SQUADRONE

INFRA & MINING PVT. LTD.

Bangalore, India

DRONE BASED GEOPHYSICAL MAGNETIC SURVEY - GAME CHANGER IN MINERAL PROSPECTING/ EXPLORATION

MEAI -MEGECON – 2022

HOSPET, INDIA.

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www.squadrone.co.in

SQUADRONE

SQUADRONE EXPERTISE

- We have our expertise in the mining and infrastructure business with over **30 years of experience**

- Integrating our strong domain expertise and **deep knowledge of drone technology**, we can jointly customize focused application of this technology in mining and infrastructure

WE'LL BE YOUR PROGRESS PARTNERS ON THIS TRANSFORMATIONAL PATH.

SQUADRONE & STRAYOS COLLABORATION

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SQUADRONE INFRA AND MINING PRIVATE LIMITED, Bangalore, India
BELIEVES IN DIGITAL TRANSFORMATION OF MINING & INFRASTRUCTURE SECTOR IN INDIA THROUGH AI & ML.

STRAYOS INC. USA, A TECHNOLOGY DRIVEN COMPANY WITH EXPERTISE IN APPLICATION OF AI & ML IN MINING HAS PARTNERED WITH SQUADRONE'S STRONG DOMAIN EXPERTISE IN MINING AND DRONE APPLICATIONS.

Strayos

Strayos overview

Founded in 2016

10
COUNTRIES

800+
MINES

50+
CUSTOMERS

CIO Review 20 MOST PROMISING METALS & MINING TECH SOLUTION PROVIDERS - 2018

GLOBAL PRESENCE

AMERICAS

Buffalo, NY (HQ)
St Louis, MO

ASIA

Bangalore, India

EUROPE
Poland

AUSTRALIA
Sydney, NSW

24/7

Live customer support

DRONE-BASED MAGNETOMETERS FOR GEOPHYSICAL SURVEYS

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NITI Aayog 2018 Strategy for New India

- India has identified **5.71 lakh sq.km (57.1 Million Ha.)** as the **Obvious Geological Potential (OGP)** area, but only **10 percent** of it has been explored and **1.5 percent** is being mined.
- Double the area explored from **10 %** of **Obvious Geological Potential (OGP)** area to **20 %.**

- Since independence, India has focused on finding **Extensions** of stratiform bulk commodities like iron ore, bauxite, coal, manganese and limestone; or
- **Brownfield exploration** of operating mines and old workings; or
- Establishing the geological resources of **discrete chance discoveries** like Sukinda chromite and Malanjkhand porphyry copper deposits.

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India must re-boot its mineral exploration strategy for twenty-first century with a new mission to discover Greenfield deposits for all the commodities critical for the country.

- **Innovation & Technology is the way forward**

Applications of Magnetometers

- **Mineral Exploration** - To discover mineralization and geological structures.
- **In Coal Exploration -** For locating the sills and other obstructions.
- **Mine Rescue** of buried objects during slope failures.
- **Groundwater exploration**
- **Oil and Gas Exploration** -For drilling the discovered wells.
- **As metal detector - Underground Pipeline Mapping , Ship wreck, etc.**
- **UXO detections**

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MAGARROW DRONE BASED GEOPHYSICAL SURVEY

MAGARROW – SPECIFICATIONS

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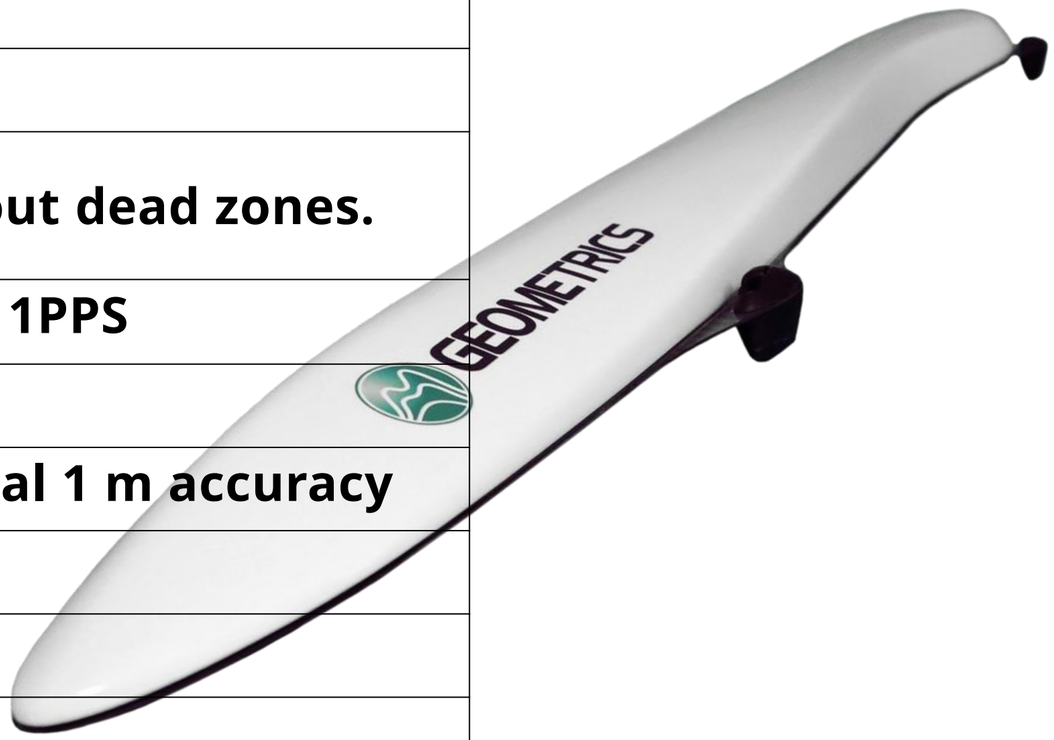
1	Operating Principle	Laser pumped cesium vapor (Cs133 non-radioactive) total field scalar magnetometer.
2	Operating Range	20,000 to 100,000 nT
3	Operating Zones	Configured for operation anywhere in the world without dead zones.
4	Sample Rate	1000 Hz synchronized to GPS 1PPS
5	Bandwidth.	400Hz
6	GPS	Commercial grade with typical 1 m accuracy
7	Data Logger	Built in Data Logger
8	Total Weight	1kg without batteries.
9	Length	1m.
10	Operating Temperature	-10°C to +50°C (+14°F to +122°F)
11	Humidity	Non-condensing.



