

## Stavely Project, Victoria: Geological Interpretation and Exploration Implications

Presentation to Stavely Minerals Ltd by Steve Garwin 10<sup>th</sup> of July 2023

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Vertical geochemical dispersion model in porphyry Cu-(Mo-Au) systems as summarized by the MDRU-study, using the Yerington porphyry deposit in Nevada as an example (Cohen, 2011 and Halley et al., 2015). In this model, the top of the causal intrusion is located about three kilometers below the paleo-surface. Metals are zoned above the porphyry center, characterized by proximal, Cu-Mo; intermediate Sn-W; distal As-Sb-Li-Tl; and the 'plume' elements of Bi-Te-Se that extend from the proximal- through to the distal-environments.



There is a consistent element distribution in global porphyry systems. Local discrepancies in metal sequence may reflect late argillic overprints or varying H<sub>2</sub>O:CO<sub>2</sub>:S proportions of the ore fluid. Distribution of Au-Ag varies and is partially controlled by oxidation / sulfidation state, temperature and metal-complex speciation.

Zoning of polymetallic replacement, "manto-like" deposits – plan view of Main Tintic, Utah, USA (after Morris, 1968). Note that the steeply-dipping, Pb-Zn-replacement bodies within limestone extend up to 4000 m from the margin of the mid-Tertiary causal monzonite stock. The district metal zoning consists of proximal Cu-Au-(Mo) through intermediate Pb-Ag to distal Zn-Mn. The ratios Cu/Zn, Pb/Zn, Ag/Pb, Au/Ag and Mo/Mn increase with proximity to the heat-source (causal stock).



Generalized geological maps and vertical profiles trough selected global porphyry systems (Seedorff et al., 2005), showing the hydrothermal alteration plan-map of the Cayley Lode – Mt Victor area in the Stavely project, western Victoria. The Cayley – Mt Victor foot-print is large and comparable to the that of many global porphyry systems.

### Cayley Lode area – Stavely project, western Victoria

Cayley - Mt Victor

foot-print / plan-map



## Cayley Lode introduction from Cairns et al. (2022) and Stavely Minerals Limited website

(https://www.stavely.com.au/stavely-project)

The Cayley Lode copper-gold-silver lode-style mineralisation was discovered in September 2019 at the Thursday's Gossan porphyry prospect, located in Western Victoria, Australia. Upon acquiring the project in 2013, Stavely Minerals commenced exploration for an inferred deep porphyry source to nearsurface alteration and low-grade copper mineralization with 28 million tonnes at 0.4% Cu in a shallow chalcocite-enriched blanket. Initial programmes included induced polarisation and ground gravity surveys followed by diamond drilling to test beneath an interpreted phyllic alteration zone. As exploration progressed, drilling intersected significant intervals (+100m) of very dense, well-developed porphyry quartz-magnetite M-veins. The M vein intercepts were progressively followed to depth with drilling that also encountered significant intervals (to 38m drill width) of structurally-controlled high-grade copper-goldsilver mineralisation at depths of between 500m to 1,050m down-hole. With a recognition that the sulphide assemblage and character of these veins was similar to the lode-style veins at Magma, Arizona and Butte, Montana, one of Stavely's consulting geologists recommended not pursuing a porphyry target at depths in-excess of 1.5km but rather, to target the high-grade structurally-controlled mineralisation closer to surface. This change in tack produced immediate results. Discovery drill hole SMD050 intersected 32m at 5.88% Cu, 1.00g/t Au and 58g/t Ag from 62m down-hole. The mineralisation was named the Cayley Lode after Geological Survey of Victoria geologist Ross Cayley, who, in conjunction with colleagues from the GSV and Geoscience Australia, had highlighted the potential of the Stavely Arc to host porphyry and other intrusive-related styles of mineralisation.

The Thursday's Gossan prospect, which includes the Cayley Lode and the chalcocite-enriched blanket, hosts a Total Mineral Resource Estimate (using a 0.2% Cu grade lower cut-off) of 27.3Mt at 0.69% copper, 0.10g/t gold and 3.4 g/t silver for 416Mlbs of contained copper, 86,000 ounces of gold and 3Mt of silver (Cube Technical Report, effective date of 1<sup>st</sup> June 2022).

