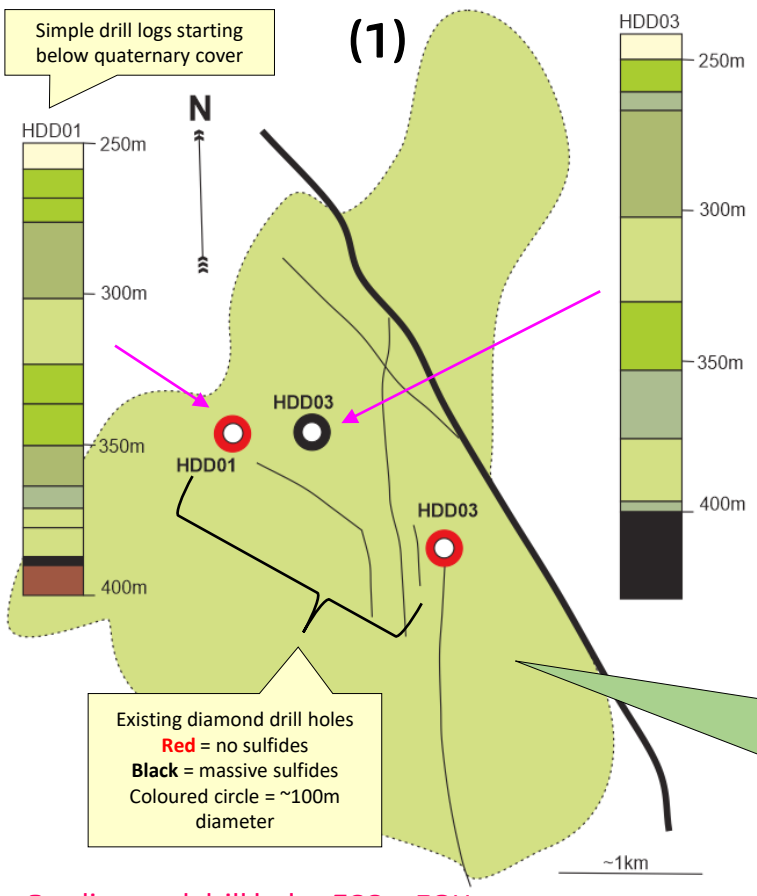
ADROK CAN HELP FIND MASSIVE SULFIDES

EXAMPLE WORKFLOW PGE, Ni, Co, Cu

Presented below is a hypothetical example workflow showing of how ADROK can significantly reduce exploration costs by exploiting the natural physical properties of rocks and sulfides to help delineate the occurrence of lenses of massive sulfides in a layered mafic intrusive such as the world class Talnakh Deposit or Sudbury-type deposits. The aim of the document is to demonstrate how Adrok fits into an exploration program. We tailor design surveys to fit your deposit style and desired outcomes.



3 x diamond drill holes 500m EOH
AUD $300/m $540,000
preliminary drilling program.

PREXISTING KNOWLEDGE

In the hypothetical scenario presented here, the project represents an immature Greenfields exploration project where just three diamond drill holes have confirmed geological evidence of sulfides present at over 400m depth.

The three drill holes, two logs presented here, show various intrusive phases ranging from Dolerites to Gabbros. Disseminated sulfides occur within some layers, however, the target massive sulfide is found near the base of the intrusive sequence.

