



CANADIAN UAVS

Your Trusted Unmanned Systems Deployment
Partner



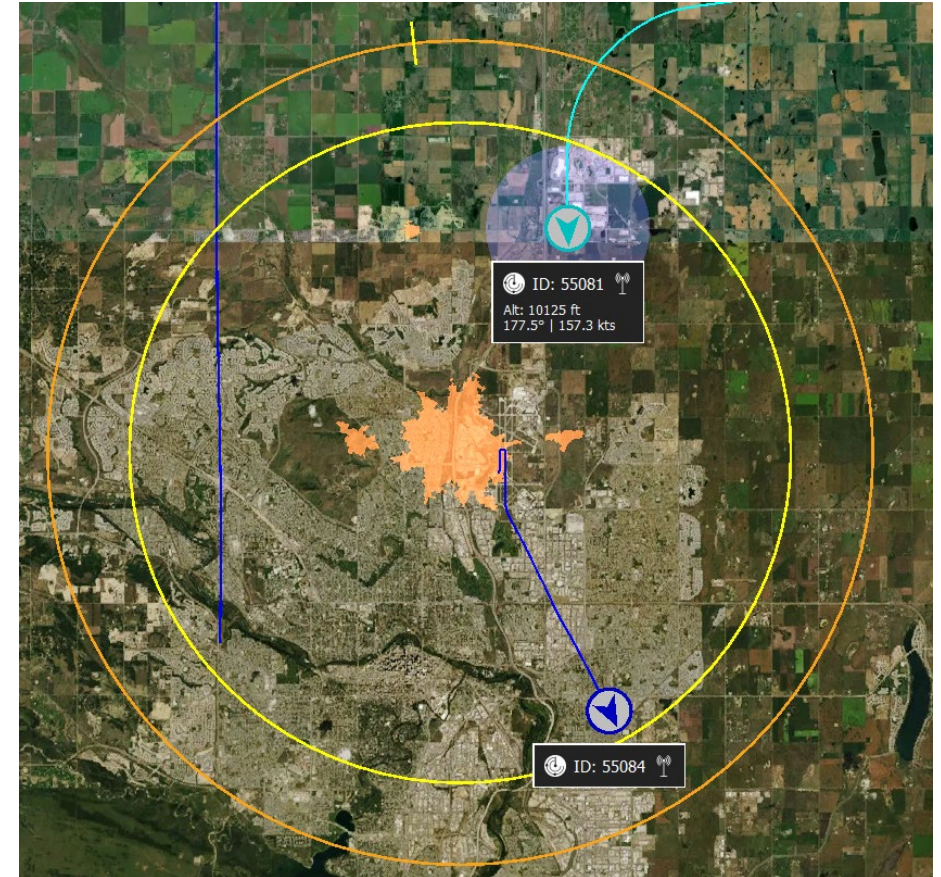
LOCKHEED MARTIN 
Canadian sUAS Distributor





Introduction to BVLOS

- ± Beyond-Line-of-Sight (BVLOS) is the method of flying a UAV or Drone, at greater distances than the operator/pilot can see the drone.
- ± Transport Canada is the regulating body in charge of approval of all aircraft operations in Canada
- ± This capability is key to unlocking the true value of drones to acquire lots of data for less money than manned aircraft and ground-based observations (servicemen in the field)
- ± After seven years of development, Canadian UAVs is the only company in Canada to have Transport Canada permitted commercial BVLOS operations based on its propriety airspace awareness platform, The Sparrowhawk™ Radar

