

**NI 43-101  
TECHNICAL REPORT AND  
RESOURCE ESTIMATE  
FOR THE  
VAN DYKE COPPER PROJECT**

**Miami, Gila County, Arizona**  
*Centred at 3,695,560 N and 512,000 E (NAD 27)*

Submitted to:

**Copper Fox Metals Inc.**

Suite 650, 340-12<sup>th</sup> Avenue SW  
Calgary, Alberta V2R 1L5

30 January 2015

Submitted by:

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## **DATE & SIGNATURE PAGES**

Herewith, our report entitled 'Technical Report and Resource Estimate for the Van Dyke Copper Project' dated 30 January 2015.

*"Originals Signed and Sealed"*

---

**Susan C. Bird, M.Sc., P.Eng.**

**Moose Mountain Technical Services**  
Principal Engineer

---

**Dated the 30 January 2015**

## CONSENT OF QUALIFIED PERSONS

I, **Susan Bird, P. Eng.**, consent to the public filing of the technical report titled “**TECHNICAL REPORT AND RESOURCE ESTIMATE FOR THE VAN DYKE COPPER PROJECT**” with the effective date of 17 December, 2014 by Copper Fox Metals Inc.

I certify that I have read the News Release dated December 19, 2014 filed by Copper Fox Metals Inc. and that it fairly and accurately represents the information in the sections of the Technical Report for which I am responsible.

Dated this 30 day of January, 2015

*“Originals Signed and Sealed”*

---

**Susan C. Bird, M.Sc., P.Eng.**  
B.C. Registration No. 25007

I, **R. A. (Bob) Lane, P.Geo.**, consent to the public filing of the technical report titled “**TECHNICAL REPORT AND RESOURCE ESTIMATE FOR THE VAN DYKE COPPER PROJECT**” with the effective date of 17 December, 2014 by Copper Fox Metals Inc.

Dated this 30 day of January, 2015

*“Originals Signed and Sealed”*

---

**R. A. (Bob) Lane, P.Geo.**  
B.C. Registration No. 18993

## CERTIFICATE & DATE – Susan C. Bird

I, Susan C. Bird, M.Sc., P.Eng., do hereby certify that as a co-author of the report titled: **TECHNICAL REPORT AND RESOURCE ESTIMATE FOR THE VAN DYKE COPPER PROJECT**

1. I am a Principal of Moose Mountain Technical Services, residing at 1752 Armstrong Ave., Victoria, B.C.
2. I graduated with a Geologic Engineering degree (B.Sc.) from the Queen’s University in 1989.
3. I graduated with a M.Sc. in Mining from Queen’s University in 1993.
4. I am a member of the Association of Professional Engineers and Geoscientists of B.C. (No. 25007).
5. I have worked as an engineering geologist for a total of 18 years since my graduation from university.
6. My past experience with Cu deposits includes acting as qualified person (QP) for the resource estimate on a number of deposits including: Rosemont, AZ, Ilovitza, as well as resource and reserve estimation for Taseko’s Gibraltar Mine, BC.
7. I have read the definition of “qualified person” set out in National Instrument 43-101 and certify that by reason of education, experience, independence and affiliation with a professional organization, I meet the requirements of an Independent Qualified Person as defined in National Instrument 43-101.
8. I am responsible for Section 14 of this report titled “**TECHNICAL REPORT AND RESOURCE ESTIMATE FOR THE VAN DYKE COPPER PROJECT**” date January 30, 2015.
9. I am independent of Copper Fox Ltd. , as described in Section 1.5 of NI 43-101 and do not own any of their stocks or shares. I work as a geological and mining consultant to the mining industry.
10. To the best of my knowledge, information and belief at the effective date, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading. I have read NI 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.
11. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them, including electronic publication in the public company files on their websites accessible by the public.

Dated this 30 day of January, 2015

*“Originals Signed and Sealed”*

---

**Susan C. Bird, M.Sc., P.Eng.**  
B.C. Registration No. 25007

## CERTIFICATE & DATE – R. A. (Bob) Lane

I, R. A. (Bob) Lane, P.Ge., do hereby certify that as a co-author of the report titled: **TECHNICAL REPORT AND RESOURCE ESTIMATE FOR THE VAN DYKE COPPER PROJECT**

1. I am an associate of Moose Mountain Technical Services, and the president of Plateau Minerals Corp., a mineral exploration consulting company with an office located at 3000-18<sup>th</sup> Street, Vernon, British Columbia.
2. I am a graduate of the University of British Columbia in 1990 with a M.Sc. in Geology.
3. I am a Professional Geoscientist (P.Ge.) registered with the Association of Professional Engineers and Geoscientists of British Columbia (Registration #18993) and have been a member in good standing since 1992.
4. I have practiced my profession continuously since 1990 and have more than 25 years of experience investigating a number of mineral deposit types, including copper porphyry and related deposits, primarily in British Columbia.
5. I have read the definition of “qualified person” set out in National Instrument 43-101 and certify that by reason of education, experience, independence and affiliation with a professional organization, I meet the requirements of an Independent Qualified Person as defined in National Instrument 43-101.
6. I visited the Van Dyke Copper Project on three occasions; November 26-29, 2013; April 22-26, 2014, and; June 20-21, 2014.
7. I am responsible for Sections 1 - 13 and Sections 15 – 27 of the technical report entitled “**TECHNICAL REPORT AND RESOURCE ESTIMATE FOR THE VAN DYKE COPPER PROJECT**” date January 30, 2015.
8. I am independent of the issuer applying all of the tests in Section 1.5 of National Instrument 43-101. I hold no direct or indirect interest in the Van Dyke Copper Project.
9. I am not aware of any material fact or material change with respect to the subject matter of the report that is not disclosed in the report which, by its omission, would make the report misleading.
12. To the best of my knowledge, information and belief at the effective date, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading. I have read NI 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.
13. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them, including electronic publication in the public company files on their websites accessible by the public.

Dated this 30 day of January, 2015

*“Originals Signed and Sealed”*

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**R. A. (Bob) Lane, P.Ge.**  
B.C. Registration No. 18993

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## 1 Summary

Copper Fox Metals Inc. (Copper Fox) retained Moose Mountain Technical Services (MMTS) to prepare a National Instrument 43-101 (NI 43-101) Technical Report and Resource Estimate for the Van Dyke Copper Project (the “Project”), Gila County, Arizona, U.S.A. The Project has a long history of exploration, development and limited mining that dates back to 1916. This Technical Report provides the first NI 43-101 mineral resource for the Project, as well as summaries of project history, geology, mineralization, deposit characteristics, and recommendations for future work.

### 1.1 Project Location, Description and Ownership

The Van Dyke Copper Project is in the Globe-Miami mining district, Gila County, east-central Arizona, approximately 110 kilometers east of Phoenix. The land survey coordinates for the Project include Sections 29, 30, and 33 of Township 1 North, Range 15 East, Gila and Salt River Baseline and Meridian (GSRBM) and Sections 25, 31, and 36 of Township 1 North, Range 14 East, GSRBM. The Project is centered at 512000 E and 3695600 N (UTM; NAD27) within the administrative boundaries of, and well beneath, the town of Miami, Arizona.

The Project consists of 26 patented parcels of mineral estate lands and 35 unpatented lode mining claims. The mineral estate lands cover a total area of 531.5 hectares (ha) and are 100%-owned by Copper Fox Van Dyke Company (a wholly-owned subsidiary of Copper Fox Metals Inc.). The unpatented lode mining claims occur immediately south of, and in part overly the mineral estate lands. They cover 292.0ha of Federal Land administered by the Bureau of Land Management (BLM) and are also 100%-owned by Copper Fox Van Dyke Company.

### 1.2 History

In 1916, newly formed Van Dyke Copper Co. (VDCC) drilled its first hole (V-1) on the Van Dyke property, mineral estates that lay adjacent to those owned by Miami Copper Company and Inspiration Consolidated Copper Company. The vertical rotary hole was drilled in the hope of intersecting a blind copper deposit. At a depth of 1182 feet it encountered a fault zone with abundant copper carbonate and copper silicate minerals, and prompted the drilling of a second hole (V-2). Hole V-2 reportedly intersected 41 feet of copper carbonate and copper silicate-bearing breccia averaging about 4% Cu (Peterson, 1962). In the spring of 1919, VDCC began to excavate the vertical Van Dyke shaft located near the first drillhole (Rice, 1921; Peterson, 1962). By 1921, the shaft had reached a depth of 1,692 feet and had intersected mineralization similar to that cut by hole V-1 (Rice, 1921).

Further development was suspended because of low copper prices, but by 1928, copper prices had recovered and VDCC resumed its exploration and development activities. Underground drifts were developed on the main 1212, 1312 and 1412 Levels. The first ore shipments were made in 1929 and continued through to 1931, when copper prices declined to uneconomic levels (Peterson, 1962). The mine reopened in 1943 as a National Defense project, but closed again in June 1945. Metal production for the two periods of operation (1929-1931 and 1943-1945) totaled 11,851,700 pounds of copper (Peterson, 1962). In the ensuing 20 years, two limited surface exploration drilling programs evaluated the property, but were of no consequence. In 1968, Occidental Minerals Corporation (Occidental) acquired the property through a lease and Option to Purchase agreement, and began to systematically

drill the property. In the early 1970s, Occidental optioned its interest in the property at different times to AMAX and to Utah International. While the two companies conducted considerable amounts of drilling, both terminated their option agreements with Occidental. By 1975, a total of 50 holes had been drilled throughout the project area, including many within the town of Miami, covering an area measuring approximately 1300m east-west by approximately 1000m north-south. Mineralization encountered consisted primarily of the secondary copper minerals azurite, malachite and chrysocolla in tectonically fractured to brecciated Early Proterozoic Pinal Schist. Drilling determined that the Van Dyke deposit is covered by from 186 - 627m of unmineralized Tertiary Gila Conglomerate. Modeling of the deposit determined that the Van Dyke deposit resides in the downthrown hangingwall block of the Miami fault, and occurs within the elongate Miami-Inspiration trend of deposits. Four different resource estimates were completed between 1973 – 1976 and range from 103,000,000 tons averaging 0.53% Cu to 140,858,000 tons averaging 0.40% Cu (the estimates were calculated before implementation of National Instrument 43-101 and are therefore historical in nature, and are not relied upon).

In 1976, Occidental initiated an in-situ leaching (ISL) pilot program in an area due west of the Van Dyke shaft. The pilot program was completed in 1977 and confirmed that ISL was suitable for extracting copper from the deposit. In 1978, Occidental initiated a second ISL test that continued until May, 1980, and further proved the feasibility of a surface ISL operation at Van Dyke (Huff et al, 1981). However, the town of Miami under which the deposit resides would not support such an operation, and under the threat of litigation, Occidental abandoned its option on the property.

In 1986, Kocide Chemical Corporation (Kocide), negotiated a deal with VDCC to develop an ISL and copper recovery operation in the area that Occidental had tested. Kocide applied for and received the necessary permits to conduct its work and production commenced in December, 1988 (Beard, 1990). Kocide suspended its operations in 1990 due to iron build up in the recycled leach solution. Approximately 4 million pounds of copper cement was produced in 1988-89 and 1989-90. Later in 1990, Arimetco International Inc. acquired the Van Dyke property, and rehabilitated the Van Dyke shaft with the intent of leaching the entire deposit using it as an extraction well. In 1992, Arimetco abandoned its plans and the Van Dyke property lay dormant for a number of years.

In 2012, Bell Copper Corporation (Bell) entered into a purchase and sale agreement with Bennu Properties, LLC, Albert W. Fritz Jr. and Edith Spencer Fritz (Bennu-Fritz) who had recently acquired the Van Dyke property through a tax lien foreclosure process. Bell also acquired 35 unpatented federal mineral lode claims (the MIA 1-35 claims) to cover approximately 600 acres of ground contiguous with the southern edge of the property.

In July, 2012, Copper Fox signed a purchase agreement with Bell to acquire 100% of its interest in the Van Dyke property. Under the terms of the purchase agreement Copper Fox, through wholly-owned subsidiary Copper Fox Van Dyke Company, acquired 100% of the Van Dyke property, including the MIA claims, by paying to Bell CDN\$500,000, by paying to Bennu-Fritz US\$1.5 million and by assuming the continuing obligations with respect to the Van Dyke property, subject to certain terms and conditions. Bennu-Fritz retains a 2.5% Net Smelter Return ("NSR") production royalty from the Van Dyke deposit. Copper Fox completed its purchase of the Van Dyke property on April 5, 2013, and has the right to purchase up to 2% of the 2.5% NSR for a period of two years from that date by making payments of US\$1.5 million for each 1% NSR purchased.

Late in 2013, Copper Fox initiated a review of all available data on the Van Dyke project, including drill core and pulps stored in Miami, and began to plan its 2014 work program.

### **1.3 Geology, Mineralization and Deposit Characteristics**

The Van Dyke Copper Project is located in the Basin and Range province of east-central Arizona, and centrally within the Globe quadrangle. East-central Arizona, including the Globe-Miami district, has undergone considerable structural deformation that began in the Paleoproterozoic and persisted through to the Tertiary. The Globe-Miami mining district is underlain by igneous, sedimentary and metamorphic rocks of Precambrian, Paleozoic, Tertiary, and Quaternary age. The oldest exposed rocks in the district are Early Proterozoic (1.6-1.7 Ga) turbidites and felsic volcanic rocks of the Pinal Schist that were metamorphosed to greenschist facies. Subsequently, the Late Proterozoic Apache Group, a relatively thin (~1km) succession of regionally extensive marine sedimentary rocks was deposited across the region. Paleozoic rocks in the district include Cambrian Troy Quartzite, Devonian Martin Limestone, Mississippian Escabrosa Limestone, and Pennsylvanian to Permian Naco Formation. On the Van Dyke property, the post-Pinal Proterozoic strata and Paleozoic strata are absent; Pinal Schist is overlain directly by Tertiary Gila Conglomerate.

Intrusions, ranging from granodiorite to diorite, granite, and granodiorite to quartz monzonite, were emplaced during several phases of igneous activity. The most recent of these is the Schultz Granite, a composite pluton that was emplaced during the Paleocene (59 to 64 Ma). It underlies the southern part of the district; its younger porphyritic phases are genetically and spatially related to the area's porphyry copper and vein deposits.

The Van Dyke copper deposit is located within the Miami-Inspiration trend of deposits that includes four principal orebodies; from west to east they are Live Oak, Thornton, Miami Caved and Miami East. The Van Dyke copper deposit lies to the east, and on the hangingwall side, of the Miami fault, a district-scale northerly-trending, east-dipping normal fault that developed during Tertiary extension. East-side down displacement on the Miami fault is estimated to be approximately 400m, placing the Van Dyke deposit at deeper levels than the adjacent Miami Caved deposit. The entire Van Dyke copper deposit resides beneath a blanket of Gila Conglomerate and alluvium that ranges from 186 – 627m in thickness.

Deposit modeling identified at least two normal faults in the hangingwall of the Miami fault that dismember the Van Dyke deposit. The deposit consists of two (or more) structural blocks or segments each bound by moderately east-dipping, east-side down normal faults. The portion of the deposit bound by the Porphyry fault and the Azurite fault consists of two crude, gently east-dipping panels separated by a barren to weakly mineralized core.

The footwall of the orebody is locally defined by a layer of red clay gouge that strikes a little west of north and dips 20°E. About 200 feet northeast of the Van Dyke shaft, mineralization is truncated by the Van Dyke fault, a structure coincident with the footwall of a granite porphyry dyke. The fault and dyke strike 110° and dip 70°NE. The localization of secondary copper minerals appears to have been controlled by the intersection of the low-angle fault zone with the Van Dyke fault.

Secondary copper mineralization comprises the majority of the Van Dyke deposit. Mineralization, consisting primarily of malachite, azurite, chrysocolla, tenorite and cuprite, occurs in tectonically fractured to brecciated panels of Pinal Schist in the hangingwall of the Miami fault. Beneath the secondary copper mineralization there exists a weakly developed supergene zone. It contains sparse malachite, azurite, chrysocolla and local chalcocite, and is transitional down-section into weakly-developed zones of hypogene mineralization, primarily in the western part of the project area.

#### **1.4 Deposit Type**

Secondary copper mineralization comprises the majority of the Van Dyke deposit. The secondary copper mineralization is believed to have formed principally from copper-laden solutions that migrated laterally and downward from nearby oxidizing copper deposits along interconnected zones of fracturing and brecciation. The principal type of mineral deposit found to-date on the Van Dyke property is that of a transported secondary copper or exotic copper deposit that is genetically and spatially tied to the well-known and well-developed porphyry copper systems located adjacent to it.

#### **1.5 Relevant Exploration Data**

Prior to Copper Fox acquiring the Project, a total of 70 exploration holes and 17 ISL wells had been drilled on the property. Of the 70 historic exploration holes, 23 were drilled between 1916 and 1964; they were a combination of churn, rotary or reverse circulation (RC) and diamond drillholes that tested the breadth of the property, and for which only anecdotal information is known. The remaining 47 exploration holes were diamond drillholes completed from 1968-1975 to systematically assess the Van Dyke deposit area; near-complete technical data has been compiled for the majority of these holes. The 17 ISL wells were drilled in close proximity to one-another from 1976-1978 and in 1988 in an area immediately west of the Van Dyke shaft. At least seven were diamond drillholes for which limited core, but no written descriptions, has been recovered. Mineralized intervals for these wells were sampled, analyzed and later reported as weighted averages in Clary et al. (1981), but no other detail exists for the wells.

The historical exploration data base includes detailed logs for 45 holes, totaling 37,145m in aggregate length, drilled between 1968 and 1975. The manual logs describe lithology, alteration and mineralization, and provide total copper and acid soluble copper analytical results for each interval sampled. A number of the logs also list analytical results for silver, gold and molybdenum, but the data is incomplete. The historical data base also includes acid soluble copper data for channel samples taken on three levels of the underground workings. These data were manually recorded on underground level plan maps.

There are no assay certificates or laboratory reports to support the underground sampling data or historical drillhole data. In the opinion of the qualified persons, the historic data are sufficient in detail and worthy of being subjected to a verification program.

Late in 2013, MMTS took part in the evaluation of the exploration materials which included: a detailed assessment of core, drillhole logs and pulps remaining from seven selected drillholes; a core box and footage determination of core remaining from the OXY and VD series of drillholes, and; a general account of the pulps that remain from core sample analysis. The six drillholes selected for detailed



review (OXY-6, -7, -8, -15, -27 and VD-73-6) cover 800m of eastward strike length and up to 550m of width. They provide an accurate representation of the geology and mineralization of the copper deposit.

All historical drillholes were originally surveyed in local mine grid coordinates; there is no record of where the mine grid originates nor which way it is oriented. Copper Fox undertook a search for historic drillhole collars using existing exploration plan maps of the project area and was able to positively identify numerous collars in the field. A Trimble GeoHX GPS with sub-metre accuracy was used to survey the located collars in North American Datum (NAD) 27, UTM zone 12 (metres). The locations of 15 exploration drillhole collars and 9 ISL test well collars have been confirmed and surveyed. Three old survey monuments that had mine coordinates associated with them were also located and surveyed. The location information for the survey monuments and drillhole collars was then used to perform a regression that translated undiscovered collar locations from mine grid coordinates into NAD 27 UTM coordinates.

