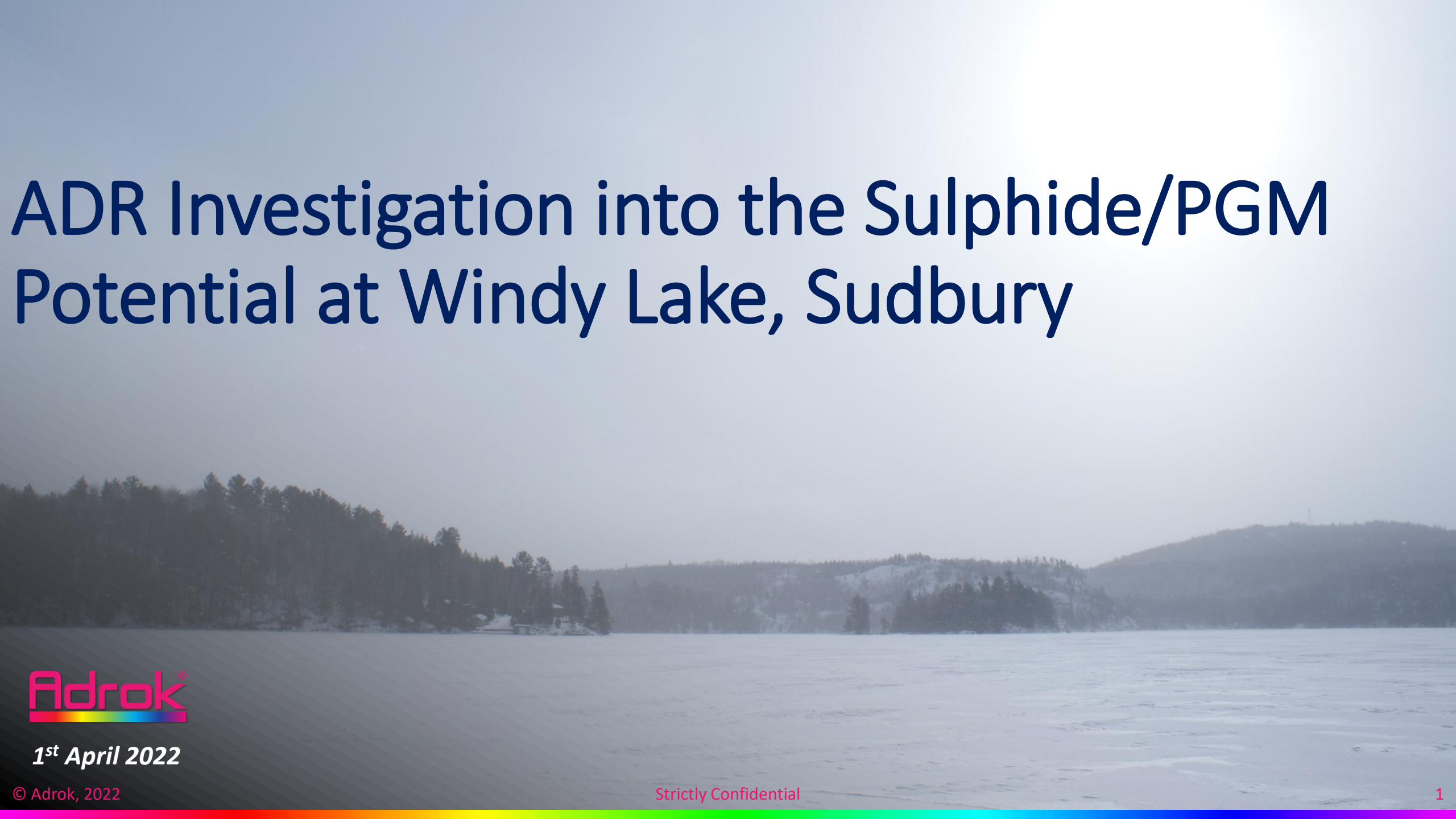
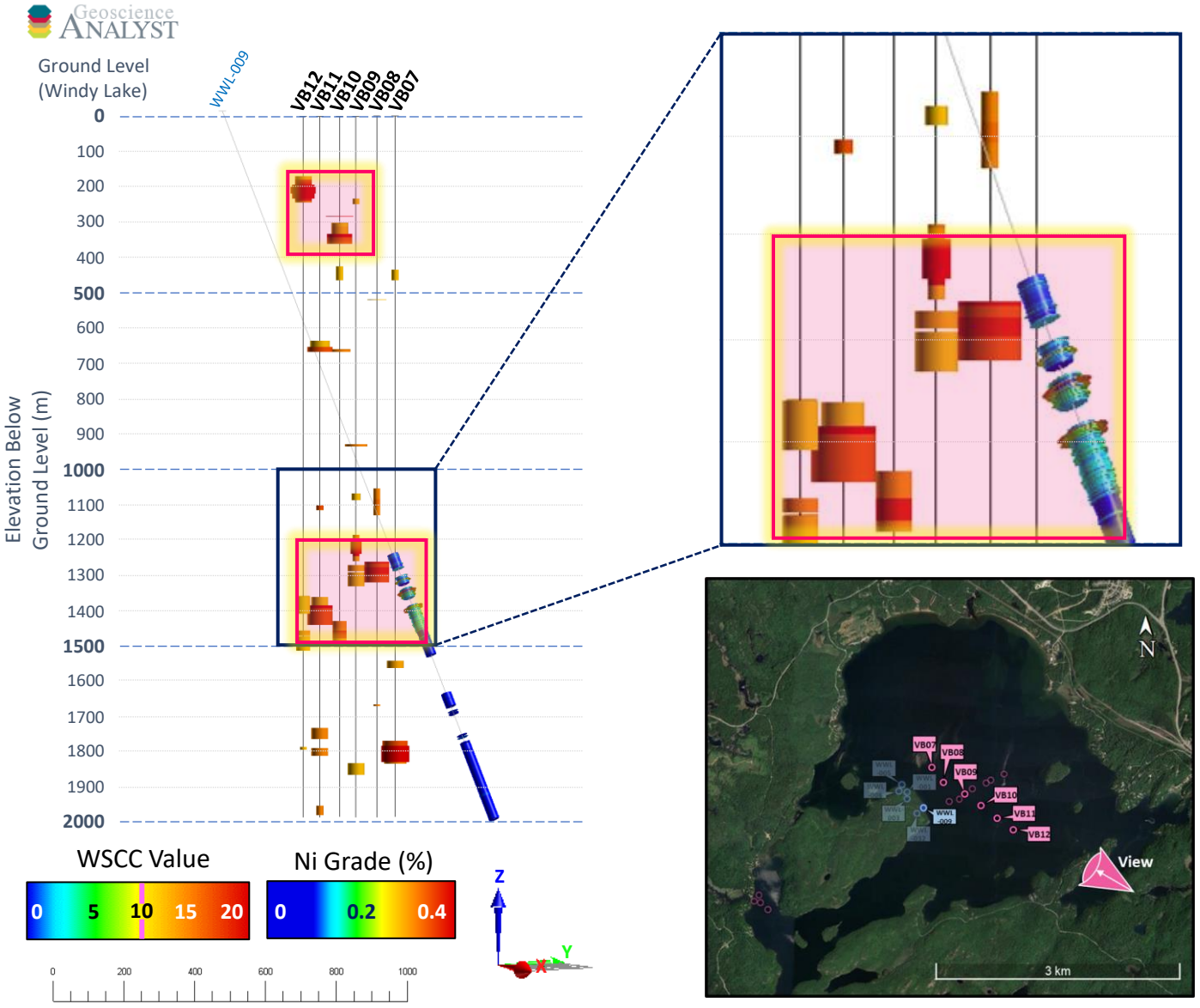
ADR Investigation into the Sulphide/PGM Potential at Windy Lake, Sudbury



Adrok®

1st April 2022

Executive Summary



This report describes the results of the February 2010 geoscientific survey completed by Adrok Limited ("Adrok") at Windy Lake in Sudbury, Canada. The results for this report have since been processed and analysed during April 2022, using Adrok's latest mineralisation exploration tools and techniques.

Adrok will primary use the Weighted Sulphide Correlation Criteria (WSCC) technique to identify areas of potentially high sulphide grade. The tool has been specifically designed to pinpoint zones of high sulphide mineralisation beneath the Earth's surface.

In summary, Adrok have identified high-confidence WSCC targets at a depth of 1250-1500m, that is validated by nearby drilling/assay results. This strong WSCC target zone can be interpretated to be an embayment deposit associated with the Sudbury Igneous Complex.

1) Introduction: The Project

This is an internal research project funded by Adrok, to be used as an inhouse training and technology capability demonstration for onshore subsurface sulphide mineralization identification in Windy Lake, Sudbury, Canada. The data was collected by Adrok during February 2010 and subsequently reprocessed during April 2022.

Project Purpose:

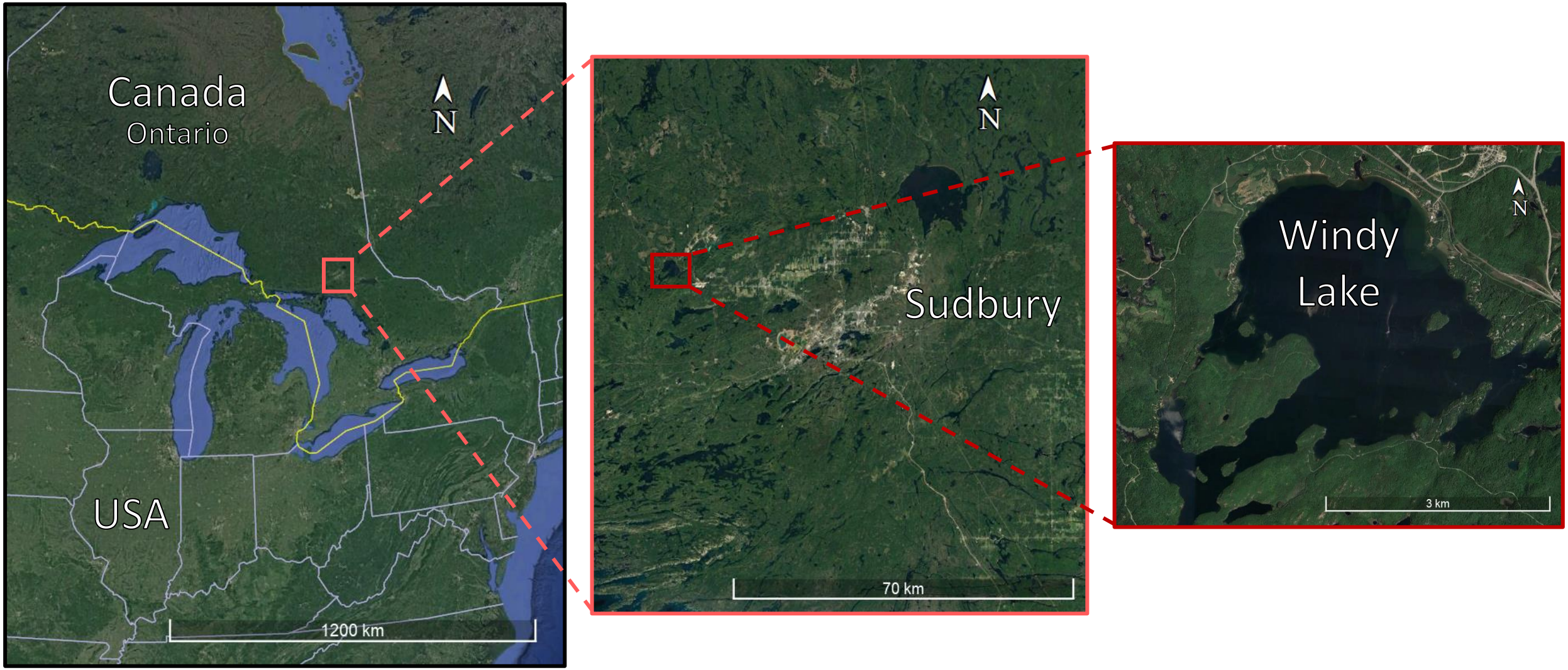
To improve upon Adrok's Sulphide and Platinum Group Metals (PGMs) identification capabilities on legacy data by using our newest released tools and workflows.

The Sudbury Deposit is one of the most well recognised mineral exploration deposits in the world, which provides an excellent showcase of Adrok's state-of-the-art mineralisation exploration technology capabilities.

1) Introduction: Glossary

Term	Definition
ADR	Atomic Dielectric Resonance.
Dielectric Constant (DC)	Stacks a large number of traces from a series of stare scans and applies mathematical filtering to give a baseline over which the signal can be described as being of high quality. The signal returns are analysed to show distinct changes in lithology for the area under investigation.
E-Log (Energy log)	During a stationary scan ("Stare" scan) the ADR transmitter and receiver antennas are positioned at known grid co-ordinates and aimed downward. The energy log ("E-log") indicator is produced by dividing the Stare scan image data in time windows. Windowing is carried out in equal time intervals or the time axis is migrated to depth after our WARR tracking of dielectric and windowing is performed equal spatial intervals. The data windows are subsequently analysed and/or enhanced utilizing a suite of signal and image processing techniques such as Fourier analysis, wavelet decomposition, and image enhancement algorithms using RADAMATIC, Adrok's proprietary data analysis software. Amongst other indicators, this analysis produces the E-Logs which represent estimated energy values as a function of depth and were found to be excellent indicators. They are usually plotted on a logarithmic scale.
Harmonic Analysis	"Harmonic Analysis" is a widely accepted mathematical method that studies the functions of signals as the superposition of waves. Using Fourier transforms to analyse the "harmonics" the technique is often used for assessing materials in a laboratory setting in the chemical industry. Unique harmonic energy frequency and phase peaks are produced and can be analysed in a number of ways producing a range of parametric statistical tests. Different rock types with different mineral assemblages will exhibit different spectral harmonic relationships over these levels.
Stare	A stationary scan where data collected with both antennae pointing the ground.
WARR	Wide Angle Reflection and Refraction scan to triangulate subsurface depths from the surface ground level. The Transmitting Antenna is moved at ground level along the scan line, away from the stationary Receiving Antenna which is fixed to the start of the scan line. Collected by ADR Scanner at ground level (that produces depth calculations).
WSCC	WSCC or Weighted Sulphide Correlation Criteria is a technique that uses the combination of the ADR Correlation Criteria (Energy & Frequency Harmonics) in order to give sufficient evidence to accurately locate sulphides beneath the ground.

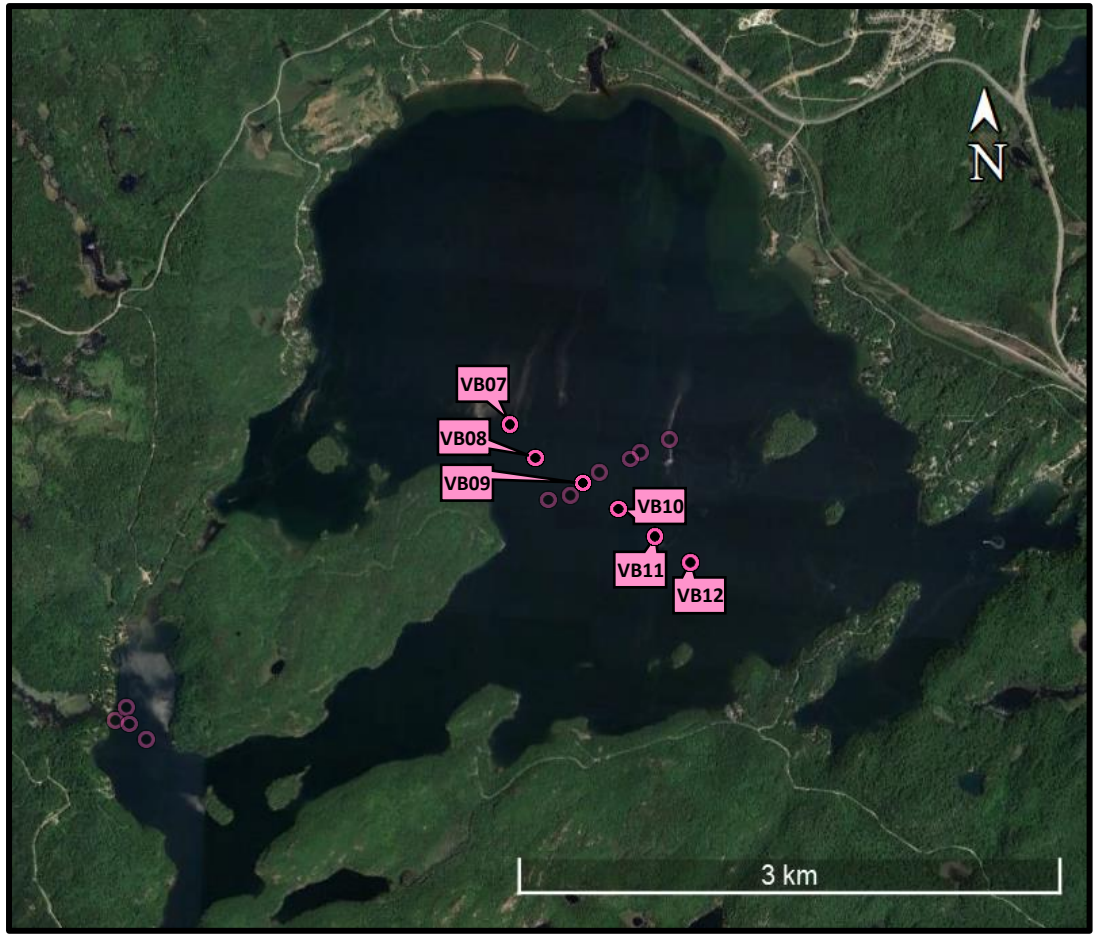
1) Introduction: Location



1) Introduction: Data Collected

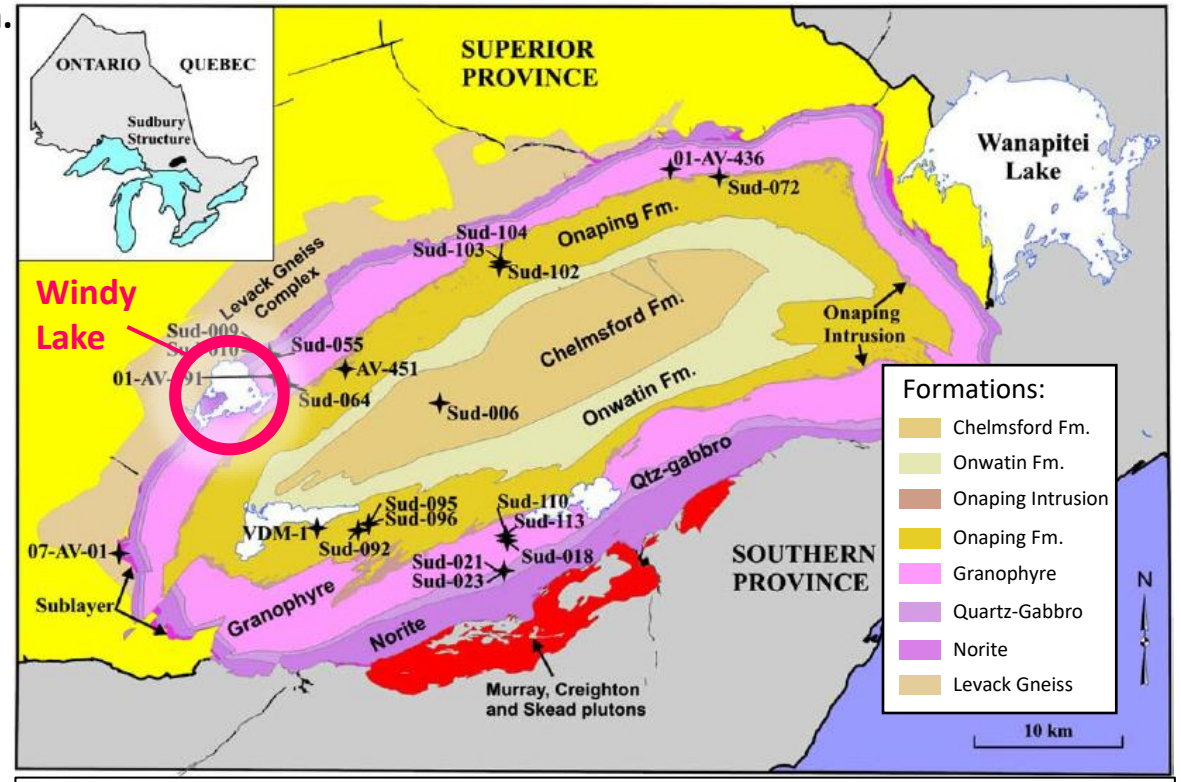
- 6 V-Bores from the centre of Windy Lake were chosen to be re-processed for project 00235, based on stare availability and proximity to pre-existing drillholes.