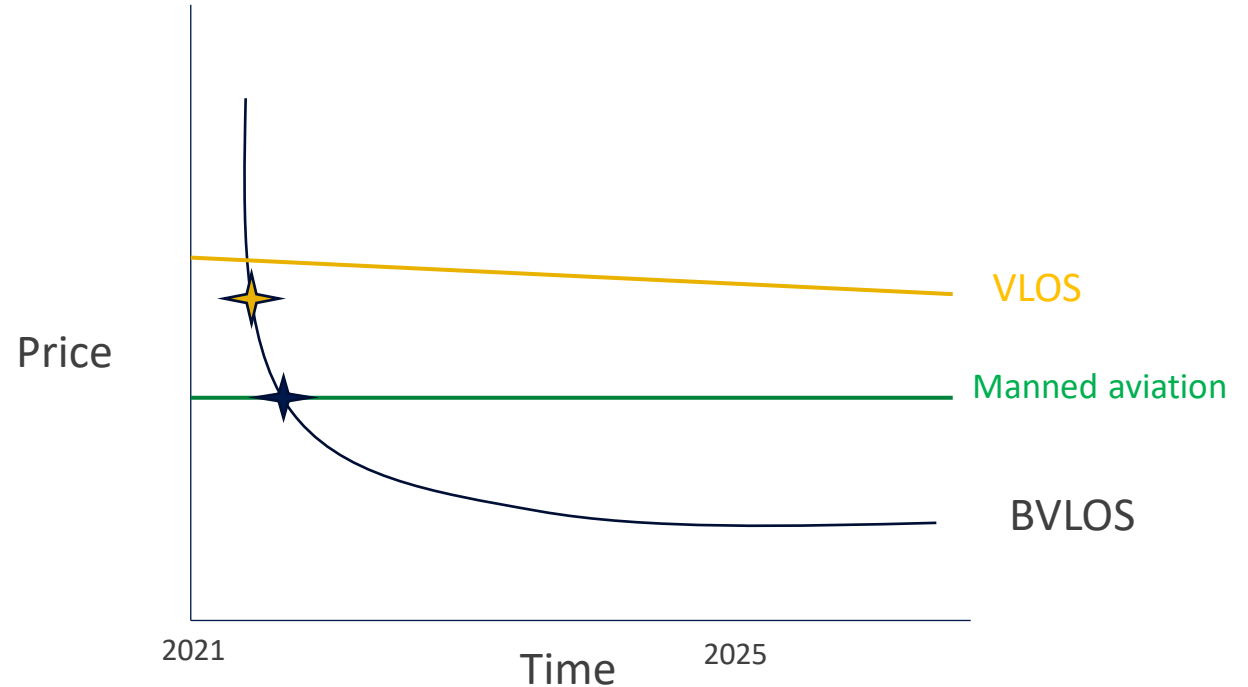




Apples to Apples

VLOS VS BVLOS VS Manned

- ✈ Area of project – there's a niche in between
- ✈ VLOS -5KM²
- ✈ BVLOS – 5-200km²
- ✈ Manned aviation – 200KM² or greater
- ✈ One stop shop for upstream/midstream oil and gas
 - ✈ Multiple services supporting a higher utilization rate of pilots, equipment and data processing
- ✈ Long term contracting distributes fixed costs more evenly and exposes true variable flight hour costs
- ✈ When the above strategy is implemented, BVLOS operations are clearly the most economic means of acquisition