## **1.6 2014 Exploration Drilling**

Copper Fox completed a six-hole, 3211.7 metre PQ diamond drilling program from late-March to mid-June, 2014. The holes were drilled across the Van Dyke copper deposit, covering a west-to-east distance of approximately 825m and a north-south distance of approximately 500m. All six holes drilled by Copper Fox in 2014 are located on mineral estate lands that it owns, and all but one hole are located on surface tenure owned or controlled by other parties. The first 2014 hole, VD14-01 was drilled within an area previously tested by several historical drillholes in the vicinity of the underground workings and in-situ leaching pilot program. The remaining five 2014 holes, VD14-02 through VD14-06, were drilled to 'twin' selected historical drillholes. The main intent of the 2014 drilling program was 1) to verify the accuracy of previously captured data for a specific number of historical drillholes, and 2) once verified, proceed with the estimate of a NI 43-101 mineral resource for the Project using all pertinent historic data and new 2014 data.

All six of the 2014 Copper Fox drillholes were completed to their desired depth and encountered geology, alteration and mineralization consistent with a secondary or exotic copper deposit. Each drillhole penetrated the base of the post-mineral Gila Conglomerate, passed through broad intervals of secondary copper mineralization and the oxide/sulphide contact, and was terminated in unoxidized, weakly to non-mineralized Pinal Schist. Mineralization is hosted primarily by variably broken to shattered or brecciated Pinal Schist, and by intrusive breccia and granite porphyry of the Schultz Granite.

The first drillhole was not a twin of any historic hole, but was drilled to evaluate an area that had been the subject of ISL. It encountered minerals that are common by-products of ISL, but still returned important intervals of supergene and hypogene copper mineralization. Each of the five twin drillholes successfully intersected its target enabling comparisons to be made with its historic equivalent hole. One of the five twin holes encountered the effects of incidental leaching which resulted in a marked reduction in the overall grade of the grade of the twin versus its original hole. The four remaining twin drillholes encountered intervals of copper mineralization consistent with those of their respective original holes. A summary of the drill results are shown in Table 1-1.

**Table 1-1 2014 Diamond Drill Intersections, Van Dyke Copper Project**

Drillhole ID	From (m)	To (m)	Interval (m)	Total Copper (%)	Acid Soluble Copper (%)
VD14-01	246.9	368.4	121.5	0.357	0.249
VD14-02	375.2	591.6	216.4	0.444	0.359
incl	375.2	398.1	22.9	1.41	1.299
incl	413.6	458.7	45.1	0.447	0.418
incl	486.2	590.1	103.9	0.394	0.249
VD14-03	315.5	434.7	119.2	0.681	0.391
VD14-04	452.3	598.0	145.7	0.376	0.316
VD14-05	401.3	448.1	46.8	0.583	0.528
VD14-06	249.0	383.7	134.7	0.346	0.246
incl	249.0	281.6	32.6	0.749	0.631

### 1.7 Analytical Methods

Copper Fox used ALS Minerals (ALS) in Reno, Nevada, for the analysis of the first batch of historic drill core and drill core pulps. Later in the year, Copper Fox used Skyline Assayers and Laboratories (Skyline) in Tucson, Arizona, for a second batch of historic drill core pulps.

Copper Fox used Skyline for the analysis of all core sampled from the 2014 diamond drilling program, with the exception of a eight short whole core samples which were analyzed by SGS E&S Engineering Solutions Inc. (SGS) in Tucson, Arizona, as part of a preliminary in-situ pressure leach test. Check sampling of 2014 core analysis was conducted by Inspectorate America Corporation (Inspectorate) in Reno, Nevada, with the exception of one sample that, because of its high grade, was sent to Inspectorate’s Vancouver facility for analysis. A comprehensive Quality Assurance/Quality Control program was instituted to make possible the verification of analytical results from historical exploration programs for which there were no laboratory analytical certificates.

Samples were analyzed for total copper, acid soluble copper, cyanide soluble copper and a standard suite of metallic and non-metallic elements, and for gold by fire assay (FA) with an atomic absorption (AA) finish.

### 1.8 Data Verification

Copper Fox’s 2014 exploration program of drillhole twinning and re-analysis of existing stored drill core and drill core pulps was designed to provide a modern data set that could be compared with, and used to verify, the historic results. In order to provide a resource estimate for the Van Dyke Copper Project, it was necessary to verify and integrate as much of the historic data as possible.

Late in 2013, MMTS selected six historic drillholes for review and comparison with detailed geological logs. Core boxes for each hole were laid out by Copper Fox staff at its core logging facility so that the geology, mineralization and sample intervals could be verified. The previously sampled historic drill core was stored in standard waxed cardboard core boxes on shelves in a locked building and adjacent sea cans.

MMTS also examined core at random from several other holes as part of its account of the stored core boxes and stored drill core pulps from the 1968-1975 exploration programs. Drill core pulps were stored

in well-labelled heavy manila envelopes, organized numerically in cardboard trays and stored on shelving in Copper Fox's office facilities. This review determined that specific historic drillholes are suitable for drill core and/or drill core pulp sampling and re-analysis. Core for drillhole OXY-27, among others, was found to be near complete and therefore suitable for re-analysis. Complete or near complete suites of drill core pulps were identified for a number of holes including OXY-6, OXY-8, OXY-15, OXY-17B, VD-73-2, and OXY-23 and OXY-26. Drill core pulps from the latter two holes were analyzed at Skyline, and the core and all other drill core pulps were analyzed at ALS. A total of 560 historic drill core and drill core pulp samples were collected and re-analyzed for a suite of 51 elements, including copper by three methods to determine total copper and acid soluble copper contents, and gold by fire assay/AA finish. Results from the historic drill core and drill core pulp re-analysis and diamond drilling programs were then compared on a sample by sample basis and on a mineralized interval by mineralized interval basis to evaluate the consistency and reproducibility of the total copper and acid soluble copper values.

A comparison of weighted averages for continuously mineralized intervals of identical length for each of the historic drillholes that were sampled and re-analyzed shows excellent reproducibility for Total Copper on an interval by interval basis (100% are within 8% of the original composited value). Data for Acid Soluble Copper shows a higher range of variability on an interval by interval basis, but the re-assays are consistently higher (50% are within 8% of the original composited value, and 50% range from 13% to 53% higher than the original composited value).

Overall, the new data produced from the re-analysis of selected historical drill core and drill core pulps correlated strongly with the original values for total copper. However the new acid soluble copper values were consistently higher than the historical values. The variances in the latter may be the result of 40 years of oxidation that affected stored historic drill core and drill core pulps. Also, modern acid soluble copper or sequential copper analytical methods, such as the use of a ferric-bearing leachate, may be more aggressive, and therefore extract more copper, than the techniques used four decades ago. The re-analysis of a selection of historical drill core and drill core pulps verify that earlier operators followed proper procedures and used adequate care to obtain reliable results.

The data generated from the re-analysis of drill core and drill core pulps generally correlated well with the historic data recorded on drillhole logs. Total copper content of the re-analyzed historic drill core and drill core pulps correlates very well with the original data. Acid soluble copper content of the re-analyzed historic drill core and drill core pulps is consistently higher than the original data. This may suggest that modern soluble copper analysis techniques are more thorough than techniques of the late 1960s and early 1970s. Overall, the re-analysis demonstrated that the historic data set is acceptable and representative of the Van Dyke Copper Project.

The drillhole twinning program, consisting of five twin pairs of holes, also verified the integrity of the historic drillhole data. In all cases lithology could be correlated between the twin pairs. The style of mineralization was found to be similar in all twin pairs, with mineralization occurring in moderately to intensely fractured, and brecciated Pinal Schist and to a lesser extent in porphyritic quartz monzonite of the Schultz Granite. With one exception, mineralogy (malachite, azurite, chrysocolla, tenorite and cuprite) and total copper grades correlate well between twin pairs. The exception, VD14-02 drilled as twin of OXY-6 in the north-central part of the Project, intersected a mineralized interval with similar

widths as the original hole, but one in which the lower 120m consists of different copper-bearing minerals, and carries markedly lower total copper and acid soluble copper grades.

MMTS is of the opinion that the 2014 Copper Fox drill program:

- 1) generated analytical results that are suitable for use in resource estimation;
- 2) where both historic drillholes and 2014 drillholes exist, data for the 2014 holes will be used for resource estimation;
- 3) confirmed that the northwest part of the property, west of the Van Dyke shaft, was affected by historic ISL testing and/or small-scale mining that removed a percentage of the available soluble copper from a volume of mineralized rock;
- 4) identified an area of possible incidental leaching in the north-central part of the property, in the vicinity of drillhole OXY-6 and twin VD-14-02, that reduced the amount of secondary copper in the mineralized interval, and impacts the use of historical data for OXY-6;
- 5) through a rigorous QA/QC assessment of the data, verified that the remainder of the historical analytical results are suitable for use in resource estimation.

## **1.9 Mineral Resource Estimate**

The mineral resource included in this technical report is the first NI 43-101 compliant resource estimate for the Van Dyke Copper Project. The estimate has been made using Ordinary Kriging of total copper (TCu) and oxide copper (CuOX) based on the available drillholes and channel samples. The modelled grades have been validated through comparisons with the original data and the de-clustered, volume-variance corrected composited data.

The mineral resources are estimated uses criteria consistent with the CIM Definition Standards (2014) and in conformity with CIM "Estimation of Mineral Resources and Mineral Reserves Best Practice" (2003) guidelines.

The Inferred Resource has an effective date of December 17, 2014, and the base case was determined using a 0.05% total copper cut-off (Table 1-2). The Base Case at a 0.05% TCu cut-off is highlighted and is considered an appropriate cut-off for the extraction of copper by in situ leaching (ISL), as determined by a literature review of similar properties in Arizona (HDI-Curis, 2013 and Excelsior, 2011).

There are no known environmental, permitting, legal, title, taxation, socio-economic, marketing and political or other factors that could materially affect the resource estimate.

**Table 1-2 Inferred Mineral Resource Estimate - Van Dyke Copper Project (December 17, 2014; Sue Bird, P.Eng.)**

Zone	Resource Category	Cut-off - TCu(%)	tonnes	TCu (%)	ASCu (%)	ASCu/TCu	Total Cu (Mlb)	Oxide Cu (Mlb)
Oxide	Inferred	0.05	101,524,000	0.416	0.261	0.63	931	579
		0.10	100,637,000	0.419	0.262	0.63	930	577
		0.15	96,424,000	0.432	0.269	0.62	917	567
		0.20	83,982,000	0.469	0.291	0.62	869	534
	<b>Resource Category</b>	<b>Cut-off - TCu(%)</b>	<b>tonnes</b>	<b>TCu (%)</b>	<b>ASCu (%)</b>	<b>ASCu/TCu</b>	<b>Total Cu (Mlb)</b>	<b>Oxide Cu (Mlb)</b>
Mixed Oxide-Sulphide	Inferred	0.05	160,158,000	0.144	0.042	0.29	509	147
		0.10	102,060,000	0.183	0.046	0.25	411	104
		0.15	46,309,000	0.257	0.054	0.21	262	55
		0.20	24,964,000	0.329	0.062	0.19	181	34
	<b>Resource Category</b>	<b>Cut-off - TCu(%)</b>	<b>tonnes</b>	<b>TCu (%)</b>	<b>ASCu (%)</b>	<b>ASCu/TCu</b>	<b>Total Cu (Mlb)</b>	<b>Oxide Cu (Mlb)</b>
Total Oxide & Mixed-Sulphide	Inferred	0.05	261,682,000	0.250	0.127	0.51	1,440	726
		0.10	202,697,000	0.300	0.153	0.51	1,341	681
		0.15	142,733,000	0.375	0.199	0.53	1,180	622
		0.20	108,946,000	0.437	0.238	0.55	1,050	568

*Notes:*

*All numbers are rounded following Best Practice Principles.*

*The total copper and oxide copper expressed in millions of pounds ('Mlb').*

*The terms Oxide and ASCu represent the acid soluble copper.*

### 1.10 Conclusions and Recommendations

Based on the available data and the resource estimate, the following conclusions and recommendations are presented.

A verification program consisting of 1) re-analysis of drill core and drill core pulps from eight historical drillholes, and 2) twinning of five historical drillholes largely validated the historical data base. One of the twin drillholes showed differing copper mineralogy and notably lower copper grades for the bottom part of the mineralized interval when compared to its original counterpart; the reason for the differences has not been determined, but one possible cause is localized, incidental leaching solutions that migrated through an open fracture system from operations located north of the property. A sixth hole drilled in an area of reported test in-situ leaching (ISL) in the northwest corner of the property, confirms that appreciable amounts of recoverable copper remain in the area and that the mineralization is open to the west and to the south.

An Inferred Resource Estimate, based on 11,220m of core sampled for TCu from historic drillholes 1,424m of historic underground channel sampling, and six 2014 drillholes is calculated for the Project. The Inferred Resource using a base case cut-off grade of 0.05% total copper is 261.7 million tonnes grading 0.25% total copper that contains 1.44 billion pounds of copper.

An 18-hole, 10,200-metre diamond drill program is recommended for 2015. The purpose of the recommended program is to upgrade quality of the existing resource and to expand the area of mineralization laterally from areas of the deposit not confined by property boundaries; particularly to the south of the Van Dyke Shaft.

## 2 Introduction

### 2.1 Purpose of Report and Terms of Reference

Copper Fox Metals Inc. (Copper Fox) retained Moose Mountain Technical Services (MMTS) to prepare a National Instrument 43-101 (NI 43-101) Technical Report and Resource Estimate for the Van Dyke Copper Project, Gila County, Arizona, U.S.A. The authors of the report are Susan Bird, P.Eng., and R. A. (Bob) Lane, P.Geo., of MMTS who are “Qualified Persons” as defined by NI 43-101 standards.

Copper Fox is a Canadian resource company listed on the TSX-Venture Exchange (TSX VENTURE: CUU) focused on copper exploration and development in North America with offices in Calgary, Alberta and Miami, Arizona. Copper Fox holds, through its wholly-owned subsidiary, Desert Fox Copper Inc. (Desert Fox), the Van Dyke Copper Project in the Globe-Miami Mining District, Arizona, and the Sombrero Butte Copper Project in the Bunker Hill Mining District, Arizona. Copper Fox also owns a 25% interest in the Schaft Creek Joint Venture in northwest British Columbia, Canada. Throughout the report reference is made primarily to the parent company Copper Fox, rather than its subsidiary Desert Fox.

The purpose of this Technical Report is to provide an NI 43-101 resource estimate for the Van Dyke Copper Project based on the evaluation of historical data, re-assaying of drill core and drill core pulps from a selection of holes drilled by Occidental Minerals Corporation, AMAX and Utah International between 1968 and 1975, and six diamond drillholes completed by Copper Fox in 2014. This report also provides a compilation of all historic exploration and development activities conducted on the property, a basic understanding of regional and local geology and mineralization, and recommendations for future work. The information presented herein forms the basis for ongoing advanced studies, such as a Preliminary Economic Assessment which will consider a range of possible options available to Copper Fox for optimizing future development of the Van Dyke Copper Project.

This Technical Report is prepared in accordance with the guidelines provided in NI 43-101, Standards of Disclosure for Mineral Projects (June 24, 2011) for technical reports, Companion Policy 43-101CP, Form 43-101F1, and uses industry accepted Canadian Institute of Mining, Metallurgy and Petroleum (CIM) “Best Practices and Reporting Guidelines” (CIM, 2003) for disclosing mineral exploration information, including the updated CIM Definition Standards for Mineral Resources and Mineral Reserves (May 2014).

### 2.2 Sources of Information

This report is based on historical information and data compiled by Copper Fox including unpublished paper and electronic copies of reports, technical memos and correspondence, geologic maps, drill logs and cross-sections, analytical results from re-sampling of stored historic drill core and drill core pulps, analytical results from diamond drilling completed in 2014, and publically available reports and documents. The principal sources of information are diamond drilling data generated by Occidental Minerals Corporation, AMAX and Utah International between 1968 and 1975, and six diamond drillholes completed by Copper Fox in 2014. All sources of data referenced in the text are listed alphabetically in Section 27: References.

## 2.3 Site Visits and Scope of Personal Inspections

Bob Lane, P.Geo., with Jaclyn Galbraith, GIT, of MMTS, initially visited the Project from November 26-29, 2013. The first MMTS site visit included an inspection of the project infrastructure, company offices and core and sample storage facilities. A tour of the site included stops at the historic Van Dyke Shaft, the former Kocide Chemical copper recovery plant, several pertinent outcrops and a number of historic drillhole collar locations. Two days were spent examining core from four holes drilled in the 1970s by Occidental Minerals Corporation and cataloging pulps that remained in storage from that period of drilling.

Additional visits to the Project were made by co-author Susan Bird, P.Eng., on April 12, 2014, and by Bob Lane on April 22-26, 2014 and again on June 20-21, 2014. The latter visits coincided with Copper Fox's Phase 1 drilling program, and included an inspection of the core logging and core processing station, stops at two of the in-progress drillholes, examination of core from three of the completed 2014 drillholes, review of drill core handling, drill core Chain-of-Custody procedures, and QA/QC methodologies.

## 2.4 Definitions and Units of Measurement

A list of terms frequently used in this report is defined in the glossary of Table 2-1 below.

**Table 2-1 Glossary**

<b>Term</b>	<b>Definition</b>
<b>Acid soluble</b>	The portion of the mineralization which can be extracted from the rock by the use of sulphuric acid
<b>Assay</b>	Analysis of a rock or soil sample metal content
<b>Composite</b>	Assay data weight-average over a larger, standardized length
<b>Cut-off grade</b>	The grade value of mineralization at which the deposit can be considered economic, or in the case of Inferred material to be considered probable for eventual extraction
<b>Dip</b>	The angle in degrees from horizontal the a surface is inclined perpendicular to strike
<b>Domain</b>	A segregation of the deposit into volumes which are interpreted to contain similar geologic characteristics
<b>Fault</b>	A structure within the earth displaying movement along the discontinuity
<b>Grade</b>	The concentration of metal within the assay, composite, or block expressed in %, ppm or ppb
<b>Kriging</b>	Interpolation of samples values that minimizes the estimation error
<b>Lithology</b>	Geologic term defining rock type
<b>Mineral Resource</b>	"a concentration or occurrence of solid material of economic interest in or on the Earth's crust in such form, grade or quality and quantity that there are reasonable prospects for eventual economic extraction" (CIM, 2014)
<b>Mineral/Mining Lease</b>	An area of land for which mineral rights are held by a certain party
<b>Mining Assets</b>	Material properties
<b>Mixed</b>	Mineralization including both oxide and sulfide mineralization
<b>Nearest neighbor</b>	Interpolation of samples to include only the closest value by polygonal estimation
<b>Sulfide</b>	Mineralization including significant sulfur bearing minerals
<b>Zone</b>	A segregation of the deposit into oxide, mixed, or sulfide based on the grade and acid solubility of the mineralization

Frequently used abbreviations and acronyms are shown in Table 2-2.

