

Long-range LiDAR VTOL launching over rainforest, Gabon, 2023

3DRONEMAPPING

Drone based LiDAR

Company Profile

High-accuracy drone-based LiDAR and aerial surveys across Africa, for sites too large for conventional drones and too remote for manned aircraft.

WHO WE ARE

Survey-grade aerial mapping, delivered anywhere in Africa.

3DroneMapping is a specialist aerial survey company. Since 2012 we have mapped mines, oil and gas concessions, wind and solar sites, cities, farms and transport corridors in some of the most difficult operating environments on the continent.

Since 2012 in continuous operation	**400+** survey projects completed	**750 000+ ha** surveyed to date
29 African countries worked in	**80 000+ ha** largest single site surveyed	**< 50 mm** standard LiDAR point accuracy

Our background

The company grew out of a South African land surveying practice that began using unmanned aircraft for topographic work well before the technology was commonplace. It was formally registered in 2014 to meet a clear need: affordable, accurate and fast mapping for projects in places that are hard to reach.

That survey heritage still defines how we work. Every project is controlled, checked and reported as a survey, not simply flown as a drone mission. Ground control is observed and adjusted by our own field staff, and every deliverable is verified against independent check points.

We occupy the gap between conventional drone operators and manned aerial survey. Our long-range aircraft cover areas of 500 ha to more than 80 000 ha, sites that are too big for off-the-shelf drones and not economical for a survey aeroplane.



Typical survey terrain: montane forest in East Africa.

Why clients choose us

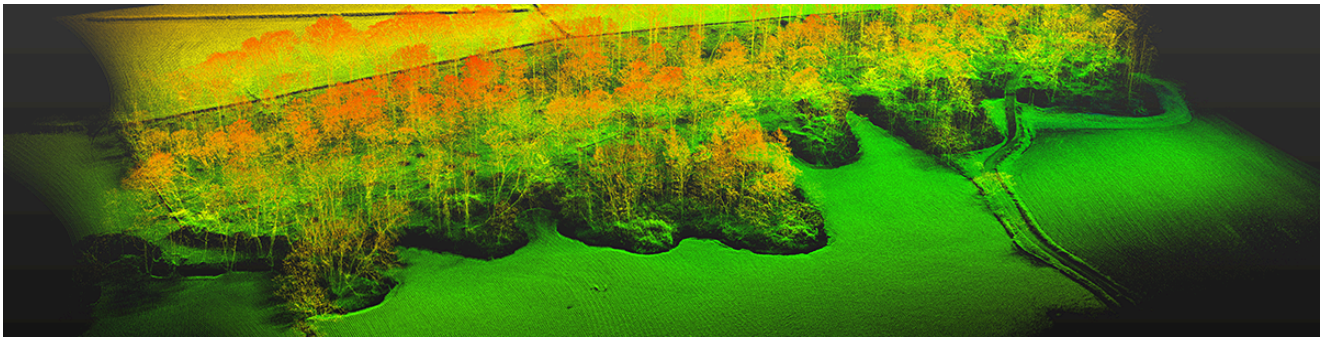
- **Experience in difficult places.** Rainforest, desert, high mountains, dense cities and remote islands, with the permits, logistics and security planning each requires.
- **LiDAR that finds the ground.** Multi-return laser scanning measures true ground level beneath vegetation, where photogrammetry cannot.
- **Purpose-built aircraft.** Long-range VTOL platforms developed in-house for African conditions, shipped with their own field maintenance kit.
- **Fast turnaround.** A 10 000 ha site can be flown in a single day and processed in about five.
- **One accountable team.** Approvals, ground control, flight operations, processing and reporting are handled in-house.

Sectors we serve

Mining and exploration · Oil and gas · Wind, solar and hydro power · Roads, rail and pipelines · Urban planning and flood risk · Agriculture and irrigation · Waste management · Conservation and tourism

WHAT WE DO

Services and deliverables



Classified LiDAR point cloud: ground is measured through gaps in the vegetation canopy.

LiDAR surveys

Airborne laser scanning at up to 2 000 000 measurements per second with up to 16 returns per pulse. Dense point clouds are classified so that a true bare-earth model can be contoured, even under forest or crops.

Orthomosaics

True-orthogonal, colour-balanced imagery at resolutions finer than 20 mm per pixel where required. Flown low, drone imagery is sharper and holds more detail in shadow than manned or satellite imagery.