Hole ID	Processed Depth (m)	Elevation (m)
VB07	2000	339
VB08	2000	339
VB09	2000	339
VB10	2000	339
VB11	2000	339
VB12	2000	339

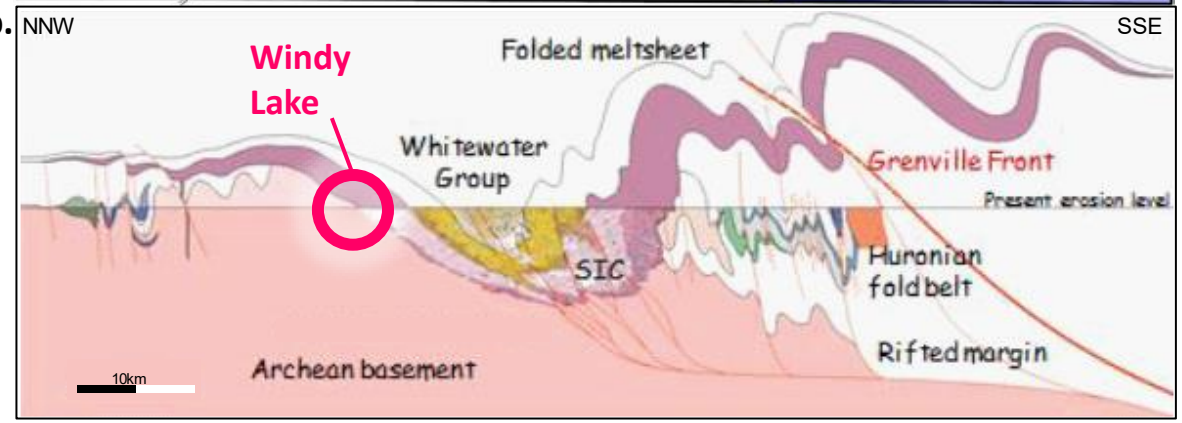


1) Introduction: Geological Setting

a.



b.

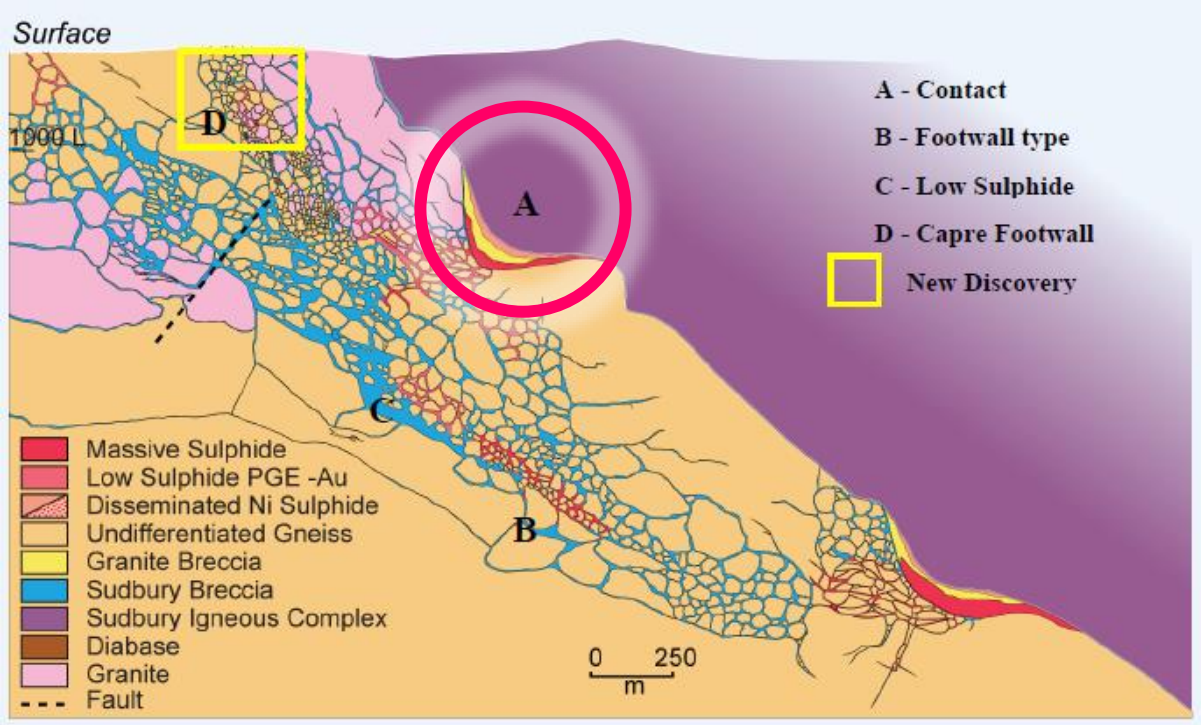


- Windy Lake is located along the northern margin of the Sudbury Basin.
- The Sudbury Basin was formed by the Sudbury Impact, and has subsequently been folded and eroded into its present day structure.
- The Sudbury Igneous Complex (SIC) is a well differentiated melt sheet that formed due to the Sudbury Impact and sits astride the Archean, Superior and Proterozoic Southern Provinces.
- The SIC is composed primarily by layers of Norite, Quartz-Gabbro and Granophyre. It is the outer contact of the SIC that hosts the mineralisation and this strikes directly underneath Windy Lake in a NE-SW orientation.

a. Campos-Alvarez, N.O., Samson, I.M., Fryer, B.J. and Ames, D.E., 2010. Fluid sources and hydrothermal architecture of the Sudbury Structure: Constraints from femtosecond LA-MC-ICP-MS Sr isotopic analysis of hydrothermal epidote and calcite. *Chemical Geology*, *278*(3-4), pp.131-150.

b. Bleeker, W., Kamo, S., Ames, D.E. and Smith, D., 2014, May. New U–Pb ages for some key events in the Sudbury area, including the Creighton Granite and Joe Lake Metagabbro. In Geological Association of Canada, Annual Meeting (Vol. 37, p. 33).

1) Introduction: Geological Background

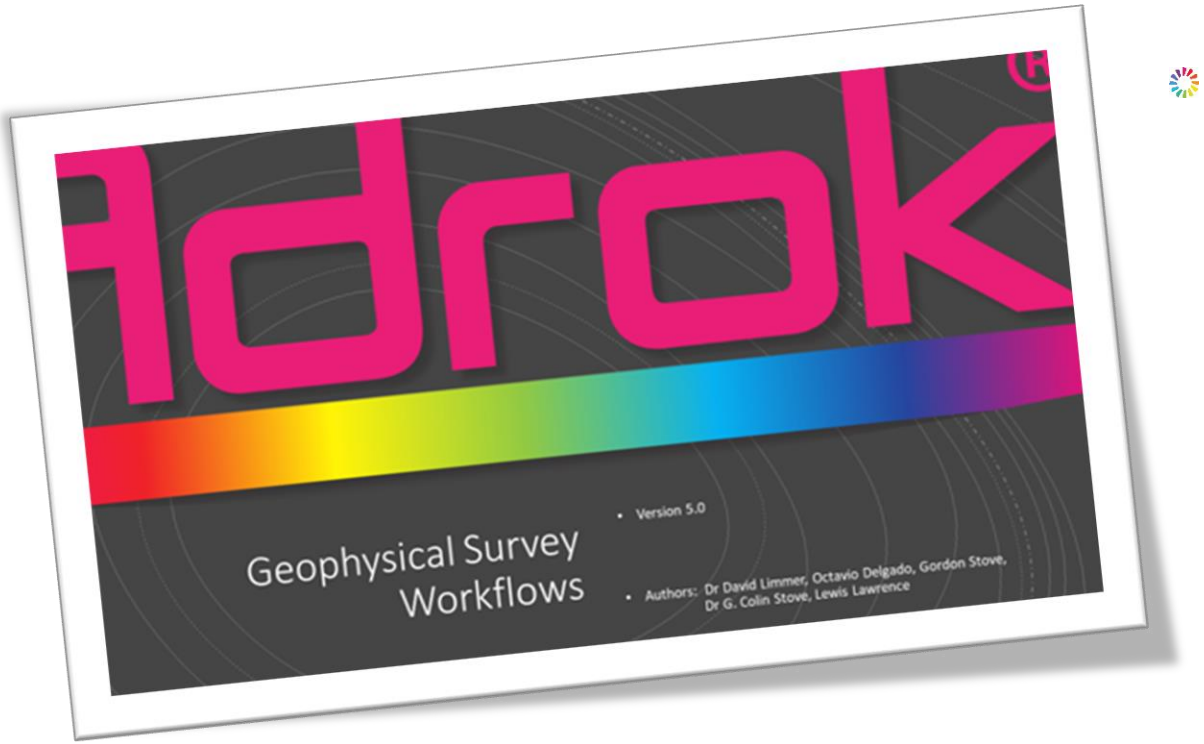


Stewart, M.C., Lightfoot, P.C., Brown, G.H., Jugo, P.L., Lesher, C.M. and Mungall, J.E., 2010, June. Diversity in platinum group element (PGE) mineralization at Sudbury: New discoveries and process controls. In *the International Platinum Symposium* (Vol. 21, p. 24).

- The outer contact between the Sudbury Igneous Complex (SIC) and the country rock are the localities for the principal resources of Ni, Cu and Co sulphide mineralisation in the Northern Range.
- The primary type of mineralisation that is present at Windy Lake is contact-related Fe-Ni-rich deposits that are associated with a magmatic breccia, termed the sublayer.
- These deposits are typically found within physical depressions, termed embayments, at the base of the SIC.
- Wallbridge drilling at Windy Lake has delineated an embayment structure which hosts contact-style pyrrhotite-pentlandite-chalcopyrite mineralization within the sublayer and footwall breccia.

2) Methods: Adrok Geophysical Survey Workflows

0. Project Management
1. Pre-survey field modelling
2. Training for geological signatures
3. On-site Survey Data Acquisition
4. Data Processing
5. Analysis & results Delivery
6. Interpretation and Report Writing
7. Integration to other data sets



- The Geophysical Survey Workflows describe which process will be performed in each stage of the project to ensure quality, repeatability and a successful completion.

THE BRITISH ASSESSMENT BUREAU ISO9001 Registration 188208

THE BRITISH ASSESSMENT BUREAU ISO27001 Registration 213059

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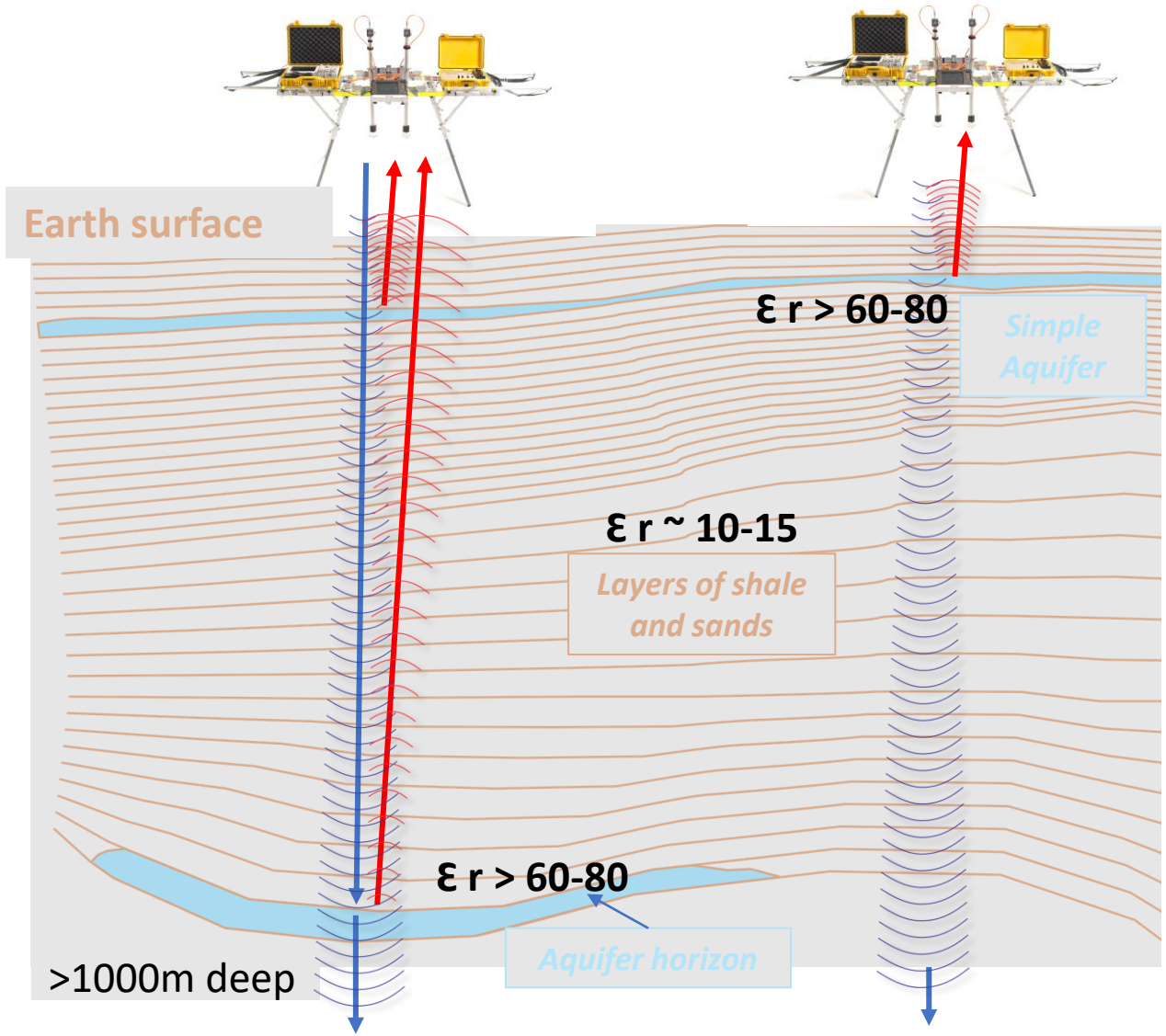
2) Methods: Atomic Dielectric Resonance (ADR)



- Transmits broadband pulses of radio waves between 1 to 70 MHz into the ground.
- Detects the modulated reflections returned from the subsurface structures.
- Measures dielectric permittivity (Ɛ r) and conductivity of material.
- Analyses spectral content of the returns to help classify materials (energy, frequency, phase).
- Time & frequency domain.
- Time ranges typically 20,000ns, 40,000ns & 100,000ns. This project uses all three of these time ranges.
- High speed time domain sampling ~5GS/s
- Stack return signals for improved signal-to-noise 20,000, 100,000…..1million.

2) Methods: Data Collection

Stares:
(Stationary Vertical Scan)

The Transmitting Control Unit (TCU) sends the signal through the Transmitting Antenna (Tx). The reflected signal is then returned through the Receiving Antenna (Rx) and captured in the Receiving Control Unit (RCU). The workstation remains stationary for stare scans.

P-Scans:
(Profile Scans)

The whole workstation with both Transmitting and Receiving Antennas are moved simultaneously in parallel along the length of the scan line. The workstation is manually walked by two field crew.

WARRs:
(Wide Angle Reflection and Refraction Scan)

The Receiving Antenna remains stationary whilst the Transmitting Antenna is slowly walked along the length of the scan line (typically between 50-100m). These scans allow for depth conversion using triangulation.

2) Methods: Processing Steps

- The flow diagrams below shows a synopsis of Adrok's processing methodology for this project.

Time-Depth Conversion

WARR Tracking
- WARR QAQC by analysing the range of frequencies and by identification of visual anomalies.
- Dielectric WARR tracking down to 2000m at a 1m interval resolutions.

Phase Correction
- Completed based on the .DCO.
- Corrects the signal and produces a more accurate depth model after tracking.

Extraction of time-depth conversion
- Extraction of the time to depth conversion form the .xlsx file.