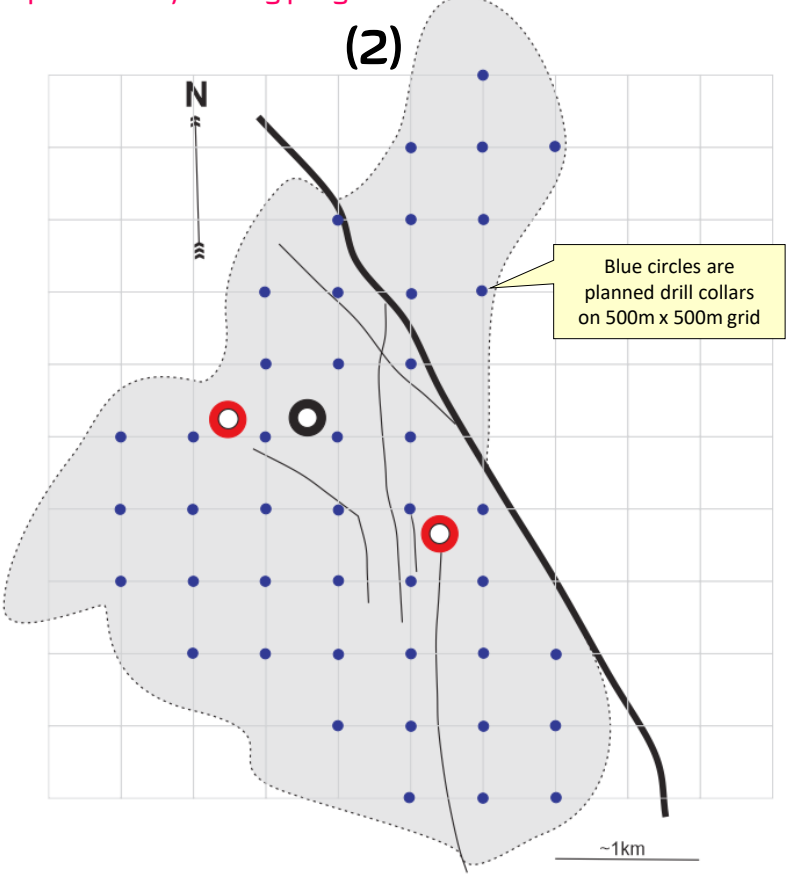
The approximate boundary of the intrusive has been mapped according to existing high-resolution magnetics and it has been proven that the top of the intrusive sequence lies at around 250m depth below thick quaternary cover rocks.

Diamond drilling costs are approximately AUD $250 per meter for HQ2. This cost does not include drill pads, clearing tracks, digging of sumps, provision of water for sumps, drill core trays, drill core transport or logging by a competent geologist. Accordingly the overall cost per meter for drilling will be significantly higher at an estimated AUD $300-350 per meter, however these costs can vary from project to project.

EXAMPLE TARGET

~4 x 6 km layered mafic intrusive containing massive sulfides (PGE, Ni, Cu, Co) as irregularly distributed lenses near base (>350m deep) of intrusive complex.

