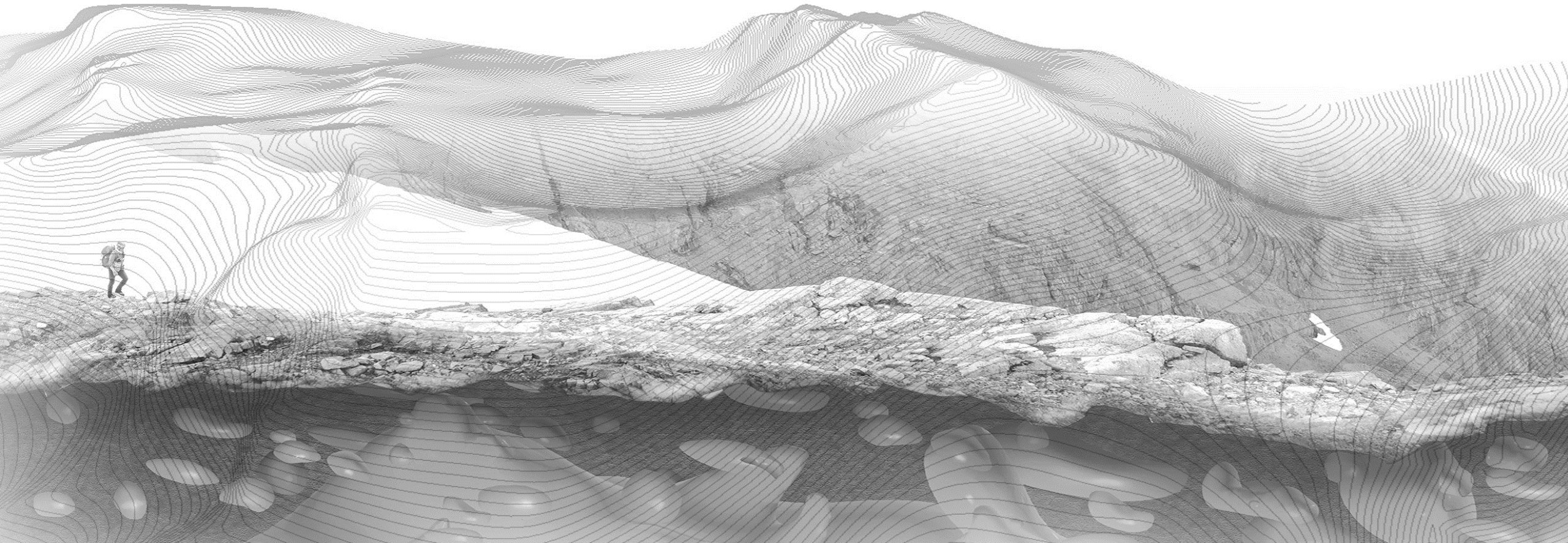
DIAS

LEADING GROUND AND AIRBORNE GEOPHYSICS

TECHNOLOGIES



DIAS

TECHNOLOGIES

DIAS32

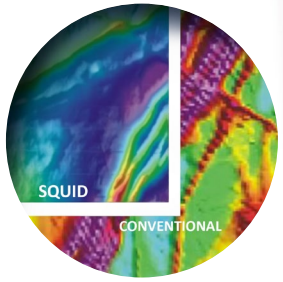
HIGH POWER 3D INDUCED POLARIZATION (IP) & RESISTIVITY SURVEYS
Ground-breaking IP and resistivity system for high resolution and deep search 3D surveying.

MAGNETOTELLURICS (MT)

MAGNETOTELLURICS (MT)
Produces a 3D resistivity model of the ground by recording naturally occurring electric and magnetic fields at the surface.

QMAG^{T}

AIRBORNE FULL-TENSOR MAGNETIC GRADIOMETRY (FTMG) Dias Airborne's QMAG^{T} system is the most advanced airborne magnetic system currently commercially available.



SQUID TECHNOLOGY

HIGH AND LOW TEMPERATURE SQUID.
Direct B-field measurement at low frequency (0.125 to 5.0 Hz)

supracon

HELI SAM

AIRBORNE EM–
SUB AUDIO MAG
TOTAL B-FIELD TECHNOLOGY
Perfect method for detection of large-tonnage VMS / Cu-Ni-PGM ore bodies to great depth

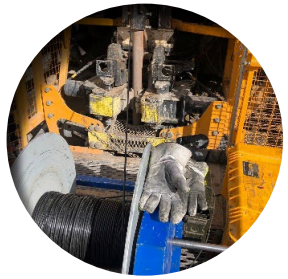
QAMT

AIRBORNE (MT) SURVEYS
With low-noise, 3C SQUID sensor acquisition for greater confidence and clearer, deeper imaging.

SAMSON

SURFACE EM SUB-AUDIO MAGNETICS
A proprietary method using SAM magnetometer sensor in a ground EM deployment where measurements are taken at individual stations.

Gap GeoPhysics



HIGH POWER BOREHOLE EM

ELECTROMAGNETIC
High-powered, deep search technology produces highest quality downhole data.

JESSY DEEP SQUID TEM

Time Domain Electromagnetics
The world's most sensitive receiver for vector transient electromagentic (TEM) measurements. Detects deeper conductors, 1 km or more with greater precision from increased signal to noise.

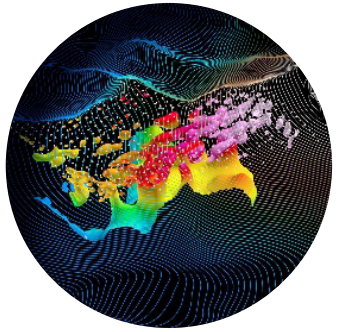
AT A GLANCE

SPECIALIZING IN RICH, HIGH-VOLUME DATA ACQUISITION

SURVEY DESIGN OPTIMIZATION

SURVEY EXECUTION DATA ACQUISITION

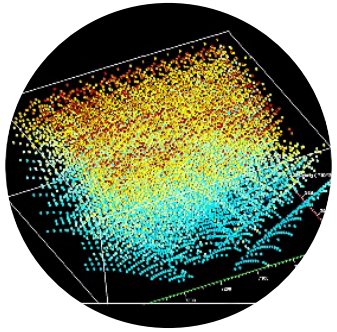
DATA PROCESSING INITIAL MODELING



3D EARTH IMAGING

Patented 3D imaging systems

With patented acquisition technology and SQUID sensor systems, Dias delivers uniquely dense, rich data sets.



BIG DATA FOR ACCURATE, RESOLVED, DEEP MODELS

The ‘big data’ we acquire allows us to produce highly accurate and resolved deep images of the subsurface.

VERTICALLY INTEGRATED TO DESIGN, BUILD, DEPLOY

From gap analysis to data delivery, and design to manufacture, Dias controls its own destiny for its products.

WORLDWIDE OPERATIONAL EXCELLENCE

With experienced leadership and a global presence and partners, Dias has successfully deployed around the world.

DIAS CARAVEL LEVERAGING BIG DATA

A cloud service for the processing and 3D inversion of ‘big data’ powered by machine learning and custom codes.

EMERGING TECHNOLOGIES STRONG R&D PIPELINE

Dias has deployed the DIAS32 system, MT, QMAG^{T} and QAMT airborne system. Coming soon - QTEM, DIASEM.

DIAS

LEADING GROUND AND AIRBORNE GEOPHYSICS TECHNOLOGIES

GROUND GEOPHYSICS

DIAS32
3D-DCIP

Hi Power 3D Direct Current Resistivity & Induced Polarization (DCIP)

DIAS32 is the most capable DCIP surveying system for high-resolution results, deep targeting and challenging terrain. In DCIP surveys, an electrical current is injected into the ground and interacts with conductive and chargeable materials in the subsurface. This resulting voltage distribution is measured by Dias patented nodes at surface across the survey area. These measurements are analyzed and interpreted to infer the 3D distribution of electrically conductive and chargeable materials in the subsurface.

Used in exploration for a myriad of minerals with high success even in challenging terrain.

DIAS32 has successfully mapped copper, gold, silver, uranium, cobalt, & more. Discoveries include the Arrow South uranium deposit in Saskatchewan & the Leviathan copper-moly porphyry in Idaho.

MT
Magnetotellurics

Magnetotelluric surveys image the resistivity distribution in the subsurface by using naturally-occurring electromagnetic signals from solar and atmospheric events as a source.

Its depth of penetration ranges from tens of meters up to tens of kilometers.

The system is designed for the acquisition of MT time series.

MT surveys have been successful at delineating regional-scale structural features, porphyry Cu deposits, IOCG deposits, and imaging the mineral systems that form deposits. AMT surveys provide better resolution than MT

SAM
Sub-Audio Magnetics

This proprietary survey technique uses a total field magnetometer at high sample rates to produce low noise electromagnetic measurements.

SAM surveys use either a transmitter loop, or a grounded bipole source to energize the subsurface. When a grounded bipole is used, the survey delivers Magneto-Metric Conductivity measurements which are excellent at mapping structure to 100s of meters.

SAM surveys are flexible, with several modes of operation, including stationary EM, walking, towed, drone, and helicopter.

SAM has been the primary technology for many significant discoveries.

SAMSON
Surface EM Sub-Audio Magnetics

A proprietary method using SAM magnetometer sensor in a ground EM deployment where measurements are taken at individual stations.

The low-noise characteristics of the cesium vapour magnetometer sensor, and the ability to acquire low noise data (even when sensor is subject to small movements and vibrations) makes this method very effective. Setup and time at each station is low as the total field measurement allows for the surveys to be logistically simple.

SAMSON was developed for high conductance ore bodies such Ni Sulphide deposits.

SAMSON has been successful at detecting VMS and Iron Ore deposits

HIGH POWER BOREHOLE EM
EM/MMR

High-powered, deep search technology produces highest quality downhole data.

Borehole ElectroMagnetics (BHEM) provides greater spatial resolution of closely spaced conductors than surface or airborne geophysical surveys.

BHEM is ideally suited for detecting and characterizing conductive massive sulphide mineralization, like nickel sulphide.

Used in exploration as for greater spatial resolution of closely spaced conductors.

Borehole EM has become an essential tool to better understand drill results and refine follow up drilling. It is responsible for many successes in VMS, Cu, and Iron Ore discoveries.

JESSY DEEP SQUID TEM
Time Domain Electromagnetics

Superconducting Quantum Interference Device (SQUID)

JESSY DEEP is the world's most sensitive receiver for vector transient electromagentic (TEM) measurements. Detects deeper conductors, 1 km or more with greater precision from increased signal to noise. The vector information results in more precise interpretations and better drill targeting.

Exceptionally high dynamic range of JESSY DEEP results in shorter data acquisition times and ultimately more efficient measuring campaigns.

Jessy Deep Squid TEM has been effective in detecting VMS, Uranium, and Iron Ore deposits.

SEMI AIRBORNE

HeliSAM
Airborne EM – Sub Audio Magnetic

HeliSAM is used commercially for large dipole (up to 12 km) SAM MMR / MMC surveys and for large scale SAM EM surveys.

HeliSAM achieves much greater production rates with typical survey speeds of 80 km/h. HeliSAM successfully detected the Lalor VMS deposit in Manitoba, Canada that lies between 700m – 1000m below surface.

Used in exploration of Nickel, VMS, Gold, Cu, and Iron Ore.

Among many, HeliSAM successfully detected the Lalor VMS deposit in Manitoba, Canada that lies between 700m – 1000m below surface.

AIRBORNE GEOPHYSICS

QAMT
Advanced Helicopter Passive MT

This exclusive lightweight, airborne magnetotelluric system delivers deep search, high resolution data.

Utilizing low-noise JESSY DEEP SQUID sensors, the QAMT system measures natural electromagnetic fields from atmospheric and solar activity. A lightweight towed bird with an advanced motion compensation system allows for precision vector measurements. A full-tensor base station provides a reference and allows for advanced processing. Simultaneous 3 component mag datasets are compared to produce Tipper and apparent resistivity models.

Used in exploration for rapid mapping of conductive structures at depths of nearly 1km.

QMAG^{T}
Full-Tensor Magnetic Gradiometry (FTMG)

This exclusive helicopter-borne survey system measures the magnetic field in detail. The SQUID sensor measures the complete gradient tensor of the earth's magnetic field (FTMG). This measurement provides 6 unique tensor components of the magnetic field which cannot be derived from total field sensors even in gradient setups. The additional information is critical in understanding complex geology and in situations where there is significant magnetic remanence.

QMAGT may be used in exploration for accurate large area data collection where geography or conditions are challenging.

The drill program demonstrated the QMAGT magnetic survey mapped both stratigraphy and structure related to the LCT pegmatite targets.

MARKET LEADERSHIP – WORLDWIDE SURVEYS

Dias operates globally with offices in Toronto, Vancouver, Chile, Mexico and head-office in Saskatoon.

Dias has carried out commercial surveys in Argentina, Australia, Canada, Chile, China, Czech Republic, Dominican Republic, India, Kazakhstan, Mexico, Peru, Mali, Saudi Arabia, West Africa and the USA.

"Dias is a fine example of SUCCESS in technical INNOVATION & provides critical services to the mineral EXPLORATION industry INTERNATIONALLY."

"Your survey will continue to be the BASIS for our drill PLANNING through the summer. THANKS. . . we've found we can TRUST Dias!"

"We HIGHLY RECOMMEND Dias for geophysical services & would ABSOLUTELY use Dias again for FUTURE geophysical survey work."

"Thanks again for making a GOOD CALL today. SAFETY first. It's a relief to me to know that our team is in RESPONSIBLE hands."

"Thank you, the DATA looks GREAT, and the productivity OUTSTANDING. We will keep you in mind for any FUTURE IP work."