**Table 2-2 List of Abbreviations and Acronyms used in this Report**

Abbreviation	Description
%	percent
°C	Degrees Celsius
ADEQ	Arizona Department of Environmental Quality
ADWR	Arizona Department of Water Resources
APP	Aquifer Protection Permit
AQL	Aquifer Quality Limit
ASLD	Arizona State Land Department
BLM	US Department of the Interior, Bureau of Land Management
Cu	Copper
CuOx or ASCu	Acid Soluble copper (copper oxide)
lbs	pounds
masl	Metres above standard sea level
ppb	Parts per billion
ppm	Parts per million
RQD	Rock Quality Designation
sg	Specific gravity
t	Metric tonne
USEPA	United States Environmental Protection Agency
WQARF	Water Quality Revolving Fund

Historical exploration and mining data in Arizona was documented using the Imperial system, with units of length expressed in feet and inches, mass in short tons, and precious metal grades in ounces per short ton. More recent exploration and mining data in Arizona is also commonly quoted using Imperial units. However, in this report the metric system is used preferentially, with units of length expressed in kilometres, metres or centimetres, units of mass expressed in kilograms or metric tonnes, and precious metal grades expressed in grams per tonne, in parts per million (ppm) or in parts per billion (ppb).

All UTM positions referenced in this report and on its accompanying figures are referenced to the North American Datum of 1927 (or NAD 27).

All currency quoted in this report refers to U.S. dollars unless otherwise noted.



### **3 Reliance on Other Experts**

In preparation of this report the authors, as Qualified Persons, have examined the historical data provided by Copper Fox and have relied on the basic data as well as project information from other sources to support the statements and opinions presented in this Technical Report. The authors have, after review of the project data, concluded that the historical data, in conjunction with the 2014 diamond drilling and historical drill core pulp re-sampling programs completed by Copper Fox are sufficient to support preparation of this Technical Report and are relied upon.

Regarding metallurgical work, the authors have relied on SGS E&S Engineering Solutions Inc. (SGS) who completed a preliminary In-Situ Copper Leaching Simulation Study on the Van Dyke Copper Project; a summary of the study is presented in Section 13: Mineral Processing and Metallurgical Testing.

#### **3.1 Land Status**

The land status information summarized herein, including ownership, location and dimension of mineral estate and surface estate lands that comprise most of the Project, was the result of exhaustive research and compilation by independent land manager Mr. Daniel L. Mead of Cornerstone Lands/DLM/L.L.C., Tucson, Arizona. The legal descriptions for these mineral estate and surface estate lands were sourced from official Gila County documents located in Globe, Arizona. The information provided to the authors by Mr. Mead is relied upon.

Official legal descriptions of unpatented mineral claims that form the southern part of the project area were collected from the federal Bureau of Land Management offices in Tucson, Arizona. This information is relied upon by the authors and the authors did not independently confirm details of this.

#### **3.2 Historic Exploration**

The geological and exploration data captured from earlier operators of the Van Dyke Copper Project and, to a lesser degree, from relevant publically available reports, provide a sound technical foundation for the Project. The authors believe that the historical technical information provided for the preparation of this report was accurate at the time it was written and is relied upon.

The interpretations and opinions expressed by these earlier workers, regarded to be competent, experienced explorationists, were based on a current understanding of the geological setting of the deposit and are reasonable. Their work is regarded to have been performed in accordance with high standards for the periods in which the work was completed and is relied upon.

## 4 Property Description and Location

### 4.1 Location

The Van Dyke Copper Project is situated within the Globe-Miami mining district, Gila County, east-central Arizona, approximately 110 kilometers (km) east of Phoenix (Figure 4-1). The core area of the Project is centered at 512000 E and 3695600 N (UTM; NAD27) and lies primarily within the town limits of Miami, Arizona. The Town of Miami lies about 10km west of the City of Globe, and near the San Carlos Apache Indian Reservation. Miami, Globe, and a number of unincorporated communities nearby, including Inspiration, Claypool and Central-Heights-Midland City, are commonly called Globe-Miami.

The land survey coordinates for the Project include Sections 29, 30 and 33 of Township 1 North, Range 15 East, Gila and Salt River Baseline and Meridian (GSRBM) and Sections 25, 31 and 36 of Township 1 North, Range 14 East, GSRBM.

The Globe-Miami mining district is a major copper mining area located in the northern foothills of the Pinal Mountains and the Globe Hills, within the Arizona-New Mexico Basin and Range Province, and the broad Walker-Texas Lineament Zone. The mining district is almost entirely within the Inspiration and Globe quadrangles and comprises the Miami-Inspiration sub-district in its western side and the Globe Hills sub-district on its eastern side. The mining district includes a number of porphyry copper deposits that have been mined since the discovery of rich veins of chrysocolla in the Globe Hills in 1874. The history of the Globe-Miami mining district, with a focus on the Van Dyke Copper Project is provided in Section 6: History. A discussion of mineral deposit types found in the Globe-Miami mining district is provided in Section 8: Deposit Types.

The productive mineral deposits of the Globe-Miami district, including the Van Dyke copper deposit, and the nearby Superior district, lie within a 10km wide, generally northeast to easterly trending corridor (Peterson, 1962). This corridor marks a zone of Proterozoic structural weakness that parallels the contact between Pinal Schist and the Proterozoic granites to the north-west. The corridor is also parallel to the main foliation within the Pinal Schist, and it is also the locus of Mesozoic and Tertiary silicic intrusions, which are interpreted to be genetically associated with mineralization in the district (Hammer and Peterson, 1968). The main copper porphyry deposits are therefore centered on the main intrusive mass, while the vein deposits occur distally, but still within the mineralized corridor.



**Figure 4-1** Location of the Van Dyke Copper Project

There are currently three producing mines in the Globe-Miami district: the Pinto Valley copper mine of Capstone Mining Corp; the Carlota copper mine of KGHM International Ltd., and the Miami-Inspiration copper mine, smelter and rod mill of Freeport-McMoRan Inc. The district also hosts the Miami-East mine of BHP Billiton, presently on care-and maintenance, and the historic Copper Cities and Old Dominion copper deposits.

The Van Dyke Project shares a common claim boundary with the Miami-East and Miami-Inspiration mine sites. The Van Dyke copper deposit does not out crop, but resides beneath a thick blanket of Gila Conglomerate, which is capped locally by a thin veneer of alluvium. The deposit is situated in the depressed hanging wall block of the Miami East fault, opposite the east end of the Miami-Inspiration orebody. The deposit strikes northeast and dips gently southeast at about 20 degrees. The mineralization that comprises the deposit occurs over 1200m by 1300m area and is approximately 225m thick.

## **4.2 Tenure and Ownership**

### **Tenure**

The Van Dyke Copper Project consists of several varieties of patented lands, many of which occur within or near the city limits of the town of Miami. Additional patented lands owned by the company are contiguous with and lie south and east of the core area of the Project. A total of 26 patented parcels of land, each of which includes subsurface mineral rights, cover an aggregate area of 531.5 hectares; these comprise the Mineral Estate of the Van Dyke Copper Project (Table 4-1 and Figure 4-2).

The Project includes a total of 83 parcels of land that include surface rights. They cover a total of 5.75ha primarily in the northwestern part of the patented mining claim area (Figure 4-3).

The company also controls 35 unpatented lode mining claims (MIA 1-35) that are contiguous with and located immediately south of the core area of the Project. The unpatented claims are located on Federal Land administered by the Bureau of Land Management (BLM). The unpatented claims cover 292.0 hectares as listed in Table 4-2 .

### **Ownership**

The ownership history of the patented lands covering the Van Dyke Copper Project is described in Section 6: History. The patents became available after taxes had not been maintained for many years. Bennu Properties, LLC, Albert W. Fritz Jr. and Edith Spencer Fritz (Bennu-Fritz) applied to Gila County and acquired clear title to surface and subsurface mineral rights (patents) that cover the Van Dyke property in April, 2012, through a tax lien foreclosure process.

Bell Copper Corporation conducted initial negotiations and finalized terms for acquisition of the Van Dyke Copper Project with Bennu-Fritz through a "Letter of Intent". However, before the deal could be completed Bell sold its position to acquire 100% of the Van Dyke patented lands to Copper Fox. Ultimately, Bennu-Fritz sold the Van Dyke property directly to Copper Fox Van Dyke Co. (a wholly-owned subsidiary of Copper Fox) by way of a Special Warranty Deed signed by the two entities on April 5, 2013. Bennu-Fritz retains a 2.5% Net Smelter Return ("NSR") production royalty from the Van Dyke deposit. Copper Fox Van Dyke Co., in its' sole and absolute discretion, has the right to purchase up to 2% of the

2.5% NSR for a period of two years from the date of closing the purchase (i.e. April 5, 2013) by the payment of US\$1.5 million for each 1% NSR purchased.

### Annual Costs to Maintain Ownership

There are no annual taxes for the Project's mining patents (Mineral Estate). However, annual taxes are required for patented lands that include surface rights (real property) in addition to sub-surface (mineral) rights, and the taxes are for the surface rights only. The annual aggregate tax required to maintain the surface lands is \$1,845.80, and payment has been made to Gila County, Arizona.

The 35 unpatented federal lode mining claims owned by Copper Fox require an annual maintenance fee of \$155 per claim be paid to the United States Bureau of Land Management (BLM), and an annual administration fee of \$10 per claim be paid to Gila County. A payment of \$5,425 was made in respect of these claims in August 2014 for the filing year September 1, 2014 to August 31, 2015.

**Table 4-1 List of Patented Lands, Van Dyke Copper Project**

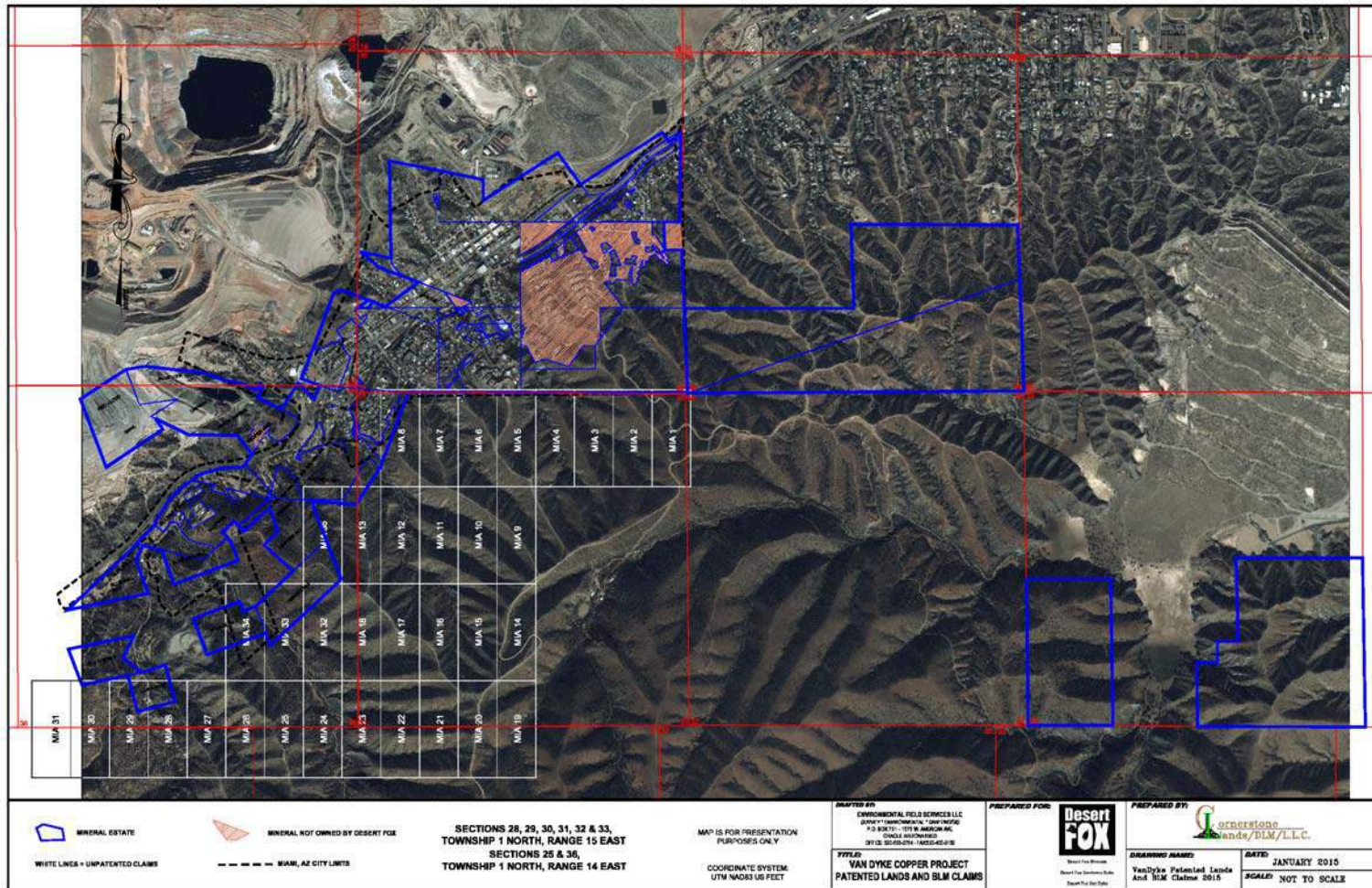
Patent Number	Legal Description	Type of Patent	Area (acres)	Area (Ha)
<b>Township 1N, R 14E</b>				
Patent-46574	T1N, R14E, Sec 36: Long shot, Solace #1 & Solace #2 claims	ME Patent	32.6	13.2
Patent-431029	T1N, R14E, Sec 25 & 36: Gray Copper claim	ME Patent	20.6	8.3
Patent-434949	T1N, R14E, Sec 36: Chief, Vesper, Cracker Jack, White Captive, Orphan, Snail, Red Cloud & Iron claims	ME Patent	63.0	25.5
Patent-546592	T1N, R14E, Sec 36: Dora fractional claim	ME Patent	0.4	0.2
Patent-590391	T1N, R14E, Sec 36: Sho Me No. 2, Copper Center, Sulphide No.1 claims	ME Patent	56.5	22.9
Patent-590392	T1N, R14E, Sec 36: Onward, Onward #2 & Onward #3 claims	ME Patent	38.0	15.4
Patent-612204	T1N, R14E, Sec 36: Blue Bell, Blue Bell #2, Blue Bell #3 & Sulphide claims	ME Patent	35.6	14.4
Patent-629135	T1N, R14E, Sec 36: Sulphide #2 claim	ME Patent	14.6	5.9
<b>Township 1N, R 15E</b>				
Patent-22128	T1N, R15E, Sec 30 Lot 4 Sec 30 & T1N, R14E Sec 25 Lot 12	HES Patent	40.0	16.2
Patent-91944	T1N, R15E, Sec 30: Sho Me claim	ME Patent	21.6	8.7
Patent-56345	T1N, R15E, Sec 30 Lot 5	HES Patent	38.3	15.5
Patent-159952	T1N, R15E, Sec 30 SE 1/4 of NE 1/4	HES Patent	40.0	16.2
Patent-219203	T1N, R15E, Sec 30: Myrtle Lode claim (MS 2583)	ME Patent	9.0	3.6
Patent-160508	T1N, R15E, Sec 30 W 1/2 of NE 1/4	HES Patent	21.2	8.6
Patent-160509	T1N, R15E, Sec 30 E1/2 of NW 1/4	HES Patent	18.4	7.4
Patent-163255	T1N, R15E, Sec 30 Lots 2, 3, & 8	HES Patent	0.4	0.1
Patent-181896	T1N, R15E, Sec 30 NE 1/4 of NE1/4	FLSDA	11.0	4.5
Patent-248767	T1N, R15E, Sec 30 SE 1/4	CE Patent	160.0	64.7
Patent-253612	T1N, R15E, Sec 30 SE 1/4 Of SW 1/4	CE Patent	40.0	16.2
Patent-302130	T1N, R15E, Sec 30 Lot 1	HES Patent	1.4	0.6
Patent-541188	T1N, R15E, Sec 29 SW 1/4	HES Patent	79.0	32.0
Patent-1106529	T1N, R15E, Sec 29 SE 1/4	CE Patent	160.0	64.7

**Copper Fox Metals Inc.  
Van Dyke Copper Project**

Patent Number	Legal Description	Type of Patent	Area (acres)	Area (Ha)
Patent-1041095	T1N, R15E, Sec 33 SW 1/4	FLSDA	132.0	53.4
Patent-1041093	T1N, R15E, Sec 33 S1/2 SE1/4 & S1/2 SW 1/4	FLSDA	40.0	16.2
Patent-1041094	T1N, R15E, Sec 33 SW1/4 NE1/4 & N1/2 SE 1/4	FLSDA	80.0	32.4
Patent-1041093	T1N, R15E, Sec 33 SE 1/4	FLSDA	160.0	64.7
			<b>1313.4</b>	<b>531.5</b>
Brief definitions of the government patents listed above:				
<p><i>ME (Mineral Estate) Patent: The Federal Government transfers its ownership for both the mineral and surface estate of an unpatented mining claim or claims to the patentee.</i></p> <p><i>CE (Cash Entry) Patent: The sale of public land to the highest bidder.</i></p> <p><i>FLSDA: The sell, exchange or interchange of USFS land (both surface and mineral estate) by a quitclaim deed to a citizen or company by authority of the Secretary of the Department of Agriculture.</i></p> <p><i>HES (Homestead Entry Survey) Patent: The sale of Federal Government land to the highest bidder to those that had pre-emption claim.</i></p>				