~250m Quaternary sedimentary cover



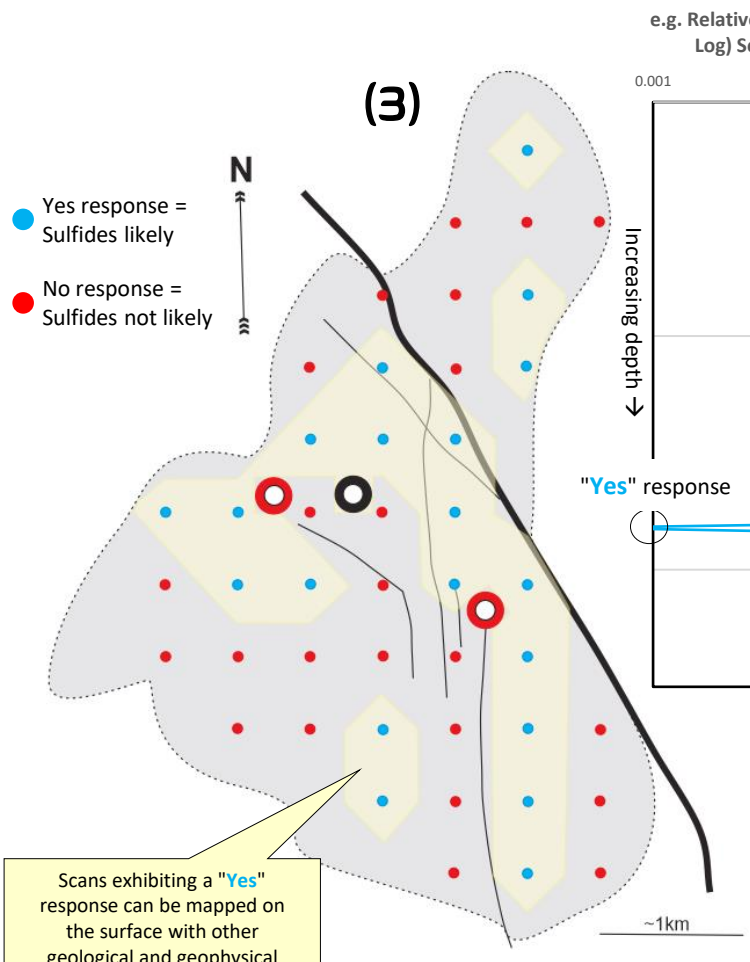
ADR SURVEY DESIGN

Following the interpretation of existing drilling and geophysics, the decision is made to undertake a regional exploration campaign in order to define the location of the lenses of massive sulfides. A 500m x 500m drilling grid is been established (blue points on map **(2)**. 44 drill holes are planned, however, in many cases RC or similar style drilling is adopted in order to reduce costs for an all-in cost of approximately AUD $130 per meter. The total cost for the program is approximately AUD $2,700,000 not including any additional expenses and does not consider the significant amount of time that a drilling campaign such as this may take.

The plan for an ADR survey is very similar to that of a drill program. Because this is a surface-based low-impact geophysical technique, no special permits such as land clearance, vegetation surveys or rehabilitation surveys are required. The equipment is portable and once set up, can be carried to "collar" locations. The entire setup fits within the back of a regular field vehicle.

The ADR survey scans would likely take place at the same planned drill hole collar locations. Approximately 4-8 scans can be carried out per day depending on access from site-to site. Data is collected to over 1000m depth but can be reduced if time is critical. Data acquisition for 44 scans will take approximately 2 weeks.

It should be noted that the grid style survey shown here is for demonstration purposes only, Adrok can carry out scans under almost any conditions and any location because the equipment in extremely portable and can be directed up, down, horizontally or at whatever angle is required for the project. .



Scans exhibiting a "Yes" response can be mapped on the surface with other geological and geophysical data. From this, domains of likely sulfides can be delineated.

THE RESULTS

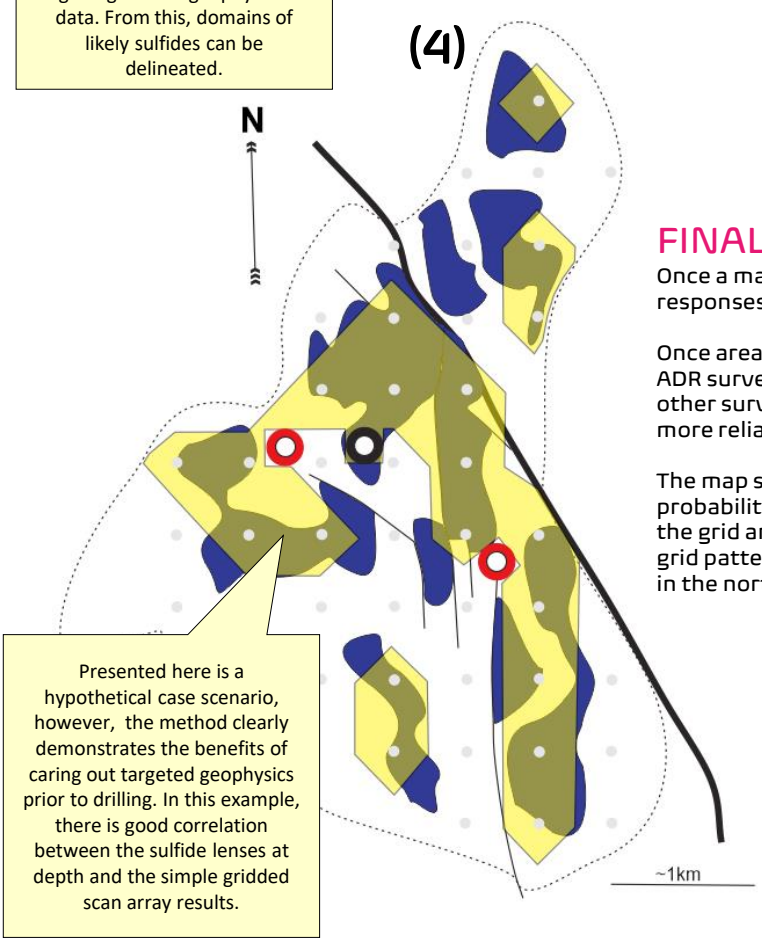
Once collected, the data is initially processed to a total depth of 500m (independent of the total amount of data recorded). Total processing time will be approximately 2-working days per scan.