Virtual Borehole Processing

Stare Image Processing
- Stare QAQC by analysing the noise to signal ratio and by identification of visual anomalies.
- Merge of those stares with the best signal to noise ratio taken at a single location to boost signal strength.

Harmonics & Energy Processing
- Completed at 128 Pixels per step and 128 per window.
- Produced Energy and Frequency Harmonics for the WSCC inputs, as well as Energy for signal reflection analysis.

Conversion to readable files
- Conversion from .prn Radamatic file to .csv excel file for further analysis.

Virtual Borehole Analysis

Data Analysis on the .csv
- Energy and Frequency Harmonics analysed using the automated WSCC tool to identify locations within the scan where the signal shows a high response to sulphide mineralisation.
- Conversion of Time to Depth data using the .DCO file.

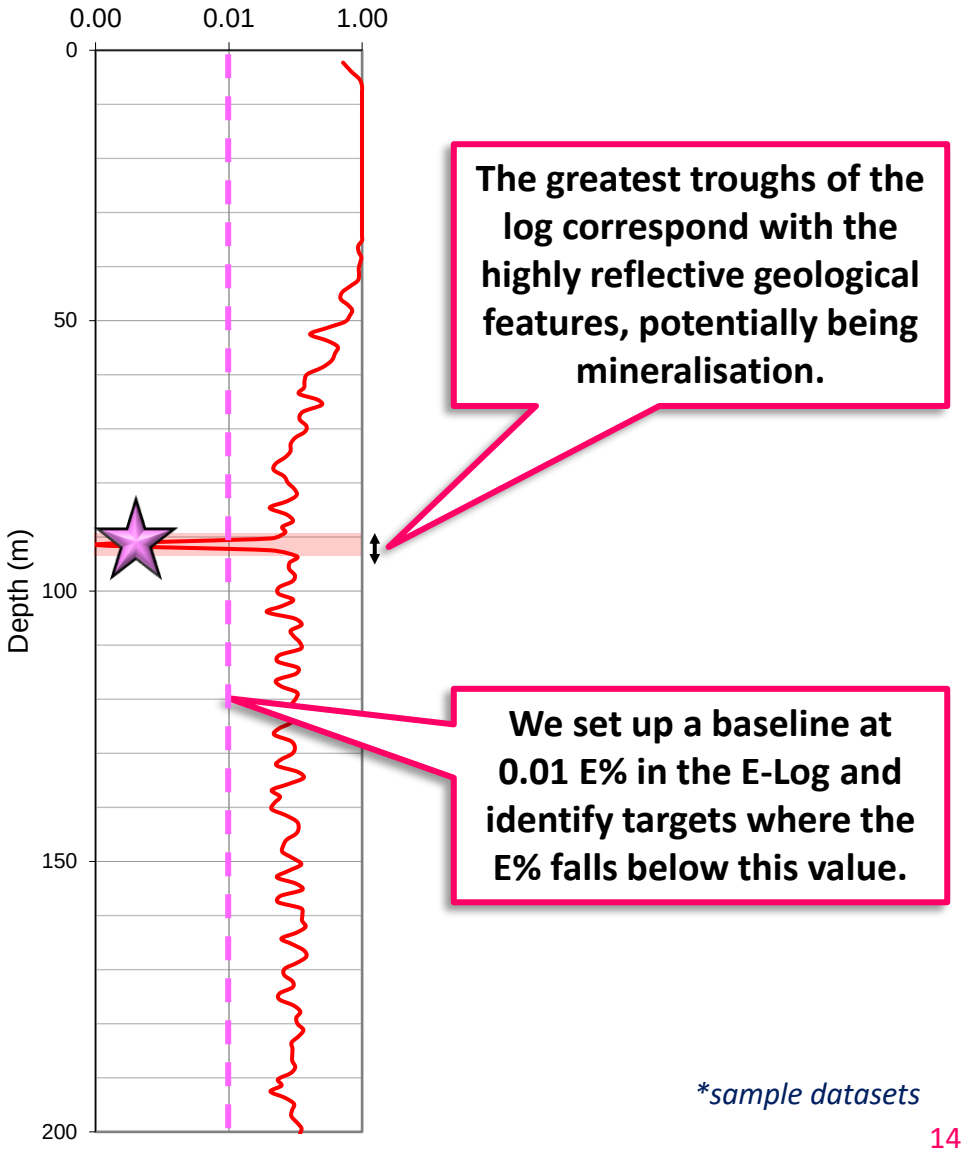
Temperature Impact Analysis
- WSCC charts plotted, showing the 8 correlation criteria harmonics, with WSCC values where higher values equate to higher grade mineralisation.
- WSCC targets are identified when the WSCC values meet of exceed the respective baselines.
- Energy % targets associated with troughs that drop below the 0.01 baseline.

2) Methods: E% Energy Log Analysis

What are the Energy Logs?

- The energy log is produced by sub-sampling the Stare image data in equal time intervals. A Fourier transform is conducted on each sub-image, whereby the energy and frequency content is computed. A mean energy decibel value is calculated for each sub-image, which provides the energy reading at that depth.
- The energy relates to the "reflectivity" of the geology the pulse is passing through. The more "reflective" the geology the more energy is returned. Adrok has found that oil accumulations, orebody locations and some lithologies can be either highly reflective or absorbing and therefore show distinct peaks and troughs in energy logs.
- The graph displays the Energy % against depth in a logarithmic scale for the site. The data selected from the single stare is the one scan (out of 5 taken) with the highest frequency range, containing the most data, and is the most suitable for potentially highlighting outliers.
- For the data we applied a horizontal smoothing of a 0.15% (of total horizontal length), that is of 3 successive traces. This generates a more repeatable result.

How do we interpret them?



**sample datasets*

2) Methods: What is WSCC?

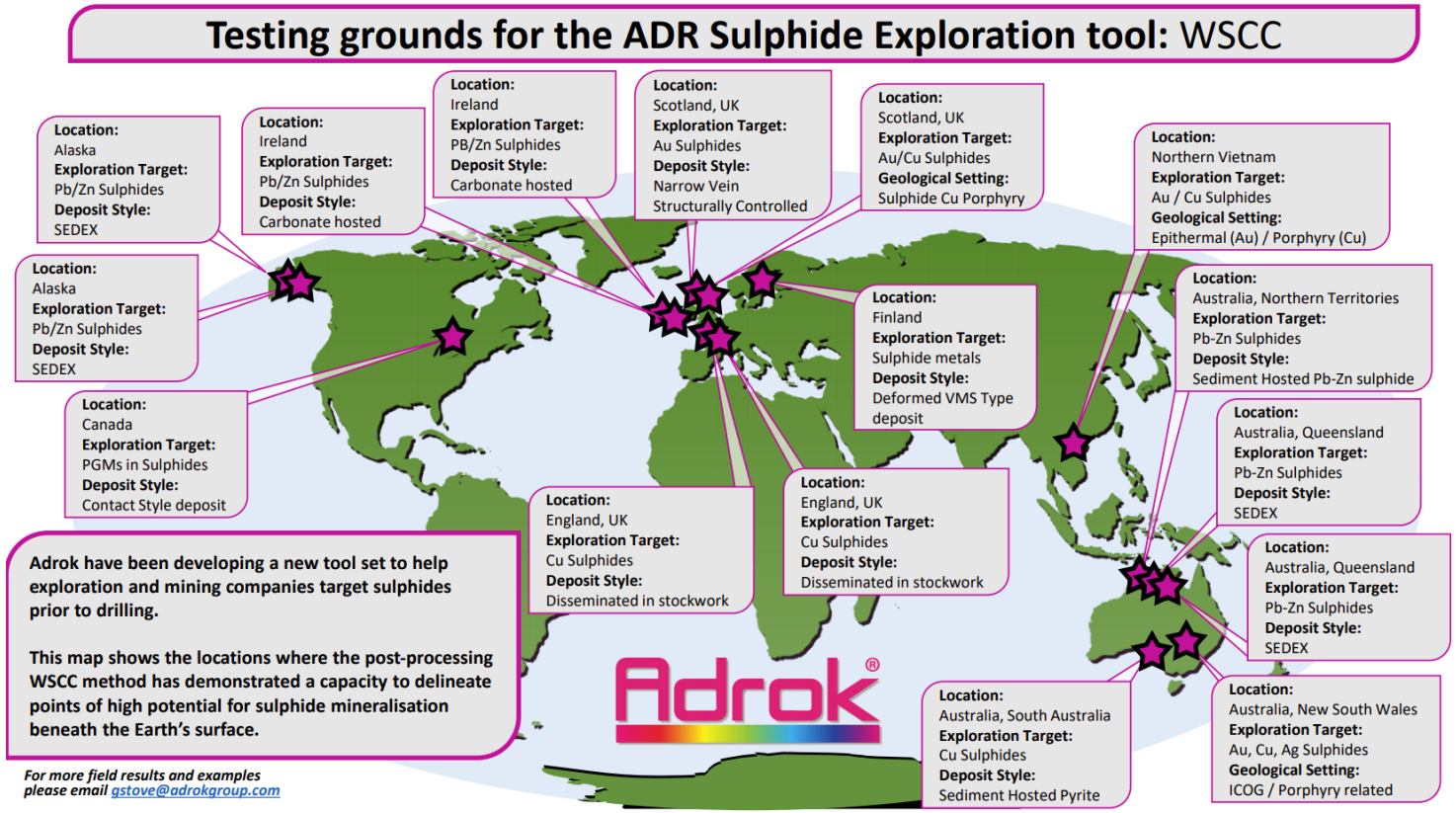
WSCC

Weighted Sulphide Correlation Criteria

Using a combination of the ADR Correlation Criteria (E- and F- Harmonics) to give sufficient evidence to accurately locate sulphides beneath the ground.

Adrok's latest sulphide targeting tool:
The WSCC approach, has successfully identified disseminated sulphides over the past 11 months across over more than 15 projects around the globe.

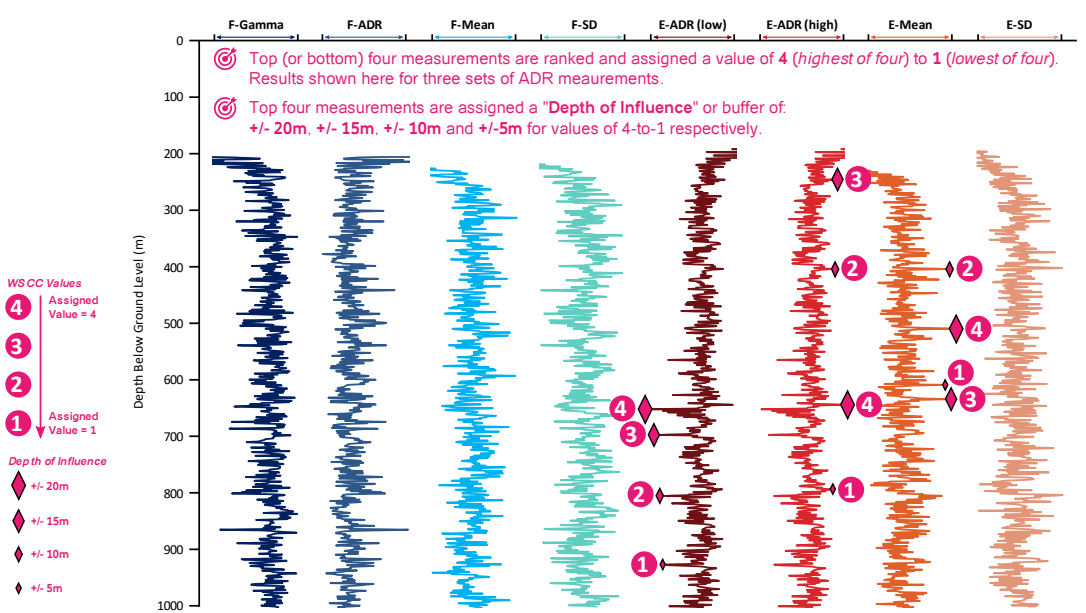
These previous successes have sculpted the threshold WSCC values that Adrok use to identify particular sulphide targets in the WSCC results.



2) Methods: WSCC Analysis

What are the WSCC Inputs?

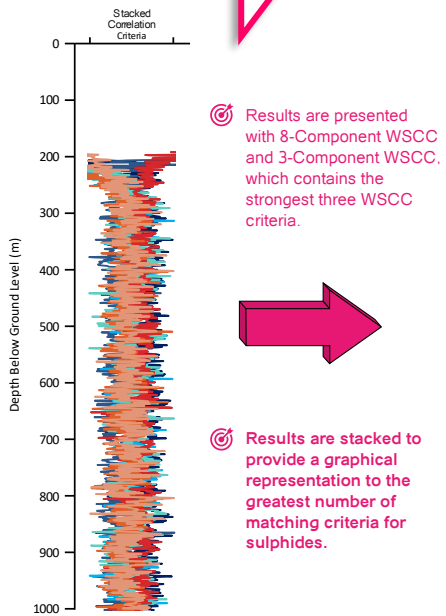
1: ADR Data (E- and F-Harmonics)



Weighted **S**ulphide **C**orrelation **C**riteria

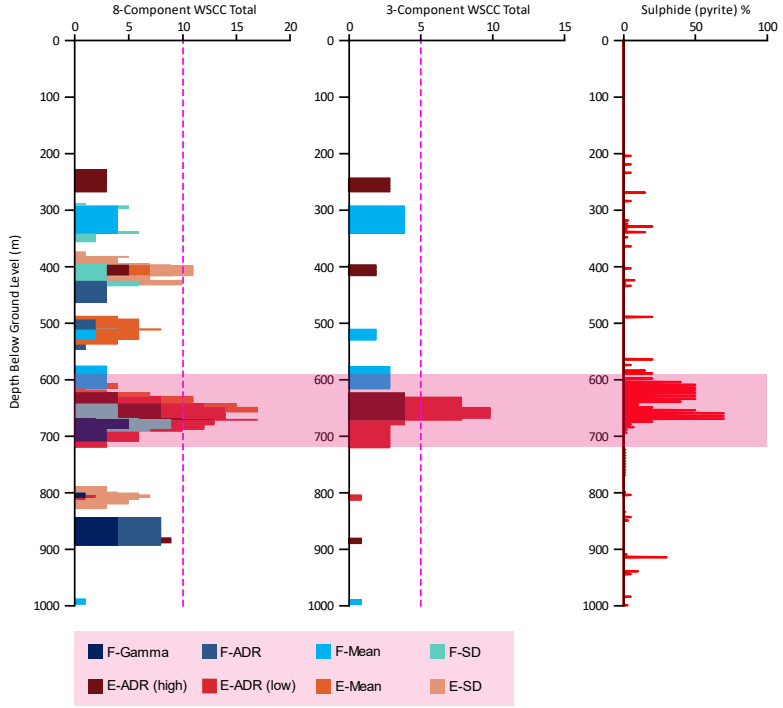
How do we interpret WSCC?

2: WSCC Results (Sulphide Targets)



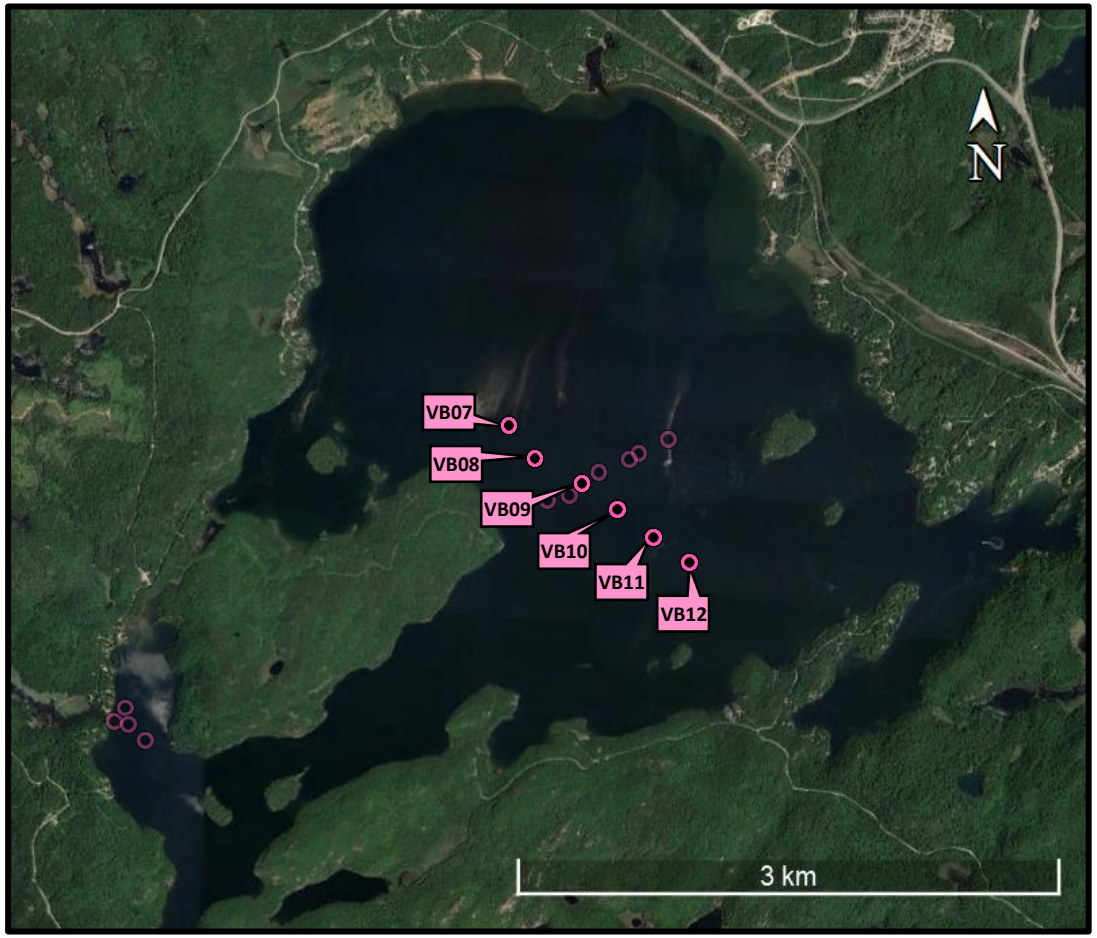
Results are presented with 8-Component WSCC and 3-Component WSCC, which contains the strongest three WSCC criteria.