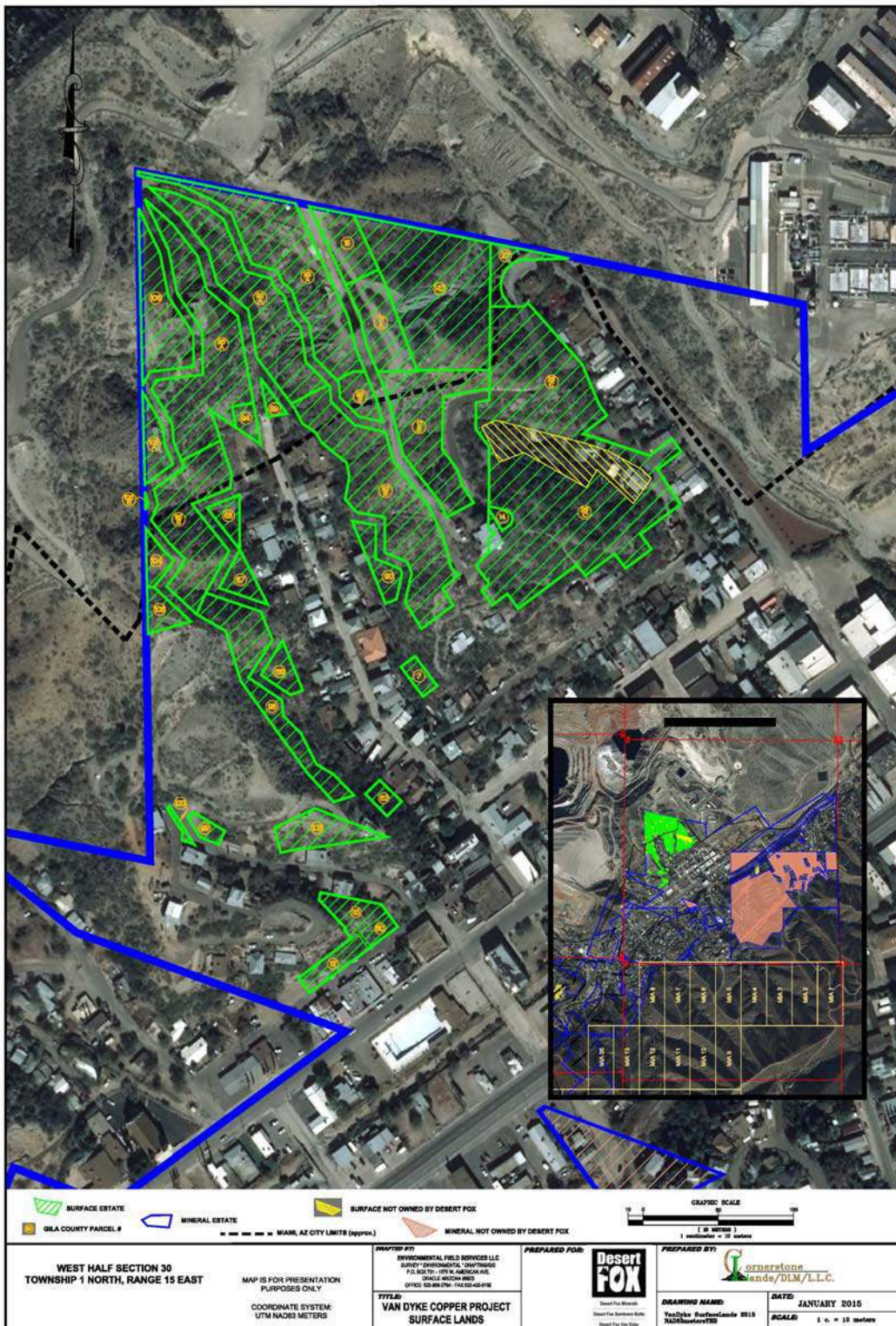
**Table 4-2 List of Unpatented Lode Mining Claims, Van Dyke Copper Project**

Claim Name	AMC #	County	Book	Fee Number	Area (acres)	Area (hectares)
MIA-1	405285	Gila	2010	12604	20.661	8.361
MIA-2	405286	Gila	2010	12605	20.661	8.361
MIA-3	405287	Gila	2010	12606	20.661	8.361
MIA-4	405288	Gila	2010	12607	20.661	8.361
MIA-5	405289	Gila	2010	12608	20.661	8.361
MIA-6	405290	Gila	2010	12609	20.661	8.361
MIA-7	405291	Gila	2010	12610	20.661	8.361
MIA-8	405292	Gila	2010	12611	20.661	8.361
MIA-9	405293	Gila	2010	12612	20.661	8.361
MIA-10	405294	Gila	2010	12613	20.661	8.361
MIA-11	405295	Gila	2010	12647	20.661	8.361
MIA-12	405296	Gila	2010	12648	20.661	8.361
MIA-13	405297	Gila	2010	12614	20.661	8.361
MIA-14	405298	Gila	2010	12615	20.661	8.361
MIA-15	405299	Gila	2010	12616	20.661	8.361
MIA-16	405300	Gila	2010	12649	20.661	8.361
MIA-17	405301	Gila	2010	12650	20.661	8.361
MIA-18	405302	Gila	2010	12617	20.661	8.361
MIA-19	405303	Gila	2010	12651	20.661	8.361
MIA-20	405304	Gila	2010	12652	20.661	8.361
MIA-21	405305	Gila	2010	12653	20.661	8.361
MIA-22	405306	Gila	2010	12654	20.661	8.361
MIA-23	405307	Gila	2010	12655	20.661	8.361
MIA-24	405308	Gila	2010	12656	20.661	8.361
MIA-25	405309	Gila	2010	12657	20.661	8.361
MIA-26	405310	Gila	2010	12658	20.661	8.361
MIA-27	405311	Gila	2010	12659	20.661	8.361
MIA-28	405312	Gila	2010	12660	20.661	8.361
MIA-29	405313	Gila	2010	12661	20.661	8.361
MIA-30	405314	Gila	2010	12662	20.661	8.361
MIA-31	405315	Gila	2010	12663	20.661	8.361
MIA-32	405316	Gila	2010	12664	20.661	8.361
MIA-33	405317	Gila	2010	12665	20.661	8.361
MIA-34	405318	Gila	2010	12666	20.661	8.361
MIA-35	405319	Gila	2010	12618	20.661	8.361



**Figure 4-2 Distribution of Patented lands and Unpatented lode mining claims that Comprise the Van Dyke Copper Project**





**Figure 4-3 Distribution of Surface Rights owned by Copper Fox Van Dyke Company that Coincide with the Van Dyke Copper Project**

### 4.3 Socio-Economic and Environmental Studies

The town of Miami is located on the northeastern slope of the Pinal Mountains, and is surrounded (except to the east) by the Tonto National Forest. The town is bisected by east-west highway U.S. Route 60 and is served by the Arizona Eastern Railway.

The census of 2010 determined that there were 1,837 people, 749 households and 472 families in Miami. The median income for a household was US\$38,534 and the unemployment rate was 3.5%. For the population 25 years and over (1,296), educational attainment was 34.5% high school graduate, 25.1% with some college education (no degree), 8.6% with a Bachelor's degree or higher and 8.3% with an Associate's degree (technical training).

Employment and median earnings by major industry sectors for residents (civilians aged 16 and older) of the Globe-Miami district over the past twelve months is shown in Table 4-3.

**Table 4-3 Main Industries by Employment and Median Earnings, Globe-Miami district, Arizona**

Subject	Estimate (number of civilians employed population 16 years and older)	Median earnings (US dollars)
Mining, quarrying, and oil and gas extraction	1 280	59 570
Retail trade	739	13 669
Transportation and warehousing, and utilities	548	41 750
Educational services, and health care and social assistance	1 642	21 100
Arts, entertainment, and recreation, and accommodation and food services	801	16 053
Public administration	565	41 824

*Source: US Census Bureau, 2008-2012 American Community Survey*

In 1989, the Arizona Department of Environmental Quality (ADEQ) declared metal-bearing water in the Pinal Creek area a cleanup site under the state's Water Quality Revolving Fund (WQARF). A group of mining companies, consisting of BHP Copper (formerly Magma), Cyprus Miami Copper Corporation, and Inspiration Consolidated Copper Company, formed the Pinal Creek Group to conduct the cleanup activities under the direction and supervision of ADEQ. The Van Dyke mine is located within the Pinal Creek watershed, adjacent to the Pinal Creek Group mines.

### 4.4 Permits and Authorizations

The Arizona Department of Water Resources (ADWR), an agency that oversees all drilling in the State of Arizona, granted Copper Fox permit 55-916587 on March 6, 2014. The permit allows for the drilling of up to 25 holes for mineral exploration purposes within Section 30, Township 1 North, Range 15 East, up to March 6, 2015.

The first hole of the 2014 program, VD14-01 located west of the Van Dyke shaft, was drilled in an area covered by surface tenure and a patent claim that are both owned by the company and did not require an access permit.

Access for the drilling of two holes in the northern part of the property, VD14-02 (a twin of drillhole OXY-6) and VD14-03 (a twin of drillhole OXY-8), both located on patented claims owned by the company, was granted by surface tenure holder BHP.

The town of Miami granted access to three sites within city limits including the site for drillhole VD14-06, which was drilled in a parking lot adjacent to the town's mayor and council office building (Plate 4-1). Agreements and social license for drilling of holes VD14-04 and VD14-05 located on private property within city limits, was also gained from local residents who have been temporarily impacted by the drilling activities.

At the completion of the 2014 drilling program, Copper Fox has authorization from ADWR to drill 19 holes without the need for additional permits until March 6, 2015.

### **Environmental Permitting Requirements for Advanced Exploration and Development**

There are several drilling and environmental permits required to advance the Van Dyke Copper Project. Below is a list of these permits including a brief description and purpose for each permit required.

An Aquifer Protection Permit (APP) is required from ADEQ for the potential discharge of pollutant to an aquifer. The applicant must show that the Best Available Demonstrated Control Technology will be used by the facility and that Aquifer Water Quality Standards (AWQS) will not be exceeded as a result of discharge from the facility.

Underground Injection Control (UIC) permits for ISL injection wells are issued by USEPA, as well as aquifer exemptions, if injecting in an Underground Source of Drinking Water (USDW). Under the Arizona Pollutant Discharge Elimination System (AZPDES) Permit Program, all facilities that discharge pollutants from any point source into waters of the United States (navigable waters) are required to obtain an AZPDES permit. Water rights, wells construction and groundwater withdrawal for mineral extraction (ISL recovery) and metallurgical processing are permitted by the Arizona Department of Water Resources (ADWR).

Other permits may be required from ADEQ (air quality, storm water) and USEPA (hazardous waste, historical preservation). The Arizona State Mine Inspector will authorize the Mined Land Reclamation Plan and the town of Miami and the Gila County will issue utilities and right-of-ways permits.

Other permit requirements could be triggered by non-compliance with respect to the following acts:

- National Environmental Policy Act
- National Historic Preservation Act
- Endangered Species Act
- Resource Conservation and Recovery Act (solid and hazardous waste)
- Emergency Response and Community Right-to-Know Act
- Clean Water Act

## 5 Accessibility, Climate, Local Resources, Infrastructure and Physiography

### 5.1 Access

The Van Dyke Copper Project is located in the Globe-Miami mining district at the town of Miami, Gila County, Arizona. The project is approximately 110km east of Phoenix and is accessed via U.S. Route 60 (Figure 5-1) which runs easterly through Bloody Tanks Wash and connects the town of Miami with the city of Globe approximately 10km further to the east. The town of Miami is built up on both sides of the highway and areas of previous drilling occur throughout the town. Many of these drill sites are still accessible by dense network of community paved and gravel roads. However, some historic drill sites are hidden beneath more recent town infrastructure such as asphalt parking lots or building construction.

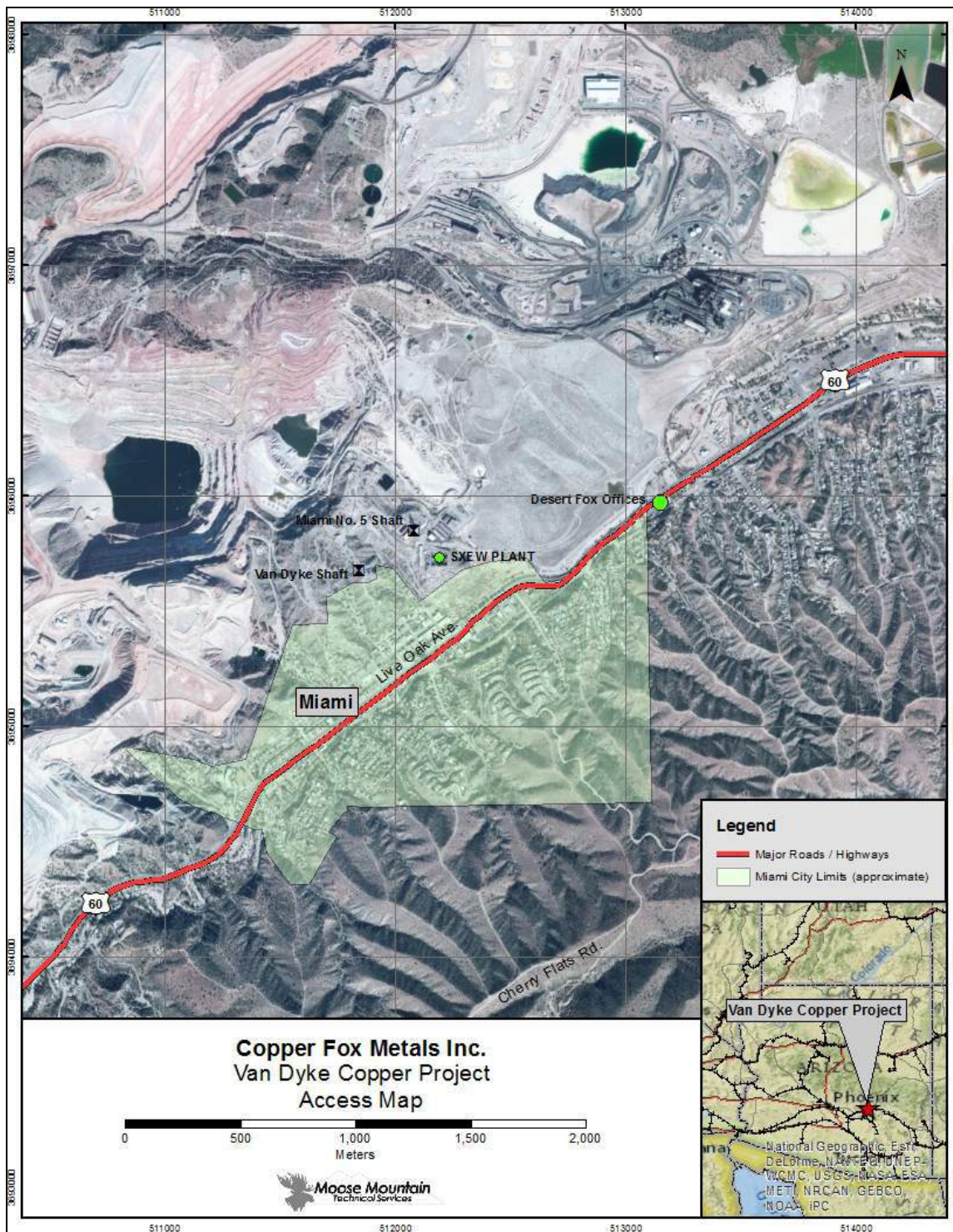
Roads servicing the mining operations of BHP Copper and Freeport McMoRan, immediately north and west of Miami and of the Project are gated and require authorizations for use. Some of these roads access historic Van Dyke drill sites that now reside on surface rights owned by the mining companies. Access agreements were struck to secure legal access to these areas whose mineral rights are unequivocally owned by Desert Fox.

### 5.2 Climate

The National Oceanic and Atmospheric Administration's Climate Atlas of the United States and the Western Regional Climate Center records provide data from 1914 - 2005 from a station in Miami, Arizona.

The regional climate is semi-arid. The average amount of annual precipitation for the area is 58.4 cm. Most of the rainfall occurs during the winter and summer months. Precipitation during the winter months (December - March) usually occurs as long, steady storms. Snow may fall at higher elevations, but does typically does not accumulate. Rain events during the summer months (July - early September) are typically short and violent in response to local thunderstorms. May and June are the driest months of the year and the period can reach drought conditions.

The average annual maximum temperature for the period of record at this station is 25°C. The warmest month is July with an average maximum temperature of 36°C. The coolest month is January, with an average minimum temperature of 1°C.



**Figure 5-1 Van Dyke Copper Project – Access and Location**

### 5.3 Local Resources

Existing facilities at the Project include a permanent office and core storage building and a series of steel “sea cans” that are used to store drill core and equipment, and a yard which serves as a suitable core layout and working area (Plate 5-1). The yard is not fenced, but core and supplies are never left out or unattended during daylight hours. All materials are put away and locked inside the office or sea cans during non-working hours. The office facility is located in the town of Miami at the following address: 344 E. Highway 60, Lower Miami, AZ 85539-1353.

### 5.4 Infrastructure

There is a long-standing tradition of copper mining in the area, and the industry still provides the largest number of jobs for residents. Therefore, the local services already in place are sufficient to supply the Project's needs. The current level of community services is thought to be adequate for the requirements of the Project. Medical facilities are available at Miami's Cobre Valley Community Hospital. Fire, police, public works, transportation, and recreational facilities are in place and fully functioning. The two communities have an adequate supply of permanent housing and temporary housing to more than accommodate the projects exploration workforce.



**Plate 5-1** Copper Fox's office, core logging and equipment storage facilities, Miami, Arizona

## 5.5 Physiography and Vegetation

The project is located in the Basin and Range physiographic province of in east-central Arizona. The topography of the project area consists of a narrow, east-west alluvial corridor, where downtown Miami is situated and through which Highway 60 runs. The alluvial corridor, Bloody Tanks Wash, is flanked to the north and to the south by hills that rise to elevations of about 4,000 feet masl. Bloody Tanks Wash slopes gently eastward and during rain events channels water toward Miami Wash and the headwaters of Pinal Creek. The town of Miami is at an elevation of approximately 3,400 feet asl; prominent dumps, heap leach pads, tailings facilities and other mining infrastructure from other operations occupy large areas immediately north and northwest of the town and project area (Plate 5-2).

There are no natural surface water features in the area. Several large tailings ponds are located north of the Bloody Tanks Wash.



**Plate 5-2** Looking northwest over the town of Miami with the Van Dyke shaft (center) and Miami No. 5 shaft (right) shown in the background

The hilly topography is dissected by steep-walled gulley's that direct seasonal storm waters toward Bloody Tanks Wash which runs easterly through town. The Van Dyke deposit is located primarily beneath the town of Miami.

## 6 History

### 6.1 Early Developments in the Globe-Miami District

The Globe-Miami mining district of south-central Arizona is one of the oldest and most productive in the United States. The first prospecting expeditions visited the Globe-Miami area in the 1860s during a time when the area was still being settled. The early prospecting activities led to the discovery of numerous, small silver+/-gold vein occurrences some of which later became producing mines. By 1883, at the peak of silver mining, there were twelve mills processing ore in the vicinity of Globe (Ransome, 1903). Through the 1880's, the price of silver decreased and the mines gradually became uneconomic; by 1887 almost all of the silver mining activity had ceased. During the same period, the price of copper rose sufficiently to create interest in high-grade copper occurrences, some of which had previously been worked for silver.

The important Globe claim was staked in 1874 to cover impressive chrysocolla-bearing veins that later became part of the Old Globe mine (later renamed the Old Dominion mine). It did not garner significant attention until 1881 when mining infrastructure was moved from a small high-grade copper operation 10km west of Globe to the Old Dominion site. Mining at the Old Dominion underground copper operation reached full production in 1884, and continued until 1931.

Toward the end of the 19<sup>th</sup> century, reserves of higher grade copper ore lessened while the demand for the metal increased, and the economics of extracting copper from lower grade deposits improved. Efficient bulk mining techniques and new recovery processes were developed to extract copper from porphyry deposits, and contributed heavily to the future development of several large surface and underground mines in the Miami area.