Terrain and surface models

Digital terrain and surface models (DTM and DSM), edited in 3D and thinned to practical file sizes without losing terrain features. Contours, cross-sections, volumes and CAD drawings follow from these.

Standard specification

LiDAR point accuracy	Better than 50 mm; tighter on request
Point density	More than 25 points/m² as standard
Orthomosaic resolution	Down to 20 mm per pixel
Ground control	Dual-frequency GNSS, typically to 20 mm or better
Positioning	PPK and PPP trajectory processing with INS
Quality check	Independent check points on every survey
Formats	LAZ/LAS, ECW/GeoTIFF, ASCII grid, DWG/DXF, SHP
On request	Thermal and multispectral data, feature extraction, volumetrics, repeat monitoring

Recent verified results include vertical accuracy better than 15 mm (1-sigma) at more than 80 points/m² on a mountain mine site, and 19 mm RMSE over a 6 000 ha wind farm site.

How a project runs

1. The client defines the area of interest and the deliverables required.
2. We issue a quotation for approval.
3. We obtain the aviation, government and, where needed, military approvals.
4. Equipment is shipped in-country by specialist cargo handlers.
5. Field staff establish ground control and quality-check points.
6. The aerial survey is flown.
7. Data is processed, classified, checked and reported.
8. Deliverables are released through our secure online portal.

Online delivery. Clients view their orthomosaic and full-density 3D point cloud in the browser, take measurements, export profiles to DXF, CSV or LAS, and download the survey files from a password-protected page.

HOW WE DO IT

Fleet, sensors and processing



Long-range LiDAR VTOL, 5.4 m wingspan, designed and built in-house.



Multirotor LiDAR survey of a coastal site in the Seychelles.

Our aircraft are built and modified for African field conditions after years of research and development on real projects. They travel from project to project in their own cases with a field workshop, so repairs do not wait for a courier. Every aircraft carries a LiDAR scanner and an RGB mapping camera as standard, with a survey-grade inertial navigation system for trajectory post-processing.

PLATFORM	USED FOR	CAPABILITY
Long-range VTOL fixed wing	Large sites and corridors: 500 ha to 80 000 ha, pipelines, roads and rail. Vertical take-off needs no runway.	5.4 m wingspan; carries a 3 kg LiDAR for up to 5 hours at about 90 km/h; up to 10 000 ha per day
Heavy-lift multirotor	Smaller or steep sites under 500 ha, mines, landfills, urban areas, very high point densities.	LiDAR at up to 2 000 000 points per second with 16 returns; integrated high-resolution RGB cameras
Sensors	Survey LiDAR scanners, calibrated metric RGB cameras up to 100 megapixel class, multispectral and thermal sensors on request	
Ground equipment	Multi-frequency GNSS base and rover receivers for static control, RTK and PPK; long-range command links; ADS-B and strobes for operations in controlled airspace	
Processing	GPU workstations with on-site and off-site redundant storage. Trajectory, point cloud and photogrammetric processing in industry-standard software including Terrasolid, LiDAR360, Inertial Explorer, DJI Terra and Global Mapper	

Compliance and safety

- South African Civil Aviation Authority UAS operator certificate: CAA/G1245D
- Rated for beyond visual line of sight (BVLOS) operations
- Licensed remote pilots with VLOS, EVLOS and BVLOS ratings
- Documented operations, safety management and quality assurance manuals
- In-country flight approvals obtained for every project
- Tax compliant and in good standing with SARS

Research and development

Through our sister company Pilotless we design and test our own airframes, payload integrations and long-range control links. Sensor accuracy is verified at a permanent calibration site with surveyed control points before equipment is sent to the field, and results are published openly on our website.

The same team has run internet-controlled remote surveys and a two-year medical cargo drone delivery programme in East Africa for the past 6 years.

TRUSTED BY

Our clients

Our work supports feasibility studies, engineering design, construction and monitoring for international operators, engineering consultancies, development agencies and governments.