Results are stacked to provide a graphical representation to the greatest number of matching criteria for sulphides.



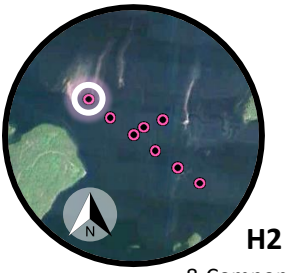
3) Results: Site by Site

- The results for each scan and setting will be displayed over 2 slides. The first will showcase the uninterpreted results. The second slide will display some interpretations of the data.

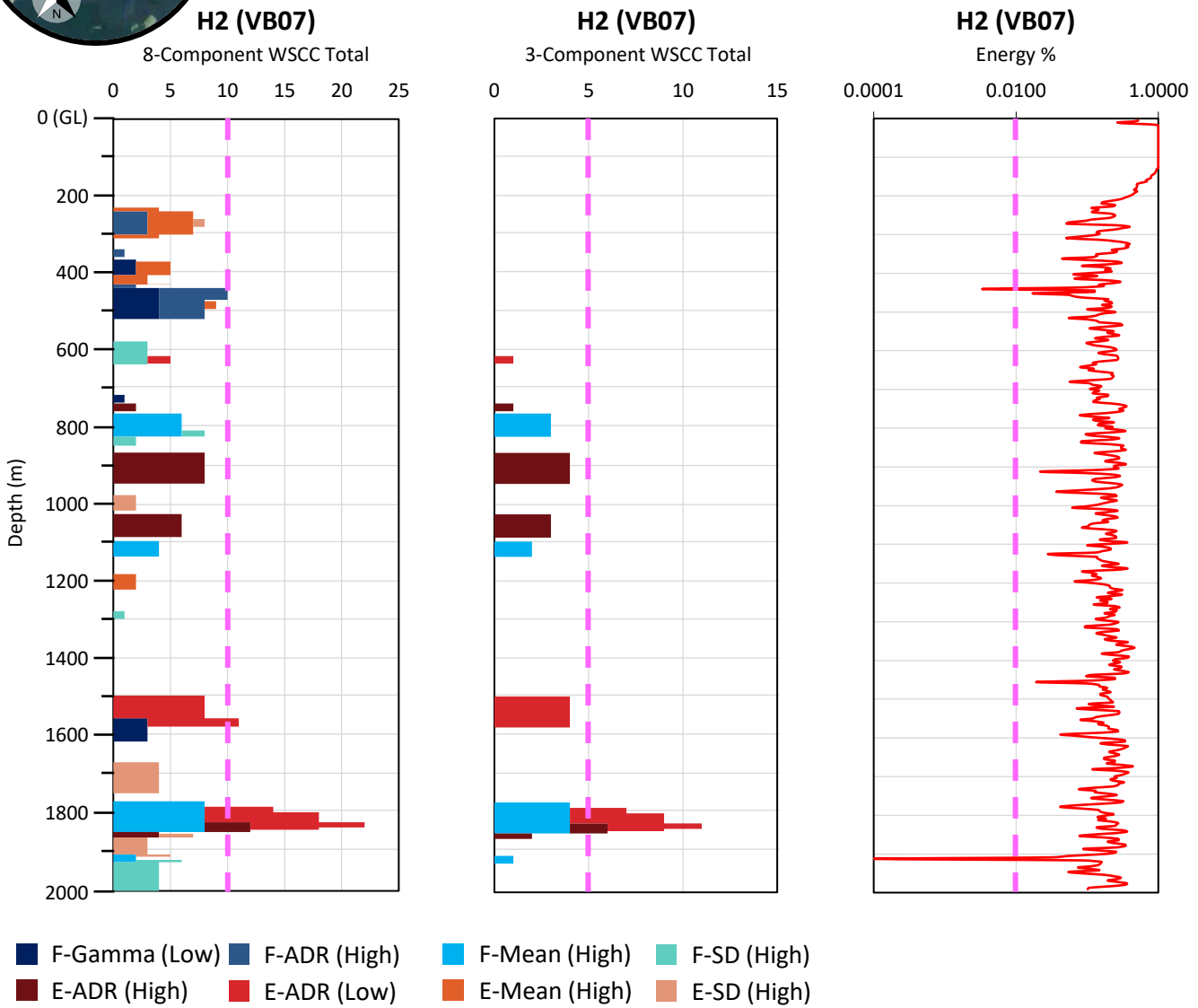


- A WSCC target is assigned if the WSCC values exceed 10 or 5 in the 3-Component or 8-Component Enhanced WSCC charts, respectively.
- A strong target is identified when the WSCC values are significantly high, they exceed baselines in both charts, or they correlate with an E% trough.

Hole ID	Processed Depth (m)	Elevation (m)
VB07	2000	339
VB08	2000	339
VB09	2000	339
VB10	2000	339
VB11	2000	339
VB12	2000	339



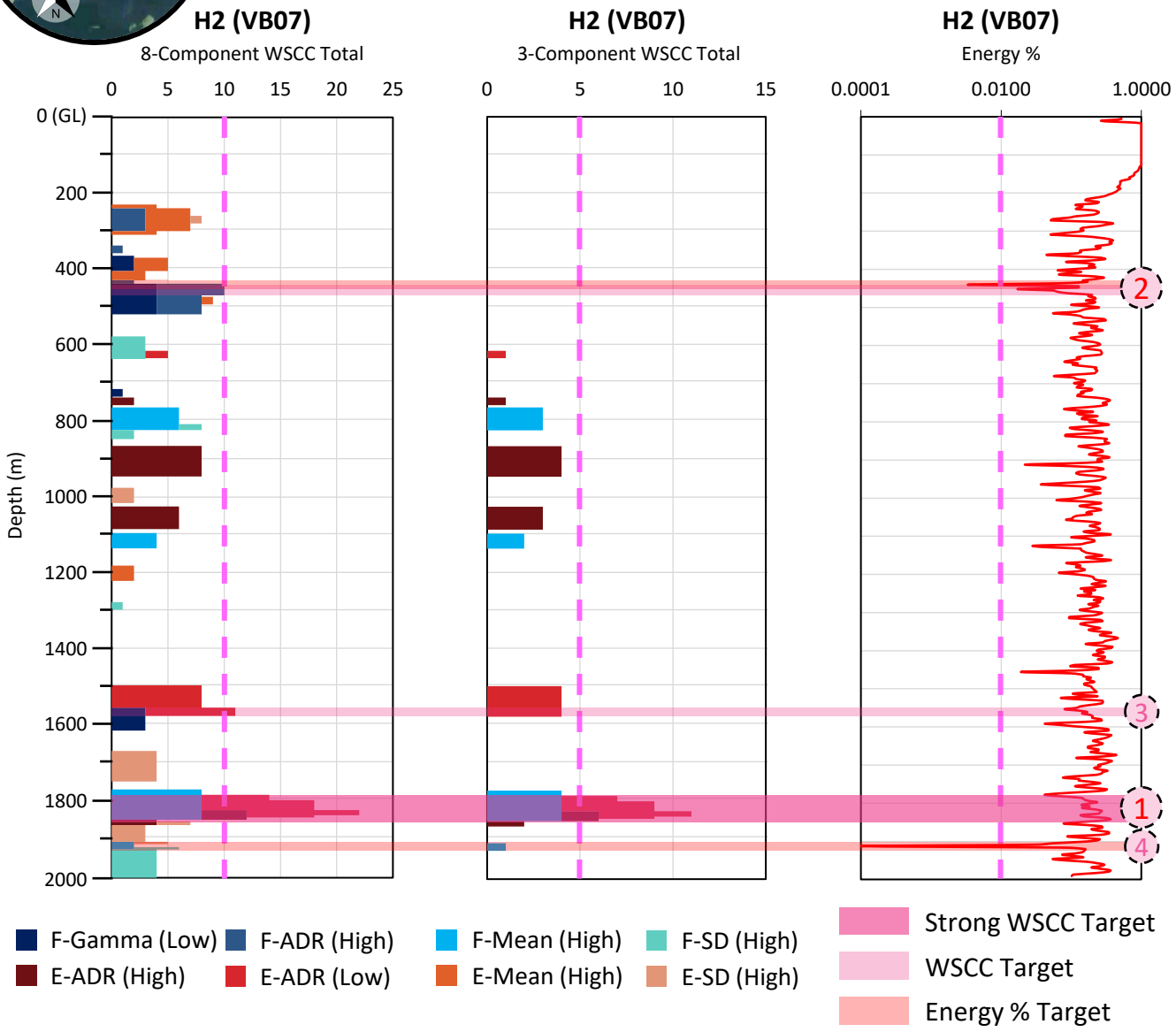
3) Results: VB07



WSCC targets will be identified when the baselines of 10 and 5 are met/passed in the 8-Component and 3-Component WSCC charts, respectively.

Energy % targets will be identified when the Energy % signal meets or drops below the 0.01 baseline.

3) Results: VB07

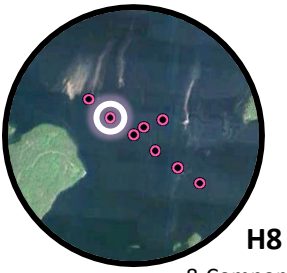


WSCC targets will be identified when the baselines of 10 and 5 are met/passed in the 8-Component and 3-Component WSCC charts, respectively.

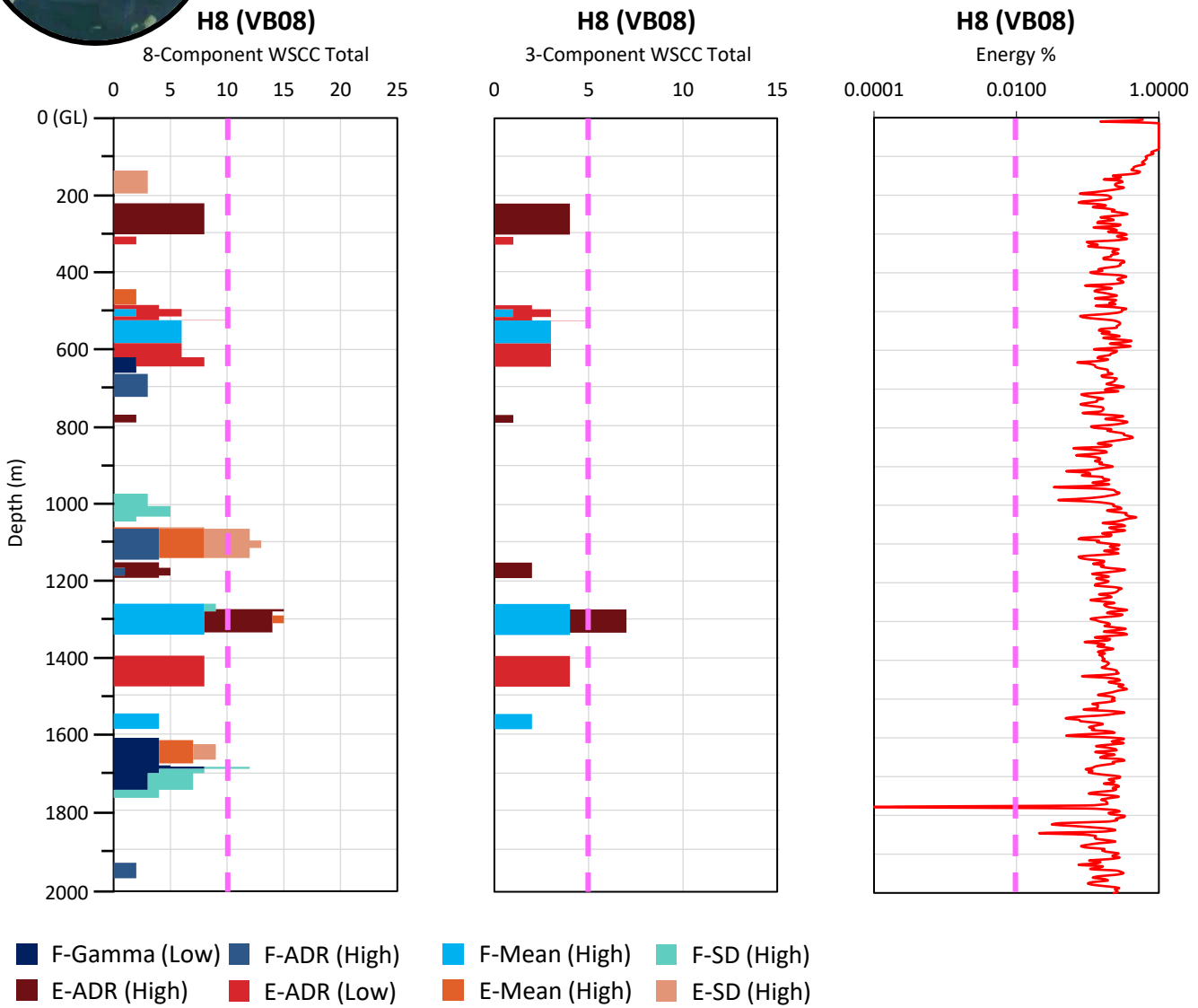
Energy % targets will be identified when the Energy % signal meets or drops below the 0.01 baseline.

- **Major Targets:**
  1. **Target 1:** Large WSCC target greatly exceeds the baselines in 3- & 8-Components from 1780-1850m.
  2. **Target 2:** Smaller WSCC target in 8-Component correlates with an E% trough at 450m depth.
- **Minor Targets:**
  3. **Target 3:** A small WSCC target in the 8-Component at 1570m.
  4. **Target 4:** A large E% trough at 1915m depth.
- **Summary:**

  Greatest confidence mineralisation zone in VB07 is located from 1780-1915m depth.

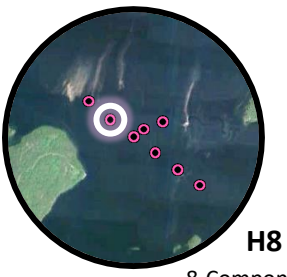


3) Results: VB08

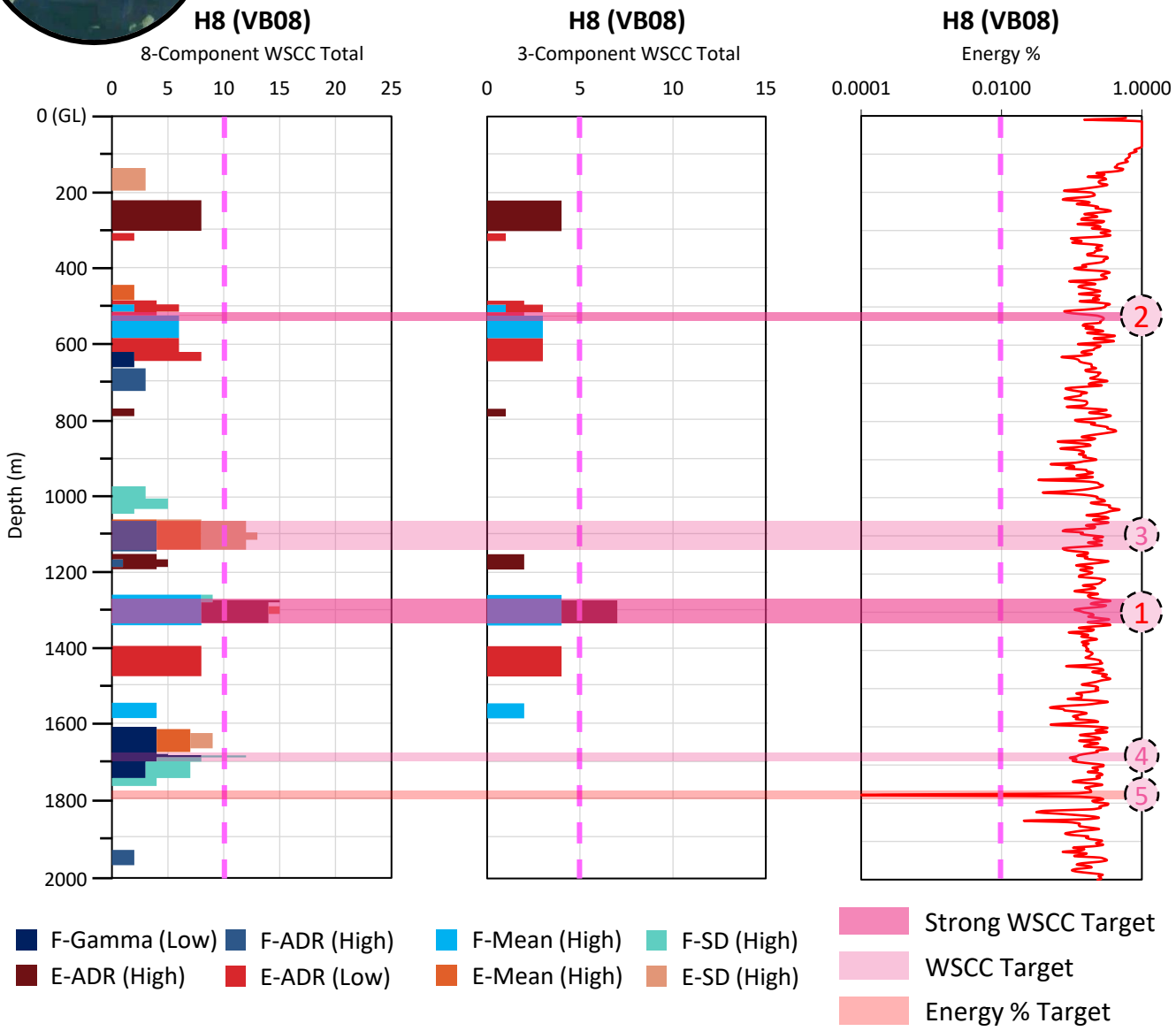


WSCC targets will be identified when the baselines of 10 and 5 are met/passed in the 8-Component and 3-Component WSCC charts, respectively.

Energy % targets will be identified when the Energy % signal meets or drops below the 0.01 baseline.



3) Results: VB08



WSCC targets will be identified when the baselines of 10 and 5 are met/passed in the 8-Component and 3-Component WSCC charts, respectively.

Energy % targets will be identified when the Energy % signal meets or drops below the 0.01 baseline.

Major Targets:

1. **Target 1:** Large WSCC target exceeds the baselines in 3- & 8-Components from 1270-1330m.
2. **Target 2:** Smaller WSCC target in both 3- & 8-Component at 523m depth.