DIAS

LEADING GROUND AND AIRBORNE GEOPHYSICS

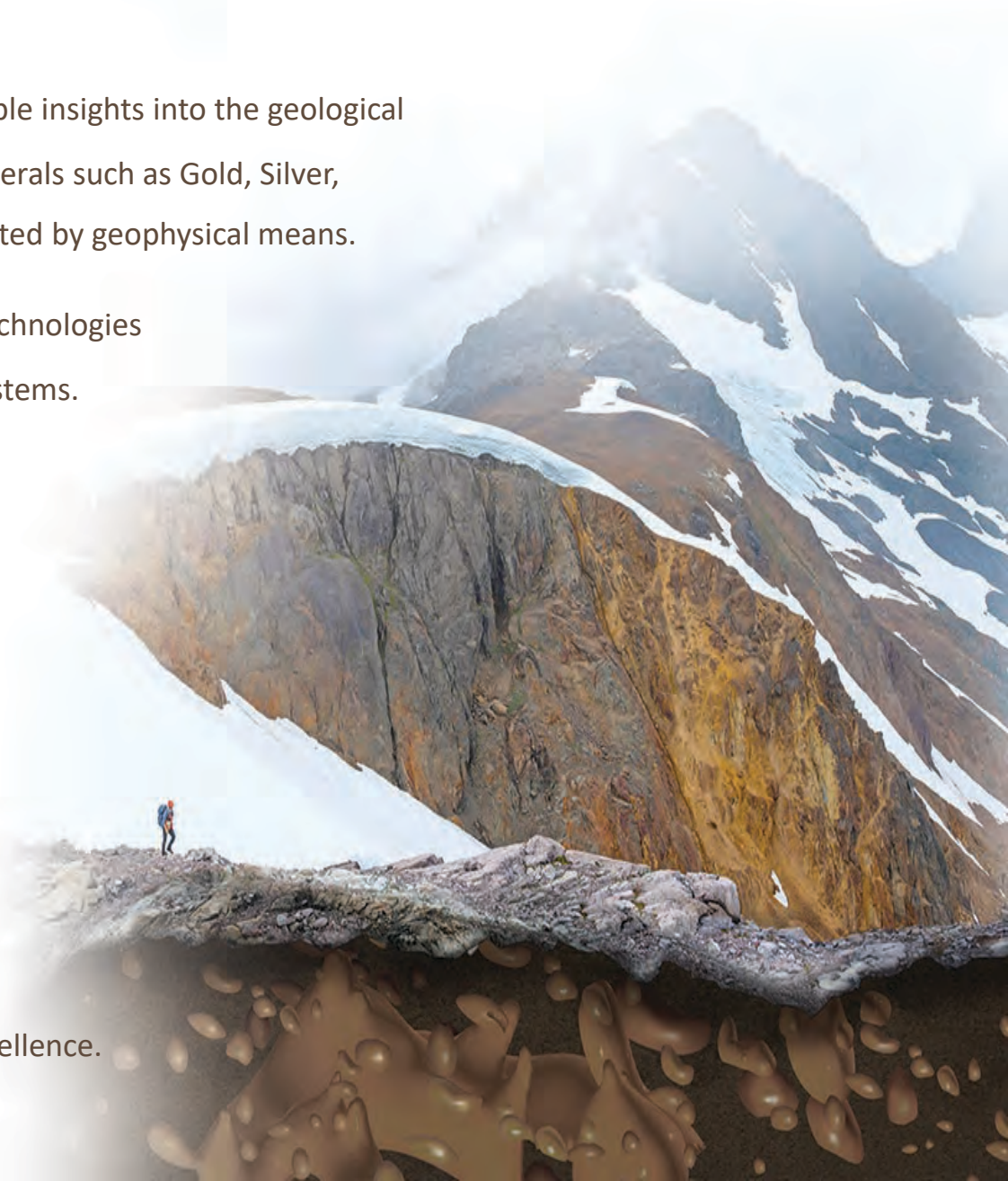
Our technology and services help clients uncover valuable insights into the geological structure, lithology, and mineralization of their projects. Minerals such as Gold, Silver, Copper, Lithium, Uranium, Iron, Zinc and more may be detected by geophysical means.

Our team of geophysicists and engineers focus on new technologies and deliver ongoing development of our own proprietary systems.

Trusted by some of the largest companies in the world, Dias is able to collect bigger datasets to provide higher resolution imaging for subsurface exploration.

We believe we have an obligation to ensure all staff are properly trained and educated to perform all tasks safely.

We deploy our professional crews with our leading-edge technology and a commitment to safety and operational excellence.



DIAS

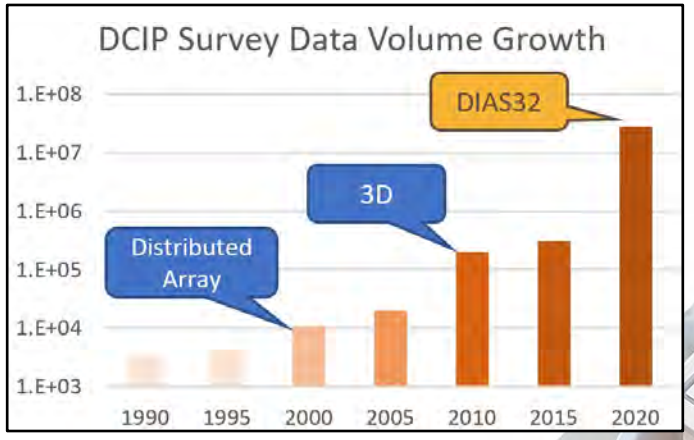
BEST IN CLASS, INNOVATIVE PROPRIETARY
DIAS32 TECHNOLOGY

3D INDUCED POLARIZATION (IP) & RESISTIVITY SURVEYS

A ground-breaking IP and resistivity system for high resolution and deep search 3D surveying.

A fully distributed DCIP system using a common voltage reference system and wireless mesh communications for telemetry.

- Proprietary safety technology and procedures assure a safer work environment.
- Mesh network technology provides real-time monitoring of system health and data quality.
- Injection point monitoring of the current waveform improves data quality.
- Optimized survey methodology produces efficient and effective field operations.
- Multi-dipole processing means better balance between depth of investigation and resolution.
- Efficient and low-cost mobilization - compact receiver design, no network cable, less wire.
- Proprietary signal processing routines produce low-noise final data.
- Fully distributed array architecture allows for full flexibility in survey design.



DIAS32

GS5000 HIGH PERFORMANCE TRANSMITTER

Dias' GS5000 is the most advanced transmitter technology in its class in the world.

This new transmitter system is fully integrated with our DIAS32 receiver system and our safety technologies.

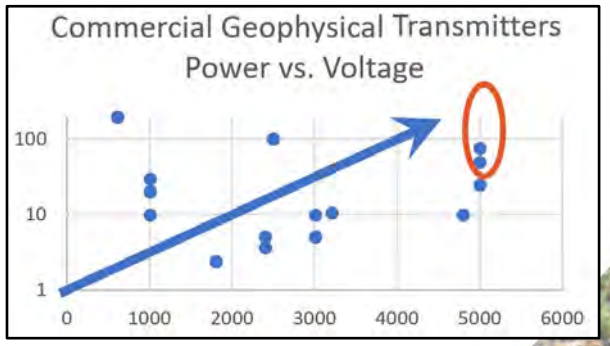
The GS5000 provides unrivalled power to weight performance with integrated safety features, timing control, and a fully-controlled waveform.

GS5000 ADVANTAGES

- Delivers top performance in both conductive and resistive ground conditions.
- The GS5000 can be checked onto an aircraft, improving operational flexibility.
- Waveform control produces a high-quality waveform at any base frequency.

GS5000 FEATURES

- Safety - auto shut-down on fault conditions, remote control
- Current recording, monitoring, and leak detection
- Base performance to 25 kW, 5,000 V, and 20 A
- Full integration with DIAS32 receiver system
- Portable – checked baggage friendly
- Internal GPS time synchronization
- Rugged, portable housing
- -40'C – 50'C



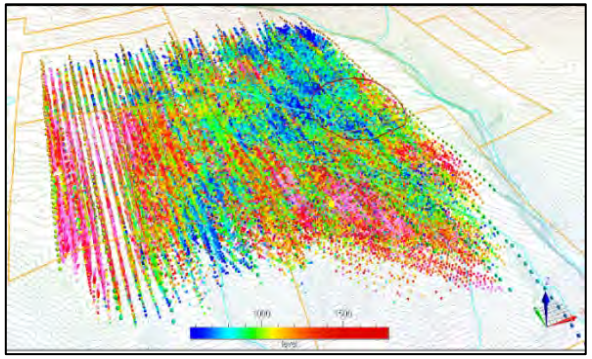
DIAS32 - ROLLING DISTRIBUTED 3D RESISTIVITY WITH CVR

CVR (Common Voltage Referencing)

enables high-quality multi-scale and multi-azimuth dipole data delivering accurate earth models.

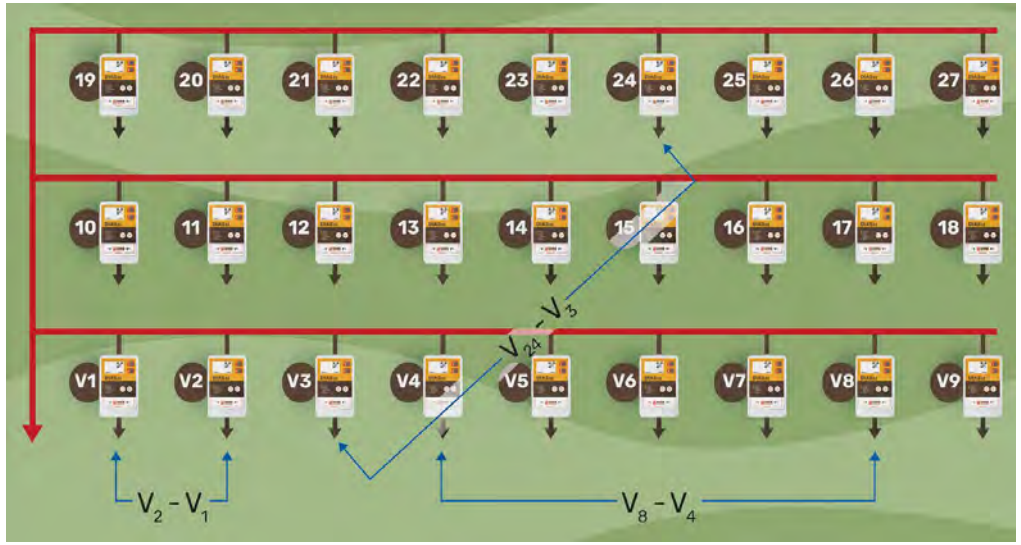
Main advantages of CVR:

- ✓ **Depth sensitivity** – mult-scale dipoles
- ✓ **High resolution** – multi-azimuth dipoles
- ✓ **Low noise** – common mode noise rejection
- ✓ **Operational efficiency** – less wire, less walking



The depth of DIAS32 3D surveys is greater with much higher resolution than 2D surveys

In the rolling distributed array 3D resistivity method using CVR, multiple survey lines are surveyed at once. Receivers are deployed along each active line to obtain the resolution necessary to image the subsurface targets. Current injections are carried out between lines or along lines at the midpoint of the adjacent receiver electrodes. For each injection, a measurement is collected at all active receivers, which are later used to calculate dipoles (see below) through integration with our CVR technology. As each line of current injections is completed, the survey is “rolled” until the entire survey area is complete.



DIAS32

SURVEY CHARACTERISTICS

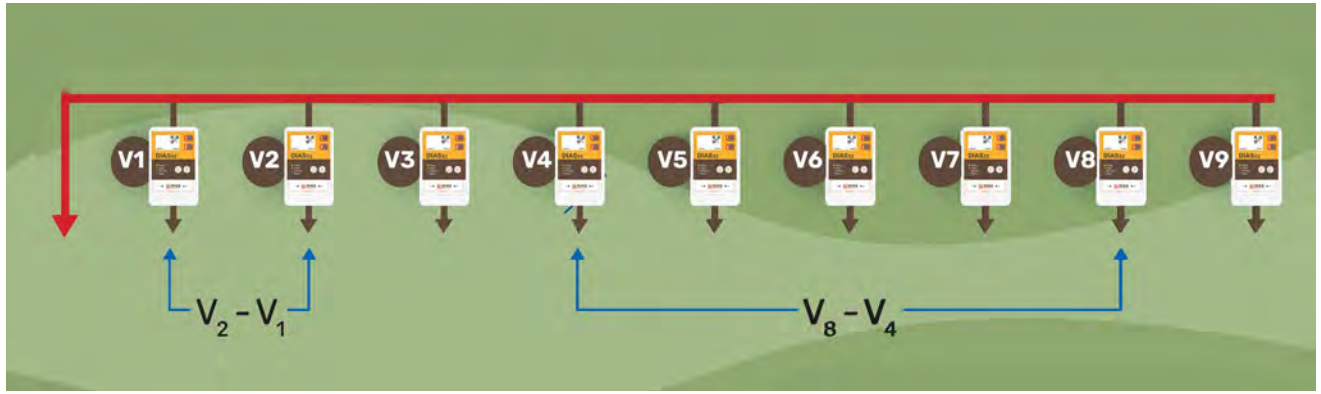
DIAS32 establishes a new standard in 3D IP and resistivity surveying. The patented CVR methodology and wireless mesh network technology deliver unprecedented safety, quality control, and survey flexibility.

DIAS32 SAFETY

- Designed with safety in mind
- Crew size is optimized - smaller crew means greater overall project safety.
- Lightning shunt and integrated current lockout technologies maximize safety
- Dias' internet-enabled HSE system comprises documentation, training, recording and reporting.

SURVEYING

- Common voltage reference surveying minimizes wire usage & facilitates acquisition of multiple data sets (p-p & p-d). This mode of surveying also reduces the amount of wire and the associated noise due to EM coupling.
- Each recorder is equipped with GPS positioning and time-synchronization for more accuracy in the modeling of the final results.



PLANNING

Single-channel architecture allows for full survey design flexibility including gradient, distributed 2D, offset 2D. rolling 3D, full 3D.

Optimization software is available to guide selection of dipole spacing and current injection.

ACQUISITION

The data are acquired as a time series with a sampling rate of up to 200 Hz.
A wireless mesh network is established in the survey area for the real-time transmission of data quality and system health information, yielding a more complete, high quality data set.
We acquire pole data at each electrode, measured against the voltage reference wire. Each of these data records can be paired with any other record to build a dipole. This decouples resolution from depth of exploration.

DIAS32

SURVEY CHARACTERISTICS

The DIAS32 system architecture allows for complete flexibility in survey design. In the following we describe several effective methods.

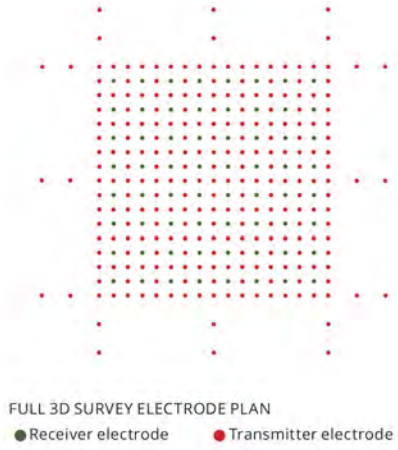
FULL 3D

APPLICATION

Where the geology is complex

Where model resolution and accuracy are critical such as in advanced projects or hi-resolution applications

For time monitoring of ground resistivity and chargeability

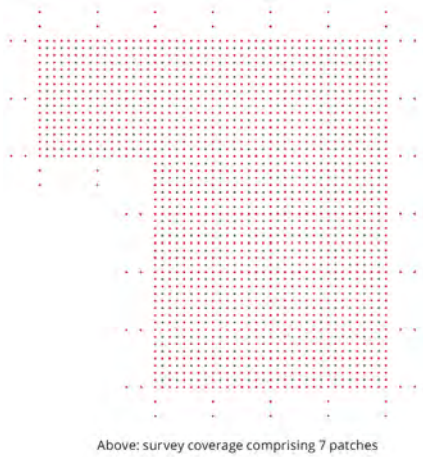


FULL 3D SURVEY ELECTRODE PLAN

Receiver electrode Transmitter electrode

FEATURES

- High-density, omni-directional data for accurate 3D models
- Regular orthogonal electrode pattern - no near-surface bias
- Current extensions to enhance coverage at depth near
- survey margins
- Full scalability – from metre-scale to kilometre-scale surveying
- – multiple ‘patches’ for extensive surveys
- Pole-dipole mode provides a good balance between resolution
- and depth penetration.
- Optional multi-pole mode adds pole-pole acquisition for greater
- depth search.



