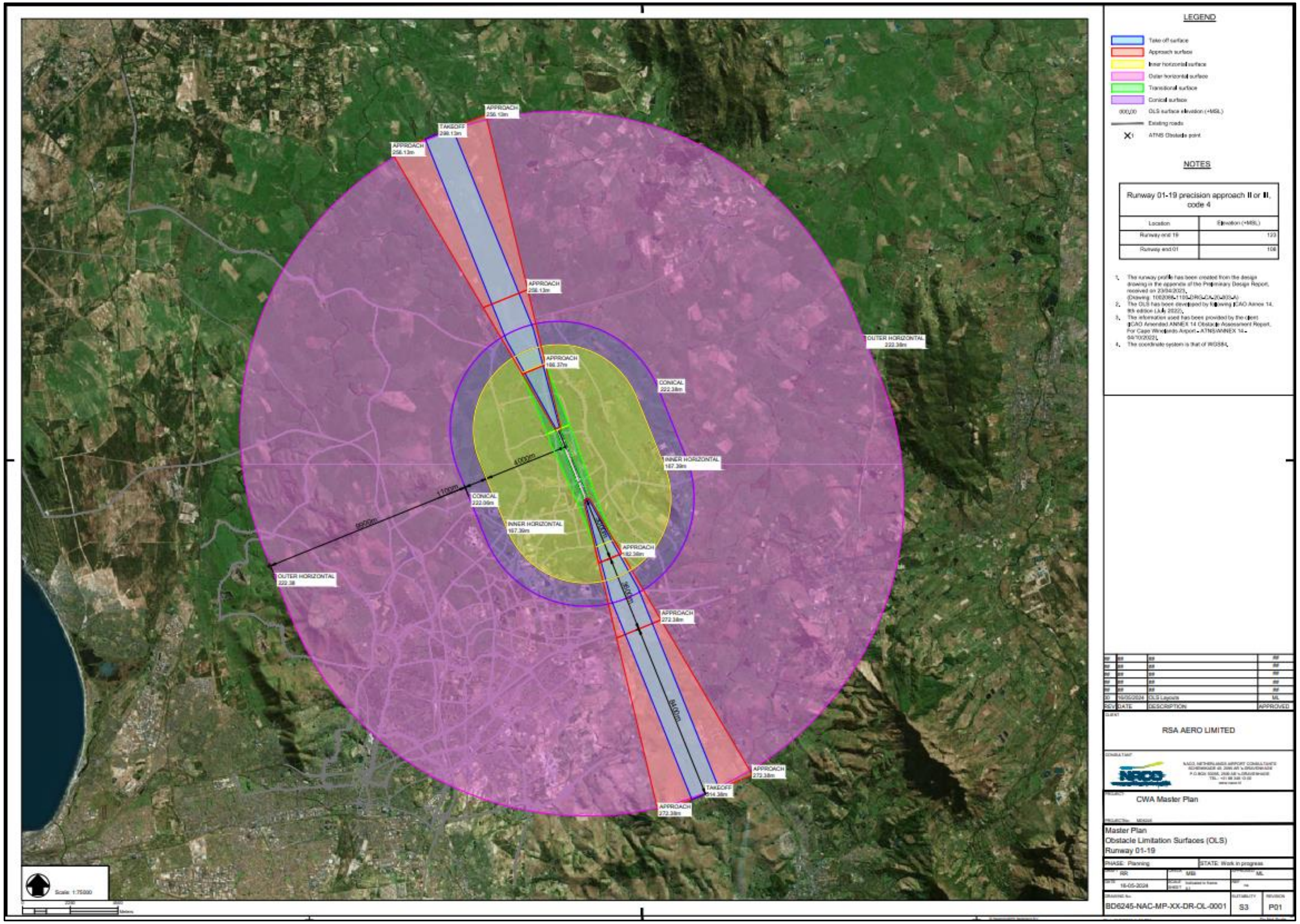

Figure 164: Runway 01-19 Obstacle Limitation Surfaces (OLS) (NACO, August 2024) indicating take-off surface in blue and approach surface in red

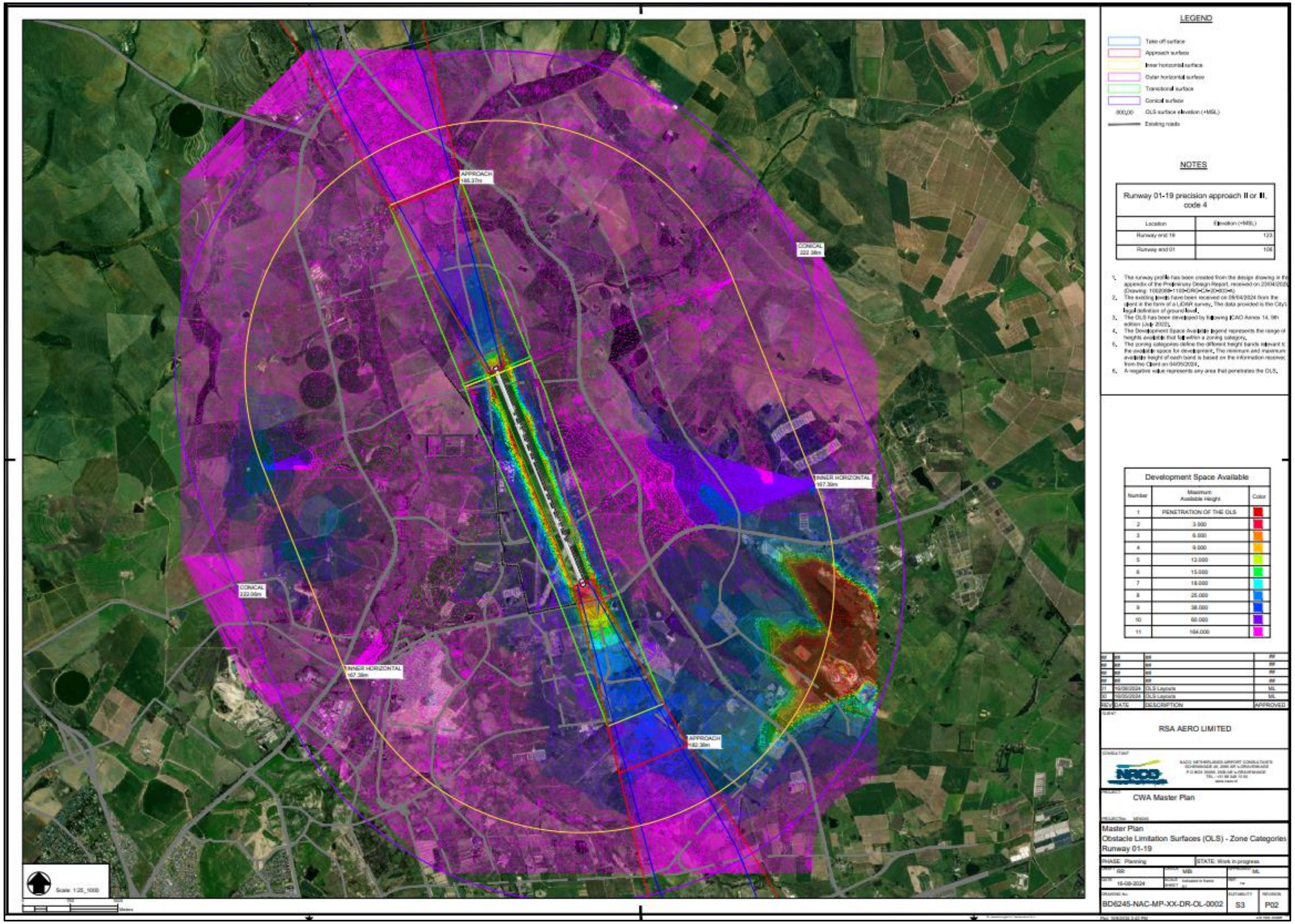

Figure 165: Runway 01-19 Obstacle Limitation Surfaces (OLS) - Zone Categories (NACO, August 2024)

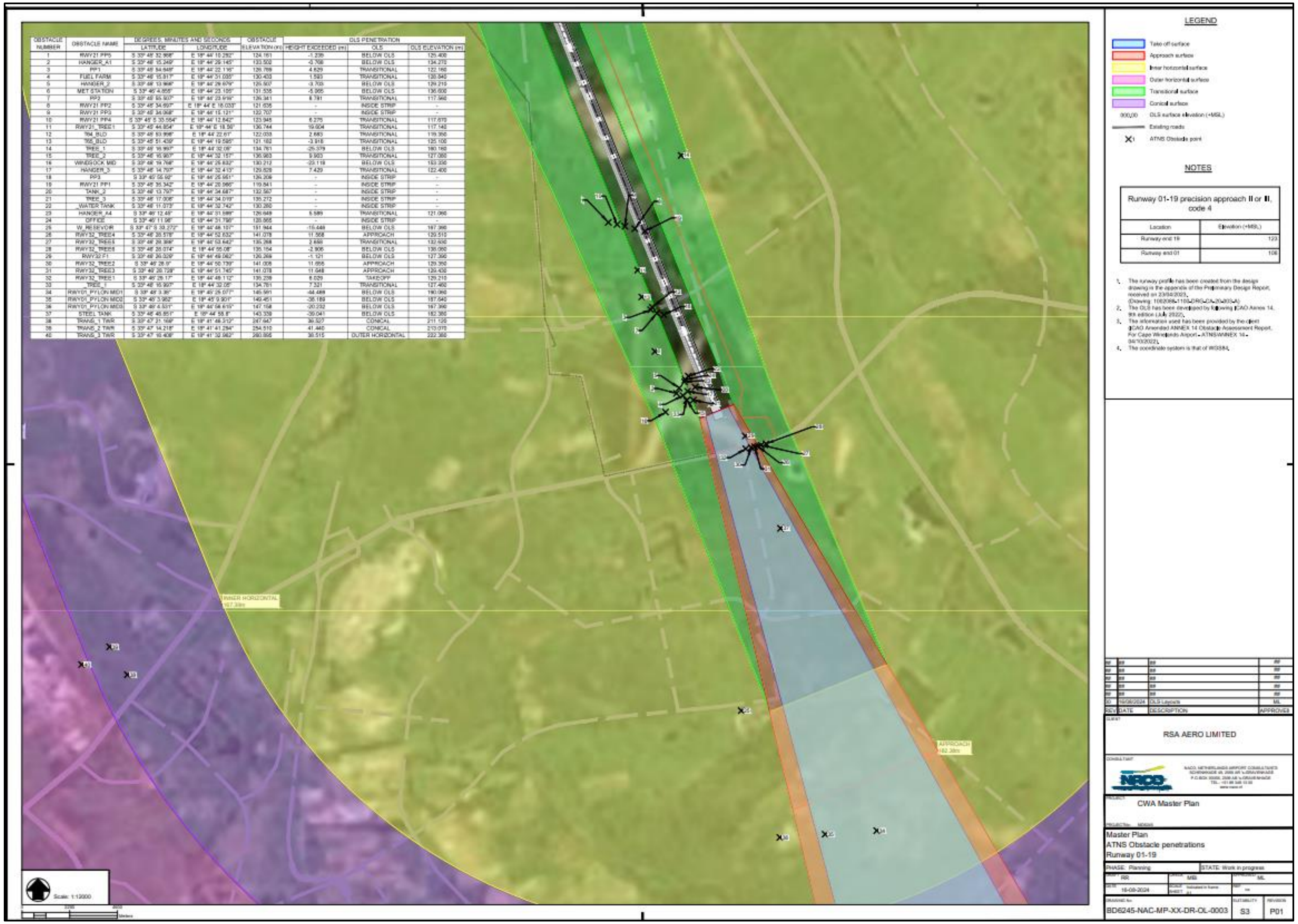

Figure 166: Runway 01-19 ATNS Obstacle penetrations (NACO, 2024)

3) The proposed increase of flight activity at CWA, and particular the introduction of scheduled commercial operations, will likely affect the flight operations at nearby aerodromes (including civil aviation aerodromes, AFB Ysterplaat and CTIA).

According to the NACO Civil Aviation Scoping study airspace at the airport should be suitably configured, and feasible departure and arrival procedures should be put in place. "*Therefore, an airspace study should be conducted by aviation specialists, suitably qualified in the field of Procedures for Air Navigation Services and Aircraft Operations (PANS-OPS), to determine safe and efficient ways of operating flights in and out of CWA in relation to CTIA and other aerodromes. This study should address the need for navigational and visual aids at the airport and identify possible impact this may have on existing (and planned) civil aviation installations in the vicinity*."

To satisfy this requirement the following studies were conducted:

APPENDIX 16: CWA Diversion Airport Analysis

APPENDIX 18: Annex 14 OLS Report

APPENDIX 19: Airspace CONOPS Report

APPENDIX 21: Airspace and Capacity Study

APPENDIX 22: Visualization of FACT and FAWN combined operations

APPENDIX 23: CWA Alternate Airport study

4) Noise from aircraft is generally recognized as one of the most significant negative impacts of airport development. The noise footprint of an airport depends on various factors:

- its airside infrastructure configuration,
- flight procedures,
- mode and time of operations,
- frequency of flights and aircraft types operating at the airport,
- prevailing weather conditions,
- topography,
- surrounding land use, as well as
- socio-economic and cultural factors.

Noise impacts are assessed by DDA Environmental as the appointed specialist for the project – refer Section 8.5 of this report. The Obstacle Limitation Surfaces report and the Noise Contours will be considered in future Development Frameworks and result in height and noise restrictions imposed in respect of future development.

5) Increased ground traffic to and from the airport from passengers, visitors, airport staff, tenants, concessionaires, and related businesses will be an anticipated impact. A TIA has been conducted for the potential traffic, transport and roads impacts – refer Section 8.12 of this report.

6) The expansion of CWA will likely have socio-economic impacts on its direct environment, the wider region and the aviation industry and will attract significant investment. The Socio-economic Impacts have been assessed by Multi-Purpose Business Solutions is the appointed specialist – refer Section 8.10 of this report.

8.14 Potential Transport Impacts

8.14.1 Introduction, Terms of Reference and Methodology

Various access opportunities to the road network system are ultimately available for the site west of the runway i.e. terminals, Fixed Base Operators (FBO's) and hangers. These include the existing Mellish Road (OP 6/8) connection onto Lichtenburg Road, the future Class 3 Lucullus Road extension and the future Class 3 Mellish Road extension through Bella Riva. Site access for any development east of the runway will have the opportunity to access from Lichtenburg Road (R312) in accordance with the AMP. The site access is largely factored by development timing/phasing (CWA and others), land ownership constraints and infrastructure costing. These options are as follows:

- Option 1: Access via Mellish Road / Lichtenburg Road (R312)

Access via Mellish Road for the initial phase of the CWA is considered the most viable in terms of external factors not impeding progress. The Bella Riva development is conditioned to upgrade this road to acceptable standards. The Lucullus Road extension will need to be built once signal warrants are met and the land has been expropriated for the northern extension. Mellish Road may become obsolete once the Lucullus Road northern extension is built. It is proposed to assess the feasibility of converting the road for airport use in the future to avoid building two parallel roads (e.g. public road internal parallel routes). Access from Lichtenburg Road is proposed to line up with the road network planning for Greenville or vice versa. This option will require the realignment of Mellish Road. The future phases of Greenville may be amended subject to the approval of the CWA and a consolidated location of an intersection with Lichtenburg Road must be found. Access from the Class 2 Provincial Road will need to remain open to the public

- Option 2: Access via Mellish Road / Klipheuwel Road (R302)

The proposed Class 3 route through Bella Riva will ultimately be available for a public connection to the CWA. Similar to the Lucullus Road extension, the feasibility of a joint agreement to design and construct the road should be assessed. This route could then be an option if the Lucullus Road extension is not feasible in the short term. Consultation with Bella Riva transport consultants and the CCT officials will confirm the preferred alignment of this route.

- Option 3: Access via Lucullus Road extension

Access via the Lucullus Road extension is the preferred initial route. Joint funding from Bella Riva and the CWA could possibly be used to construct the road. However, agreements would need to be established between the developers as well as the current landowner to accommodate the existing operations of the chicken farm on the property.

It is envisaged that the phasing of the access will be:

1. Mellish / Lichtenburg (interim main access)

2. Bella Riva Class 3

3. Lucullus Road

Terms of Reference:

The updated Transport Scoping report stated that "*per the CCT requirements, the scope of the full/phased TIA needs to be based on the 1995 Department of Transport (DoT) Manual for Traffic Impact Studies (DoT, 1995). Defining the study area based on this manual is provided below. The final study intersection will be confirmed with the CCT prior to the development of the full TIA*." Phased road infrastructure and intersection control types and lane configurations will be assessed as part of the full TIA.

The latest Transport Scoping report also stated that "*Due to the nature of the development as well as all the other major developments in the area, an area-wide master plan approach is proposed whereby all parties are involved in the planning and concomitant implementation of the necessary transport infrastructure to accommodate the development growth in the area*."

The following issues raised during the pre-application Scoping Phase PPP were considered: Airport Access, traffic congestion and infrastructure constraints; Challenges for transporting livestock and accessing farming facilities; Alteration of traffic patterns during construction; Increased security risks associated with increased pedestrian and vehicular traffic; Traffic-related fauna collisions; Pedestrian, motorist, and animal safety; Safety concerns with roads and children; Noise and air pollution from increased traffic; Disruption of the rural environment; Degradation of existing roads.

The following issues raised during the in-process Scoping Phase PPP were considered:

Increased traffic volumes; existing infrastructure constraints; increase in congestion; longer commute times; road degradation; uncertainty with regards to future road developments and transport services are required by the airport; noise associated with increased heavy vehicle traffic.

<u>Methodology:</u>

The trip generation rates for the commercial airport traffic were derived from data collected at Cape Town International Airport (CTIA). Cordon counts were conducted at 10 locations around the CTIA to determine the number of vehicles entering and exiting through the various access points.

Based on these cordon counts, the following **peak-hour rates** were identified:

• Weekday AM Peak Hour: 136.34 trips per million annual airline passengers

• Weekday PM Peak Hour: 253.64 trips per million annual airline passengers

A Daily Conversion Factor of 13.15 was derived from the 24-hour profile at the CTIA Airport Approach Road counting station for the airport traffic. A **daily trip rate of 3335.51 trips per million annual airline passengers** was determined.

To determine the **vehicular trip generation rates**, the supplemental land uses for the airport were categorised based on the land use classifications in COTO TMH 17, with a GLA factor of 0.85 was applied to the office and retail land uses, and a GLA factor of 1.00 applied to the warehouse land uses.

Daily vehicle trip estimates for airport operations for the 2032 and 2050 horizon years are provided were estimated as 13 205 trips for 2032 and 24 172 trips for 2050.

Peak hour vehicle trip estimates for the operations of the airport for the 2032 and 2050 horizon years:

- 2032 Horizon:

o Weekday AM peak hour: 601 total (467 in / 134 out)

o Weekday PM peak hour: 1 199 total (659 in / 540 out)

- 2050 Horizon:

o Weekday AM peak hour: 1 314 total (1 004 in / 310 out)

o Weekday PM peak hour: 2 228 total (1 151 in / 1 077 out)

The **estimated trip distribution for the CWA** follows similar origin and destination patterns as the

CTIA. Therefore, the following trip distribution was considered for Phase 1 (PAL 1B) of the CWA:

- 10% north along Klipheuwel Road
- 30% east along Lichtenburg Road
- 55% south along Klipheuwel Road
- 5% along Okavango Road

The **public transport split for the CWA** is expected to be similar to that of the CTIA with approximately 30% of air passengers and airport staff use public transport options, including scheduled bus services, MBTs, metered taxis, and e-hailing services.

Prior discussions regarding **cargo** indicated that operations will be on the site east of the runway. Access from the external road can be provided along Lichtenburg Road in accordance with the access management plan and aligned with the future Greenville development. Any movement of cargo between the east and west of the site will be done internally via internal access roads. WCG will not accept movement along Lichtenburg Road. Recent proposals exclude development on the east of the runway and the accommodation of linking the east and west of the site for transport of people and goods is therefore not application.

The CTIA makes provision for 682 **parking bays** per million annual passengers based on 2019 surveys done by ITS. Based on the CTIA parking provision, 1 705 parking bays should be provided for Phase 1 (PAL 1B) based on the projected 2.5 million annual passengers.

An 8-year (2032) and 26-year (2050) horizon year was assessed for the CWA, which aligns with the CWA Phase 1 (PAL 1B) projections of 2.5 million annual passengers by 2032 and Phase 2 (PAL 4) projections of 5.2 million annual passengers by 2050.

8.14.2 Assessment of Impacts: Construction Phase

If it is assumed that all earthworks for the CWA construction will be sourced from existing quarries, mostly located West of the site, initial estimates indicate that approximately 875 000m³ of earthworks will be required for construction (worst-case scenario). With a truck capacity of 15m³, this equates to approximately 58 167 truckloads. However, most of the earthworks will be done onsite to balance cut and fill areas. The quarries can be accessed either via the existing surfaced road network or the gravel road network.

Note: the final quantities for earthworks will depend on the results of the geotechnical investigation for the CWA site, and initial estimates presented may change based on these findings.

Further to the above, noise from trucks and dust caused from movement of vehicles on site have also been identified and assessed, with suitable mitigation proposed (refer Noise Impact Assessment – section 8.5 of this report and Air Quality Impact Assessment – section 8.4 of this report).

8.14.3 Proposed Mitigation Construction Phase

- Due to the poor condition of the gravel roads and the heavy loads expected, it is recommended that trucks use the surfaced road network.
- A detailed construction management plan must be developed for the CWA, ensuring that deliveries are scheduled outside peak hours to prevent congestion during peak periods.

8.14.4 Proposed Mitigation Operational Phase

The following has been proposed as part of future design of the road network in and around CWA:

- Based on the estimated trip generation and multiple access points, single-lane roads with dedicated turning lanes should be able to accommodate the vehicle demand. However, it is suggested that multi-lane roads be constructed for the main public circulation route for more ideal vehicular flow. The planning of road reserve will make allowance for dualling when necessary.
- Public transport services should be scoped to link the CWA with planned and existing services. Bus stops should be provided near the terminal buildings. Once the Fisantekraal commuter rail service is in operation, a shuttle service between the CWA and the rail station should be established. Such service will be demand driven and phased with the future development of the CWA. The details of public transport facilities for the CWA will be finalised at a later stage. However, provision for these facilities must be included in the finalisation of the SDP.
- All public roads need to be designed to accommodate pedestrian and bicycle movements. Detailed of which can only be more refined upon development and finalisation of a refined master plan SDP.
- There is the possibility of linking the cargo to the rail. However, this will depend on the regional freight movement along the rail network/infrastructure and the type of cargo and its destinations. These discussions will continue with the refinement of the layouts.
- In concept, the site will be separated by primary and secondary roads. A separate one-way system for drop and go’s and access to the parkades are envisioned. These routes also need

to be linked with dedicated public transport services. Separate access points and circulation will be identified for the supplemental uses.

- The main internal roads would ultimately have 2 lanes per direction. However, construction could be phased and only a single lane per direction would be required if vehicle demand does not warrant dual carriageways or significant turning movements. Controlled access points to restricted areas need to be identified. Space for U-turns in from of any controlled access points should be provided.
- The main road circulating adjacent to the terminals and parking area should include dedicated public transport, e-hailing and passenger vehicle stop and go zones. Details of this can be finalised with refined of the SDP and terminal layout requirements.
- The parking provision for any future phases of the CWA can established based on actual parking demand based on the 2032 scenario. Provision of parking within the FBO and hanger restricted areas can be based on the projected number of employees, number of hanger spaces and specific tenant requirements.
- The following upgrades are recommended Phase 1 (PAL 1B) of the CWA:

a) Lichtenburg Road/Mellish Road:
    - Southbound – Construct two dedicated right-turn lanes and a dedicated left-turn lane.
    - Eastbound – Construct a dedicated left-turn lane.
    - Westbound – Construct an additional through lane and a dedicated right-turn lane.
    - Intersection control – Install a traffic signal.

b) East-West Link/CWA Access:
    - Intersection control – Construct a dual-lane roundabout.

- Based on the 2032 (Phase 1) capacity analysis results, the priority-controlled intersections along Klipheuwel Road and Lichtenburg Road will continue to experience capacity constraints. However, alternative routes are available via the signalised Darwin Road and Dulah Omar Street intersections.
- The Klipheuwel Road/Olifantsrivier Avenue intersection is also expected to operate at capacity during the PM peak hour according to the 2032 capacity analysis. However, these vehicles can be redistributed as there is still sufficient capacity available at the Klipheuwel Road/Okavango Road intersection.
- The results of the 2032 capacity analysis indicate that the proposed upgrades for the 2032 Total Traffic Conditions scenario will be sufficient to accommodate Phase 1 (PAL 1B) of the CWA.
- The 2050 (Phase 2) capacity EMME model results showed that the future road network will be capable of supporting future developments in the area, including Phase 2 (PAL 4) of the CWA. It is, however, recommended that an updated TIA be prepared after 2032 for each PAL once new SDPs are available and the latest traffic conditions can be assessed closer to the time.
- Development charges (DCs) were estimated for the CWA and future developments in the area to determine the available funds for the proposed upgrading of the road network for the 2050 scenario. When comparing the cost of the road upgrades with the available DCs, there is a shortfall of R42 900 000. This shortfall can be covered by further future developments in the area, such as the Darwin Housing or Lucullus Gardens developments, which are already in the application process. The costs of upgrading the road network should be divided and phased

among the various developments to ensure that the road network can accommodate their development as they progress.

- 2024 Existing Traffic Conditions – Most of the study intersections currently operate at an acceptable LOS during peak hours. However, several intersections, including Klipheuwel Road/Lichtenburg Road, Lichtenburg Road/Boys Biers Drive, and Klipheuwel Road/Arum Lily Street, experience significant delays (LOS F) during peak periods. Upgrades are recommended for Klipheuwel Road/Lichtenburg Road, including the installation of a traffic signal and additional turn lanes, which are expected to improve the LOS to B. Planned future developments and access management plans (AMPs) for Lichtenburg Road (MR213) and Klipheuwel Road (MR188) include changes to intersection configurations and realignments, which are expected to reduce demand at some constrained intersections. Given these future plans, no further upgrades are recommended for the remaining intersections. Upgrades are recommended as part of the Background Traffic Conditions scenario and mitigation of these intersections will be done by these background developments.
- Background Traffic Conditions – Given the multiple developments planned in the area, over 8 000 background development trips will be added to the road network during the PM peak hour. This increase in traffic will trigger the need for road upgrades, especially along Klipheuwel and Lichtenburg Roads. The proposed upgrades include the dualling of Klipheuwel Road between Brackenfell Boulevard and Lichtenburg Road, the installation of traffic signals at several intersections, and the construction of additional turning lanes. The Klipheuwel Road/Arum Lily Street intersection will be converted to a left-in, left-out (LILO) configuration as part of their access management plan (AMP). With proposed upgrades in place, capacity constraints are expected at some priority-controlled intersections. However, alternative routes via signalised intersections such as Klipheuwel Road/Darwin Road and Lichtenburg Road/Dulah Omar Street will help alleviate traffic congestion.
- Proposed Access Phasing:

1. Mellish Road will be the initial connection from Lichtenburg.

2. The East-West link to Klipheuwel Road when Bella Riva constructs this. CWA to engage with Bella Riva landowner/developer to establish if feasible to build Lucullus Road extension and/or the East-West Class 3 road. The East-West Class 3 at this stage is the most likely to come first.

3. The ultimate link will be via the northern extension of Lucullus Road once the EIA process has been completed. The alignment and road reserve requirements of Lucullus Road bordering the west edge of the site must be confirmed.

- 2032 Total Traffic Conditions – This scenario assessed the impact of Phase 1 (PAL 1B) of the CWA the realigned Mellish Road access and the East-West link from Bella Riva as a secondary access. The proposed upgrades include the installation of a traffic signal at Lichtenburg Road/Mellish Road and the construction of a dual-lane roundabout at the East-West Link/CWA Access intersection. As with the 2032 Background Traffic Conditions, capacity constraints are expected to continue at the priority-controlled intersections along Klipheuwel and Lichtenburg Roads. However, alternative routes via signalised intersections on Klipheuwel Road/Darwin Road and Lichtenburg Road/Dulah Omar Street will help alleviate congestion. Additionally, the Klipheuwel Road/Olifantsrivier Avenue intersection is expected to reach capacity during the PM peak hour. This traffic can be redistributed to the Klipheuwel Road/Okavango Road intersection, which has sufficient capacity.

- 2032 Sensitivity Analysis –The capacity analysis results show that the proposed upgrades in the 2032 Total Traffic Conditions scenario will be sufficient to accommodate the traffic generated by Phase 1 (PAL 1B). Mellish Road is therefore the only access required to accommodate the CWA Phase 1 (PAL 1B) traffic. It is, however, recommended that the East-West link across Bella Riva Phase 1 be extended to the airport by CWA when the road reserve available.
- The future developments will require several upgrades to be implemented as more than 8 000 peak-hour trips will be added to the road network. The construction of the R300 northern extension, along with new road links such as the Darwin Road extension and extensions of Lucullus Road and the East-West links, is expected to reduce the demand at some of the study intersections. Therefore, it is recommended that the construction of these road links be fast tracked to ensure that the intersection upgrades are not abortive in the future.
- Based on the TIA, it is evident that the impact of the CWA will be relatively low compared to the other future developments in the area. Hence, it is recommended that Phase 1 (PAL 1B) of the CWA be approved from a transport point of view, and that an updated TIA be prepared for the future phases of the CWA.

Should the above be implemented, the impact of Phase 1 will be LOW. Prior to the implementation of Phase 2 a revised Traffic Impact Assessment needs to be undertaken.

8.15 Potential Climate Change Impacts

8.15.1 Introduction, Terms of Reference and Methodology

The regulatory framework and the legal provisions related to climate change in South Africa are still in the process of being developed. For the Climate Change Impact Assessment, the guidelines provided in the '*Draft National Guideline for Consideration of Climate Change Implications in Applications for Environmental Authorisation, Atmospheric Emission Licenses and Waste management Licenses*' together with insight gained from the Thabametsi case should be used as a basis for developing the required specialist report. The Thabametsi case is currently seen as South Africa's legal precedent pertaining to climate change assessments. Considering the Thabametsi judgement, Climate Change Impact Assessments, as part of the environmental authorisation process, must now follow a two-pronged approach, in line with international best-practice, assessing both:

(a) The impact of the project on climate change; and

(b) The resilience of the project in terms of climate change.

The proposed scope for the CCIA included:

- Review of the relevant international agreements and national, provincial and local frameworks, protocols and strategies pertaining to climate change in South Africa,
- Determination of the impact of the project on climate change:
    - Conduct a GHG inventory for the construction and operation phases of the project;

  - Conduct an analysis of the GHG inventory regarding the impact of the project on climate change;
  - Compare the GHG emissions associated with the value chain of the project (scope 3 emissions) against South Africa's current baseline with consideration of the future baseline and implications for the national emissions budget;
  - Describe the existing climate conditions and future climate change scenarios of the local area to inform the EIA;
  - Conduct an impact assessment of the project which includes the cumulative impacts of climate change in relation to the project; and
  - Propose mitigation and adaptation measures to minimise the impacts of the project on climate change.
- Determine the impact of climate change on the project:
  - Conduct an analysis of the projected climate change impacts for the region in which the project will be located;
  - Determine the processes and associated infrastructure of the proposed project that will be affected by climate change, and the potential magnitude of the impacts (e.g. climate related emergencies as they relate to the operation of flights etc.);
  - Determine impacts on the upstream value chain;
  - Propose mitigation and adaptation measures to minimise the impacts of climate change on the proposed development.
- Determine possible mitigation and adaptation measures to reduce the projects impact on climate change and improve its resilience to climate change.

The following issues raised during the pre-application Scoping Phase PPP have been considered: The alteration and disturbance caused by airport construction and the ability of wetlands to adapt to climate change; Alignment with the national and provincial vision and strategies of climate change; Inclusion of a Climate Change Impact Assessment in the plan of study; Inadequate assessment of CWA climate impacts; Increased greenhouse gas emissions and associated climate sanctions; Private jet amplification of climate change and social inequality; Scope-3 emissions - "Social Cost of Carbon".

The following issues raised during the in-process Scoping Phase PPP have been considered: Carbon emissions related to more frequent flights; inadequate assessment of CWA climate change impacts.

<u>Methodology in determining the project's impact on climate change:</u>

The GHG Protocol's Corporate Accounting and Reporting Standard (GHG Protocol, 2024) is an internationally recognised standard for calculating and reporting GHG emissions for corporate and public entities on a voluntary basis, i.e., non-compliance reporting. It provides guidance on defining operational and organisational boundaries (such as determining which activities and GHG emission sources to include), methods for calculating emissions to create a GHG emissions footprint, and procedures for reporting emissions. The GHG Protocol's standards cover seven GHGs - Carbon Dioxide (CO_2), Methane (CH_4), Nitrous Oxide (N_2O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), Sulphur hexafluorides (SF_6) and Nitrogen trifluorides (NF_3). The GHG Protocol categorises the different GHG emissions produced by a company during its operations and from its wider value chain into three "Scopes": 1- Direct emission; 2- Indirect emissions, 3- Value chain emissions. The GHG Protocol guidelines follow the general procedure of setting the boundary of the project, identifying

GHG emission sources, collecting activity data and then using emission factors to calculate the various GHG emissions.

Assumptions and Limitations in Quantifying GHG Emissions:

The accuracy of the carbon footprint calculation in this study is inherently dependent on the quality and scope of the data collected. As with any analysis, certain assumptions had to be made to fill gaps where data might be incomplete, unavailable, or estimated. These assumptions aim to standardise the methodology and ensure consistency throughout the study, but they also introduce limitations that should be acknowledged.

A) Baseline Assumptions:

The current airport site is undeveloped with minimal activity occurring relating to flight training, recreational training, private charter and unscheduled general aviation. The related emissions are therefore marginal compared to the construction and operations phase. Within this context, the following assumptions were made due to limited data availability -

- The litres of diesel burnt on site were assumed from the approximate number of times the truck's tank is filled up per month (Brundtland Questionnaire, 2024).
- As related activities during the year are relatively stable, the electricity consumption for the baseline phase was assumed to be constant each month over a one-year period and was calculated from the provided electricity statement for one month (CWA Electrical Bill, 2024).
- Due to very low activity levels, the waste generated onsite is minimal and therefore it was assumed that the related emissions would be negligible and not material (Brundtland Questionnaire).
- The emissions from business travel were estimated based on the cost of flights undertaken by CWA staff (Brundtland Questionnaire, 2024).
- The emissions for employee commuting (20 employees in total) were based on a round-trip average travel distance of 57.4km to the neighbouring towns in the area and that employees work onsite daily (Brundtland Questionnaire, 2024 and Google Maps, 2024).

B) Construction Phase Assumptions:

- The calculation of emissions related to the bulk earthworks was limited Scope 3 – category 1. The total areas requiring bulk earthworks was stated in the capital expenditure (Capex) sheets provided. These earthworks account for the site preparation up to the ground level and include clearance for runway laying, road layout and stormwater infrastructure and cabling. The choice of emission factor used accounts for the energy inputs required for the earthmoving equipment (Emission Factor Database for Construction, 2024).
- The Scope 3 – Category 1 emission for steel purchases only accounts for steel fencing mentioned in the Capex report. The length of the fence was obtained in the Capex sheet. A sample fence from First Fence was used to determine the weight of steel per meter of 21.44 kg, which was then used to calculate emissions using the CO2 Database emission factor which accounts for embedded emissions.
- The Scope 3 – Category 1emissions for plastic purchases was limited to water management pipes and major telecommunications cables. The type and specification of these were obtained from the Capex report where only the outer diameter and length was provided. The inner diameter was found through standard pipe dimensions retrieved online (Plastic Pipe

Shop, 2024). The weight required was determined using a Pipe Weight Calculator (Omni Calculator, 2024).