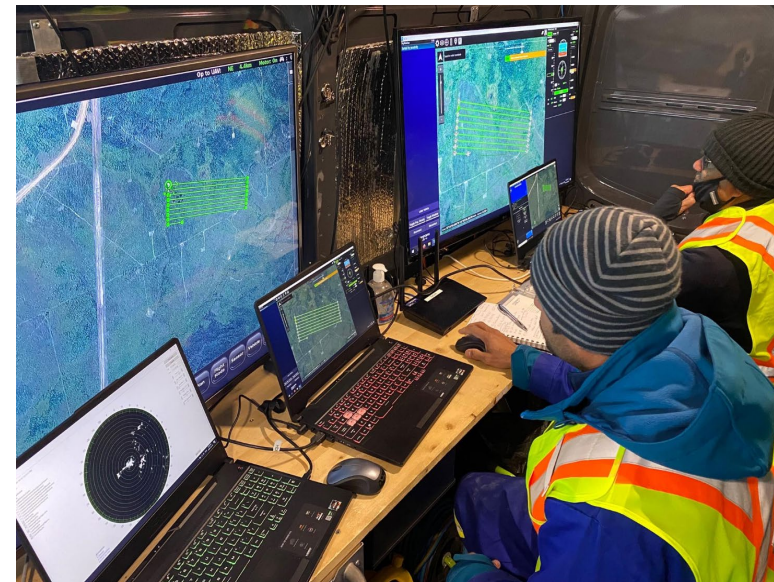
Assumptions

- VLOS is ~8 years old, relatively stable with minimal cost efficiencies left available
- Manned aviation >80 years, little efficient left and exposed to fuel cost fluctuations



Introduction to Sparrowhawk

- ± Detect and Avoid (DAA) technology - developing in house ground-based radar (Sparrowhawk™ Radar)
 - ± This will facilitate safe commercial and DND BVLOS operations in Canada
 - ± 1st operationally-approved DAA to support BVLOS missions in Canada (July 2020)
 - ± 1st commercial BVLOS operation in Canada on October 16
- ± RPAS Traffic Management (RTM) radar system enabling recurrent BVLOS operations
 - ± First company to fly BVLOS in non-restricted civilian airspace in Canada (Transport Canada BVLOS trials 2018)
 - ± NCI Agency 2020 Defense Innovation Challenge qualifier
 - ± Project Skysensus selected by Transport Canada and Nav Canada for multi-year RTM trials