Above: survey coverage comprising 7 patches

IRREGULAR 3D

APPLICATION

Where access is restricted for safety or other reasons

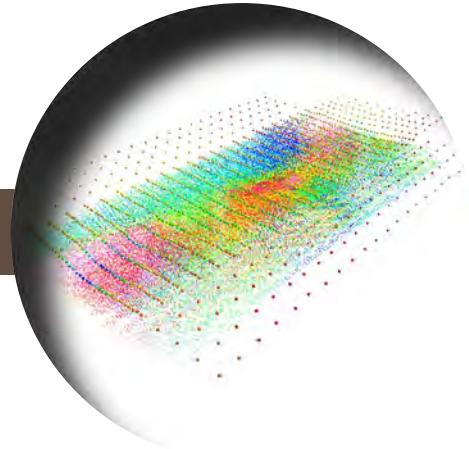
FEATURES

- With single-channel nodes, deployment is efficient and there is no restriction on survey configuration
- GPS location/synchronization in each DIAS32 receiver means each electrode is accurately located – GPS is also recorded at each current injection point
- Survey is planned with safety & efficiency in mind
- Compact, lightweight DIAS32 receivers mean safer and more efficient set-up in challenging terrain
- DIAS32 receivers work in autonomous mode if it is not possible to establish a wireless network
- Common voltage referencing allows full flexibility in dipole selection post-survey

DIAS32

WHITE PAPER

The DIAS32 IP and resistivity system is a ground-breaking geophysical technology built from the ground up for the express purpose of carrying out 3D surveys safely, effectively and efficiently. The DIAS32 system features two significant technologies and a design philosophy that together establish it as the leading IP and resistivity survey technology in the world today.



CVR

CVR is a completely **new mode of acquiring IP and resistivity data**. The DIAS32 system measures the response from individual electrode sensors relative to a common voltage reference wire (CVR). The DIAS32 system places a receiver immediately adjacent to each sensor, minimizing analog noise. The CVR mode of measurement provides several distinct advantages.

Operational flexibility and scalability. The DIAS32 system can be deployed in any array configuration at any scale, both 3D and 2D

Enhanced safety. Dias crews are usually smaller, individual crew members have less weight to carry, & generally walk far less for a given survey coverage than for non-CVR surveys. .

Multi-scale dipoles for unrivalled data volume. CVR allows for the computation of a dipole from any two electrodes across the survey area, and as many dipoles as the survey scope allows. In 2016, Dias Geophysical completed the first 3D survey with over 1 million processed data records. In this data set, over 25 million pole-dipole records were available for processing.

High signal to noise. Multi-scale dipoles deliver high signal to noise – larger dipoles can be selected when increase signal is needed, and low noise is achieved through natural removal of common-mode noise in the normal CVR processing flow.

MESH

Mesh networking, a technology developed for the 3D seismic industry, allows individual receivers to communicate with each other and with the acquisition computer through a self-managing, self-healing network. The first benefit of mesh networking is obvious – no network cables. Less equipment, no cable problems, more efficient deployment. The second advantage is the ability to get real time information from each receiver. The DIAS32 system delivers data quality metrics, system status and health, and detailed diagnostics – all in real-time.

More complete final data. Problems encountered are addressed immediately, not the following day.

Higher quality data. Real-time QC informs the operator of any data issues for rapid resolution.

Greater survey efficiency. Any identified system problems are addressed immediately and precisely.

DIAS32

WHITE PAPER

SAFETY

Safety technology and procedures have been integrated into the development of the DIAS32 system. As mentioned, CVR and mesh networking contribute to a fundamentally safer survey methodology, but Dias has developed two new, survey-specific safety technologies, and use robust HSE processes and procedures facilitated by an on-line tracking and recording system.

Lightning Shunt Technology. Proprietary DIAS-LS lightning shunt technology mitigates the risk of electrocution due to electrical storms during surveying.

Current Lockout System. Integrated with the mesh network system, the lockout technology protects at-risk personnel from the risk of electrocution from high voltage wires & electrodes.

On-line HSE Management. Dias employs eCompliance, an internet-enabled HSE training, tracking, and reporting system, which provides timely, accurate information for decision-making.

CAPABILITY

Survey Methods – Dias has carried out full 3D, partial 3D, distributed 2D (deep IP), gradient, and combined surface and borehole surveys.

Location – Dias has successfully carried out surveys in South America, the USA, Australia, China, the Middle East, Europe, and Canada. With light, compact systems, Dias can mobilize internationally very efficiently.

System Capacity – With over 900 single-channel DIAS32 receivers, Dias has the largest capacity for 3D surveys, and can efficiently carry out large-scale 3D programs with greater efficiency than other DCIP technologies.

Applications – While mineral exploration is currently our largest application, the DIAS32 system has completed surveys for groundwater, geothermal, environmental and engineering applications as well.

Water and Rugged Terrain – Each DIAS32 receiver records a single channel and has GPS timing and location, so surveying safely and with efficiency on water or in rugged environments is more feasible than ever.

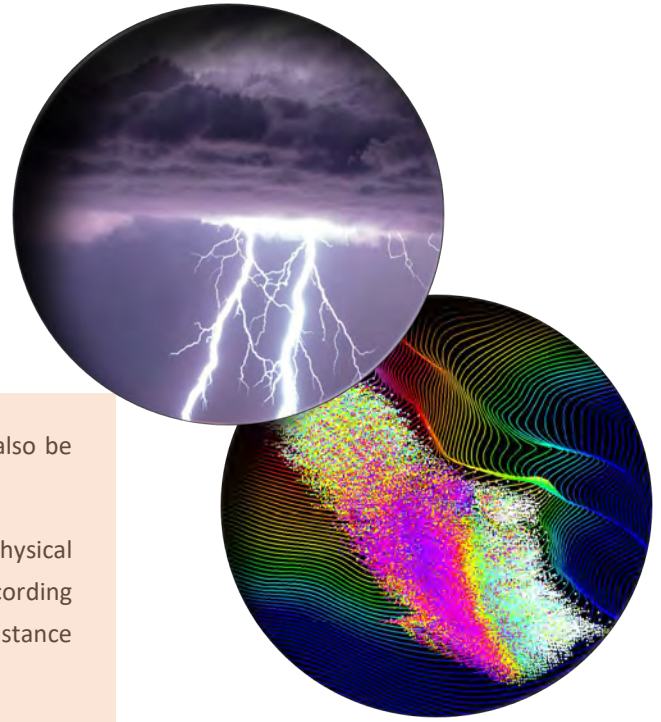
Experience – Dias has completed surveys in conditions from desert to swamp, from -20 to +40, from flat to mountainous, and from barren to forested. We have completed surveys from a 7 m to a 400 m inter-electrode spacing. Our clients are happy to provide a reference for our operational and technical capabilities.

"ACCURATE EARTH MODELS ARE INFORMED BY HIGH DENSITY FULL AZIMUTH DATA.
DIAS' CVR TECHNOLOGY DELIVERS HIGH DATA VOLUME WITH GREAT EFFICIENTY."

DIAS32

MAGNETOTELLURICS (MT) SURVEYS

MAGNETOTELLURICS (MT) aims to produce a 3D resistivity model of the ground by recording naturally occurring electric and magnetic fields at the surface. Its depth of penetration ranges from tens of meters up to tens of kilometers.



The DIAS32-MT system is designed for the acquisition of MT time series. Capable of recording up to 19,200 samples per second, the system is equipped for the acquisition of Broadband-MT (BBMT), Audio-Magnetotellurics (AMT), and controlled-source AMT (CSAMT).

The system is an upgrade of the DIAS32 DCIP single-channel receivers and is based on the same wireless communication technology. Ultimately designed to be integrated into a combined 3D DCIP – MT acquisition, the receivers can also be used for MT-only surveys.

The wireless communication technology allows a geophysical operator to perform initial data quality control before recording data, through data streaming and ground resistance measurements.

DIAS32 MT ADVANTAGES

- Survey designs and optimization using 2D/3D forward modeling and inversion with SimPEG.
- Low-noise MFS07e magnetic induction coil sensors from Metronix Geophysics.
- A wide array of electrodes are available, from stainless steel for AMT surveys to non-polarizable porous pots for long period MT recordings.
- Low instrumental noise from the receiver.
- Complete flexibility on survey design (sparse magnetic sensors w/ high density electrics, high density E and H).
- Compact receiver design, easy to camouflage in sensitive areas, with a plug and play option to record from the interface without the need for a geophysical operator.

OPERATIONAL ADVANTAGES

- For long-period recording, data can be streamed without accessing the remote site.
- Lighter weight for hybrid MT layout (Telluric-Magnetotelluric, only TE mode for 2D surveys…), no need for a full acquisition unit at each station.

PRODUCTS

- EDI files – standard in MT community.
- Apparent resistivity maps.
- 2D sections/3D resistivity models
- Orientation information

LEADING THE INDUSTRY IN AIRBORNE GEOPHYSICS

Dias' airborne expertise includes highly effective technologies using SQUID-based sensors in partnership with Supracon AG of Germany
(SQUID - superconducting quantum interference detectors).

- Measure magnetic field with incredible accuracy and resolution
- Measure directional information that other magnetic system cannot measure
- Produce more accurate and higher resolution models for our clients
- Dias has flown these system for exploration of nickel, iron ore, lithium, and copper.
- As a lightweight system, QMAG^{T} can be deployed in most operating environments.
- QMAG^{T} system is deployed in a custom-built airfoil beneath a helicopter.
- Sensors measure the magnetic field with unrivaled sensitivity.

QMAG^T

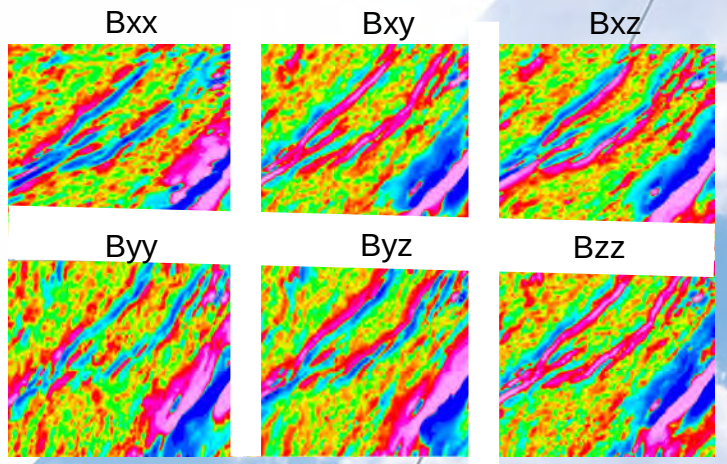
AIRBORNE FULL-TENSOR MAGNETIC GRADIOMETRY (FTMG) SURVEYS

QMAG^T Advantages

- Plug and play helicopter operation for acquisition in most environments.
- Direct determination of anomaly geometry, irrespective of whether the source is remanent or induced.
- Better information on magnetization directions. The magnetic moment of compact sources can be directly determined.
- Gradient measurements, particularly full tensor measurements, determine on which side of a survey line a source lies.
- Effective survey results in low latitude environments
- Redundant tensor components (4 of the 9 measured tensors are redundant) give inherent error correction and noise estimates.
- Desirable mathematical properties, allowing magnetization mapping, rigorous continuation, reduction to the pole, depth slicing, invariants, etc.

PRODUCTS

- Tensor gridding
- Magnetization mapping
- Rigorous continuation and RTP
- Inclination deviation angle
- 3D inversion models
- High quality 3C magnetic products



The QMAG^T technology will take magnetic mapping and interpretation to the next level. After over 50 years of measuring and interpreting the total magnetic field, the QMAG^T system will improve the interpretation of target location, geometry, orientation, and magnetization.

DIAS

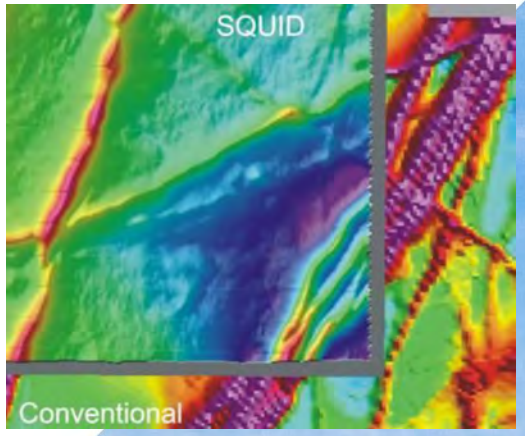
QMAG^{T}

THE MOST ADVANCED HELICOPTER MAGNETIC SYSTEM

The product of 24 years of R&D, the QMAG^{T} technology has a long track record of successful application throughout the world.

QMAG^{T} System Specifications

SQUID Sensor:	6 channels first order planar gradiometers
Intrinsic Gradient Noise:	<100 fT / (m√Hz)
Magnetometer:	4 channels of magnetometers
Intrinsic Noise:	2 pT / √Hz
SQUID Electronic Bandwidth:	> 3 MHz
Operating Temperature Range:	-10°C to +40°C
Cryostat Operation:	2.5 days after refill
Data Acquisition:	20 channels of 24 bit ADCs
IMU System:	3 fibre optic gyros, 3 accelerometers
Radar Altimeter:	Max of 3% or 0.5 m
Laser Altimeter:	+/- 1 to 2 cm typical
Total Bird Weight:	267 kg
Tow Rope:	Dyneema™ – 32+ m



SQUID sensor systems have revolutionized ground EM surveying – we expect the same advantages will be seen in airborne applications

The QMAG^{T} system can be combined with radiometric data acquisition for multi-parameter surveying

supracon

Dias Airborne is a partnership between Dias Geophysical of Saskatoon, Canada, and Supracon AG of Jena, Germany. Dias Airborne offers QMAG^{T} and QAMT surveys.