MAGARROW DRONE BASED GEOPHYSICAL SURVEY

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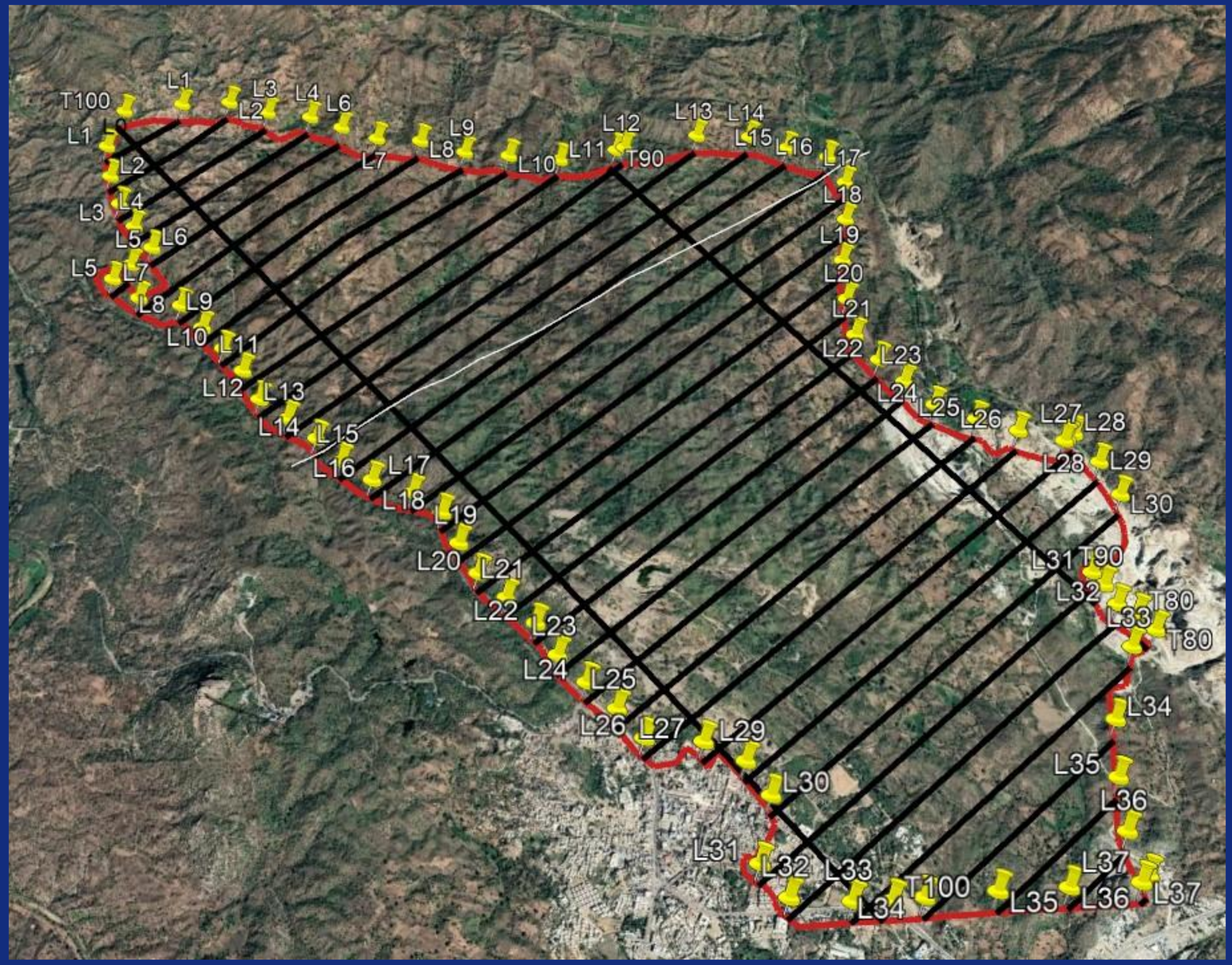

Advantages of Drone based Magnetometer

- **UAS**-enabled magnetometer can easily prospect **rough and inaccessible areas.**
- Can prospect in **thick forests without disturbing the eco system**
- **Can prospect in densely populated areas-villages, towns etc.**
- Avoid hostility from local people

Advantages of Drone based Magnetometer

- Does **not need making of approach roads** which by itself is the biggest hassle of any prospecting project, that sucks **both time and money & resources.**

- Could be integrated with EM and MMR to be able to identify and **capture deep seated Mineral deposits and Deep acqufiers**

Advantages of Drone based Magnetometer

- **Huge saving in Cost & Time**
- Depth of exploration can be 500-**1000m from the earth surface**
- **High number** of measurements can be taken 1000 Samples per second
- **High Resolution Outputs**

Advantages of Drone based Magnetometer

- Simplify surveys that are difficult due to the various limitations of **pilot-on-board surveys** and **ground surveys.**
- Does not require **complicated licensing** like an aeroplane or helicopter.
- **Survey of small parcels** also can be undertaken **quickly.**

Advantages of Drone based Magnetometer

- Can reduce the survey time by **10x** that of a terrestrial survey.
- If a **terrestrial survey** takes **1 year** a **drone magnetic survey** takes just **1 month** to complete the same survey area.
- A project that may take **3 - 4 years** to Complete by traditional Trestrial mapping **Magnetic Geophysical survey ,** will be **completed just in 5-6 months by Drone Magnetics**