- The Scope 3 – category 1 emissions related to purchasing asphalt was determined using the depth and area of asphalt used stated in the Capex sheet and the corresponding weight was assumed using the PAVEPRO Asphalt calculator.
- The calculation for Scope 3 – category 1 emissions from concrete use is limited to the concrete used in earthworks, runways and stormwater infrastructure. The weight of this concrete was determined using the concrete calculator from Calculator.net. For the concrete pipes, only the outer diameter was given in the Capex sheet, so typical concrete pipe sizes found online were assumed as standard. The specification of manhole covers provided online by Cementile Group were assumed as standard.
- Building function was allocated according to the SDP linear coordinates document. The area was provided in the document, and 70% of this area is assumed to be used by buildings (Capex Projects – SDP Linear coordinates, 2024). The average emission factor for buildings was 569 kgCO2/m2.
    - For these buildings, the emissions are divided into construction energy-related emissions (7kgCO2e/m2 for any earth-moving equipment and 27kgCO2e/m2) and embedded construction material emissions (Emission Factor Database for Construction, 2024).
    - Only construction materials that have material associated production emissions were considered, namely concrete, cement, steel and glass. These materials make up 70% of construction material. Other materials may include wood and sand with minimal related emissions, thus considered non-material. Additionally, the emission factors from the CO2 Database based on building type (i.e. commercial buildings, hotels and industrial) were used to account for any additional emissions not considered.
    - Quantities for the above-state materials were estimated from a study under UC Berkly on the Life-cycle Environmental and Economic Management of Airport Infrastructure and Operation (Greer, 2023).
    - For areas that have been denoted for hangar use, the primary material used was assumed to be steel (Airport Hangar Design, 2018).
- The cost of capital goods in the construction phase was stated in the Capex sheet, these include electrical utility infrastructure. Because the weight of these items cannot be determined from the Capex sheet and supplier-specific emission factors are not available, spend-based emission factors for manufactured goods were used. This was done using the Worldwide Embodied Impacts Journal (Mishina et al, 2021).
- An average of three sources stated that 20% of construction materials purchased become waste products. The required materials to be purchased for construction were assumed to be the main waste items and as such 20% top-up was used considering wastage.

<u>C) Operations Phase Assumptions:</u>

- The fuel consumption for ground servicing equipment and airport activity for the operational phase has not been determined by CWA. For emissions calculations, this data was estimated by benchmarking the average fuel consumption per passenger using information from various airports available in (Heathrow, Sydney, Istanbul, Hong Kong and Malta International Airport Integrated reports, Airports Association South Africa Integrated Report 2023).

- The Master Plan Report compiled by NACO contains the expected volumes of wastewater to be treated per PAL.
- For each PAL, a minimum electricity load of 5 MVA will be supplied to CWA by the national electricity utility, i.e. Eskom. It is assumed that CWA operates at full capacity 24/7.
- It is assumed that the biodigester operates at full capacity for the entire duration of the Project. The Biogas Budget Proposal prepared by Global Energy Biogas (Pty) Ltd details the design of a 1 MW continuous biogas plant. The biogas (predominantly methane) is produced in a biodigester using chicken litter, energy crop and effluent water. The estimated production of biogas and calorific value was provided by the budget proposal It was also assumed that a negligible amount of electricity will be required from the grid for operation of the biodigester.
- The types of ground equipment were based on desktop research regarding what is typically used in existing airports. The number of each type of equipment was estimated based on the average amount needed to service the peak number of flights the airport can handle during each phase of the expansion (Tronair, 2024).
- The emissions from the upstream delivery of chicken manure were based on the average distance of 43km between the airport location and the surrounding poultry farms. This average distance was calculated by measuring the distances between CWA and 10 local poultry farms. The mean of these distances was then assumed to represent the daily travel distance required to meet the biodigester's daily input needs. The upstream emission of the manure was based on the number of chickens required to produce the required quantity of chicken manure (i.e. 30 tonnes) for the biodigester (Global Energy - Biogas Budget Proposal, 2023).
- The predicted waste generated was based on a waste per passenger basis but was not further divided into types of solid waste, thus it was assumed to be commercial and industrial waste (NACO – The Master Plan Report, 2023).
- The emissions from business travel of the operation phase were calculated on the assumption that the money spent is predominantly on flight costs, thus the full amount was allocated to flights. The emissions estimate for business travel was calculated by using the business travel spend from Airports Association South Africa (ACSA, 2023) as a benchmark. The ratio of business travel expenditure to number of employees was used to get the future expected expenditure.
- The emissions from employee travel assumed that employees would come from the stated catchment area of the Master Plan (NACO - The Master Plan Report, 2023), the two-way average distance of 57.4km between these areas and the airport was used in the emission calculation.
- The emissions for the transportation of passengers to and from the airport is determined in the same way as employee commuting, thus the same assumptions apply as above (NACO - The Master Plan Report, 2023).
- The emissions estimates concerning the transportation of cargo to and from the airport were based on the assumption that cargo will originate/be delivered to the catchment areas stated above and that they will be delivered using standard Heavy Goods Vehicles and standard Vans (NACO - The Master Plan Report, 2023).
- The emissions estimate related to the combustion of downstream aviation fuel emissions is based on the fuel required by the airport for sales to airlines according to its Fuel Master Plan

and assumes that all the forecasted fuel usage will be combusted (KANTEY & TEMPLER – Fuel Master Plan, 2022).

Methodology in determining impact of climate change on the project (physical climate risk assessment /PCRA):

The impacts of climate change are likely to increase climate-related vulnerabilities for the CWA. Using public and scientific resources, climate-related hazards were identified, and their potential effects on the project area assessed. here are two categories of climate-related risks. The first are transitional risks, which are related to the transition to a lower carbon economy and the second are physical risks, which are related to the physical impacts of climate change. This section will focus on physical risks. Physical risks that are event based such as extreme weather, floods or fires are classified as acute risks. Alternatively, physical risks associated with longer-term shifts in climate patterns like rising mean temperatures are classified as chronic risks (TCFD, 2017). Physical risks have many implications, often causing damage to assets and supply chain disruptions which affect businesses financially and/or impact the wellbeing and safety of employees.

A comprehensive analysis of climate change impacts specifically relevant to the project region was undertaken. This involved a thorough examination of historical climate data, as well as projections for future climate conditions, considering factors such as temperature changes, precipitation patterns and extreme weather events. Furthermore, the assessment investigated the potential impacts of these climate changes on the proposed projects processes and infrastructure. Material climate hazards were identified, and the associated risks assessed, considering both the likelihood and potential impacts of these hazards on the project site.

Assumptions and Limitations in the PCRA:

The proposed project’s risk to various climate-related hazards is assessed in this report through the analysis of available data sets. This physical climate risk analysis is subject to the following assumptions and limitations:

- Impacts solely related to the direct value chain of the proposed project were assessed.
- No modelling was conducted on the impacts of hazards identified, or the future timelines thereof.
- Only impacts anticipated to occur during the lifetime of the proposed project were assessed.
- Historical climate data and future climate projections at a regional level were utilised and assumed to be representative of the site.
- It is assumed that all information provided by the EAP is accurate and factual.
- It is assumed that the information gathered from online resources is accurate and factual.
- The outputs of the climate change models used are limited spatially and temporal.

8.15.3 Assessment of Impacts: Impact of the project on Climate Change

Baseline Phase Emissions

The current airport site is undeveloped with minimal activity occurring. The current site has an estimated carbon footprint of 647tCO_2e each year.

Construction Phase Emissions

Construction emissions were estimated at a high level, capturing the most significant material emission sources. It is estimated that the construction phase will produce approximately 326 662tCO_2e.

Scope 3 Category 1 - Purchased Goods contains the most significant GHG emissions, including the usage of cement, steel, asphalt, and plastic for the development of roads, runways, and stormwater infrastructure. These emissions arise from the fuel and energy use of on-site machinery, such as cranes, bulldozers, rollers, excavators, tractors, and dumpers. Emissions from building construction were estimated based on the embedded material emissions from common construction materials like cement, steel, and glass. This estimate also included fuel and energy-related emissions per square meter, accounting for material transport and earthworks, sourced from the CO_2 Database. Emissions related to electrical infrastructure were estimated using spend-based information. Employee commuting emissions for construction workers have been determined based on the estimated number of direct jobs the construction is expected to create.

Operational Phase Emissions

Emissions for the operational phase have been determined per PAL to project emissions up to 2050. The assumption is that by 2050, CWA will have fully implemented renewable technologies and mitigated any hard-to-abate emissions through offsetting. In relation to electricity needs CWA will still be reliant on grid electricity of up to 5MVA of the total electrical requirements despite the implementation of renewable energy initiatives (Solar PV, Biodigester, wind energy), so the project will not be optimally running off the grid. The biodigester uses renewable biomass (e.g., energy crops and chicken manure), making its emissions climate-neutral. For direct emissions, it is assumed that ground servicing equipment and on-site vehicles use combustion engines, but with the potential investment in electric vehicles, which could further reduce Scope 1 emissions by 8% (5350tCO_2e). Additional Scope 1 emissions arise from the operation of the wastewater treatment plant. Over 60% of emissions from wastewater treatment plants are direct process emissions, with the remainder related to energy use. Methane (CH_4) and nitrous oxide (N_2O) are the primary GHG's emitted during treatment depending on the process type.

1.1.1 The majority of emissions during the operational phase result from downstream (Scope 3) emissions, with Scope 3 Category 11 – Use of Sold Products as the largest contributor, estimated at 3.8milliontCO_2e. This category includes emissions related to passenger movement, cargo movement, and aircraft operations. The primary source of Scope 3 emissions is aeroplane movements, projected to reach 3.15 milliontCO$_2$e by 2050, representing 79% of total Scope 3 emissions. Only domestic aviation emissions of 1.5milliontCO$_2$e will be accounted for in the GHG impact assessment on the South African national inventory, in accordance with the determination of sectoral emissions in South Africa. Category 7 – Employee Commuting accounts for 4% of Scope 3 emissions, followed by Category 5 – Waste Generated in Operations.

Total Carbon Footprint

The carbon footprint of the CWA expansion project is determined by calculating the direct and indirect emissions associated with the construction and future operation. The carbon footprint is presented in Table 114. It is expected that the Project Scope 1 emissions produced up to 2050 is 5350tCO$_2$e. Due to the design plans indicating self-sufficiency using a solar plant, biogas to electricity facility and a battery system, no Scope 2 emissions have been included. The total footprint of the project (construction and operation) is approximately 4.3 milliontCO$_2$e. Scope 1 emissions for the operations phase contribute 0.12% and the value chain emissions from construction contribute approximately 8%, and from the operational phase 92%.

Table 114: Carbon Footprint of CWA Expansion Project up to 2050 (Brundtland, Sept 2024)

Project Phase	**Direct Scope 1 & 2 Emissions (tCO$_2$e)**	**Indirect Scope 3 Emissions (tCO$_2$e)**	**Total Emission (tCO$_2$e)**
Construction Phase	0	326 662	326 662
Operation Phase	1 022 824	3 981 946	**5 004 769**
Total	**1 022 824**	**4 308 608**	**5 331 431**

The emissions trajectory for the operations of the airport is shown in Figure 167. In terms of the impact on South Africa the carbon footprint would be 3.35milliontCO$_2$e as emissions from international aviation are excluded from the National Inventory. 1.7milliontCO$_2$e emissions is associated with international aviation flights. The average annual impact from the operation of the CWA expansion project is estimated to be 217 599tCO$_2$e per annum.

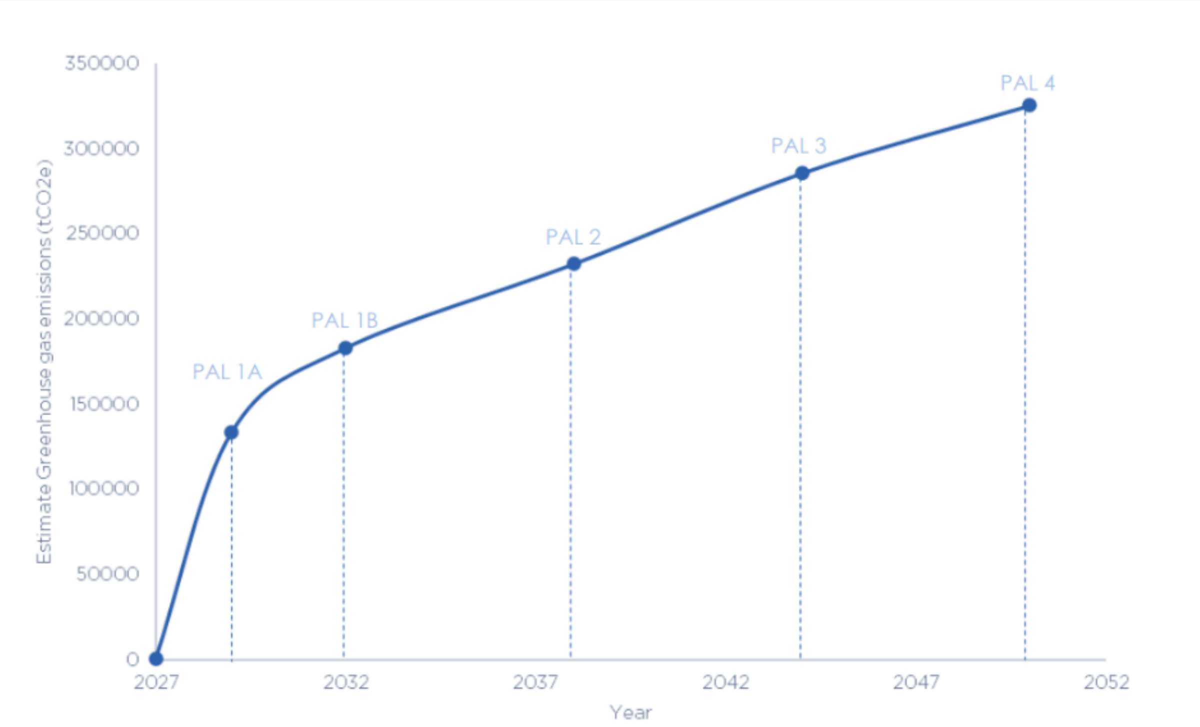

Figure 167: GHG emissions trajectory for the CWA expansion project (Brundtland, Sept 2024)

IMPACT OF THE PROJECT ON BOTH SOUTH AFRICAN AND GLOBAL INVENTORIES

It is crucial to differentiate where emissions occur. It can be reasonably assumed that the manufacture of all construction materials and the direct emissions during the operations phase would occur within the boundaries of South Africa. International aviation emissions, categorised under indirect emissions, would not be included, as these are monitored by ICAO and not included in the national inventory. For this reason, the total calculated emissions for the expansion project only including domestic aviation amount to 3.68milliontCO$_2$e. The CWA calculated emissions inventory as a portion of the global budget is presented in Table 115.

Table 115: Impact of Project emissions on national carbon budget (Brundtland, Sept 2024)

	Contribution to National Carbon Budget (%)	**Impact on National Carbon Budget**
Total Scope 1+2 emissions (up to 2050)	0.027	Low-Medium
Cape Winelands Expansion Project Total emissions (up to 2050)	0.097	Medium

	Contribution to National Carbon Budget (%)	Impact on National Carbon Budget
Total Scope 1+2 emissions (up to 2050)	0.027	Low-Medium
Cape Winelands Expansion Project Total emissions (up to 2050)	0.097	Medium

The direct operation of the CWA would have a **low-medium impact** due to the planned sustainability measures of the Project. The total project emissions including value chain emissions would have a **medium impact** on the National Carbon budget due to the significant contribution of Scope 3 emissions to the Project's overall footprint.

The major contributor to Scope 3 emissions, are emissions from domestic aviation, representing 44% of total emissions. The impact of emissions from domestic aviation should be considered in light of the regulatory and legislative instruments in place or under development to deal with emissions from domestic aviation, namely the Carbon Tax and the mandatory carbon budgets allocation under the Climate Change Act. As the regulatory environment and framework is designed to deal with these Scope 3 emissions from domestic aviation, a reduction in emissions can be expected as the year 2050 approaches.

The potential of the CWA project to mitigate some of the future growth-induced emissions such as improved Infrastructure, which would result in more efficient operations, potentially reducing overall energy consumption per passenger and sustainability practises if effectively implemented, could help limit the growth of Scope 3 emissions associated with the airport's operations. It's important to consider that the Scope 3 emissions are largely due to domestic and international aviation. In the context of aviation, a distinction is made between airport operator and airline operator, the deciding factor hinges on the classification of the activity according to the IPCC Guidelines and the National Greenhouse Gas Emission Reporting (NGER) regulations of the Department of Environment, Forestry and Fisheries (DEFF). Domestic aviation, categorized under IPCC code 1A3a, is subject to carbon tax and future carbon budget regulations. The nationality of the airline and the registration of the aircraft are irrelevant for tax purposes; however, domestic law mandates that entities conducting domestic aviation must have a significant legal presence in the Republic, and aircraft used for domestic flights must be registered within the Republic. This ensures that all domestic aviation activities comply with national regulations controlling emissions.

As imposed by ICOA, all flights must carry additional reserve fuel in the event of diversion to an alternate airport in the case of emergencies or unexpected events. Carrying excess fuel places a weight burden on airline/aircraft operators, leading to increased emissions and operational costs for airlines. Currently, flights may divert to OR Tambo International airport (1 270km away) or Port Elizabeth International Airport (747km away). CWA on the other hand is 25km away from CTIA and as a closer alternative would significantly reduce excess fuels required in the event of diversion. By using CWA as an alternative airline could reduce the GHG emissions resulting from diversion by 3-5% (CWA Diversion Airport Analysis Summary Report, 2022). This would directly contribute to combating climate change and aligning with sustainable aviation goals. Additionally, airlines can optimise their operations by carrying less fuel on flights resulting in lower operating costs and passing the savings from freed up weight to lowering airfare and increasing cargo capacity.

OVERALL IMPACT OF PROJECT ON CLIMATE CHANGE

a) Nature – the GHG emissions resulting from the construction and operation of the CWA will contribute to global anthropogenic climate change. However, the expected changes in global climate cannot be specifically linked to the GHG emissions of a specific emission source or individual emitter. Direct emissions resulting from fuel combustion and wastewater treatment are expected. There are specific indirect emissions associated with the operation/value chain of the airport such as waste generation, employee commute, passenger commute and aviation. The emissions taken into consideration are those which occur within the boundaries of South Africa (i.e., international aviation is excluded). The estimated emission from the airport is estimated to be 3.68milliontCO$_2$e, approximately 0.097% of the South African budget of 3 380MtCO$_2$e. The value of 3.68million is high to the national budget. As illustrated in Table 116 the significance of the environmental impact criteria was determined to be **medium**.

Table 116: Evaluation of environmental impact criteria (Brundtland, Sept 2024)

	1	2	3	4	5
Extent (E)	Local	Regional	National	International	Global
Duration (D)	Very Short (0 – 1 years)	Short (2 – 5 years)	Medium (5 – 15 years)	Long (>15 years)	Permanent
Magnitude (M)	Very low	low	Medium	High	Very High
Probability (P)	Very Improbable	Improbable	Probable	Highly Probable	Definite

b) Mitigation - CWA proposes many measures to mitigate its carbon footprint. Particularly, mitigation measures such as adopting a 100% renewable electricity policy, wastewater treatment plant technologies with limited GHG emissions and measures around waste disposal have been proposed. These mitigation options will not be able to alter the impact that the GHG emissions will have on climate change in terms of their extent, duration or probability. It is only the magnitude of the GHG emissions impact that can be reduced by reducing the quantity of GHG emissions.

8.15.4 Assessment of Impacts: Impact of Climate Change on the project

According to the Global Facility for Disaster Reduction and Recovery (GFDRR, 2019), the Cape Winelands District Municipality (CWDM) where the CWA site is located, is vulnerable to hazards including wildfires, landslides, water scarcity, extreme heat, river floods and urban floods. The baseline air quality report (DDA Environmental Engineers, 2022) concludes that air quality in the vicinity of CWA is considered good with low concentrations of relevant air pollutants derived from airport operations. Therefore, air quality itself is not expected to be a significant climate hazard.

However, potential implications of hazards such as wildfires and heatwaves on air quality at the site are discussed. The identified hazards can be considered acute physical climate risks, since they are events based in nature. How the above-mentioned hazards might impact the proposed project, and on what time scale are detailed in the tables 106 to 110.

The climate projections for the Western Cape were obtained from The World Bank Group (2021), which are informed by Coupled Model Intercomparison Project Phase 6 (CMIP6) database as shown in Figure 168 and Figure 169. CMIP6 data formed the basis of the IPCC's sixth assessment report. Five shared socioeconomic pathways (SSPs) are considered. SSPs are various climate change scenarios of anticipated global socioeconomic changes up to the year 2100, defined by the IPCC Sixth Assessment Report on climate change in 2021. They are used to derive different greenhouse gas emission scenarios under various climate policies (IPCC, 2021). SSP1-1.9 represents a stringent mitigation scenario, while SSP5-8.5 represents a very high warming scenario. It should be noted that current climate tools available in South Africa only provide for information at provincial level. As such, the Western Cape context described and considered relevant to the proposed site.

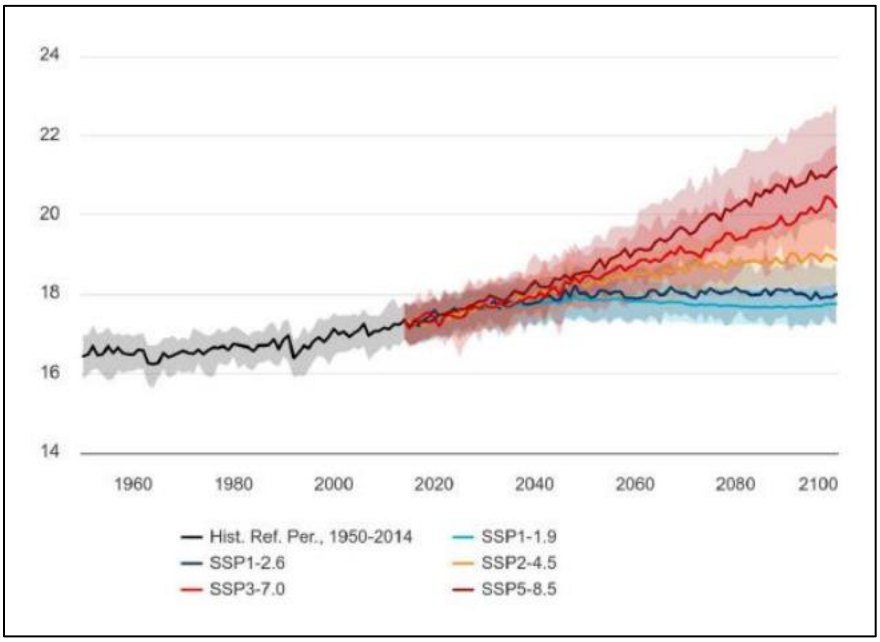

Figure 168: Projected mean temperature for the Western Cape with reference period 1995 – 2014 (The World Bank Group, 2021) (Brundtland, Sept 2024)

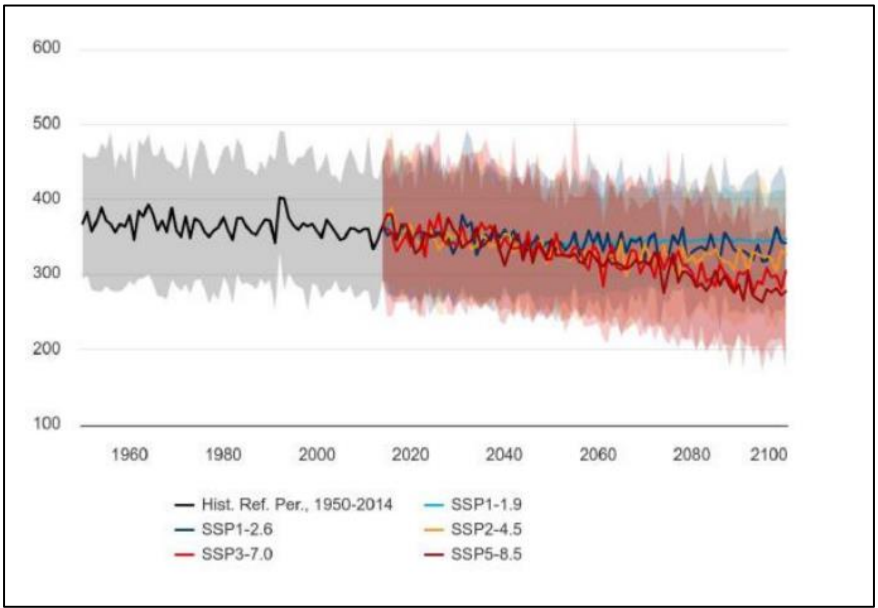

Figure 169: Projected precipitation for the Western Cape with reference period 1995 - 2014) (The World bank Group, 2021) (Brundtland, Sept 2024)

According to Figure 168, mean annual temperatures in the Western Cape are projected to increase under all SSPs. Increased temperatures are expected in all seasons (The World Bank Group, 2021). Based on Figure 169, a slight decreasing trend for future precipitation in the Western Cape is apparent, however substantial multiyear fluctuations are predicted for future scenarios.

A) Risk of Wildfires

The CWA site is situated in a region where climate and fire prone vegetation (fynbos and renosterveld) increase the risk of fires (CSIR, 2023), linked to increased temperatures and greater rainfall variability expected for the area.

Table 117: Risk of Wildfires (Brundtland, Sept 2024)

Impact	**Description of hazard**
Health and safety	• Fires may lead to injuries/hospitalisations/loss of life. • Increased smoke and ember storms may lead to injuries and hospitalisations. • Compromised food (i.e., due to crop loss) and water supplies may affect the nutrition and wellbeing of personnel. • Wildfires can impact air quality by increasing emissions of particulate matter and ozone precursors, posing a risk to human health (Fann et al., 2016).
Impact	**Description of hazard**

Operational and value chain	• Damage and/or loss of property and infrastructure due to fire, strong winds and/or lifted debris. • Smoke from wildfires can travel long distances, and reduced visibility may impact the efficiency of air traffic operations, that could lead to economic losses. • Electricity generation may be disrupted, which could halt operations. The site is currently supplied by Eskom. Sustainable energy sources including a bio-digestor plant and photo-voltaic power supplies (solar PV) are being considered to meet electricity requirements above 5 MVA. The accessibility of the airport may be reduced impacting goods and service delivery, arrival of staff/personnel and passengers. This could halt/delay operations leading to economic losses.

B) Risk of Landslides

Due to rainfall patterns, terrain slope, geology, soil and land cover, the site locality is considered susceptible to landslides, however this hazard does not occur often and is more common in areas with steep slopes.

Table 118: Risks of Landslides (Brundtland, Sept 2024)

Impact	Description of hazard
Health and safety	• Landslides may lead to injuries/hospitalisations/loss of life in affected areas. • Compromised food (i.e., due to crop loss) and water supplies in affected areas may impact the nutrition and wellbeing of staff/personnel.
Operational and Value Chain:	• Landslides may lead to damage and/or loss of property and infrastructure in affected areas. • The accessibility of the airport may be reduced impacting goods and service delivery, arrival of staff/personnel and passengers. This could halt/delay operations leading to economic losses.

C) Risk of Water Scarcity

The risk of water scarcity to the region is considered **medium** by the GFDRR (2019). This is due to the potential increase in "drought tendency", and "physical area of drought" projected for the region, which will impact water scarcity. According to the GFDRR (2019), there is up to a 20% chance that droughts will occur in the next 10 years. Thus, droughts can be expected in the short to medium term. The risk of water stress in the region, defined as "*the ratio of total water demand to available renewable surface water and ground water supplies*" by WRI (2019), is considered **extremely high**. The CWA plans to make use of groundwater at site. According to WRI (2019), groundwater decline in the region is expected to be 0 – 1cm/year and is rated as a **low to medium** risk.

Table 119: Risk of water scarcity (Brundtland, Sept 2024)

Impact	Description of hazard
Health and safety	• Water scarcity may lead to reduced water quantity and quality on site and in adjacent areas which could create human health risks. • Drought conditions can impact food security, leading to the malnutrition of staff/personnel.

Operational and Value Chain	• Airports rely on water during construction, in daily operations, on the airfield and in terminals. Reduced water supply may impact the functioning of airport facilities, and halt/delay operations that could lead to economic losses. • Increases in operational costs may be experienced, if the cost of water increases which may result in reduced profits.

D) Risk of Extreme Heat

The Western Cape is projected to experience increased temperatures and greater numbers of hot days where temperatures exceed 30°C (CSAG, 2022). The risk of extreme heat to the CWDM is considered **medium**, meaning that there is a 25% chance that at least a period of prolonged exposure to extreme heat, causing heat stress, will take place in the following five years (GFDRR, 2019).

Table 120: Risk of extreme heat (Brundtland, Sept 2024)

Impact	Description of hazard
Health and safety	• Heat stress may cause staff/personnel to experience heat related illnesses, dehydration and fatigue, which consequently could impact operations on site. • Compromised food (i.e., due to crop failure) and water supplies due to heat waves may impact the nutrition and wellbeing of staff/personnel. • Heat waves can lead to poor air quality, as increased temperatures can lead to increased ozone concentrations (a key component of smog). Poor air quality poses a risk to human health (Fann et al., 2016).
Operational and Value Chain	• Heat stress may impact the health of the workforce leading to operational delays, that could result in economic losses. • Extreme heat events may lead to equipment failures/malfunctions that could halt/delay operations. • Heat wave can also negatively influence road and rail infrastructure causing transportation delays, that may impact goods and service delivery, arrival of staff/personnel and passengers.

E) Risk of Flooding Events

There are no rivers located within the CWA area, however, the Mosselbank River is located about 1km West of the site and the Klapmuts River is located about 1.1km northeast of the site (FEN Consulting, 2023). According to the flood risk assessment conducted for the CWA expansion (Zutari, 2024), the airport itself is at zero risk of flooding from surrounding rivers due to its elevated position. However, runoff from the site will change with the airport development, and slopes and drainage patterns will change. Thus, flood risks for catchments downstream of the CWA will change. The CWA plans to construct detention ponds as a mitigation measure. According to both the GFDRR (2019) and WRI (2019), the site region is at **low risk of both urban and riverine floods**. This is consistent with modelled predictions for the Western Cape, which show that an increase in temperature and decrease in rainfall can be expected in the future (CSAG, 2022). There is a greater than 1% chance of floods occurring in the coming 10 years (GFDRR, 2019).

Table 121: Risk of flooding events (Brundtland, Sept 2024)

Impact	Description of hazard
Health and safety	• Workplace injuries and potentially loss of life • Compromised food (i.e., due to crop failure) and water supplies due to flooding may impact the nutrition and wellbeing of staff/personnel.
Operational and Value Chain	• Flooding may result in infrastructure and property damage. • Flooding may result is road closures, causing transportation delays, that may impact goods and service delivery, arrival of staff/personnel and passengers.

8.15.5 Mitigation Measures to reduce the impact of Climate Change on the CWA

Mitigation and adaptation measures have been developed to reduce the vulnerability of the CWA to identified climate-related risks. Recommendations for consideration in project design, planning, construction and operation are outlined in Table 122.

Table 122: Recommended mitigation and adaptation measures (Brundtland, Sept 2024)

Risk	Adaption and Mitigation measures
Wildfires	• Identify infrastructure and areas on site that are vulnerable to wildfire risks. • Consider wildfire risks in site design and layout planning and fuel management procedures. • Construct firebreaks in areas vulnerable to wildfires. • To ensure the health and safety of employees, site evacuation and emergency response plans for wildfire events should be implemented. • Ensure backup power systems are available, should the energy supply be disrupted.
Landslides	• Avoid building near steep slopes, close to cliffs or near stream channels and drainage ways. • Plant ground cover on slopes. • If the area is prone to landslides, seek professional evaluation of the site as construction plans may need to consider structures for debris flow diversion or retention. • Ensure multiple transportation routes of entry to and exit from the site in case roadways are damaged.
Water Scarcity	• A water scarcity management plan should be developed to mitigate water scarcity risks. • The CWA should increase water storage, reduce water use and improve water consumption efficiencies. • Ensure that multiple potable water sources are available for the site to alternate between should it be required. • Investigate monitoring and forecasting systems to help predict future periods of drought and enhance preparedness. • Monitor water consumption during drought periods to prevent compromising water availability.

Extreme Heat	• Keep facilities/buildings cool with efficient use of air-conditioning. • Consider building designs appropriate for local climate that are conducive to cooling in summer i.e., consider building orientation, natural shading, and ventilation. • Ensure that equipment and vehicles purchased for use on site can operate under increased ambient temperatures to avoid downtime. • Investigate early warning/monitoring systems to inform the site of expected heat wave occurrences. • Ensure health and safety of employees by regularly monitoring hydration levels, avoiding work hours during the hottest part of the day and providing medical attention/resources to those who are vulnerable.
Urban and Riverine Floods	• Ensure that drainage infrastructure is well maintained. • Ensure infrastructure built on site is resilient to projected flood levels, and that site design and layout planning considers the potential for flooding event on site • To ensure health and safety of employees, site evacuation and emergency response plans for flooding events should be implemented. • Ensure backup power systems are available, should energy supply be disrupted.

In addition to the mitigation proposed in Table 122, CWA has also included a variety of climate change adaptation mitigation measures which are aligned with the City of Cape Town Climate Change Strategy (2021):

Urban cooling and heat responsiveness – The CWA aims to develop buildings appropriate for the local climate that reduce the need for cooling/heating in summer/winter.

Water scarcity and drought readiness – The CWA expansion aims to utilise treated groundwater abstracted from boreholes on site as a short to medium term solution to potable water supply. In the medium to long term, potable water supplied by the City of Cape Town will be added. To treat the ground water to a potable standard, a water treatment facility will be established on site. Non-potable water needs will be met using treated sewage water. Water saving technologies such as rainwater harvesting, water reuse and recycling, efficient irrigation and drought resisted landscaping will be implemented.

Water sensitivity, flood-readiness and storm management – The CWA expansion plans to develop a full stormwater design to accommodate the increase in hardened surfaces and additional stormwater runoff anticipated from buildings. The stormwater design will focus on the prevention of flooding.

Managing fire risk and responsiveness – The CWA expansion plans to implement the placement of fire water tanks on site and include fire protection measures in its building designs. A fire response plan will also be developed. Fire response vehicles and trained fire fighters will be present on site, to ensure fast emergency response times. Fire breaks will also be constructed along the site perimeter and alien vegetation removal will be prioritized to decrease the likelihood of veld fires crossing the site.

Zero emissions buildings - Two sustainable energy options are being considered, including a biodigester plant and photo-voltaic power supplies (solar PV) with optional storage batteries. Ideally, diesel generators will serve as a back-up option in case of unfavourable weather conditions, plant failure or maintenance operations. As mentioned above, the CWA expansion plans to construct buildings that minimise the need to heating and cooling, which will subsequently reduce electricity needs and associated emissions.

Waste generation, management and disposal – waste is expected to be generated from the biodigester, the wastewater treatment plant and from the daily operation of the airport. The design of the wastewater treatment plant should consider best practises for mitigation depending on the technology chosen. i.e., a standard wastewater treatment plant using anaerobic digestion should consider capturing methane generated and use it to provide some of the energy requirements. When drafting the waste management plan, should include aspects such as recycling and composting.

8.15.6 Mitigation Measures to reduce the impact of the project on Climate Change

- Additional Scope 1 emissions arise from the operation of the wastewater treatment plant. These emissions were determined using a DEFRA default value, as the plant's design is not yet finalised. Over 60% of emissions from wastewater treatment plants are direct process emissions, with the remainder related to energy use. Methane (CH_4) and nitrous oxide (N_2O) are the primary GHG’s emitted during treatment depending on the process type.
  Mitigation strategies include energy production from methane in anaerobic systems to reduce fugitive methane emissions and energy consumption and optimising nutrient recovery and control strategies in bioreactors to minimise N_2O emissions.
- CWA aims to be self-sustainable and off-grid in meeting its electricity needs. Consequently, the bulk electrical services report proposes investing in a Solar PV farm with a 20-100MW capacity, incorporating a 1MW biogas generation plant, and planning a lithium-ion backup battery system. The proposed backup diesel generators have a capacity of 8MW. Implementing these developments will reduce reliance on grid electricity. However, CWA will still be reliant on grid electricity of up to 5MVA of the total electrical requirements, the project will not be optimally running off the grid. While emissions from the biodigester have been calculated and included in the operational emissions, it's important to note that the biodigester uses renewable biomass (e.g., energy crops and chicken manure), making its emissions climate-neutral. For direct emissions, it is assumed that ground servicing equipment and on-site vehicles use combustion engines. However, CWA's commitment to sustainability suggests a potential investment in electric vehicles, which could further reduce Scope 1 emissions by 8% (5350tCO_2e).
- Mitigating Scope 3 emissions is challenging, as a significant portion of these emissions are produced by operations outside the control of the airport. However, the project should consider the options to reduce emissions from Category 5, 6, 7 and 11. When developing the waste reduction and management plan, the project developer should consider implementing comprehensive recycling programs for items such as paper, plastic, glass, and metal. Additionally, on-site composting facilities for organic waste disposal should be established, creating job opportunities and promoting sustainability. In employee and passenger, the project should promote the use of electric vehicles (electric busses or shuttle services) and collaborate with the government and the transport sector to improve public transportation links to and from the airport. For business travel, the project should prioritise sustainable travel options and implement carbon offset programs for unavoidable business travel to neutralise the carbon footprint. The airport operation should also support and promote the

development and of sustainable aviation fuel and strive for operational efficiencies such as reduced aircraft idling times on runways and taxiways.