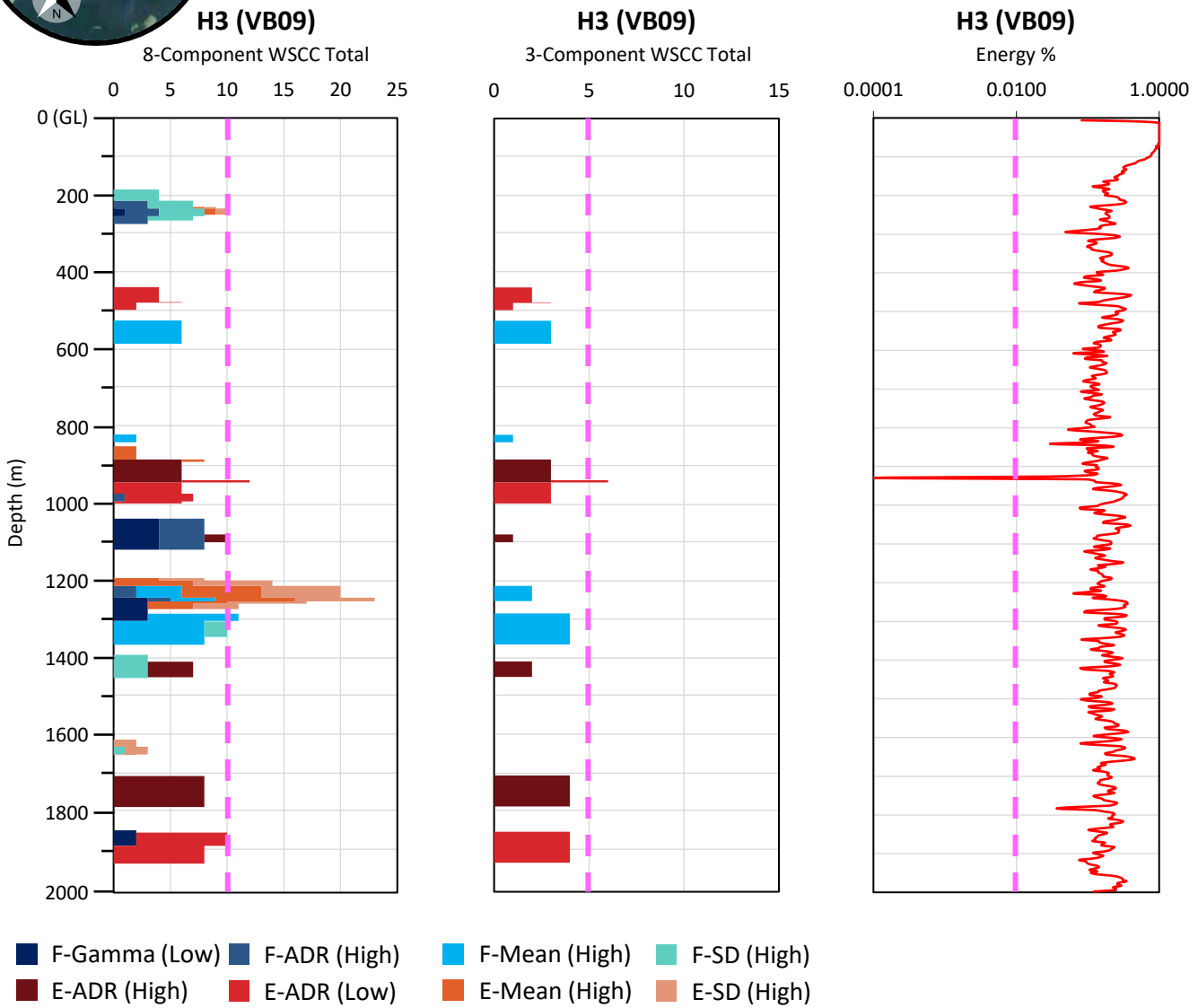
Minor Targets:

3. **Target 3:** WSCC target in the 8-Component from 1060-1140m.
4. **Target 4:** WSCC target in the 8-Component at 1680m.
5. **Target 5:** A large E% trough at 1780m depth.

Summary:

Greatest confidence mineralisation zone in VB08 is located from 1060-1330m depth.

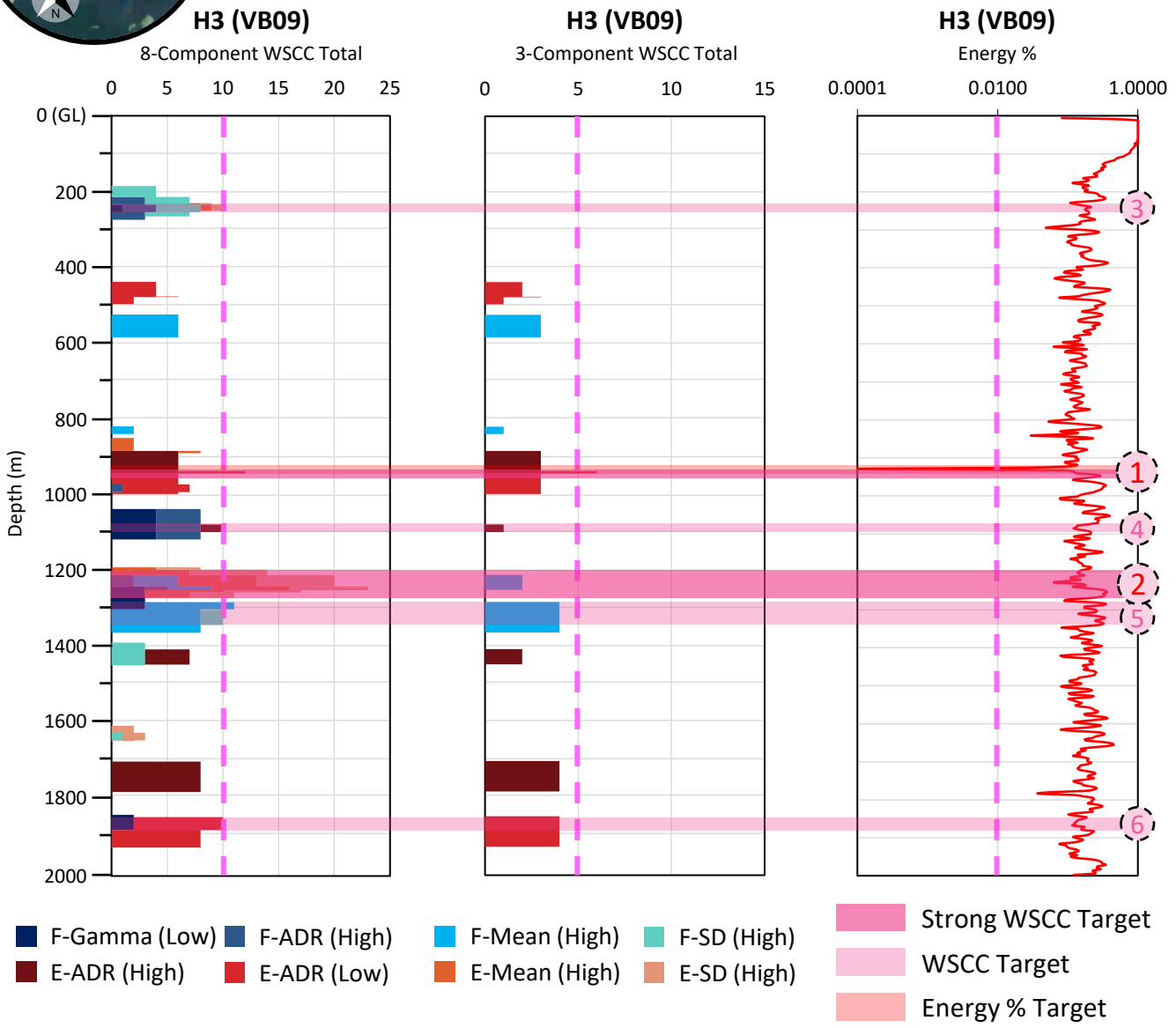
3) Results: VB09



WSCC targets will be identified when the baselines of 10 and 5 are met/passed in the 8-Component and 3-Component WSCC charts, respectively.

Energy % targets will be identified when the Energy % signal meets or drops below the 0.01 baseline.

3) Results: VB09



WSCC targets will be identified when the baselines of 10 and 5 are met/passed in the 8-Component and 3-Component WSCC charts, respectively.

Energy % targets will be identified when the Energy % signal meets or drops below the 0.01 baseline.

Major Targets:

1. **Target 1:** WSCC target that exceeds the baselines in both 3- & 8-Components, as well as a strong E% trough at 940m.
2. **Target 2:** Very strong WSCC target in the 8-Component, however, not in the 3-Component.

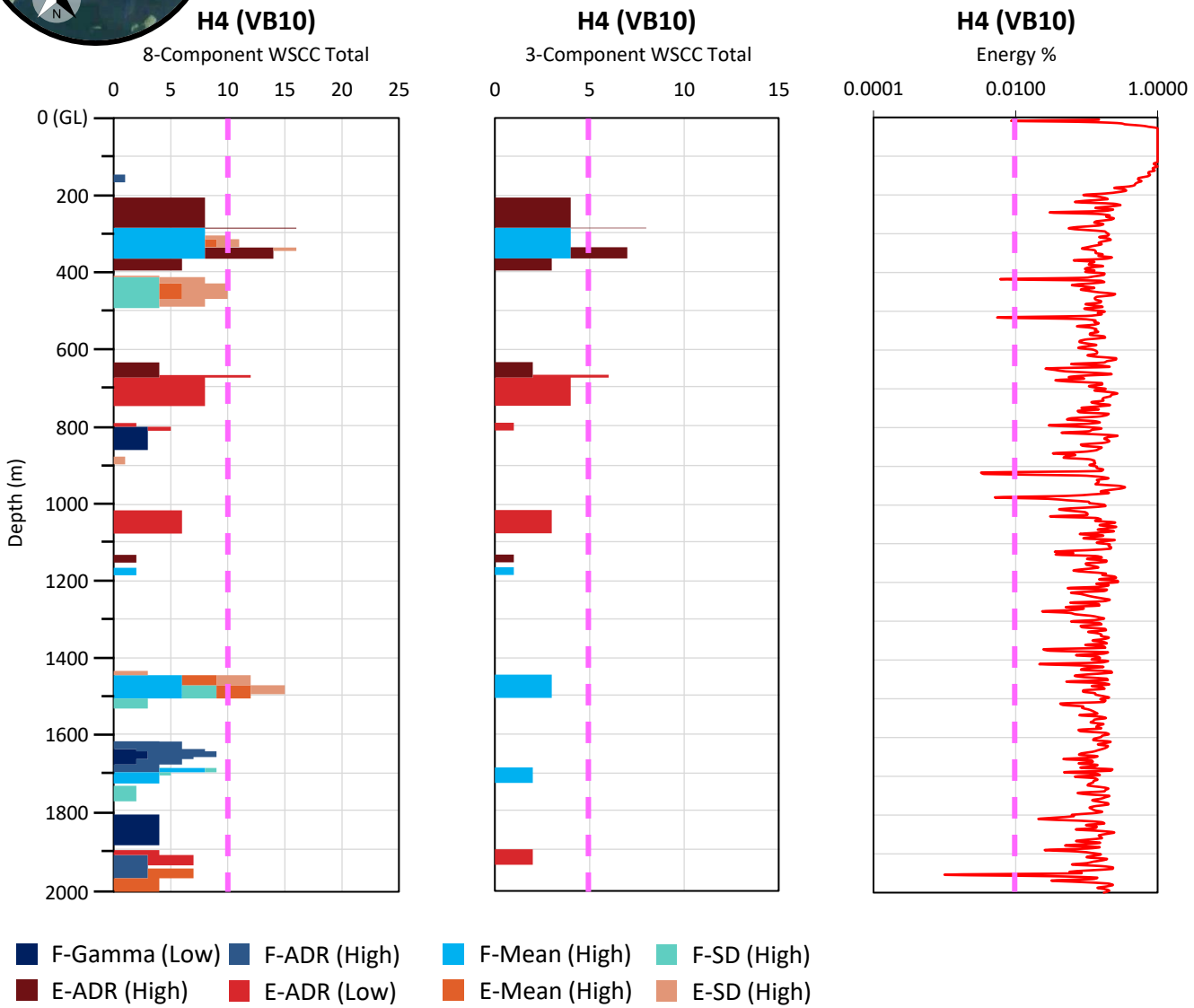
Minor Targets:

3. **Target 3:** WSCC target in the 8-Component at 240m.
4. **Target 4:** WSCC target in the 8-Component at 1085m.
5. **Target 5:** WSCC target in the 8-Component from 1280-1340m depth.
6. **Target 6:** WSCC target in the 8-Component at 1860m.

Summary:

Greatest confidence mineralisation zone in VB09 is located from 940-1340m depth.

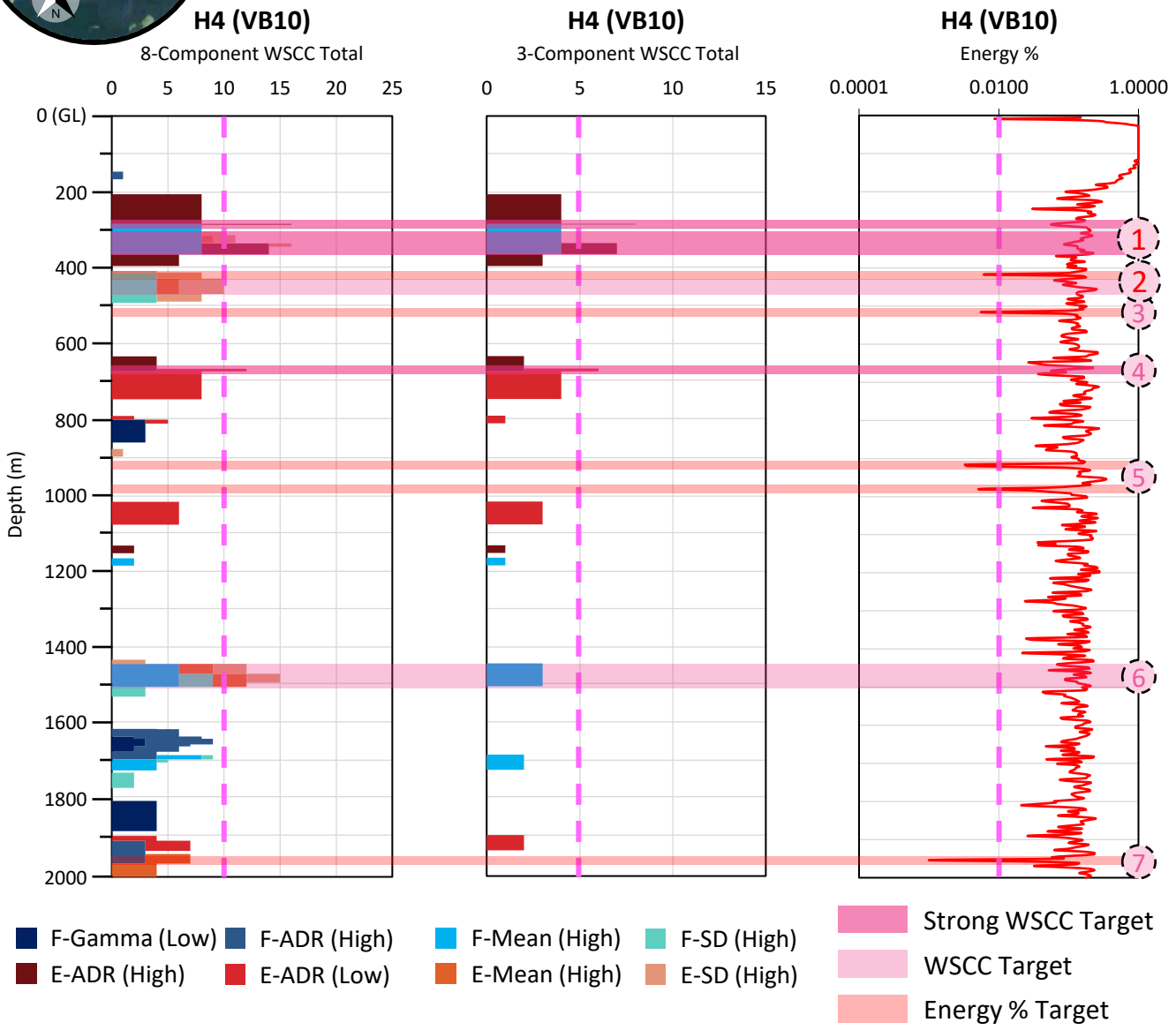
3) Results: VB10



WSCC targets will be identified when the baselines of 10 and 5 are met/passed in the 8-Component and 3-Component WSCC charts, respectively.

Energy % targets will be identified when the Energy % signal meets or drops below the 0.01 baseline.

3) Results: VB10



WSCC targets will be identified when the baselines of 10 and 5 are met/passed in the 8-Component and 3-Component WSCC charts, respectively.

Energy % targets will be identified when the Energy % signal meets or drops below the 0.01 baseline.

Major Targets:

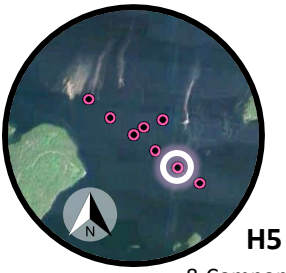
1. **Target 1:** WSCC target that exceeds the baselines in both 3- & 8-Components, from 285-360m
2. **Target 2:** Smaller WSCC target in 8-Component correlates with an E% trough at 450m depth.