Plan-view of the near-surface interpretive hydrothermal alteration zones (left-hand image) and simplified geological models (provided by Stavely; right-hand image) for the Cayley Lode area. The overlays show the approximate location of an inferred NE-striking, steeply SW-dipping cross-structure that is recommended for follow-up exploration (red line); the surface projection of the target at depth in the southeastern part of the Cayley Lode (black ellipse); and a second target, Drysdale, that lies near the intersection of the north-south structure and lamprophyre dike with the inferred NE-striking cross-structure (red ellipse). The NE-structure is expressed near-surface by a central zone of advanced argillic alteration that is flanked by intermediate argillic (chlorite-sericite-clay) alteration and more distal phyllic alteration; the distribution of the argillic zones have been attributed to the Mount Victor porphyry. The two target zones potentially represent younger Cu-Au-Ag mineralized intrusions that have been emplaced along the flanks of the Mount Victor QDP. The SE Cayley Lode target (black ellipse) has been tested by holes SMD 183 – 187. It is recommended that the Drysdale target (red ellipse) be tested by a westerly inclined diamond drill-hole(s). The contents of this slide and others are based on the compilation and interpretations of Garwin (October, 2022).



Plan-view of the simplified geological models (provided by Stavely; left-hand image) and interpretive regional geology (right-hand image) for the Cayley Lode area. The overlays show the approximate location of an inferred NE-striking, steeply SW-dipping cross-structure that is recommended for follow-up exploration (red line); the surface projection of the target at depth in the southeastern part of the Cayley Lode (black ellipse); and the Drysdale target that lies near the intersection of the north-south structure and lamprophyre dike with the inferred NEstriking cross-structure (red ellipse). The target zones are located near the intersections of NW-striking and steeply SW-dipping thrust faults with the NE-striking cross-structure. Northerlytrending lineaments (blue lines in final overlay) are inferred on the basis of the distribution of the map units.



Plan-view of the simplified geological models (provided by Stavely; left-hand image) and first-vertical derivative (1VD) of the total magnetic intensity (right-hand image) for the Cayley Lode area. The overlays show the approximate location of an inferred NE-striking, steeply SW-dipping cross-structure that is recommended for follow-up exploration (red line); the surface projection of the target at depth in the southeastern part of the Cayley Lode (black ellipse); and the Drysdale target that lies near the intersection of the north-south structure and lamprophyre dike with the inferred NE-striking cross-structure. The SE Cayley Lode and Drysdale target zones are located near the intersections of NW- and N-trending magnetic lineaments (black lines in overlay) with the NE-striking cross-structure. The interpretation of the magnetics data could be improved by additional processing to reduce the contribution of the highly magnetic ultramafic unit to the color-stretch in the images and enhance the magnetic gradients at varying wavelengths. Fathom Geophysics has reprocessed the magnetics data; refer to subsequent slides for the resultant images.



Plan-view of the simplified geological models (provided by Stavely; left-hand image) and 1-km residual gravity (right-hand image) for the Cayley Lode area. The overlays show the approximate location of an inferred NE-striking, steeply SW-dipping cross-structure that is recommended for follow-up exploration (red line); the surface projection of the target at depth in the southeastern part of the Cayley Lode (black ellipse); and the Drysdale target that lies near the intersection of the north-south structure and lamprophyre dike with the inferred NE-striking cross-structure (red ellipse). The two target zones are located along major gravity gradients that intersect the NE-striking cross-structure. The interpretation of the gravity data could be improved. Fathom Geophysics has reprocessed the gravity data; refer to subsequent slides for the resultant images.



Plan-view of the near-surface interpretive hydrothermal alteration zones (left-hand image) and simplified geological models and the Cu/Zn in drill-hole model (right-hand image) for the Cayley Lode area. The overlays show the approximate location of an inferred NE-striking, steeply SW-dipping cross-structure that is recommended for follow-up exploration (red line); the surface projection of the target at depth in the southeastern part of the Cayley Lode (black ellipse); the Drysdale target that lies near the intersection of the north-south structure and lamprophyre dike with the inferred NE-striking cross-structure (red ellipse); and the location of Junction 3. The second overlay shows an inferred rhomboidal prism that is created by the interaction of NW- and N-trending mineralized structures, drawn to coincide with the surface projection of high Cu/Zn in drill-hole.



Plan-view of the simplified geological models and the Cu/Zn in surface auger samples (individual samples and contours) for the Cayley Lode area. The range of the Cu/Zn values are indicated by the colors in the legend and the size of the data points correspond to the Cu values. The overlays show the approximate location of an inferred NE-striking, steeply SW-dipping cross-structure that is recommended for follow-up exploration (red line); the surface projection of the target at depth in the southeastern part of the Cayley Lode (black ellipse); and the Drysdale target that lies near the intersection of the north-south structure and lamprophyre dike with the inferred NE-striking cross-structure (red ellipse). The penultimate overlay shows an inferred rhomboidal prism that is created by the interaction of NW- and N-trending mineralized structures, drawn to coincide with the surface projection of high Cu/Zn in drill-hole. Additional zones of exploration interest are indicated in the final overlay (magenta ellipses, including Junction 3), based on zones of high Cu/Zn in auger that have yet to be adequately drill-tested. The auger data shown in this slide reflects that collected prior to October 2022. Refer to subsequent slides for an update from data obtained in 2023.