- Further investment in renewable energy to make the project completely self-sustainable, with minimal reliance on grid electricity.
- Collaboration with airline partners to facilitate the development and use of sustainable aviation fuels.
- Collaboration with local authorities to optimise public transport to and from the airport.
- Feeding of excess renewable electricity to the grid.
- Designing green buildings with materials of low embedded GHGs, incorporating designs that reduce the need for external heating and cooling
- A waste management system focusing on recycling and/or composting
- Incorporating mitigation measures, appropriate to the chosen design of the wastewater treatment plant.

8.16 Aviation Glint and Glare Assessment

8.16.1 Introduction, Terms of Reference and Methodology

Future Impact were appointed to conduct a desktop review pertaining to glint and glare impacts on aviation receptors as a result of light reflecting off solar PV installations at the proposed expansion of the CWA.

The location of the solar PV within the airport proximity requires the compilation of a Glint and Glare study to inform the placement of the solar PV. The South African Civil Aviation Authority (SACAA) stipulates that a Glint & Glare Assessment must be conducted for any solar project that is within three kilometres of an airport and located on the extended centreline of a runway (Obstacle Notice 3/2020). Obstacle Notice 3/2020 further states the assessment must focus specifically on aviation and aircraft activities related to the airport. The proposed Glint & Glare Assessment should therefore assess the glint and glare hazards associated with the proposed PV infrastructure and how it may impact on aviation and aircraft activities at the Cape Winelands Airport. The glare impact can be defined as the potential hazards for pilots and air-traffic control personnel, which can range from discomfort to disability (Zhu, 2018). Impacts should therefore be identified, and possible mitigation measures should be proposed.

The aim of the Glint and Glare study was to determine the impact that solar glint and glare would have on various aviation receptors. The FAA model Figure 170 to Figure 173 below illustrate the proposed solar layout.

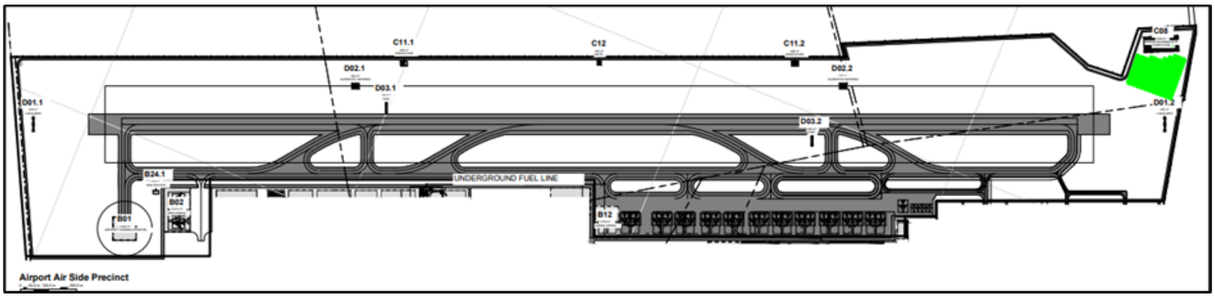

Figure 170: Proposed solar PV Layout air side precinct (SANDS, August 2024)

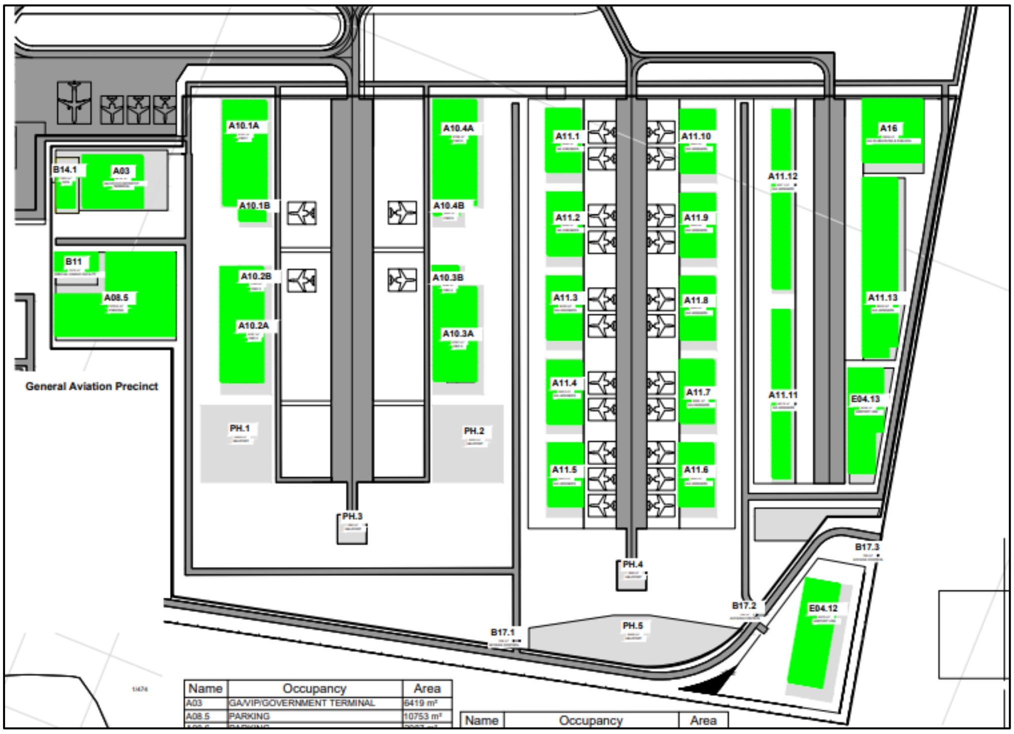

Figure 171: Proposed solar PV layout general aviation precinct (SANDS, August 2024)

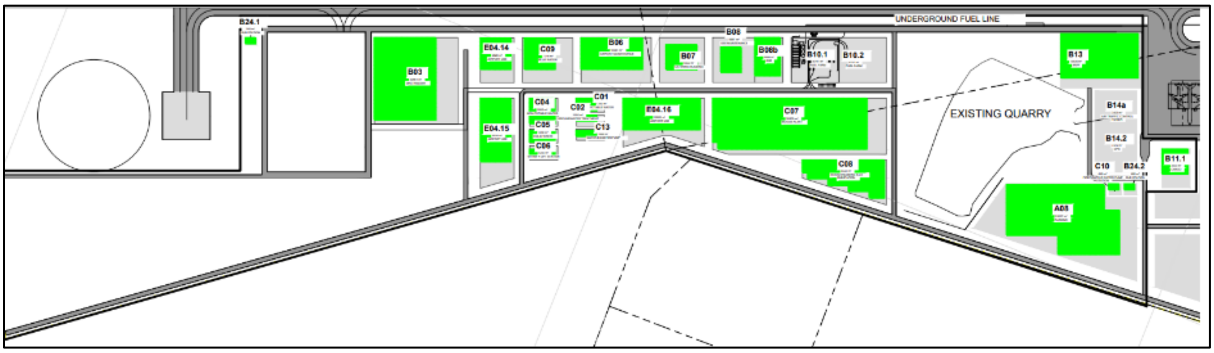

Figure 172: Proposed solar PV layout services precinct (SANDS, August 2024)

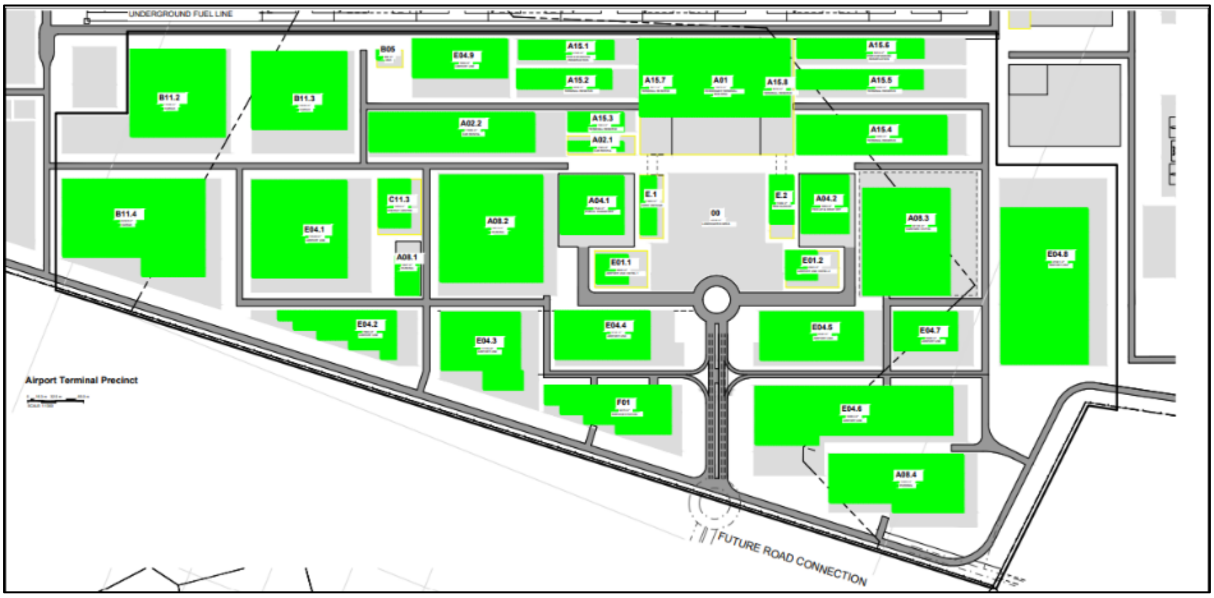

Figure 173: Proposed solar PV layout terminal precinct (SANDS, August 2024)

A summary of assumptions and abstractions required by the ForgeSolar analysis methodology is provided below:

- The algorithm does not rigorously represent the detailed geometry of a system; detailed features such as gaps between modules, variable height of the PV array, and support structures may impact actual glare results. However, the software developers have validated the models against several systems, including a PV array causing glare to the air-traffic control tower at Manchester-Boston Regional Airport and several sites in Albuquerque USA, and the tool accurately predicted the occurrence and intensity of glare at various times and days of the year.
- Several calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for large PV footprints. Additional analyses of array sub-sections can provide additional information on expected glare. This primarily affects analyses of path receptors.
- Random number computations are utilized by various steps of the annual hazard analysis algorithm. Predicted minutes of glare can vary between runs as a result. This limitation primarily affects analyses of Observation Point receptors, including Air Traffic Control Towers (ATCT's). The ForgeSolar methodology relies on an analytical, qualitative approach to accurately determine the overall hazard (i.e., green vs. yellow) of expected glare on an annual basis.
- The subtended source angle (glare spot size) is constrained by the PV array footprint size. Partitioning large arrays into smaller sections will reduce the maximum potential subtended angle, potentially impacting results if actual glare spots are larger than the sub-array size. Additional analyses of the combined area of adjacent sub-arrays can provide more information on potential glare hazards. (See previous point on related limitations.)
- The algorithm does not consider obstacles (either man-made or natural) between the observation points and the prescribed solar installation that may obstruct observed glare, such as trees, hills, buildings, etc.

- The variable direct normal irradiance (DNI) feature scales the user-prescribed peak DNI using a typical clear-day irradiance profile. This profile has a lower DNI in the mornings and evenings and a maximum at solar noon. The scaling uses a clear-day irradiance profile based on a normalized time relative to sunrise, solar noon, and sunset, which are prescribed by a sun-position algorithm and the latitude and longitude obtained from Google maps. The actual DNI on any given day can be affected by cloud cover, atmospheric attenuation, and other environmental factors such as smoke from fire, mist etc.
- The ocular hazard predicted by the tool depends on several environmental, optical, and human factors, which can be uncertain. The developers provide input fields and typical ranges of values for these factors so that the user can vary these parameters to see if they have an impact on the results.
- The system output calculation is a DNI-based approximation that assumes clear, sunny skies all year-round.
- Hazard zone boundaries shown in the Glare Hazard plot are an approximation and visual aid. Actual ocular impact outcomes encompass a continuous, not discrete, spectrum.
- Glare locations displayed on receptor plots are approximate. Actual glare-spot locations may differ.
- Glare vector plots are simplified representations of analysis data. Actual glare emanations and results may differ.
- Due to the final design specifications of the proposed developments not yet being finalized, a standard height of 0.5m above ground was used to model the solar PV structures. Other heights above ground were modelled in 0.5m increments up to 2.5m. The result show that the difference in height had a negligible difference in glint and glare impacts. All results in this report pertain to the 0.5m height above ground.

8.16.2 Summary of Results

<u>Panels on a Fixed Tilt Axis Orientated 0° (True North)</u>

Table 123 to Table 126 below shows the annual minutes of glare exposure that can be expected at different building heights on which the solar PV arrays will be installed for panels that are orientated at 0° azimuth (True North).

Table 123: Glint and Glare Yearly Exposure Time - 5m Building Height (0° Orientation) (Future Impact Pty Ltd, Sept 2024)

Receiver Name	Green Glare (mins)	Yellow Glare (mins)	Red Glare (mins)
FAWN Runway Approach 01	0	0	0
FAWN Runway Approach 19	0	0	0
Air Traffic Control Tower (ATCT-1)	128 484	994	0
Total	**128 484**	**994**	**0**

Table 124: Glint and Glare Yearly Exposure Time - 10m Building Height (0° Orientation) (Future Impact Pty Ltd, Sept 2024)

Receiver Name	Green Glare (mins)	Yellow Glare (mins)	Red Glare (mins)
FAWN Runway Approach 01	0	0	0
FAWN Runway Approach 19	0	0	0
Air Traffic Control Tower (ATCT-1)	128 484	994	0
Total	**120 363**	**1 724**	**0**

Table 125: Glint and Glare Yearly Exposure Time - 15m Building Height (0° Orientation) (Future Impact Pty Ltd, Sept 2024)

Receiver Name	Green Glare (mins)	Yellow Glare (mins)	Red Glare (mins)
FAWN Runway Approach 01	0	0	0
FAWN Runway Approach 19	0	0	0
Air Traffic Control Tower (ATCT-1)	110 305	2 630	0
Total	**110 305**	**2 630**	**0**

Table 126: Glint and Glare Yearly Exposure Time - 20m Building Height (0° Orientation) (Future Impact Pty Ltd, Sept 2024)

Receiver Name	Green Glare (mins)	Yellow Glare (mins)	Red Glare (mins)
FAWN Runway Approach 01	0	0	0
FAWN Runway Approach 19	0	0	0
Air Traffic Control Tower (ATCT-1)	97 907	3 954	0
Total	**97 907**	**3 954**	**0**

Panels on a Fixed Tilt Axis Orientated 338°

Table 127 to Table 130 below shows the minutes of glare exposure that can be expected at different building heights on which the solar PV arrays will be installed for panels that are orientated at 338° to True North.

Table 127: Glint and Glare Yearly Exposure Time - 5m Building Height (338° Orientation) (Future Impact Pty Ltd, Sept 2024)

Receiver Name	Green Glare (mins)	Yellow Glare (mins)	Red Glare (mins)
FAWN Runway Approach 01	0	0	0
FAWN Runway Approach 19	0	0	0

Air Traffic Control Tower (ATCT-1)	123 301	1 742	0
Total	**123 301**	**1 742**	**0**

Table 128: Glint and Glare Yearly Exposure Time - 10m Building Height (338° Orientation) (Future Impact Pty Ltd, Sept 2024)

Receiver Name	Green Glare (mins)	Yellow Glare (mins)	Red Glare (mins)
FAWN Runway Approach 01	0	0	0
FAWN Runway Approach 19	0	0	0
Air Traffic Control Tower (ATCT-1)	114 721	2 763	0
Total	**114 721**	**2 763**	**0**

Table 129: Glint and Glare Yearly Exposure Time - 15m Building Height (338° Orientation) (Future Impact Pty Ltd, Sept 2024)

Receiver Name	Green Glare (mins)	Yellow Glare (mins)	Red Glare (mins)
FAWN Runway Approach 01	0	0	0
FAWN Runway Approach 19	0	0	0
Air Traffic Control Tower (ATCT-1)	105 053	3 468	0
Total	**105 053**	**3 468**	**0**

Table 130: Glint and Glare Yearly Exposure Time - 20m Building Height (338° Orientation) (Future Impact Pty Ltd, Sept 2024)

Receiver Name	Green Glare (mins)	Yellow Glare (mins)	Red Glare (mins)
FAWN Runway Approach 01	0	0	0
FAWN Runway Approach 19	0	0	0
Air Traffic Control Tower (ATCT-1)	93 664	4 065	0
Total	**93 664**	**4 065**	**0**

The modelling of the configurations described in Table 123 to Table 130 above shows that Green and Yellow Glare exposure will occur to receptors in the Air Traffic Control Tower for all configurations that were modelled. Yellow glare has the potential to cause a temporary after-image and is of more concern than Green Glare. Therefore, although solar panels installed on buildings with lower roof heights may be exposed to green glare for longer periods, lower heights are preferred as exposure to yellow glare is minimized. Further details of the worst-case scenario (Building height at 20m with panels orientated towards True North) are discussed below. The temporal and spatial aspects shown below will be similar to all configurations and are not repeated below so as to avoid redundancy.

Figure 174 below shows that the green glare will occur for the Control Tower (ATCT-1) receptors throughout the year in the morning hours from approximately 07h00 to 10h00. Green glare will be expected in the afternoon and evening hours throughout the year. The periods between January to May and August to November will expose the receptors to Yellow Glare in the evening time when the sun is setting at approximately 18h00.

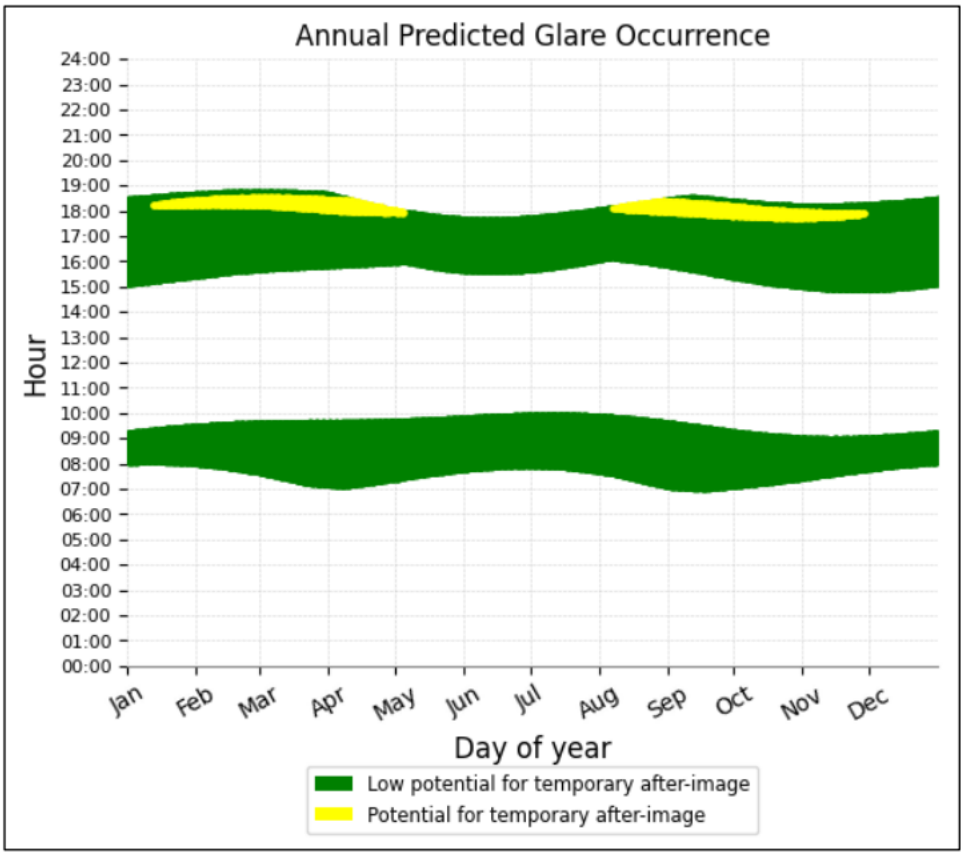

Figure 174: Annual Predicted Glare Occurrence (Future Impact Pty Ltd, Sept 2024)

8.16.3 Conclusions and Recommendations

The modelling results indicate that the Air Traffic Control Tower will be exposed to green and yellow glare. The aircraft on the approach paths will not be affected by the PV panels.

It is recommended that the south portion of the Services Precinct (see Figure 175 below) be excluded from the installation of the Solar PV panels to eliminate the exposure to the Air Traffic Control Tower.

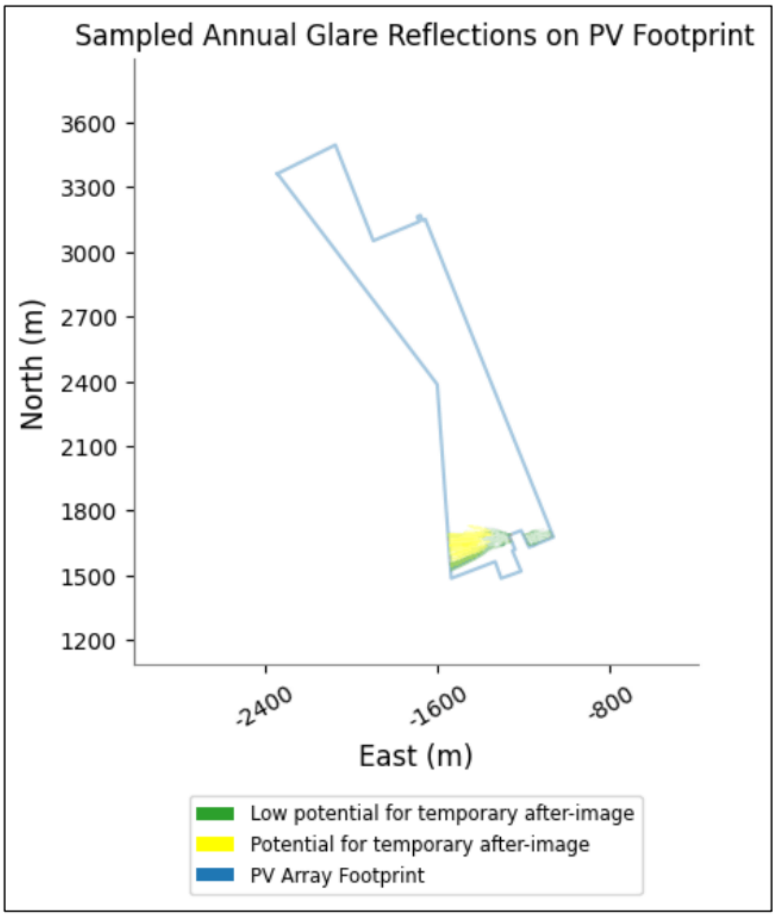

Figure 175: Reflection Areas (Future Impact Pty Ltd, Sept 2024)

The Glint and Glare Impacts will therefore be **Very Low** and acceptable in terms of the United States FAA Regulations if the recommendations are implemented. It is therefore recommended that the project receive authorisation from the Civil Aviation Authority from a glint and glare perspective.

8.17 Bird Strike Risk Assessment

8.17.1 Introduction, Terms of Reference and Methodology

Bird and wildlife management on an aerodrome is a critical part of the airport safety management system and an integrated approach is required to adequately address this risk. Factors that contribute to this increasing threat are increasing populations of large birds and increasing air traffic by quieter, turbofan-powered aircraft. Wildlife Management at airports is essential to maintain an adequate level of safety for aircraft operations.

In the international aviation industry, safety is of paramount concern and collisions between aircraft and birds (termed bird strikes), or with other wildlife, pose a very real and serious threat for both passenger and crew safety. The threats posed by individuals, and also by flocks of birds, are regularly reviewed by an international panel: The World Bird Strike Association (formerly known as the International Bird Strike Committee). Birds are attracted to airport grounds because of the habitats created and maintained provide opportunities to forage or to roost. Birds will also fly over the aerodrome when moving between roosting and other feedings sites. In the commercial aviation industry, most bird strikes occur during the crucial phases of take-off (departure) and landing (approach), this is when aircraft are at a lower altitude (Dolbeer & Wright, 2008).

Airports are often bordered by urban and industrial developments as well as agricultural fields and some of these adjacent areas and industries may regularly attract scavenging birds such as gulls. The International Civil Aviation Organisation (ICAO) has developed specific guidance on land-use where there is a high potential for wildlife attractions and these includes: food garbage disposal, sewage treatment, artificial and natural waterbodies; abattoirs; agricultural activities; and bird sanctuaries.

More than 70% of bird strikes with civil aircraft occurred at just below 150m (<500 feet) above ground level, i.e. in the take-off and landing phases of flight.

The purpose of this document is to provide guidance on managing bird and wildlife hazards through landscape and open space planning at and around the proposed CWA, which is situated within the Fynbos Biome.

The terms of reference of this aviation safety related avifaunal specialist assessment have therefore been outlined as:

- Conduct a legislative and regulatory review of land use practices in the vicinity of the proposed airport and how land use planning and proposed developments should take these into consideration,
- Assess the proposed development and identify potential features that could attract bird species classified as potential hazards to aviation safety,
- Determine bird species presence and abundance in the vicinity of the proposed development
  - Identify bird species that would pose an aviation safety hazard
  - Identify habitats and land uses around CWA and the proposed development area which would attract potentially hazardous bird species
- Recommended development options and mitigation measures during construction and operation of the development
  - Design and layout recommendations and mitigation measures
  - Construction phase impacts and mitigation measures
  - Ongoing monitoring, evaluation and adaptive management

The study area was defined as the ICAO prescribed 13km radius around the proposed CWA and as part of the risk assessment methodology primary, secondary and special bird hazard zones (refer **Error! Reference source not found.** were defined around the proposed CWA:

PRIMARY BHZs (PBHZs) enclose the airspace in which aircraft are typically at or below altitudes of 1500 feet AGL (above ground level). These are the altitudes at which hazardous birds are most likely to be found at, and at which most collisions with birds are likely to occur.

The PBHZ for airports servicing commercial transport aircraft are typically defined as follows:

- A buffer area of 2km on either side of the runway that extends for 9km along the centreline of the runway widening to a width of 4km at its furthest point away from the airport

SECONDARY BHZs (SBHZs) are a buffer area of 4km around the PBHZ that account for:

- variables in pilot behaviour and technique;
- variations in departure and arrival paths that are influenced by environmental conditions, ATC (air traffic control) requirements, etc.; and
- unpredictability of bird behaviour, and variations in bird movements around specific land uses.

SPECIAL BHZs – Special BHZs are specific bird attractants within the remainder of the 13km radius that can potentially have a significant effect on bird presence or movement through the Primary or Secondary BHZs. No Special BHZs were identified as in the study area as several bird attractive areas were already identified within close proximity of the airport falling within the PBHZ and SBHZ.

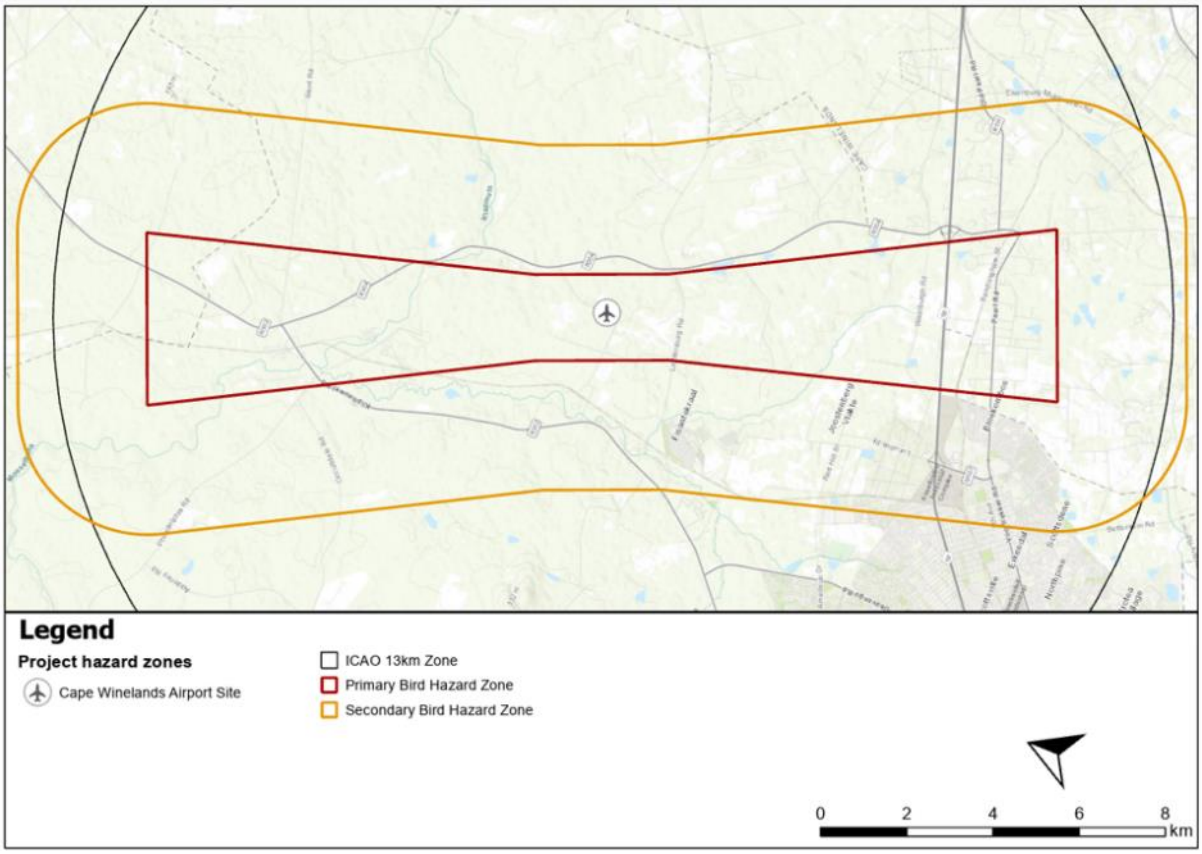

Figure 176: Bird Hazard zones around the proposed expansion of the CWA (AfriAvian, Sept 2024)

The assessment also considered the bird diversity and land uses (habitat types) in the study area:

- Avifaunal habitats likely to attract hazardous birds
- Agricultural Land Uses (Crop Cultivation and Livestock Management) and the bird species likely to be associated with them
- Waterbodies and wetlands and the hazardous bird species attracted to them
- Avifaunal diversity analysis of the bird populations around the proposed airport expansion site. Hazard levels based on the likely risk that a particular species could pose to aircraft were assigned based on their reporting rate, weight and flocking behaviour.

Table 131: bird hazard classification system used to determine the risk level of bird species occurring in the area (AfriAvian, Sept 2024)

Level of Risk	Characteristics	Illustrative Species
Level 1 (Highest)	Very large (>1.8 kg)	Great White Pelican (6-14kg) Spur-wing Goose (3.5 – 5.1 kg) Egyptian Goose (2.1 kg)
Level 2	Large (1-1.8 kg)	Hadada Ibis (1.25 kg) Sacred Ibis (1.5 kg)
Level 3	Medium (300 – 1000 g)	Western Cattle Egret (0.4 kg)
Level 4	Small	Grey-headed Gull (0.28 kg)

8.17.2 Results of Avifaunal Risk Assessment

Based on the assessment criteria a subset of species was identified (frequently recorded and/ or having a hazard / risk level of between 1 and 4). Most notably 8 species with a high Level 1 hazard ranking were identified to occur frequently (based on SABAP2 average reporting rate) in the area all associated with the habitat classes identified above.

Table 132: Bird species posing a potential hazard to aircraft known to occur in the study area (AfriAvian, Sept 2024)

Species	Scientific Name	Average Reporting Rate (%)	Weight (kg)	Habitat	Flocking behaviour	Bird Hazard Ranking
Great White Pelican	*Pelecanus onocrotalus*	21.0%	6 – 14	Waterbodies	Yes	Level 1
Secretarybird	*Sagittarius serpentarius*	1.5%	2.8 – 5	Farmland, Grasslands	No	Level 1
Egyptian Goose	*Alopochen aegyptiacus*	96.2%	1.5 – 3.5	Waterbodies, cultivated fields	Yes	Level 1
Spur-winged Goose	*Plectropterus gambensis*	76.9%	2.5 – 7	Waterbodies, cultivated fields	Yes	Level 1
Blue Crane	*Anthropoides paradiseus*	55.2%	4 – 5.5	Grassland, cultivated fields, wetlands	Yes	Level 1

White Stork	*Ciconia ciconia*	15.0%	2.4 – 4	Grasslands, cultivated fields, wetlands	Yes	Level 1
African Fish Eagle	*Icthyophaga vocifer*	35.8%	2 – 3.8	Waterbodies	No	Level 1
White-breasted Cormorant	*Phalacrocorax carbo*	35.0%	1.8 – 3.2	Waterbodies	Yes	Level 1
Hadada Ibis	*Bostrychia hagedash*	94.0%	1 – 1.5	Grasslands, fields, wetlands	Yes	Level 2
African Sacred Ibis	*Threskiornis aethopicus*	90.3%	1.5	Wide range – wetlands, cultivated fields, rubbish dumps etc.	Yes	Level 2
Helmeted Guineafowl	*Numida meleagris*	91.7%	1.1 – 1.8	Grassland, cultivated fields	Yes	Level 2
Black-headed Heron	*Ardea melanocephala*	60.5%	1.2 – 1.9	Grassland, fields, vleis	No	Level 2
Common Buzzard	*Buteo buteo*	25.3%	0.54 – 0.92	Open cropland and woodland	No	Level 3
Western Cattle Egret	*Bubulcus ibis*	90.3%	0.28 - 0.45	Grassland, pastures and open savanna	Yes	Level 3
Spotted Thick-knee	*Burhinus capensis*	43.3%	0.38 – 0.6	Open grassland, lawns, airfields	No	Level 3
Yellow-billed Kite	*Milvus migrans*	39.5%	0.57 – 0.76	Wide range incl. built-up areas	No	Level 3
Grey-headed Gull	*Chroicocephalus cirrocephalus*	5.2%	0.22 - 0.34	Waterbodies, rubbish dumps	Yes	Level 4
Common Starling	*Sturnus vulgaris*	95.5%	0.65 – 0.95	Urban and suburban areas	Yes	Level 4
Blacksmith Lapwing	*Vanellus armatus*	91.7%	0.13 - 0.2	Associated with water & open short grassland & lawns	No	Level 4

In order to assess the spatial distribution of high-risk bird species in the study area BirdLasser® observation locations were plotted. Figure 177 to Figure 180 indicate that species of risk level 1, 2 and 3 occur in high densities within both the primary and secondary bird hazard zones. The fact that high-risk bird strike species are common around the airport further supports the notion that more favourable habitat for these species cannot be created on the airfield itself.