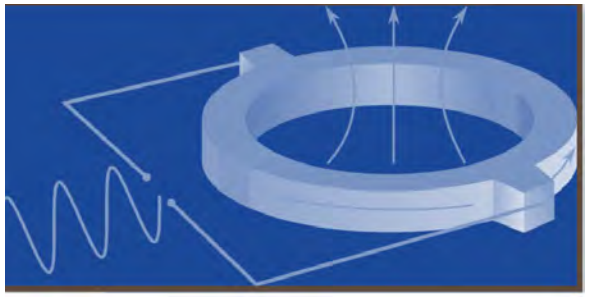
QAMT

ADVANCED HELICOPTER MT SURVEYING

Lightweight, airborne magnetotelluric system that delivers deep search, high resolution data

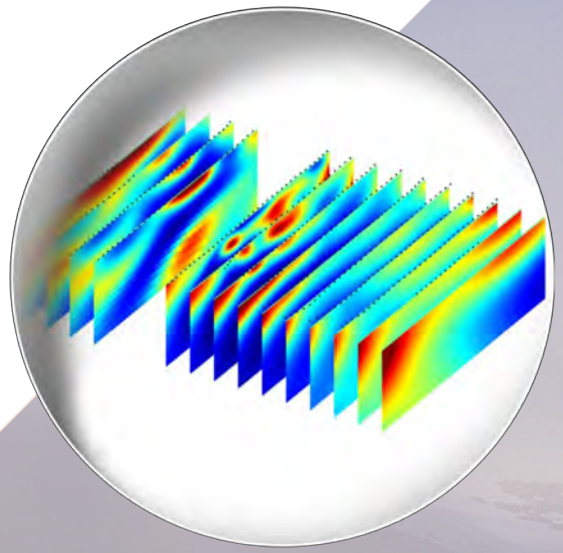
ADVANTAGES

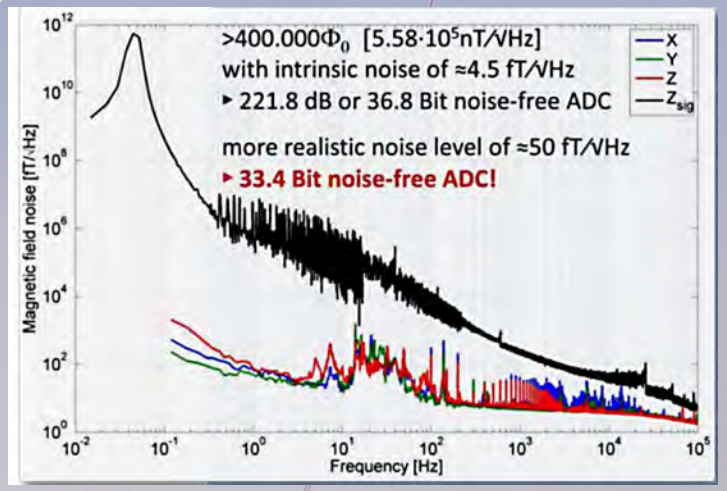
- Low-noise LT SQUID sensors
- Mobile 3C H-field measurement
- Lightweight towed bird
- Full-tensor base station
- Simultaneous 3C mag data



PRODUCTS

- Apparent resistivity maps for a broad frequency range
- Tipper and Impedance Tensors
- 3C magnetic products
  - Bx, By, Bz
  - Calculated Total Field





DIAS

HeliSAM RAPID DEEP MINERAL DETECTION

AIRBORNE EM - SUB-AUDIO MAGNETIC HeliSAM

TOTAL B-FIELD TECHNOLOGY

- The perfect methodology for detection of large-tonnage VMS / Cu-Ni-PGM ore bodies to great depth
- ‘Seeing’ through conductive regolith or strata
- Map sheers associated with sheer hosted gold mineralization
- Explore far deeper than conventional Airborne EM systems at similar pricing

Specifications

- Frequency: 2 to 10 Hz
- Sample Interval: 5 to 10 m
- Daily Production: 300 km +

HeliSAM successfully detected the Lalor VMS deposit in Manitoba, Canada that lies between 700– 1000 m below surface at the typical survey speeds of 80 km/h.

DRONESAM TECHNOLOGY

- Proprietary technology
- Ideal for inaccessible terrain

Gap GeoPhysics

JESSY DEEP SQUID TEM

HIGH AND LOW TEMPERATURE SQUID

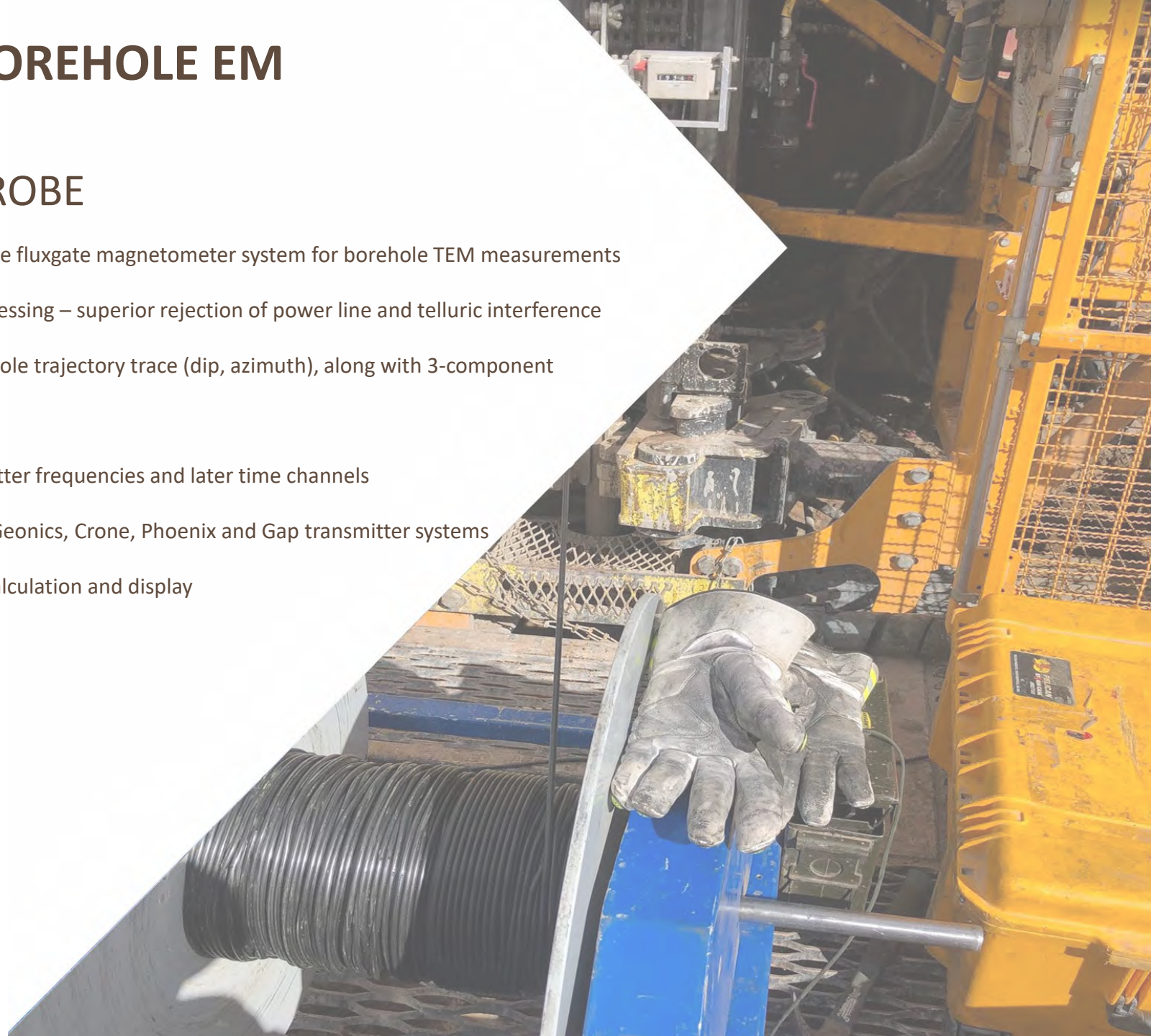
Direct B-field measurement at low frequency (0.125 to 5.0 Hz).

- Highest signal-to-noise of any TDEM system in the world.
- Essentially unlimited deep detection capability (from a mining economics perspective).
- Enhanced response from good conductors in the presence of weaker conductive formations and overburden (pyrrhotite hosted VMS, Ni-Cu-PGE like targets at great depths.)
- Unsurpassed sensitivity and coupled with high power transmitters enables survey efficiencies.

HIGH POWER BOREHOLE EM

DOWNHOLE PROBE

- The first high-performance fluxgate magnetometer system for borehole TEM measurements
- SMART digital signal processing – superior rejection of power line and telluric interference
- Also measures accurate hole trajectory trace (dip, azimuth), along with 3-component magnetic data
- Capable of lower transmitter frequencies and later time channels
- Compatible with Zonge, Geonics, Crone, Phoenix and Gap transmitter systems
- Real-time primary field calculation and display



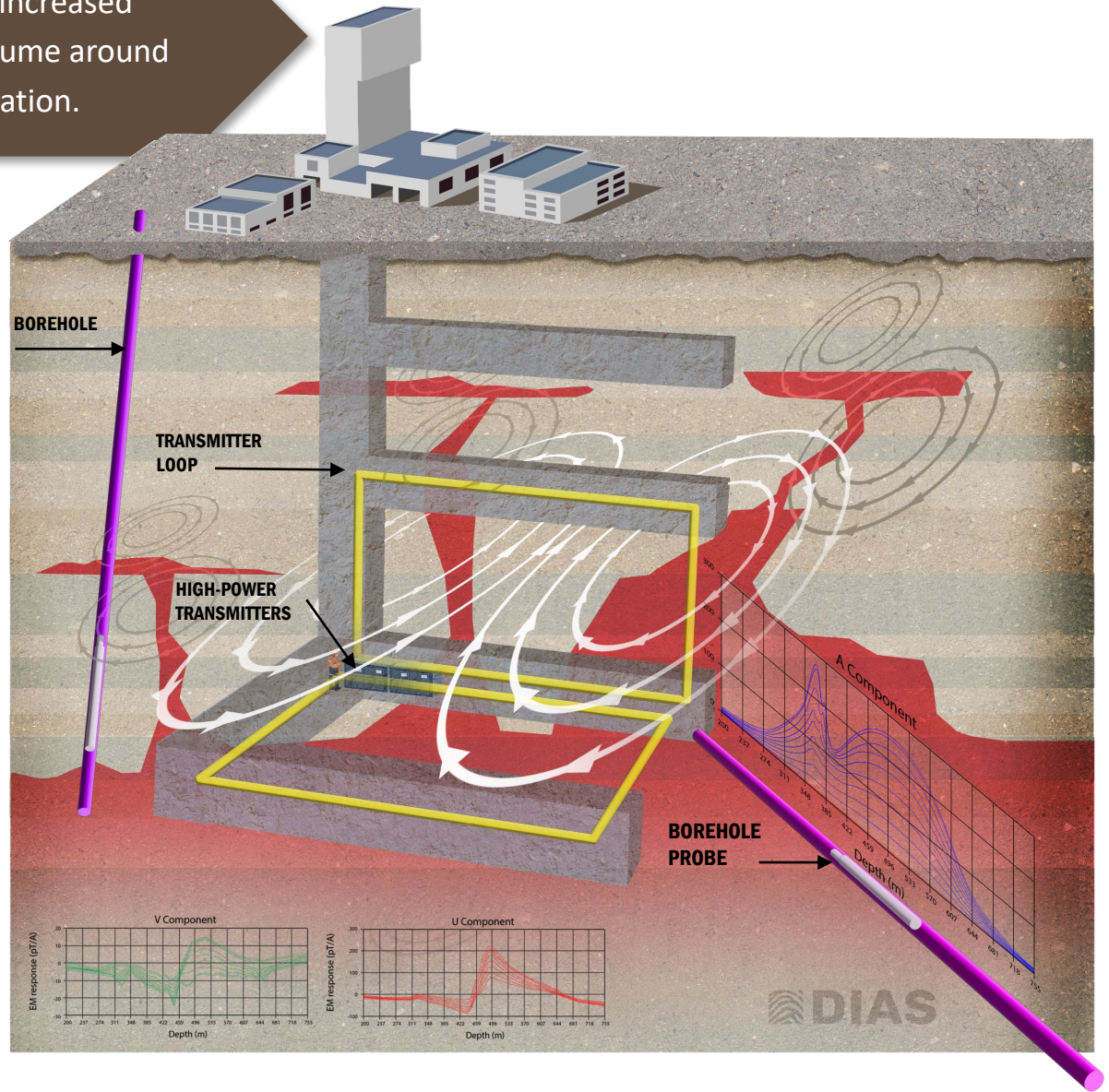
DIASEM HIGH POWER IN-MINE BOREHOLE EM

HIGH-POWER IN-MINE BOREHOLE ELECTROMAGNETIC SYSTEM deploys a unique high-power transmission system for increased signal to noise. This system explores a much larger volume around each drill hole, for much more efficient in-mine exploration.

DIASEM In-mine BHEM

- Highest power solution available
- Tx loop deployed in workings
- Selection of receiver probes

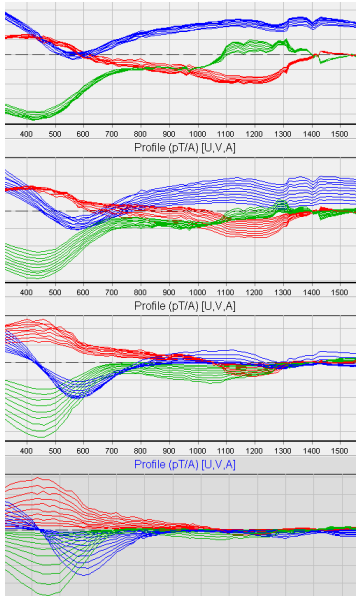
While the high-power TerraTx-200 system is transmitting, boreholes within and adjacent to the mine can be surveyed to detect conductive sources. Compatible with standard B-field or dB/dt borehole EM probes, such as EMIT Digi-Atlantis, Monex Geoscope Vectem V, and Geonics 3D.



DIASEM HIGH POWER IN-MINE BOREHOLE EM (continued)

Deliverables Summary

- Maxwell TEM Files
- Logistics Report
- PDF Profile Plots
- Borehole log image



Four TerraTX-200 transmitters paired with 160 V / 188 A rectifiers, operating at 480 V.

TerraTx-200 TRANSMITTER SPECIFICATIONS

- Can synchronize up to 4 units for enhanced performance
- Maximum output current: 200 A per unit
- DC Loop Input: 4 V to 350 V
- Waveform: bipolar square wave, 50% to 100% duty cycle
- Maximum power: 30 kW per unit
- Inbuilt protection: overload and earth leakage
- Active monitoring: loop input voltage, loop current, temperature, and over-current
- Cooling: glycol-water
- Operating temperature: -20 to + 50 degrees C
- Console dimensions: 48 cm (W) × 68 cm (D) × 13.3 cm (H)
- Console weight: 56 kg
- Power source: mains

DIAS TIMELINE

2014

Dias Geophysical is founded with offices in Toronto and Saskatoon. Company values
- Safety
- Innovation
- Transparency
- Integrity
- Resolve

Patents issued for the CVR (Common Voltage Reference) method which allows multi-scale dipoles & improved survey efficiencies & reduced health & safety risks.

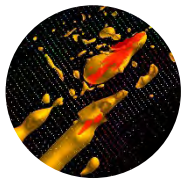
2015

Introduction of DIAS32 - the first fully distributed, wireless IP & resistivity system using CVR technology. Provides revolutionary model accuracy & reliability. Wireless communication for real time quality assurance. Battery life & compact design improve survey productivity & safety.

Improvements in the wireless control protocols & data processing for DIAS32.

2016

First commercial survey. Thanks to Rio Tinto for their consistent support of new technologies.



DIAS32 is used for some of the world's largest 3D resistivity surveys with more than 10 million data records & 24 sq. km of coverage.

Dias expands offices to Vancouver.

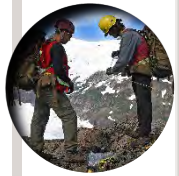
2017

DIAS32 capacity increased to over 300 receivers.

Second generation of DIAS32 receiver with a compact, rugged design & battery life of up to a week – productivity is greatly improved.