Drone Based Magnetometer

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- Millimeter data sampling intervals
- Slow flying
- Very Low flying
- Full autonomous flight
- Precision flying in severe terrain

- Follow the Terrain
- Capable of flying at night
- Excellent for high detailed magnetic surveys, water detection, boreholes, well detection
- Magnetic sampling at 1000 times a second

MAGARROW

DRONE BASED GEOPHYSICAL SURVEY

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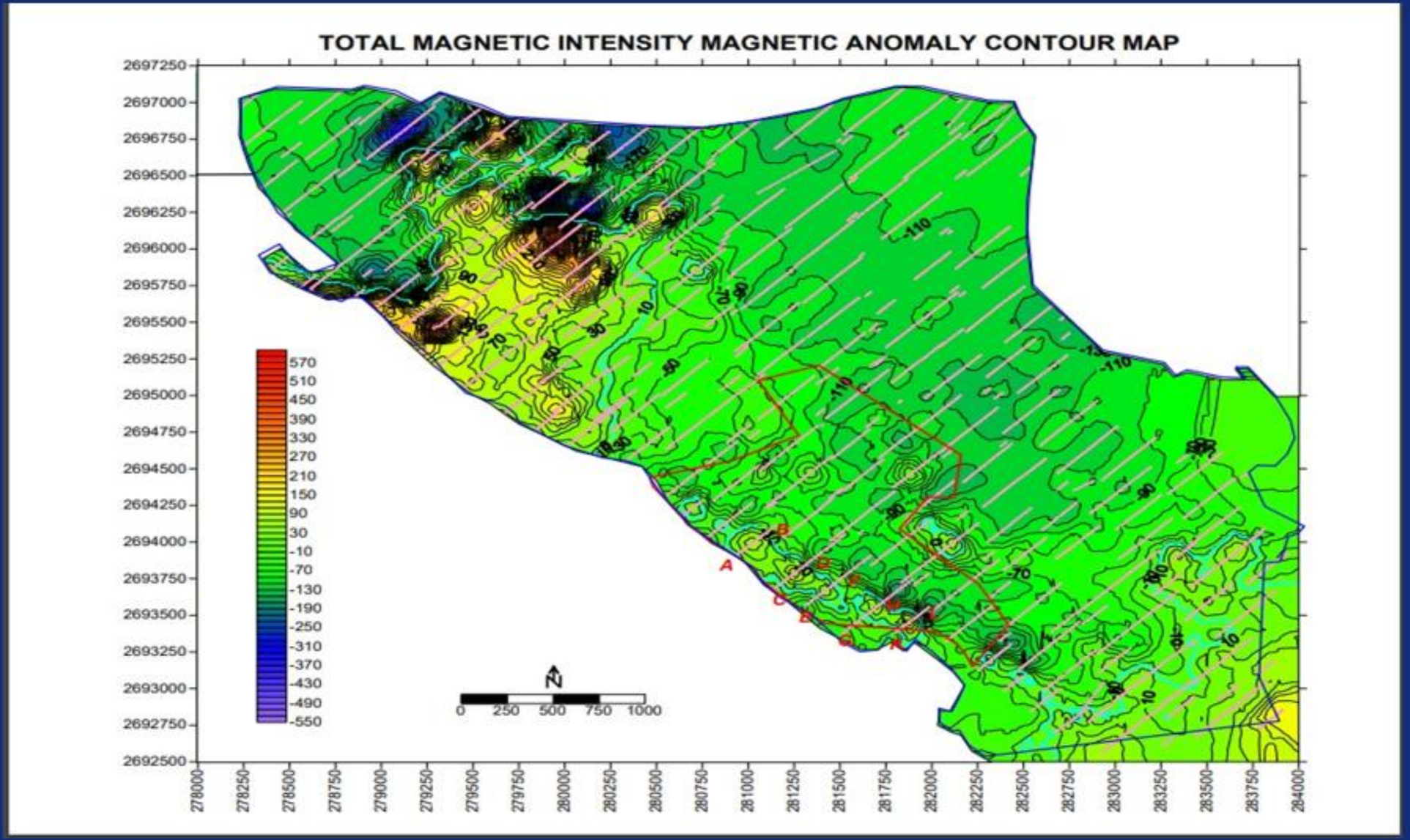