QUESTEM image for the Cayley Lode area provided by C. Cairns on 12 October 2022, showing EM conductivity results (blue = low; red = high) and structural interpretation. The rhomboidal prism, based on the geometry of NW- and N-trending mineralized structures (cf. previous slides), is conductive and inferred to form in a pull-apart basin that is related to NNW-SSE directed regional transpression and associated sinistral offset on the NS structure. The interpretation shows that this interpreted extensional basin is filled by a porphyry (intrusive) complex (blue stippled pattern). The overlay shows the approximate location of the inferred NE-striking, steeply SW-dipping cross-structure that is recommended for follow-up exploration (red line).

#### 1994 QUESTEM - Channel 9



#### Abbreviations:

UCF – Ultramafic contact fault / Cayley Lode CLS – Potential Cayley Lode parallel structure NSS – North-south structure ??? – Potential structure



Plan-view of the near-surface interpretive hydrothermal alteration zones (left-hand image) and interpreted geology projected to near-surface (provided by Stavely; right-hand image) for the Cayley Lode – Drysdale area. The Drysdale target sits near the intersection of the north-south structure and the NE-structure along the western margin of the Mt Victor quartz diorite porphyry body. The Junction 3 target area is also of interest as indicated by anomalous auger-hole and air-core drill results. The NE-structure is expressed near-surface by a central zone of advanced argillic alteration that is flanked by intermediate argillic (chlorite-sericite-clay) alteration and more distal phyllic alteration; the distribution of the argillic zones have been attributed to the Mt Victor porphyry.





Aerial photograph of the Cayley Lode area, Stavely Project, showing the recommended diamond drill-holes to test for porphyry Cu-Au mineralization at depth along the western margin of the Mount Victor quartz diorite porphyry body, about 1000m west of the Cayley Lode. The traces of the existing drill-holes are shown for reference. The first overlay shows the location of a small north-northwesterly-trending hill of quartz-sericite-limonite boulders that are inferred to represent a structurally-controlled zone of phyllic alteration. The second overlay shows the geological models created by Stavely Minerals for the ultramafic contact, Cayley Lode, Mt Victor porphyry, Lamprophyre dike and the North-South Lode. The first-priority, Drysdale target hole is designed to extend ~800m (inclined 60 degrees towards N70E) and the second-priority, West SMD 114 target hole is recommended to extend 1100m (inclined 70 degrees towards N70E).



Plan-view of drill-holes (traces) and the geological models created by Stavely Minerals (left-hand image) and interpreted geology projected to near-surface and chalcocite blanket (right-hand image) for the Cayley Lode – Drysdale area. The location of recently completed drill-holes and other holes of interest are indicated for reference. The first-priority, Drysdale target hole is designed to extend ~800m (inclined 60 degrees towards N70E) and the second-priority, West SMD 114 target hole is recommended to extend 1100m (inclined 60 degrees towards N70E). Both holes are recommended to test for a potential Cu-(Au)-bearing porphyry system that overprints the western margin of the Bi-Mo-anomalous, Mt Victor porphyry vein system intersected in SMD046 and nearby holes. The Junction 3 target area is also of interest as indicated by anomalous auger-hole and air-core drill results.



Plan-view of drill-holes (traces), geological models created by Stavely Minerals and 3D models of the Cu-Zn ratio in drill-hole (left-hand image) and visually logged chalcopyrite-pyrite ratios in drill-hole (right-hand image) for the Cayley Lode – Drysdale area. The location of recently completed drill-holes and other holes of interest are indicated for reference. The first-priority, Drysdale target hole is designed to extend ~800m (inclined 60 degrees towards N70E) and the second-priority, West SMD 114 target hole is recommended to extend 1100m (inclined 70 degrees towards N70E). Both holes are recommended to test for a potential Cu-(Au)-bearing porphyry system that overprints the western margin of the Bi-Mo-anomalous, Mt Victor porphyry vein system intersected in SMD046 and nearby holes. Both the Drysdale and West SMD114 targets are characterized by elevated Cu/Zn in drill-hole. Note that there is no logged sulfide data for the historic drill-holes (e.g., VIC1D3) in the Drysdale target area. The Junction 3 target area is also of interest as indicated by anomalous auger-hole and air-core drill results.