Once the results pare processed, the un-interpreted results are sent to the client for review. Processed data includes, Relative Energy (shown here), Dielectrics, Frequency.....

Many other results are obtained during the scan survey, however, only energy values are shown here for simplicity

INTERPRETING THE RESULTS FOR TARGETED DRILLING

Based on the results from other projects, massive sulfides can respond strongly to ADR and are usually recognised as an anomalous value in the relative energy (see example results above). The transmitted pulse is reflected by the contact between layers of contrasting dielectric permittivity's. Sulfides tend to have permittivity values up to an above 70 whereas the host gabbro's and silicate-based intrusives exhibit values of less than 15. The scans can be sorted into those that exhibit a strong relative energy versus those that do not. These results can be plotted spatially and then domains of higher probability generated by grouping "yes" responses **(3)**. The nature of broad gridding is such that it may not necessarily intersect all locations of sulfides, however, it is useful for demonstration purposes.



Presented here is a hypothetical case scenario, however, the method clearly demonstrates the benefits of caring out targeted geophysics prior to drilling. In this example, there is good correlation between the sulfide lenses at depth and the simple gridded scan array results.

FINAL TARGETING AND DRILLING

Once a map has been generated, large domains containing "yes" or "no" responses can be ranked as high- and low-priority areas respectively.

Once areas are selected, more focused drilling can be completed, and/or further ADR surveys can be carried out between points with positive returns. As with other surveys including soil, rock chip or scout drilling, the results will become more reliable with increased resolution.

The map shown in **(4)** demonstrates the usefulness of defining zone of high probability prior to drilling. It is apparent that some areas have been missed by the grid and, therefore, ADR, however, if drilling was completed on the same grid pattern, drilling would have also missed these locations, including the zone in the north-west of the complex.

Only the yes responses would be drilled saving time and money in drilling areas with a no response for massive sulfides. Infill-drilling and/or infill scanning would allow the explorer to completely define the sulfide lenses and subsequently generate resource or reserve models at a fraction of the cost of drilling alone.

REAL WORLD RESULTS AND CASE STUDIES

Detecting gold and massive sulfides can be reviewed here

Detecting water at over 350m distance through rock can be reviewed here

SUMMARY

- Results from existing case studies has demonstrated that massive sulfides are suited to the ADR technique
- Scan data can be collected at a fraction of the time and cost of drilling and, under many circumstances, can result in a saving of over 1/10th the cost of drilling!
- The technique is based on existing and well-documented physical principals and physics, however, Adrok bring the very specialised hardware that makes this type of survey possible.
- Adrok always work closely with in-house geologists to plan the best possible survey for the desired outcome
- The example used here is for layered massive sulfide lenses, but a similar workflow can be adopted for any style of massive sulfide deposit or even groundwater and aquifers, potash, uranium, hydrocarbons and coal.

Please contact Adrok to discuss how your deposit might fit into an ADR survey workflow www.adrokgroup.com
Or email info@adrokgroup.com (Scotland, Canada, Australia and everywhere in-between)

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