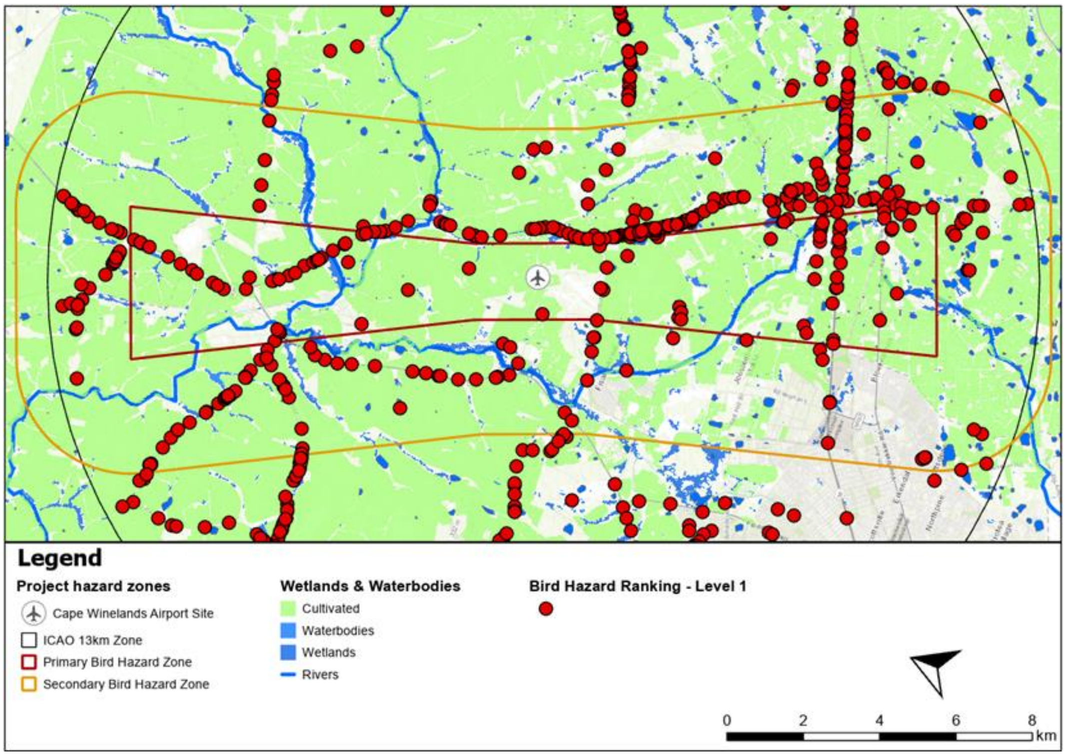

Figure 177: Bird Hazard Ranking - Level 1 species distribution (AfriAvian, Sept 2024)

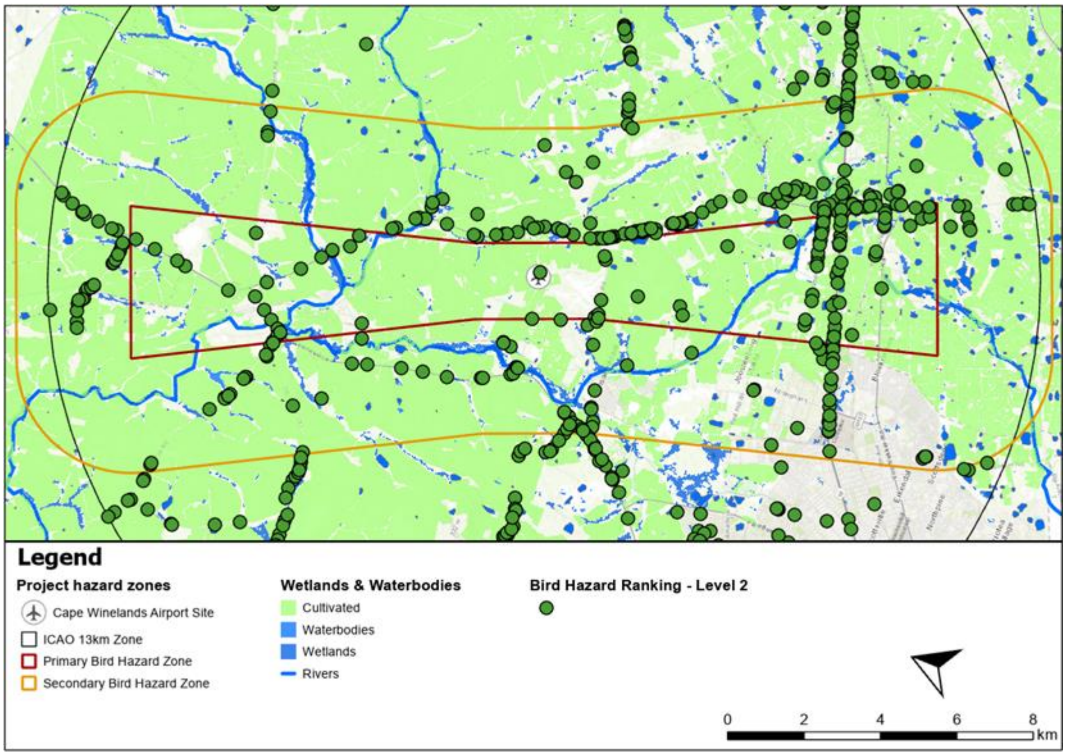

Figure 178: Bird Hazard Ranking - Level 2 species distribution (AfriAvian, Sept 2024)

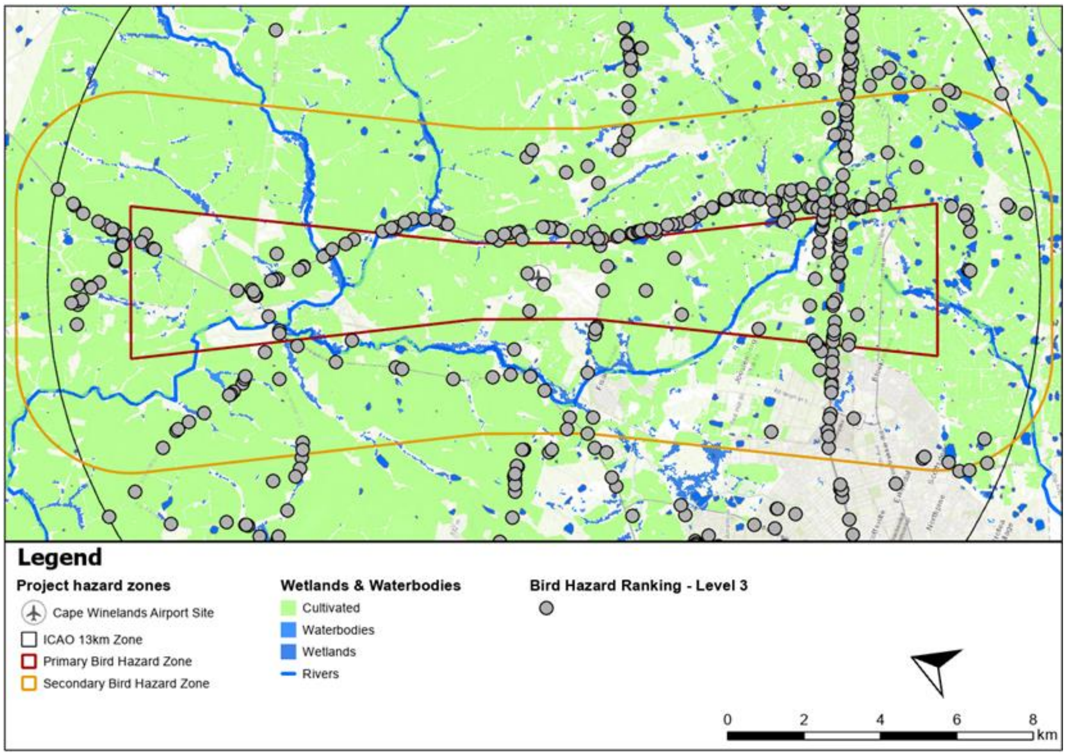

Figure 179: Bird Hazard Ranking - Level 3 species distribution (AfriAvian, Sept 2024)

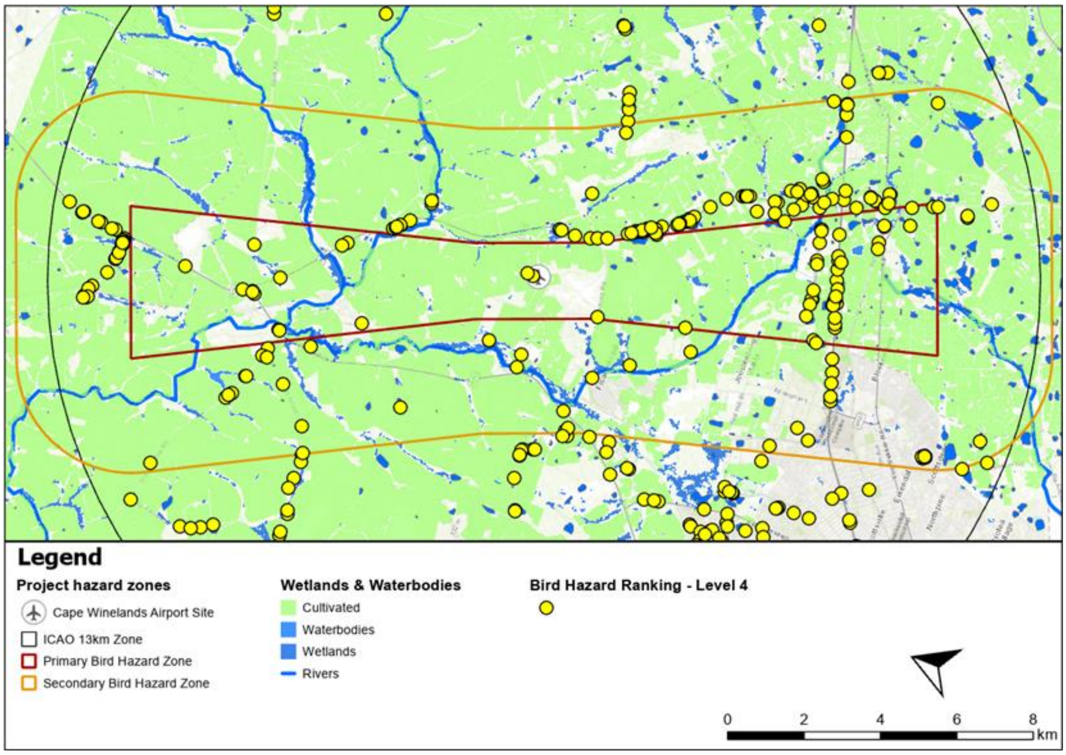

Figure 180: Bird Hazard Ranking - Level 4 species distribution (AfriAvian, Sept 2024)

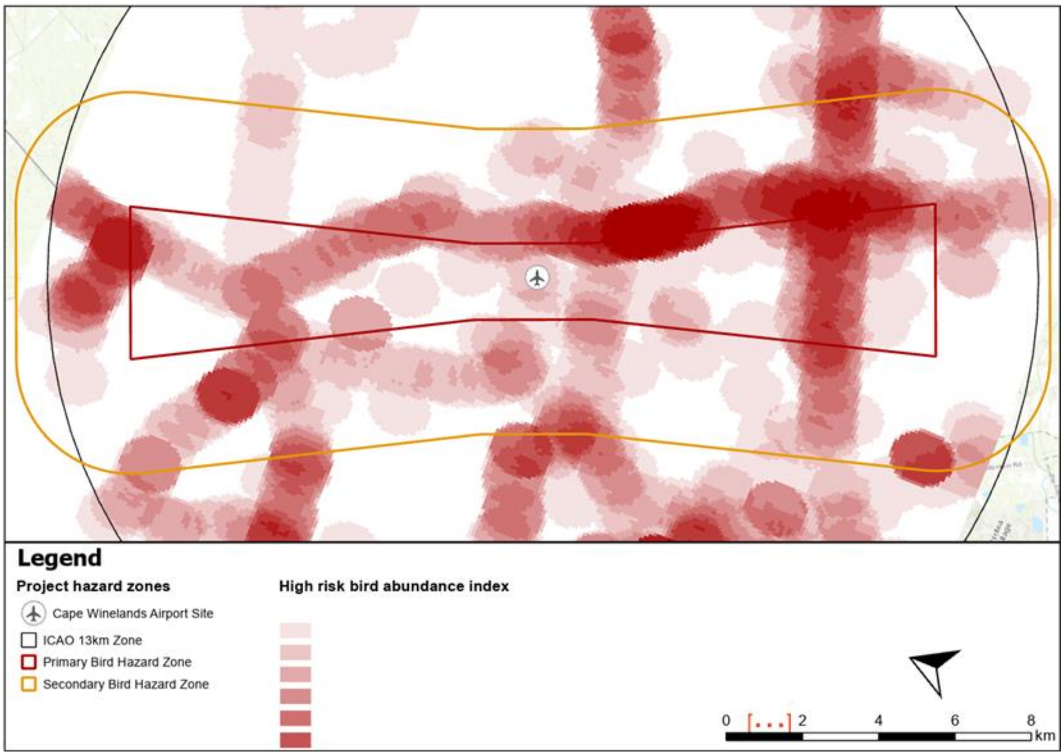

Figure 181: Aggregated high risk bird abundance in the study area (AfriAvian, Sept 2024)

8.17.3 Conclusion and Recommendations

- The presence and abundance of high-risk bird species are primarily associated with agricultural land use and water bodies within the primary bird hazard zone surrounding the proposed CWA. The movement of birds between these habitats warrants attention.
- Specific attention should be given to managing the Fisantekraal wastewater treatment works (WWTW), its expansion, and the surrounding livestock feedlots and lawn cultivation areas.
- Additionally, the large open water body to the southeast of the airfield requires careful oversight.
- Effective management will necessitate engagement with landowners in the vicinity to mitigate the attractiveness of agricultural and farming activities to birds.
- Notably, given that most high-risk bird species are drawn to grasslands, establishing grassed areas directly on the airfield and adjacent to manoeuvring zones is not advisable.
- The Bird and Wildlife Hazard Management Landscape and Open Space Planning Guideline for the proposed CWA should be considered where appropriate.

8.18 Major Hazard Risk Assessment

8.18.1 Introduction, Terms of Reference and Methodology

Since off-site incidents may result due to hazards of some of the fuels to be stored on, produced at or delivered to site, RISCOM (PTY) LTD was commissioned to conduct a quantitative risk assessment (QRA) to determine whether the facility would classify as a Major Hazard Installation (MHI) / have an impact onto surrounding properties and communities as part of the EIA.

The main hazards that would occur with a loss of containment of hazardous components at the proposed CWA facility include exposure to:

- Thermal radiation from fires;
- Overpressure from explosions.

The methodology of assessment was based on:

- Software calculations
- Meteorological mechanisms that will govern dispersion, transformation and the eventual removal of hazardous vapours from the atmosphere
- Detail on road receipt of the fuel
- The proposed design of the fuel storage facilities on site, bowser filling and the distribution pipeline

During the hazard identification component of the report, the following considerations are taken into account:

- Chemical identities;
- Location of on-site installations that use, produce, process, transport or store hazardous components;
- Type and design of containers, vessels or pipelines;
- Quantity of material that could be involved in an airborne release;
- Nature of the hazard most likely to accompany hazardous materials spills or releases, e.g., airborne toxic vapours or mists, fires or explosions, large quantities to be stored and certain handling conditions of processed components.

The evaluation methodology assumes that the facility will perform as designed in absence of unintended events, such as component and material failures of equipment, human errors, external events and process unknowns.

<u>Limitations and Assumptions</u>

The risk assessment was developed based on the information provided by CWA. These designs are conceptual and does not include detailed designs, which will be completed before construction. Thus, some information, as required by the risk assessment simulations, were assumed and based on similar installations. However, it is assumed that the relatively large storage tanks will determine the endpoints from a release and will be the major contributor towards the risks generated. To this end, the results obtained in this report may lack the accuracy of a detailed engineered plant. However, the risks generated are expected to represent the facility, provided the vessel size and inventory are not increased.

The risk assessment is limited to the fuel storage of Avgas and Jet A-1 fuels located on the proposed CWA site.

8.18.2 Hazard Identification

Notifiable Substances

The General Machinery Regulation 8 and its Schedule A on notifiable substances requires any employer who has a substance equal to or exceeding the quantity listed in the regulation to notify the divisional director. A site is classified as a Major Hazard Installation if it contains one or more notifiable substances or if the off-site risk is sufficiently high. The latter can only be determined from a quantitative risk assessment. No material to be stored on site is listed as notifiable.

Hazardous Materials

a) Chemical Properties

Jet A-1 / Kerosene (UN No. 1863)

A-1 / Kerosene has the same chemical and physical properties as paraffin but requires stricter controls as aircraft fuel. Kerosene is a clear colourless to light amber liquid with a petroleum odour and consists of a distillate fraction refined from crude petroleum. Therefore, the composition and physical properties may vary. The flashpoint is approximately 38°C, and it is considered flammable. It has a low toxicity to humans. It is relatively stable under normal storage conditions. However, saturated aliphatic hydrocarbons contained in kerosene may be incompatible with strong oxidising agents like nitric acid. It can be absorbed into the body by inhalation of its vapour, through the skin and by ingestion. Short-term exposure could irritate the skin and respiratory tract. Swallowing the liquid may cause aspiration into the lungs, with risk of chemical pneumonitis. Repeated or prolonged contact with skin may cause dermatitis, as the liquid defats the skin. It may cause an environmental problem, particularly in water, if spilt.

Avgas (UN No. 1203)

Avgas is aviation fuel that consisting mostly of gasoline (petrol). It is a hydrocarbon mixture with variable composition and with a boiling point range of between 35°C and 170°C. It is a pale-yellow liquid with a strong petroleum odour. Due to the flash point of minus 40°C, this material is considered highly flammable and will readily ignite under suitable conditions. The vapours of petrol are heavier than air and may travel some distance to an ignition source. Avgas may contain up to 5% volume of benzene, a known animal carcinogen. It may also contain ethers and alcohols as oxygenates to a maximum concentration of 2%. It may also contain small quantities of lead to enhance performance. Petrol is stable under normal conditions. It will react with strong oxidising agents and nitrate compounds, which reaction may cause fires and explosions. Although Avgas is of a low to moderate oral toxicity to adults, ingestion of small quantities may prove to be dangerous or fatal to small children. Contact with vapours may result in slight irritation to the nose, eyes and skin. Vapours may cause headache, dizziness, loss of consciousness or suffocation, as well as lung irritation with coughing, gagging, dyspnoea, substernal distress and rapidly developing pulmonary oedema. If swallowed, petrol may cause nausea or vomiting, swelling of the abdomen, headache, CNS depression, coma and death. The long-term effects of Avgas exposure have not been determined. However, it may affect lungs and may cause the skin to dry out and become cracked. Avgas floats on water and can result in environmental hazards with large spills into waterways. It is harmful in high concentrations to aquatic life.

b) Corrosive Liquids

No bulk materials to be stored on, produced at or delivered to site are considered extremely corrosive.

c) Reactive Components

All substances to be stored on, produced at or delivered to site are considered thermally stable in atmospheric conditions. The reaction with air is covered under the subsection dealing with ignition probabilities.

d) Flammable and Combustible Components

Table 133: Flammable and combustible substances to be stored on, produced at or delivered to site (RISCOM, August 2024)

Component	Flashpoint (°C)	Boiling Point (°C)	LFL (vol. %)	UFL (vol. %)
Jet A-1	> 37	> 150	0.7	5
Avgas	-40	25 - 170	1%	Not available

8.18.3 Risk Analysis

In order to establish which impacts, follow an accident, it is first necessary to estimate the physical process of the spill (i.e., rate and size), spreading of the spill, evaporation from the spill, subsequent atmospheric dispersion of the airborne cloud and, in the case of an ignition, the burning rate and resulting thermal radiation from a fire and the overpressures from an explosion.

The second step is then to estimate the consequences of a release on humans, fauna, flora and structures in terms of the significance and extent of the impact in the event of a release. The consequences could be due to toxic or asphyxiant vapours, thermal radiation or explosion overpressures. They may be described in various formats.

Consequence modelling gives an indication of the extent of the impact for selected events and is primarily used for emergency planning. A consequence that would not cause irreversible injuries would be considered insignificant, and no further analysis would be required.

Bulk Fuel Tank Farm

Pool fires and flash fires from a loss of containment at the storage and offloading installations of Jet A-1 and Avgas and subsequent fires were simulated. Tank explosions from Avgas were also simulated.

The 1% fatality for Avgas and Jet A-1 from fires, could extend a short distance over the tank farm boundary. However, these impacts would not extend to areas occupied by the general public or to the runway and airplanes.

Risks greater than 1x10-4fatalities per person per year, are considered tolerable for industrial areas, but excessive for residential areas. The 1x10-4 fatalities per person per year did not extend into areas occupied by the general public on the proposed CWA site.

The risk of 3x10-7fatalities per person per year isopleth indicates the extent for land-use that would be suitable for vulnerable populations, such as hospitals, retirement homes, nursery schools, prisons, large gatherings in the open, and so forth. As the risks did not extend into areas occupied by the general public, no land planning would be required. The risk from the installations after Phase 3 would be considered acceptable.

Avgas Kerbside Filling

The kerbside filling will consist of a 9m^2 Avgas tank with an offloading area. Pool fires form a loss of containment would extend beyond the secondary containment but would not extend to the area occupied by the general public.

Risks greater than 1x10-4 fatalities per person per year, are considered tolerable for industrial areas, but excessive for residential areas. The 1x10-4 fatalities per person per year did not extend into areas occupied by the general public on the proposed CWA site.

The risk of 3x10-7fatalities per person per year isopleth indicates the extent for land-use that would be suitable for vulnerable populations, such as hospitals, retirement homes, nursery schools, prisons, large gatherings in the open, and so forth. As the risks did not extend into areas occupied by the general public, no land planning would be required. The risk from the kerbside filling would be considered acceptable.

Apron Pipeline

The apron pipeline is expected to be constructed during Phase 3. The pipeline would be located in a chamber. Thus, a loss of containment will firstly fill the chamber and then overflow. For this study, the maximum area from a pool formed from a loss of containment was limited to 300m^2.

The 1% fatality from the apron pipeline could extend 41m from the pipeline. However, the risks from the apron pipeline failure would be considered acceptable.

Impacts onto Neighbouring Properties, Residential Areas and Major Hazard Installations

Impacts from Jet A-1 and Avgas would not extend into areas occupied by the general public.

Major Hazard Installation

The expected MHI hazard tier for each phase of the fuel storage projects, is given in Table 134.

Table 134: Expected establishment hazardous tier per project phase (RISCOM; August 2024)

Phase	Avgas Inventory (t)	Jet A-1 Inventory (t)	Total (t)	Hazard Tier
1	394.2	48.3	442.5	Low Hazard
2	664	48.3	712.3	Low Hazard

2	1864	38.3	1 902.3	Low Hazard

The MHI study found that the proposed CWA facilities would be classified as a Low Hazard Establishment Major Hazard Installation, resulting in the risks to the general public being considered acceptable.

8.18.4 Mitigation measures

- Secondary containment for the storage and offloading / loading of road tankers has been described. However, pooling of fuels below the road tankers, from a loss of containment, should be prevented
- Overfilling instrumentation has been described. However, compliance with IEC61511 should be contemplated.
- Hazardous areas should be reviewed by using a detailed Process Hazard Analysis (PHA) such as a HAZOP study that should be completed to identify potential hazards and suggest further mitigation for safer operations. Due to the seriousness of the hazardous material stored, transported and produced on site, it is suggested that a detailed PHA / HAZOP study should be completed by an independent chairman, who is registered with the Engineering Council of South Africa. Furthermore, any instruments used should incorporate the findings of a SIL assessment defined in IEC 61511.
- Ignition sources near the depot must be minimised as far as possible. This is particularly relevant with the fuel storage area.
- A hazardous area classification as per SANS 10108 must be developed for all flammable materials. Only suitable instrumentation and electrical equipment should be installed in accordance with the requirement of the code.
- The fast detection of a loss of containment with appropriate shut-down action to limit the amount of Jet A-1 and Avgas released, will assist in the reduction of the site risks.
- Applicable international best practice production and guidelines or equivalent international recognised codes of good design and practice of installations, must be incorporated in the designs. This implies that best practices would be applied to the design and operation of the proposed site.
- IEC 61508/61511 (Safety Instrumented Systems) are codes specifically related to the instrumentation requirements for adequate protection from hazards in chemical plants and applicable for the life cycle of the plant. These codes are aimed at reducing risks to surrounding populations to acceptable levels. Demonstrating compliance with the IEC 61508/11 can be achieved only once full-detailed designs have been completed and is thus premature at this stage in the project.

8.18 Poultry Biosecurity Assessment

8.18.1 Introduction, Terms of Reference and Methodology

The report aims to investigate and as far as possible quantify the effect of a new airport on the adjacent poultry farms, focusing on those aspects that will affect the biosecurity of a poultry farm and the health of the poultry. The term biosecurity refers to a set of measures, both physical and managerial, designed to reduce or manage the risk of introducing or spreading a disease into the establishment. Diseases, whether subclinical or clinical, can significantly reduce productivity, profitability, and the long-term financial viability of a poultry production unit. Broiler breeder operations have high biosecurity requirements, and the introduction of a disease can have catastrophic consequences as in some cases it can affect the broilers that emanate from the breeder farm. Thus, biosecurity is a very important issue for any poultry farmer.

According to the World Organisation of Animal Health (WOAH) there is a need for a suitably isolated geographical location for a poultry farm to prevent the transmission of diseases. A general practical guideline which is in use and informs many of the legal requirements is a buffer of 1km between a poultry farm and a settlement or between a poultry farm and another poultry farm. In this case the distance between the fence and the nearest shed is 100m and this means that the impact of the airport and the poultry farm on each other will have to be carefully considered.

The biosecurity assessment has relied on relevant publications and the specialist's experience both visiting poultry farms as a poultry veterinarian and as a recognized biosecurity specialist, to address the impact that this development would have.

8.18.2 Potential Biosecurity Impacts: Construction Phase

During construction, dust is the main pollutant, generated by land clearing, site preparations, bulk earthworks, material handling, and wind erosion (Draculoulides, 2024). Dust settles near sources but can affect nearby poultry farms, especially if construction is adjacent. Although the main construction may last up to 2 years, with dust deposition expected below the DEA guideline of 600mg/m²/day (for residential areas), most of the construction will happen away from the farm side and dust ceases to become an issue 300m away from the construction site. The time period where dust is of concern is therefore limited.

Noise from construction vehicles.

8.18.3 Potential Biosecurity Impacts: Operational Phase

<u>Air quality impacts:</u>

Poor air quality can affect broiler performance and suppress immune function due to their unique respiratory system, which deposits many particles in the lungs and air sacs, removed by heterophils and macrophages. Poor air quality (elevated Total Suspended Particles, Ammonia or other pollutants) in barns, often due to litter type, stocking density, or ventilation, affects bird health more than external conditions.

According to the Air Quality Impact Assessment (Appendix 4):

- Scenario 2: Low air pollutant levels outside airport boundaries during operation.

- Scenario 3: Air quality impact zones for the new runway extend beyond airport boundaries in a north-westerly and south-easterly direction, within standards except for highest 1hr NO_2 concentrations in small areas.

From the assessment of the 2 scenario's, long-term air quality is unlikely to impact poultry significantly. The WWTW will generate ammonia emissions, but this is too far away from the poultry farm to be of significance.

Noise:

Scenario 2: County Fair falls outside the 55-60 dB contour.

Scenario 3: Easternmost boundary of the farm is within 55-60 dB contour.

All scenarios remain below the 80 dB level associated with harm to poultry and are only slightly higher than current levels

Light Pollution:

Disruption of circadian rhythm and ovulation resulting in altered laying cycles.

Startling of the birds and resultant mortalities.

Water quality and provision concerns:

Decline in the quantity and quality of water can significantly affect the ability of farms to produce poultry.

By analyzing the current water volumes, a surplus of 1,172,623.3m^3/a is available within the Groundwater Resource Unit, and the water demand of the property is well within the sustainable supply volume of the aquifer, indicating that there is no overutilization of the water source and that there will be adequate water available for County Fair.

The groundwater in this area was of poor quality before the onset of the project and is likely going to need treatment to avoid negative consequences for the birds. The project is unlikely to contribute to the contamination of the groundwater.

Pests:

Rodents play a key role in the transfer of salmonella. In both the case of rats and mice, these species are likely to stay near a constant food source rather than migrate in search of other food sources. The proposed site for a commercial garage is the closest to the poultry farm. Attention should be given to the waste handling at this facility.

More than 100 pathogens associated with the house fly may cause disease in humans and animals, including typhoid, cholera, bacillary dysentery, tuberculosis, anthrax, eye infections and infantile diarrhoea, as well as infestation with parasitic worms. Flies have been implicated as being vectors in most poultry diseases. Effective fly control programmes in both the industrial area and the poultry farm are essential.

Waste management

The normal waste generated by the airport itself in the form of food waste can attract rodents and other pests, and waste emanating from the aircraft including food waste can have an impact on biosecurity.

The waste from aircraft consists mainly of two kinds, namely galley waste from the aircraft galleys as well as cabin waste. Galley waste from international flights can be classified as hazardous waste and has been associated with Foot and Mouth outbreaks, African Swine fever, Classical swine fever and others. Biological items confiscated from or voluntarily surrendered by international travellers will also be classified as high risk. There is a requirement for it to be handled and disposed of in a responsible manner.

The use of a biodigester to convert poultry manure and feed waste into methane needs to be considered carefully:

- The volumes mentioned in the waste section would be difficult to source since there do not appear to be layer farms in close proximity to the airport.
- Furthermore, the transport of manure is associated with adverse aesthetic elements (it smells and because of its wetness often leaks out and contaminates roads, feathers will also contaminate the area).
- It forms a significant biosecurity risk for any poultry farm since large quantities of poultry manure from a layer farm will almost certainly pose a disease risk to wild birds and poultry in the area.
- If manure contaminated with antibiotics is fed into a biodigester, it is likely that the microorganisms will be inhibited or even killed (Tawfik, et al., 2023) which may interfere with the process and result in the biodigester needing to be cleaned out.
- Large amounts of organic waste piling up will adversely affect the environment of the airport.
- Methane leaks are not uncommon, and this will be hazardous to passengers and crew. Careful attention.

Sewage waste

Many airports have sewage processing systems but that these are closed systems and do not resemble the traditional sewage systems that serve towns (International Civil Aviation Organisation, n.d). As long as there are no open bodies of water and sedimentation dams, the second solution will have no impact on poultry. The existing wastewater treatment works does have emissions of ammonia that are high and only partially mitigated but this is too far away from the poultry farm to affect the ammonia levels on the farm.

Stormwater management

Many stormwater management options could become wildlife attractants (if no protection is put in place) and thus create potential hazards for aviation (International Civil Aviation Organisation, n.d) but also for poultry farms since wild birds are known to carry avian influenza and other diseases.

There are a number of dry runoff dams planned that will temporarily absorb excess water and not be a permanent feature. Any dams that are created to store effluent should be managed to discourage wild birds as suggested above.

8.18.4 The No Go (Alternative 1)

It must be noted that there has always been an airfield in the vicinity of the poultry farm and therefore many of the concerns about wild birds, rodents and people are existing biosecurity concerns, although the increase in the volume of traffic associated with an expanded airport needs to be taken into account. Proximity to an airfield has not been identified as a biosecurity concern for poultry, but any factor that would affect water quality, air quality, or a factor that attracts wild birds and pests to an area could potentially affect the health of the birds and mitigation for this must be investigated.

It must further be noted that in this case, there are four different parent flocks in close association with each other on this complex. The distance between the breeder flocks is certainly less that recommended for good biosecurity. It is noted that distance between poultry farms and other livestock concerns is the critical biosecurity issue rather than proximity to other forms of development. It is suggested that there are already existing biosecurity concerns pertaining to the County Fair breeder farm.

According to the Noise Impact Assessment the baseline noise for the poultry farm is 55.2 dB (daytime) and 39.1 dB (nighttime). For the Operational Scenarios: Scenario 1: Easternmost section of the farm is within 55-60 dB contour. The rest of the farm is outside the contour.

Currently low to no air quality issues are found.

If there is no development, the airport will continue as it is.

The advantages of this would be decreased human traffic on roads, no additional usage of water, and no potential for pollutants associated with development. The disadvantages would be no jobs, no development, and further poverty in the area.

8.18.4 Mitigation measures

Construction Phase dust mitigation:

- Applying wet suppression on main site roads.
- Implementing a 30km/h speed limit on unpaved roads.
- Preferential routing away from the western site boundary.
- Reducing stockpile disturbance frequency.

- Installing a solid barrier (wall) between the farm and the development. Planting of fast growing vegetation that does not attract wild birds, and/or a solid wall to screen the section of the poultry farm closest to the construction (Gerber, Opio, & Steinfeld, 2007).

Operational Phase:

Noise:

Adhering to Western Cape Noise Control legislation will help keep noise within permissible limits (45dBA for rural and 70dBA for industrial areas). Higher-angled landings and take-offs, along with higher altitude manoeuvres, can reduce noise by about 7.7 dB at ground level (Antoine & Kroo, 2004).

Planting fast growing vegetation that does not attract birds, to muffle noise, construction of facility wall to muffle sound, schedule arrivals during the daytime, avoid runways closest to the farm (phase 1).

Waste Management:

Areas where waste are sorted or handled should be undercover with efficient removal systems and rodent control. At least 20% of the municipal solid waste from the airport and 80 % of the cabin waste can be recycled as it consists of paper and plastic. Food waste from the airport and even galley waste can effectively be dealt with in a biodigester dedicated to converting food waste to grey water and sludge.

Flies and Rodents:

Adherence to good housekeeping and municipal by laws.

Light pollution:

Design the road so that light does not shine into poultry sheds, signs requiring that car lights are dipped on the affected section of road, diversion of traffic to an alternative road, barriers that prevent light going into the sheds erected on farms , Hood the sources of light, erection of a facility wall which will block some of the light, use of minimal lighting in the car park area.

Groundwater quality and depletion:

Refer to Groundwater Impact Assessment report (Appendix 3).

Influx of people into the area:

Isolate the people from the farm -do not allow people access to the farm.

Wild birds attracted to the area:

Avoid creating stagnant pools of water by treating wastewater in closed systems, handle waste according to municipal by laws.

Use of poultry manure to fuel methane production:

Place any biodigester dependent on manure off site and in an isolated area or omit manure as feedstock for the on-site biodigester.

International waste:

Handling and disposal of international galley waste must be done in a safe way and with regard to legislation.

9. PUBLIC PARTICIPATION PROCESS

The Public Participation Process (PPP) plays a key role in the scoping process and achieves various objectives - from creating awareness of the project to identifying the issues and impacts. This section provides a summary of methods employed and activities that will be undertaken during the PPP.

NOTE: This report summarises the process undertaken to date, and highlights further steps required to complete the Environmental Impact Assessment (EIA). It follows on the draft pre-application Scoping report that was circulated for public comment from 8 November to 8 December 2023 and the in-process Scoping report that was circulated for public comment from 24 July to 26 August and forms the basis of the statutory EIA process. Issues identified and comments received from Interested and Affected Parties (I&APs) were considered and informed various reports and studies, and amendments to this report, prior to the lodging of the formal application with DEA&DP.

9.1 Notification

I&AP Register

The initial I&AP register was developed after completion of the pre-app Scoping Report commenting period which expanded through advertisements, notifications, and site notices. The I&AP register was updated after the completion of the in-process commenting period and will be continually updated throughout the PPP in the ensuing phases.

The initial I&AP register included adjacent landowners, organs of state, industry role-players with a vested interest in the project, and the local councillor.

I&APs were able to register via the following means:

- Email
- Facsimile
- Post
- Phone (land line)
- Whatsapp portal

Public Notices and Advertisements

Pre-application phase: Suitable locations to display public notices were identified and four notices were placed in publicly accessible and visible locations in the area surrounding the CWA and at the Fisantekraal Library. These site notices were in English, Afrikaans and Xhosa during the pre-application phase. The public notices provide I&APs with information about the proposed project and the S&EIA, and with the contacts, details, and process for registering as an I&AP.

English and Xhosa advertisements were placed in the Tygerburger (a free newspaper). An Afrikaans advertisement was placed in Die Burger and an English advertisement in The Cape Times.

In-process phase: an English advertisement was placed in the Tygerburger (a free newspaper). Site notices (in English) was placed at the previous identified publicly accessible and visible locations in the area surrounding the CWA and at the Fisantekraal Library.

Inform Councillors and Key Interested Parties

The Ward Councillors of ward 105 (Fisantekraal) and ward 102 (Joostenberg Vlakte) were consulted in the initial stages of the PPP. The ward councillors were asked to notify their community via their preferred method of communication or existing communication system. Surrounding (adjacent) landowners and key I&APs, such as relevant government departments, were also be notified and engaged in the PPP.