During 1905 and 1906, prior to the establishment of the town of Miami, the predecessors of the Miami Copper Company (Miami Copper) began to procure options on many of the claims that eventually formed the bulk of the Miami mining operation (Miami Unit). In 1907, development of the Redrock shaft encountered abundant, rich copper oxide mineralization that compelled the company to develop the site. By 1911, Miami Copper had completed construction of a mill, power plant, and other infrastructure and produce copper concentrate from the Miami deposit (Ransome, 1919). From 1911 to 1959 block caving was used as the primary mining method. In 1943, in-situ leaching in an area of subsidence was initiated, and post-1959 this method of mining was used exclusively. Ownership and operatorship of the site changed hands numerous times throughout its development (Miami Copper was taken over by Magma Copper Company which became part of Newmont Mining, Inc. in 1969; Magma Copper was spun-off by Newmont in 1987) ultimately being purchased in 1996 by BHP Copper, Inc., which then merged with Billiton in 2001 to become BHP Billiton. In addition to mining, reclamation and reprocessing of old tailings to extract additional copper began in the 1989 and was completed in 2001 when mining operations were suspended. The site produced more than 2.7 billion pounds of copper during its 90 years of operation and is presently undergoing remediation and reclamation.

The early success of Miami Copper enhanced the prospectively of the Miami area. Inspiration Mining Co. (IMC) acquired ground in the area and by 1911 had drilled more than 80 holes, sunk a number of



shafts, and developed 27,000ft of underground workings. In 1912, IMC merged with another local explorer, Live Oak Development Co., to form the Inspiration Consolidated Copper Company (Inspiration Consolidated) and, after a construction phase, began producing in 1915. Ultimately, multiple deposits were discovered and later developed by Miami Copper and Inspiration Consolidated over an irregular west-east corridor more than 4km in length; the area is known as the Miami-Inspiration trend. Mining of rich secondary copper mineralization took place from a complex of deposits distributed along the trend including the Thornton, Live Oak, Red Hill, Blue Bird, Joe Bush and Oxhide pits and from underground block-caving of the Miami and Miami East ore bodies (Skillings, 1978; Creasey, 1980). Ownership and operatorship of the Inspiration Consolidated site also changed as a number of mergers and acquisitions took place. Inspiration Consolidated was purchased by Cyprus Minerals Company in 1988, which evolved into Cyprus Amax Minerals Company. Cyprus Amax was purchased by Phelps-Dodge in 1999, which in turn was purchased in 2007 by present owner/operator Freeport McMoRan Copper & Gold Inc. (Freeport).

The Carlota (Cactus) property, located west of Miami-Inspiration, also began as a small underground copper-silver producer, being operated intermittently from 1929 to 1964. Copper carbonates and silicates occur in shattered diabase in the footwall of the Kelly fault zone. The property was re-evaluated in the early 1970s and late 1980s, and after changing ownership multiple times, was purchased in 2005 by Quadra Mining Ltd. Quadra developed a large open pit and heap leach/SX-EW operation that was commissioned in 2008. KGHM International purchased the mine in 2011.

The first bulk mining of porphyry-style copper mineralization in the Globe-Miami district began in 1943 when the Castle Dome deposit, located 3km northeast of Carlota and approximately 8km west of the town of Miami, transitioned from a high-grade low-tonnage operation. Mineralization at Castle Dome consisted of a chalcocite-enriched supergene blanket and was mined until 1953. In 1954, the Copper Cities disseminated copper deposit approximately 5km north of Miami was exploited, followed at a later date by the small Diamond H pit, located about 2km southwest of Copper Cities (Peterson, 1954). The large Miami and Inspiration deposits transitioned to bulk mining techniques at about the same time. Stripping of the Pinto Valley deposit, which constituted the hypogene mineralization immediately northeast of the original Castle Dome supergene orebody, began in 1972. In 2013, Capstone Mining Corp. purchased the Pinto Valley copper mining operation from BHP Copper.

In 1969, Miami Copper discovered the Miami East deposit, a tabular ore body located 3km east of the Miami-Inspiration workings and at a depth of approximately 1km. Production began in 1974 utilizing a combination of conventional mining and in-situ leaching techniques until reserves were exhausted. The mine site, known as the Miami Unit, has been on care-and-maintenance since 2002.

Presently, mining in the Globe-Miami district is taking place at Freeport's Miami mine, at Capstone's Pinto Valley mine, and at KGHM's Carlota mine. Freeport's operations include open pit mining and heap leaching of copper ore and recovery by solution extraction/electrowinning (SX/EW). The site also has a smelter and rod mill.

## **6.2 History of the Van Dyke Copper Project**

In the early 1900's, as the demand for a local workforce increased, the need to provide miners with convenient housing, shopping and places of amusement led to the founding of the town of Miami. Miami was founded in 1907 when the Miami Land and Improvement Company (MLIC) acquired a tract of land on the upper end of Miami Flats (present-day downtown Miami). In 1908, Mr. Cleve W. Van Dyke purchased the tract from the MLIC, purchased adjacent land, formed the Miami Townsite Company and began to sell surface building lots. The first train arrived in October, 1909, and a federal census taken in 1910 determined that Miami had 1,390 residents.

Mr. Van Dyke shrewdly retained the mineral rights beneath the town, and in 1916 transferred these mineral rights to newly formed Van Dyke Copper Co. (VDCC). VDCC provided a vehicle for him to explore and potentially develop the ground that lay adjacent to mineral estates owned by Miami Copper Company (Miami Copper) and Inspiration Consolidated Copper Company (Inspiration Consolidated).

Later in 1916, VDCC drilled the initial hole into the Van Dyke deposit (Rice, 1921). The vertical rotary drillhole, V-1, was located on a ridge approximately 1000 feet southwest of the No. 5 Shaft of Miami Copper Company. It was drilled through post-mineral sedimentary rock (Gila Conglomerate) of uncertain thickness in the hope of intersecting a blind copper deposit. At a depth of 1182 feet the drill encountered a fault zone with abundant copper carbonate and copper silicate minerals. The hole was lost shortly thereafter in the footwall of the structure. VDCC drilled a second vertical rotary hole 2,600 feet east-southeast of hole V-1. Hole V-2 reportedly intersected 41 feet of copper carbonate and copper silicate-bearing breccia averaging about 4% Cu (Peterson, 1962). VDCC also collared a third hole 6,700 feet farther to the southeast, but it was abandoned in Gila Conglomerate at a depth of 1,400 feet.

Exploration drilling was suspended early in 1918 because of the United States' increased participation in World War One, but resumed in 1919 following an agreed upon armistice that ended the war and led to the signing of the Versailles Treaty. In the spring of that year, VDCC began to sink a vertical shaft located 200 feet south of drillhole V-1 (Rice, 1921; Peterson, 1962). By 1921 the shaft, which was designed for development and exploration purposes only, had been sunk to a total depth of 1,692 feet and had intersected mineralization similar to that cut by drillhole V-1 (Rice, 1921). Sinking of the shaft provided a significant cross-section of the geology and mineralization it encountered (Table 6-1 and Figure 6-1), including the Miami fault, a southeast-dipping normal fault that abruptly truncated the eastern extension of the Miami East deposit. This information enabled geologists to estimate with greater certainty the direction and amount of displacement on the Miami fault.

Unfortunately, a sharp decline in the price of copper during the year led to the suspension of further underground development activities.

By 1928, copper prices had recovered. VDCC dewatered the shaft and resumed its exploration and development of the Van Dyke deposit. Underground drifts were developed on the 1212 Foot, 1312 Foot and 1412 Foot levels and the first shipments of ore were made in 1929. Ore shipments continued through to 1931 when copper prices again fell to levels that would not sustain profitable mining operations (Peterson, 1962).

In 1943, the Van Dyke mine was reopened as a National Defense Project. It was found that most of the stopes and some of the drifts had caved (Kreis, 1974), but ore was available in parts of the mine. Despite exceptional average ore grades of approximately 5% Cu, the operation was not profitable because of the limited capacity of the small single hoist used to bring ore to surface from the 1212 Level. The mine was closed in June 1945. Metal production for the two periods of operation (1929-1931 and 1943-1945) totaled 11,851,700 pounds of copper (Peterson, 1962).

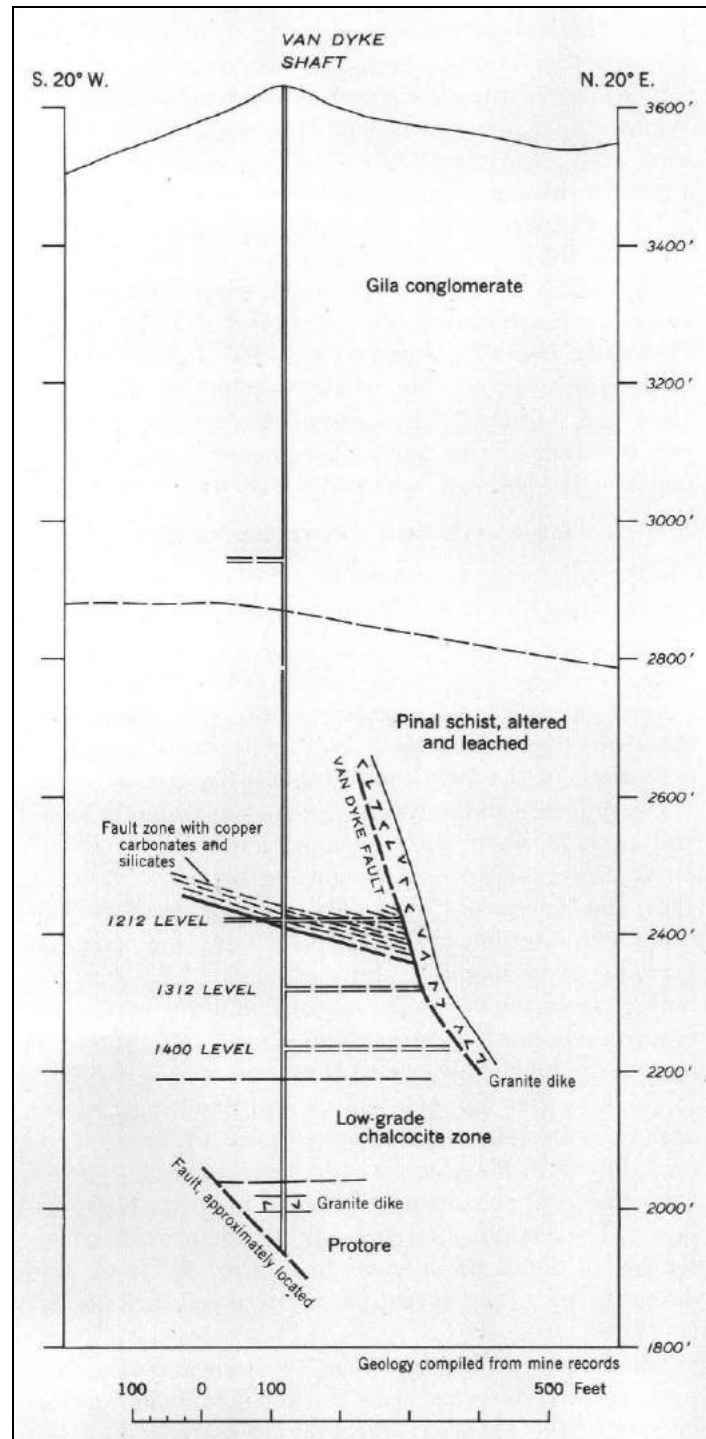
The property was idle in 1946, but in 1947, AMICO Mining Corp. (a company formed and held equally by Anaconda Copper Co., Miami Copper Co. and Inspiration Consolidated Copper Co.) leased the Van Dyke property and drilled four holes to test for the southern extension of the deposit. The holes failed to intersect encouraging mineralization; and AMICO was dissolved in 1949 (Peterson, 1962).

The Van Dyke property remained inactive from 1948 to 1963. In 1964, Freeport Sulfur Company leased the Van Dyke property and drilled two holes that failed to intersect mineralization (Clary et al., 1981). The property was again dormant until 1968.

In April, 1968, Occidental Minerals Corporation (Occidental) acquired the Van Dyke property through a lease and Option to Purchase agreement with VDCC. In the early 1970's, Occidental optioned its interest to several other companies including AMAX and Utah International (Utah). The two companies conducted considerable amounts of drilling but neither completed its earn-in.

**Table 6-1 Description of Geology encountered in the Van Dyke Shaft (after Rice, 1921)**

From (ft)	To (ft)	Description
0	760	Gila Conglomerate
760	1183	Pinal Schist with traces of chalcotrichite
1183	1218	Orebody (within Pinal Schist) copper silicates and carbonates
1218	1430	Pinal Schist with traces of chrysocolla, malachite, azurite, cuprite, and native copper
1430	1595	Pinal Schist with stringers and disseminations of chalcocite
1595	1610	Pinal Schist with pyrite and chalcopyrite (top of 'Primary' zone)
1610	1635	Granite Dyke
1635	1692	Miami Fault followed by tectonic breccia composed of Pinal Schist



**Figure 6-1 Geological Cross-section along 020° of the Van Dyke Shaft (reproduced from Peterson, 1962)**

AMAX terminated its option with Occidental late in 1973 and Utah terminated its option with Occidental in late 1975 or early 1976. By 1975, a total of 50 holes had been drilled throughout the project area, including many within the Town of Miami. The drilling covered a polygonal area with maximum dimensions of approximately 1300m in an east-west direction by approximately 1000m in a north-south direction.

Drilling determined that the Van Dyke deposit is covered by from 186m (in the northwest part of the deposit) to more than 627m of unmineralized Tertiary Gila Conglomerate. Mineralization encountered consisted primarily of the secondary copper minerals azurite, malachite and chrysocolla in tectonically fractured to brecciated Early Proterozoic Pinal Schist.

Modelling of the Van Dyke deposit using information from the early underground workings and details from drilling completed between 1968 and 1975 determined that the Van Dyke deposit resides in the downthrown hangingwall block of the Miami fault, east of the truncated, elongate Miami-Inspiration system of deposits. At Van Dyke, significant mineralization (equal to or greater than 0.15% Cu) generally occurs in two sub-parallel zones separated by a band of weaker copper grades Table 6-2). However, in the Van Dyke shaft area and in nearby drillholes, copper mineralization was shown to be vertically continuous, and therefore became the focus for later assessments.

A total of 34 drillholes intersected sufficient widths and grade of copper mineralization to be used to calculate resource estimates for the Van Dyke deposit. Four different estimates were completed, all from 1973 to 1976, decades before implementation of National Instrument 43-101 (NI 43-101); the estimates are therefore historical and are not relied upon by the authors of this report or by Copper Fox. The historical estimates range from 103,000,000 tons averaging 0.53% Cu to 140,858,000 tons averaging 0.40% Cu. These estimates are outlined in Table 6-3 below. Resource estimates were also completed for a limited area in and adjacent to the Van Dyke underground workings and led to further test work (outlined below) in the immediate area of the mine (Kreis, 1974; Caviness, 1987).

**Table 6-2 List of Selected Drillhole Intersections, Van Dyke Copper Deposit (Acid Soluble Copper (CuAS) Intervals (Shoulder Cut-Off of 0.1 %)**

DDH ID	Zone (relative)	From (m)	To (m)	Interval (m)	CuAS (%)
<b>OXY-6</b>	upper	376.12	402.34	26.21	0.661
	mid	415.44	435.86	20.42	0.676
	lower	506.27	582.17	75.90	0.831
	total	376.12	582.17	206.05	0.481
<b>OXY-7</b>	upper	396.24	418.19	21.95	0.696
	lower	427.94	541.93	114.00	0.417
	total	396.24	541.93	145.69	0.429
<b>OXY-8</b>	upper	322.48	339.24	16.76	0.196
	lower	374.29	439.22	64.92	0.504
	total	322.48	439.22	116.74	0.322
<b>OXY-10</b>	upper	339.85	379.17	39.32	0.654
	mid	426.72	460.55	33.83	0.283
	lower	473.96	489.51	15.54	0.207
	total m+l	426.72	489.51	62.79	0.211
<b>OXY-18</b>	upper	408.74	442.57	33.83	0.719
	mid	477.32	521.21	43.89	0.162
	lower	576.07	584.91	8.84	0.310
	total U+M	408.74	521.21	112.47	0.291
<b>OXY-20</b>	upper	428.85	452.93	24.08	0.313
	mid	479.15	500.79	21.64	0.159
	lower	508.10	528.52	20.42	0.376
	u+m+l	428.85	528.52	99.67	0.217
<b>VD-5</b>	upper	417.27	432.51	15.24	0.871
	mid	438.61	450.80	12.19	0.293
	lower	530.66	579.42	48.77	0.371
	total	417.27	579.42	162.15	0.230
<b>VD-6</b>	upper	364.54	429.16	64.62	0.412
	mid	450.49	459.64	9.15	0.134
	lower	480.97	500.48	19.51	0.302
	total	364.54	500.48	135.94	0.273

**Table 6-3 Comparison of Historical Resource Estimates, Van Dyke Copper Deposit**

Company or Estimator	Year	Tonnage	Total Cu (%)	Oxide Cu (%)	Method	Cut-off Grade
Occidental	1973	115,700,000	0.51	0.34	polygonal	0.20 % Cu
AMAX	1973	117,000,000	0.49	0.31	polygonal	0.20 % Cu
Utah	1975	140,585,000	0.40	0.24	sections	0.15% Cu
C.R. Caviness	1976	119,202,494	0.52	0.32	sections	0.20 % Cu

In 1976, Occidental initiated an in-situ leaching pilot program in an area due west of the Van Dyke shaft on patented claims and surface estate lands owned by VDCC. The work consisted of drilling from surface one vertical injection well and one vertical recovery well, each 1,000 feet in length, spaced 75 feet apart. Water was then pumped down the injection well to hydraulically fracture rock containing acid soluble copper mineralization. A weak sulphuric acid solution was then pumped down the injection well and allowed to percolate through the fractured rock until being drawn up the recovery well. The pilot program as completed in 1977 and confirmed that in-situ leaching was an efficient and effective method of extracting copper from the deposit. In 1978, Occidental initiated a second phase of in-situ testing by drilling five injection and recovery wells and eight monitoring wells. The testing continued until May, 1980, and proved the feasibility of a surface in-situ leaching operation at Van Dyke (Huff et al, 1981). However, a surface operation at Van Dyke was not supported by the Town of Miami under which the deposit resides. Town ordinances and ongoing litigation discouraged Occidental sufficiently and later in 1980 the company relinquished its option on the Van Dyke property.