Plan-view of drill-holes (traces), geological models created by Stavely Minerals and logged chalcopyrite (left-hand image) and chalcopyrite-pyrite ratio (right-hand image) in drill-hole for the Cayley Lode – Drysdale area. The location of recently completed drill-holes and other holes of interest are indicated for reference. Drill-holes SMD183 to 187 have adequately tested for the down-plunge porphyry target in the southeastern part of the Cayley Lode. The Drysdale and West SMD114 are recommended for drilling to test for a potential Cu-(Au)-bearing porphyry system that overprints the western margin of the Bi-Mo-anomalous, Mt Victor porphyry vein system intersected in SMD046 and nearby holes. The Junction 3 target area is also of interest as indicated by anomalous auger-hole and air-core drill results.



Plan-view of the simplified geological models, the Cu/Zn in drill-hole model and Cu/Zn in surface auger samples for the Cayley Lode – Drysdale area. The Cu/Zn values are indicated by the colors in the legend and the size of the data points. The left-hand image shows all auger results; the right-hand image shows the Stavely auger data that includes low-levels of detection for multi-elements. The historic auger data includes Cu and Zn assays but lacks the multi-element results. The Drysdale target is well expressed in the drill-hole and auger Cu/Zn results; the West SMD 114 target is supported by drill-hole Cu/Zn and to a lesser extent by auger Cu/Zn results. The Junction 3 target area is supported by anomalous Cu/Zn in air-core drill holes and auger results.



Plan-view of the simplified geological models, the Cu/Zn in drill-hole model and Cu/Zn in surface auger samples collected by Stavely Minerals for the Cayley Lode – Drysdale area. The Cu/Zn values are indicated by the colors in the legend and the size of the data points. The left-hand image shows the Stavely auger data and a contour model based on all auger samples (including historic data). The right-hand image shows the Stavely auger data and a contour model based on the Stavely results (excluding historic data). The Drysdale target is well expressed in the drill-hole and auger Cu/Zn results; the West SMD 114 target is supported by drill-hole Cu/Zn and to a lesser extent by auger Cu/Zn results. The Junction 3 target area is supported by anomalous Cu/Zn in air-core drill holes and auger results.



Plan-view of drill-holes (traces) and geological models created by Stavely Minerals shown on base-maps of detailed magnetics as processed by Fathom Geophysics (Buckingham, Nov. 2022). The left-hand image shows the vertical-derivative of the reduced-to-the-pole magnetics (total magnetic intensity; file name: SVY\_Det\_TMI\_RTP\_vd\_heq\_NE) and vectorized gradients (orange lines). The right-hand image shows the magnetic gradients, colored by strength (red = high and blue = low; file name: SVY\_Det\_TMI\_RTP\_res0\_2000\_AGC40\_log\_Struct40\_Total) and vectorized gradients (orange lines). The Drysdale target sits on a major magnetic gradient. The West SMD114 target is not as clearly define by the magnetics data. Junction 3 sits near the intersection of magnetics gradients.



Plan-view of drill-holes (traces) and geological models created by Stavely Minerals shown on base-maps of gravity as processed by Fathom Geophysics (Buckingham, Nov. 2022). The left-hand image shows the Bouguer gravity image (file name: SVY\_AGG\_Gzz\_heq) and vectorized gradients (white lines). The right-hand image shows the gravity gradients, colored by strength (red = high and blue = low; file name: SVY\_AGG\_Gz\_res0\_800\_Struct80\_Total) and vectorized gradients (white lines). The Drysdale and West SMD114 target areas sit east of a major gravity gradient. Junction 3 sits astride a moderate gravity gradient.



Plan-view of drill-holes (traces), geological models created by Stavely Minerals and Cu/Zn in drill-hole model shown on base-maps of detailed magnetics and gravity as processed by Fathom Geophysics (Buckingham, Nov. 2022). The left-hand image shows the gravity gradients and the right-hand image shows the magnetics gradients. Both sets of gradients are colored by strength (red = high and blue = low). The Drysdale target sits on a major magnetic gradient, adjacent to a gravity gradient. The West SMD114 target sits adjacent to gravity- and magnetic-gradients. Junction 3 is characterized by the intersection of gravity and magnetic gradients. All three target areas show elevated Cu/Zn in drill-hole. The location of the cross-sections shown in the following slides are indicated in the final overlay.