9.2 Engagement

I&APs were able to submit written comment via email, post, facsimile and Whatsapp. I&APs who are unable to read or write or who otherwise need special assistance to state their views on the proposal, may request assistance in recording their comments or objections. These I&APs could send their comments using the voice note option on Whatsapp.

A public meeting and a meeting with the Fisantekraal/Durbanville Farmers Association was held during the pre-application scoping phase.

Several focus group meetings were held during the in-process Scoping phase, including with the Fisantekraal community leaders, and the CoCT Air Quality Department.

Records of these engagements are contained in Appendix 44.

Open House Meetings and Public meetings where and when required are planned during the Impact Assessment Phase where the public will be able to learn more about the application and will have the opportunity to ask any questions.

9.3 Comment and Response Report

All comments received are compiled into a Comments and Response Report (C&R) for each phase in the EIA process, indicating the details of the I&AP that made the comment, what the comment pertains to and the response. The C&R is a vital tool in preparing the Plan of Study for the EIA phase as it provides a list against which to check that all issues of concern have been, or will be, addressed. The POPIA will be applied to all information circulated containing IAP contact/ personal information. The comments received and responses formulated for the pre-application Scoping Report are attached as the Comments and Response Report (Appendix 30A) to this report. The comments received and responses formulated for the in-process Scoping Report are attached as the Comments and Response Report (Appendix 30B) to this report.

9.4 Pre-Application Scoping Phase Public Participation

Numerous methods were used to effectively engage I&APs in the Pre-Application Scoping Phase of the S&EIA for the proposed CWA expansion. The Public Participation (PPP) consisted of three main components: i) Notification, ii) Engagement, and iii) Comments and Response, as elaborated below:

The pre-application Scoping Report (containing NEMA, NEM: AQA and NWA detail) was made available for a 30-day commenting period to potential I&APs including but not limited to: Neighbours;

Organisations; Groups; Trusts; Aviation Organisations; State Departments; Organs of State; with jurisdiction in the area. Public participation ran from 8 November to 8 December 2023.

Notification to all potential I&APs, by -

- Sending notification letters via email to neighbouring landowners.
- Landowners were asked to notify their tenants of the proposal and the commenting period.
- Written notifications sent via email to the municipal ward councillors that represents the community in the area. The ward councillors were asked to notify their community via their preferred method of communication or existing communication system.
- English and Xhosa advertisements were placed in the Tygerburger (a free newspaper). An Afrikaans advertisement was placed in Die Burger and an English advertisement in The Cape Times.
- Three larger site notices were placed on or near the site along various roads adjacent to the site. These site notices were in English, Afrikaans and Xhosa.
- The Pre-Application Scoping Report and supplementary reports were made available as separate links on the PHS Consulting website. Documentation was left on the PHS Consulting website for access by IAPs until July 2024, and additional IAP registration and comments were accepted in this extended period.
- In addition, a hard copy of the report was lodged at the Fisantekraal Public Library for public viewing.
- A site notice was pinned on the library notice board.
- I&APs were encouraged to submit any comments via email, fax, post or Whatsapp.

I&APs who are unable to read or write or who otherwise need special assistance to state their views on the proposal, may request assistance in recording their comments or objections. These I&APs could send their comments using the voicenote option on Whatsapp.

Issues identified and comments received from Interested and Affected Parties (I&APs) were considered and informed various reports and studies, and amendments to this report, prior to the lodging of the formal application with DEA&DP.

The comments received and responses formulated for the pre-application Scoping Report are attached as the Comments and Response Report (Appendix 30A) to this report. Table 135 summarises the issues raised by IAPs and an indication of the manner in which issues were incorporated, or the reasons for not including them.

A public meeting was held on 8 May 2024 and input provided at a Durbanville Farmers Association meeting on 4 June 2024 as part of the Pre-application Scoping Phase, and all comments/issues raised were recorded. Additional IAP engagement has also been captured in Appendix 44. Focus group meetings are ongoing. NOTE: Issues are not listed in order of relevance or severity (refer Appendix 30 for full C&R).

9.5 In-process Scoping Phase PPP

After submission of the application form, Registered I&APs and relevant State Departments and Organs of State had another opportunity to comment on the Draft Scoping Report. No extensions were allowed during the commenting period because of strict timeframes. Below is a summary of the PPP undertaken as part of the statutory process:

The in-process Draft Scoping Report (containing NEMA, NEM: AQA; NEM: WA and NWA detail) was made available for a 30-day commenting period on the PHS Consulting website. A Background Information Document (BID) on the proposed project and containing public participation information was also made available with the Draft Scoping Report. All appendices, the main report and the BID were separate links.

In addition, a hard copy of the report was lodged at the Fisantekraal Public Library. A site notice was pinned on the library notice board.

Registered I&APs and State Departments were notified via email / WhatsApp / sms of the availability of the draft Scoping Report. Any additional IAPs highlighted by State Departments, or the competent authority were included in the registered IAP list.

An advertisement in English was placed in the Tygerburger with detail on and how to comment on the draft Scoping Report and the Water Use Licence application.

Three site Notices in English were placed on or near the site along various roads adjacent to the site with detail on and how to comment on the draft Scoping Report and the Water Use Licence application during the 30-day commenting period.

Focus Group meetings were held during the 30-day period with various identified interest groups.

All comments received during the 30-day comment period were considered in the final Scoping Report and responded to in the Comments and Response (C&R) report which is included in the final Scoping Report submitted to the DEA&DP for approval.

The ongoing development of Cape Winelands Airport's airspace protocol has reached a critical stage, focusing on ensuring compliance with, among other, the Civil Aviation Assessment Protocols, as stipulated in Government Notice No. 320, Government Gazette 43110, dated 20 March 2020.

The progress to date includes:

Engagement with SACAA - A request has been made for a meeting with representatives from the South African Civil Aviation Authority (SACAA) to discuss and agree on the requirements for issuing a compliance statement. This meeting is essential to ensure that all necessary criteria and documentation are met before submission.

Documentation Prepared - The following documents are required for submission:

- Synopses of the EIA process to date.
- The Airspace Concept of Operations (CONOPS) within the NASCOM ATM/CNS process.
- Baseline Assessment Report

Stakeholder Requirements - It has been confirmed that SACAA requires letters of support for the project from both the City of Cape Town and the Western Cape Province. Additionally, evidence of public consultation must be provided to meet the compliance requirements.

Engagement with SACAA and aviation stakeholders will be ongoing in the EIA Phase.

9.6 Planned Statutory EIA Phase PPP

The draft Environmental Impact Report (EIR) and Environmental Management Programme (EMPr) (containing NEMA, NEM: AQA and NWA detail) will be circulated for an initial 30-day commenting period to all Registered I&APs and relevant State Departments and Organs of State.

Registered I&APs and State Departments will be notified via email / WhatsApp / sms of the availability of the EIR. The Report will be uploaded on the PHS Consulting website. All appendices, the main report and BID will be separate links. In addition, the report will be lodged at the Fisantekraal Public Library for public viewing and a site notice will be pinned on the library notice board.

A public open day is planned during the 30-day commenting period where the public will be able to learn more about the application and will have the opportunity to ask any questions.

An advertisement in English will be placed in one local newspapers with detail on and how to comment on the draft EIR, the Water Use Licence, the Air Quality Licence, and details of the Open Day to be held during the 30-day commenting period. Three site Notices in English will be placed on or near the site along various roads adjacent to the site with detail on and how to comment on the draft EIR, the Water Use Licence, the MMP, and with details of the Open Day to be held during the 30-day commenting period.

All comments received during the initial 30-day commenting period will be included in the draft EIR and all comments received will be responded to in the comments and response (C&R) report.

The draft Environmental Impact Report (EIR) and Environmental Management Programme (EMPr) (containing NEMA, NEM: AQA and NWA detail) will be circulated for a second 30-day commenting period to all Registered I&APs and relevant State Departments and Organs of State early in 2025.

All comments received during the second 30-day commenting period will be included in the final EIR and all comments received will be responded to in the comments and response (C&R) report which will also be included in the final EIR. The final EIR will then be submitted to the DEA&DP for their decision.

Engagement with SACAA and stakeholders within the aviation industry will be ongoing during this phase with resultant compliance with the Civil Aviation Airspace Protocol. Proof of compliance to be appended to final EIA submission to DEA&DP.

The draft HIA is to be submitted to the HWC registered conservation body (The Durbanville Heritage Society) for comment and to the CoCT Environmental Management Department’s Environment, Heritage, and Signage Branch for comment, prior to submission to HWC for consideration and authorisation.

Note: PPP for the Maintenance Management Plan will be run concurrent to the EIA PPP and will include elements required for the MMP.

Table 135: Summary of issues by IAPs during Pre-application and In-process Scoping Phase (inclusive public meeting, farmers association meeting, & focus group meetings)

Item	Summary of Issues Raised	Considered within the EIA
Pre-Application Scoping Phase		
Aviation	The following issues were raised by counterparts in the aviation industry: International licence application; Airport designation; National engagements; Competent authority (CA); Alignment to CoCT MSDF (2023); Relocation of GA to CWA; CTIA Capacity; Unmet Market Demand; Alternate Airport Status; Fuel Supply and Availability; Co-Existence of CWA and CTIA; Compliance to applicable regulations and legislation; Airspace (Design, Conflicts and restrictions, Dependencies & Capacity); Recognition of AMP element: realigned runway; Recognition of the CTIA future second parallel runway; Dilution of economy; Air Traffic Control; Competing for the same market; Cumulative airspace and noise impact; Primary / Secondary Radar; Northern District Plan; impact of weather on operations;	The issues raised were considered and communicated to specialists. Amendments were made to specialist reports (Civil Aviation Scoping report) and the Scoping report where appropriate, and replies to queries provided in the C&R. Issues will also be discussed further with individual counterparts through the SACAA Subcouncil structures and processes.
Noise	The following issues related to NOISE were raised by various IAPs: Availability of noise cones; Noise pollution due to construction activities and ongoing air traffic; Impacts on the health and well-being of residents; Impacts on property values and house sales; Effects on wildlife, livestock and pets; Land use & development impacts and restrictions in relation to the development’s noise cones; The cumulative noise impact of CTIA and CWA; Cumulative noise impact from the proposed development and existing sources; Social impacts (e.g. disruptions at schools); Impacts on tourism; Ecosystem impacts.	The issues raised were considered and communicated to specialists. Impacts associated with NOISE will only be assessed in the EIA Phase of the proposed project and will at that time be included by specialists in their assessment. Where appropriate, clarification on concerns/ issues raised was provided in the C&R.
Services Availability	The following issues were raised regarding Electricity: Operational concerns relating to the biodigester (water demand and potential pollution, noise, odour and transport of feedstock); Risks of electrical outages to the Fisantekraal WWTW; Impacts of electricity generation on non-renewable resources.; Availability of chicken manure for the operation of the biodigester. The following issues were raised regarding Potable Water: Resource availability within a water scarce area; Water demand and supply; Impact of groundwater abstraction on surrounding groundwater users; Uncertainty on potable water supply strategy. The following issues were raised regarding Sewage: Limited capacity of the Fisantekraal WwTW; Limited service provision in close proximity to the site; Biosecurity risks posed by the proposed onsite sewage treatment package plant to nearby poultry operations.	The issues raised were considered and communicated to the technical staff. Clarification on queries raised were addressed in the C&R where appropriate. The potable water supply strategy was clarified and updated in the Bulk Engineering report. The concerns raised around sewage was noted and replied to in the C&R where appropriate. The biosecurity concerns regarding the on-site sewage treatment plant were noted for the future design of the plant.
Waste Management	The following issues regarding waste were raised: Clarification on the use of sewage as feedstock for the biodigester; Clarification on the disposal of treated sludge from the	The issues raised were noted and considered by the CWA team and specialists. Alternative feedstock for the biodigester is being considered.

	onsite sewage treatment package plant; Lack of detailed waste management strategies for the different waste streams originating from the proposed project; Biosecurity risks posed by the proposed onsite sewage treatment package plant to nearby poultry operations; Biosecurity risks of onsite composting of garden waste.	The waste management strategy will be developed as part of the EIA Phase and include all waste streams. The biosecurity concerns regarding the on-site sewage treatment plant were noted for the future design of the plant.
Stormwater Management	The following issues re stormwater were raised: Increased stormwater runoff due to land use changes and associated erosion; Avifaunal and biosecurity risks associated with stormwater ponds; Surface water quality impacts; Potential for groundwater contamination.	The issues raised were considered and communicated to the technical staff. A stormwater management plan will form part of the design for the site. The avifaunal and biosecurity risks associated with the stormwater ponds will be considered by the specialists (Landscape design, Bird Strike Hazard assessment, Poultry Biosecurity and Health study) and incorporated in the future design. Surface water quality and groundwater contamination concerns will be assessed by the Freshwater Ecological and Geohydrological assessments in the EIA Phase.
Traffic	The following issues were raised re traffic: Airport Access, traffic congestion and infrastructure constraints; Challenges for transporting livestock and accessing farming facilities; Alteration of traffic patterns during construction; Increased security risks associated with increased pedestrian and vehicular traffic; Traffic-related fauna collisions; Pedestrian, motorist, and animal safety; Safety concerns with roads and children; Noise and air pollution from increased traffic; Disruption of the rural environment; Degradation of existing roads.	The issues raised were communicated to the technical specialist team and considered by the CWA team. The road infrastructure design and Transport Impact Assessment will consider the issues raised. The concerns raised were replied to in the C&R where appropriate.
Air Quality	The following issues were raised re Air Quality: Increased air pollution resulting from proposed development activities; Health risk (humans and animals) related to dust and particulate matter released during construction activities as well as aircraft emissions during the operational phase; Increased health risks resulting from air pollution will place increased strain on local public health services; Negative impact of air pollution on property values and house sales; Incomplete air quality assessment.	The concerns raised were replied to in the C&R where appropriate. The issues raised were communicated to the specialist for consideration in the Air Quality Impact Assessment during the EIA Phase.
Climate Change	The following issues were raised re Climate Change: The alteration and disturbance caused by airport construction and the ability of wetlands to adapt to climate change; Alignment with the national and provincial vision and strategies of climate change; Inclusion of a Climate Change Impact Assessment in the plan of study; Inadequate assessment of CWA climate impacts; Increased greenhouse gas emissions and associated climate sanctions; Private jet amplification of climate change and social inequality; Scope-3 emissions - “Social Cost of Carbon”.	The issues raised were communicated to the technical specialist team and considered by the CWA team. A Climate Change Impact Assessment (incorporating these concerns) has been commissioned for the proposed project. Where appropriate, individual specialists incorporated climate change in their impact assessment.

Biophysical (fauna, flora, wetlands and terrestrial biodiversity loss)	The following Biophysical concerns were raised: Noise impacts on wildlife in the region; Biohazards such as the introduction of invasive species; Displacement of animals (wildlife and domestic); Traffic-Related Fauna Collisions; Increased stray animals; Disruption of ecosystem balance; Concerns for avian and amphibian species; Reduction in endangered species habitat; Edge effects on adjacent ecosystems; Applicability and feasibility of offsets; Habitat loss and biodiversity loss; The impact of light pollution on fauna and flora; Maintenance of indigenous landscaping; Spread of infectious diseases; Impacts on animal health, behaviour, and productivity; Water quality impacts; Disruption of hydrological patterns.	The issues raised were communicated to the technical specialist team and considered by the CWA team. A stormwater management plan will form part of the design for the site. The Faunal and Avifaunal Impact Assessments will incorporate the issues related to fauna and avifauna and habitat. A Terrestrial offset study (for the terrestrial biodiversity loss) and a Freshwater offset study were commissioned and will form part of the EIA process. Surface water quality and groundwater contamination concerns will be assessed by the Freshwater Ecological and Geohydrological assessments in the EIA Phase.
Security and social issues	The following issues were raised concerning Security and Social: There is currently a crime problem in the Fisantekraal area; Lack of policing resources in the area; Criminal elements stemming from the development and impacting the community's safety; MyCiti & private airport transport vs taxis; The need for additional public transport and the potential thereof to result in increased taxi strikes, directly impacting the safety of local communities; Increased crime in an area with inadequate police and security services could turn the area into a new hijacking hotspot; Economic viability of the development.	Where appropriate issues were addressed in the C&R. The Socio-economic Impact Assessment will incorporate these issues for consideration and assessment.
Loss of agricultural land and food security	The following issues were raised: Land conversion from agriculture to airport and associated activities; Decrease in average farming income; Devaluation of agricultural land; Impacts on food production and associated local economy in the area; Displacement of valuable agricultural land and community livelihoods; As farms surround the Airport, plant diseases and animal infections can lead to reduced agricultural productivity, affecting food security; As the rural nature of the area is phased out, the farms will eventually be forced to close down, reducing food security and jobs; Impacts on small scale and subsistence farmers; Impacts on nearby poultry facilities which supply affordable protein.	Where appropriate issues were addressed in the C&R. The Agri-Ecological Impact Assessment and the Socio-economic Impact Assessment will incorporate these issues for consideration and assessment.
Visual and light pollution	The following issues were raised: Visual and Aesthetic Impacts in the rural/scenic landscape; Light pollution impact on plants growth; Light pollution impact on nocturnal species; Light pollution impact on nearby poultry facilities.	Where appropriate issues were addressed in the C&R. The Visual Impact Assessment will include light pollution, while the Poultry Biosecurity and Health study will consider the light pollution on the nearby poultry facilities.

Alternatives	The following issues were raised: Additional Location alternatives; Additional Runway alternatives; Service provision alternatives; Road network alternatives; Site layout alternatives.	Where appropriate issues were addressed in the C&R. The Alternatives Section in the Scoping report has been expanded on in terms of motivation.
Need and Desirability	The following issues were raised: Proximity of the proposed development to CTIA; Existing capacity available at CTIA; Increased burdens on already insufficient infrastructure; The PSDF does not highlight the need for the expansion of airport facilities in the Western Cape and the Status Quo Report for the GCMRSIF concluded that preference should be given to the expansion and development of existing airports before an alternative site be considered for a new or secondary airport; General concerns from local residents related to the desirability of the proposed development within a currently rural landscape.	Where appropriate issues were addressed in the C&R. The Need and Desirability section of the Scoping report was expanded on to consider these issues and to provide clarity and additional background information.
Heritage	The following issues were raised: Need for a heritage impact assessment; Impacts on the cultural landscape; Disruption of the scenic beauty of the area; Tourism appeal of the broader area, Potential impact on nearby heritage resources including heritage value of surrounding farms; Heritage significance of the existing airport; Development pressure on the surrounding landscape.	A Heritage Impact Assessment (Cultural, Visual and Archaeological) forms part of the proposed project. The issues raised were shared with the specialists for consideration in the HIA. Where appropriate issues were addressed in the C&R.
Spatial planning	The following issues were raised: Concerns related to the formalisation of the airstrips zoning; Planned (known) residential and other habitable developments within certain proximities/radius to the proposed site (e.g. Greenville and Bella Riva); Location of a portion of the development site within Discouraged Growth Areas (DGAs); Location of a portion of the development within an Area of Agricultural Significance; Location within a rural landscape; Existing infrastructure limitations; land area required; enquiry whether any residents would need to move.; potential influx of job seekers	Where appropriate issues were addressed in the C&R. The spatial planning process will run concurrent to the EIA process and consider these issues raised. The Socio-economic Impact Assessment will also consider some of the issues raised.
Residential property prices negatively affected (socio-economic)	The following issues were raised: Impact on property values and house sales; Devaluation of farms; Increase in property taxes.	Where appropriate issues were addressed in the C&R. The issues were shared with the specialist for consideration in the Socio-Economic Impact Assessment report.
Request for public consultation / meetings	Several requests were made for community meetings and engagements with the general public as well as the Greenville and Fisantekraal community specifically.	Open House Meetings and Public meetings where and when required are planned during the Impact Assessment Phase where the public will be able to learn more about the application and will have the opportunity to ask any questions. The Scoping report has been amended to reflect this.

Employment opportunities	Several enquiries were made during the public meeting regarding employment opportunities for members of the local community: How will the CWA ensure that the local communities within the vicinity of the development get access and opportunity to jobs at the CWA during construction & operational phase? How will the procurement process work? How will CWA ensure that existing businesses get access to opportunities? Access to opportunities specifically for South African citizens;	Registration of businesses, skilled & unskilled workers on CWA website, get involved in COCT procurement strategy, community forums, skills development & learning. CWA intends to include the communities they are their neighbours. Procurement plan still in progress but intent is to include local community. Local register essential for feedback regarding procurement plan. CWA will accommodate unskilled labour where applicable as it is a requirement. Localization is valued, contractors and sub-contractors will be employed on localized approach as far as feasibly possible, CWA will work and consult with community, councillors
Item	**Summary of Issues Raised**	**Considered within the EIA**
In-Process Scoping Phase		
Aviation	The following issues were raised by counterparts in the aviation industry: Negative impacts on various aspects of general aviation; Morningstar airport and associated General Aviation not considered; impacts on VFR traffic; shortfalls within CONOPS report; insufficient information provided on general aviation in the area; expansion of controlled airspace introduces safety hazard; VFR routes not considered with IFR routes, risks associated with potential narrow; congested VFR routes; airspace restrictions & increased air traffic impacting agricultural aviation needs; communication and coordination between commercial and agricultural aviation; fuel supply constraints; airspace capacity and independent operation concerns; consideration of the role of George International Airport; concerns related to the concurrent growth and development airports and airfields in the vicinity of proposed CWA.	The issues raised were considered and communicated to specialists. Amendments will be made to Aviation specialist reports going into the EIA phase and the Scoping report were amended to strengthen the POS, and replies to queries provided in the C&R. Two additional technical reports have been identified and will be completed and form part of the EIA Phase. Issues will also be discussed in consultation with the Aviation industry and further with individual counterparts through the SACAA Sub council structures and processes.
Noise	The following issues related to noise were raised by various IAPs: Residential areas are within flight paths of planes; concerns related to planes' operating hours; noise impacts on animals, people, and ecosystems; impacts on property values; impact on noise-sensitive receptors such as schools in vicinity of CWA; concerns related to noise associated with increased heavy vehicle traffic; noise impacts within Mikpunt and Fisantekraal; impact of noise on existing and approved land use rights.	The issues raised were considered and communicated to the specialist. Impacts associated with noise will only be assessed in the EIA Phase of the proposed project and will at that time be included by specialists in their assessment. Where appropriate, clarification on concerns/ issues raised was provided in the C&R. The issues raised will be considered by the specialist in the EIAR and have been included in the POS.
Services Availability	The following issues were raised regarding Electricity: Limited exploration of renewable energy alternatives; solar panels potentially attracting birds; risk of bird strikes associated with wind turbines	The issues raised were considered and communicated to the technical experts. Clarification on queries raised were addressed in the C&R where appropriate. The issues raised will be considered by the technical specialist in the EIAR and have been included in the POS.

	The following issues were raised regarding Potable Water: Updated hydro census information required; risk of groundwater contamination; resource security; risk of over abstraction of groundwater; no existing municipal potable / bulk water supply lines in close proximity to the site. The following issues were raised regarding Sewage: Biosecurity risk posed by the potential onsite wastewater treatment works to the nearby poultry facility; existing operational issues within the Fisantekraal WWTW; pollution risk associated with the onsite WWTW. The following general service provision concerns were raised: Service capacity of existing service networks; financial implications for each role player in the bulk and link infrastructure network system.	The concerns raised around sewage was noted and replied to in the C&R where appropriate. The biosecurity concerns regarding the on-site sewage treatment plant were noted for the future design of the plant. The issues raised will be considered by the technical specialist in the EIAR and have been included in the POS.
Waste Management	The following issues regarding waste were raised: Ambiguous waste management strategy; odour nuisance related to the biodigester; management of proposed onsite WWTW; health and pollution risk associated with solid waste management; waste license requirements.	The issues raised were noted and considered by the CWA team and specialists. The waste management strategy will be developed as part of the EIA Phase and include all waste streams. A waste management plan forms part of the Norms and Standards submission and the EMPr. The issues raised will be considered by the technical specialist in the EIAR and have been included in the POS.
Stormwater Management	The following issues re stormwater were raised: Unclear water management plans; risk of groundwater contamination; pollution risk associated with improper stormwater management; avifaunal biosecurity risks associated with proposed stormwater ponds.	The issues raised were considered and communicated to the technical specialist. A stormwater management plan will form part of the design for the site. The avifaunal and biosecurity risks associated with the stormwater ponds will be considered by the specialists (Landscape design, Bird Strike Hazard assessment, Poultry Biosecurity and Health study) and incorporated in the future design. Water quality and Groundwater contamination concerns will be assessed by the Freshwater Ecological and Geohydrological assessments in the EIA Phase. The issues raised will be considered by the technical specialist in the EIAR and have been included in the POS.
Traffic	The following issues were raised re traffic: Increased traffic volumes; existing infrastructure constraints; increase in congestion; longer commute times; road degradation; uncertainty with regards to future road developments and transport services are required by the airport; noise associated with increased heavy vehicle traffic.	The issues raised were communicated to the technical specialist team and considered by the CWA team. The road infrastructure design and Transport Impact Assessment will consider the issues raised. The concerns raised were replied to in the C&R where appropriate. The issues raised will be considered by the technical specialist in the EIAR and have been included in the POS.
Air Quality	The following issues were raised re Air Quality: Decreased air quality impacting health of local inhabitants; air pollution in Mikpunt; incomplete air quality assessment; air	The concerns raised were replied to in the C&R where appropriate.

	pollution risks posed by the biodigester; air pollution resulting from emissions escaping. from fuel storage tanks; proximity to the community of Fisantekraal; increased carbon emissions associated with proposed development.	The issues raised were communicated to the specialist for consideration in the Air Quality Impact Assessment during the EIA Phase.
Climate Change	The following issues were raised re Climate Change: carbon emissions related to more frequent flights; inadequate assessment of CWA climate change impacts.	The issues raised were communicated to the technical specialist team and considered by the CWA team. A Climate Change Impact Assessment (incorporating these concerns) has been commissioned for the proposed project. Where appropriate, individual specialists incorporated climate change in their impact assessment.
Biophysical (fauna, flora, wetlands and terrestrial biodiversity loss)	The following Biophysical concerns were raised: Risk of birds and wildlife strikes; general pollution risks; threats to wildlife habitats; concerns for avian and amphibian species; consideration of endangered species in surrounding area; endangered species habitat reduction; edge effects; traffic related faunal collisions; potential water pollution risks associated with the biodigester; impact of the development on existing conservation areas; applicability of biodiversity offsets; impact of the airport on local conservation efforts. The following concerns were raised re groundwater: Updated hydro census information required; risk of groundwater contamination; resource security; risk of over abstraction of groundwater; leaks and spills in fuel storage tanks resulting in groundwater contamination; impact of over abstraction on local habitats.	The issues raised were communicated to the technical specialist team and considered by the CWA team. CWA will be implementing a bird/wildlife strike prevention programme. A stormwater management plan will form part of the design for the site. The Faunal and Avifaunal Impact Assessments will incorporate the issues related to fauna and avifauna and habitat. A Terrestrial offset study (for the terrestrial biodiversity loss) and a Freshwater offset study were commissioned and will form part of the EIA process. Surface water quality and groundwater contamination concerns will be assessed by the Freshwater Ecological and Geohydrological assessments in the EIA Phase.
Health, safety and social concerns	The following issues were raised concerning health risks: constitutional rights to an environment that is not harmful to health or wellbeing; potential health hazards associated with the biodigester; health risks for nearby communities where health care service provision is already limited The following issues were raised concerning safety concerns: Safety risks in the Mikpunt community during take-off and landing due to its alignment with the runway; increased gangsterism and organized crime in Fisantekraal which lacks sufficient policing resources The following issues were raised concerning social concerns: Decreased quality of life within the local rural communities; change from rural landscape to urban; elevated living costs and taxes; potential disruptions to local businesses, farms, and overall	Where appropriate issues were addressed in the C&R. The Socio-economic Impact Assessment will incorporate these issues for consideration and assessment.

	livelihoods; shortfalls in the socioeconomic report; potential for job losses in nearby agricultural industries	
Agricultural concerns	The following issues were raised: Absence of a scoping phase poultry study; airspace restrictions & increased air traffic impacting agricultural aviation needs; communication and coordination between commercial and agricultural aviation; proximity of proposed development to existing laying farm; light impacts on poultry facility.	Where appropriate issues were addressed in the C&R. The Plan of Study in the Scoping report identifies the requirement for a Poultry Biosecurity and Health study which will be completed and circulated for comment in the Impact Assessment Phase. The Agri-Ecological Impact Assessment and the Socio-economic Impact Assessment will incorporate these issues for consideration and assessment.
Visual and light pollution	The following issues were raised: Light impacts on nearby poultry facility	The Poultry Biosecurity and Health study will consider the light pollution on the nearby poultry facilities.
Alternatives	The following issues were raised: Requests were made for consideration of an alternative location, alternative runway alignment, and alternative layout of landside infrastructure; concerns regarding lack of alternatives considered;	The Alternatives Section in the Scoping report has been expanded on in terms of motivation.
Need and Desirability	The following issues were raised: Concerns regarding quality of life for local residents; general wellbeing of Fisantekraal & Greenville communities; need and viability of a second commercial international airport; CTIA has sufficient capacity; future development plans at CTIA; concerns were raised regarding government services that will be required by the airport such as SARS, Border Management Authority, SAPS, and bulk infrastructure which would require funding; spatial appropriateness of land use for an airport at this location; need and desirability of CWA within the regional context of airport clusters.	Where appropriate issues were addressed in the C&R. The Need and Desirability section of the Scoping report was expanded on to consider these issues and to provide clarity and additional background information.
Spatial planning	The following issues were raised: Implications on existing and approved land use rights; expansion of the urban edge; approved residential development in the vicinity of the proposed CWA; land use zoning of proposed development area; inadequate reference to the existing tall communication masts; lack of connection with an operational freight rail line; risks associated with expansion of informal development in the vicinity of the proposed CWA;	Where appropriate issues were addressed in the C&R. The spatial planning process will run concurrent to the EIA process and consider these issues raised. The Socio-economic Impact Assessment will also consider some of the issues raised.
Residential property prices negatively affected (socio-economic)	The following issues were raised: Devaluation of property prices, increased property taxes	Where appropriate issues were addressed in the C&R. The issues were shared with the specialist for consideration in the Socio-Economic Impact Assessment report.

Public consultation	It was queried why a public meeting has not been organised in MIKPUNT; concerns raised regarding accessibility of information for general public; enquires as to how concerns that have been raised have been incorporated into the application; misleading information in media; request for social and economic opportunities to be made available to local communities	A public meeting was held on May 8th, 2024. Prior to the meeting, the public was informed through site notices, email notifications, and an advertisement in the Tyger Burger. Open House Meetings and Public meetings where and when required are planned during the Impact Assessment Phase where the public will be able to learn more about the application and will have the opportunity to ask any questions. The Scoping report has been amended to reflect this.
Employment opportunities	The following enquiries related to employment opportunities were made: several individuals seeking employment reached out to offer their services; queries were made regarding the number of jobs that will be created by the proposed development and how this was determined; concerns related realistic benefit to unskilled community in terms of permanent employment; generation of sustainable opportunities; queries were raised regarding providing technical training to youth to ensure that local communities benefit from the jobs being created;	Interested individuals can register as a supplier/service provided on the CWA website. Registration of businesses, skilled & unskilled workers on CWA website, and COCT procurement strategy, CWA will work and consult with community, councillors.
WULA	A query was raised regarding the WULA Commenting Period for which 60 days must be made available.	The 60 days for comment on the WULA technical report will be completed as 30 days within the Scoping Phase and 30 days within the Impact Assessment Phase of the application in order to accommodate the requirements of the “One Environmental System” application process. This is in agreement with DWS.

10. CONCLUSIONS AND RECOMMENDATIONS

10.1 Environmental Impact Statement

10.1.1 Summary of Negative impacts:

A) Botanical Impacts

The main construction phase botanical impact of the proposed development is loss and degradation of the remaining natural and partly natural vegetation in some of the development footprints. It is likely that about 1ha of the 1.6ha patch of Very High sensitivity in the North will be lost, along with the two associated plant SCC in this area. About 1.3ha of High sensitivity vegetation will be lost, and about 2.7ha of Medium sensitivity vegetation will be lost. Thus, a total of about 5ha of vegetation of some sensitivity will be lost, with all the rest being of Low sensitivity (generally heavily disturbed or cultivated).

Only three of the 25 recorded plant Species of Conservation Concern in the study (and Agricultural Precinct) area will be lost to the proposed development footprint, one of which already seems to be extinct on the site (*Leucospermum grandiflorum*).

The overall botanical construction phase impact of the proposed development is likely to be **Medium – High negative before mitigation**, driven mainly by the partial loss of a 1.6ha patch of Very High sensitivity Swartland Silcrete Renosterveld (Critically Endangered), and the two associated plant Species of Conservation Concern in this area. This impact is largely unavoidable, other than by runway layout alteration. **After mitigation** this could be reduced to an acceptable **Medium negative level, or even Low negative**, if adequate ecological management of the priority remaining natural areas is implemented, along with an appropriate biodiversity offset.
The **No Go alternative** (Alternate 1) is likely to have a **Low negative** botanical impact, but with a low degree of certainty, with construction phase impacts arising from mowing, some new building, and possible random excavation and dumping.

Operational phase impacts include reduction of the current low - moderate levels of ecological connectivity across the study area, and associated habitat fragmentation. The airside open space areas will need to be brushcut and mown to various heights (from 200mm to 700mm), to comply with safety regulations, and to minimise potential bird-strikes. This regular mowing will obviously have a negative physical effect on the plants, but most of them should survive, although they will remain stunted, and may not flower or set seed, depending on the timing of the mowing.
Once construction is completed the overall change in ecological connectivity is likely to be **Low to Medium negative** on a regional scale.
Overall, the operational phase botanical impacts of the proposed development are likely to be **Low to Medium negative** at a local scale, before mitigation, and **Neutral to Low negative** after mitigation.

The **No Go** alternative would possibly have a slightly lower indirect (operational phase) ecological impact than the proposed development and is likely to be **Low negative** (before and after mitigation). Impacts would be expected from unmanaged alien invasive vegetation, lack of ecological fire management and ongoing mowing.

B) Faunal and Avifaunal Impacts

Faunal Impacts -

- Loss of habitat due to vegetation clearance activities;
- Displacement of species from the footprint areas during construction activities;
- Potential increased mortalities due to human – wildlife conflict as well as faunal species collisions with construction and operational vehicles;
- Potential poaching/snaring by staff/construction personnel;
- Loss of habitat connectivity and movement corridors within the landscape;
- Increased noise pollution from machinery during the construction phase and noise pollution from aircraft during the operational phase; and
- Increased light pollution, notably during the operational phase of the airport.

Subsequently, the perceived impacts are expected to have a **low to very low** impact significance to faunal species in the study area.

Avifaunal Impacts -

- Direct loss of avifaunal habitat;
- Decreased avifaunal abundances and species richness;
- Increased anthropogenic movement;
- Potential for bird strikes;
- Altered avifaunal movement patterns;
- Loss of avifaunal SCC habitat and possible SCC occurrence both within the study area and in the surrounding habitats;
- Altered biotic integrity and disturbance to ecosystem function; and
- Altered water quality.

Provided mitigation measures are implemented, impact significance to avifauna is expected to range from **medium to very low** significance.

C) Freshwater Ecological Impacts

The proposed ‘no-go’ Alternative 1 will not result in any additional impacts to the freshwater ecosystems identified within the study and investigation area, and as such, has not been included in the impact assessment.

Construction Phase Impacts (Alternative 2 and 3)–

- Modification of the seep wetland 1 and CVB wetland 2 and 3’s hydrological functioning and water quality

- Changes to the geomorphological processes (sediment balance, erosion and sedimentation)
- Wetland habitat loss, altered wetland habitat and impacts to biota

Operational Phase Impacts (Alternative 2 and 3) –

- Modification of the seep wetland 1 and CVB wetland 2 and 3's hydrological functioning and water quality
- Changes to the geomorphological processes (sediment balance, erosion and sedimentation)
- Wetland habitat loss, altered wetland habitat and impacts to biota

The proposed CWA development poses a **moderate negative impact** on the ecological integrity of the wetlands in the study and investigation areas with the implementation of control measures as a result of the loss of wetland habitat due to the construction and operation of the proposed CWA development. Impacts to the CVB wetlands 2 and 3 are considered to be **Very low to Low** with control measures in place, whereas impacts to the seep wetland 1 are considered to be **Very low to Moderate** with implementation of control measures. The **Moderate impact** is associated with the 6.74ha seep wetland 1 habitat loss anticipated as a result of the construction and operation of the proposed CWA development.