Minor Targets:

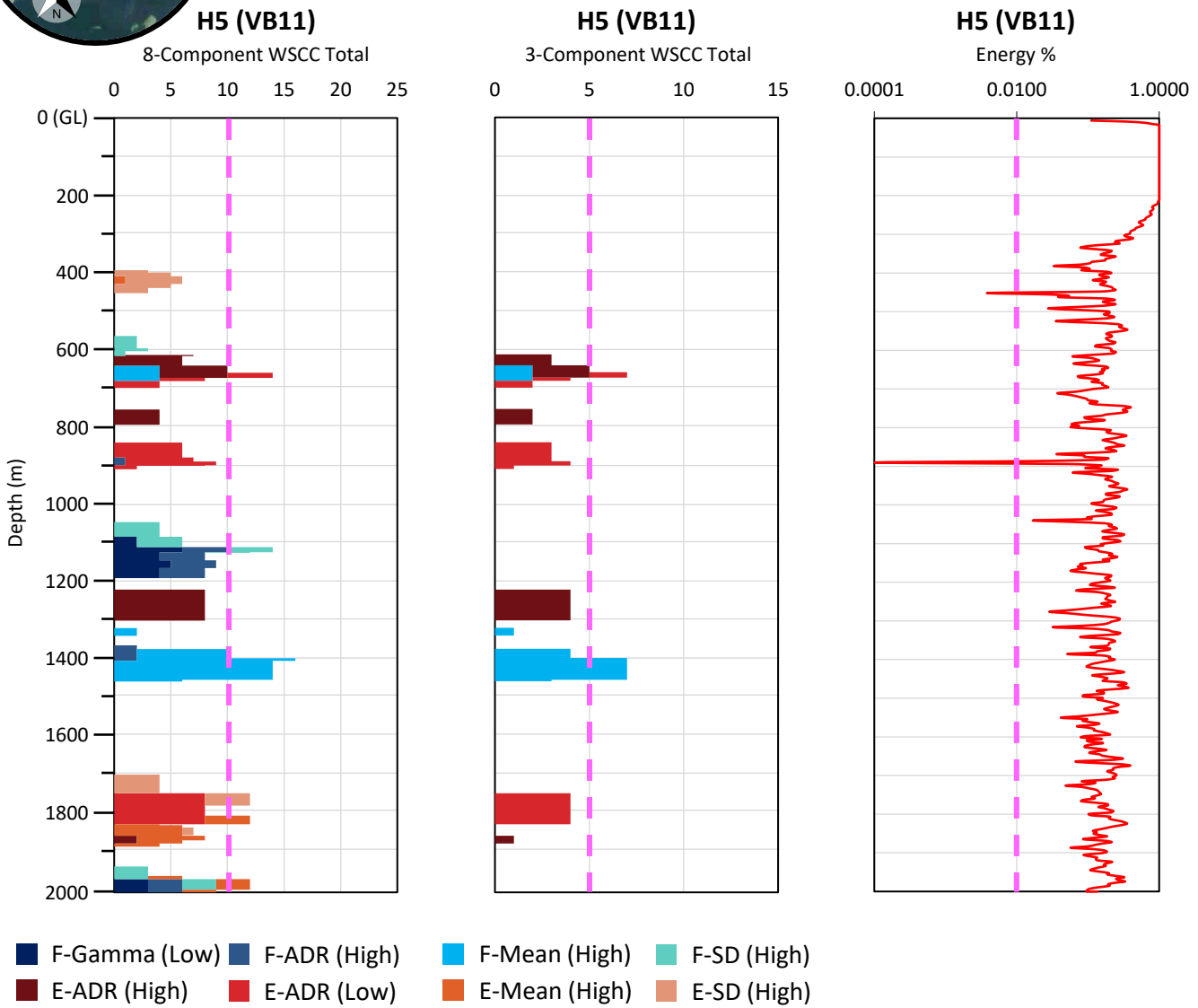
3. **Target 3:** E% trough at 516m.
4. **Target 4:** WSCC target in 3- & 8-Component at 670m.
5. **Target 5:** E% troughs at 920m & 980m depths.
6. **Target 6:** WSCC target in the 8-Component from 1440-1500m depth.
7. **Target 7:** Strong E% trough at 1950m.

Summary:

Greatest confidence mineralisation zone in VB10 is located from 285-670m depth.



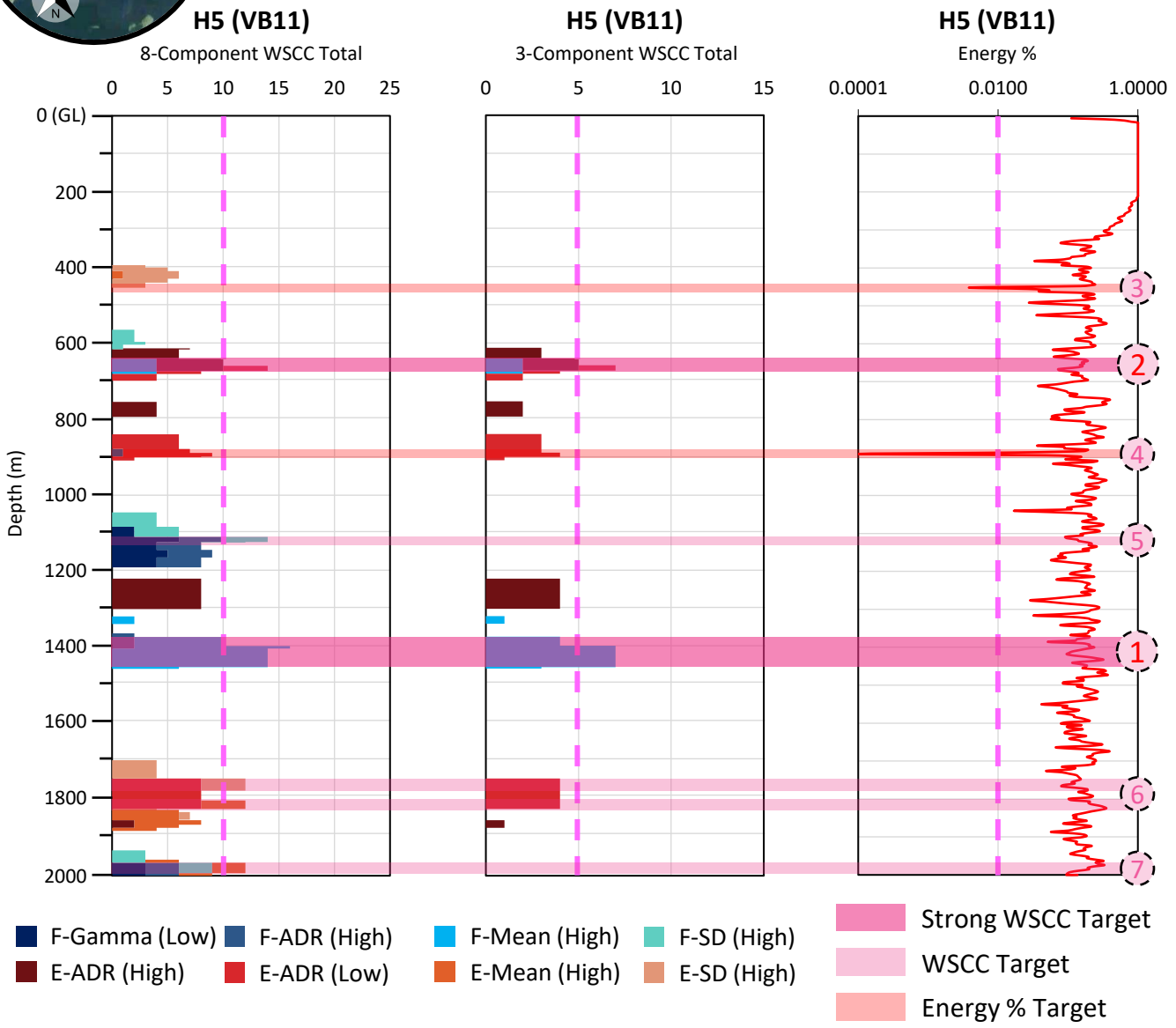
3) Results: VB11



WSCC targets will be identified when the baselines of 10 and 5 are met/passed in the 8-Component and 3-Component WSCC charts, respectively.

Energy % targets will be identified when the Energy % signal meets or drops below the 0.01 baseline.

3) Results: VB11



WSCC targets will be identified when the baselines of 10 and 5 are met/passed in the 8-Component and 3-Component WSCC charts, respectively.

Energy % targets will be identified when the Energy % signal meets or drops below the 0.01 baseline.

Major Targets:

1. **Target 1:** Strong WSCC target that exceeds the baselines in 3- & 8-Components, from 1370-1450m.
2. **Target 2:** WSCC target that exceeds the baselines in 3- & 8-Components, from 640-670m.

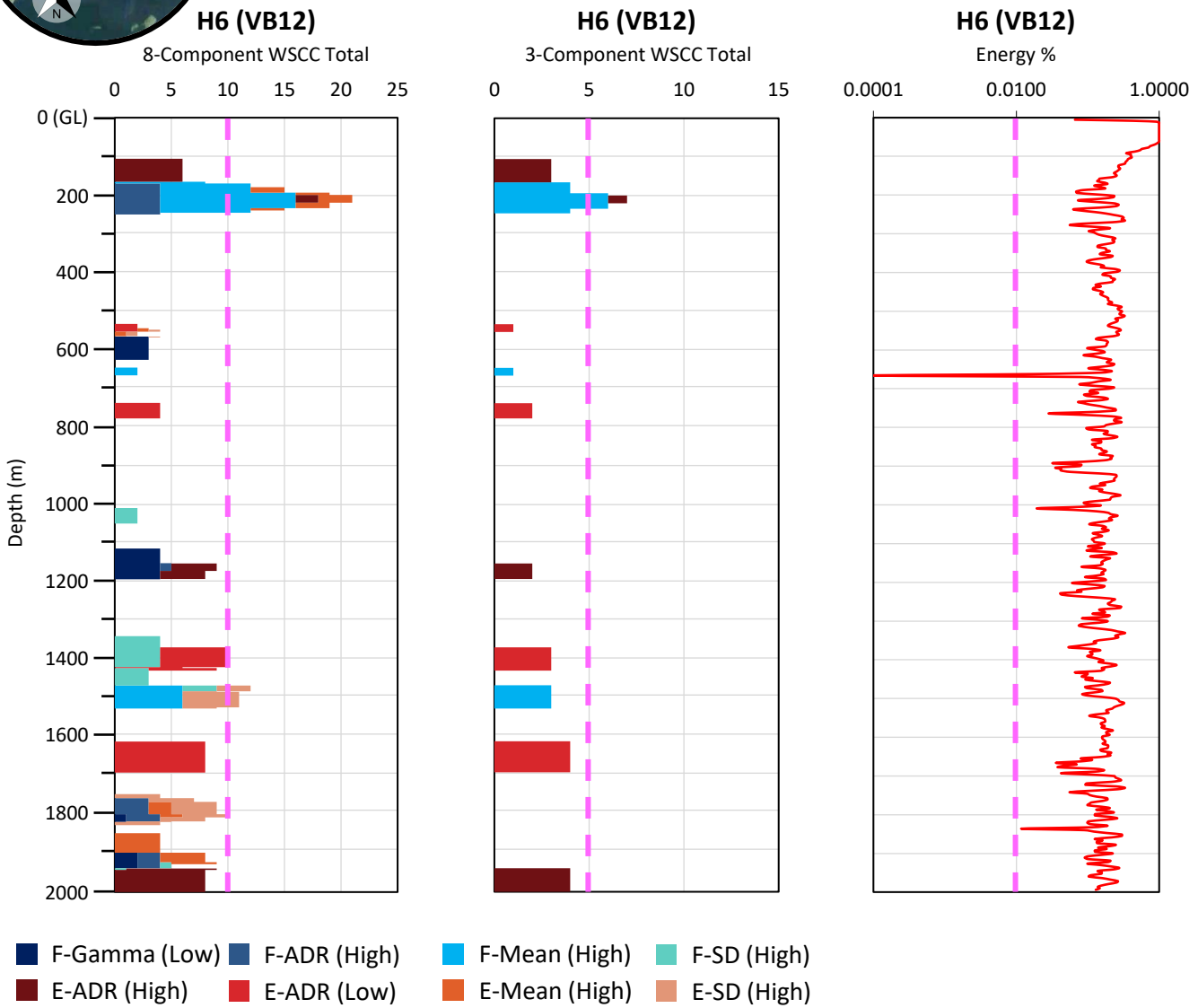
Minor Targets:

3. **Target 3:** E% trough at 450m.
4. **Target 4:** Strong E% trough at 890m.
5. **Target 5:** WSCC target in the 8-Component at 1115m.
6. **Target 6:** Two WSCC target in the 8-Component from 1745-1825m depth.
7. **Target 7:** WSCC target in the 8-Component at 1980m.

Summary:

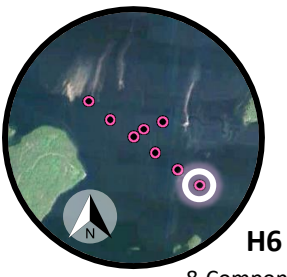
Greatest confidence mineralisation zone in VB11 is located from 1115-1450m depth.

3) Results: VB12

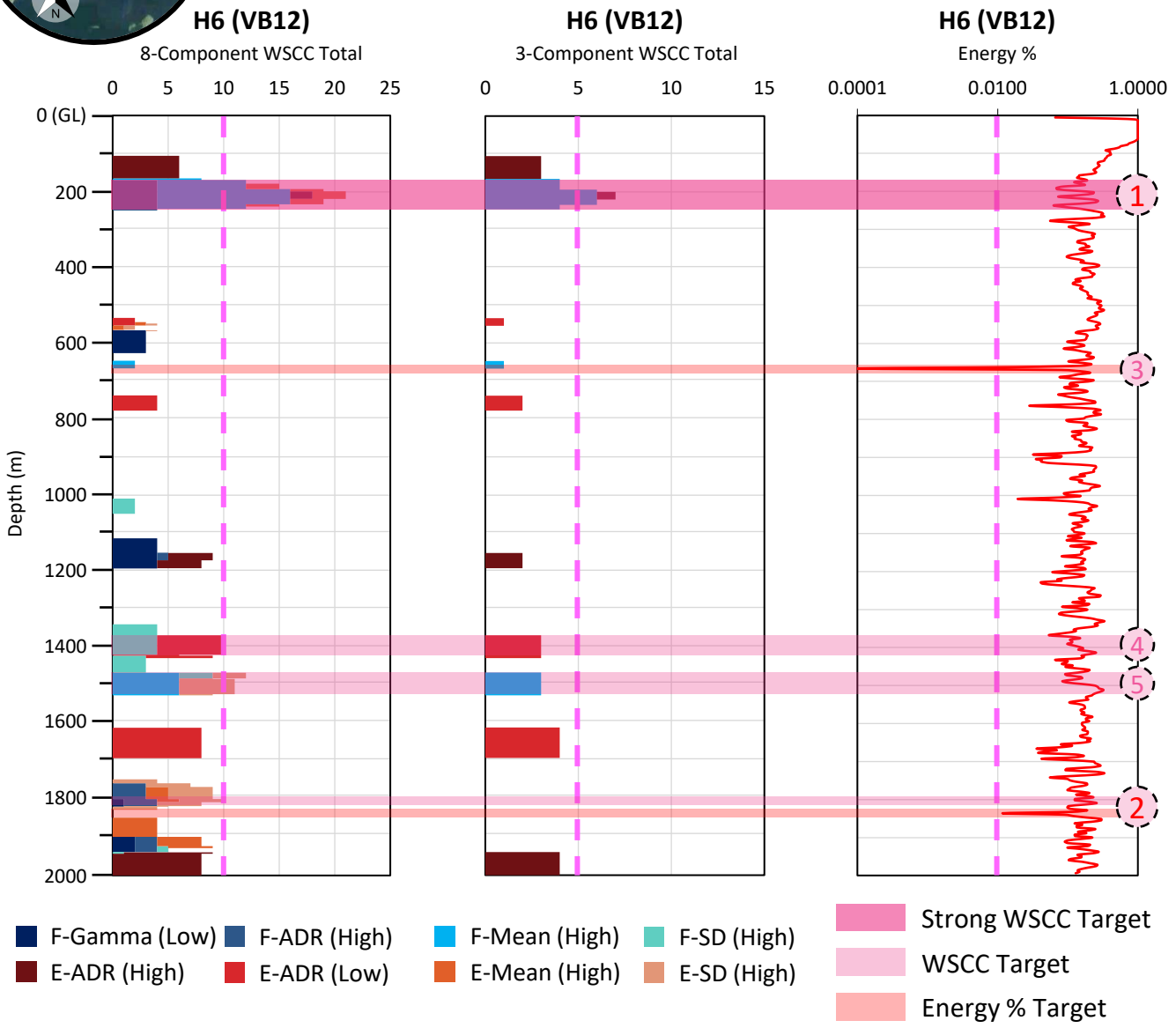


WSCC targets will be identified when the baselines of 10 and 5 are met/passed in the 8-Component and 3-Component WSCC charts, respectively.

Energy % targets will be identified when the Energy % signal meets or drops below the 0.01 baseline.



3) Results: VB12



WSCC targets will be identified when the baselines of 10 and 5 are met/passed in the 8-Component and 3-Component WSCC charts, respectively.

Energy % targets will be identified when the Energy % signal meets or drops below the 0.01 baseline.

Major Targets:

1. **Target 1:** Large WSCC target greatly exceeds the baselines in 3- & 8-Components from 170-245m.
2. **Target 2:** Smaller WSCC target in 8-Component directly above an E% trough at 1800m depth.