MAGARROW

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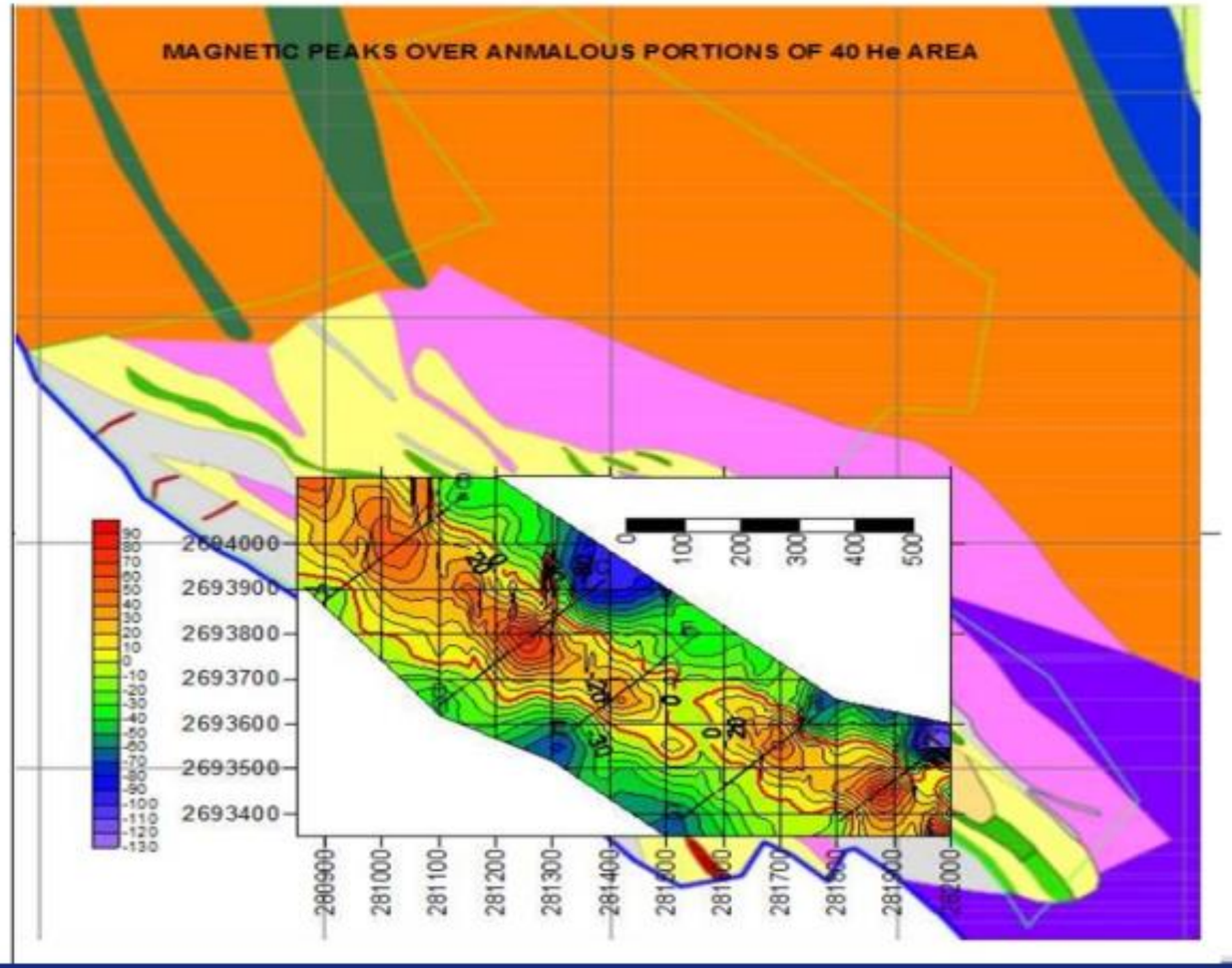