Discovery of South Arrow Deposit. NexGen Energy tests a DIAS32 anomaly & discovers a new uranium deposit in the SW Athabasca basin near their world class Arrow Deposit.

2018



New tools for real time data analysis are introduced & a new processing environment for the data is completed. Continued refinements of DIAS32 system & expansion of operational capacity.

Largest 3DIP survey conducted (99 sq. km.) in the western United States.

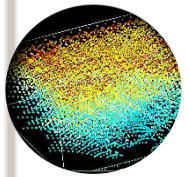
DIAS32 capacity increased to over 800 receivers.

2019

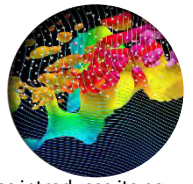
DIAS' GS5000 transmitter is introduced - 5000 V, 20 A & 25 kW weighing only 31 kg. Leading power to weight ratio, stackable to 100 kW of power optimizes current in any situation. Safety features include remote control & safe key system.

Introduction of QMAG^T airborne full tensor magnetic gradient system.

2020



Unique QMAG^T technology images subtle magnetic features & enhances interpretation in remanent magnetic, low latitude, & complex structural environments.



Dias introduces its new generation of DIAS32 receivers featuring a more advanced processor and higher sample rates allowing for MT and CSAMT recording.

A full suite of MT processing & inversion tools developed in house allows Dias to provide MT services using the most advanced methods.

2021

DIAS32 capacity increased to over 1100 receivers.

Dias completes its first CSAMT survey.

Dias completes its first MT survey using the DIAS32 system.

Dias expands to offices in Chile and Mexico.

Introduction of CARAVEL, a proprietary software that allows processing & inversion of high-volume 3D data sets. Clients access dedicated purpose-built hardware & leading inversion codes from a simple, easy to access interface.

Dias moves head office to new facility with advanced R&D capabilities at 2131 Airport Dr., Saskatoon.

2022

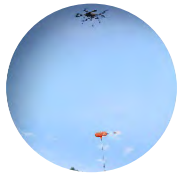
Dias introduces the QAMT system. Advanced SQUID magnetometer technologies, developed by Supracon AG of Germany. The QAMT uses atmospheric energy to image with higher resolution. This lightweight system provides access to challenging environments.

DIAS32 Capacity increased to over 1400 receivers

Dias wins SABEX Award for growth.

To date, Dias has carried out commercial surveys in Argentina, Australia, Canada, Chile, China, Czech Republic, Dominican Republic, India, Kazakhstan, Mexico, Peru, Mali, Saudi Arabia, West Africa & USA.

2023



Dias purchases Discovery Intl. Geophysics to expand their leading geophysical services to include:
- Semi-airborne HeliSAM system
- SQUID Electromagnetics
- Borehole EM Technologies

Gap GeoPhysics

supracon

DIAS

Trusted Ground and Airborne Geophysical Surveys Worldwide

SALES@DIASGEO.COM

DIASGEO.COM

TORONTO
647.951.8499

VANCOUVER
604.334.6417

SASKATOON
306.700.6442

MEXICO
+52.553.676.5757

CHILE
+56.966.766.062

What our clients say…

"We HIGHLY RECOMMEND Dias for geophysical services & would ABSOLUTELY use Dias again for FUTURE geophysical survey work."

"Dias is a fine example of SUCCESS in technical INNOVATION & provides critical services to the mineral EXPLORATION industry INTERNATIONALLY."

"Dias Airborne's QMAG^{T} system is the most advanced airborne magnetic system currently commercially available."

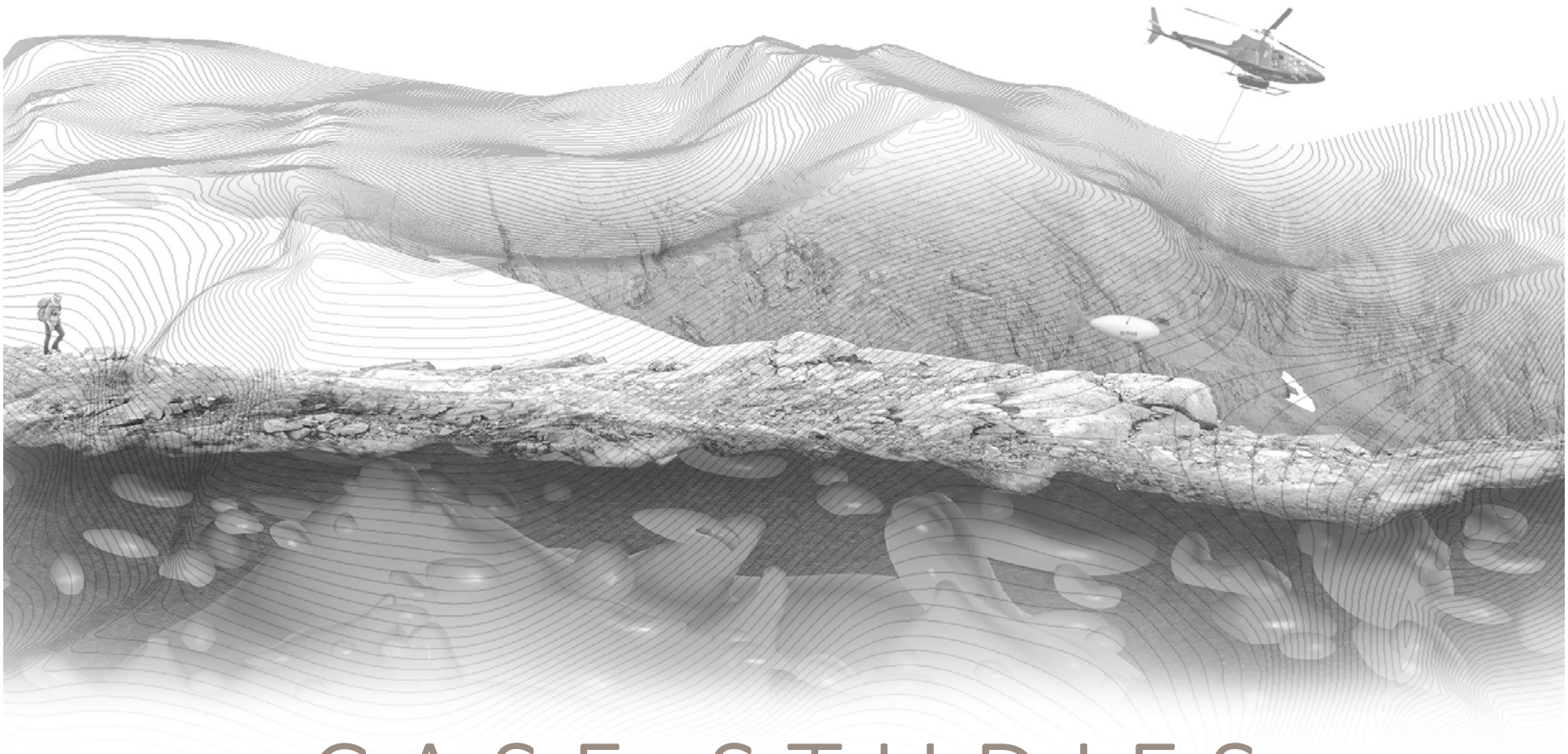
- Acme Lithium

"The QMAG^{T} results will greatly assist the upcoming field mapping and drill program."

- Lake Winn Resources

DIAS

LEADING GROUND AND AIRBORNE GEOPHYSICS



CASE STUDIES

WWW.DIASGEO.COM

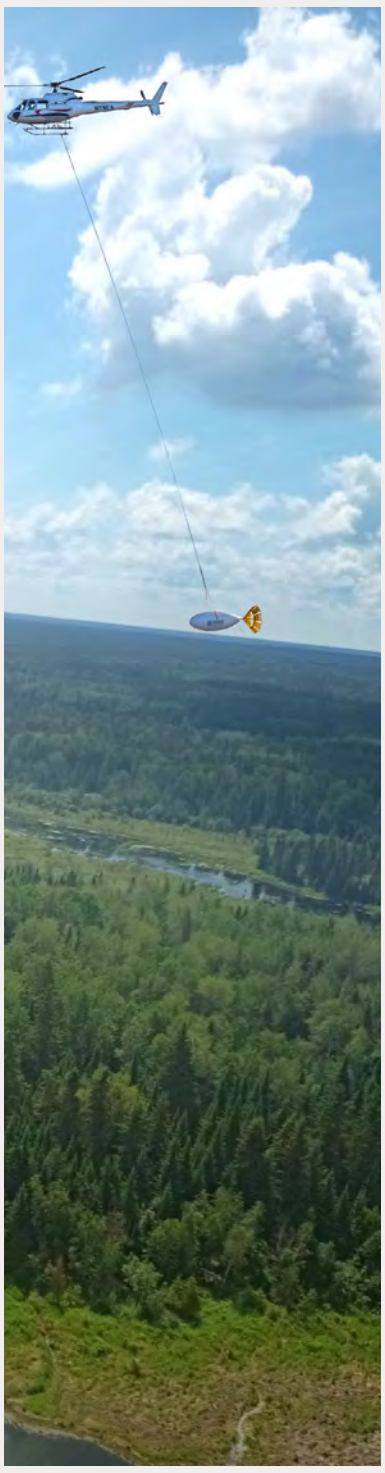
DIAS
AIRBORNE CASE STUDY

PROJECT
LITTLE NAHANNI PEGMATITE PROJECT
Lake Winn Resources
Little Nahanni, NT, Canada

TECHNOLOGY
QMAG^T
Airborne Full-Tensor
Magnetic Gradiometry

TARGET
LITHIUM

"The ability of the QMAG^T system to detect very weak magnetic signals, and image complex directional patterns is very important to exploration for this type of challenging target."



Little Nahanni Pegmatite Project, NT, Canada

SITUATION

Dias' QMAG^T system completed a survey over Lake Winn Resources' 100% owned Little Nahanni Pegmatite project in the Northwest Territories. The project covers 7,080 hectares that encompasses a 7 km long, and up to 500 m wide, lithium, tantalum, and tin pegmatite dyke swarm. Historical drilling and channel sampling on the Project confirms the presence of significant Lithium, Tantalum, Tin, and Cesium.

Historic drilling and channel sampling has proven numerous intervals of mineralized pegmatite grading >1% LiO2 over 1 m to 16.65 m intervals. Lake Winn reports that they believe that the QMAG^T system has successfully mapped the LCT pegmatite dyke swarm. Anomalies coinciding with the known dykes appear to coalesce into numerous larger anomalies which range from 10 m to 100 m widths and can be intermittently traced along strike for up to 7 km. The QMAG^T results are being integrated with other data sets to accelerate exploration through the project area.

QMAG^T System

The QMAG^T system is a helicopter-borne magnetic survey system utilizing a SQUID (superconducting quantum interference device) sensors that measure the complete gradient tensor of the Earth's magnetic field. The SQUID system was developed by Supracon AG of Jena, Germany. Operating within a liquid helium bath, the sensors measure the magnetic gradients with great sensitivity. The survey delivers 6 tensor components, each of which highlights different magnetic directions in the survey area.

QMAG^T Results and Interpretation

Figure 1 shows a colour image of the Bzz data channel from the survey. The colour palette is reverse, so the zones of low gradient are the "hot" red colors and the high gradients are the cold colours (blue). The current thinking is that the LCT pegmatites have very little magnetic response, so they should image as zones of low gradient. However, when they were intruded into the surrounding sandstones, a hornfels was formed causing the relatively high vertical gradient response. Therefore, the red colors (magnetic low response) is thought to map directly the LCT pegmatite dykes. This is an exciting result.

The other QMAG^T tensor images (like Bxy, not shown) support this interpretation with coincident anomalies matching the linear features in the Bzz image. The results show a dense swarm of pegmatites, tens of metres across near the northern drill holes. Drill hole MAC06 encountered 17.96 m of LCT pegmatite grading 1.03% LiO2 and drill MAC07 drilled from the same site at a 60° dip encountered 10.94 m of LCT pegmatite grading 1.47% LiO2 (Figure 2). Figure 1 also illustrates an 80 m to 100 m wide magnetic signature that traverses the entire data set for several kilometers. This anomaly has been named Alpha Prime. Close inspection of nearby historic collars suggest they drilled near, but did not test this target. Lake Winn plans to ground truth these anomalies in the summer of 2023.

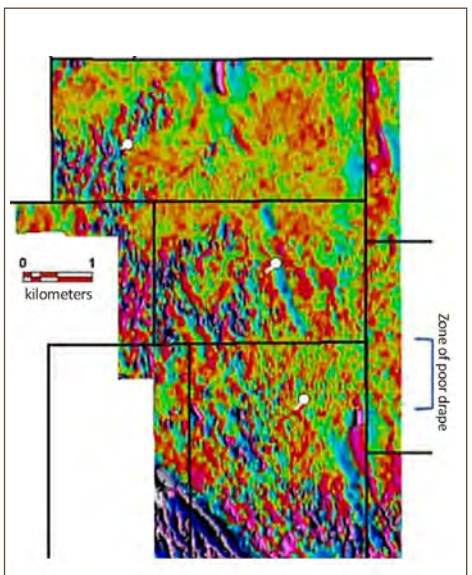


Figure 1: Bzz tensor image (measured vertical gradient of the vertical component) flown over the central portion of the LNPG project. Historic drilling is shown in white. Colours are reversed with low magnetic response in reds and high magnetic response in blue.

Figure 2 illustrates the northern part of the surveyed area, around drill holes MAC 06 and 07, as a reverse-colored image and overlain by topographic contours. The interpreted LCT pegmatite dykes have been traced out with lines of white dots. They seem to get cut-off by the cirques, but Lake Winn knows from mapping that they persist in the cliff faces of the cirques. The apparent cut-off in the magnetic imaging is caused by the loss of sensitivity due to the increased height of the sensor. Signal drops off more rapidly with increased flight height because it is a gradient system. On the upper plateau, a swarm of anastomosing dykes can be interpreted, including the dyke that was sampled by drill holes MAC 06 & 07. This magnetic data will aid in guiding further drilling across these target pegmatites.

The concept that the Alpha Prime target is part of the LCT pegmatite swarm is supported by soil sampling undertaken in the south end of the property in 2006 and 2007.

The concept that the Alpha Prime target is part of the LCT pegmatite swarm is supported by soil sampling undertaken in the south end of the property in 2006 and 2007.

Figure 3 shows the sampling results in relation to the Alpha Prime target. The trace of the Alpha Prime anomaly has a strong, coincident Li-in-soil anomaly.

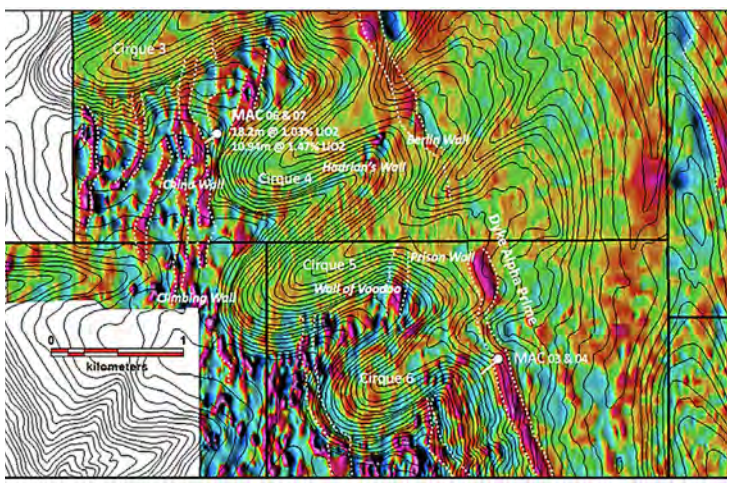


Figure 2: A zoomed in view of the Bzz data in reverse colour over the NW portion of the property. Topography contours are shown in black. The red linears are thought to map out the LCT pegmatite dykes.