By sector

Mining	ArcelorMittal, Leo Lithium, Kodal Minerals, Canyon Resources, Blencowe Resources, Wardell Armstrong, Randgold Resources, Storm Mountain Diamonds
Oil and gas	TotalEnergies, Perenco, Saipem, Worley
Renewable energy	EDF, Scatec, Magnora
Development	The World Bank, UNCDF, Office of the Prime Minister of Uganda
Engineering	SGI Studio Galli Ingegneria, Yapı Merkezi, Birlik Harita, AECOM, Mariswe, LuxConsult
Agriculture	Nestlé, Elite Agro
Conservation	&Beyond, Gorongosa National Park

Where we have worked

Projects completed in countries including:

Botswana · Cameroon · Central African Republic · Democratic Republic of the Congo · Djibouti · Eswatini · Ethiopia · Gabon · Kenya · Lesotho · Madagascar · Mali · Mauritania · Mauritius · Mozambique · Namibia · Rwanda · Senegal · Seychelles · Sierra Leone · Somalia · South Africa · South Sudan · Sudan · Tanzania · Uganda

Featured in sUAS News, Emlid and GIS Cloud for our work on long-range survey aircraft, PPK positioning and LiDAR accuracy testing.

Logos are the property of their respective owners and are shown to indicate past engagements.

SELECTED PROJECTS

Work we are known for



GABON · 2023 · OIL AND GAS

82 000 ha of rainforest for an onshore producer

LiDAR survey of an onshore concession entirely under dense jungle, for pipeline routes and road extensions. Humidity and canopy cut radio range, so missions were planned around relay positions.

5 215 km flown in 11 days · 5 TB of raw data · delivered in under 3 weeks



MALI · 2022 TO 2025 · MINING

Lithium and gold projects in southern Mali

Pre-development terrain models and orthomosaics for three exploration and mine projects, flown in temperatures above 40 °C and winds over 14 m/s.

18 000 ha, 31 000 ha and 26 800 ha · first site flown in 3 days, processed in 72 hours



UGANDA · 2020 · AGRICULTURE

28 000 ha sugar estate in four days

A contiguous estate surveyed for irrigation and drainage design using direct georeferencing, which removed the need for dense ground control across cane fields.

28 000 ha captured in 4 days · end-to-end delivery in 3 weeks



ETHIOPIA · 2016 TO 2017 · RAIL

Construction monitoring of a new railway

A ten-month programme of repeat corridor surveys for volumes and progress reporting on a US$1.8 billion railway, across terrain from 700 m to 3 000 m above sea level.

447 km of line · terrain-following BVLOS flights · 10 months



LESOTHO · 2024 · MINING

High-accuracy LiDAR of a diamond mine

Pit, tailings and infrastructure of a mountain mine surveyed in one day with a multirotor LiDAR, tied to twelve permanent control points.

315 ha · over 80 points/m² · vertical accuracy better than 15 mm (1-sigma)



CENTRAL AFRICA · PIPELINE

280 km pipeline route survey

A 1 km wide LiDAR corridor for route design, flown by long-range VTOL through heavy rain and strong winds. Control points every kilometre now serve as construction benchmarks.

280 km × 1 km · 6 flying days · 18 points/m² · better than 50 mm

TRACK RECORD

Project register

A selection from more than 400 completed projects. Clients are named where we are free to publish them.