<u>Cumulative Impacts:</u>

- Increasing urbanisation and continued urban sprawl - degradation of freshwater features due to land transformation and resultant disturbance to surrounding freshwater features through proliferation of AIPs, as well as physical transformation of freshwater ecosystems, primarily in the form of impoundments and other artificial structures (such as stormwater drains) that have been developed along most of the drainage lines in the area.
- Potential impacts on freshwater systems located downgradient of, and adjacent to the study area from stormwater impoundments (freshwater habitat transformation, hydrological impacts, hydromorphological impacts), linear infrastructure (roads and railways), urban expansion and climate change.
- The operation of the CWA and stormwater related impacts associated with the proposed development will cumulatively add to the existing water quality and sediment issues currently experienced by the freshwater ecosystems.
- The loss of an area of wetland in the study area, if not offset, will contribute to the cumulative loss of wetland habitat within a local catchment context.
- Climate change impacts (changes in precipitation patterns, temperature increases, extreme weather events, changes in vegetation composition) on wetland ecology should not be overlooked, as these ecosystems provide ecological services such as flood regulation, water purification, and biodiversity support, which are important for maintaining overall environmental health and resilience.

D) Geohydrological Impacts

Development Alternative 1 (also referred to as the No-Go option) would entail the preservation of the site as is and no further development. Impacts associated with Surface runoff, groundwater quality deterioration because of leaks from fuel storage and distribution, groundwater quality deterioration because of atmospheric deposition, and groundwater quality deterioration because of Accidental Release are **Very Low** post mitigation. Potential impact on groundwater quality deterioration because of direct release rates as **Low** post mitigation.

As the differences between Development Alternatives 2 and 3 are minor, the same risks exist for both alternatives. Impacts associated with groundwater quality deterioration because of contamination by construction of the facility, due to surface runoff, leaks from fuel storage and distribution, atmospheric deposition, the bio-digestor facilities, the operation of solar PV, over abstraction of groundwater, and wastewater storage pre and post treatment, rates as **Very Low** post mitigation. The over-abstraction of groundwater rates as **Very Low** post mitigation.

The potential impact on groundwater quality deterioration because of direct release, and groundwater quality deterioration because of Accidental Release, rates as **Low** post mitigation.

<u>Cumulative Impacts:</u>

Potential cumulative impact when considered along with other developments in the area:

- Construction and development of CWA – Very Low post mitigation
- Surface runoff generated by CWA site – Medium post mitigation
- Leaks caused by storage and distribution of fuel on site - Medium post mitigation
- Atmospheric deposition - Very Low post mitigation
- Direct / surface release – Low post mitigation
- Accidental release – Low post mitigation
- Energy supply (Solar PV) – Very Low post mitigation
- Over abstraction of groundwater (resource depletion) - Low post mitigation
- Over abstraction of groundwater (Quality deterioration) – Low post mitigation
- Storage of wastewater before treatment – Very Low post mitigation
- Storage of brine - Very Low post mitigation
- Storage of chemicals (WWTW) – Very Low post mitigation
- Landscape irrigation with treated water - Very Low post mitigation

E) Hydropedological Impacts

Potential Construction Phase impacts:

- Sealed surfaces post-construction could alter the natural flow of water in the study area, potentially leading to increased erosion and sedimentation in lower-lying areas
- Reduced infiltration due to sealed surface may necessitate the channelisation of water into stormwater structures and discharge into downstream watercourse or lower lying areas in the landscapes.
- Encroachment on interflow soils may disrupt wetland recharge mechanisms, affecting subsurface processes and ecological state.
- Downstream streams are ephemeral and likely recharged mainly by overland flow and direct precipitation over short periods. As such the contribution of interflow soils to these downstream watercourses is likely limited.

Basin scale hydropedology shows:

a) a slight increase in streamflow and surface runoff, each by 10.55% and 10.99% respectively, although this change is not expected to significantly alter the timing or pattern of water flow, minimizing impacts on instream functionality.
b) decreases in lateral flow and percolation by 2.21% and 5.62% respectively, largely due to flow path disruptions and sealed surfaces from proposed development.

While there is a slight increase in profile water at this scale, changes in hydropedological processes are predicted to have minimal impact on wetland conditions, with no more than one PES class change expected (refer

c) Table 106).

At the landscape unit (hillslope) scale:

a) streamflow and surface runoff show a modest increase of 6.17% and 6.52% respectively, attributed to new impervious surfaces and redirected water flow through stormwater channels due to proposed development.
b) Lateral flow and percolation decrease by approximately 2.8% and 3.7% respectively, with minimal impact on the water balance due to the absence of interflow soils.
c) While there is a slight decrease in profile water at this scale, changes in hydropedological processes are predicted to have minimal impact on wetland conditions, with no more than one PES class change expected (refer Table 107).

At the **hydrological response unit scale**:

a) site clearing, and surface infrastructure establishment are expected to reduce evapotranspiration and increase direct evaporation from bare soil.

Potential Operational Phase impacts:

a) Streamflow and surface runoff are projected to increase by approximately 13.62% and 14.26% respectively, due to impervious surfaces and low soil storage capacity.
b) Lateral flow shows minimal change with a loss of about 0.4%, while percolation decreases by 4.35%.
c) A slight increase in available profile water is also expected, indicating higher moisture levels.
d) Overall, the hydropedological processes are predicted to remain largely unmodified in the post development scenario, and the functionality of the wetlands identified within the catchment area will likely remain unchanged if stormwater is managed effectively.

F) Air Quality Impacts

- Generation of dust during construction.
- Exhaust emissions from the truck movements and equipment at the site during construction.
- Dust deposition from construction activities.
- Generation of air pollutants from operation of runway

G) Noise Impacts

During construction the noise levels at the closest community receptors are not expected to exceed the SANS guidelines for Urban Residential areas.

The resulting noise levels from the CWA aircraft operations were simulated with the use of the US FAA's AEDT model. Based on the noise modelling methodology and input data, the resulting noise contour levels were estimated for the following scenarios:

Scenario 1: Existing runway setup under full utilisation (No-Go Alternative);

Scenario 2: Operations on the new runway 01/19 in the operational year;

Scenario 3: Operations on the new runway 01/19 at full capacity.

The busy day operations are expected to reach 301 by the time the current runway system reaches its operational capacity (Scenario 1). For Scenario 2, the expected busy day aircraft operations per day with the new runway 01/19 will be reduced to 29. When the new airport operates at capacity the busy day operations will reach 208.

Scenario 1: Existing Runway System at Full Utilisation (No-Go Alternative)

The day-night noise rating level L_{Rdn} noise contour of 55dB(A) will encompass a total area of 2.47km^2 around the airport. A small portion of this contour extends beyond the R312 towards the South, within the Greenville Garden City and covers a zone of approximately 0.44km^2. Within this zone it would not be recommended to establish residences, without providing additional noise mitigation measures.

The L_{Rdn} 60dB(A) zone is completely contained within the airport site for Scenario 1.

From the day-night N70 contours, which indicate the number of aircraft movements that exceed 70dB(A) L_{Amax} at a given location, it was found that the 30 and above events area is 8.6km^2, and a portion of this zone extends beyond the airport site boundaries into the Bella Riva development and primarily into the Greenville Garden City. The area affected in the later development is 1.6km^2. This is considered significant, and mitigation measures in terms of appropriate land use planning should be implemented for this zone.

No nighttime aircraft operations are planned for the nighttime period for this scenario.

Based on the resulting noise contours, it is evident that the existing residential areas of Fisantekraal and Klipheuwel fall outside of the above-mentioned impact zones. In addition, the fact that the proposed residential developments of Bella Riva and the Greenville Garden City are in the design phase could provide an opportunity to consider and implement appropriate mitigation measures, considering the areas of impact in each development.

Scenario 2: New Runway 01/19 in Operational Year

The area with L_{Rdn} 55dB(A) during the operational year will only be 1.44km^2 and will not extend into the proposed residential areas West and South of the airport and will be contained within the development area of the airport site.

The aircraft operations that will cause 5-10 events per day exceeding the 70dB(A) L_{Amax}, will extend outside air airport’s site boundary towards the South. However, this zone is very small, and the number of events is considered of low significance.

Scenario 3: New Runway 01/19 at Full Capacity

By the time that the new airport and runway 01/19 reaches its capacity, the length of the L_{Rdn} 55dB(A) impact zone will reach 4 km north of its northern site boundary. The Klipheuwel residential area will be outside this impact zone. The noise level on the south-eastern part of Klipheuwel community is expected to reach 49dB(A), which is in accordance with the SANS 10103 guideline for Urban Districts with little road traffic. Towards the South, the 55dB(A) noise contour will extend less, reaching a distance of 3.3km. This zone will overlap the Greenville Garden City development and cover an area of approximately 1.03km^2. It should be noted that immediately South of the runway, there will also be a small zone of 0.11km^2 within the Greenville Garden City area, where the L_{Rdn} reaches between 60 dB(A) and 63 dB(A).

Towards the Bella Riva area, the L_{Rdn} 55dB(A) contour will extend approximately 300m from its eastern further most point of this development. The area that is covered by this contour within the Bella Riva development is 0.38km^2. From the N70 day-night contours it is evident that there is an area within the Greenville Garden City that will experience more than 30 events of 70dB(A) L_{Amax}. This is considered significant, and mitigation measures in terms of appropriate land use planning should be implemented for this zone, which is approximately 1.2km^2.

It should be noted that the above-mentioned zone that should be considered for appropriate land use planning is smaller than the relevant one for Scenario 1, which is 1.6km^2. The Klipheuwel residential area was found to fall within the 5-10 events contour but outside the 20-30 events. The number of events that exceed the 70dB(A) L_{Amax} during nighttime, i.e. between 22h00 and 06h00, are expected to be only 3, and their contour is contained around the northern section of the new runway, within the airport development site.

Similarly, the number of events that exceed the 60 dB(A) LAmax during nighttime is 3, and its contour is primarily around the northern section of the new runway. This contour marginally extends beyond the airport site boundaries and covers a small portion of the northern Bella Riva development area. However, this is considered of low significance, since it only refers to 3 events and will take place before 11h00.

H) Socio-economic Impacts

- Vehicular traffic flows (construction and operations)
- Nuisance factors, such as dust and noise (construction)
- Influx of job seekers (construction)
- Construction workers in local communities (construction)
- Local crime (construction and operations)
- Risk of informal settlements (operations)
- Sense of place (operations)
- Nearby farming and business operations (operations)
- Surrounding land values (operations)
- Bulk infrastructure requirements (operations)

Cumulative Impacts:

- Ongoing and approved developments in the area will increase the number of construction vehicles along the access routes, in particular Bella Riva.
- Additional construction activities in the immediate area (particularly Garden City and Bella Riva) will compound the nuisance factors if they coincide or overlap with construction at the CWA site

- Given the high unemployment levels in the nearby communities, construction projects in the area will attract job seekers. More casual workers will be attracted to the area if multiple developments' construction phases overlap.
- If the construction phase of the CWA expansion overlaps with other developments, a large number of construction workers may interact with the local communities.
- Given the high unemployment rate in the Fisantekraal area, construction activities are likely to attract criminals in search of easy targets. Each additional development project will contribute to the risk of criminal activities, but effective security measures should confine these problems to site-specific events with less cumulative impact.
- Similar projects in the Cape Metropole area would act synergistically to create more demand for supplies and services, which, due to the multiplier effect, would act as a catalyst for further economic growth and employment.
- Similar projects (in particular, the proposed improvements at CTIA) would create more supply in the transport sector and demand for associated supplies and services in the CMA.
- Further development and densification along the Darwin corridor are already underway and will generate significant additional traffic on the access routes.
- Together with the proposed expansion at CTIA, more aircraft will pass over the Northern District residential areas, impacting their sense of place.
- Other industrial or residential developments nearby could have a cumulative impact in attracting criminals in search of easy targets
- Other industrial or residential developments in the area could have a cumulative impact in attracting jobseekers that erect informal structures due to a lack of nearby housing.
- Other industrial developments in the immediate area could compound any negative impacts on surrounding land users.
- On the other hand, several large-scale developments in the area could increase the perceived value of undeveloped properties within the urban edge, particularly those that could form part of a future airport precinct.
- Other developments near the CWA will increase the local demand for bulk services
- The CTIA expansion may act synergistically to create more demand for airport-related supplies and services and stimulate further economic growth in the CMA. However, it is more likely that existing and new businesses closer to CWA will have a cumulative impact in creating new opportunities in the goods and services industries within the Northern District.
- Other development projects in the CMA could act synergistically to create more demand for supplies and services and thus catalyse further economic growth in the area.
- Other development projects would further enhance the rate base of the City of Cape Town.

I) Agro-ecosystem Impacts

Change in Productivity:

- Loss of productive land
- Impact on Food Security – in terms of availability
- Loss of farming infrastructure
- Loss of farming infrastructure

Additional Environmental Impacts

- Possible soil degradation by wind and/or water erosion;
- Impact on vleis, marshes, water sponges and water courses;
- Impact on the flow pattern of run-off water.

Climate change impacts:

- Temperature increases
- Changes in precipitation patterns – seasonality and likely reductions in rainfall
- Increased extreme weather events

Cumulative Impacts:

Reduction in arable land – induced by the CWA in conjunction with other surrounding developments.

The No Go Alternative 1 refers to the scenario where future development is done within existing development rights. No farmland or land zoned for agriculture will be transformed in this alternative and thus there will be no impact on the agro-ecosystem.

J) Heritage Impacts (Cultural, Archaeological and Visual)

The **Archaeological Assessment** found the project does not pose a significant threat to local archaeological heritage resources and that the proposed development area is not a sensitive or threatened archaeological landscape. The significance is likely to be Low and no Impact Assessment was undertaken for the proposed project.

IN terms of the **Cultural Assessment**, none of the farmsteads in the study area appears to be of aesthetic, historical or architectural significance although they contain structures older than 60 years, and although two of the structures in the study area are older than 60 years neither of them is of aesthetic significance nor conservation worthy.

Visual Assessment

The impact assessment findings for the Initial Preferred alternative were similar enough to those of the New Preferred Alternative so as not to warrant their inclusion in this report as a separate set of Impact Assessment Tables.

The "Do Nothing" Alternative 1, in which the current rights of the existing airport would remain in place and no additional development would occur. No visual impacts anticipated as a result of activities.

A) Potential effect and/or intrusion on protected landscapes or scenic resources; and potential effect of change to the visual character of the area:
   - Visibility of sources of light at night (for sensitive receptors) within LCA 2 & 3 (inside Urban edge, and within Joostenburg Vlakte CL

Construction - Very Low negative visual impact

Operational - Moderate / Medium negative visual impact

- Visibility of sources of light at night (for sensitive receptors) within LCA 4 (within the Durbanville Hills CL and the Koeberg/Swartland Farms CL).

Construction - Very Low negative visual impact

Operational - Low negative visual impact

- Visibility of sources of light at night (for sensitive receptors) within LCA 1 (within the Agter-Paarl Paardeberg CL)

Construction - Very Low negative visual impact

Operational - Low negative visual impact

- Transformation of land use and site character: New buildings, structures and service infrastructure visible within a previously predominantly rural agricultural landscape. Transformation of land uses within the site boundaries from an existing airfield and farmland (mostly undeveloped) into a regional airport including a commercial component (mostly developed). Total clearance of the developable areas of the subject site during construction phase (bulk earthworks).

Construction - Moderate / Medium negative visual impact

Operational - Low negative visual impact (with scope for Positive Enhancement)

B) Potential effect on the visual amenity of Scenic routes
   - The R312 Lichtenburg Road Scenic Route (Route 31; SR1: Scenic drive envelope, Gateway Point and view corridors as scenic resources).

Construction – Very Low negative visual impact

Operational - Low negative visual impact (with scope for Positive Enhancement)

C) Potential effect on the landscape character and sense of place of the Agter-Paarl Paardeberg Cultural Landscape (LCA 1 - areas not within the property boundary). Potential effect on the scenic amenity of the portion of the R304 Provincial Scenic Route (between the R312 Lichtenburg Road crossing and its intersection with Slent Road near Klipheuwel) that bisects the subject site but lies eastward and outside of the portion of the CWA that is earmarked for development.

Construction – Low negative visual impact

Operational - Low negative visual impact

D) Potential effect on the landscape character and sense of place of the Durbanville Hills CL and the Koeberg/Swartland Farms CL (both within LCA4). Potential effect on the scenic amenity of: R302 Klipheuwel road Scenic Route (Route 30b; SR1) and the Spes Bona Road.

Construction – Low negative visual impact

Operational - Low negative visual impact

E) Potential effect on the landscape character and sense of place of the Joostenberg Vlakte Cultural Landscape (also referred to as LCA 2). Potential effect on the scenic amenity of the R304 (S1: between the N1 and the crossing with the R312 Lichtenburg Road).

Construction – Low negative visual impact

Operational - Low negative visual impact

F) Cumulative Impacts:

- The visual impacts of lights at night will be a notable Cumulative visual impact of the proposed CWA development:

a. This is due to the amount, brightness, complexity and overall ubiquity of a range of different kinds of light sources that will be visible at night (static, dynamic (moving) and intermittent (flashing)).

b. For viewers within the urban areas, the effects of skyglow and light trespass will be cumulative upon the existing high levels of light pollution that the Durbanville and Fisantekraal area experiences at night.

c. For the R312 scenic route, the night-time character of the viewer will be lost / transform entirely from the baseline if the proposed perimeter lighting and outdoor advertising and signage proposals are implemented.

d. For viewers located within the surrounding Cultural Landscapes (i.e., viewing the night sky and surrounding night-time landscapes from the surrounding rural areas), the visual impacts of light at night will be the most obvious.

i. Point sources of light (such as the lights atop the ATCT, the apron lights, the lights of airplanes etc.) will be visible especially from the Agter-Paarl Paardenberg CL;

ii. Point sources of light and skyglow/light trespass will also be visible from the Koeberg / Swartland farms CL and the Durbanville Hills CL (although these lights will be visible across urban and urbanizing areas in the foreground – truly a cumulative effect upon existing light pollution).

iii. The Joostenberg Vlakte CL contains the highest density of residents (highly sensitive visual receptors), who will experience less visibility of point sources of light (due to the high level of existing vegetation patterns that screen line of sight) but will experience increased levels of light pollution in the form of sky-glow and light trespass at night as a result of the proposed development.

- The proposed development will result in an overall increase in developed land and conditions of urbanity within the Northern District of the City of Cape Town (Sub-district 4 Agricultural/Rural Hinterland). These impacts are considered Cumulative in the context of the 2023 Urban Development Edge (UDE) revision in the MSDF, as well as the future development earmarked for neighbouring and nearby properties:
  - It will result in a starker transition between the developed and rural agricultural landscape, as the UDE fills in to the west and south of the subject site.
  - From elevated views especially, the proposed development will add to the compounded visual effect of densification and infill development in the area (inside the urban edge).

(It should be noted that this trend is supported by local and regional planning policy).

- The proposed CWA will also result in the de-facto incremental movement of the UDE outward to the North and the East (outside of the designated Urban Development Edge).
- The proposed runway, visible infrastructure and airport buildings will be visible from within the Areas of agricultural Significance, the Cultural Landscapes and Scenic routes that encircle the site from the southwest, all the way through the west, the northwest, the north, the northeast, the east and the southeast.
- Portions of the proposed development will result in the loss of uninterrupted scenic views of the rural agricultural hinterland within the Agter-Paarl Paardeberg Cultural Landscape; mapped areas of Critical Biodiversity; elements that define the structure of the landscape of the Receiving environment (farm werfs and mature existing tree avenues) and the baseline condition of very low light conditions at night.
- The proposed CWA development will however make a significant contribution to the cumulative visual impact on the visual character of the Scenic Route within the Scenic Route envelope. The height, distance and massing of buildings as well as the treatment of the boundary interface and the verge landscaping will determine what kind of character the landscape adopts in the future, whether scenic quality is maintained, and whether or not the characteristic long views towards the encircling landscapes (and landmark topographical features) remain important in the view frame.
- The increase in air traffic and the upgrade of the existing airport to accommodate larger types of aircraft will result in a concomitant increase in the regularity and visibility of aircraft in the sky within the Receiving environment, which can be seen as a Cumulative visual impact.
- The ad-hoc/market responsive nature of the development strategy and the resultant proposed length of time of the Construction phase(s) will result in Construction Phase impacts overlapping significantly with Operational phase impacts, to the extent that it may be difficult to distinguish between them. These can be considered Cumulative upon one another.
- The proposed CWA development may contribute cumulatively to the removal of the mapped Gateway point for the R312 Lichtenburg Road outward towards the East. A new threshold point may emerge, one that has a greater focus “outward” towards the rural Hinterland than “inward” towards the built-up areas within the new UDE.
  - At this interface (and along all of its proposed development edges) the CWA has the potential to contribute positively to how the public values the remaining Cultural Landscape areas.

K) Aviation Impacts

- Identification of potential Annex 14 obstacles and marking or removing of these.
- Identification of height restriction on adjacent land and implications and restrictions for landuse development.
- Identification of airspace design requirements to accommodate CWA needs.
- Noise from increased operations at CWA
- Increased ground transportation from increased operations at CWA
- Socio-economic impacts from the proposed CWA development

L) Transport Impacts

- Increase in vehicular movement during construction and operational phase 1B.
- Dust and Noise from construction activities.

M) Climate Change Impacts

<u>Impact of project on Climate Change</u>

- Nature – the GHG emissions resulting from the construction and operation of the CWA will contribute to global anthropogenic climate change.
- The current airport site is undeveloped with minimal activity occurring. The current site has an estimated carbon footprint of 647tCO_2e each year.
- Construction emissions were estimated at a high level, capturing the most significant material emission sources. It is estimated that the construction phase will produce approximately 326 662tCO_2e.
- In terms of the impact on South Africa the carbon footprint would be 3.35milliontCO_2e as emissions from international aviation are excluded from the National Inventory. 1.7milliontCO_2e emissions is associated with international aviation flights.
- The average annual impact from the operation of the CWA expansion project is estimated to be 217 599tCO_2e per annum.
- The direct operation of the CWA would have a low-medium impact due to the planned sustainability measures of the Project. The total project emissions including value chain emissions would have a medium impact on the National Carbon budget due to the significant contribution of Scope 3 emissions to the Project's overall footprint.

The direct operation of the CWA would have a **low-medium impact** due to the planned sustainability measures of the Project. The total project emissions including value chain emissions would have a **medium impact** on the National Carbon budget due to the significant contribution of Scope 3 emissions to the Project's overall footprint

The significance of the environmental impact criteria was determined to be **medium**.

<u>Impact of Climate Change on project:</u>

- Increased risk of wildfires
- Increased risk of land slides
- Increased risk of water scarcity

- Increased risk of extreme heat

N) General Impacts:

The generation of waste on site from construction and operational activities was identified as a general impact and assessed in terms of its potential impacts per phase. Impacts identified include:

- Generation of general waste, organic waste, hazardous and industrial waste, and sewage during the construction phase.
- Generation of general solid waste, organic waste, hazardous and industrial waste, brine and sewage during the operational phase.
- Potential for natural resource contamination and soil erosion during the operational phase.
- Generation of atmospheric emissions and odors, dust and noise during the operational phase.
- Visual impacts, consumption of resources (water), attraction of birds and vermin, and potential leakage of potentially hazardous substances during the operational phase.

10.1.2 Summary of Positive Impacts:

The section below lists the potential positive impacts as identified by the EAP and specialists.

Potential positive socio-economic impacts

- Provision of transport infrastructure (operations)

The proposed development will address a growing need for transport facilities and amenities.

H & A Planning (2024) indicated that the proposed CWA development will address the need for a secondary airport and diversion capability. "*CWA as an alternate airport instead of Port Elizabeth or OR Tambo Airports for flights inbound to CTIA17 will result in cost savings due to the shorter diversion distance, which results in less fuel weight being allocated to the reserve. With increasing air travel demand, a secondary reliever airport is necessary to alleviate congestion at Cape Town International Airport (CTIA) and support future growth. The development will alleviate hangar shortages and relocate general aviation from CTIA, reducing congestion in airspace and on runways.*

Both CWA and CTIA are vital for unlocking economic development and ensuring the aviation industry's sustainability, aligning with best practices observed in thriving global cities. Having two international airports will also create healthy price competition and service offerings between the airport operators as opposed to being exposed to a monopolistic situation as is the case with Cape Town's port."

- Creating new employment opportunities (construction and operations) and new business opportunities (operations)

Potential positive impacts include temporary employment opportunities during construction phase and a contribution towards the local economy, with specific reference to the construction, retail, and services sectors and industries.

The initial construction is envisaged to take 4 years (Phase 1), with most of the capital expenditure occurring in the first two years (Year -1 and Year 0). Phase 2 will entail further upgrades scheduled periodically over the next 20 years. Table 136 estimates the economic impact of the envisaged direct spending in the first two years of construction, focusing on Output4, Gross Geographic Product (GGP)5, jobs, and nominal household income.

Table 136: Direct, indirect and induced impact of construction spending related to GGP, output, household income and jobs in the first two years of construction

Economic measure	Direct	Indirect	Induced	Total
Production (output, R' billion)	R6,1	R7,8	R3,6	**R17,4**
Gross Geographic product (GGP, R' billion)	R1,4	R2,8	R1,4	**R5,6**
Jobs (number)	4 751	15 441	4 195	**25 107**
Household income (R' billion)	R0,8	R1,3	R2,7	**R4,7**

Source: Multi-Purpose Business Solutions SAM model

The information provided in the table above indicates the following for the initial two years of construction:

- An estimated R6,4 billion in capital investment could generate R17,4 billion in new business sales, referred to as the production (or output) that creates demand for business activity during construction.
- The increase in production output could add R5,6 billion (net of the import leakage) to the GGP of the CMA.
- The project could sustain about 25 107 (direct, indirect and induced) employment opportunities (refer to net jobs movement below).
- Household income from job opportunities could increase by R4,7 billion.
- Economic income (construction and operations)

The CMA and Western Cape economies will benefit from the procurement of goods and services and the spending of wages and salaries, as well as temporary employment for people with different types and levels of skill.

The impact of capital expenditure on the CMA economy during construction can be estimated over the long term (22 years). This impact is represented by an income and output multiplier, an indication of temporary job opportunities that will taper away after the construction period, and the impact on household incomes of those workers directly or indirectly involved in the construction phase. The impacts are direct, indirect and induced, with the latter representing the spending of salaries and wages in the local economy.

Figure 182 illustrates the annual impacts for the individual items used to assess the impact, with the initial construction envisaged to peak in the initial construction years.

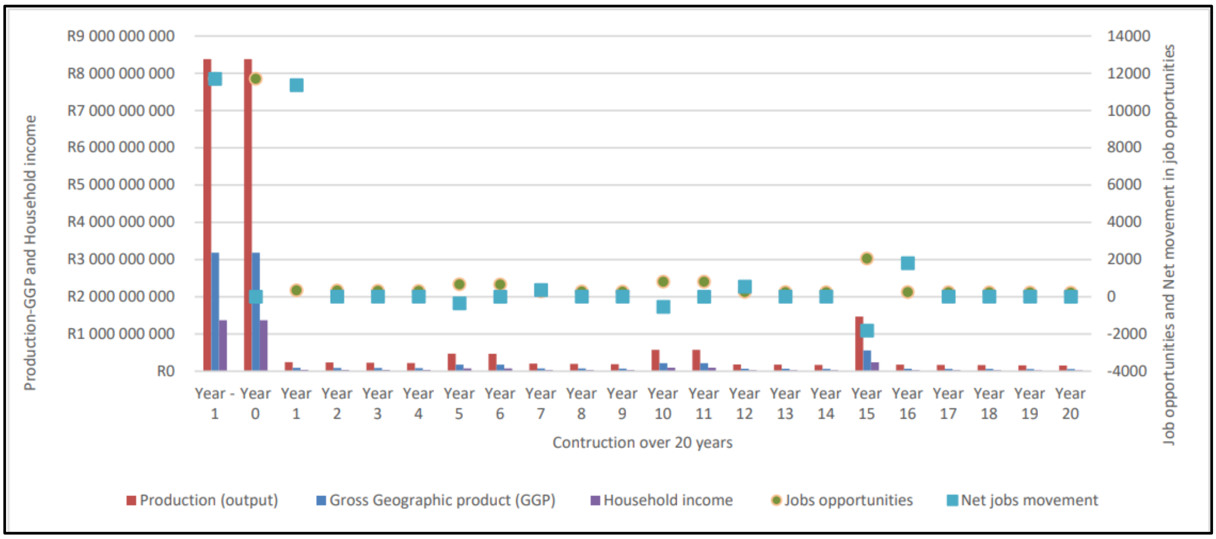

Figure 182: Impact of annual capital expenditure over initial 2 years of construction and 20 years thereafter

To give effect to the long-term impact of capital expenditure, the analysis presented above is extended to include a further 20 years of capital expenditure in nominal terms. Table 137 indicates the total impact economic impact of the envisaged direct capital spending associated with the construction of the CWA, focusing on Output (production), Gross Geographic Product (GGP), the net movement in jobs and household income over 22 years.

Table 137: Impact of capital expenditure over 22 years

Economic measure	Total	Average (p.a.)	Maximum (Year -1)	Minimum (Year 20)
Production (output, R' billion)	**R23.2**	R1.1	R8.4	R0.2
Gross Geographic product (GGP, R' billion)	**R8.8**	R0,4	R3.2	R0,059
Jobs (number)	**32 433**	1 474	11 707	217
Household income (R' billion)	**R3.8**	R172.8	R1.4	R0.025
Net jobs movement (number)	**11 420**			

Source: Multi-Purpose Business Solutions SAM model

The information provided in the table above indicates the following for the construction period of 22 years:

- The estimated capital investment could generate R23,2 billion in new business sales, the production (or output) that creates demand for business activity during construction with an average expenditure of R1,1 billion per annum. The highest output impact of R8,4 billion is achieved in Year -1 and the minimum in Year 20.
- The increase in production output could add R8,8 billion (net of the import leakage) to the GGP of the CMA in nominal terms. The average GGP contribution is R400 million annually, with the highest impact of R3,2 billion in Year -1 and the lowest of R59 million in Year 20.
- The household incomes from the workers could result in an additional spending of R3,8 billion, which translates to an average of R173 million per annum.

- Impact on surrounding property values

A new development may affect the current and future perceived value of properties in the surrounding area. For the CWA development, property owners in nearby neighbourhoods may be negatively affected due to a change in the sense of place. However, land adjacent to the airport site may be in demand for commercial and/or industrial developments, thus increasing the perceived value of the properties. properties adjacent to the CWA are predominantly zoned Agricultural, but there are a few exceptions, such as the approved Bella Riva mixed-used development directly east of the airport and other land uses. The Northern District is considered a growth and development node for the CoCT, attracting interest from developers for megaprojects. In general, properties inside the urban edge may experience demand for infill development, often increasing the perceived value of undeveloped properties. Properties outside the urban edge could also experience an increase in perceived value over time, which is often realised when the urban edge is adjusted to include said properties. However, landowners that bought properties bordering on a green belt may be concerned about the sense of place, visual impact (interrupted views), peace and tranquillity (increased traffic, noise and dust), privacy and security.

- Revenue accruing to local authorities (operations)

The CWA will contribute to the fiscus during construction and ongoing operations as various taxes and levies will become payable or accrue to the national government and the City of Cape Town. The fiscus will benefit from individual and company taxes, individual taxes and levies, VAT and import duties. The CoCT will benefit from Development Changes (DCs) based on the envisaged construction expenditure, property rates, and services (utilities). Several assumptions are applied to determine the fiscal and monetary contributions:

- The period covered is 2025 to 2046, of which the first 4 years are earmarked for construction and 20 years as the operational period;
- Statutory rates and levies are applied as they relate to UIF, SDL, Company Tax, Import duties and VAT;
- Import duties are levied on aeronautical ground lighting (AGL) CAT II, GSE: tug, loaders, steps, pax busses, etc., GSE: fire tenders and equipment and baggage equipment;
- Marginal rates for PAYE (41% for skilled, 25% for semi-skilled and 18% for unskilled labour);
- Development charges are calculated per the DCs levied by or agreed to with the CoCT;
- Municipal property rates are estimated at 1,2% of the capital expenditure applicable to initial construction, and based on the 2023/24 property tariffs of the City of Cape Town for 350 000m^2 of commercial space to be developed over 20 years;
- Municipal services are assumed to be 1% of revenue;
- A discount rate of 10% is applied to determine the fiscal and monetary benefit in current terms (2023); this rate is used in the public sector and essentially equates to prevailing borrowing rates.

Table 138 indicates the fiscal and monetary impacts. In current terms, the CWA expansion could contribute R3,9 billion to central government coffers over 22 years, while the City of Cape Town could obtain R2,1 billion from rates and services based on the applied assumptions.

Table 138: Fiscal and monetary funds accruing to the two spheres of government in current terms

	R' million
National Government	R3 896.9
PAYE (Construction)	R575 397.1
Unemployment Insurance Fund (UIF)	R25.7
SDL	R25.7
VAT (net)	R1 534.4
Company Tax	R1 355.9
Import duties	R31.1
PAYE operations	R316.0
Unemployment Insurance Fund (UIF)	R21.8
Skills Development Levy (SDL)	R10.9
City of Cape Town	**R2 055.9**
Municipal rates	R969.6
Municipal taxes	R1 051.2
Development charges	R35.1

Potential Positive Botanical Impacts

The Landscape Concept Plan (Planning Partners 2024) indicates that a suitably low growing (depending on location) mix of indigenous annuals, vygies, herbs and low shrubs will be hydroseeded and planted in most of the airside open areas. If this is even partly successful it could enhance the current low indigenous plant diversity in these areas.

However, at the operational phase of the proposed development some positive impacts could be realised on the remaining conservation worthy areas, and via the required biodiversity offset, and thus the development alternatives would have a more positive botanical impact than the No Go at this stage.

No biodiversity offset would be implemented in the No Go alternative, which thus means that the very positive impacts of this aspect would not be realised. This is an important difference, as the implementation of an appropriate biodiversity offset would be very positive for Renosterveld conservation in the region.

No significant positive ecological impacts of the proposed development are likely during either the construction or the operational phase in the absence of mitigation. However, the alien invasive vegetation management already undertaken on site has had a minor positive impact and will hopefully continue (and will be included in the EMPr for both the primary project area and the Agricultural Precinct). If the required environmental management of the natural areas on site is properly implemented, and if the required biodiversity offset is secured, then the proposed development could have a notable positive botanical impact on a regional scale (in contrast to the No Go alternative), even considering the loss of patches of sensitive habitat on site.

Potential positive Agro-ecosystem impacts:

The direct long-term benefits of the proposed rezoning to the current farming operation are:

- A capital injection into the remainder of the farm;
- Improved security in the area.

Potential positive Cultural Impacts:

Capital investment in the airport expansion is estimated to be of the order of R7-Billion. The proposed passenger terminal is designed to accommodate 5.2 million passengers per year. The developers have stated that their aim is for the airport to be more than just an aviation hub. It will be used as a driver of regional economic development and local community inclusion.

The proposed CWA It will reduce airline fuel costs and emissions, improve the business case for air travel, and drive economic growth in the region. It will also provide additional capacity, improve redundancy, reduce inefficiencies at Cape Town International Airport, and make air travel more affordable and accessible. Its proximity offers airlines a more viable alternate airport for diversion planning, alleviating the need to carry an excessive amount of fuel for long-haul flights.

By reducing the fuel burden by up to 10,000kg per flight, the airport will reduce fuel consumption and carbon emissions. Independent estimates suggest that the airport will collectively save airlines millions of kilograms of fuel and boost cargo-carrying capabilities, demonstrating its immense potential to promote a more environmentally responsible aviation sector.

The City of Cape Town's rates income will be dramatically increased.