Cross-section showing the Drysdale target and proposed diamond drill-hole, the geological models of Stavely Minerals Ltd and a model of Cu/Zn (looking N2OW, with drill-traces projected up to 100m away from the section-line). The Drysdale target sits beneath a small hill of quartz-sericite-altered boulders and a drill-hole Cu/Zn anomaly. The target occurs between the N-S lode structure and the lamprophyre dike, above the projection of the low-angle structure (LAS) and west of the Mt. Victor quartz diorite porphyry. The southeasterly extension of the Cayley Lode and ultramafic contact occupy a similar and symmetric location on the eastern margin of the Mt Victor porphyry body. The recommended drill-hole is 800m deep and inclined -60 degrees towards N70°E.



Cross-section showing the Drysdale target and proposed diamond drill-hole, the geological models of Stavely Minerals Ltd and a model of Cu/Zn (looking N20W, with drill-traces projected up to 100m away from the section-line). The chalcopyrite-pyrite ratios as logged by Stavely geologists are indicated for drill-holes SMD071 and SMD186. The Drysdale target sits beneath a small hill of quartz-sericite-altered boulders and a drill-hole Cu/Zn anomaly. The target occurs between the N-S lode structure and the lamprophyre dike, above the projection of the low-angle structure (LAS) and west of the Mt. Victor quartz diorite porphyry. The southeasterly extension of the Cayley Lode and ultramafic contact occupy a similar and symmetric location on the eastern margin of the Mt Victor porphyry body. The recommended drill-hole is 800m deep and inclined -60 degrees towards N70°E.



Cross-section (looking N20W), showing the West SMD114 target, a proposed diamond drill-hole and the geological models of Stavely Minerals Ltd with drill-traces projected up to 200m away from the section-line. The target sits beneath the Low-angle structure (LAS), to the west of the Mt Victor porphyry and between the N-S lode structure and the lamprophyre dike. The Cayley Lode and ultramafic contact occupy a similar location on the eastern margin of the Mt Victor porphyry body. Drill-holes VSTD3, SMD46, 114, 117, 160, 161, 183 and 185 are shown for reference. The proposed drill-hole is 1100m deep and inclined -70 degrees towards N70°E.



Cross-section (looking N2OW) showing the West SMD114 target, a proposed diamond drill-hole, Cu/Zn in drill-hole and a Cu/Zn model with drill-traces projected up to 200m away from the section-line. The target sits beneath the Low-angle structure (LAS), to the west of the Mt Victor porphyry and between the N-S lode structure and the lamprophyre dike. The Cayley Lode and ultramafic contact occupy a similar location on the eastern margin of the Mt Victor porphyry body. Note the southwesterly dip of the elevated Cu/Zn values beneath the LAS, which is inferred to indicate that this structure is long-lived and may have localized mineralization, as well as offset the Cayley Lode (refer to Garwin report, Oct. 2022). Drill-holes VSTD3, SMD46, 114, 117, 160, 161, 183 and 185 are shown for reference. The proposed drill-hole is 1100m deep and inclined -70 degrees towards N70°E, and will test the down-dip extension of the zone of elevated Cu/Zn.



Cross-section (looking N2OW) showing the West SMD114 target, a proposed diamond drill-hole, the Cu/Zn model and logged chalcopyrite/pyrite in drill-holes, with drill-traces projected up to 200m away from the section-line. The target sits beneath the Low-angle structure (LAS), to the west of the Mt Victor porphyry and between the N-S lode structure and the lamprophyre dike. The Cayley Lode and ultramafic contact occupy a similar location on the eastern margin of the Mt Victor porphyry body. Note the southwesterly dip of the elevated Cu/Zn and increased chalcopyrite/pyrite in drill-holes beneath the LAS, which is inferred to indicate that this structure is long-lived and may have localized mineralization, as well as offset the Cayley Lode. Drill-holes VSTD3, SMD46, 114, 117, 160, 161, 183 and 185 are shown for reference. The proposed drill-hole is 1100m deep and inclined -70 degrees towards N70°E, and will test the down-dip extension of elevated Cu/Zn and chalcopyrite/pyrite in drill-hole.





# West SMD114 target: drill-core photographs from SMD46 (from Stavely Minerals):

3m @ 0.6% Cu from 467m, associated with broken core of sericite-clay (phyllic) alteration and quartz-pyrite-chalcopyrite veins (in sandstone)

0.9m @ 0.3% Cu from bottom of hole (636-636.9m), associated with quartz-chalcopyrite-pyrite vein (hosted in sandstone)



# West SMD114 target: drill-core photographs from SMD114 (from Stavely Minerals):

12m @ 1.43% Cu, 0.23 g/t Au and 7.4 g/t Ag from 830m, including 1m @ 8.5% Cu from 840m

Chalcopyrite >> pyrite vein @ ~840-841m

The quartz-chalcopyrite-pyrite veins are characterized by selvedges of strong sericite (phyllic) alteration, hosted by sandstone. Anhydrite veinlets and quartz-pyrite veinlets are common.