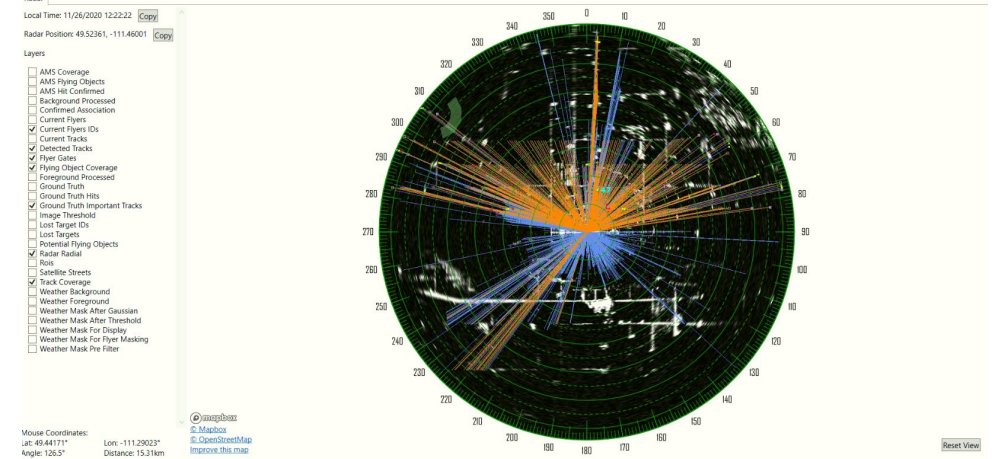


CUAVS Approach

Data-Driven Intelligence



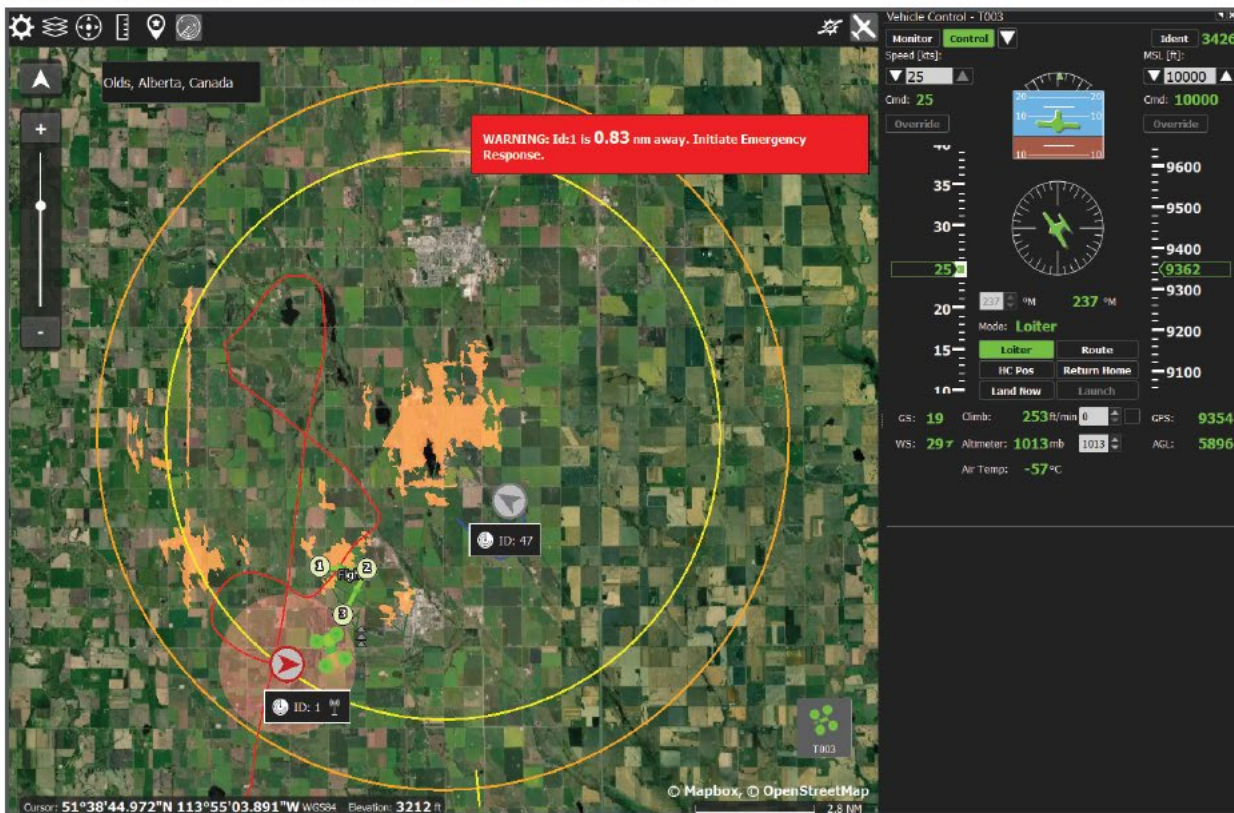
- ± High Quality Layered Data
 - ± View multiple layers of data for more informed decision making
- ± In-flight Data Processing
 - ± Verify data integrity during flight
- ± Automated Data Acquisition
 - ± Event-triggered data collection
 - ± Increased resource efficiency
- ± GIS Intelligence – extract meaning and knowledge from your data
 - ± Track trends from collected data to analyse and gain better understanding of your data/resources
 - ± Leverage machine learning and artificial intelligence to anticipate and prepare for future
- ± Weather detection
- ± Automated Risk Profiling
- ± Automated UAV Tasking
- ± Future Counter UAV capability