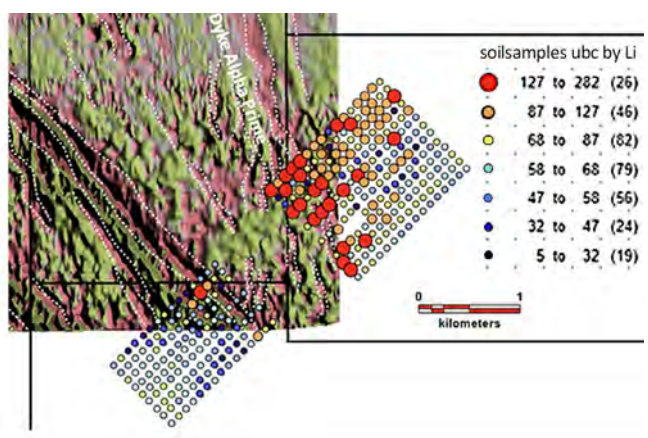


Figure 3 Southwest portion of the QMAG^T Bzz image in reversed pastel colours, with the Li in soil geo-chem results as colour symbols. The Alpha Prime dyke target is labeled.

CONCLUSIONS

The QMAG^T system appears to be effective in imaging an anastomosing series of LCT pegmatite dykes on Lake Winn Resources' Little Nahanni project. The dykes, as expected, are showing as low magnetic response. Weak magnetic high responses on the sides of these dykes are interpreted to be reflecting hornfels alteration during emplacement of the dykes in the sedimentary host rocks. The ability of the QMAGT system to detect very weak magnetic signals, and image complex directional patterns is very important to exploration for this type of challenging target.

DIAS
WWW.DIASGEO.COM
• TORONTO
• VANCOUVER
• SASKATOON
• MEXICO
• CHILE

DIAS AIRBORNE CASE STUDY

PROJECT
SHATFORD LAKE LITHIUM PROJECT
ACME Lithium Inc.
Manitoba, Canada

TECHNOLOGY
QMAG^T
Airborne Full-Tensor Magnetic Gradiometry

TARGET
LITHIUM

Shatford Lake Lithium Project, Manitoba, Canada

SITUATION

ACME's 100% owned Shatford-Birse project area in southeastern Manitoba, Canada, is within the southern limb of the Bird River Greenstone Belt. The project is immediately south of Sinomine's world-class Tanco Mine property, a Lithium, Cesium and Tantalum (LCT) producer since 1969. The region hosts hundreds of individual pegmatite bodies, many of which are classified as complex rareelement LCT pegmatites – known to account for a quarter of the world's lithium production. The Shatford – Winnipeg River structure, which extends through the project area, is analogous to the Bernic Lake high strain zone that is interpreted to be related to the Tanco pegmatite. One priority area for exploration, referred to as Shatford East, is part of an approximately 7 km long curvilinear structural feature with multiple observations of pegmatites containing anomalous lithium.

The Shatford Lake property has abundant overburden, but in the broad deformation zones where most of the pegmatites occur, outcrop is virtually non-existent. In these deformation zones, overburden cover ranges up to 30 m thick.LCT pegmatites generally do not contain any ferromagnetic minerals, so do not produce an anomalous magnetic response unless they occur in host rocks that are magnetic. The host rocks are usually also non-magnetic or have very low magnetization, so provide virtually no contrast to aid detection and delineation with conventional magnetic systems.

However, it is possible that a highly sensitive gradient magnetic system could detect weak contrasts, and image structures and folding within the host rocks. Through interpretation of structure and lithology, prospective targets for pegmatite emplacement could be determined.

SOLUTION

In the summer of 2022, ACME contracted Dias Airborne to complete a helicopter-borne QMAG^T full tensor magnetic gradiometry (FTMG) survey across the property. QMAG^T is the most advanced airborne magnetic system currently commercially available. The survey comprises 1,991 line-km with a line spacing of 65 m. The FTMG survey was designed to map and characterize the variation in magnetization throughout the survey area towards interpreting structure, lithology, and alteration. The QMAG^T system measures all independent tensor components of the magnetic field using low temperature SQUID (superconducting quantum interference device) sensors. The QMAG^T system provide greater sensitivity to weakly magnetic sources, higher resolution, and the directional information that allows for accurate modeling and detailed interpretation of the data sets.

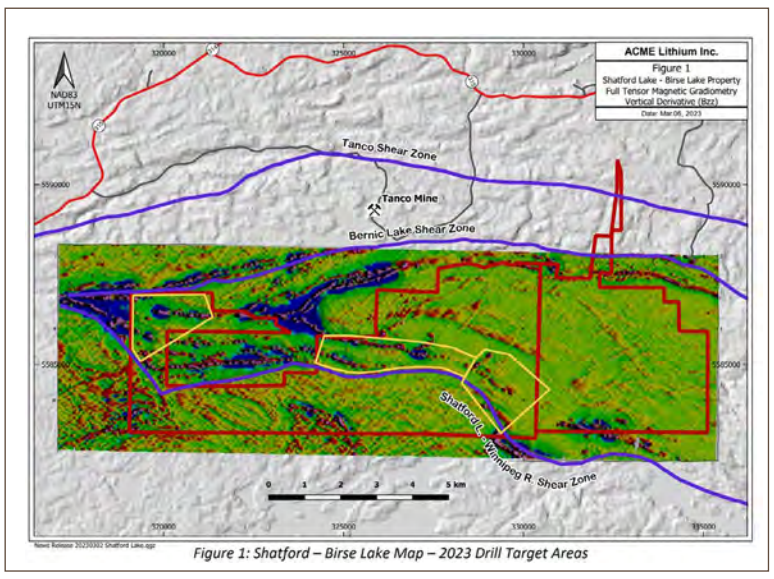


Figure 1: Shatford – Birse Lake Map – 2023 Drill Target Areas

ACME Drill Targeting

ACME designed its initial 2023 drill program using the basic responses in the vertical magnetic gradient of the vertical component (Bzz). Now, modelling confirms the initial targeting and delineates additional targets. Mira Geoscience Limited (Mira) performed modelling of the FTMG data. After a preliminary interpretation, Mira performed a computationally intense Magnetic Vector Inversion (MVI) integrated with ACME and regional geological data.

Taken together with the area geology, the priority areas for drilling are as follows (see Figure 1):

The Central Shatford area (left ellipse in the image below) is adjacent to the Tin Island pegmatite cluster. Through this area, subparallel NE trending magnetic low lineaments cross the Shatford Lake – Winnipeg Lake Shear Zone. Many prospective targets occur where NE lineaments cross the shear zone. Note the east-west, northeast and northwest trends in the batholith to the south. The Southeast Shatford area (right ellipse Fig. 2) encompasses a substantial flexure in the Shatford Lake – Winnipeg Lake Shear Zone. This area contains a broad zone of en-echelon magnetic responses, indicating splays and dilatant zones on the northeast side of the principal shear zone, representing highpriority exploration targets.

CONCLUSIONS

The extensive glacial till cover is transparent to the QMAG^T magnetic survey. The detailed FTMG data detects magnetite iron formation across the entire survey area and delineates the major G2 fold structures that envelope the Birse Lake pluton. A NE to ENE fracture set is evident across the entire span of the survey area, as detected in the Bzz tensor component in Figure 1.

Fine details in the vertical gradient (Bzz) adjacent to the Shatford Lake – Winnipeg River shear zone identify dilatant jogs and fold structures favourable for pegmatite intrusion. Magnetic low gaps in the high magnetic response of basalt and magnetite iron formation delineate probable pegmatite intrusion.

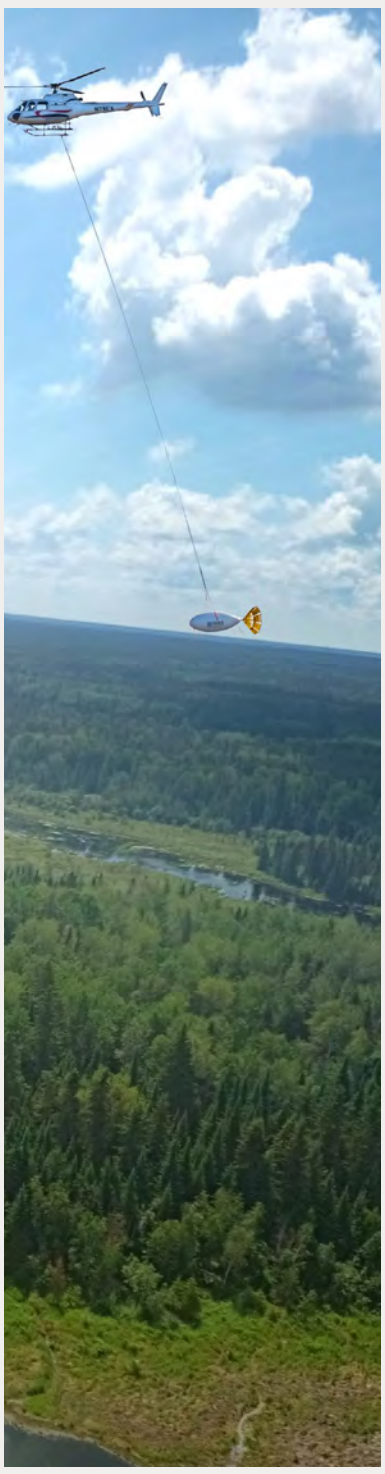
Vertical Derivative (Bzz) indicates that the path of the prolific Bernic Lake Shear Zone is more southerly than mapped in previous regional studies and more proximal to the Company's property.

Low contrast between the magnetic response of the pegmatites and their typical host lithologies limits the use of conventional magnetic surveys. ACME states that, "the sensitivity of Dias Airborne's QMAG^T system and Mira Geoscience's MVI modelling significantly alters this convention."

Drilling commenced at Shatford Lake in January 2023 based on findings from the Summer Exploration Program and the Winter 2023 Drill Program was completed in April 2023. Eight holes were completed totaling 3,280 m of diamond drilling. Drill targets from multiple sites identified include numerous pegmatites, some of which were undocumented prior to the Summer Exploration Program. 235 samples have been cut for assay, with results pending.

Pegmatites were encountered in 6 of 8 holes and previously unknown relatively fine-grained intrusive rocks indicate the possible occurrence of unexposed potential source plutons for lithium-bearing pegmatites. The drill program demonstrated QMAG^T magnetic survey mapped both stratigraphy and structure related to the LCT pegmatite targets.

"The drill program demonstrated the QMAG^T magnetic survey mapped both stratigraphy and structure related to the LCT pegmatite targets."



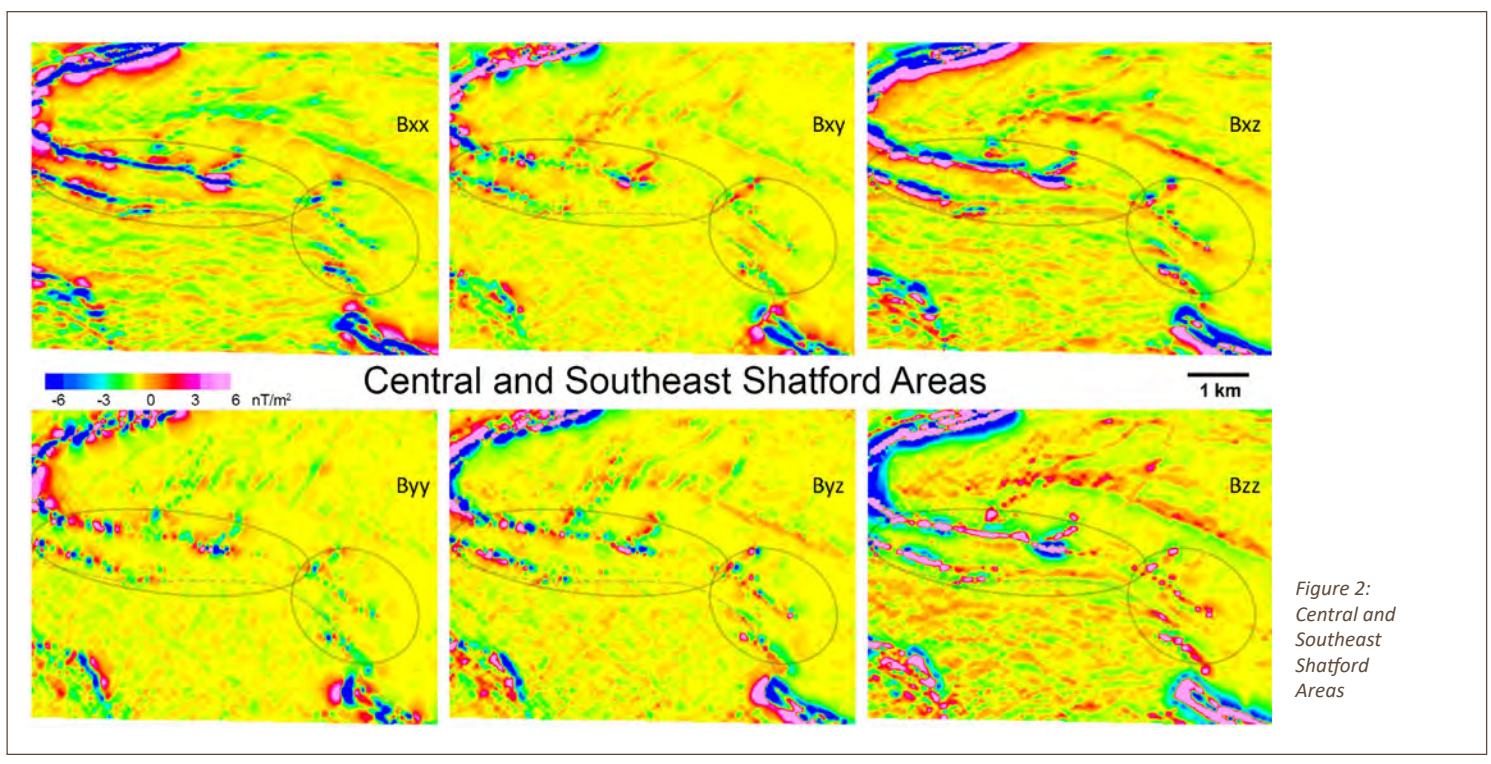


Figure 2: Central and Southeast Shatford Areas

DIAS
WWW.DIASGEO.COM
• TORONTO
• VANCOUVER
• SASKATOON
• MEXICO
• CHILE

DIAS GROUND CASE STUDY

"The ground 3D resistivity survey conducted by Dias Geophysical was key in elevating South Arrow as a high priority target that has now returned off-scale radioactivity associated with a large and robust alteration system."