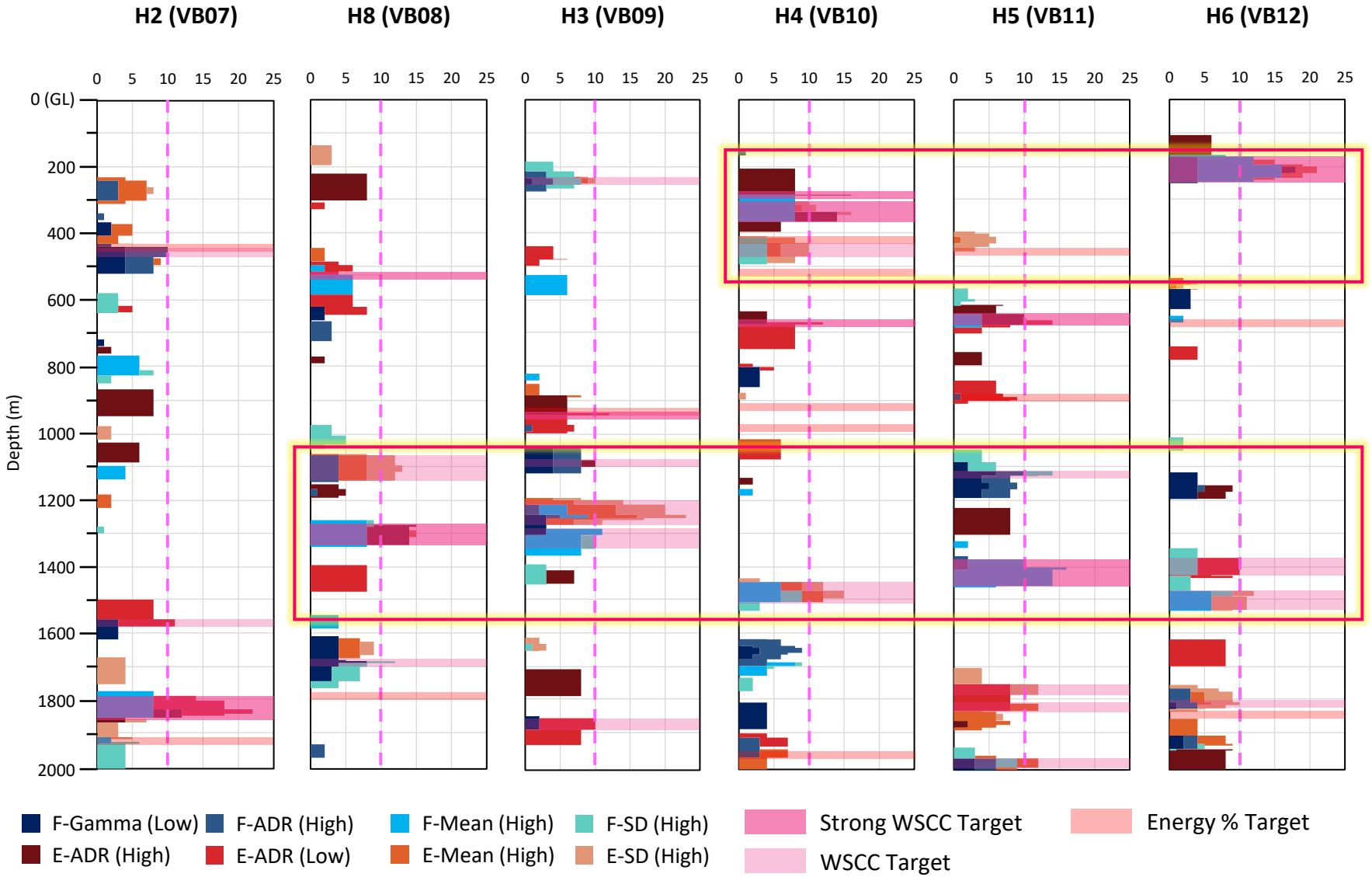
Minor Targets:

3. **Target 3:** A large E% trough at 665m depth.
4. **Target 4:** WSCC target in the 8-Component at 1400m.
5. **Target 5:** WSCC target in the 8-Component at 1500m.

Summary:

Greatest confidence mineralisation zones in VB12 are located from 170-245m, and 1400-1500m depths.

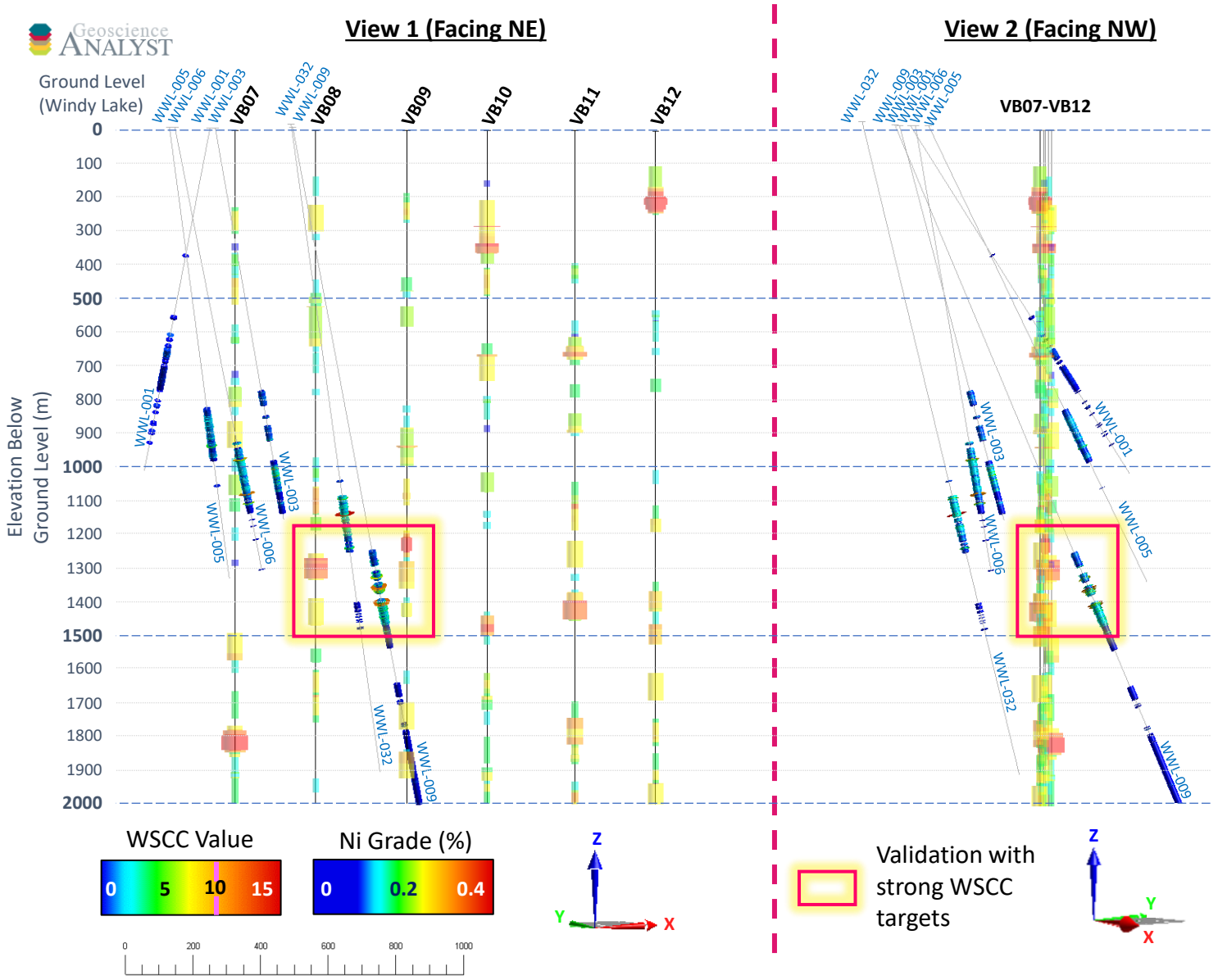
3) Results: Summary



Major Mineralisation Zones:

- The most significant mineralisation zone is located from 1050-1550m depth across VB08 to VB12.
- There is also a shallow mineralisation zone from 150-550m depth across VB10 to VB12.

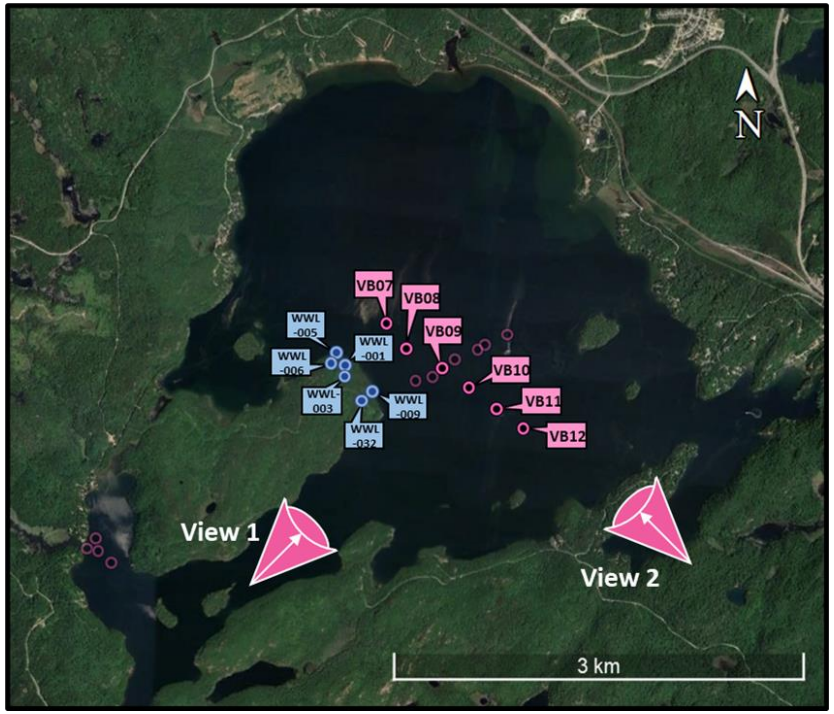
4) Discussion: Validation



The closest drill hole to the vertical ADR scans in Windy Lake is WWL-009, where there is a section of assay data within the Felsic Norite that is close to both VB08 and VB09.

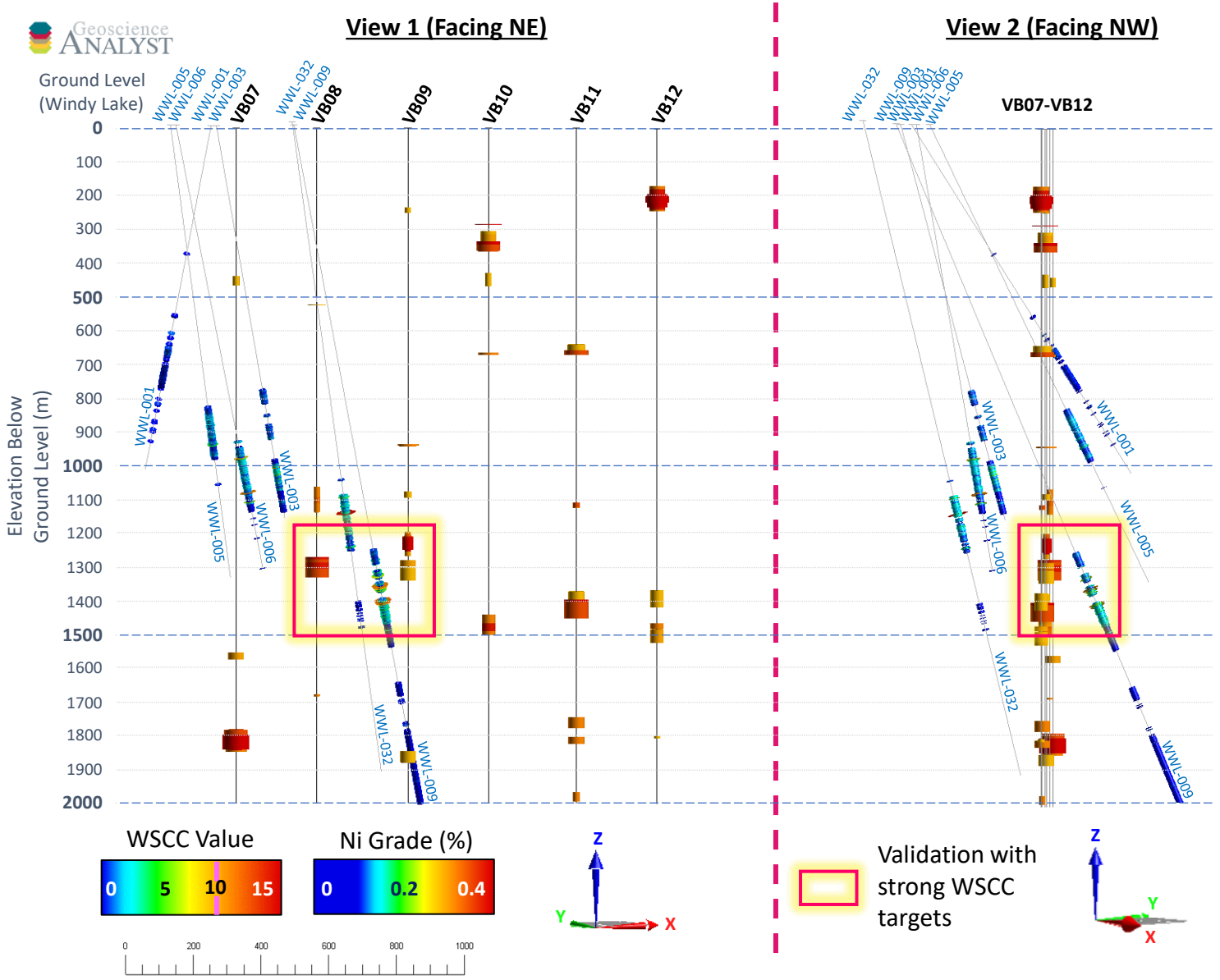
There is a section of high mineralisation in WWL-009 from 1300-1450m depth (BGL) that correlates very well to the most significant mineralisation zone of interest in the ADR results from 1050-1550m depth.

The high grade mineralisation in WWL-009 correlates well with the strong WSCC targets in VB08 and VB09.



*The strongest mineralisation zones can be more easily visualised when all WSCC values below the baseline of 10 are removed.

4) Discussion: Validation



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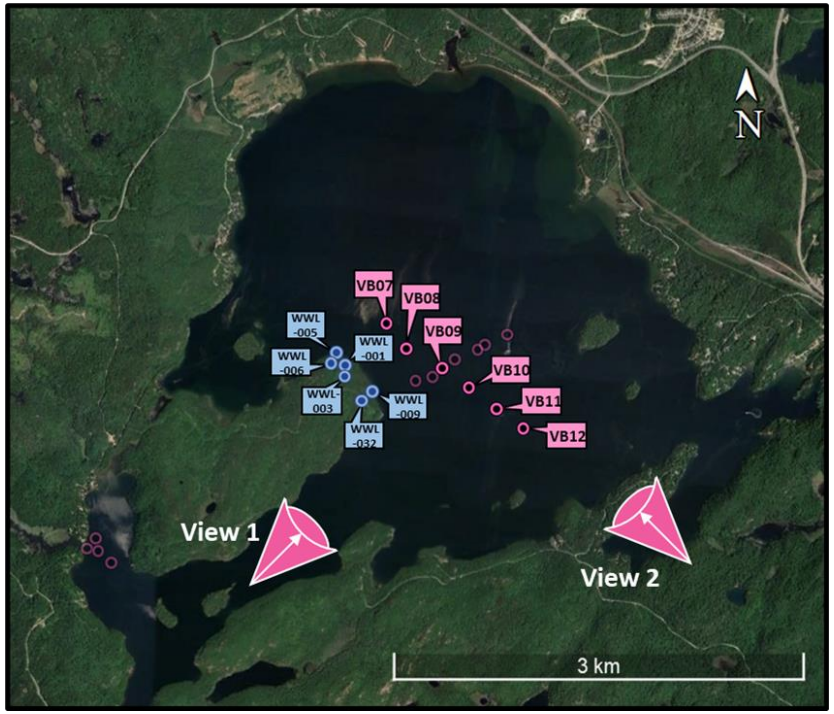

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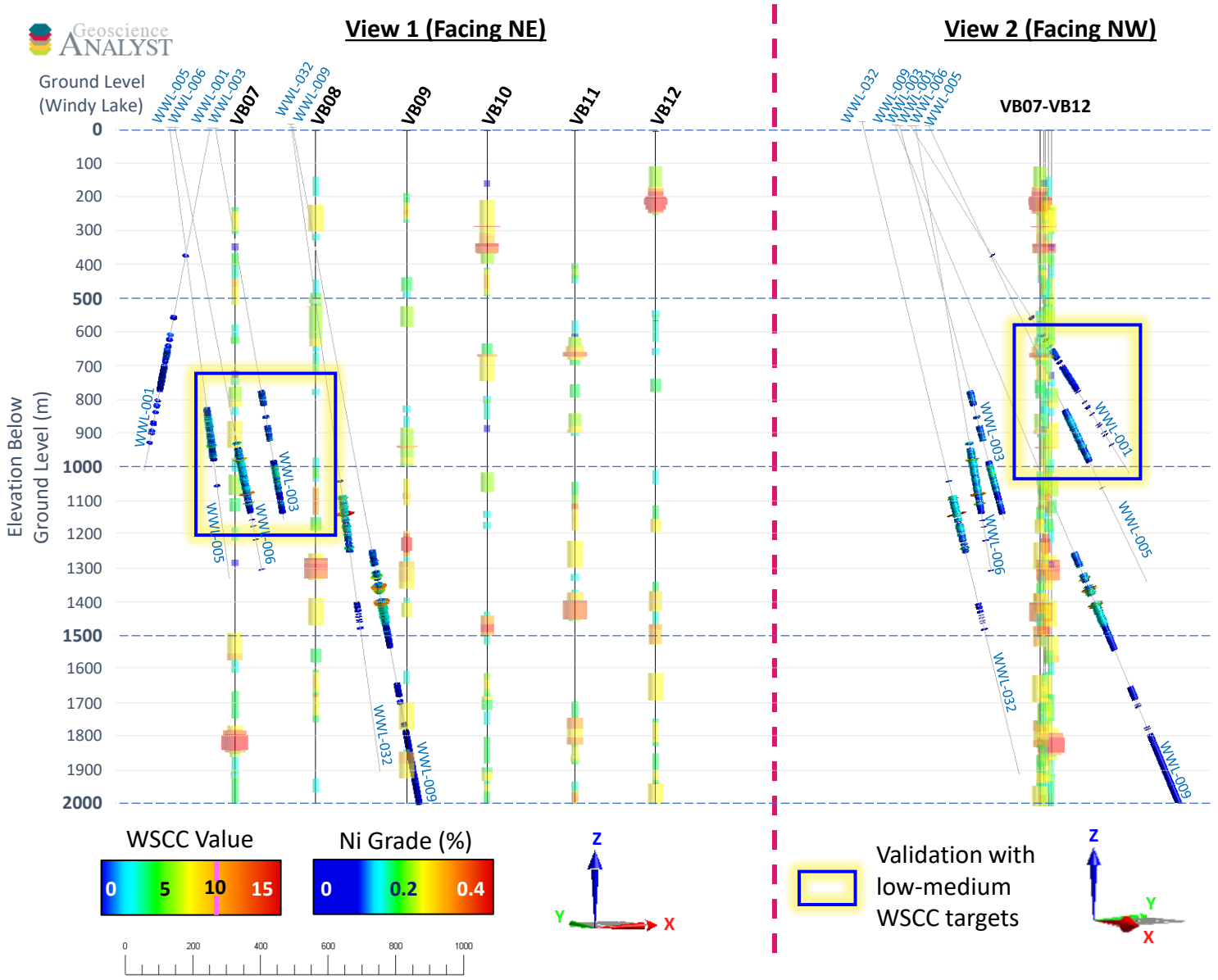
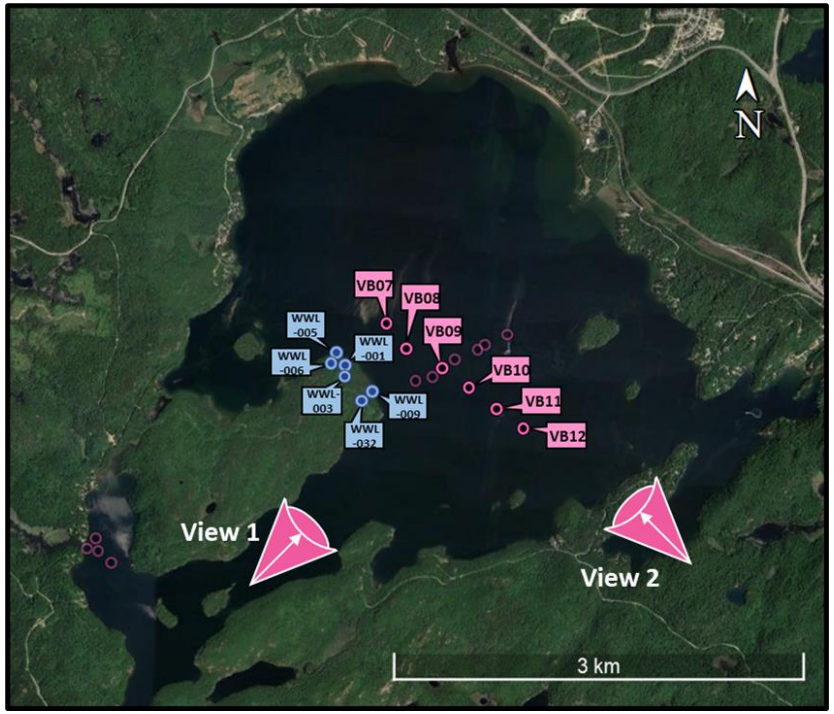


There are some other sections of the vertical ADR scans where the drill hole results are within 100m.