Potential positive Visual impacts:

- There is the possibility of positive cumulative visual impacts, if the undeveloped areas of the subject site are not degraded and are managed actively to maintain scenic quality. To achieve this, the proposed CWA development must consistently find ways to protect and enhance the capacity of the urban hinterland to continue to "provide a certain quality" to the adjacent urban environment (Northern District Plan, 2023, p32).
- There is also a distinct possibility that effect of the proposed CWA development on the R312 Scenic route can result in a positive cumulative visual impact (after the construction phase and establishment phase), when the landscapes are established (e.g. upgrades to the public realm, well-maintained development interface, continuity of legibility in terms of the features that define the structure of the landscape such as tree avenues, wide verges and long views).
- The proposed CWA development may contribute cumulatively to the removal of the mapped Gateway point for the R312 Lichtenburg Road outward towards the East. A new threshold point may emerge, one that has a greater focus "outward" towards the rural Hinterland than "inward" towards the built-up areas within the new UDE. At this interface (and along all of its proposed development edges) the CWA has the potential to contribute positively to how the public values the remaining Cultural Landscape areas.

Potential positive Aviation impacts:

- Nett gain for regional air travel - CWA as a designated airport will generate its own traffic, facilitating domestic and international scheduled airline services and performing a complementary role to the existing Cape Town International Airport and the region by providing an injection of needed capacity (specifically during peak hours).

- Given the location, CWA is well positioned to provide a convenient and safe airport option for residents in the Cape Metropole and beyond. Road access to the site is through various safe routes and the site does not pose restrictions and risk to expansion through squatting and land invasion. Having only one airport to choose from limits the ability of travellers to choose the most convenient option for them. The positioning of the proposed CWA – along the N1 corridor – is very desirable such that it will be a far more convenient option for hundreds of thousands of travellers who live to the North and North-East of the city.

- The added capacity and convenient location will in turn reduce the cost of flying and travel time on the roads for residents, thereby making air travel more affordable and accessible for South Africans.

- By distributing passenger traffic across two airports (CWA & CTIA), road congestion around these two airports would be reduced, making it easier for passengers to reach their flights on time instead of funnelling all passengers via the N2/R300 highways.
- Alternate airport - a critical reason for CWA implementing the infrastructure in Phase 1 is not just about scheduled passenger growth at CWA – it is to specifically unlock the benefits enabled to the aviation sector from Phase 1 by introducing a much closer alternate airport for the purposes of diversions and fuel planning on flights inbound to CTIA. To perform the role of an alternate for flights inbound to CTIA from Phase 1, it is a technical requirement for CWA to provide similar levels of runway capability as CTIA, hence the proposed runway length.
- With the existence of CWA as a diversion airport, passengers will have the immense benefit of diverting to an airport in the same city only 25km away from their intended destination, enabling them to continue their journey with minimal disruptions.
- Having two airports enhances CoCT's overall resilience to disruptions. If one airport faces operational issues, such as weather delays or maintenance closures, the other can continue to operate, ensuring that passenger flow into and out of CoCT remains steady.
- By spreading passenger traffic across two airports, Cape Town reduces the risk associated with relying on a single facility. This diversification can attract more airlines and passengers who value reliability and consistency in their travel plans.
- Any flight diversion to another city comes at significant cost to the airline sector, and a major inconvenience to all (additional fuel; additional logistics; carrying costs of diversion fuel per flight) – CWA as an alternate airport reduces the costs substantially. This will bring the cost of flying down, making air travel more affordable and thus contributing to the growth in air travel at both airports.
- Reduction in emissions -the reduction in the need to carry diversion fuel and the favourable location of CWA, will result in decreased emissions from aviation and road transport sources. The study CWA DIVERSION AIRPORT ANALYSIS estimated an annual reduction in fuel consumption and carbon emissions by up to 5% per flight and per annum.
- CWA will be the only airport in the region other than CTIA with the infrastructure capable of serving the broader General Aviation (GA) sector – a sub-sector that is currently faced with significant capacity shortages rendering the industry unable to serve the ever-increasing demand.
- Reliever airport - relieving congestion at CTIA during times of temporary increased activity or providing redundancy to CoCT in times when the airport is closed for an extended period of time.
- CWA will improve the attractiveness of the city to host major events by providing additional airport capacity. When the city bids for a mega event, air access is always a key consideration and with added airport capacity it could be the difference between being the winning bidding city or not.
- CWA will contribute toward continuity of economic activity (trade and tourism) in the event of an extended closure at CTIA.

- CWA could provide additional temporary or permanent capacity during peak periods (slot constraint times and peak seasons noting the seasonal nature of visitor trends)
- CWA will offer redundancy in the event of catastrophic fires, structural failures, fuel or power supply interruptions, etc.
- To support all the operations and activities at the expanded airport, CWA will unlock property development. This includes support facilities, offices, admin buildings and hangars where applicable for each industry. This will attract further investment into the region, stimulating further economic growth and job creation.
- Enhanced aviation sector - CWA aims to fulfil several key roles within the aviation sector, unlocking new markets while enhancing existing ones and creating further opportunities within the sector, significantly improving the socio-economic landscape within the region. It is important to note that CWA's role – even when considering the other operators in the market – will have an enhancing effect on the aviation sector for existing operators, as opposed to a mere redistribution of the market to existing sub-sectors.
- Redesign of airspace in the regional area allowing interaction between GA and CWA and other stakeholders and the formalisation of these procedures to create a safer and more optimised airspace.

<u>Potential positive Climate change impacts:</u>

Awareness of the potential CCI of the proposed project has motivated the CWA to upfront incorporate resource efficient (water and energy) measures in the design of the site. Particularly, mitigation measures such as adopting a 100% renewable electricity policy, wastewater treatment plant technologies with limited GHG emissions and measures around waste disposal have been proposed.

Urban cooling and heat responsiveness - The CWA aims to develop buildings appropriate for the local climate that reduce the need for cooling/heating in summer/winter.

Water scarcity and drought readiness - The CWA expansion aims to utilise treated groundwater abstracted from boreholes on site as a short to medium term solution to potable water supply.

Water sensitivity, flood-readiness and storm management - The CWA expansion plans to develop a full stormwater design to accommodate the increase in hardened surfaces and additional stormwater runoff anticipated from buildings. The stormwater design will focus on the prevention of flooding.

Managing fire risk and responsiveness - The CWA expansion plans to implement the placement of fire water tanks on site and include fire protection measures in its building designs. A fire response plan will also be developed. Fire response vehicles and trained fire fighters will be present on site, to ensure fast emergency response times. Fire breaks will also be constructed along the site perimeter and alien vegetation removal will be prioritized to decrease the likelihood of veld fires crossing the site.

Zero emissions buildings - Two sustainable energy options are being considered, including a biodigester plant and photo-voltaic power supplies (solar PV) with optional storage batteries. Ideally, diesel generators will serve as a back-up option in case of unfavourable weather conditions, plant failure or maintenance operations.

Waste generation, management and disposal - The waste management plan includes aspects such as recycling and composting and the site design incorporates a waste management.

CWA is 25 km away from CTIA and as a closer alternative would significantly reduce excess fuels required in the event of diversion. By using CWA as an alternative airline could reduce the GHG emissions resulting from diversion by 3-5% (CWA Diversion Airport Analysis Summary Report, 2022). This would directly contribute to combating climate change and aligning with sustainable aviation goals.

Additionally, airlines can optimise their operations by carrying less fuel on flights resulting in lower operating costs and passing the savings from freed up weight to lowering airfare and increasing cargo capacity.

Potential positive Freshwater impacts:

The proposed offset initiative is expected to significantly contribute to positive wetland resource management and conservation in the region, counteracting the wetland loss and residual wetland impacts by the proposed CWA project.

The operation of the rehabilitated wetlands will pose a net positive impact once rehabilitative measures have been implemented.

It should be noted that although the impact on the wetland hydrology of seep wetland 1 and CVB wetland 3 is considered negative, the release of treated stormwater into these wetlands can contribute to the recharge of the systems, resulting in a net positive impact if the recommended control measures and management measures in the Stormwater Management Plan are implemented.

The proposed mitigation measures will improve the functionality of existing freshwater systems on site through rehabilitation, implementation of buffers and alien vegetation removal.

The offset plan includes the rehabilitation of ~40 ha of wetland habitat which will compensate for the 7.44ha total wetland loss resulting from the proposed CWA development. The planned restoration is expected to improve the PES of the wetlands, contributing to a net gain in wetland functionality and elevating its ecological status, ensuring that the offset delivers a positive contribution to the region's wetland conservation efforts.

Potential positive resource management impacts:

Solar PV – the generation of renewables on site decreases the dependency of the site on Eskom supply, minimises the risk of operational disruption and provides a more financially viable energy option not subject to continuous rising energy supply costs.

Biodigester – the utilisation of organic waste feedstock will assist in the reduction in disposal to landfill.

The proposed indigenous landscaping plan will result in reduction in irrigation needs.

The development of an on-site WWTW will decrease dependency on CoCT for sanitation services and resultant risk of operation.

The provision of non-potable water needs through using treated sewage water will decrease dependency on potable supply from CoCT and assist in making the site more drought resilient.

The provision of on-site potable supply through boreholes will result in decreased dependency on CoCT for potable services. It will enable drought resilience and an ability to still operate when risk of low water feed due to drought or maintenance of bulk infrastructure is high.

Stormwater management on and around site has been improved through the new planning and design, decreasing risk of flooding, downstream siltation of natural systems and

10.2 Recommendations

10.2.1 Management outcomes for inclusion in EMPr:

Certain technical management plans will be required as condition of the EA:

- Wildlife Management Plan (inclusive of bird strike alleviation)
- Emergency preparedness and response plan
- Groundwater Quality Monitoring Plan
- Noise Management Plan
- Service Infrastructure Management Plan

These plans can only be developed once the EA and other authorisations are in place and will be required to be authorised by the respective CA prior to implementation.

10.2.2 Aspects conditional by specialists to be included as conditions of EA:

The following conditions were developed by the EAP and specialists and are to be included in the Environmental Authorisation:

Conditions of EA from Geohydrological IA:

- Due to the proximity of the Colenso Fault to the CWA, a no-go area for specific high-risk activities is proposed to the northeastern section of the study area as seen in Map 9. The precise location of the Colenso Fault is uncertain and therefore, the no-go area was drawn 500 m from the closest geologically mapped fault. The 1: 250 000 (Cape Town, 3318) and the 1: 50 000 (Paarl, 3318DB) geological maps were used and both of these maps delineate the closest fault in the same area. This no-go area does not have to apply to all activities, but only to certain high-risk activities such as the aviation fuel farm, bulk fuel storage, retail service station or other activities that are considered high risk.

- The site development should only proceed on condition that no contamination of the underlying aquifer takes place. This will require the appropriate protection, mitigation and monitoring measures, including those indicated in this report.
- In situations where it is not possible to avoid pollution because of higher operational priorities for example, the need to protect people, take all reasonably practical steps to mitigate the effects of such pollution.
- A groundwater monitoring network will be required, and will require the following:

- Regional monitoring boreholes: To monitor the regional groundwater quality, e.g. of the fractured bedrock aquifer. These boreholes should ideally be monitored prior to the commencement of construction to establish baseline conditions.
- Local monitoring boreholes: These boreholes are required specifically to monitor the groundwater surrounding high-risk facilities (e.g. firefighting training areas, fuel farms, chemical storage facilities etc). The design and position of these boreholes will need to be established once the positions of the high-risk facilities are finalised and the final site development plan is made available. Importantly, any planned development of groundwater production boreholes could be appropriately designed to serve for both groundwater production and monitoring purposes.

- The groundwater impact assessment should be updated if the final site development plan/area changes and once intricate details of the activities for each component of the facilities are known and available.
- It is recommended that all mitigation measures given in this report are to be adhered to in order to minimise the potential impacts of the development on the environment.

<u>Conditions of EA from MHI:</u>

- Compliance with all statutory requirements, i.e., pressure vessel designs;
- Compliance with applicable SANS codes, i.e., SANS 10087, SANS 10089, SANS 10108, etc.
- Incorporation of applicable guidelines or equivalent international recognised codes of good design and practice into the designs;
- Completion of a recognised process hazard analysis (such as a HAZOP study, FMEA, etc.) on the proposed facility prior to construction to ensure that the design and operational hazards have been identified and adequate mitigation are put in place;
- Full compliance with IEC 61511 (Safety Instrument Systems) standards or equivalent to ensure that adequate protective instrumentation is included in the design and would remain valid for the full life cycle of the tank farm: This is particularly relevant to the overfilling of the storage tanks and applicable shutdown systems:
    - Including demonstration from the designer that sufficient and reliable instrumentation would be specified and installed at the facility;
- Preparation and issuing of a safety document detailing safety and design features reducing the impacts from fires, explosions and flammable atmospheres to the MHI assessment body at the time of the MHI assessment:
    - Including compliance to statutory laws, applicable codes and standards and world's best practice;
    - Including the listing of statutory and non-statutory inspections, giving frequency of inspections;
    - Including the auditing of the built facility against the safety document;

  - Noting that codes such as IEC 61511 can be used to achieve these requirements;
- Demonstration by CWA or their contractor that the final designs would reduce the risks posed by the installation to internationally acceptable guidelines;
- Signature of all terminal designs by a professional engineer registered in South Africa in accordance with the Professional Engineers Act, who takes responsibility for suitable designs;
- Completion of an emergency preparedness and response document for on-site and off-site scenarios prior to initiating the MHI risk assessment (with input from the local authorities);
- Permission not being granted for increases to the product list or product inventories without redoing part of or the full EIA.
- Final acceptance of the facility risks with an MHI risk assessment that must be completed in accordance with the MHI regulations:
  - Basing such a risk assessment on the final design and including engineering mitigation.

<u>Conditions of EA from Visual Impact Assessment:</u>

Master Plans and Guidelines required for the overall development

It is recommended that the first Site Development Plan (SDP) to be submitted to the CoCT for approval must trigger the requirement for the following to be submitted for approval at the same time:

1) A detailed Master Architectural Guidelines document to govern all architectural development within the CWA throughout all future phases -
   a. This document may also be titled a Master “Development Guidelines” document.
   b. It must include all standard chapters appropriate to the scale and complexity of the CWA development, including the applicable legal frameworks relating to compliance, and the internal hierarchy of communication between stakeholders, including property owners, architects, developers, and local authorities.
   c. It must include Urban Design Guidelines and the Landscape Architectural Guidelines as sub-sections.
   d. It must establish (or designate) an HOA (or equivalent) body to oversee the enforcement and maintenance of the Architectural or Development guidelines.
   e. The CWA must establish an Architectural Review Committee (that includes a suitably Qualified Landscape Architect) to internally review, adjudicate and approve future development applications within the CWA development (which will include Landscape Plans).
   f. It should include the following aspects (which should provide detailed textual and image-based precedent or examples of both inclusions and exclusions to clarify design intent):

      i. Signage guidelines;

      ii. Guidelines for Fencing, Walls, Entrances and Boundary interfaces;

      iii. Lighting guidelines (refer to 7.3.2 (c) for guidance);

      iv. Materials and finishes guidelines (refer to 7.3.2 (d) for guidance).

2) A detailed Master Landscape Plan (that supersedes the current Draft Overall Landscape Concept Plan (PAL 4)) to show all landscape architectural development within the CWA throughout all future phases. This plan must include:
    a. A Tree Survey (quantitative and qualitative) of all existing trees on site showing trees to be retained or removed.
        i. The tree Survey and Plan must be approved by the relevant CoCT before construction (i.e. the removal of existing trees) may commence.
    b. A Tree plan (which includes a site-wide, phased tree planting strategy
    c. A detailed Irrigation Proposal/Plan;
        i. It must demonstrate integration with the approved Stormwater management plan.
        ii. It must show all relevant high-level design decision making regarding the provision of irrigation water to soft landscaping and trees.
    d. A Fencing, Walls, Entrances and Boundary interface plan for the various portions of the development perimeter.
    e. A Master Landscape phasing plan and strategy, showing the connection between the phased development of the overall development and the development of the landscape.
        i. This plan and strategy must link all proposed landscaping to the development of roads, buildings, precincts, erven or zones; to ensure that the proposed landscaping is implemented concurrently to the development of said roads, buildings, precincts, erven or zones.
        ii. This plan and strategy must also explicitly indicate where the proposed landscaping is the responsibility of the CWA/overall developer to establish and maintain; and where the proposed landscaping is the responsibility of private entities/future tenants etc. to establish and maintain.
3) A detailed Master Landscape Guidelines document to provide a standard and framework for, and govern all landscape architectural development within the CWA throughout all future phases. This must include:
    a. A Landscape Architectural motivation section, with emphasis on explaining the Landscape Architect's approach to ensuring responsiveness to the scenic and landscape context of the subject site within the Receiving Environment (sense of fit, protection of and contribution to landscape character, sensitive receptors, screening at key points, enhancement of views etc.).
    b. A diagram or plan showing the areas that are the responsibility of the CWA/overall developer to establish and maintain vs. the areas that are the responsibility of private landowners/tenants/partner developers etc. to establish and maintain.
    c. Soft and hard landscaping guidelines and specifications (incl. species, materials inclusions and exclusions etc.).
    d. A detailed Irrigation Proposal and strategy;
        i. The Irrigation strategy must demonstrate integration with the approved Stormwater management plan (especially with regards to SUDS and the dual use of Stormwater attenuation / detention / retention facilities for irrigation collection / storage).

ii. It must in particular demonstrate that the establishment of the proposed landscape (especially screening trees proposed) will be possible and feasible given the high irrigation demands of establishing a landscape at the scale proposed by the Concept Plan/future Master Landscape Plan (Refer 7.3.2 (e) v. b. (i – ii) in the VIA for further detail).

e. Detailed Irrigation guidelines must be included (refer to 7.3.2 (e) vi – xvii in the VIA for guidance).
f. Tree planting guidelines and specifications must be included (Refer to 7.3.2 (e) in VIA for guidance).
g. Visual & aesthetic sensitivities vary depending on the development edge, as do design informants such as access control, security and lighting needs, distance of buildings from property boundary and the like.
   i. The Master Landscape Guidelines document must include a set of typical section details for the various development edges illustrating architectural responses to the various different site and interface conditions, as well as contextual (visual) informants.
      *Particular attention is required for areas abutting natural, agricultural, and rural areas or Cultural Landscapes, as well as those that have a public interface (such as the southern and western property boundaries. Valuable view corridors and existing vistas should be enhanced and celebrated by any development proposal.
   ii. The section details should provide further detail regarding fencing/boundary treatment, pedestrian and other NMT routes, proposed planting, lighting and signage where relevant and NGL interaction with SUDS structures etc.
   iii. The section details should also demonstrate the feasibility of the proposed tree lines along fences and roads in terms of the location of irrigation, fencing and underground services.
h. A Tree Management Strategy for the management of existing trees to be retained.
   i. Existing landscape patterns are important to conserving landscape character, sense of place and maintaining the inherent VAC of the subject site. The project team is therefore strongly advised to avoid removing any additional vegetation (especially tree avenues and mature copses).
i. A Landscape management and maintenance strategy and guidelines for implemented landscapes and for areas not earmarked for development (i.e. areas within the Agricultural Precinct, and undeveloped areas within the Airport Airside Precinct). This should include (but are not limited to):
   i. An Alien & invasive species management plan.
   ii. Rehabilitation and Revegetation Guidelines
   iii. Hydroseeding Guidelines and protocols for the planting of embankments to stabilize soil

Plans and Guidelines required to accompany all future Site Development Plans

All future Site Development Plans within the CWA development that are to be submitted to CoCT for approval must contain / be accompanied by the following:

i. A Detailed Landscape Plan and (SDP-level appropriate) Landscape Architectural Guidelines document prepared by a suitably qualified Landscape Architect.

a. The Landscape Plan and its accompanying Guidelines document must be prepared in alignment with the Master Landscape Plan, the Master Landscape Architectural Guidelines, and the recommendations of this report.

b. Additionally, it must demonstrate adherence to the Tree planting specifications and Irrigation guidelines, as well as the Master documents' guidelines and strategies relating to interface conditions and boundary treatment and any other relevant guidelines and strategies.

*These mitigation measures are particularly important given the crucial role that provision of water plays in the successful establishment and ongoing maintenance of trees and screening planting.

c. The Landscape Plan must Indicate trees that function as screening and softening, especially from views within cultural landscapes (e.g. Agter-Paarl Paardeberg CL).

ii. A detailed Fencing proposal

a. To ensure appropriate design of road verges, stormwater structures, fences etc. which should be in character with the natural or rural surroundings (as per the Heritage and Scenic Resource: Inventory and Policy Framework, 2003)

b. This requirement is for boundary fencing and public interfaces specifically - internal fencing is not a concern from a visual impact management point of view.

iii. A detailed Signage proposal, where signage is proposed. The signage proposal must demonstrate that signage has been designed in such a way that the sensitivities of the adjacent Cultural Landscape and the relevant Scenic Routes have been (a) taken into consideration, and (b) that design responses have been included in the design proposal in a positive way. The signage proposal should include:

a. Graphic renderings or 3D models showing the location in context, height, mounting details and proposed content of all proposed signage.

b. Please note that signage in this case includes branding, logos and lettering on building facades.

c. SDP applications should not be approved without input from the appropriate CA that the signage proposal is acceptable in terms of the relevant Outdoor Advertising and Signage Policy and By-law

iv. A detailed Lighting proposal (for all outdoor lighting, façade lighting (if any), street lighting and security lighting – i.e., all light sources that would be visible from within the Receiving Environment). The lighting proposal must demonstrate that lighting design has been undertaken in such a way that the sensitivities of the adjacent Cultural Landscape and the relevant Scenic Routes have been (a) taken into consideration, and (b) that design responses have been included in the design proposal in a positive way. The lighting proposal should include:

a. A consolidated lighting layout showing the location of all sources of light.

b. The lighting proposal should include basic technical/specification details for all sources of light.

c. The information provided should enable:

i. the visual specialist to properly scope and model/simulate visible light sources (if necessary);

ii. and the CA and/or the visual specialist to make an informed decision regarding the acceptability of light impacts at night.

Plans and Guidelines required to accompany particular Site Development Plans

Certain areas within the CWA development require particular attention in response to contextual informants or must be accompanied by additional information or further visual specialist input at a later stage of design development.

i. Any SDP that includes development in areas within the Scenic Drive/route Envelope of the R312 (i.e., any areas adjacent to the R312 scenic Route or within the 100m signage buffer area) must be accompanied by:

a. Further detail regarding the articulation and design of buildings proposed on the southern property boundary

i. This should include sections and plans that illustrate building massing, form, fenestration / glazing / curtain walls, roof design and materials / finishes.

ii. Any associated visible elements such as masts, solar panels, wind turbines, chimneys, antennae etc.

iii. This should include a reasoned motivation from an architectural, landscape architectural and urban design perspective, explaining the ways in which the proposal is responsive to the visual / scenic informants along this interface and the visual sensitivities of this part of the receiving Environment.

b. Detailed Landscape Plans at SDP level (as called for in 7.3.1 (b) i) must include the entire scenic route envelope of the R312 Lichtenburg Road verge, as well as the 30m buffer zone.

i. The guidelines and policies of the City of Cape Town's MSDF must be consulted, as well as the Scenic Drive Network Management Policy, the Heritage and Scenic Resource: Inventory and Policy Framework for the Western Cape, Urban Design Policy, Outdoor Advertising Bylaw and all relevant considerations within the Northern District SDF Development Guidelines for further guidance.

c. A Visual Statement prepared by a suitably qualified specialist consultant:

a. This is called for to ensure that visual impact management mitigation measures are applied, visual impacts are managed as priority in the detailed design development in future planning & approval phases; and to determine if the impact assessment findings of this report are affected.

b. The Visual statement should focus on: fencing, boundary treatment and public road interface, lighting, signage and compliance with material recommendations of this VIA. Also to address appearance of development edges visible from the roadway.

c. The Visual statement should include detailed simulations from key views.

d. The SDP must be accompanied by detailed renderings by the project architects from the relevant viewpoints identified in this report, and/or viewpoints identified by the visual specialist undertaking the visual statement.

* These renderings must inform the visual simulations prepared by the specialist in the Visual statement.

ii. Any SDP that includes development in areas within the Airport Airside Precinct must be accompanied by:

a. A Visual Statement prepared by a suitably qualified specialist (refer7.3.1 (c) i. c. in the VIA for further detail).

b. The SDP must be accompanied by detailed renderings by the project architects (refer 7.3.1 (c) i. d. in the VIA for further detail).

iii. Any SDP that includes development in areas within Zone 1 (the Services Precinct) must be accompanied by:

a. A Visual Statement prepared by a suitably qualified specialist (refer 7.3.1 (c) i. c. in the VIA for further detail).

* This VS must provide comment on the acceptability of building and infrastructure visibility from the R304 Scenic route and the Agter-Paarl Paardeberg Cultural Landscape and provide additional mitigation measures if necessary.

b. The SDP must be accompanied by detailed renderings by the project architects (refer 7.3.1 (c) i. d. in the VIA for further detail).

Miscellaneous Conditions of Approval

i. The Visual Impact Assessment must accompany the Land Use Planning application as an Annexure (and informing document).

a. All relevant recommendations and mitigation measures established therein must be incorporated into the project documentation in measurable, enforceable form.

b. The Land Use Planning approvals process must allow sufficient time for the final Land Use Planning application set to be reviewed by the author (or another suitably qualified visual specialist) before submission.

i. The purpose of this requirement is to confirm that the findings of the VIA remain unchanged.

ii. A covering letter or brief Visual statement will suffice to screen and/or Scope possible issues as necessary.

ii. The ECO must conduct a lighting audit at the end of each Construction phase, to ensure that the mitigation measures set out in this report (as well as future Visual Statements or CA inputs) are adhered to and successfully implemented.

iii. The Final Completion of the landscape installation should be made a condition for final occupancy certificates to be issued during the Construction phase. This is to ensure that the landscape installation accompanies (and is completed during) the construction phase of its associated building/s, precinct, erven etc (Refer 7.3.2 (e) v. in the VIA for further detail).

iv. The SDP architectural plans must show the substation and the Solar Panel arrays in the layout.

iv. Local policy dictates that visual cluttering of the landscape by non-agricultural development must be managed. The following applies to buildings (and associated structures such as the ATCT) facing and/or visible from the R304 and the Agter-Paarl Paardeberg Cultural Landscape:

a. Building facades and the surfaces of structures may not be illuminated; may not have any signage, lettering, logos or advertising (illuminated or otherwise) mounted upon them.

b. Buildings and structures must be designed to be visually recessive in materials/finishes, colour, form and massing.

c. Buildings and structures must be designed to be sympathetic to the rural Agricultural landscape character in their design and architectural expression.

v. Visual impacts along Scenic routes are generally managed using visual buffer zones with setbacks and height restrictions. The following development parameters are recommended at Conditions of Approval:

a. Apply a 30m visual buffer zone offset from the R312 Lichtenburg Road scenic Route within which no buildings may be placed.

b. Enforce a 100m Signage “buffer zone” along the R312 Scenic Route.

i. No 1st Party signage, 3rd Party signage, billboards, outdoor advertising and (specifically) no illuminated or digital signage should be permitted within 100m of the property boundary adjacent to the R312.

1. Standard Provincial road signage within the road verge indicating the location of the entrance to the Cape Winelands Airport is acceptable.

2. One 1st Party Sign may be permitted at the entrance to the CWA

c. Apply a 9m Height control restriction along the R312 Scenic Route.

i. This height restriction must extend 100m into the subject site to include a large enough part of the Scenic Route Envelope to have the desired effect of maintaining long views through this newly urbanizing area

vi. The scoping report makes mention of wind turbines as possible alternative sources of energy. While these elements are not necessarily problematic, this VIA is unable to provide any further comment on their visual impact at this time and must rely on future statutory processes to manage visual impact of possible future wind energy infrastructure.

a. Therefore, if Wind turbines (either mounted on roofs or land-based) are proposed during the SDP phase for any building, precinct, erven etc., this should trigger the input of a visual specialist to provide a Visual Statement that includes simulations to determine the extent and significance of direct and cumulative visual impacts of the proposed wind power generating infrastructure.

b. The provisions in 7.3.1 (c) i. c. in the VIA are also called for here.

c. The provisions in 7.3.1 (c) i. d. in the VIA are also called for here.

vii. The Agricultural Precinct must be considered a “No-Go” area.

a. No further development should be allowed within the Agricultural Precinct.

viii. Existing landscape patterns are important to conserving landscape character, sense of place and maintaining the inherent VAC of the subject site.

a. No further removal of existing vegetation (except for alien invasive species) should be permitted within the Agricultural Precinct.

b. The Tree Survey and Tree Plan must motivate for the removal of existing trees within Zone 1-3, and existing trees should be retained wherever possible (especially those that contribute to the characteristic landscape patterns of the surrounding Cultural landscapes). This is to ensure that windbreaks, avenues, copses and place-defining or gateway planting is not needlessly destroyed by new development.

The development of an Outdoor Signage Master Plan is essential. CoCT requires and approves a SMP in respect of any new development where the erection of numerous signs is proposed.

The SMP must set out the specifics of the location, placement, type and design of signs to be erected on a premises or within a particular area and should be developed in collaboration with CoCT to ensure all environmental considerations are addressed.

Components of an Outdoor Signage Master Plan include:

- Signage Inventory: A detailed list of all proposed outdoor signage, e.g., billboards, digital boards etc. and the locations and conditions
- Design Guidelines: Standards for the visual aspects of signage, such as size, colour, typography, materials, and lighting. Inclusive will be examples of structural details relating to all outdoor signs.
- Placement Strategy: Guidelines for where signs should be located to maximize visibility and effectiveness without causing clutter or obstruction to any traffic signage.
- Regulatory Compliance: Ensuring all signage adheres to local laws e.g. Advertising Standards Authority and regulations, such as the CoCT Outdoor Advertising By-Law No. 8969, 2023.
- Environmental Considerations: Collaboration with environmental management to minimize the impact of signage on the surrounding area.

Further to the above conditions, the Terrestrial and Freshwater offsets developed as part of the proposed mitigation must be finalised and in place prior to the authorisation of the EA.

10.3 Conclusion and Authorisation Opinion

10.3.1 Reasoned opinion of proposed project should or should not be authorised:

The site sensitivity verification for the proposed development site based on the DFFE Screening tool, produced several environmental themes (refer to Appendix 2) and requirements for specialist studies. Additional studies were commissioned by die EAP based on I&AP consultation in the Scoping Phase. The specialist studies commissioned adhere to the protocols and are complimented by technical design and guideline development for the proposed CWA.

All the specialist assessments listed by the Screening Tool was conducted except for Defence which rates as MEDIUM. The Annex 14 OLS and CONOPS confirmed that the CWA and immediate surrounds are not used for any defence operations, that the proposed airspace procedures required for the expansion at CWA do not interfere with military airspace, that there will not be a need for new communication system frequencies, and that frequency interference with existing defence installation and radar systems is unlikely. This led to the EAP recommending that the rating be LOW and no further specialist studies required. The SANDF, the SAAF and NASCOM are included as IAPs for the EIA and remain part of the consultation process at SACAA level.

<u>Opinions from specialist / technical reports:</u>

A) Faunal and Avifaunal Specialist opinion

From a faunal and avifaunal ecological perspective, the sensitivity of the habitat units varies from moderately low (Modified habitat) to intermediate within the Renosterveld and Freshwater Habitat. The highly fragmented nature the indigenous vegetation limits the conservation potential of the study area within the highly modified landscape. Although SCC do utilise the study area, the notable habitat degradation as a result of historic impacts from the existing airport and agricultural activities is clearly evident. *Grus paradiseus* (Blue crane) do breed East of the study area and will forage within the study area, as such, the development and airport activities may pose a threat to this species in terms of lost foraging grounds and potential bird strikes. Based on the results of the site assessment and the overall impact significance scores, it is the opinion of the specialist that this project may be approved, provided that all management and mitigation measures as stipulated in the reports (Part B and C) are adhered to.

B) Freshwater Ecological Specialist opinion

The proposed CWA development poses a moderate negative impact on the ecological integrity of the wetlands in the study and investigation areas with the implementation of control measures. Impacts on the CVB wetlands 2 and 3 are considered to be Very low to Low with control measures in place, whereas impacts to the seep wetland 1 are considered to be Very low to Moderate, with the implementation of appropriate control measures as guided by the recommended mitigatory measures in this study. The Moderate impact is associated with the 6.74 ha seep wetland 1 habitat loss anticipated as a result of the construction and operation of the proposed CWA development. See Section 8.7.5 of this report for suitable control measures to be applied during the construction and operational phases. Additional "good practice" control measures applicable to a project of this nature are provided in Appendix G of this report.

It should be noted that although the impact on the wetland hydrology of seep wetland 1 and CVB wetland 3 is considered negative, the release of treated stormwater into these wetlands can contribute to the recharge of the systems, resulting in a net positive impact if the recommended control measures and the management measures outlined in the Concept Stormwater Management Plan (Zutari, 2024b) are implemented.

Based on the results of the DWS RAM and impact assessment, both the Preferred Alternative 3 and Alternative 2 layouts are considered acceptable from a freshwater ecosystem management perspective, with implementation of the control measures.

C) Freshwater Offset Specialist opinion

The proposed Freshwater offset is expected to significantly contribute to positive wetland resource management and conservation in the region. The offset strategy aligns with national and local biodiversity offset guidelines, and the selected offset site more than adequately offsets the residual impacts associated with the project. It is recommended that the proposed offset be approved by the relevant competent authorities as part of the development authorization process.

D) Heritage Specialist Opinion (Cultural, Archaeological and Visual):

Archaeological: The area identified for upgrading and development of the Cape Winelands Airfield does not constitute a sensitive archaeological landscape. Apart from the existing CWA, almost the entire surrounding farms, including the recently acquired properties, have been fundamentally transformed by agriculture and its associated infrastructure. Isolated ESA and MSA tools may likely be encountered in the surrounding agricultural lands, old excavations, and other disturbed areas, but these are not likely to be important (Not Conservation Worthy) or require any archaeological mitigation.

Visual: Based on the findings of the Visual Impact Assessment, and subject to the successful application of the mitigation measures, the proposed Cape Winelands Airport development can be supported at the level of Environmental Impact Assessment for the purposes of the NEMA authorisation application. Further visual specialist input will be needed at the level of the Land Use Planning application and the future SDP planning phases to ensure that visual impacts associated with this complex and multi-dimensional project are scoped and managed, and that compliance with the recommendations and mitigation measures can be enabled within the future statutory processes.

With mitigation, the visual impact anticipated can generally be reduced, however, some aspects such as certain construction phase activities and visual impacts associated with certain proposed lighting installations present very little opportunity for mitigation, and impacts will remain Moderate in significance.

Given that the impact on heritage resources will be low and that the sustainable social and economic benefits will be immense it was recommended that HWC supports the development proposals.

E) Climate change Specialist Opinion

It is the specialist's opinion that the Project can align with national and global climate goals while ensuring resilience against evolving climate challenges by implementing the planned mitigation and adaptation strategies. In this respect, it was considered that the emissions controlled by the airport are low when compared to the emissions related to fuels burnt by incoming and outgoing flights which will be managed through future carbon budgets imposed on airlines under the Climate Change Act. Furthermore, the additional benefits in terms of decongestion and enhanced operational efficiencies that come with the role of the Project in the region may facilitate sustainable growth. No special conditions with respect to the authorisation of the project were proposed.

F) Transport Specialist Opinion

Based on the TIA, it is evident that the impact of the CWA will be relatively low compared to the other future developments in the area. Hence, it is recommended that Phase 1 (PAL 1B) of the CWA be approved from a transport point of view, and that an updated TIA be prepared for the future phases of the CWA.

G) Botanical Specialist Opinion

The overall botanical impact of the proposed development (Alternatives 2 and 3) is likely to be **Medium – High negative before mitigation**, driven mainly by the loss of at least part of the 1.6ha patch of Very High sensitivity Swartland Silcrete Renosterveld (Critically Endangered), and the two associated plant Species of Conservation Concern in this area. This impact is largely unavoidable, other than by runway layout alteration (not feasible). **After mitigation** this could be reduced to an acceptable **Low to Medium negative level,** provided that the required ongoing ecological management of the priority remaining natural areas on site is implemented, along with the securing and management an appropriate biodiversity offset of 77ha (off-site). There is no significant difference between Alternatives 2 and 3 in terms of botanical impact.

H) Agro-ecosystem Specialist Opinion

While the impact of the loss of 168ha high potential productive land is regarded as high, it is deemed justified in terms of the perceived importance of the proposed CWA development as a key infrastructure node for the Cape Metropole and surrounding districts and is therefore supported and recommended for approval.