NexGen Energy Press Release

DIAS
WWW.DIASGEO.COM
• TORONTO
• VANCOUVER
• SASKATOON
• MEXICO
• CHILE

PROJECT
ARROW URANIUM DEPOSIT PROJECT
NexGen Energy
Saskatchewan, Canada

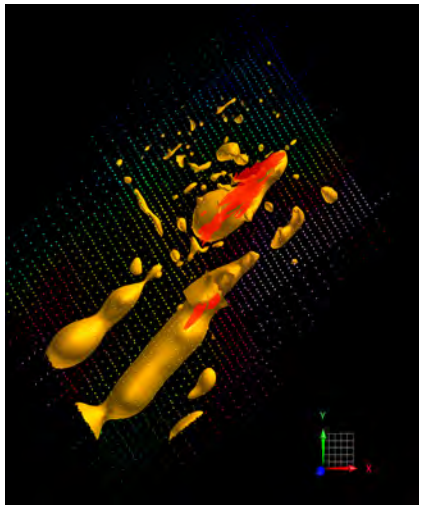
TECHNOLOGY
DIAS32
3DIP and
Resistivity

TARGET
Uranium

NexGen Energy, Saskatchewan, Canada

OVERVIEW

Dias Geophysical successfully imaged alteration related to a known uranium deposit from 100 m depth to over 600 m depth. A similar conductive response 400 m south of the known deposit led to the discovery of the South Arrow uranium deposit.



50 Ω-m resistivity iso-surface in plan view

SITUATION

Canada's Athabasca Basin hosts the vast majority of high-grade uranium deposits. NexGen Energy's Arrow deposit in Saskatchewan, Canada, is the largest undeveloped uranium deposit in the world. Direct detection of unconformity uranium deposits is virtually impossible with conventional geophysical exploration techniques. The DIAS32 DCIP survey was designed to image the alteration related to the high-grade uranium mineralization at Arrow, and by integration with other geologic and geophysical data sets, improve exploration efficiency.

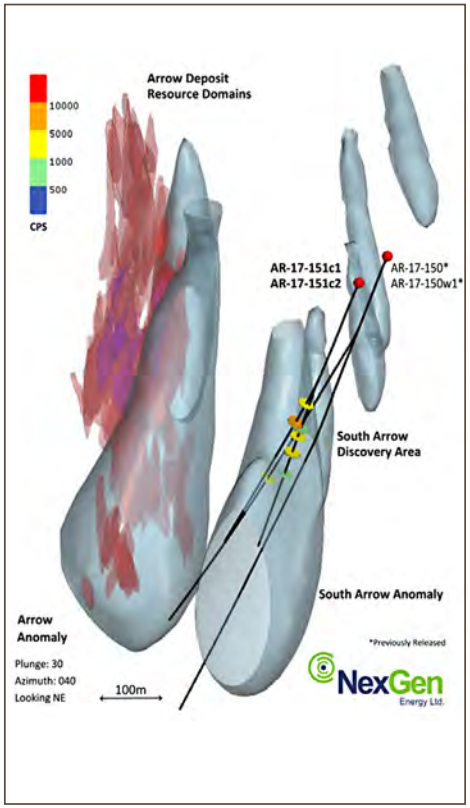
SOLUTION

A full 3D resistivity survey was completed across a 1.4 by 1.4 km area centered over the known deposit. A portion of the survey was completed over a large open-water lake. The multi-azimuth, and multi-scale data set was processed and inverted to generate a high-resolution 3D resistivity model of the survey area from surface to 600 m depth.

CONCLUSIONS

The DIAS32 3D survey successfully imaged the alteration related to the Arrow high-grade uranium deposit with a high degree of correlation. A similar response in the data, 400 m south of the Arrow Deposit was drill tested and high-grade uranium mineralization was discovered. This discovery of the South Arrow deposit **confirms the effectiveness of the resistivity method in the exploration** for basement-hosted unconformity-related uranium deposits in and around the Athabasca basin.

- **Unconformity-related uranium deposit**
- **Imaged alteration related to a highgrade, basement-hosted uranium deposit to 600 m depth**
- **The South Arrow deposit was discovered from the DIAS32 data set**



DIAS GROUND CASE STUDY

PROJECT
VIRGIN RIVER URANIUM
Athabasca Basin
Saskatchewan, Canada

TECHNOLOGY
DIAS32
2DIP and Resistivity

TARGET
Uranium

• High-grade, unconformity-related Uranium

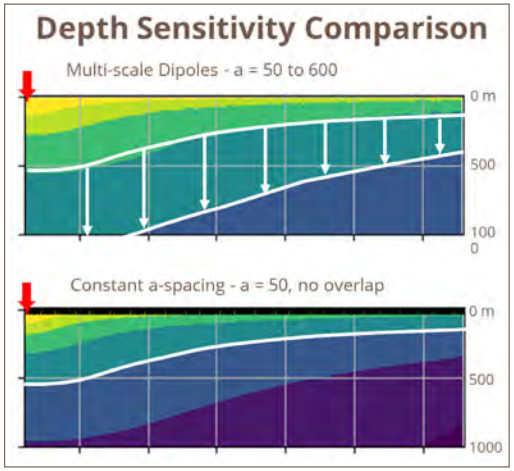
• Imaged alteration plume related to uranium mineralization

• Imaged basement lithologies below 900 m depth."

Virgin River Uranium, Saskatchewan, Canada

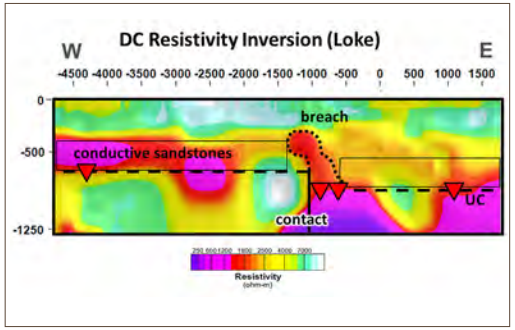
OVERVIEW

Dias Geophysical successfully imaged the geological structure, lithology and alteration related to a known mineralized structure at a depth of 700 m to 900 m. The survey identifies an alteration plume emanating up from a mineralized basement fault structure.



SITUATION

Canada's Athabasca Basin hosts the vast majority of high-grade uranium deposits. The Virgin River Uranium project occurs along a major structural corridor which hosts several world-class uranium deposits. The 2D survey line was completed to demonstrate the depth capabilities of the DIAS32 system in the Athabasca Basin environment. While direct detection of uranium deposits is not possible with geophysical methods, it is possible to image associated features such as the conductive graphite common in the host structures and the alteration plume that often emanates upward into the overlying sandstones.

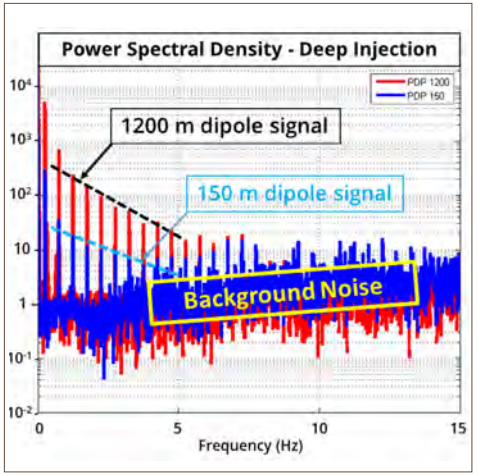


DIAS32 SOLUTION

A 12.5 km 2D line was surveyed with the DIAS32 system across the Virgin River structure. A receiver spacing of 150 m and a current injection spacing of 75 m produced a relatively high data volume of 2D data with a-spacings of 150 m, 300 m, 450 m, etc. up to 1,200 m. This multi-scale data set was processed and inverted with the UBC-GIF and Loke RES3DINV codes to generate high-resolution 2D resistivity sections from surface to a depth of 1.2 km.

CONCLUSIONS

The DIAS32 2D test survey successfully imaged the alteration related to potential uranium mineralization in an area of the Athabasca basin where the unconformity lies at a depth of 700 m to 900 m. The survey mapped variation in the bedrock beneath the unconformity and hosted unconformity-related uranium deposits.



DIAS
WWW.DIASGEO.COM
• TORONTO
• VANCOUVER
• SASKATOON
• MEXICO
• CHILE

DIAS GROUND CASE STUDY

PROJECT
WEEDNANNA GOLD DEP
Alliance Resources Limited
South Australia

TECHNOLOGY
DIAS32
ROLLING 3D SURVEY
3DIP and Resistivity

TARGET
Gold

- High-grade, intrusion related gold (skarn)
- Imaged sulphides associated with gold mineralization to a depth of 300 m
- Identified several high priority targets for further exploration

South Australia

OVERVIEW

Dias Geophysical successfully imaged geological structure, lithology and mineralization at the Weednanna Gold Deposit in South Australia. A rolling 3D DIAS32 survey images the sulphide mineralization beneath ubiquitous surficial sediments with great clarity and to a depth of over 300 m. The survey generated several high priority targets.

SITUATION

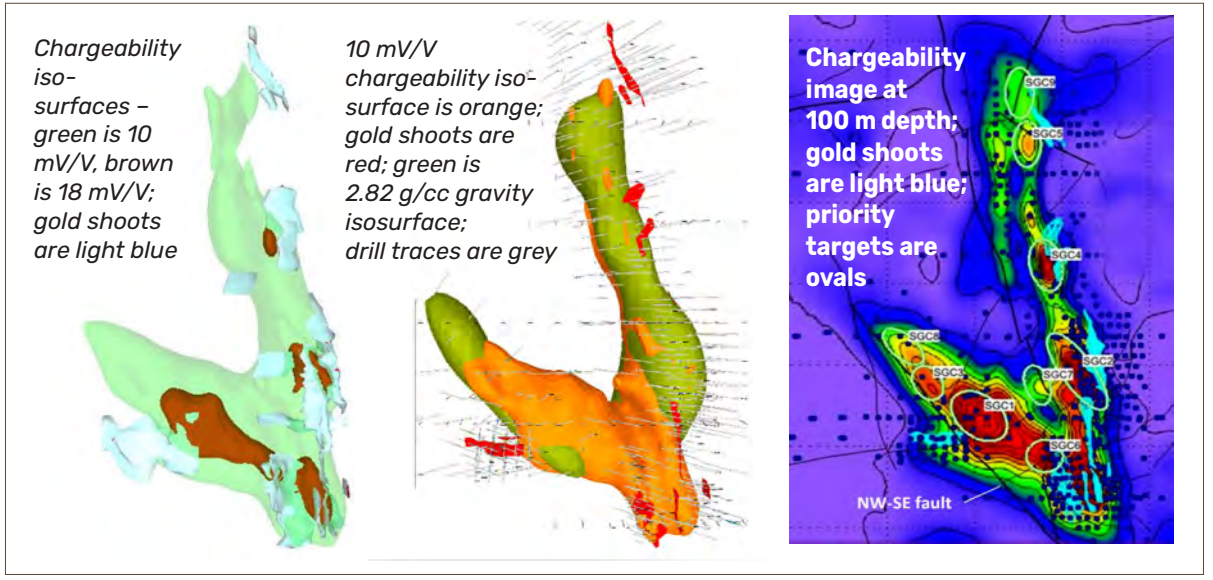
The Weednanna deposit is a magnetite breccia in carbonate altered rocks forming a skarn near the contact with a granite intrusion and containing elevated gold, bismuth, tin, uranium, lead and zinc. High grade gold is associated with sulphide replacement of magnetite. The survey area is covered by a veneer of transported sediments that makes exploration challenging. Prior to the DIAS32 survey little was known about the potential for mineralization below 200 m. The strong association of gold with sulphides makes the IP method an effective tool for imaging potential mineralization.

DIAS32 SOLUTION

A rolling 3D survey with CVR was completed over the 1.1 km by 1.5 km survey area with the DIAS32 system. A line spacing of 50 m and a receiver spacing of 25 m provided for detailed 3D imaging of the subsurface. The CVR data set provided multi-scale and multi-azimuth data for 3D inversion. The final 3D models of resistivity and chargeability were resolved to 5 m.

CONCLUSIONS

The DIAS32 3D survey successfully imaged the mineralized system to a depth of approximately 300 m. The final 3D models of resistivity and chargeability provided insight into structure, lithology and mineralization, and several high priority targets were interpreted from integration of the survey results with other geophysical, and geological data sets.



DIAS
WWW.DIASGEO.COM
• TORONTO
• VANCOUVER
• SASKATOON
• MEXICO
• CHILE

DIAS
GROUND CASE STUDY

- Imaged resistive features that were successfully tested for epithermal vein mineralization
- Imaged a deep conductive and chargeable feature currently beingtested as a possible porphyry source
- The DIAS32 data set assisted in upgrading the geologic knowledge of this project, moving from epithermal to porphyry

DIAS
WWW.DIASGEO.COM
• TORONTO
• VANCOUVER
• SASKATOON
• MEXICO
• CHILE

PROJECT
QUARTZ RISE PROJECT
Seabridge Gold Inc.
Northern British Columbia, Canada

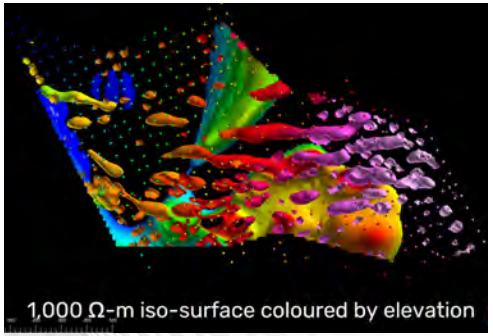
TECHNOLOGY
DIAS32
ROLLING 3D DIAS32 SURVEY
3DIP and Resistivity

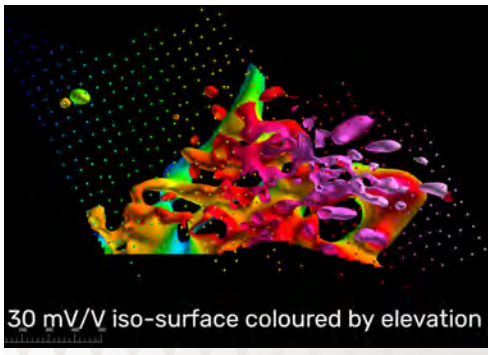
TARGET
GOLD

Northern British Columbia, Canada

OVERVIEW

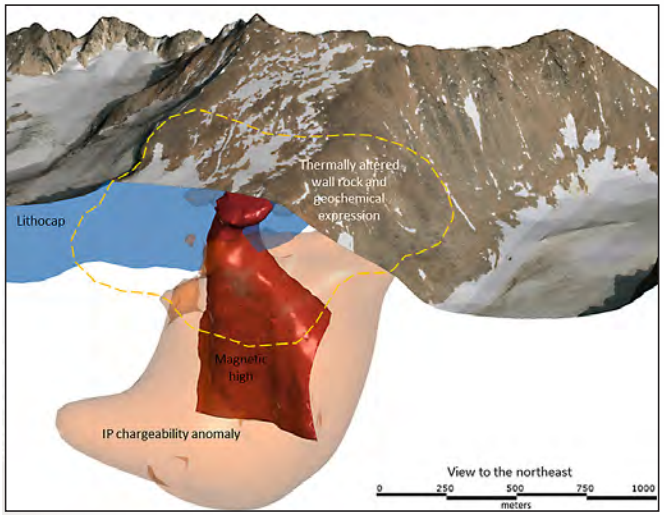
Dias Geophysical successfully imaged geological structure, lithology and mineralization at the Quartz Rise project in British Columbia's Golden Triangle region. A rolling 3D DIAS32 survey images the epithermal vein systems in the near-surface, and when combined with geology and magnetic data, identifies a potential porphyry source at depth.