In 1986, Kocide Chemical Corporation (Kocide), a wholly-owned subsidiary of Griffin Corporation, negotiated a deal with the owners of the VDCC to develop an in-situ leaching and copper recovery operation in the area that Occidental had tested in the 1970s. Kocide applied for and received the necessary permits to drill a series of injection and recovery wells and to construct a copper cementation plant. Production was expected to total approximately 600,000 pounds of copper per month during the initial phases of operation and then increase to approximately 1.5 million pounds of copper per month within two years. Advancement of the Project was delayed through 1987, and production did not commence until December, 1988 (Beard, 1990). Initially, Kocide injected a dilute sulfuric acid solution into the underground workings and recovered the pregnant solution from a production well. Cement copper was precipitated in 'Kennecott Cones' using shredded and de-tinned cans and the product was shipped to the company's Casa Grande plant for further refining to produce copper sulphate. A recorded 4 million pounds of copper cement was produced in 1988-89 and 1989-90. Kocide suspended its operations in 1990 due to iron build up in the recycled leach solution.

Later in 1990, Arimetco International Inc. acquired the Van Dyke property and the following year rehabilitated the Van Dyke shaft. In 1992, Arimetco was developing plans to leach the entire deposit using the Van Dyke shaft as an extraction well, but this work did not proceed past the planning stages. Following Arimetco's departure, the Van Dyke property lay dormant for a number of years.

### **6.3 Recent Developments - Van Dyke Copper Project**

In April, 2012, Bennu Properties, LLC, Albert W. Fritz Jr. and Edith Spencer Fritz (Bennu-Fritz) concluded its acquisition of clear title to certain surface and subsurface mineral rights that comprise an estimated 90 - 95% of the known extent of the Van Dyke property through a tax lien foreclosure process. At about the same time, Bell Copper Corporation (Bell), through a wholly-owned subsidiary, entered into a purchase and sale agreement with Bennu-Fritz to acquire the Van Dyke property. Bell also acquired 35 unpatented federal mineral lode claims (the MIA 1-35 claims) that cover approximately 600 acres of ground contiguous with the southern edge of the Van Dyke property.

In July, 2012, Copper Fox Metals Inc. (Copper Fox) signed a purchase agreement with Bell to acquire 100% of Bell's interest in the Van Dyke property. Under the terms of the purchase agreement Copper Fox, through a wholly owned subsidiary Copper Fox Van Dyke Company, acquire 100% of the Van Dyke property, including the MIA claims, as well as the Sombrero Buttes property, by paying to Bell CDN\$500,000, by paying to Bennu-Fritz US\$1.5 million and by assuming the continuing obligations with respect to the Van Dyke property, subject to certain amended terms and conditions. Bennu-Fritz retains a 2.5% Net Smelter Return ("NSR") production royalty from the Van Dyke deposit. Copper Fox Van Dyke Co., in its' sole and absolute discretion, has the right to purchase up to 2% of the 2.5% NSR for a period of two years from the date of closing the purchase (i.e. April 5, 2013) by the payment of US\$1.5 million for each 1% NSR purchased.

Late in 2013, Copper Fox initiated a review of all available data on the Van Dyke project, including drill core and pulps stored in Miami, and began to plan its 2014 work program. A summary of the work completed in 2013-2014 is described in Section 9.0: Exploration and in Section 10: Drilling.



## 7 Geological Setting and Mineralization

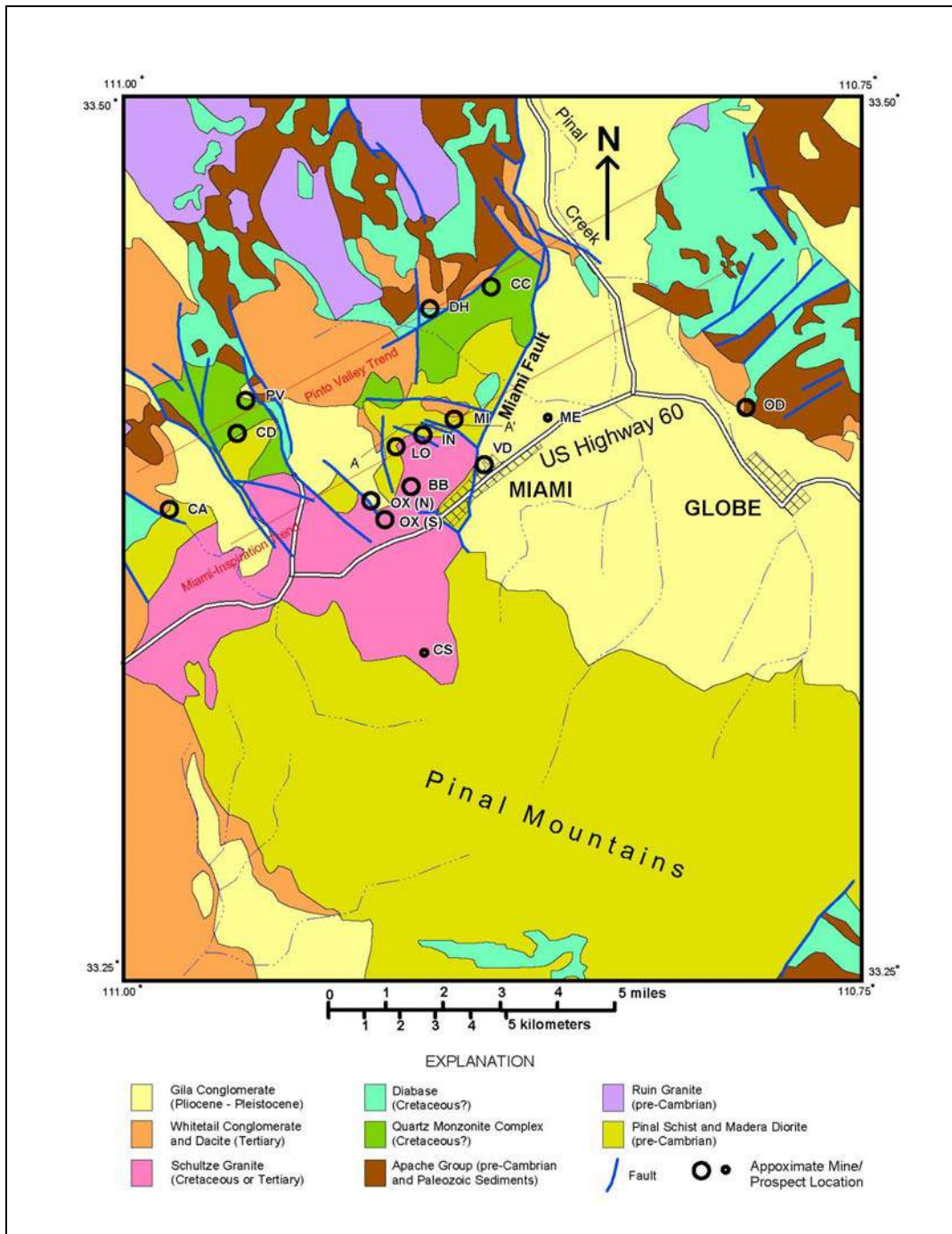
### 7.1 Geological Setting

The Van Dyke Copper Project is located in the Basin and Range province of east-central Arizona, and centrally within the Globe quadrangle. The general geology of the Globe quadrangle was studied by F. L. Ransome in 1901 and 1902. The results of his work were published by the United States Geological Survey as Professional Paper 12 (Ransome, 1903) and as folio 111 of the Geologic Atlas (Ransome, 1904). In 1911, following the realization of the significance of low-grade disseminated copper deposits, Ransome returned to the district to conduct additional work, the results of which were included in Professional Paper 115 (Ransome, 1919). In the middle of the 20<sup>th</sup> century, N.P. Peterson and others conducted fieldwork and produced a number of important reports, including United States Geological Survey Professional Paper 342, describing the geology and ore deposits of the district (Peterson, 1962), a publication that provides the geological framework for the area.

Southeast Arizona, including the Globe-Miami district, has undergone considerable structural deformation that began in the Paleoproterozoic and persisted through to the Tertiary. During the Late Cretaceous and Early Tertiary, the area endured basement-cored uplifts bounded by reverse faults, volcanism, intense compressive deformation, and plutonism that are all related to the development of the Laramide orogeny and magmatic-hydrothermal arc (Coney, 1978). A period of extensive erosion, including the unroofing of porphyry copper systems followed, and was in turn followed in the Late Tertiary by Basin and Range rifting (Maher et al., 2005; Seedorf et al., 2008).

The Globe-Miami mining district is underlain by igneous, sedimentary and metamorphic rocks of Precambrian, Paleozoic, Tertiary, and Quaternary age. Figure 7-1 shows a simplified geological map of the western half of the district. lists the stratigraphy of the Miami-Inspiration area. Figure 7-2 shows a diagrammatic sketch that illustrates the age and spatial relationships of the major rock units.

The oldest exposed rocks in the district are Early Proterozoic (1.6-1.7 Ga) turbidites and felsic volcanic rocks of the Pinal Schist that were metamorphosed to greenschist facies. These rocks were intruded by granodioritic to dioritic rocks at ~1.6 Ga, including the Madera Diorite. Post-metamorphic, regionally extensive granitic plutons (~1.4 Ga) were emplaced into this sequence and developed andalusite-bearing contact aureoles. Subsequently, the Late Proterozoic Apache Group, a relatively thin (~1 km) succession of regionally extensive marine sedimentary rocks dominated by siliciclastic and minor carbonate rocks, was deposited across the region. It consists of, from oldest to youngest: the Pioneer Formation, including the basal Scanlan Conglomerate; the Dripping Spring Quartzite, including the Barnes Conglomerate; the Mescal Limestone; and, minor basalt closely associated with the Mescal.



Note: Deposit Abbreviations: BB=Bluebird; CA=Cactus/Carlota; CC=Copper Cities; CD=Castle Dome; CS=Copper Springs; DH=Diamond H; IN=Inspiration (Thornton); LO=Live Oak; ME=Miami East; MI=Miami Caved; OD=Old Dominion; OX(N)=Oxhide North; OX(S)=Oxhide South; PV=Pinto Valley; VD=Van Dyke

**Figure 7-1 Simplified Geological Map of the Western Half of the Globe-Miami Mining District (modified by L. J. Bernard after Peterson, 1962; Creasey, 1980; Sillitoe, 2010)**

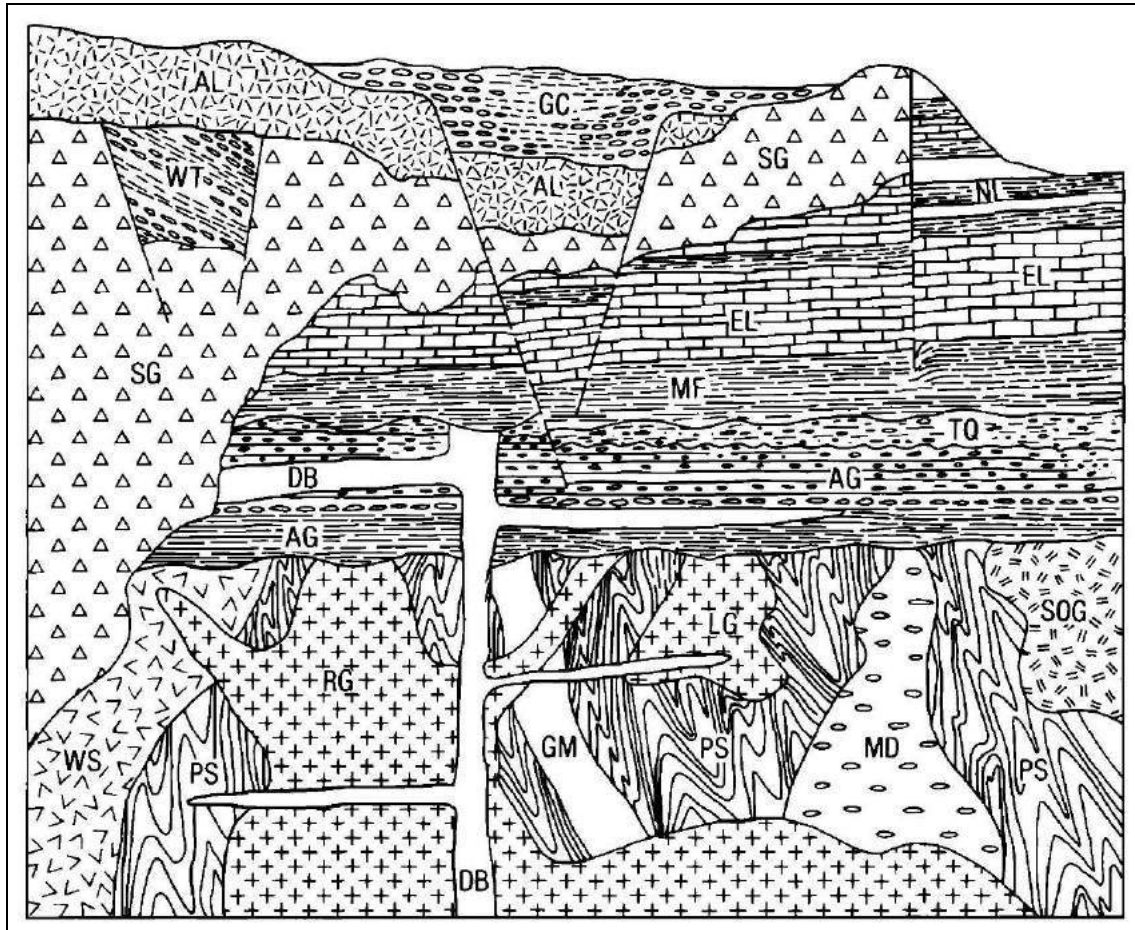
Paleozoic rocks in the district are the Cambrian Troy Quartzite, Devonian Martin Limestone, Mississippian Escabrosa Limestone, and Pennsylvanian to Permian Naco Formation.

During the latter stages or following deposition of the Apache Group, basaltic magmas were emplaced at about 1.1 Ga as sub-horizontal sheets (sills and sill-like bodies) of diabase with local, steeply dipping feeder dikes. These intrusions were emplaced predominantly at shallow depths, within the upper 2km of the crust, but locally breached the surface in the form of basalt flows. The masses of diabase locally are important hosts to mineralization and provide key markers used in reconstructing Laramide reverse and mid-Tertiary normal faults (Maher et al., 2008).

**Table 7-1 Stratigraphy of the Miami-Inspiration Area (after Ransome, 1903 and 1919; Peterson, 1962; Creasey, 1980)**

Rock or Formation	Age	Description
Alluvium	Upper Tertiary and Quaternary	Unconsolidated, poorly sorted poly-lithologic detritus
Gila Conglomerate	Upper Tertiary and Quaternary	poorly sorted, matrix-supported bouldery cobble conglomerate
Apache Leap Tuff	Miocene	dacitic ash flow tuff
Whitetail Conglomerate	Oligocene	well-bedded, hematite-rich matrix supported conglomerate
Naco Formation	Pennsylvanian - Permian	thin bedded calcareous sediment, marl and fossiliferous limestone
Escabrosa Limestone	Lower Mississippian	cliff forming limestone and dolostone
Martin Limestone	Upper Devonian	dolostone, minor shale and sandstone
Troy Quartzite	Cambrian	well-bedded, well-sorted quartzite with basal quartzite conglomerate
<b>Apache Group</b>		
Mescal Limestone	Precambrian (~1.2 Ga)	stromatolitic limestone, dolomitic limestone and chert
Dripping Spring Quartzite	Precambrian	upper quartzite beds and lower arenaceous shale
Pioneer Formation	Upper Precambrian	arkosic sandstone to arenaceous shale
<b>Pinal Schist</b>	Early Proterozoic (1.6-1.7 Ga)	regionally extensive meta-turbidites and minor felsic volcanic rocks metamorphosed to greenschist facies; locally andalusite-bearing

Several other igneous intrusions, ranging from granodiorite to quartz monzonite, were emplaced during late Mesozoic and early Tertiary time. The most recent of these is the Schultz Granite, which underlies the southern part of the district, and was intruded into the Precambrian and Paleozoic country rock during the Paleocene. The Schultz Granite is a composite pluton consisting of at least three intrusive phases. The earliest phase is a granodiorite, the intermediate or main phase is a porphyritic quartz monzonite, and the youngest phase is a series of porphyritic intrusions that were not all emplaced at the same time (Creasy, 1980). Near the northern-most exposures at the Inspiration deposit, Schultz Granite has various textures and compositions that have been called granodiorite, quartz monzonite, and porphyritic quartz monzonite (Olmstead and Johnson, 1966). Creasey (1980) refers to this as the porphyry phase (i.e. granite porphyry) of the Schultz Granite. A separate body of granite porphyry has been mapped at the Pinto Valley, Copper Cities, Diamond H, and Miami East deposits, and is seen near the vein-controlled mineralization at Old Dominion.



Abbreviations: AG, Apache Group; AL, Apache Leap Tuff; DB, diabase EL, Escabrosa Limestone; GC, Gila Conglomerate; GM, granite of Manitou Hill; LG, Lost Gulch Monsonite; MD, Madera Diorite; MF, Martin Formation; NL, Naco Limestone; PS, Pinal Schist; RG, Ruin Granite; SG, Schultze Granite; SOG, Solitude Granite; TQ, Troy Quartzite; WS, Willow Spring Granodiorite; WT, Whitetail Conglomerate.

**Figure 7-2 Diagrammatic Sketch Illustrating Geologic Relationships of Rock Units in the Globe-Miami Mining District (Creasey, 1980)**

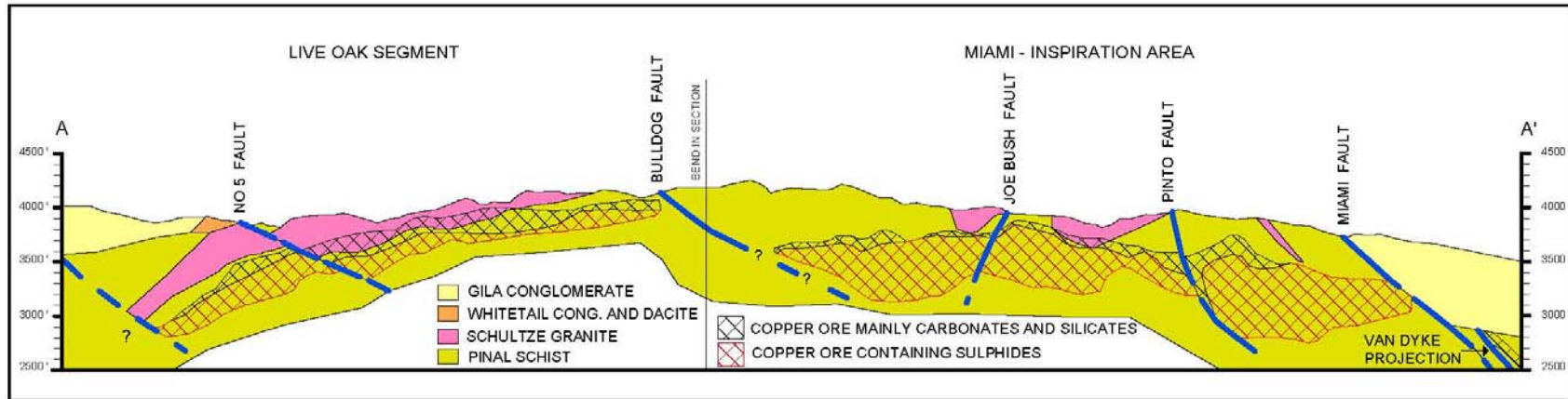
Tertiary sedimentary and volcanic rocks cover the mineralized units. The Whitetail Conglomerate was formed as a result of regional uplift approximately 32 Ma. Rocks of the Whitetail Conglomerate contain weathered clasts of older rocks in a red iron oxide-rich, very fine-grained matrix, and locally detrital to exotic copper mineralization. A Miocene ash-flow tuff, known as the Apache Leap Tuff, covered the area following the Whitetail Conglomerate (21 Ma). Further Basin and Range faulting and subsequent erosion produced the Tertiary to Quaternary Gila Conglomerate from the erosion of all older rocks.