Longitudinal-section of the Cayley Lode, showing the model for visually logged chalcopyrite / pyrite in drill-hole (from Garwin, October 2022 report). The drill-hole traces are projected from up to 50m away from the section-line. The first overlay shows the approximate trace of the Low-Angle Structure (LAS) and Alpha breccia zones for reference. The subsequent overlays show the Cu ore-shoots inferred above the LAS (black arrows) and the copper targets below the LAS (red elliptical outlines). Elevated chalcopyrite / pyrite coincide with the known copper ore-shoots above the LAS and highlight the prospectivity of the southeastern targets below the LAS (e.g., SMD159, 161, 162, 163, 173 and 182). The major ore-shoots in the southeastern part of the lode have been tested by the recent drilling of holes SMD183 to 187, as indicated in the following slides.



Longitudinal-section of the Cayley Lode, showing the model for visually logged chalcopyrite / pyrite in drill-hole and the Cu-Zn ratio for those holes that have been assayed. The drill-hole traces are projected from up to 100m away from the section-line. Note that the majority of drill-core from holes SMD183 to 187 have yet to be assayed.



Longitudinal-section of the Cayley Lode, showing the visually logged chalcopyrite / pyrite in drill-hole and the model created in LeapFrog from this data, including SMD183 to 187. The drill-hole traces are projected from up to 100m away from the section-line. The recent round of drilling has adequately tested the southeasterly plunge to the ore shoots in the southern part of the lode and downgraded the potential for a porphyry deposit in this zone.



Longitudinal-section of the Cayley Lode, showing drill-holes and the model for the visually logged chalcopyrite / pyrite in drill-hole. The drill-hole traces are projected from up to 100m away from the section-line. The recent round of drilling has adequately tested the southeasterly plunge to the ore shoots in the southern part of the lode and downgraded the potential for a porphyry deposit in this zone.





Legend Towns **Silurian Devonian Faults** Dextral Sinistral - Normal Thrust ----- Un-assigned **Geological Units** Quaternary deposits Newer Volcanic Group duricrust **Brighton Group** Paleogene deposits Grampians Group **Buckeran Diorite** Bushy Creek Granodiorites Fairview Andesitic Breccia Lalkaldarno Porphyry Nanapundah Tuff Towanway Tuff Williamsons Road Serpentinite Chatsworth Basalt Glenthompson Sandstone

Simplified regional geology map for the Stavely region (as provided by Stavely Minerals). The locations of the Cayley Lode resource and S41 area are indicated in the overlay.



S41 air-core drill hole locations shown on the gravity (600 m residual) image with the location of diamond hole STDD001 indicated (left-hand image). The right-hand image shows the abundance of sulfur (in weight-percent) in the air-core holes (after Halley, June 2023). The abundance of sulfur is significant, with the southern gravity high characterized by > 2 wt. % sulfur.



Cross-section showing STDD001 (looking N30°W, from recent Stavely release) and photograph of core-interval (approximately 394 to 404m downhole, labelled with Mn concentration in ppm) that is characterized by sericite-kaolinite+chlorite-altered, polymictic andesite volcanic breccia, which is cut by late-stage pinkish (Mn-bearing?) calcite veins. The grey zone (~397.7 to 400.2m) consists of chlorite-destructive sericitic alteration with about 3-7 weight-percent fine-grained pyrite. The style of mineralization and alteration mineral assemblage are consistent with formation in an intermediate-sulfidation epithermal system. The contents of this slide are taken from the presentation of Halley (June 2023).





Summary of trace-element results for air-core holes (from Halley, June 2023) showing the location of STDD001. This diamond hole was drilled under the best air-core Au-Ag result (STAC0115; 4m at 2.2 g/t Au and 6.9 g/t Ag from 96m, previous slide), however, only tested the northern portion of the hydrothermal alteration system as delineated by As-Bi-Sb-Te results.



Summary of illite crystallinity in ASD drill-hole results, composited to 20m down-hole and viewed looking down from 200m above sea-level, shown on magnetics as processed by Fathom Geophysics (Buckingham, 2022; file name = SVY\_Reg\_TMI\_RTP\_res100\_400\_heq\_NE). The brown lines indicate gravity gradients (file name = SVY\_AGG\_Gz\_res0\_800\_Struct160\_Total\_vec). The location of STDD001 is indicated for reference. The first overlay shows crystallinity values  $\geq$  1.0. The second overlay shows red dashed lines and magenta lines that mark zones of elevated crystallinity, which are inferred to approximate zones of increased temperature of formation in the S41 hydrothermal system. Note that STD001 lies near the center of the northern zone of elevated crystallinity.