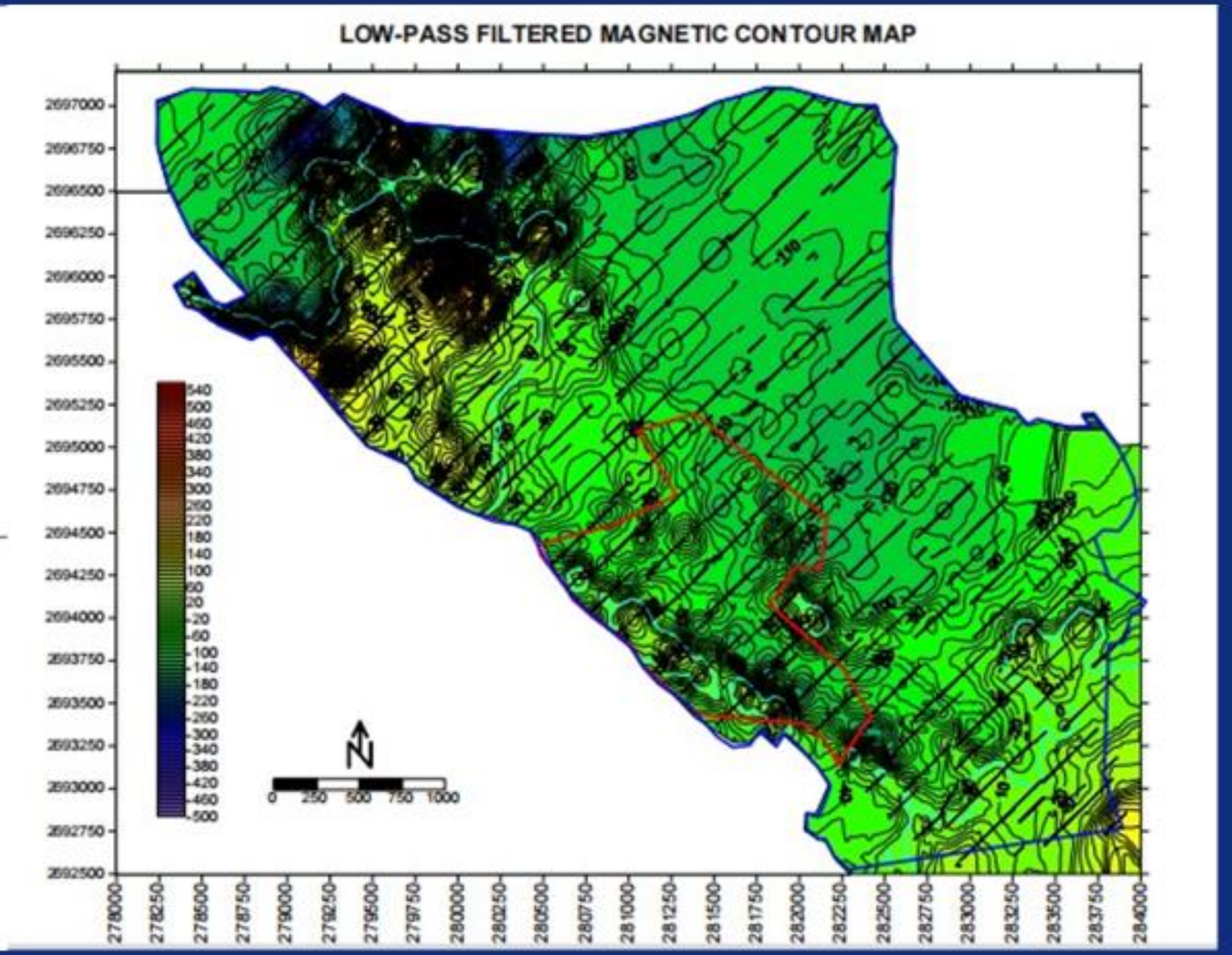

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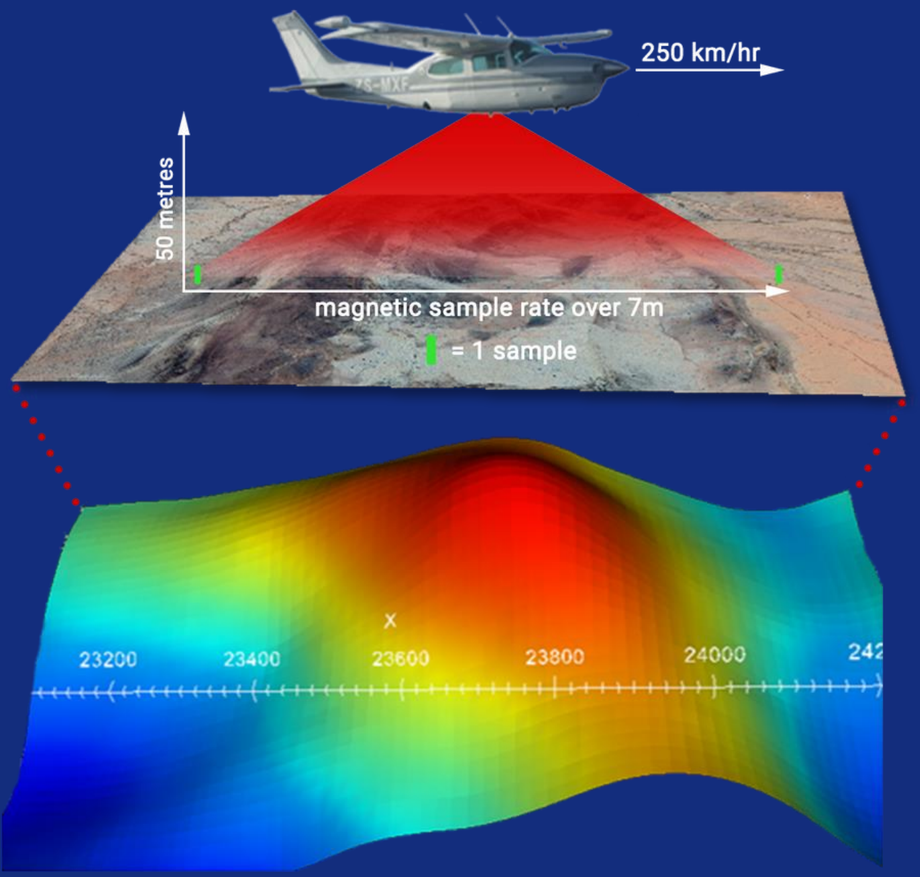
MAGARROW DRONE BASED GEOPHYSICAL SURVEY

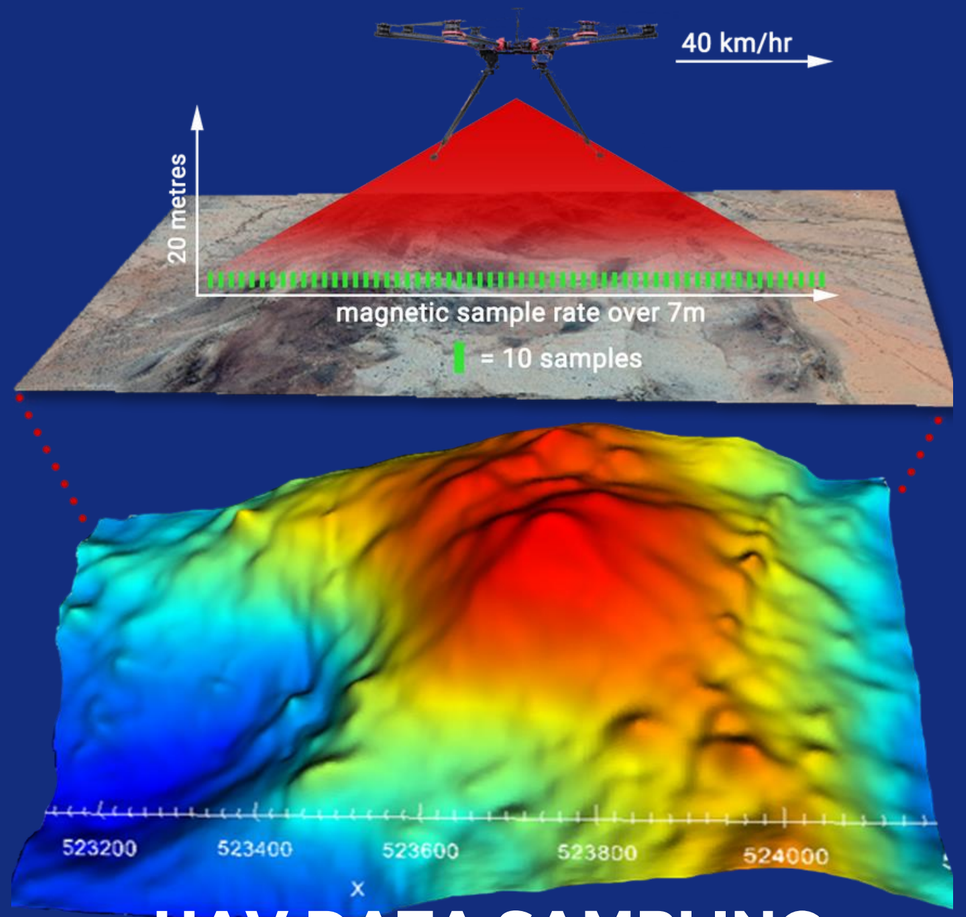
FIXED WING (Manned) Vs UAV MAGNETIC

Lower flying height, slower flying speed and the MagArrow magnetometer sampling at 1000 Hz, **100 times faster than current magnetometers, results in a more detailed map.**