The Gila Conglomerate fills a deep structural basin between the towns of Miami and Globe, a distance of more than 10km, and extends northward along Miami Wash and Pinal Creek. It was deposited as two alluvial fan complexes that washed down from the Apache Peaks to the north and from the Pinal

Mountains to the south. Gila Conglomerate is covered by variably thick surficial deposits of alluvium and outwash. Figure 7-3 provides a cross-section of part of the Miami-Inspiration trend.

## **7.2 Mineralization in the Globe-Miami Mining District**

The Globe-Miami mining district of east-central Arizona occupies part of the Laramide magmatic-hydrothermal arc of southwestern North America, one of the world's premier copper provinces (Titley, 1982b; Long, 1995). The district is known for a cluster of large disseminated or porphyry copper deposits, many of which have been or are actively being mined and copper-rich polymetallic vein deposits (Ransome, 1903). The vein deposits, based on their predominant metals, have been further divided by Peterson (1962) into copper veins, zinc-lead veins, zinc-lead-vanadium-molybdenum veins, manganese-zinc-lead-silver veins, gold-silver veins, and molybdenum veins. Many vein deposits were important producers during the early history of the district.



**Figure 7-3 West to East Section of the Miami-Inspiration Trend (modified by L.J. Bernard after Peterson, 1962)**

The district's porphyry copper deposits include Miami-Inspiration, Miami East, Pinto Valley, Copper Cities, Castle Dome and Carlota. Potassic, argillic, sericitic and propylitic phases of alteration are associated with the deposits. Mineralization is either primary sulphide or hypogene, and secondary enrichment (oxide, silicate and sulphide), or supergene. Hypogene zones consist of the primary sulphide minerals pyrite and chalcopyrite with minor amounts of molybdenite, occasional sphalerite and galena; gold and silver may be recovered in small amounts as by-products. Supergene enrichment zones, and locally exotic copper deposits, are dominated by chrysocolla, malachite, azurite and tenorite as replacements of sulphide species or as infiltrations of late fracture systems. Chalcocite locally occurs as 'blankets' proximal to hypogene ore. The development of supergene mineralization was so extensive and the process of copper enrichment so thorough, that it led to the formation of numerous large, copper-rich ore bodies. Almost all of the ore mined in the Globe-Miami district came from supergene-enriched deposits.

The hydrothermal deposits are genetically and spatially related to the emplacement of Paleocene (59 to 64 Ma) calc-alkaline hypabyssal intrusions, specifically the younger porphyritic phases of the Schultz Granite (Pederson, 1962; Creasey, 1980; Titley, 1982b; Seedorff et al., 2008). The mean intrusive age of the main phase of the Schultz Granite is 61.2 +/- 0.4 Ma. The isotopic age of the porphyry phase is uncertain because of extensive alteration and because of multiple periods of intrusion. The age of mineralization differs from place to place across the district and spans about 5m.y. From oldest to youngest, the known periods of mineralization are: Copper Cities orebody, 63.3 +/- 0.5 Ma; regional quartz-sericite veins, 61.1 +/- 0.3 Ma; Miami-Inspiration orebody, 59.5 +/- 0.3 Ma; and Pinto Valley orebody, 59.1 +/- 0.5 Ma (Creasey, 1980).

Following their formation, porphyry copper systems were affected by faulting, erosion and oxidation and, in the Oligocene-Miocene, by extensional tectonism that dismembered and variably tilted the upper crustal rocks in the area through the development of grabens and half-grabens (Creasey, 1980; Spencer and Reynolds, 1989; Wilkins and Heidrick, 1995; Seedorff et al., 2008; Mayer et al., 2008).

The Van Dyke copper deposit is located within the Inspiration-Miami trend of deposits that includes four principal orebodies; from west to east they are Live Oak, Thornton, Miami Caved and Miami East (Ransome, 1919; Peterson, 1962; Olmstead and Johnson, 1966; Creasey, 1980).

### **7.3 Structural Setting, Geology and Mineralization of the Van Dyke Copper Deposit**

#### **7.3.1 Structural Setting and Deposit Geometry**

The Van Dyke copper deposit lies to the east, and on the hangingwall side, of the Miami fault. The Miami fault is a district-scale northerly-trending, east-dipping normal fault that can be traced from the Van Dyke project to the Copper Cities mine three miles to the north. The Miami fault developed during the Tertiary; it forms the western edge of a graben that extends eastward to the city of Globe. The graben is filled with Late Miocene and younger Gila Conglomerate that thickens to the east and to the north.

East-side down displacement on the Miami fault is estimated to be approximately 400 m, placing the Van Dyke deposit at deeper levels than the adjacent Miami Caved deposit. Diamond drilling and deposit

modeling have identified the presence of at least two more sympathetic normal faults in the hangingwall of the Miami fault. They include the Porphyry and Azurite faults which further dismember the Van Dyke deposit. Interpretive cross-sections produced by Occidental in the early 1970s illustrate a deposit that consists of two (or more) structural blocks or segments each bound by moderately east-dipping, east-side down normal faults. The deposit may originally have been a continuous, sub-horizontal sheet-like body, but now dips eastward at 15-20°. The portion of the deposit bound by the Porphyry fault and the Azurite fault consists of two crude, gently east-dipping panels separated by a barren to weakly mineralized core. To the authors knowledge no mineralization has been intersected by drilling east and in the hangingwall of the Azurite fault.

The footwall of the orebody is locally defined by a layer of red clay gouge that strikes a little west of north and dips 20°E. About 200 feet northeast of the Van Dyke shaft, mineralization is truncated by the Van Dyke fault, a structure coincident with the footwall of a granite porphyry dyke. The fault and dyke strike 110° and dip 70°NE. The localization of secondary copper minerals appears to have been controlled by the intersection of the low-angle fault zone with the Van Dyke fault. The greatest amount of brecciation and the highest copper grades occur near this intersection. The Van Dyke fault and its eastern extension the CW fault, appear to have formed barriers to the copper-bearing solutions that seeped into the low-angle fault zone. The amount of offset along these structures is uncertain.

The mineralization that comprises the Van Dyke copper deposit has a drill-defined, north-easterly strike length of 1200m, a down-dip dimension of 1300m, and a thickness of approximately 225m. A three dimensional view of the deposit is illustrated in Figure 7-4, indicating the major faults, the Gila Conglomerate-Pinal Schist boundary and the Oxide solid used in modelling, as well as the drillholes used. Additional plans and sections can be found in Section 14.

### 7.3.2 Geology

The Van Dyke deposit is not exposed at surface, therefore all known geological information for the deposit has been gained from exploration diamond drilling programs and from development of the Van Dyke shaft and related level workings. Based on diamond drilling, the deposit is covered by between 186 - 627m of alluvium and post-mineral Gila Conglomerate.

Almost all of the Van Dyke deposit is hosted by Lower Precambrian Pinal Schist; a minor amount of copper mineralization occurs in an altered porphyritic phase of the Paleocene Schultz Granite.

#### Stratified Rocks

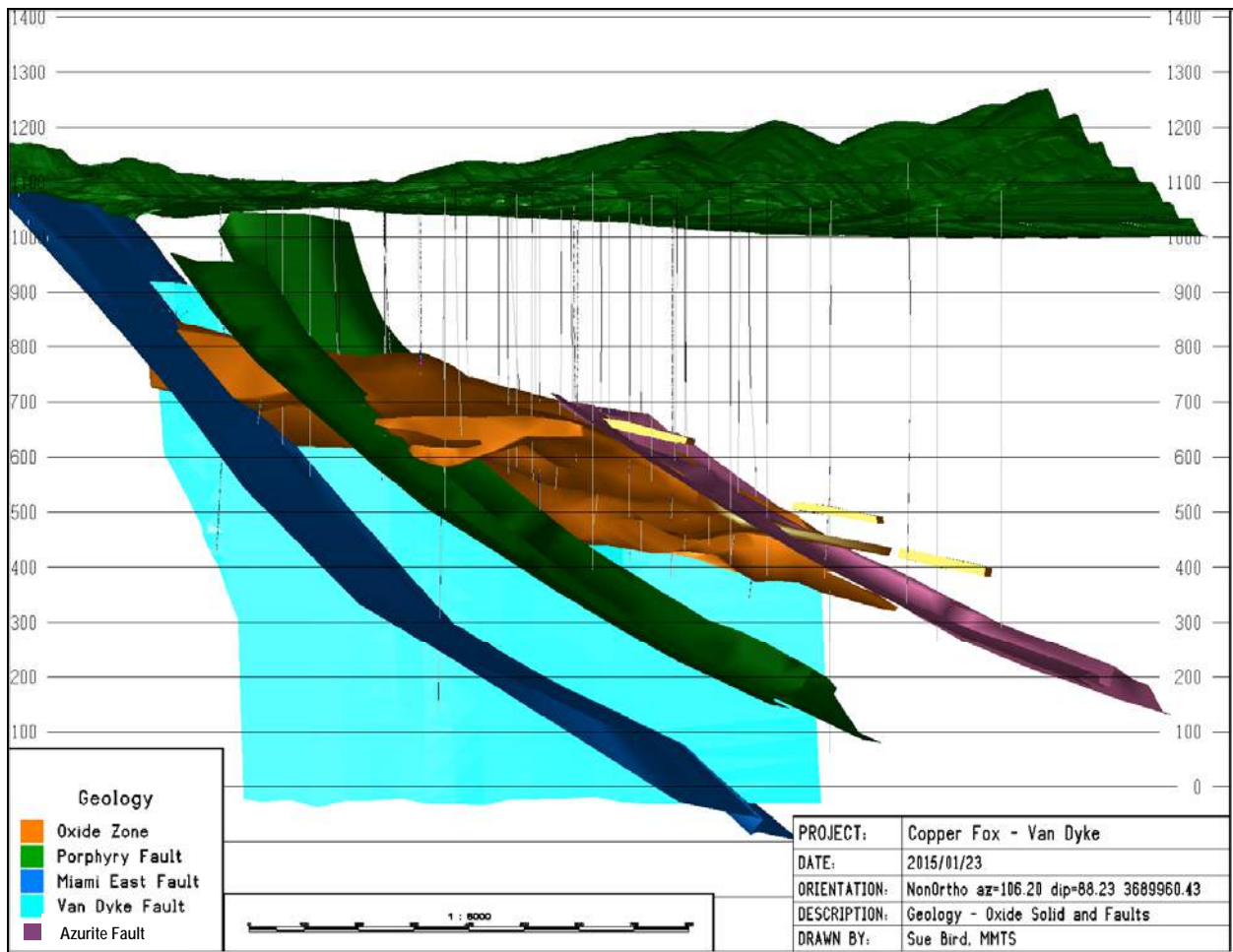
##### *Pinal Schist*

Lower Precambrian (~1.7 - 1.6 Ga) Pinal Schist is typically pale to medium grey, strongly foliated meta-sedimentary rock consisting of up to 75-80% muscovite (or sericite) and quartz, and varying amounts of biotite, chlorite, k-feldspar and clay. It ranges from coarse-grained quartz-sericite schist to fine-grained quartz-sericite-chlorite schist. Evidence of early ductile deformation is provided by sections of schist that display tight (i.e. chevron) to isoclinal folds (Plate 7-1). More recent brittle deformation is demonstrated by extensive intervals of fractured to brecciated (and re-cemented) schist (Plate 7-2). The interconnected open spaces created during brittle deformation served as conduits and depositional sites



for secondary copper minerals. Near the Miami fault and subsidiary faults, bands or zones of breccia and pale grey clay gouge predominate. Quartz ± sulphide veinlets cut the foliation.

Diabase, an important host to secondary copper mineralization at Miami East, has not been observed at Van Dyke.



**Figure 7-4** Three-Dimensional View of the Van Dyke Copper Deposit – Major Fault and Oxide with Drillholes



**Plate 7-1**      **Chevron-folded Pinal Schist, Drillhole VD-14-05 at 439.7m**



**Plate 7-2**      **Brecciated Pinal Schist Re-cemented in Part by Azurite and Malachite, Drillhole VD-14-04 at 473.3m**

### *Gila Conglomerate*

The Tertiary and Quaternary Gila Conglomerate is the youngest of all sedimentary rock units on the Project. Its deposition was preceded by periods of faulting, uplift and extensive erosion. The base of the unit rests on a pronounced angular unconformity. In the Van Dyke area, Gila Conglomerate lies directly on Lower Precambrian Pinal Schist.

The composition of the conglomerate is highly variable, often representing the dominant local lithology. It is typically poorly sorted, but generally is moderately to well-stratified, and is compositionally matrix-supported (Plate 7-3). Clasts range in size from pebbles to large cobbles and small boulders and are typically subrounded. This unit overlies and postdates mineralization, and therefore has little economic potential.

### **Intrusive Rocks**

#### *Schultz Granite*

The only intrusive rock identified to-date on the Project is regarded to be Granite Porphyry. The most continuous interval of intrusive rock encountered in drilling is a pale greenish grey, porphyritic biotite granodiorite. The rock is composed of up to 10% clear quartz phenocrysts, 2% zoned K-feldspar phenocrysts (Plate 7-4) set in a finer grained groundmass consisting mostly of plagioclase, K-feldspar, quartz, sericite, biotite and hornblende.

The rock is often moderately to intensely sericite-altered and ranges from being non or weakly mineralized to strongly mineralized, particularly where it is intensely fractured to shattered or brecciated.

While most of the historic holes drilled on the Project did not encounter any intrusive rock, Copper Fox's first hole, VD14-01, passed through Pinal Schist and into Schultz Granite porphyry at a depth of 576.1m and stayed in intrusive to the end of the hole at 639.2m. Near the contact both units are weakly mineralized with pyrite±chalcopyrite and later (?) quartz-molybdenite veinlets. The Pinal Schist was phyllic-altered and Schultz Granite was phyllic to potassic-altered.

### **Alluvium**

Tertiary alluvium is composed primarily of reworked detritus derived from Gila Conglomerate. It contains appreciable brown clay and an assortment of pebbles, cobbles and boulders. It forms thin (<1m to ~ 20m) poorly sorted and poorly cemented deposits that are well-exposed in Bloody tanks Wash through the town of Miami. Recent erosion is dissecting these deposits and the underlying Gila Conglomerate.



**Plate 7-3** Gila Conglomerate, Drillhole VD-14-01 at 45.7m



**Plate 7-4** Schultz Granite, Drillhole VD-14-01 at 628.4m Showing Porphyritic Biotite Granodiorite with one zoned K-spar Megacryst

### 7.3.3 Mineralization

Mineralization includes both hypogene or primary sulphide, and supergene or secondary enrichment (oxide-silicate+/-sulphide) types, but the latter far outweighs the former in terms of abundance, grade and therefore economic potential.

Secondary copper mineralization comprises the majority of the Van Dyke deposit. Mineralization, consisting primarily of malachite, chrysocolla, azurite and tenorite occurs principally in tectonically fractured to brecciated panels of Pinal Schist in the hangingwall of the Miami fault (Plate 7-5). The secondary minerals occur primarily as bands and crustifications, textures that suggest formation was by filling of open spaces. There are no relict sulphide grains in the upper part of the deposit. Beneath the secondary copper mineralization there exists a weakly developed supergene zone; it contains sparse malachite, azurite, chrysocolla and chalcocite and is transitional down-section locally into weakly-developed zones of hypogene mineralization, primarily located in the western part of the project area.

The secondary copper mineralization that comprises the majority of the Van Dyke copper deposit is believed to have formed from copper laden solutions that migrated laterally and vertically along interconnected fractures and zones of brecciation from the nearby oxidizing copper deposits. In general, the grade of the secondary copper mineralization is at least in part a function of how well the country rock was structurally prepared prior to the mobilization of copper into solution.