YEAR	COUNTRY	PROJECT	CLIENT	EXTENT
2026	**South Africa**	Wind farm site LiDAR, Eastern Cape, 19 mm RMSE	EDF	6 000 ha
2026	**Eswatini**	Mine site LiDAR, orthomosaic and terrain model		350 ha
2025	**Mali**	Gold project LiDAR survey, 15 points/m²		26 800 ha
2025	**Eswatini**	Development site and bridge crossing LiDAR	Third Lens	380 ha
2025	**South Africa**	Mine rail link and yard: imagery and LiDAR, Northern Cape		2 500 ha
2024–26	**South Africa**	Recurring landfill volumetric surveys in three provinces		Annual
2024	**South Africa**	Wind farm site survey, Northern Cape		9 000 ha
2024	**Lesotho**	Kao diamond mine high-accuracy LiDAR	Storm Mountain Diamonds	315 ha
2024	**Botswana**	Development site survey with benchmarks, Selebi Phikwe		150 ha
2023–24	**C. African Rep.**	Bangui city mapping for flood resilience planning	SGI	21 000 ha
2023	**Gabon**	Onshore oil and gas concession LiDAR under rainforest	Perenco	82 200 ha
2023	**Mali**	Goulamina lithium project terrain model and orthomosaic	Leo Lithium	33 800 ha
2023	**Seychelles**	Island LiDAR and orthomosaic for development planning		87 ha
2022	**South Africa**	Wind and solar development sites, Northern Cape		25 000 ha
2022	**Mali**	Bougouni lithium project terrain model and orthomosaic	Kodal Minerals	18 000 ha
2021–22	**Uganda**	Medical cargo drone delivery trials, West Nile	UNCDF	15 weeks
2021	**Sierra Leone**	Topographic survey for rice production, several sites	Elite Agro	65 000 ha
2021	**Uganda**	Iganga irrigation and dam scheme	SGI	31 000 ha
2021	**DR Congo**	Kinshasa river valley survey in controlled airspace	SGI	19 000 ha
2021	**DR Congo**	Road alignment survey, Goma		380 km
2021	**Mozambique**	Storm-damaged dyke system, Maragra sugar estate	Mariswe	60 km
2020	**Mali**	Bamako city terrain model for flood risk analysis	The World Bank	32 000 ha
2020	**Uganda**	Sugar estate survey for irrigation and drainage		28 000 ha
2020	**Uganda**	Orom graphite project site survey	Wardell Armstrong	15 000 ha
2019	**Cameroon**	Minim Martap bauxite project	Canyon Resources	42 000 ha
2019	**Tanzania**	Farm survey for irrigation development and design		20 000 ha
2019	**Lesotho**	Mountain plateaux terrain models for wind power design		14 000 ha
2019	**Uganda**	Bududa landslide and flood analysis	The World Bank	2 regions
2018–19	**Uganda**	East African Crude Oil Pipeline route and site surveys	Saipem	350 km +
2018	**Uganda**	Tilenga oil field topographic surveys	TotalEnergies	Multiple
2018	**Lesotho**	Diamond mine pit and tailings above 3 000 m		Mine site
2017	**Tanzania**	Mnemba Island topographic survey, Zanzibar	&Beyond	Island
2016–17	**Ethiopia**	Awash to Woldia railway construction monitoring	Yapı Merkezi	447 km
2016	**Mozambique**	Gorongosa National Park flood modelling, six sites	Gorongosa	1 500 ha
2016	**Mauritius**	Development area survey with river cross-sections	LuxConsult	4 200 ha
2016	**Tanzania**	Topographic and bathymetric survey, Zanzibar resort	Penny Royal	2 900 ha
2015	**Mozambique**	Crop health (NDVI) and drainage survey, Nampula	AgroMoz	3 000 ha
2014	**Uganda**	Hydroelectric feasibility survey of a highland river valley	AECOM	15 × 5 km
2012–13	**Mali, Senegal**	Proposed mine sites and access roads	Randgold Resources	1 900 ha

THE PEOPLE AND THE DETAILS

Team and company information

Luke Wijnberg

Founder and Director · Flight operations, survey and processing lead

Luke has worked in survey, GIS and photogrammetry since 2000, including precise engineering, tunnelling, geodetic monitoring and hydrographic surveys, and has flown commercial drone surveys for 16 years. He holds a South African remote pilot licence with VLOS, EVLOS and BVLOS ratings and oversees flight operations on every project.

Melissa Wijnberg

Operations and Safety Manager

Melissa has managed safety, aviation authority compliance and project logistics since 2017, from permits and customs clearance to field team movements. She is trained in aviation safety management systems and is the first point of contact for client enquiries.

Field and processing teams are scaled to each project from a long-standing group of licensed remote pilots, professional land surveyors, GIS and point cloud technicians and in-country logistics partners. For areas beyond the economic range of unmanned aircraft we work alongside manned aerial survey partners.



Company details

Registered name	3DroneMapping (Pty) Ltd
Registration	2014/256136/07, South Africa
Operating since	2012
Head office	R407, Prince Albert, 6930, Western Cape, South Africa
Operator certificate	SACAA UASOC CAA/G1245D
Area of operation	Africa and the Indian Ocean islands

Supporting documents

The following are available on request for tenders and vendor registration:

- Company registration and tax compliance status
- B-BBEE certificate
- Operator certificate and pilot licences
- Insurance confirmation
- Sample survey reports and client references

Start with an area of interest.

Send us a KMZ or draw your site on our online quote tool for an estimate in minutes.

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