FIXED-WING DATA SAMPLING

- 100-200m flying height
- 100m line spacing
- **10 samples per second**



UAV DATA SAMPLING

- 25M flying height
- 25m spacing
- **1000 samples per second**

MAGARROW-DRONE BASED GEOPHYSICAL SURVEY

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MINERAL PROSPECTING & EXPLORATION

For Quick Assessment of AUCTION BLOCKS

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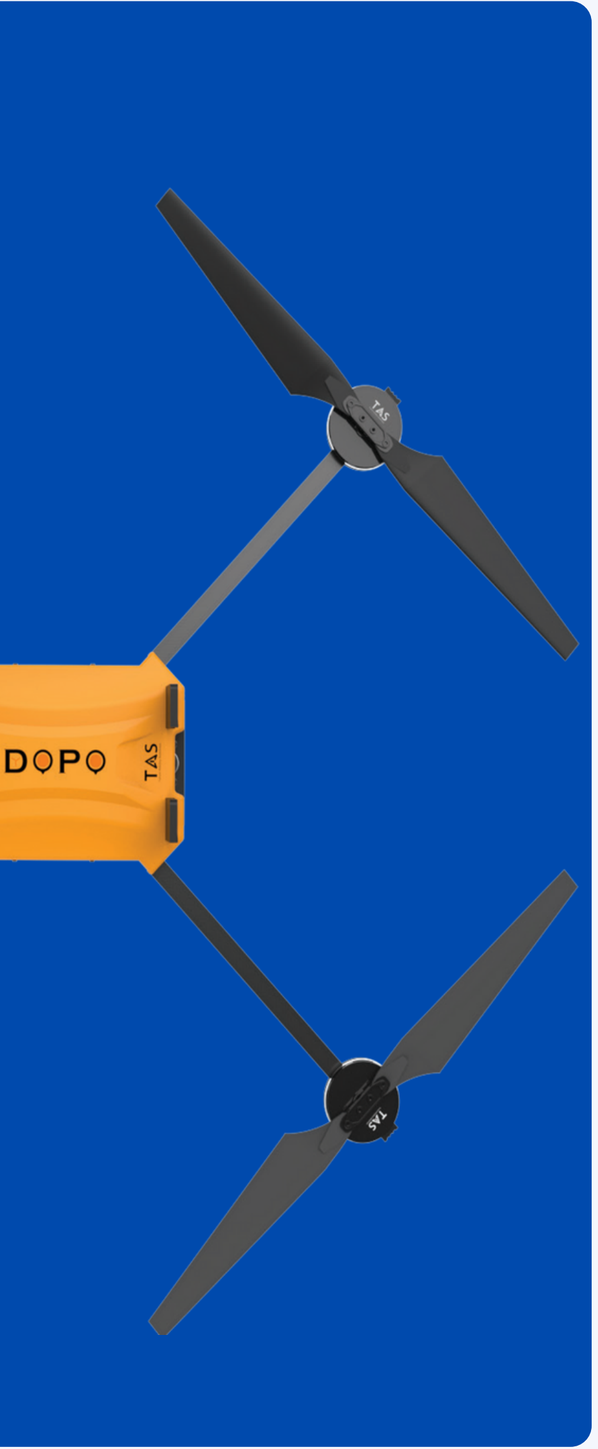
FOUNDER &
CEO



DRONE SPECIFICATIONS

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DGCA APPROVED DRONES

- **MODEL - : Lookout VTOL TALV 2400 (DOPO)**
- **ENDURANCE - 40 minutes per flight**
- **RANGE - 5-6 km can be extended up to 10kms**
- **SENSOR - Sony Alpha 600, 24 Mega Pixels RGB Camera**
- **TYPE - PPK DRONES.**
- **The drone has Return To Home feature.**

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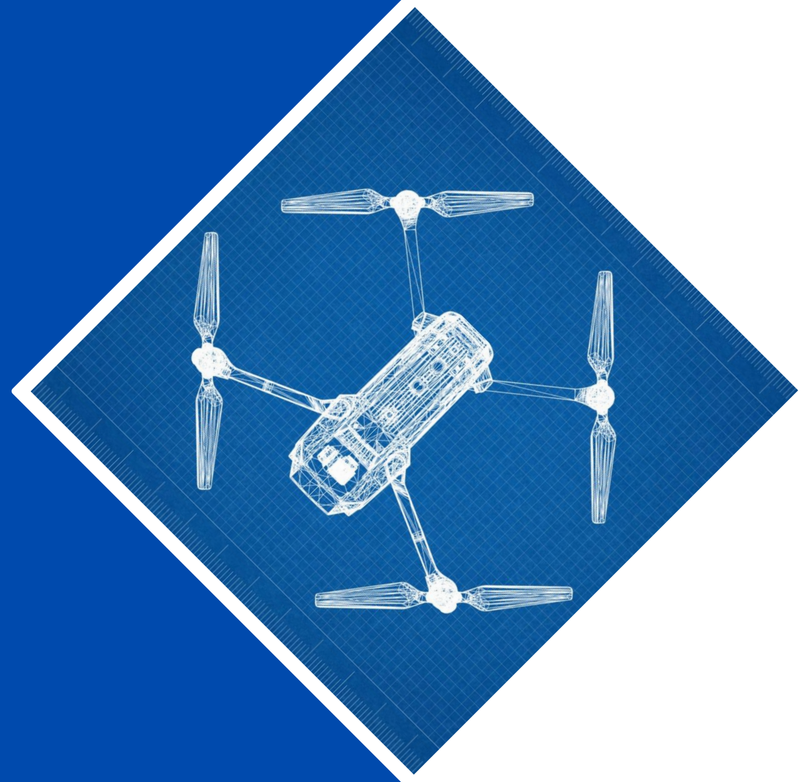
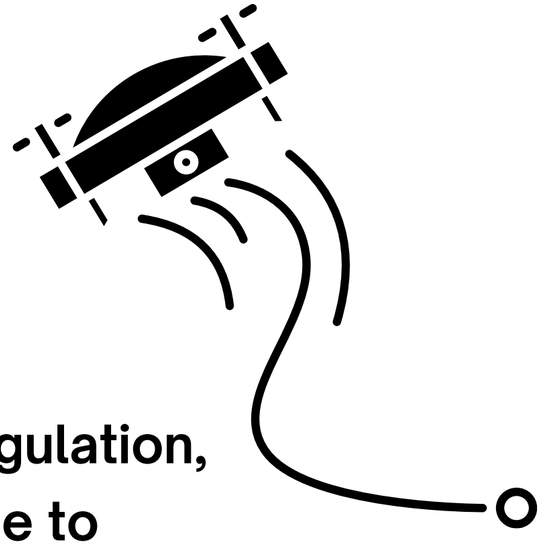
STANDARD OPERATING PROCEDURE