Sparrowhawk™

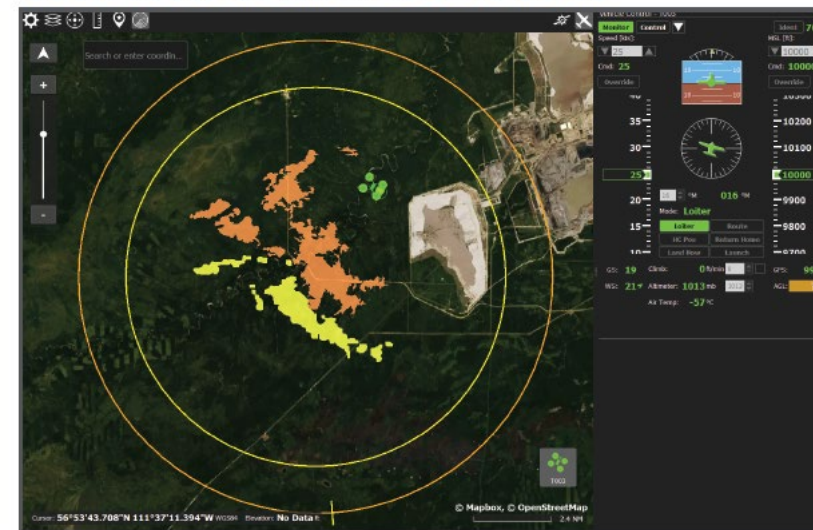
AIRSPACE RISK ASSESSMENT



Sparrowhawk integrates directly into a UAS ground control station (GCS) to provide a holistic airspace picture to the mission operator, identifying impending air risk in an effective manner to allow for rapid airspace deconfliction.

Sparrowhawk software detects and assesses airspace encounters to ensure an appropriate risk mitigation with high reliability.

WEATHER and CLUTTER



Sparrowhawk detects local weather systems that may affect your UAV mission, and presents that natively to operator on the GCS display. It is capable of tracking fog, rain, snow, and smoke and distinguishes that from ground clutter and terrain masking.

SYSTEM SPECIFICATIONS

Radar Performance - 1m² RCS

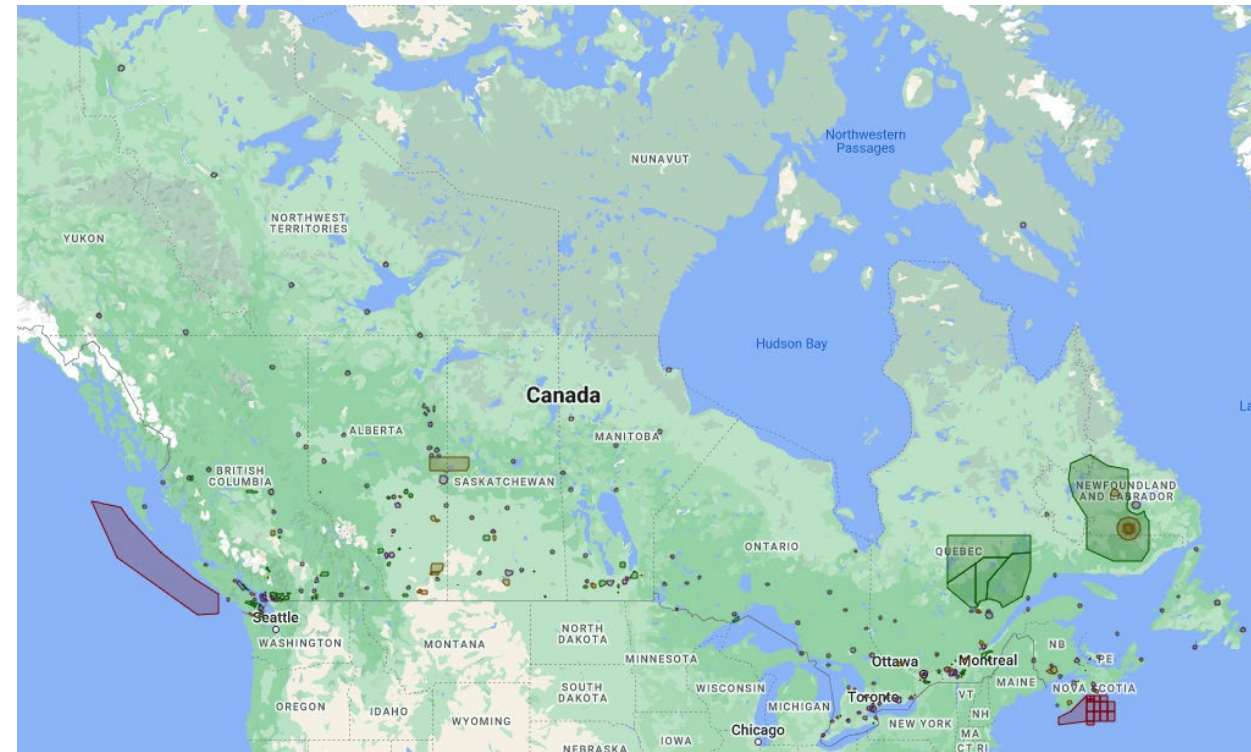
	0-6.2 NM Range	0-7.75 NM Range
Probability of Detection (%)	90%	70%*
Horizontal Position RMSE (m)	110	140
Radiator Length	8ft	
Frequency	9410 MHz ±30 MHz	
Output Power	8ft	
Environmental	-25° to 55°, Waterproofing: IP56	