WWL-001, WWL-003, WWL-005 and WWL-006 have low to medium mineralisation grade and correlate to low to medium WSCC targets, particularly in VB07.

Overall, the highest assay grades correlate to strong WSCC targets, whereas smaller assay grades correlate to smaller WSCC targets.



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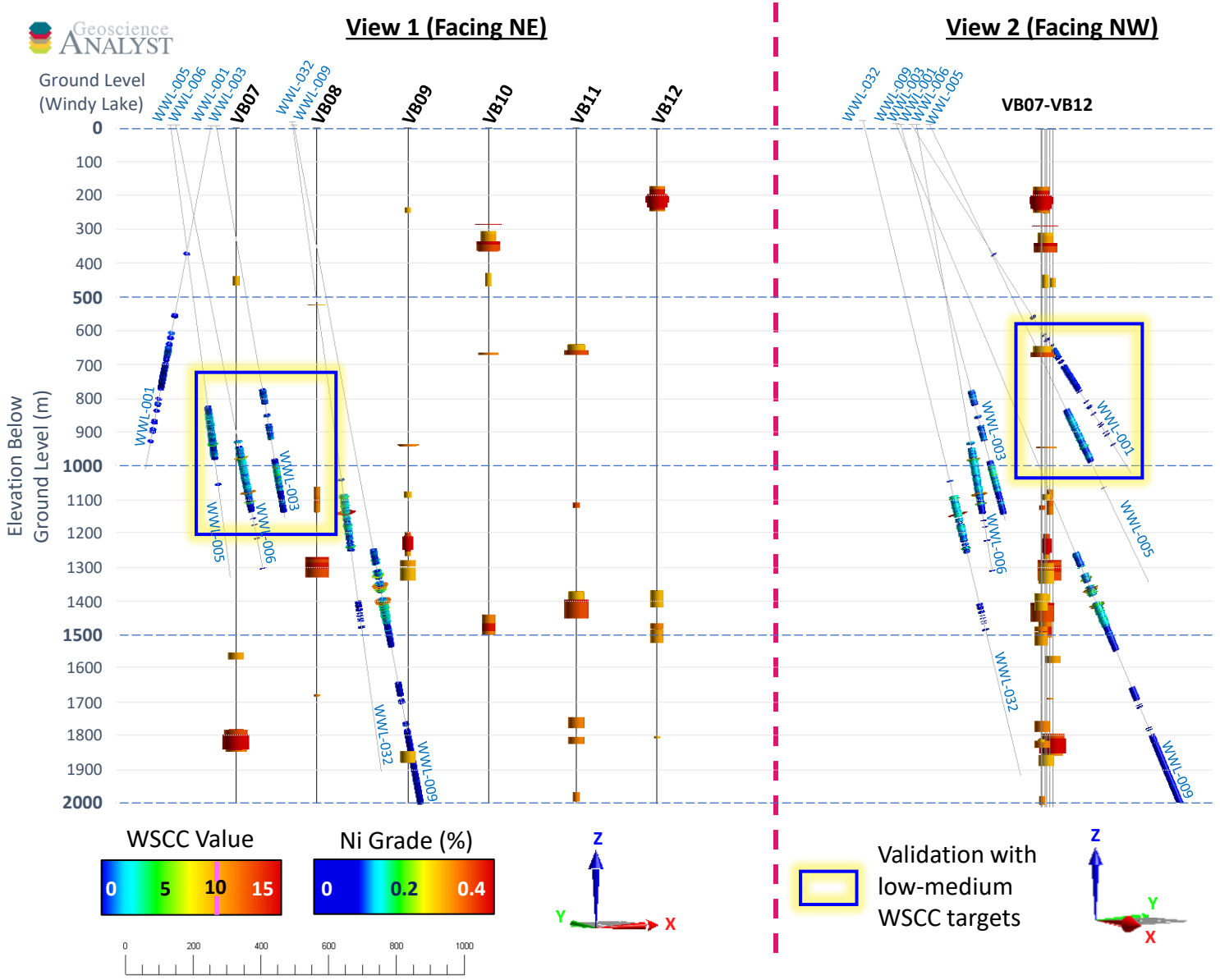

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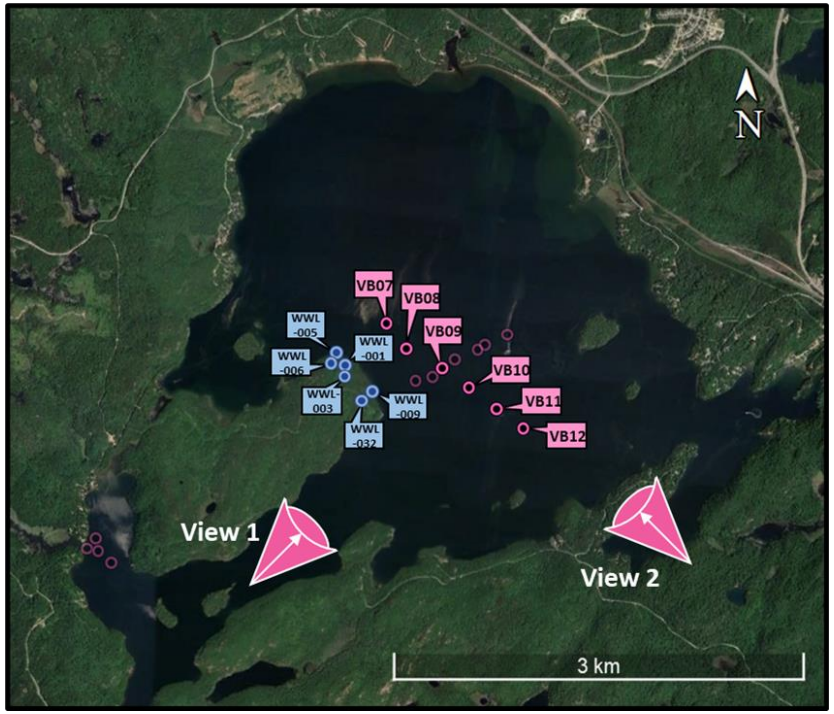
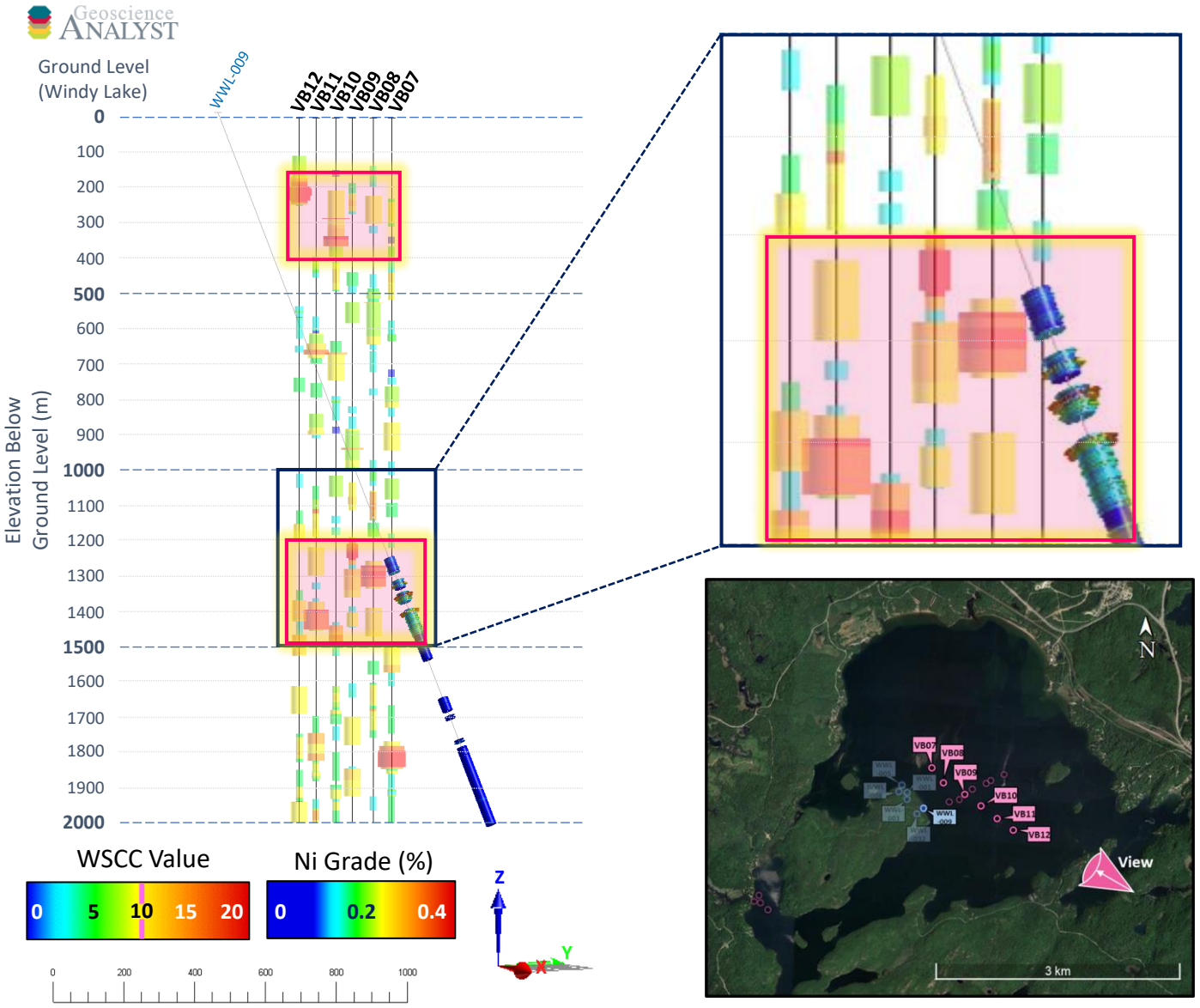
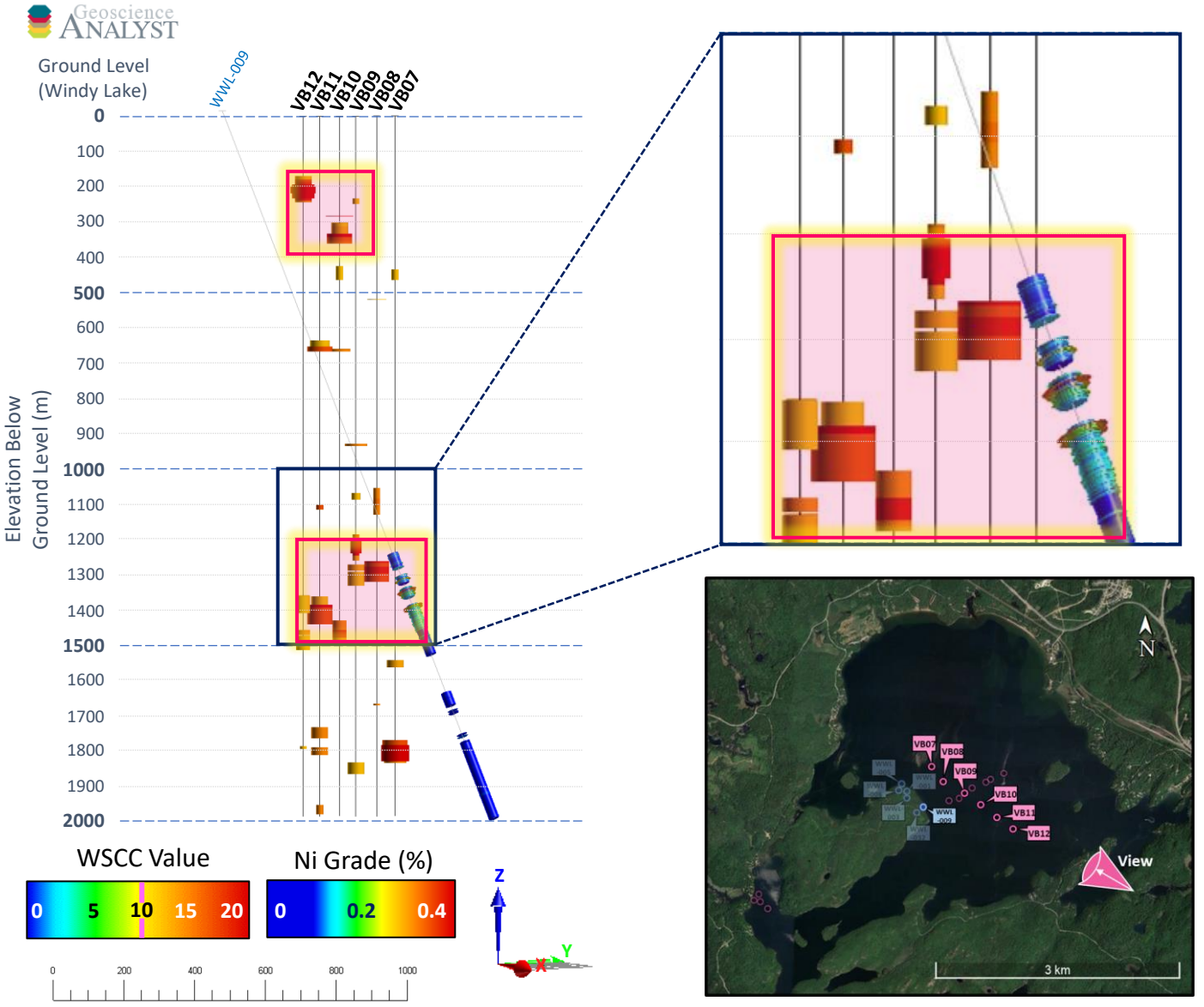


5) Conclusions: Mineralisation Potential



- The Adrok V-Bores at Windy Lake have identified a high-confidence mineralisation zone from the WSCC results at a depth of 1250-1500m.
- This zone of interest is validated by the training data, with the highest Ni grade from drilling correlating exactly with the identified mineralisation.
- Adrok have also identified a zone of high WSCC mineralisation at a shallower depth of 150-400m, however, there is no intersecting drilling here.
- **In summary, the validated mineralisation zone that Adrok have identified at a depth of 1250-1500m can be interpretated to be an embayment deposit associated with the Sudbury Igneous Complex.**

5) Conclusions: Mineralisation Potential



- The high-confidence mineralisation zones can be more accurately observed when only viewing above the 10 WSCC threshold.
- The Adrok V-Bores at Windy Lake have identified a high-confidence mineralisation zone from the WSCC results at a depth of 1250-1500m.
- This zone of interest is validated by the training data, with the highest Ni grade from drilling correlating exactly with the identified mineralisation.
- Adrok have also identified a zone of high WSCC mineralisation at a shallower depth of 150-400m, however, there is no intersecting drilling here.
- **In summary, the validated mineralisation zone that Adrok have identified at a depth of 1250-1500m can be interpretated to be an embayment deposit associated with the Sudbury Igneous Complex.**

5) Conclusions

- The full suite of ADR data processing and analysis at the Windy Lake, Sudbury prospect has been completed as part of this project.
- The ADR data has been fully integrated into a 3D model of this section of the Sudbury deposit, with mineralisation interpretations made based on the confidence and occurrences of WSCC targets and E-Log troughs. This has been validated by drilling results.
- These results can be turned into a case study and infographics in order to market our sulphide exploration techniques in one of the most well recognised mineral exploration deposits in the world.

*Video works best in presentation mode

Appendix

Filename	Document Description	Delivery Date
Adrok Collar (UTM).csv	Location of the Adrok stare scans in Urchin Tracking Module (UTM) Zone 17T coordinate system (WGS84)	13/04/2022
Adrok Energy Log Results.csv	Energy % data for all ADR stare sites	13/04/2022
Adrok WSCC Results.csv	WSCC results for all ADR stare sites	13/04/2022
Drillhole Collar (UTM).csv	Location of the relevant WWL drillholes in Urchin Tracking Module (UTM) Zone 17T coordinate system (WGS84)	13/04/2022
Drillhole Assay Results.csv	Assay results from drilling, including Au (g/t), Ag (g/t), Co %, Cu %, Ni %, Pt (g/t), Pd (g/t), TPM (g/t) & S %.	13/04/2022