Summary of the Pb-Zn ratio in drill-hole results, viewed looking down from 200m above sea-level, shown on magnetics as processed by Fathom Geophysics (Buckingham, 2022; file name = SVY\_Reg\_TMI\_RTP\_res100\_400\_heq\_NE). The brown lines indicate gravity gradients (file name = SVY\_AGG\_GZ\_res0\_800\_Struct160\_Total\_vec). The hand-drawn contours for gold in air-core results have been provided by Stavely. The location of STDD001 is indicated for reference. The first overlay indicate those holes with Pb/Zn > 0.4 near the 200m RL (blue lines). The second overlay shows dashed red lines and solid magenta lines that mark zones of elevated crystallinity, which are inferred to approximate zones of increased temperature of formation. Note that STD001 lies near the center of the northern zone of elevated crystallinity and is characterized by high gold and moderate Pb/Zn. Increased gold and Pb/Zn are inferred to provide vectors to the higher temperature, more gold-rich portion of the hydrothermal system. The location is indicated for the cross-section in the next figure.



Schematic cross-section (looking N30°W) through STDD001 and STAC0115 in the S41 project, showing simplified geology, Au, Ag, Pb and Zn assays (from recent Stavely news release) and Au/Ag and Pb/Zn results in drill-hole. In intermediate-sulfidation systems, increasing values of Au/Ag and Pb/Zn typically provide vectors towards the hotter, more gold-rich portions of the hydrothermal system. The first overlay shows that a zone of high Au/Ag and Pb/Zn (purple ellipse) characterizes the anomalous interval of 37m at 0.10 g/t Au and 4.8 g/t Ag from 320m in STD001. The final overlay illustrates a narrow zone of elevated Pb/Zn (red ellipse) that coincides with 4m at 2.2 g/t Au and 6.9 g/t Ag from 96m in STAC0115.





# Summary and Conclusions

- Metal- and mineral-zoning in Cayley Lode provides a vector towards a Cu-Au-Ag-rich core in the SE part of the lode, which has been drill-tested
  - The ratio of visually logged chalcopyrite to pyrite in drill-core provides the best vector towards the potential cupola at depth in the southeastern part of the Lode
  - Other vectors include: Cu, Cu/Zn, Cu/S, Ag/Pb, K/Na and the increase in intensity of Mg-chlorite and paragonitic white-mica alteration (Garwin report, Oct. 2022)
  - This target has been tested by holes SMD 183 to 187, which have down-graded the potential for a mineralized cupola in the southeastern part of the Cayley lode
- Drysdale and West SMD 114 targets indicate potential for a Cu-(Au) porphyry deposit at depth these are priority drill targets
  - These targets lie about 1000m west of the Cu-Au-Ag-rich ore-shoot in the southern part of the Cayley Lode and sit along the western margin of the Mt Victor porphyry
  - Both target areas occur near major gradients expressed by magnetics and gravity survey data and show similarities to the geophysical expression of the Cayley Lode
  - The Drysdale target (first-priority) is located along a NE-striking cross-structure that intersects the obtuse bisectrix to a northerly-elongate rhomb (2.5 km by 1.0 km) outlined by N- and NW-trends defined by the surface projections of anomalous Cu and Cu/Zn in drill-hole; the rhombic outline is well-supported by an elevated EM conductivity response
  - The Drysdale target is characterized by a NW-elongate hill of quartz-sericite-altered boulders and Cu- and Cu/Zn-anomalous auger soil and air-core drill results
  - The NE cross-structure is characterized by central advanced argillic alteration and flanking intermediate argillic (chl-ser-clay) and phyllic (qtz-ser-pyr) alteration, which has been attributed to the Mt Victor porphyry This geometry may suggest that the two targets represent a younger Cu-(Au) mineralized intrusion(s) that has ascended along the western shoulder of the Mt Victor porphyry system
  - Additional targets are distributed along the outer margins of the Cu-rhomb, south of the NE-structure, as identified by anomalous Cu/Zn in soil auger
- Junction 3 target supported by anomalous Cu/Zn in auger samples and air-core holes worthy of more air-core and diamond drilling
  - Target well-expressed by the intersection of magnetics and gravity gradients and sits at the southern apex of the mineralized rhombic structure
- S41 target area shows potential for an intermediate-sulfidation epithermal Au-Ag system with a foot-print that exceeds 3km by 1.5km
  - Air-core holes and STDD001 show pyritic hydrothermal alteration and significantly anomalous Au-Ag-(Pb-Zn) results that are open to the northwest and southeast
  - Best drill-hole results to date indicate 4m at 2.2 g/t Au and 6.9 g/t Ag from 96m in STAC0115 and 37m at 0.10 g/t Au and 4.8 g/t Ag from 320m in STD001
  - Trace-element (As-Bi-Sb-Te) zoning suggests that STDD001 only tested the northern portion of the metal-rich portion of the system
  - Au, Pb/Zn and illite crystallinity data in air-core holes place STDD001 in the near center of the anomalous results; within magnetic lows (inferred de-magnetization)