I) Hydropedological Opinion

The results of the Hydropedology Assessment undertaken by the Zimpande Research Collaborative indicate that the proposed project can be considered for authorisation from a hydropedological perspective as it is not anticipated to cause an unacceptable impact of the wetland recharge mechanisms based on the type of soils identified as well as the quantification of hydropedological losses (Zimpande Research Collaborative, Hydropedological Assessment, June 2024). The PES/EIS and functionality will likely remain unchanged once mitigations have been implemented.

J) Glint and Glare Opinion

The Glint and Glare impacts are Very Low and acceptable in terms of the United States FAA Regulations if the recommendations are implemented. It is therefore recommended that the project receive authorisation from the Civil Aviation Authority from a glint and glare perspective.

K) Geohydrological Specialist Opinion

The site development should only proceed on condition that no contamination of the underlying aquifer takes place. This will require the appropriate protection, mitigation and monitoring measures. No high-risk activities are to take place in the no-go area delineated in the proximity of the Colenso fault.

In situations where it is not possible to avoid pollution because of higher operational priorities for example, the need to protect people, take all reasonably practical steps to mitigate the effects of such pollution.

A groundwater monitoring network is recommended, and will require the following:

- *Regional monitoring boreholes*: To monitor the regional groundwater quality, e.g. of the fractured bedrock aquifer. These boreholes should ideally be monitored prior to the commencement of construction to establish baseline conditions.
- *Local monitoring boreholes*: These boreholes are required specifically to monitor the groundwater surrounding high-risk facilities (e.g. firefighting training areas, fuel farms, chemical storage facilities etc). The design and position of these boreholes will need to be established once the positions of the high-risk facilities are finalised and the final site development plan is made available. Importantly, any planned development of groundwater production boreholes could be appropriately designed to serve for both groundwater production and monitoring purposes.

The groundwater impact assessment should be updated if the final site development plan/area changes and once intricate details of the activities for each component of the facilities are known and available. It is recommended that all Geohydrological mitigation measures are to be adhered to in order to minimise the potential impacts of the development on the environment.

L) Aviation Specialist opinion

The DFFE Screening tool identified the proposed development area as a "high sensitive" civil aviation area and the protocol requires a Civil Aviation Compliance Statement as a minimum. The various aviation studies and reports indicate that the CWA can fit into the airspace and that it can be operated as proposed, and no unacceptable impacts on civil aviation installations are expected. Therefore, as part of this EIA it should be concluded by SACAA that the proposed development will not result in unacceptable impacts on civil aviation installations. A draft Civil Aviation Compliance Statement confirming that the proposed development has no unacceptable impacts on civil aviation installations has been provided to SACAA and is included as Appendix 45 to the EIAR.

The Civil Aviation Baseline study (Appendix 17) highlighted the requirement for the ICAO Annex 14 Obstacle Limitation Surfaces (OLS), the redesign of airspace, the assessment of noise around CWA, the impact on ground transport and socio-economic impacts on the direct environment. The Noise Impact Assessment (Appendix 5), the Transport Impact Assessment (Appendix 25) and the Socio-economic Impact Assessment (Appendix 24) address these concerns.

The CONOPS (Appendix 19) outlines the way forward and highlights the need for industry consultation (both formal and informal structures), the need for further investigation into visual and navigational aids, traffic forecast and airspace capacity, development of airspace procedures, and the design of flight procedures and airspace. Final decision making on these elements will be within the SACAA structures and will result in unlocking the redesign of the airspace to accommodate CWA, which is enabled by the EIA process. The eventual international licence for CWA will become a condition of EA.

The OLS Visualisation of Development Heights (Appendix 20) sets restrictions on heights of buildings at specific distances to the North and South of Runway 01-19 based on flight approach and departure heights, affecting the land use capabilities of these areas. The Spatial Planning Land use study (Appendix 40) addresses this impact and proposes mitigation as change in land use.

The OLS Annex 14 study (Appendix 18) identifies obstacles within the Annex-14 surfaces around CWA, that need to be addressed (in terms of Annex-14 Lighting and Marking). Re-assessment should be on a regular basis before any installation of new structures in and around CWA. The PANS-OPS office should be consulted when there are modifications, painting and surface reconstructions at CWA.

In terms of aviation, there is no critical flaw that cannot be mitigated through redesign, rezoning, development of procedures, and engagement and authorisation through SACAA.

M) Noise Specialist Opinion:

During construction the noise levels at the closest community receptors are not expected to exceed the SANS guidelines for Urban Residential areas.

Based on the resulting noise contours for Scenario 1, it is evident that the existing residential areas of Fisantekraal and Klipheuwel fall outside of the above-mentioned impact zones. In addition, the fact that the proposed residential developments of Bella Riva and the Greenville Garden City are in the design phase could provide an opportunity to consider and implement appropriate mitigation measures, considering the areas of impact in each development. Based on the above, the overall impact rating without mitigation for Scenario 1 was found to be of HIGH significance. With the implementation of the mitigation measures, primarily in terms of land use planning for the proposed residential areas adjacent to the airport, the overall impact rating was found to be of MODERATE significance.

The overall impact rating for Scenario 2 was found to be of LOW significance without mitigation. Additional noise abatement procedures for the aircraft operations are not required for the operational year of the new runway. However, consideration of such measures and operations should be initiated before the full capacity of the new runway is reached, based on the noise monitoring around the airport and noise modelling of the applicable mitigation measures.

The unmitigated overall impact rating for Scenario 3 was found to be of HIGH significance. With the implementation of appropriate land use planning for the proposed adjacent residential areas, the overall impact rating for Scenario 3 was found to be of MEDIUM significance.

N) Air Quality Specialist Opinion:

Based on the modelling results for Scenario 1, the existing air pollution intensity due the airport's operations is low. The extent of the impact is mostly limited to the airport site, with two small areas extending towards the west and south of the site. The overall impact rating for Scenario 1 was found to be of VERY LOW significance.

The overall air quality impact for Scenario 2 is considered to be of VERY LOW significance, while the overall air quality impact for Scenario 3, is considered to be of LOW significance.

O) Socio-economic Specialist Opinion:

The most significant socio-economic benefit from the proposed CWA project is the anticipated contribution to the aviation industry in the Western Cape. In terms of economic benefits, an estimated R8,9 billion in capital investment could generate R23,1 billion in new business sales, which could add R8,8 billion (net of the import leakage) to the GGP of the Western Cape economy during construction. During an initial 20-year operational period, which includes a substantial component of maintenance expenditure, an estimated R36,1 billion in nominal terms could generate R76,1 billion in new business sales. The project could sustain about 32 433 (direct, indirect, and induced) employment opportunities during construction, including ongoing capital expenditure upgrades over 20 years. This could increase household incomes by R3,8billion over 22 years. During the initial 20 years of operations, the project could sustain about 102 732 direct, indirect, and induced employment opportunities, adding R17,7billion in household income.

Several potential negative impacts were identified, including traffic flows, sense of place, nuisance factors, local crime, influx of job seekers, informal settlements and construction workers that could impact local communities. However, if the site is properly managed and the mitigation measures indicated by the various specialists are implemented, the significance of these impacts will be low to moderate.

The specialist stated the proposed development's social benefits outweigh the potential costs, but this must be considered in an operation that adheres to local and national operational guidelines.

P) Bird Strike Specialist Opinion:

The proposed landscaping plan and the stormwater design and planting plan for the CWA has taken into consideration the guidance and requirements of the bird strike specialist to minimise the risk on site. Implementing these design changes that eliminate suitable habitat for hazardous bird species at the proposed airport will ensure that bird strike incidents are kept to a minimum. This means that the economic benefits of the development can still be realized while maintaining aviation safety standards, while also minimizing maintenance costs.

Off-site risks have been identified by the specialist and will necessitate engagement with landowners (mainly agricultural) in the vicinity to mitigate the attractiveness of agricultural and farming activities to hazardous birds.

Q) Poultry Biosecurity Specialist Opinion:

The construction of the Cape Winelands Airport will undoubtedly impact the adjacent poultry farm. However, it must be borne in mind that the biosecurity is already compromised by its situation close to a main road as well as a settlement. The critical mitigation which would be important is not to use poultry manure for the biodigester as this has implications for biosecurity. Other recommended mitigation measures are important to avoid health and production losses.

Opinions from EAP:

No fatal flaws were identified in terms of the Biophysical environment: the Botanical and Freshwater impacts were mitigated by Terrestrial and Wetland offsets that have been developed and will be in place prior to EA. Additional groundwater development is in process to enable the site to be self-sufficient in terms of potable supply, and to minimise risk to operational disruption due to drought or maintenance of CoCT bulk lines. The Geo-hydrological specialist confirmed that the aquifer can sustain the proposed abstraction needs. The Agro-ecosystem study found the perceived loss of agricultural land and associated food security is acceptable. The Faunal/ Avifaunal study found the highly fragmented nature of the indigenous vegetation limits the conservation potential of the study area within the highly modified landscape and coupled with the notable habitat degradation as a result of historic impacts from the existing airport and agricultural activities, the recommendation is that the proposed project may be approved.

As per the Town Planning and Traffic specialists the proposed CWA fits into the urban planning framework and the current and proposed roads network for the area. The socio-economic impact assessment found the proposed project is desirable from a societal cost-benefit perspective, does not infringe the current spatial planning of the CoCT and enhances the strategic objectives of the planning context at the national, provincial and local levels.

The CWA focusses on transport and commercial uses that will contribute to employment and new business opportunities for the CMA. The roll-out of the project offers an opportunity for skills development, will contribute to transport infrastructure, and creates job opportunities.

In terms of civil aviation impacts, it is deemed feasible for the proposed project to be integrated into the local and regional airspace based on the CONOPS. The successful acquisition of an international licence to accommodate international scheduled flights becomes a condition of EA. Perceived impacts on General Aviation, CTIA, and other stakeholders have been assessed and mitigation proposed where appropriate, with no fatal flaws or unacceptable impacts to civil aviation identified.

The impacts of noise were modelled, and mitigation proposed, resulting in decreased severity in noise impacts. Impacts on air quality were assessed and found to range between Very Low (Scenario 1 & 2) to Low (Scenario 3). Development of mitigation with stakeholder input is key to both Noise and Air Quality impact management.

The Glint and Glare assessment informed the proposed Solar PV layout and is in line with Annex 14 ICAO requirements for SACAA. The solar PV layout will be redesigned and reassessed to minimise the impact further.

The implementation of the Bird Strike Guideline, the Billboard and Outdoor Advertising Guideline and the Architectural guideline further mitigates the risks and impacts associated with the CWA and incorporates local and international best practice. The use of manure at the biodigester will be removed based on the Poultry Biohazard recommendation and the need to develop the on-site WWTW as a closed system will be considered and incorporated into the future design.

The overall design of the proposed CWA is forward thinking in terms of sustainability, climate change adaptability, minimisation of resource consumption, prevention of pollution, and allows for the use of renewable energy. Even though the CWA aims to be self-sufficient municipal services exist or will be in place in the near future and can potentially service the site in terms of backup municipal water supply and sewage treatment.

The need and desirability of the proposed project was illustrated through the analysis of the DEA&DP Guideline and shows contribution to economic growth, maintaining a competitive advantage by having a diversified aviation infrastructure to cater to multiple aviation needs, alleviating capacity constraints at major hubs, and illustrating that the proposed development of CWA is more time-efficient and cost-effective than building a new airport.

The development would contribution to infrastructure development, with existing roads, power, water, and telecommunication infrastructure that can be augmented to also benefit the surrounding area. CWA would play a role as an alternate airport, a reliever airport, a general aviation facility, a logistics hub, accommodate national and international flights and cargo, and stimulate commercial property developments around it.

Its location, ability to avoid urban constraints or have an undue negative impact on established large residential communities, accessibility from major roads (N1) and railway, adds to its desirability. The site is not close to a nature reserve or within any heritage or sensitive cultural landscape area, falls outside a built-up area, and the Koeberg Nuclear Protection Zone, and can coexist with CTIA.

The assessment of negative impacts by technical and specialist input has resulted in significance ratings for Alternative 1 (No Go), Alternative 2 and Alternative 3, as illustrated in Appendix 47.

Alternative 1 represents the No Go option, where the CWA is operated at its maximum capacity within its existing rights. Impacts associated with Alternative 1 generally rated as low to Very Low on Biophysical (Botanical, Geohydrological), Socio-economic, Air Quality and Operational Phase Waste. Only Operational Phase Noise rated as high pre-mitigation and as medium post mitigation.

Due to the similarity in footprint between **Alternative 2 and 3**, specialists tended to rate them as similar in terms of their impacts.

In terms of Biophysical impacts, the loss of 1.6ha of Very High sensitivity vegetation and 2.3ha of Medium sensitivity vegetation rates as medium to high on both Alternative 2 and 3 during the Construction Phase, and requires a terrestrial offset to mitigate to medium impact. Similarly, the loss of 6.74ha of seep wetland 1 rates as high pre-mitigation and as medium post mitigation in the Construction Phase with wetland offset mitigation required for both Alternative 2 and 3. Even with the offset requirement the impact on seep wetland 1 in terms of hydrological function and geomorphological processes remains during the Operational Phase post mitigation as medium. Further impacts on geohydrology, terrestrial fauna, flora, avifauna and freshwater ecological rate as low post mitigation for the Construction and Operational Phase.

In terms of Heritage, the cultural impact rates as low during the Construction Phase. Visual impacts rate as low post mitigation for the Construction Phase, except for transformation of land use and site character which remains medium post mitigation. In terms of the Operational Phase, the visibility from within Landscape Character Areas 1, 2 and 3 remain medium post mitigation.

Air Quality impacts rate as very low (Construction Phase) to low (Operational Phase). Noise Impacts during Construction Phase rates as very low, and low for Scenario 2 during the Operational Phase. Scenario 3 rates as high pre-mitigation and as medium post mitigation during the Operational Phase.

Impacts associated with Agro-ecosystem and Transport (up to PAL1B) rated low for both Construction and Operational Phase, while the Glint and Glare assessment rated the Operational Phase impact as very low.

In terms of Poultry Biosecurity impacts rated as low for the Construction Phase and Operational Phase, except for Visual, Noise and the use of manure in the Biodigester that rated as medium post mitigation.

The impact of the proposed project on Climate Change rated as medium post mitigation for both Construction and Operational Phase, while the impact of Climate Change on the proposed project during the Operational Phase rated as high for both risk of wildfires and risk of water scarcity. Risk of landslides and risk of extreme heat rate as medium, while the risk of flooding rate as low.

The rating on terms of waste management rates as low to very low for both Alternative 2 and 3 during the Construction Phase and Operational Phase, except for the generation of Hazardous and Industrial waste during the Operational Phase which rates as Medium to Low post mitigation.

Impacts in terms of Civil Aviation were assessed as a requirement in terms of the Civil Aviation Protocol and resulted in various studies to address the findings of the Baseline Assessment. No impact ratings were generated, but rather the impacts on Noise, Transport and Socio-economic were addressed through their various specialist studies and resultant impact ratings. The restriction on height of adjacent land was assessed through an OLS height restriction study, and the Annex 14 OLS assessed where the OLS surface is penetrated. Airspace design and operation was assessed through the

CONOPS. The comments received from stakeholders and IAPs gave rise to 3 further aviation studies (APPENDIX 21: Airspace and Capacity Study; APPENDIX 22: Visualization of FACT and FAWN combined operations; APPENDIX 23: CWA Alternate Airport study). The Civil Aviation Protocol requires a statement from SACAA of *no unacceptable impacts to civil aviation* and in light of this a draft Civil Aviation Compliance Statement was prepared by NACO illustrating *no unacceptable impacts to civil aviation* and forming the basis of the response received from SACAA to date. The relevant aviation approvals will be an ongoing process beyond the EIA, but in terms of the specialist assessments to date it is clear that the proposed development is reasonable and feasible.

In terms of the current impacts assessed by specialists, the mitigation proposed and based on the recommendations from specialist and technical experts, the proposed CWA is deemed acceptable in terms of impacts. Further amendments based on I&AP input and specialist recommendations will be incorporated into a SDP amendment and development of the final Preferred Alternative 4, which will become available for IAP consideration early 2025.

10.3.2 Indication of any deviation from approved scoping report (including POS) and motivation for deviation:

The approved Scoping report (submitted 6 September 2024) presented the reasonable and feasible layout alternatives considered to date (Alternative 1 and 2), however as expected a further layout Alternative 3 evolved for assessment during the EIA process. Alternative 1 assesses the “Do Nothing” scenario within the current rights of the airport. Alternative 2: “Initial Preferred Alternative” comprises a 700m cross runway 14-32 and 3.5km Code F runway at orientation 01-19 in Phase 1, and only the 3.5km runway 01-19 in Phase 2. Alternative 3: “New Preferred Alternative” comprises the 3.5km Code F runway in Phase 1 and Phase 2 and no cross runway, with landside development amended to reflect development demand in each Phase.

The POS in the approved Scoping report did not include the three additional aviation studies (APPENDIX 21: Airspace and Capacity Study; APPENDIX 22: Visualization of FACT and FAWN combined operations; APPENDIX 23: CWA Alternate Airport study). These reports were originally prepared for the SACAA engagement process, but from the comments received during the in-process Scoping Phase PPP it became clear that these three studies would assist I&APs with additional information, therefor they were included in the EIAR for consideration and comment.

The POS in the approved Scoping report did not include the APPENDIX 20: OLS Height Limitations report. From the comments received during the in-process Scoping Phase PPP it became clear that this study would assist I&APs with additional information on the impact of the proposed CWA on the height limitations of surrounding land uses, therefor it was included in the EIAR for consideration and comment.

The draft Scoping report distinguished between specialist reports and technical reports. The specialist reports comply with either the protocol (if identified in the Screening tool) or in absence of an applicable protocol (or where studies were commissioned in addition to those of the Screening tool) the outline and content of the specialist report complies with Appendix 6 of the NEMA Regs.

Technical reports provide background information to the proposed project or technical information to guide design and do not necessarily comply with the protocol requirements or Appendix 6 of NEMA.

Further to this, there are specialist reports (guided by the protocol in the Screening Tool) that only developed up to Scoping layout:

1) Archaeological Report – the scoped impacts were seen as negligible and no need to progress to impact assessment (Appendix 14)
2) Civil Aviation Baseline and Scoping Report – the Civil Aviation protocol requires a Compliance Statement to SACAA for comment, and if confirmation from SACAA of no unacceptable impact then no impact assessment is required. This process is in progress at present, with the Compliance Statement attached as Appendix 45 to this report.

Please note no Palaeontological Impact Assessment was completed or is planned as the rating on the Screening report was LOW and the EAP motivated for no further specialist study in the SSV.

The Hydropedological study (Appendix 34) was requested by DWS in lieu of the WULA, and information from it was included in the EIAR as background. Therefor it does not comply to Appendix 6 of NEMA in terms of layout and content.

Table 139: Specialist and Technical report layout requirements

Report name	Appendix nr	Layout requirement
Groundwater Impact Assessment Report	3	Appendix 6 of NEMA
Air Quality Impact Assessment Report	4	Appendix 6 of NEMA
Noise Impact Assessment Report	5	Protocol requirement
Botanical Impact Assessment Report	6	Protocol requirement
Freshwater Ecological Impact Assessment Report	7	Appendix 6 of NEMA
Freshwater Offset report	8	2016 Wetland offset guideline and 2023 biodiversity guideline
Terrestrial Ecology Impact Assessment Part A, B & C	9, 10, 11	Protocol requirement
Terrestrial Offset Report	12	Offset implementation guideline under NEMA S24j and aligned with industry best practice.
Heritage Impact Assessment Report	13	Protocol requirement (Cultural) and HIA according to Heritage Act
Archaeological Report for Scoping	14	Protocol requirement
Visual Impact Assessment Report	15	Appendix 6 of NEMA
CWA Diversion Airport Analysis	16	No applicable std or guideline or protocol. Industry std.
Civil Aviation Baseline and Scoping Report	17	Protocol requirement

Annex 14 OLS Report	18	ICAO standards and guidelines
Airspace CONOPS Report	19	Industry std
OLS Height Limitations report	20	No applicable std or guideline or protocol. Industry std.
Airspace and Capacity Study	21	No applicable std or guideline or protocol. Industry std.
Visualization of FACT and FAWN combined operations	22	No applicable std or guideline or protocol. Industry std.
CWA Alternate Airport study	23	No applicable std or guideline or protocol. Industry std.
Socio-economic Impact Assessment Report	24	Protocol requirement
Transport Impact Assessment Report	25	Protocol requirement. TIA based on the 1995 DoT Manual for Traffic Impact Studies (DoT, 1995)
Aircraft Refuelling Facilities Report	27	No applicable std or guideline or protocol. Industry std.
Agro-Ecosystem Impact Assessment Report	28	Protocol requirement
Climate Change Impact Assessment Report	29	Appendix 6 of NEMA
WULA Technical Report	31	DWS layout requirement
Outdoor Advertising Guideline	32	No set requirement
Preliminary Architectural Guideline	33	No set requirement

Hydropedological Assessment	34	Hydropedological Guidelines (WRC; 2023) and best practice
Major Hazard Installation Risk Assessment	35	OHS Act requirement
Glint and Glare	36	United States FAA Guidelines - Review of Solar Energy System Projects on Federally Obligated Airports (2021)
Bird Strike Risk Assessment	37	No applicable std or guideline or protocol. Industry std.
CWA Maintenance Management Plan	38	DEA&DP template
Poultry Biosecurity Assessment	39	No applicable std or guideline or protocol. Industry std.
CWA in the context of Spatial Policy and Land Use Rights	40	No applicable std or guideline or protocol
Bulk Engineering Services Report (Version I)	41	No applicable std or guideline or protocol
Electrical Supply Technical Report	42	No applicable std or guideline or protocol
EMPr (inclusive of inclusive of Waste Management Plan; Alien Clearing plan; Veldfire Management Plan; Environmental Awareness Plan)	43	Appendix 4 of NEMA
Aviation Protocol Compliance Statement	45	Protocol requirement
Stormwater Management Plan	46	CoCT Policy requirements and industry std
Impact Assessment	47	Industry Best practice and NEMA requirement

10.4 Way Forward

The following is a list of tasks to be performed as part of the EIA Process. Should the process be modified significantly, DEA&DP and registered I&APs will be notified.

Table 140: Plan of Study (PoS) for EIA (steps that are completed indicated in bright green shading)

EIA PROCESS	DURATION	DATE
Compile Pre-application Draft Scoping Report and Plan of Study for EIA		Completed Oct 2023
Notice of Intent to Develop	10 days	Submitted 16 Oct 2023
Public participation process on Pre-application draft Scoping Report	30 days	Completed 8 Nov to 8 Dec 2023
Address Issues & Concerns		
Submit Application Form to DEA&DP	1 day	23 July 2024
Period for Acceptance of Application Form by DEA&DP	10 days	24 July to 7 Aug 2024
Public participation process on draft Scoping Report	30 days	24 July to 26 Aug 2024
Preparation of Comments and Response report		
Submit Final Scoping Report and Plan of Study for EIA to DEA&DP		6 Sept 2024
Acceptance of Scoping Report and Plan of Study for EIA	43 days	**15 Oct 2024**
Specialist Impact Assessment		
Compile Draft EIAR		
Public participation process on Draft EIAR (1st PPP round)	30 days	13 Nov to 13 Dec 2024
Public participation process on Draft EIAR (2nd PPP round)	30 days	15 Jan to 14 Feb 2025
Preparation of Comments and Response report		
Submit Final EIAR to DEA&DP	1 day	21 Feb 2025
DEA&DP Assess submission and issue EA	107 days	13 June 2025
Notify I&APs of Decision	14 days	17 June to 1 July 2025
Appeal Notification	14 days	2 July to 21 July 2025

NEMA appeal period	120 days	22 July to 22 Sept 2025

Note: To be amended according to project plan as needed.

The PPP to be conducted is designed to achieve three key objectives:

i. To adequately inform Interested and Affected Parties (I&APs) of the proposed development plans and options, and the status of the application.

ii. Enable I&APs to comment on draft reports.

iii. Gain the visions and perceptions of I&APs to advise the specialist assessments and to inform the proposed development planning and ensure appropriate growth of the study area.

This informative and engaging approach is adopted to ensure the active participation and input of all I&APs.

The PPP to be conducted in the statutory EIA Phase will involve the activities detailed in the sub-section to follow.

The C&R register was initiated during the Pre-application Scoping Phase and will be finalised post the Impact Assessment Phase and submitted with the final EIA report to DEA&DP.

<u>Planned Process to be Followed During the Statutory EIA Phase</u>

The draft Environmental Impact Report (EIR) and Environmental Management Programme (EMPr) (containing NEMA, NEM: AQA and NWA detail) will be circulated for an initial 30-day commenting period to all Registered I&APs and relevant State Departments and Organs of State.

Registered I&APs and State Departments will be notified via email / WhatsApp / sms of the availability of the EIR. The Report will be uploaded on the PHS Consulting website. All appendices, the main report and BID will be separate links. In addition, the report will be lodged at the Fisantekraal Public Library for public viewing and a site notice will be pinned on the library notice board.

A public open day is planned during the 30-day commenting period where the public will be able to learn more about the application and will have the opportunity to ask any questions.

An advertisement in English will be placed in two local newspapers with detail on and how to comment on the draft EIR, the Water Use Licence, the Air Quality Licence, and details of the Public Meeting / open day to be held during the 30-day commenting period. Three site Notices in English will be placed on or near the site along various roads adjacent to the site with detail on and how to comment on the draft EIR, the Water Use Licence, the Air Quality Licence, and with details of the Public Meeting / open day to be held during the 30-day commenting period.

All comments received during the initial 30-day commenting period will be included in the draft EIR and all comments received will be responded to in the comments and response (C&R) report.

The draft Environmental Impact Report (EIR) and Environmental Management Programme (EMPr) (containing NEMA, NEM: AQA and NWA detail) will be circulated for a second 30-day commenting period to all Registered I&APs and relevant State Departments and Organs of State.

All comments received during the second 30-day commenting period will be included in the final EIR and all comments received will be responded to in the comments and response (C&R) report which will also be included in the final EIR. The final EIR will then be submitted to the DEA&DP for their decision. All comments received during the 30-day commenting period will be included in the EIR. All comments received will be responded to in the comments and response (C&R) report which will also be included in the EIR.

The final EIR will then be submitted to the DEA&DP for their decision making.

Upon issuing of the Environmental Authorisation by DEA&DP, all I&APs will be notified and be given the opportunity to appeal the decision. Authorisations obtained in terms of the National Heritage Act and the National Water Act will be communicated to IAPs as part of the EIA process.

11. References

Botanical Sensitivity mapping kmz dataset (Nick Helme Botanical Surveys, September 2024)

Cape Farm Mapper Version 3, Western Cape Department of Agriculture

Capewinelands Aero (Pty) Ltd, Combined CWA EIA SDP, August 2024

Freshwater Ecological mapping kmz dataset (FEN, September 2024)

Freshwater offset kmz dataset (FEN, August 2024)

Geohydrological Buffer area kmz dataset (GEOSS, April 2024)

Stormwater infrastructure kmz dataset (Zutari, September 2024)

Solar PV layout kmz dataset (SANDS, August 2024)

12. Declarations by EAP and Applicant

DECLARATION OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER ("EAP")

I Amanda Fritz-Whyte, EAPASA Registration number 2019/367 as the appointed EAP hereby declare/affirm the correctness of the:

- Information provided in this report and any other documents/reports submitted in support of this application;
- The inclusion of comments and inputs from stakeholders and I&APs;
- The inclusion of inputs and recommendations from the specialist reports where relevant; and
- Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties, and that:
- In terms of the general requirement to be independent:
    - other than fair remuneration for work performed in terms of this application, have no business, financial, personal or other interest in the activity or application and that there are no circumstances that may compromise my objectivity; or
    - ~~am not independent, but another EAP that meets the general requirements set out in Regulation 13 of NEMA EIA Regulations has been appointed to review my work (Note: a declaration by the review EAP must be submitted);~~
- In terms of the remainder of the general requirements for an EAP, am fully aware of and meet all of the requirements and that failure to comply with any the requirements may result in disqualification;
- I have disclosed, to the Applicant, the specialist (if any), the Competent Authority and registered interested and affected parties, all material information that have or may have the potential to influence the decision of the Competent Authority or the objectivity of any report, plan or document prepared or to be prepared as part of this application;
- I have ensured that information containing all relevant facts in respect of the application was distributed or was made available to registered interested and affected parties and that participation will be facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments;
- I have ensured that the comments of all interested and affected parties were considered, recorded, responded to and submitted to the Competent Authority in respect of this application;
- I have ensured the inclusion of inputs and recommendations from the specialist reports in respect of the application, where relevant;
- I have kept a register of all interested and affected parties that participated in the public participation process; and
- I am aware that a false declaration is an offence in terms of Regulation 48 of the NEMA EIA Regulations;

5 November 2024

Signature of the EAP: Date:

PHS Consulting

Name of company (if applicable):

DECLARATION OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER ("EAP")

I Paul Slabbert, EAPASA Registration number 2019/1036 as the appointed EAP hereby declare/affirm the correctness of the:

- Information provided in this report and any other documents/reports submitted in support of this application;
- The inclusion of comments and inputs from stakeholders and I&APs;
- The inclusion of inputs and recommendations from the specialist reports where relevant; and
- Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties, and that:
- In terms of the general requirement to be independent:
  - other than fair remuneration for work performed in terms of this application, have no business, financial, personal or other interest in the activity or application and that there are no circumstances that may compromise my objectivity; or
  - ~~am not independent, but another EAP that meets the general requirements set out in Regulation 13 of NEMA EIA Regulations has been appointed to review my work (Note: a declaration by the review EAP must be submitted);~~
- In terms of the remainder of the general requirements for an EAP, am fully aware of and meet all of the requirements and that failure to comply with any the requirements may result in disqualification;
- I have disclosed, to the Applicant, the specialist (if any), the Competent Authority and registered interested and affected parties, all material information that have or may have the potential to influence the decision of the Competent Authority or the objectivity of any report, plan or document prepared or to be prepared as part of this application;
- I have ensured that information containing all relevant facts in respect of the application was distributed or was made available to registered interested and affected parties and that participation will be facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments;
- I have ensured that the comments of all interested and affected parties were considered, recorded, responded to and submitted to the Competent Authority in respect of this application;
- I undertake to incorporate comments / concerns of all interested and affected parties in the Plan Of Study for undertaking the env impact assessment where required;
- I have ensured the inclusion of inputs and recommendations from the specialist reports in respect of the application, where relevant;
- I have kept a register of all interested and affected parties that participated in the public participation process; and
- I am aware that a false declaration is an offence in terms of Regulation 48 of the NEMA EIA Regulations;

	5 November 2024
Signature of the EAP:	Date:

PHS Consulting

Name of company (if applicable):

DECLARATION OF THE APPLICANT

Note: Duplicate this section where there is more than one Applicant.

I.... Deon Anton Cloete ...., ID number ...6509295209088.......in my personal capacity or duly authorised thereto hereby declare/affirm that all the information submitted or to be submitted as part of this application form is true and correct, and that:

- I am fully aware of my responsibilities in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) ("NEMA"), the Environmental Impact Assessment ("EIA") Regulations, and any relevant Specific Environmental Management Act and that failure to comply with these requirements may constitute an offence in terms of relevant environmental legislation;

- I am aware of my general duty of care in terms of Section 28 of the NEMA;

- I am aware that it is an offence in terms of Section 24F of the NEMA should I commence with a listed activity prior to obtaining an Environmental Authorisation;

- I appointed the Environmental Assessment Practitioner ("EAP") (if not exempted from this requirement) which:
  - meets all the requirements in terms of Regulation 13 of the NEMA EIA Regulations; or
  - ~~meets all the requirements other than the requirement to be independent in terms of Regulation 13 of the NEMA EIA Regulations, but a review EAP has been appointed who does meet all the requirements of Regulation 13 of the NEMA EIA Regulations;~~

- I will provide the EAP and any specialist, where applicable, and the Competent Authority with access to all information at my disposal that is relevant to the application;

- I will be responsible for the costs incurred in complying with the NEMA EIA Regulations and other environmental legislation including but not limited to –
  - costs incurred for the appointment of the EAP or any legitimately person contracted by the EAP;
  - costs in respect of any fee prescribed by the Minister or MEC in respect of the NEMA EIA Regulations;
  - Legitimate costs in respect of specialist(s) reviews; and
  - the provision of security to ensure compliance with applicable management and mitigation measures;

- I am responsible for complying with conditions that may be attached to any decision(s) issued by the Competent Authority, hereby indemnify, the government of the Republic, the Competent Authority and all its officers, agents and employees, from any liability arising out of the content of any report, any procedure or any action for which I or the EAP is responsible in terms of the NEMA EIA Regulations and any Specific Environmental Management Act.

Note: If acting in a representative capacity, a certified copy of the resolution or power of attorney must be attached.

2024 . 11 . 05

Signature ~~of the~~ Applicant: Date:

Capewinelands Aero (Pty) Ltd.

Name of company (if applicable):

13. APPENDIXES

13.1 APPENDIX 1: EAP Curriculum Vitae

13.2 APPENDIX 2: DFFE Screening report and Site Sensitivity Verification

13.3 APPENDIX 3: Groundwater Impact Assessment Report

13.4 APPENDIX 4: Air Quality Impact Assessment Report

13.5 APPENDIX 5: Noise Impact Assessment Report

13.6 APPENDIX 6: Botanical Impact Assessment Report

13.7 APPENDIX 7: Freshwater Ecological Impact Assessment Report

13.8 APPENDIX 8: Freshwater Offset report

13.9 APPENDIX 9: Terrestrial Ecology Impact Assessment Part A

13.10 APPENDIX 10: Terrestrial Ecology Impact Assessment Part B

13.11 APPENDIX 11: Terrestrial Ecology Impact Assessment Part C

13.12 APPENDIX 12: Terrestrial Offset Report

13.13 APPENDIX 13: Heritage Impact Assessment Report

13.14 APPENDIX 14: Archaeological Report for Scoping

13.15 APPENDIX 15: Visual Impact Assessment Report

13.16 APPENDIX 16: CWA Diversion Airport Analysis

13.17 APPENDIX 17: Civil Aviation Baseline and Site Sensitivity

13.18 APPENDIX 18: Annex 14 OLS Report

13.19 APPENDIX 19: Airspace CONOPS Report

13.20 APPENDIX 20: OLS Height Limitations report

13.21 APPENDIX 21: Airspace and Capacity Study

13.22 APPENDIX 22: Visualization of FACT and FAWN combined operations

13.23 APPENDIX 23: CWA Alternate Airport study

13.24 APPENDIX 24: Socio-economic Impact Assessment Report

13.25 APPENDIX 25: Transport Impact Assessment Report

13.26 APPENDIX 26: SDP & technical plans and layouts

13.27 APPENDIX 27: Aircraft Refuelling Facilities Report

13.28 APPENDIX 28: Agro-Ecosystem Impact Assessment Report

13.29 APPENDIX 29: Climate Change Impact Assessment Report

13.30 APPENDIX 30: A - Comments & Response Report (Pre-application Scoping Phase); B – Comments & Response Report (In-process Scoping Phase)

13.31 APPENDIX 31: WULA Technical Report (inclusive of WULA process status and Geohydrological report)

13.32 APPENDIX 32: Outdoor Advertising Guideline

13.33 APPENDIX 33: Preliminary Architectural Guideline

13.34 APPENDIX 34: Hydropedological Assessment

13.35 APPENDIX 35: Major Hazard Installation Risk Assessment

13.36 APPENDIX 36: Glint and Glare

13.37 APPENDIX 37: Bird Strike Risk Assessment

13.38 APPENDIX 38: CWA Maintenance Management Plan

13.39 APPENDIX 39: Poultry Biohazard Assessment

13.40 APPENDIX 40: CWA in the context of Spatial Policy and Land Use Rights

13.41 APPENDIX 41: Bulk Engineering Services Report (Version I)

13.42 APPENDIX 42: Electrical Supply Technical Report

13.43 APPENDIX 43: A - EMPr; B - Waste Management Plan; Alien Clearing plan; Veldfire Management Plan; Environmental Awareness Plan

13.44 APPENDIX 44: Engagement with IAP's to date

13.45 APPENDIX 45: Aviation Protocol Compliance Statement

13.46 APPENDIX 46: Concept Stormwater Management Plan

13.47 APPENDIX 47: Impact Assessment Summary