Transport Canada Issued Permits

Regulatory achievements 2022

- ✈️ CUAVS has received a Wood Buffalo region wide BVLOS SFOC for 800' AGL, renewable annually in hand (March 1st, 2022)
- ✈️ Canada wide BVLOS permit for 400' Class G
- ✈️ Multiple UAVs per radar allowed by Transport Canada
- ✈️ Increased infield efficiencies and reduces time to acquire (more weather flexible)

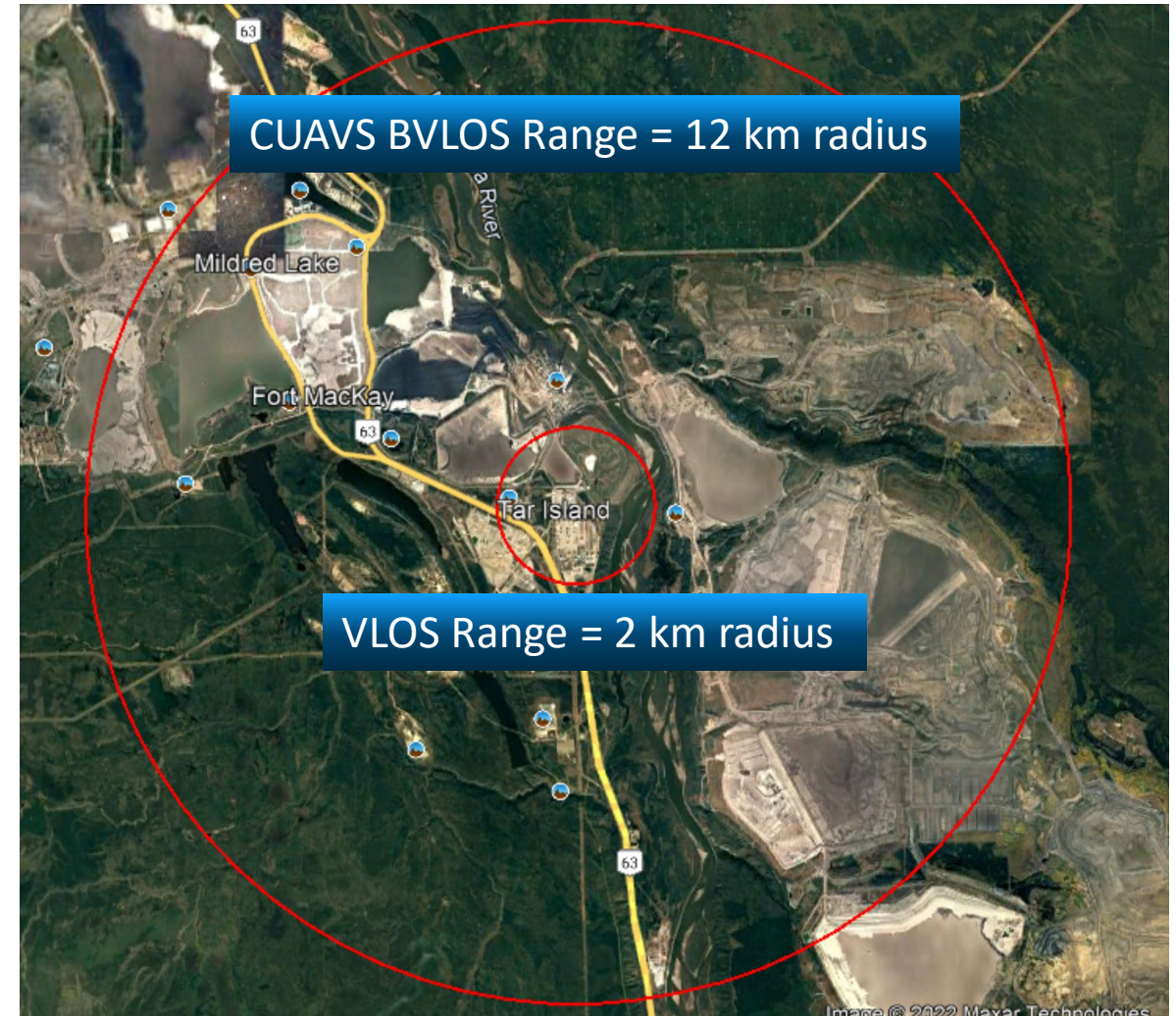




Oil Field Data Acquisition At Scale

Capability Per Radar – An order of magnitude larger area coverage than the competition

- ± Unparalleled permitting range vs UAV operator competition
- ± More economical means of data acquisition than ground based and manned aviation acquisition
- ± Higher resolution, Higher accuracy, more dynamic tasking, less atmospheric distortion than satellite
- ± Total Area:
 - ± VLOS 12 km²
 - ± BVLOS 450 km²