# **Stavely Project - Recommendations**

- Drill-test high-potential porphyry targets at Drysdale (1st priority) and West SMD114 (2nd priority)
  - Consider westerly-inclined holes (60 to 70 degrees towards N70°E to depths ranging from 800 to 1100m) to test for the potential of a Cu-(Au) porphyry system that has been emplaced along the western margin of the older, Bi-Mo-anomalous Mt Victor porphyry body
- Advance exploration at Junction 3 and nearby targets through additional air-core and diamond drilling as access allows
  - Drill-test the soil auger Cu and Cu/Zn anomalies along the southern margins of the rhombic-shaped zone defined by the surface-projection of Cu/Zn in drill-hole
  - Continue to explore other targets in the vicinity of Junction 3 that are characterized by elevated Cu/Zn in auger soil and air-core drill results and geophysical anomalies
- At S41, consider the implementation of two orientation IP-Resistivity lines over the existing air-core traverses completed in the vicinity of STDD001
  - Should the chargeability-conductivity response correspond to the distribution of illite-pyrite alteration and Au-Ag-As-Bi-Sb-Te mineralization in the air-core holes and STDD001, extend the electrical survey to cover the 3km by 1.5km alteration foot-print discovered to date and potentially beyond
- Undertake 3D geochemical modelling of auger soil and air-core drill results, using the algorithm of Fathom Geophysics, to determine the probability of the existence of a Cu-(Au) porphyry center(s) in the Stavely project area
  - This method requires that the geochemical results are obtained using a strong acid digest and low detection limits, and is based on the distribution of metals in the Yerington Cu deposit and other global porphyry systems

## **Reference Citations**

Buckingham, A., 2022, Filtering of magnetic and gravity data, Stavely project, Victoria, unpublished report for Stavely Minerals Ltd, November 2022, 26 p.

- Cairns, C., Murphy, J., Forgan, H., Johnson, S., Agnew M., and Heard, S., 2022, The Cayley Lode a 'Magma' style copper lode, in proceedings of the 8<sup>th</sup> Mines and Wines Conference, Orange, NSW, Australia, 9<sup>th</sup> 13<sup>th</sup> of May 2022, 12 p.
- Cohen, J.F., 2011, Mineralogy and geochemistry of alteration at the Ann-Mason copper deposit, Nevada: Comparison of large-scale ore exploration techniques to mineral chemistry: M.Sc. thesis, Corvallis, Oregon, Oregon State University, 112 p. plus appendices.
- Garwin, S., 2022, Stavely project, Victoria: Geological interpretation and exploration implications, presentation to board of directors for Stavely Minerals Ltd, Nedlands, WA, Australia, 19<sup>th</sup> of October 2022, 43 slides (technical report available on Stavely website).
- Halley, S., Dilles, J.H, and Tosdal, R.M., 2015, Footprints: Hydrothermal alteration and geochemical dispersion around porphyry copper deposits, Society of Economic Geologists Newsletter v. 100, p. 1, 12-17.
- Halley, S., 2023, Geochemistry and mineralogy of the S41 breccia target, unpublished report for Stavely Minerals Ltd, 20 June 2023, 22 slides.
- Morris, H.T., 1968, The main Tintic mining district, Utah, in Ridge, J.D., ed. Ore deposits of the United States, 1933-1967: New York, American Institute of Mining, Metallurgical and Petroleum Engineers, p. 1044-1073.
- Seedorff, E., Dilles, J.H., Proffett, J.M., Einaudi, M.T., Zurcher, L., Stavast, W.J., Johnson, D.A. and Barton, M.D., 2005. Porphyry deposits: Characteristics and origin of hypogene features, in Hedenquist, J., Goldfarb, R. and Thompson, J. (eds.), Economic Geology 100<sup>th</sup> Anniversary Volume, Society of Economic Geologists, P. 251-298.