DGCA REQUIREMENTS





DRONE AGENCY REGISTRATION &PERMISSIONS

Drone agencies adhere to all the rules, regulation, guidelines etc., notified by DGCA from time to time

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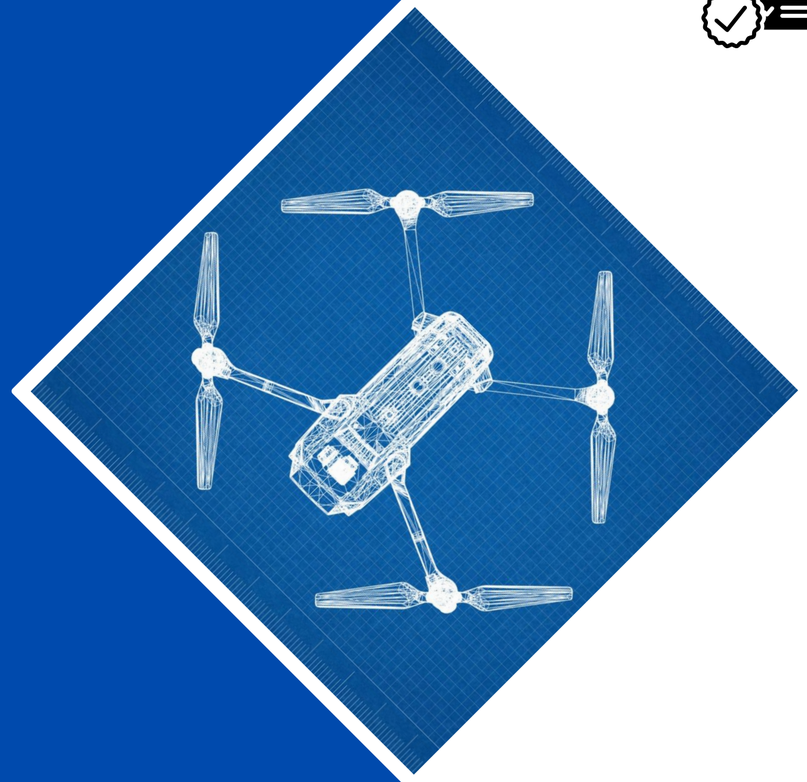

DGCA REQUIREMENTS

- Only DGCA Approved drones must be used for the survey
- Remote pilot licence by DGCA is required.
- Drones Should have an UIN issued by DGCA.
- Maximum flying height - 120 m agl.
- Permission from central government is required to fly in RED ZONE