SITUATION

Three years of exploration work at Quartz Rise have isolated a promising source of the lithocap above the old, high-grade Johnny Mountain Mine. Further geophysical, geochemical and geological mapping surveys have been completed, and an initial drill program totaling up to 8,000 meters has been designed to test the large intrusive system that is likely responsible for the lithocap and elevated gold and copper concentrations. This area has a geological environment astonishingly similar to KSM.



DIAS32 SOLUTION

A rolling 3D survey with CVR was completed over the 1.5 km by 0.8 km survey area with the DIAS32 system. A line spacing of 50 m and a receiver spacing of 25 m provided for detailed 3D imaging of the subsurface given the epithermal vein target. The CVR data set provided multi-scale and multi-azimuth data for 3D inversion. The final 3D resistivity and chargeability models were resolved to 5 m.

CONCLUSIONS

The DIAS32 3D survey imaged the vein system and identified an unexpected east-west trend. Targeting of the high resistivity features was successful, and analysis of the core identified a breccia vein, which suggests a proximal porphyry source. A successive DIAS32 survey was completed in 2019 to close out the chargeability anomaly, and integration of this data with geology, geochemistry and magnetic data, a priority target for a porphyry source was interpreted and is currently being drill tested.

DIAS GROUND CASE STUDY

PROJECT
3D vs 2D COMPARISON
Comparison of DIAS32 3D Survey with conventional 2D

TECHNOLOGY
DIAS32

- In DIAS32 surveys, dipoles are built in-line and crossline and with varying azimuths for dense, rich data sets
- DIAS32 data sets combine high resolution and depth sensitivity for robust and accurate 3D models
- Accurate models reduce exploration risk

DIAS
WWW.DIASGEO.COM
• TORONTO
• VANCOUVER
• SASKATOON
• MEXICO
• CHILE

OVERVIEW

Dias Geophysical's DIAS32 3D induced polarization and resistivity (DCIP) system is unique in its ability to deliver high volume data sets that include both multi-azimuth and multi-scale dipoles. These data sets support highly resolved and accurate 3D models of resistivity and chargeability.

OUTCOME

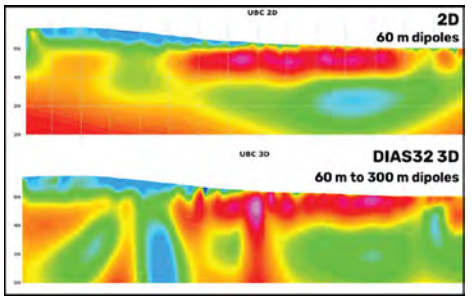
In the figure below, note the significant resolution difference between the DIAS32 3D resistivity survey model (left) and the 2D model (right). In several places the apparent geologic features and trends differ significantly. In the image to the right, note the significant differences between the 2D and 3D models. The vertical sources at depth are known vertical conductive basement units. DIAS32 CVR data sets provide accurate, high resolution models for confident interpretation and follow-up.

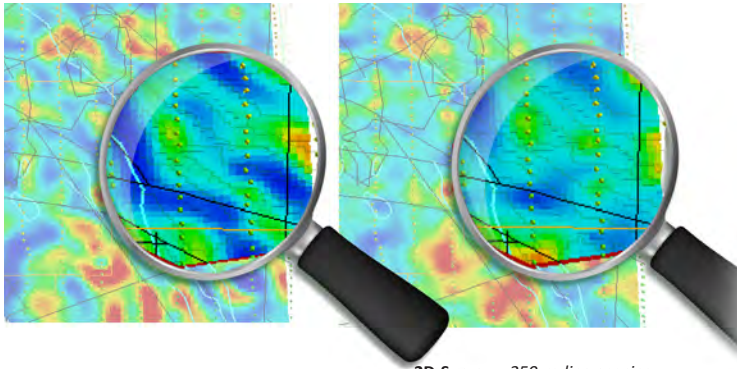
SITUATION

In many environments, conventional 2D DCIP surveys image the geology with a high degree of uncertainty. 2D surveys generally produce a relatively low data density and lack the ability to confidently image sources between the survey lines. As a result, there is significant risk in targeting drill holes in complex geologic environments and the ability to accurately image deep sources is limited.

DIAS32 SOLUTION

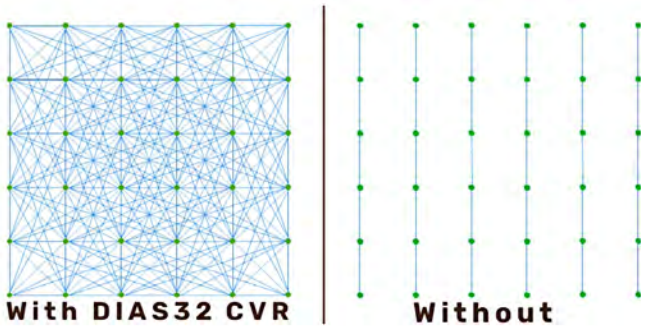
Dias has patented a completely new mode of acquiring IP and resistivity data called CVR. The DIAS32 system measures the response from individual electrode sensors relative to a common voltage reference (CVR) wire. DIAS32 provides advantages in safety, operational efficiency, data volume and data quality. The DIAS32 system can be deployed in any array configuration at any scale, both in 3D and 2D. CVR allows for the computation of a dipole from any two electrodes across the survey area. This yields a rich, high volume data set that contains multi-azimuth and multi-scale dipoles. Most DIAS32 surveys yield data sets of several million possible dipoles.





DIAS32 3D Survey - *250 m line spacing, 100 m to 800 m dipole spacing - 3D inversion model at 100 m depth*

2D Survey - *250 m line spacing, 100 m dipole spacing - 3D inversion model at 100 m depth*



DIAS GROUND CASE STUDY

The IP anomaly correlates with the strongest surface sulfur anomaly and is the principal target for pyritic quartz vein stockwork with gold and silver mineralization.

DIAS
WWW.DIASGEO.COM
• TORONTO
• VANCOUVER
• SASKATOON
• MEXICO
• CHILE

PROJECT
BIG TEN - AMSEL PROJECT
VR Resources
Nevada, USA

TECHNOLOGY
DIAS32
3DIP and Resistivity

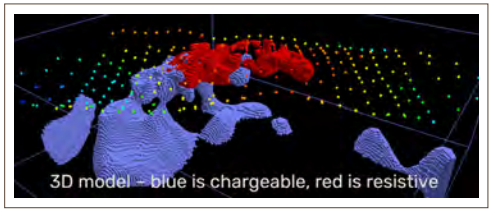
TARGET
GOLD/SILVER

VR Resources, Nevada, USA

SITUATION

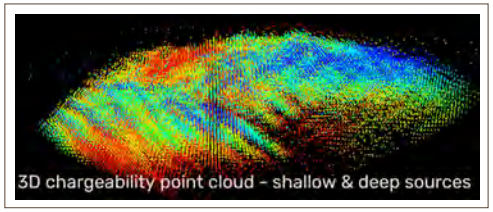
The Big Ten caldera is a Tertiary-aged volcanic complex approximately 20 km in diameter in west-central Nevada. It occurs in an extensional rhyolite volcanic centre, which is analogous in age and setting to the Round Mountain Mine.

The Amsel project area lies within the Big Ten complex. Prior work has defined a 2 km X 3 km airborne radiometric potassium anomaly with a coincident robust Au-Ag-Sb-Mo soil anomaly. These anomalies plus a hilltop of silica-clay altered volcanic tuff with gold-bearing quartz veins indicates potential for a large epithermal gold system analogous to the Round Mountain deposit, where mineralization is found below an alteration cap in a welded tuff.



DIAS32 SOLUTION

The DIAS32 survey was designed to identify where sulphide-bearing quartz veins are concentrated within the large alteration cap and geochemical anomaly. The 3D CVR survey using 200 m line spacing and 100 m station spacing



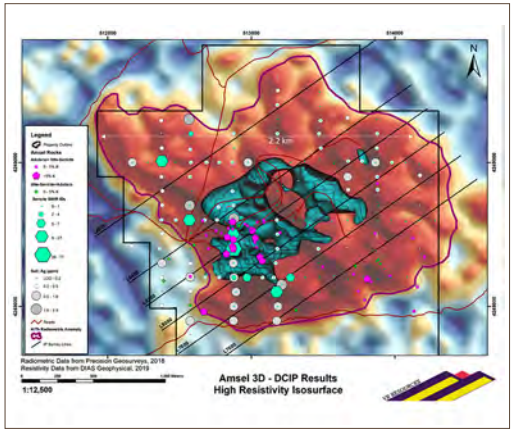
generated more than 225,000 data records from which a final data set of 95,000 data records were used for 3D inversion modelling. The survey was designed to image toover 600 m depth.

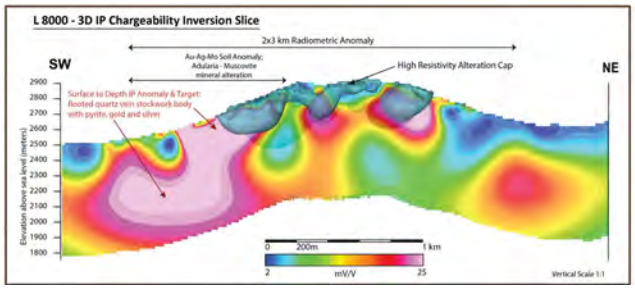
OUTCOME

The 3D resistivity model identifies a large, nearsurface high resistivity anomaly covering a 700 m by 900 m area in the southwest quadrant of the radiometric anomaly and surface alteration zone. The high resistivity zone appears to form a cap directly above an underlying IP anomaly. The high resistivity correlates with high temperature adularia and muscovite alteration in rocks, and the strongest multi-element soil geochemical anomaly.

A section along line 8000 through the 3D IP model depicts the chargeability anomaly directly below the high resistivity zone interpreted as an alteration cap. The anomaly extends from surface to a depth of at least 600 vertical metres. The anomaly occurs below the main multi-element soil geochemical anomaly and below the area where muscovite and adularia alteration minerals are identified in rock samples.

The IP anomaly from the 3D inversion model correlates directly with the overlying high resistivity alteration cap. It is also co-spatial with the silver soil geochemistry anomaly, and with sulfur, because the IP is expected to relate to pyrite associated with secondary hydrothermal silica. The IP anomaly correlates with the strongest surface sulfur anomaly and is the principal target for pyritic quartz vein stockwork with gold and silver mineralization.





DIAS GROUND CASE STUDY

- The DIAS32 survey produced significantly higher resolution and deeper results than conventional surveys
- From the survey outcome, targeted drilling from 3D chargeability models to a depth of approximately 900 m

DIAS
WWW.DIASGEO.COM
- TORONTO
- VANCOUVER
- SASKATOON
- MEXICO
- CHILE

PROJECT
HAT PROJECT, Golden Triangle
Doubleview Gold
Britsh Columbia, Canada

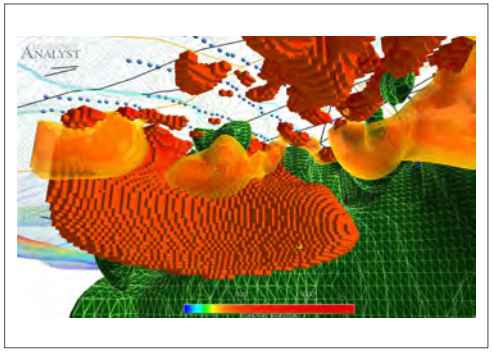
TECHNOLOGY
DIAS32
3DIP and Resistivity

TARGET
GOLD

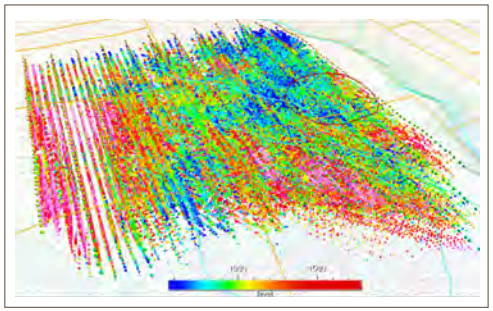
Doubleview Gold - British Columbia, Canada

SITUATION

The Hat Property is situated in the prolific Golden Triangle of northern British Columbia, Canada, which hosts many significant gold and copper deposits. The Hat Property is thought to host an Alkalic Copper Gold porphyry. The property is structurally complex; generally, the southwestern portion of the property has a large dioritic intrusion which is interpreted to sit on top of Stuhini group volcanics. Soil



sampling has outlined several zones of copper, gold and silver near the margin of the intrusion. Historical 2D geophysical surveys have shown the IP method to be effective in detecting mineralization, but limited depth and poor resolution have hampered drill targeting.



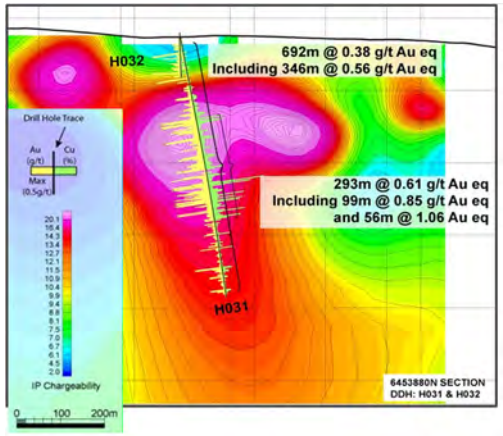
DIAS32 SOLUTION

In 2018, Dias Geophysical was contracted to carry out a 3D DIAS32 survey across the priority portion of the property. The 9 sq. km. survey comprises 12 lines with a 250 m line spacing and 100 m station spacing. The survey was carried out in a pole- dipole configuration with common voltage referencing.

The depth of investigation was designed to be 500 m or more, and high resolution was achieved through multi-azimuth acquisition. During the QC process, approximately 10% of the DC data and 15% of the IP data were removed, leaving a high volume data set of over 100,000 data points.

OUTCOME

Unconstrained 3D inversions for the resistivity and chargeability parameters produced robust 3D models with a near-surface resolution of 25 m. The DIAS32 survey identified an extensive chargeability high which occurs below the Lisle Zone, which had yielded encouraging drill results prior to the DIAS32 survey. The DIAS32 3D models were integrated with geological, geochemical and magnetic data sets to produce a prioritized list of targets. The subsequent drill program produced significant results in the Lisle Zone where



mineralization was found to occur to depths of over 700 m. Visible gold was encountered in one hole. Drill testing of hole H036 revealed an occurrence of visible gold which was accompanied by chalcopyrite, bornite and magnetite.