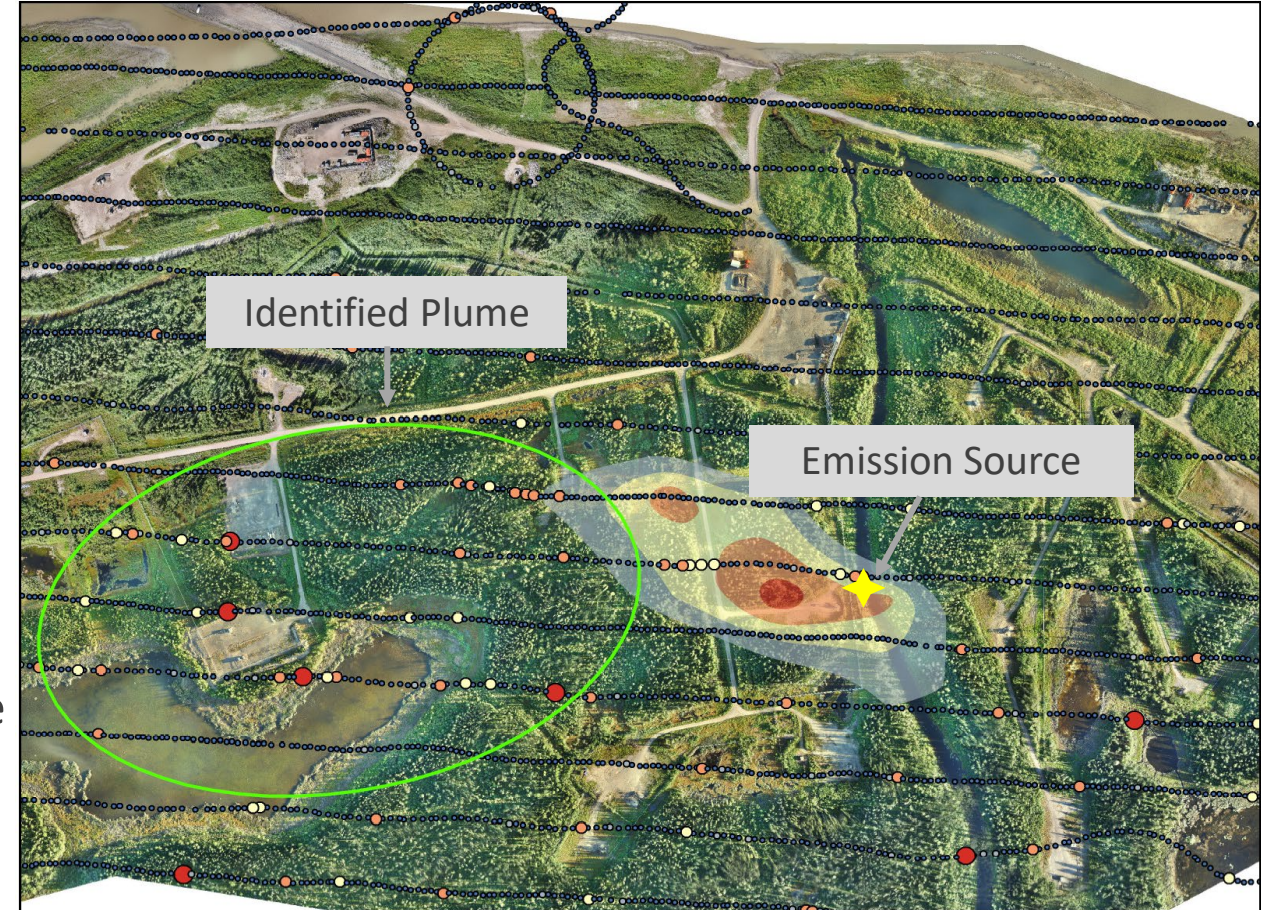
Operations and Maintenance Expertise

- ± Instructors and maintainers with extensive NATO weight Class I, II, III RPAS experience
- ± Transport Canada registered training organization since 2016
- ± Transport Canada certified 9 Advanced Pilots and 4 Flight Reviewers
- ± Joint Operational Tactical System (JOTS) training experience
- ± Pilots, Payload Operators, and Maintainer Instructors with experience on several major programs:
 - ± Royal Canadian Navy 2018
 - ± NOCTUA
 - ± NANKEEN
 - ± CANSOFCOM 2019 (audited by CAF)
 - ± CAF UAS 2019
 - ± Team Artemis for pilot and maintainers
 - ± www.teamartemis.ca



Gas Sensing Data Processing

- ± Key strategic partnerships
- ± Raw data review and cleaning
- ± Geotagging of collected gas data
- ± Data visualization & interpretation
- ± Automated source localization
- ± Source localization inputs
 - ± Raw ppm concentrations
 - ± Atmosphere stability classification
 - ± Wind speed
 - ± Wind direction
 - ± Temperature
- ± Combination of advanced algorithms and remote sensing expertise to provide robust solutions





Current Oil-Field RPAS Fleet

- ± Our fleet is focussed on proven, airworthy airframes from reputable manufactures
- ± Best aircraft available for internal and external plant inspections (including flare stack inspection as well as small/large area mapping and pipeline upstream pipeline inspections
- ± A flexible portfolio ensuring optimal application for any job size or complexity





Future RPAS Fleet

- ± The next generation of long-range (2-12 hours), long endurance full BVLOS enabled
- ± Runway independent
- ± Over 100,000 flight hours of operation
- ± Scalable payloads (multisensory operations)
- ± Onboard data analytics
- ± Robust, military grade coms-links
- ± Max gross weight range from 20kg to 80kgs





CAF RPAS

Team Artemis- The team securing Alberta's RPAS future





Thank You



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