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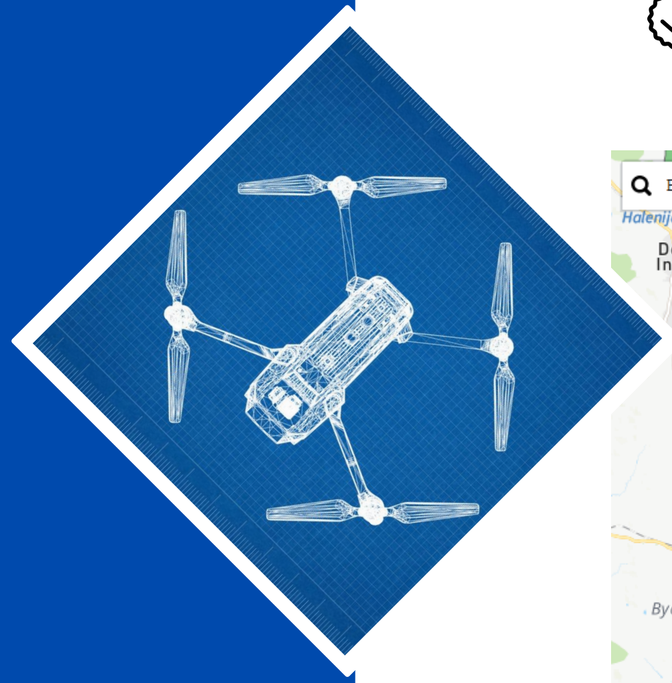
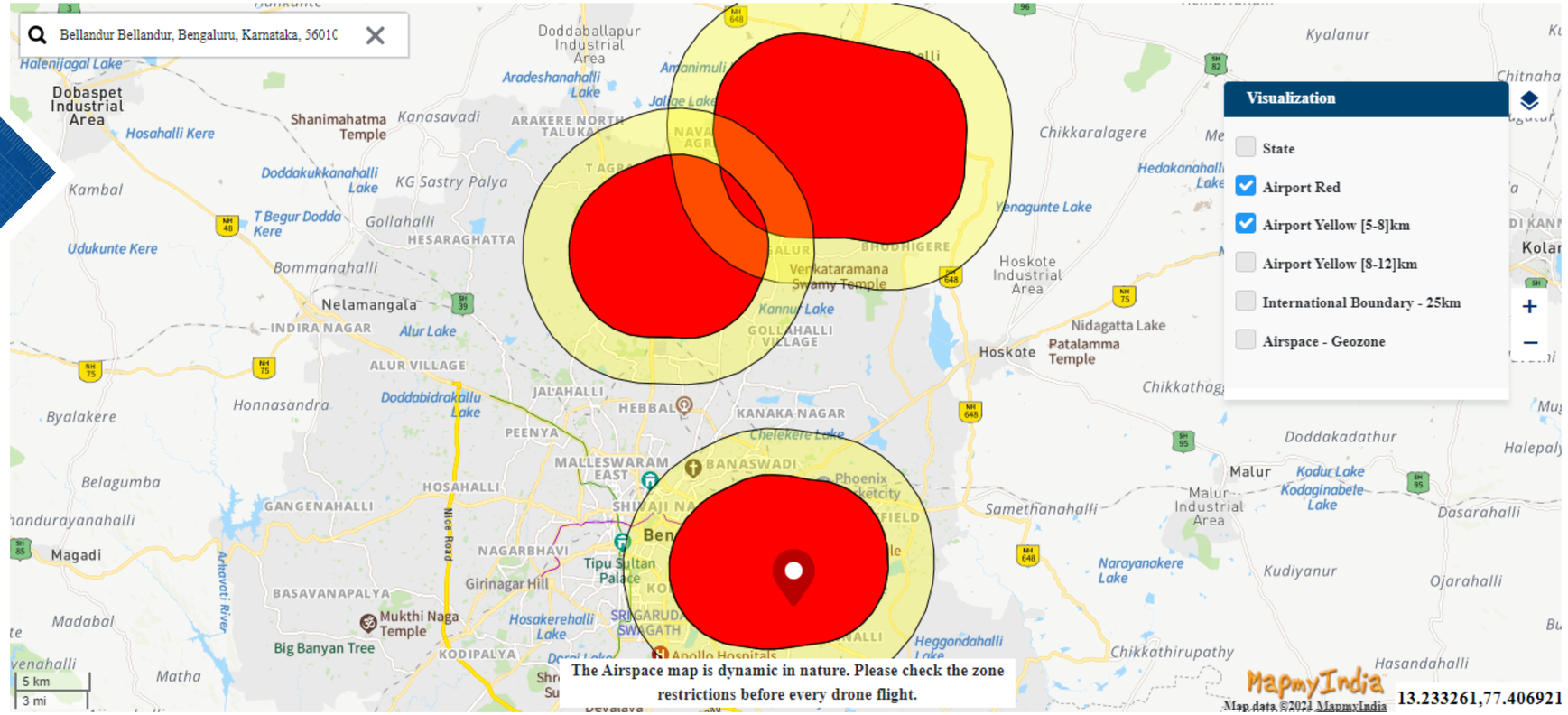
DGCA REQUIREMENTS





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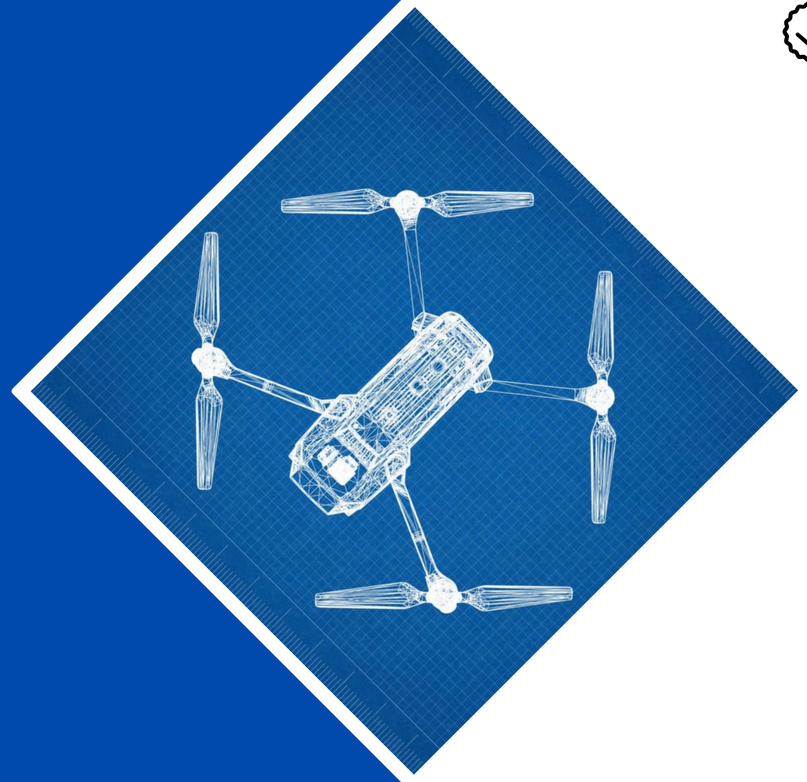

DGCA REQUIREMENTS

RED ZONE -

- **No Free Fly-zone in Designated /sensitive areas**
- **upto 5 km from Airports.**

GREEN ZONES - Free to fly Upto 120 meters AGL.

YELLOW ZONE -

- **Any Flying within 5 - 8 km from perimeter of any operational Airport.**
- **above 60 metres in the area located between the lateral distance of 8 km and 12 km from the perimeter of an operational airport.**
- **The airspace above 120 metres in the designated GREEN ZONE**

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