Plate 7-5 Malachite, Azurite and Chrysocolla in Fractured to Brecciated Pinal Schist, 412.46 – 417.67m in Drillhole VD-14-03

## 8 Deposit Types

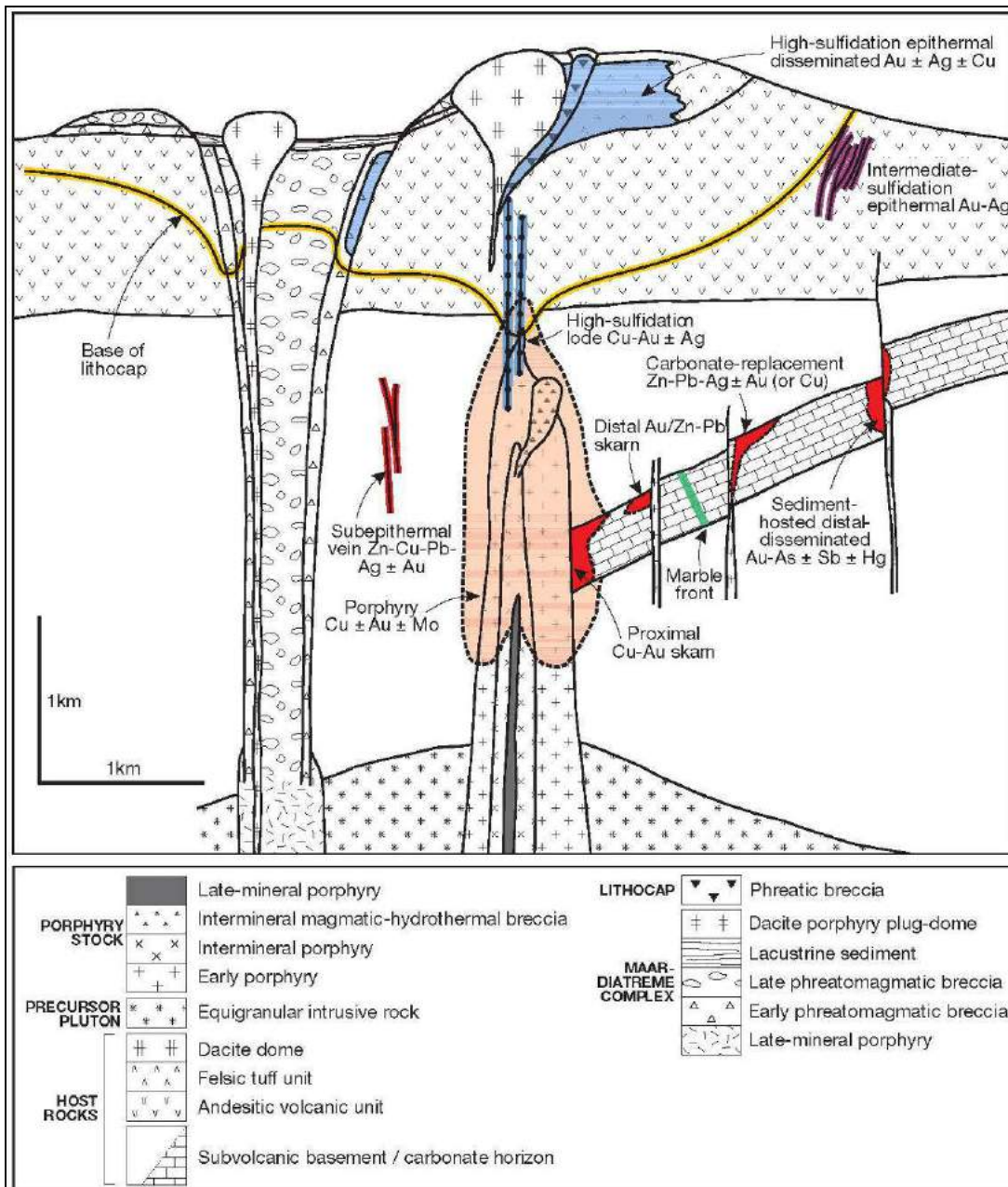
The Globe-Miami mining district in which the Van Dyke project occurs is known mainly for its large porphyry copper deposits, including the Miami-Inspiration, Miami East, Pinto Valley, Copper Cities and Castle Dome mines, and copper-bearing veins of the Old Dominion mine. The Miami-Inspiration operation consisted of a complex of ore bodies, including the main Live Oak and Thornton pits, and the underground Miami Caved deposit, that together covered an arcuate west-to-east strike length of about 4km (Creasey, 1980). The Miami East deposit is the eastern down-faulted extension of Miami-Inspiration (Peterson, 1962; Titley, 1989). About half of the Miami-Inspiration ore was mined from a porphyritic quartz monzonite phase of Paleocene Schultz Granite and about half came from the Proterozoic Pinal Schist. The deposits consisted of partly eroded leached caps, well-developed supergene enrichment zones, and underlying lower-grade hypogene zones. At the Miami East deposit, a chalcocite-bearing diabase sill was an important source of ore.

Porphyry copper deposits consist of disseminated copper minerals and copper minerals in veins, stockworks and breccias that are relatively evenly distributed throughout large volumes of rock. Porphyry copper deposits are typically high tonnage (greater than 100 million tons) and low to medium grade (0.3–2.0% Cu). They are the world's most important source of copper, accounting for more than 60% of the annual world copper production and about 65% of known copper resources. Porphyry copper deposits also are an important source of other metals, notably molybdenum, gold and silver.

The geometry and dimensions of porphyry copper deposits are diverse, in part because of post-ore intrusions, varied types of host rocks that influence deposit morphology, relative amounts of hypogene and supergene ore each of which has different configurations, and erosion and post-ore deformation including faulting and tilting. Porphyry copper deposits commonly are centered on small cylindrical porphyry stocks or swarms of dikes. A generalized model for a classic or calc-alkalic porphyry copper deposit is presented in Figure 8-1.

The vertical extent of hypogene mineralization in porphyry copper deposits is generally less than or equal to 1 to 1.5km. The predominant hypogene copper sulphide minerals are chalcopyrite, which occurs in nearly all deposits, and bornite, which occurs in about 75% of deposits. Molybdenite, the only molybdenum mineral of significance, occurs in about 70% of deposits. Gold and silver, as by-products, occur in about 30% of deposits.

The development of supergene, or secondary copper, mineralization occurs when low-pH groundwater dissolves copper from hypogene copper minerals in an oxidizing environment, and transports and re-precipitates the copper in the form of oxides, carbonates, silicates and or sulphides in a stable, low-temperature, reducing environment (Figure 8-2). Numerous dissolution-precipitation cycles can occur and may lead to re-concentration of copper in laterally extensive deposits known as supergene oxide deposits and chalcocite enrichment blankets or enriched copper sulfide zones, and less commonly in distal concentrations known as exotic oxide deposits.



**Figure 8-1 Generalized Model for a Telescoped Porphyry Copper System (After Sillitoe, 2010)**

Common supergene or secondary copper minerals include malachite, azurite, cuprite, tenorite, chrysocolla, native copper, copper wad, and atacamite. These minerals occur as crystalline aggregates and crystals that fill fractures and line voids in leached capping, and in micrometer-to-millimeter aggregates that impregnate alteration and primary minerals in enriched copper sulfide ore, and less often, in hypogene ore. The complex paragenetic relationships and disequilibrium mineral associations common in copper oxide ores reflect changing chemical conditions during weathering cycles.

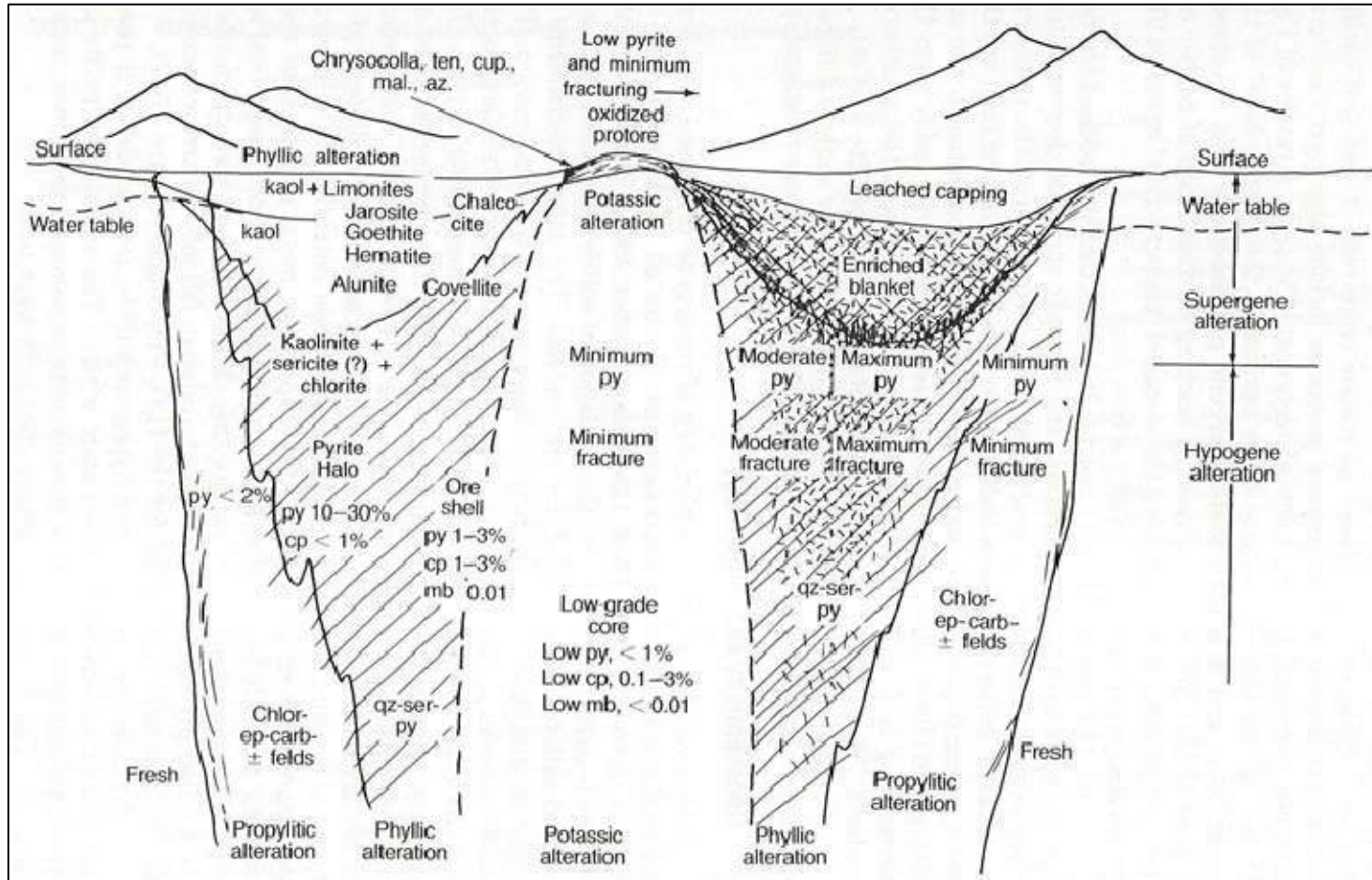


Figure 8-2 Idealized Results of the Interaction between Hypogene and Supergene Mineralization at an Exposed and Oxidizing Porphyry Copper Deposit (Guilbert And Park, 1986)



The Van Dyke deposit is located immediately southeast of the Miami Caved deposit and immediately southwest of the Miami East deposit. It is separated from the Miami Caved deposit by the district scale northeast-trending Miami normal fault and from the Miami East deposit by one or more east-trending (normal?) faults, including the Van Dyke / CW fault. The Van Dyke deposit is the eastern extension of the Miami-Inspiration operation and may be the southern extension of the Miami East deposit. It is not exposed at surface, but is covered by from 186m to 627m of alluvium and post-mineral Gila Conglomerate.

Secondary copper mineralization comprises the majority of the Van Dyke deposit. Mineralization, consisting primarily of malachite, chrysocolla, and azurite occurs principally in tectonically fractured to brecciated panels of Pinal Schist in the hangingwall of the Miami fault. Beneath the transported secondary copper mineralization there exists a weakly developed supergene zone; it contains sparse malachite, azurite, chrysocolla and chalcocite and is transitional down-section into local, weakly-developed zones of hypogene chalcopyrite-pyrite-molybdenite mineralization particularly in the western part of the project area. At this time, however, hypogene copper-molybdenum mineralization is subordinate to the secondary copper mineralization that comprises the majority of the Van Dyke copper deposit.

The secondary copper mineralization is believed to have formed principally from copper laden solutions that migrated laterally and vertically along interconnected fractures and zones of brecciation from nearby oxidizing copper deposits. Therefore, the principal type of mineral deposit found to-date on the Van Dyke property is that of a transported secondary copper or exotic copper deposit that is genetically and spatially tied to the well-known and well-developed porphyry copper systems located adjacent to it.

A local example of an exotic copper deposit is the Emerald Isle deposit located in northwestern Arizona. However, at Emerald Isle, mineralization consisting of tenorite, malachite and chrysocolla, is hosted by Gila Conglomerate. The source of copper at Emerald Isle is interpreted to be the low-grade porphyry copper mineralization at Alum Wash about 3.5 mi northeast of the Emerald Isle deposit (Agnerian and Postle, 2006)

Perhaps a suitable international analogue to the Van Dyke deposit is the Mina Sur deposit (formerly Exotica) located in northern Chile. Mina Sur developed within a 6.5km long paleo-channel south of the Chuquicamata porphyry copper deposit. It is generally believed that the secondary copper mineralization (mainly copper wad, atacamite and chrysocolla) was deposited as the result of the lateral flow of acidic solutions formed during the oxidation of the primary copper mineralization (Munchmeyer, 1996).

## 9 Exploration

### 9.1 Historical Exploration

Exploration on the Van Dyke property began in 1916 with the collaring of rotary drillhole V-1 by Van Dyke Copper Co. from a ridge top located 1000 feet southwest of the Miami Copper's No. 5 Shaft in the northwest corner of the patented claim area. The drillhole intersected abundant copper oxide and copper silicate mineralization within a fault zone at a depth of 1,182ft (Peterson, 1962). A second drillhole, V-2 collared 2,600ft east-southeast of V-1 also intersected mineralized breccia, and a third hole, V-3, collared 6,700ft farther to the southeast was abandoned at a depth of 1,400ft in Gila Conglomerate Gila.

The partial success of the drilling program led to the sinking of the Van Dyke shaft, located just 200ft south of drillhole V-1. The excavation of the 6' by 11' vertical shaft began in 1919 and was completed to a depth of 1,692ft in 1920 (Rice, 1921). The shafts' intended use was for exploration and development, but three levels of underground workings were advanced from it that supported two short periods of mining. The mine was closed in 1945.

Two small inconsequential exploration drilling programs were later completed. In 1947, AMICO Mining Corp., a consortium of three major copper producers, leased the property and drilled four deep churn holes to test the deposit. All four holes were collared in Gila Conglomerate and were spaced equally along a northeast-oriented line starting approximately 2500 feet south of the Van Dyke shaft near Cherry Flats Road. Three of four holes penetrated the base of the Gila conglomerate, beneath which only traces of copper oxide and iron oxide minerals were noted in generally fresh and unmineralized Pinal Schist (Clary et al., 1981). In 1964, Freeport Sulfur Company leased the property and drilled two holes that failed to intersect mineralization (Clary et al., 1981). Data does not exist for any of the six holes mentioned above.

In 1968, Occidental Minerals Corporation leased the property and began what became a systematic exploration diamond drilling program. Occidental optioned the property to other operators periodically during the ensuing 12 years that it held the lease, including Utah and AMAX, but those entities did not earn an interest in the property. By 1975, a total of 50 holes had been drilled throughout the project area covering a polygonal area with maximum dimensions of approximately 1300m east-west by approximately 1000m north-south.

From 1976-1980 Occidental's work focused on in-situ leach pilot testing in an area west of the Van Dyke shaft, and area that was later leached in the late 1980s by Kocide, and evaluated on a broader scale by Arimetco.

### 9.2 Assessment of Historic Exploration Data

Following acquisition of the Project in 2013, Copper Fox initiated compilation and detailed re-examination of all available historical information that existed for the Project. The information included public and private hard copy reports, underground level plan maps, surface drillhole plan maps and cross-sections, and drillhole logs. All of the information was scanned and organized into an electronic

data base that was made available to MMTS. Hard copies were re-filed and safely stored in the company's corporate offices.

In addition to capturing project information from the paper files, Desert Fox was also able to locate historic drill core and pulps for most of the holes drilled between the years 1968 and 1976. Fortunately, careful storage and a dry climate preserved the majority of the materials. Core and pulps were removed from the basement of a storage building located within the town of Miami and paper files were retrieved from trailers located on patented claims near the Van Dyke shaft. All of the materials were relocated to Desert Fox's new office and storage facilities located in the town of Miami.

### **Relevant Exploration Data**

The historical exploration data base includes detailed logs for 45 holes drilled between 1968 and 1975 that describe lithology, alteration and mineralization. The logs also provide a complete total copper and acid soluble copper analytical results for each interval sampled. A number of the logs also list analytical results for silver, gold, sulphur and molybdenum. The recorded values for silver, gold and sulphur, where present, typically cover a series of sample intervals and may represent weighted averages. The recorded values for molybdenum are shown on a sample by sample basis, but only for a select number of the drillholes. The lack of a complete or near complete historic data set for silver, gold and molybdenum excludes these elements from further evaluation. Any re-assessment of historic drill core or drill core pulps or any new drilling should include multi-element analysis to determine the significance of other metals.

Results for total copper and acid soluble copper were compiled and reviewed in detail. However, there are no assay certificates for the any of the historical holes to back up the manually recorded analytical data. Core recovery data and any QA/QC procedures were not apparent from the drillhole logs or from any other historical documentation reviewed.

A review of drill logs, drill core and pulps by MMTS served to determine holes suitable for re-analysis as a means of verifying the authenticity and accuracy of the data recorded manually on the drill logs.

The historical data base also includes underground data for total copper.

### **MMTS Assessment of Exploration Data**

Late in 2013, MMTS took part in the evaluation of the exploration materials which included: a detailed assessment of core, drillhole logs and pulps remaining from seven selected drillholes; a core box and footage determination of core remaining from the OXY and VD series of drillholes, and; a general account of the pulps that remain from core sample analysis.

The six drillholes selected for detailed review (OXY-6, -7, -8, -15, -27 and VD-73-6) cover 800m of eastward strike length and up to 550m of width. They provide an accurate representation of the geology and mineralization of the copper deposit. However most of the material remaining in the core boxes was not split (i.e. halved) core, but consisted of ~3/8" minus material. The reason for this was that the core was so badly broken that it could not be halved with a splitter, so Occidental ran each sample through a jaw crusher, took a riffle-split of the material to send to the lab, and returned the

remainder to the core box as the reference sample (Tim Marsh, personal communication, December, 2013). This procedure would likely have resulted in a more homogeneous and representative sample than using a conventional core splitter.

### **Drillhole Collar Locations – Conversion of Grid and Resurvey**

All historical drillholes were originally surveyed in local mine grid coordinates; there is no record of where the mine grid originates nor which way it is oriented. Copper Fox undertook a search for historic drillhole collars using existing exploration plan maps of the project area and was able to positively identify numerous collars in the field. A Trimble GeoHX GPS with sub-metre accuracy was used to survey the located collars in North American Datum (NAD) 27, UTM zone 12 (metres). The locations of 15 exploration drillhole collars and 9 ISL test well collars have been confirmed and surveyed. Three old survey monuments that had old mine coordinates associated with them were also located and surveyed. The location information for the survey monuments and drillhole collars was then used to perform a regression that translated undiscovered collar locations from mine grid coordinates into NAD 27 UTM coordinates.

## 10 Drilling

### 10.1 Historic Drilling

Prior to Copper Fox acquiring the Project, a total of 70 exploration holes and 17 ISL wells had been drilled on the property. Of the 70 historic exploration holes, 23 were drilled between 1916 and 1964; they were a combination of churn, rotary or reverse circulation (RC) and diamond drillholes that tested the breadth of the property, and for which only anecdotal information is known. The remaining 47 exploration holes were diamond drillholes completed from 1968-1975 to systematically assess the Van Dyke deposit area; near-complete technical data has been compiled for the majority of these holes. The 17 ISL wells were drilled in close proximity to one-another from 1976-1978 and in 1988 in an area immediately west of the Van Dyke shaft. At least seven were diamond drillholes for which limited core, but no written descriptions, has been recovered. Mineralized intervals for these wells were sampled, analyzed and later reported as weighted averages in Clary et al. (1981), but no other detail exists for the wells.

In 2013, BHP mistakenly drilled hole MU-13-2, located near historic drillhole OXY-6, on the north-central part of the Van Dyke project where it owns surface rights but not the mineral estate patent. Once the trespass was realized, BHP provided all data for the drillhole to Copper Fox. BHP completed the RC hole to a depth of 1166.5m to assess the area's potential to host deeply buried porphyry copper mineralization. Unfortunately, it did not log or retain cuttings from the upper part of the hole that passed through the secondary copper zone that is of particular interest to Copper Fox.

Table 10-1 lists exploration drillholes and ISL wells completed on the property by year and operator. Figure 10-1 shows the locations of historic drillholes and wells.

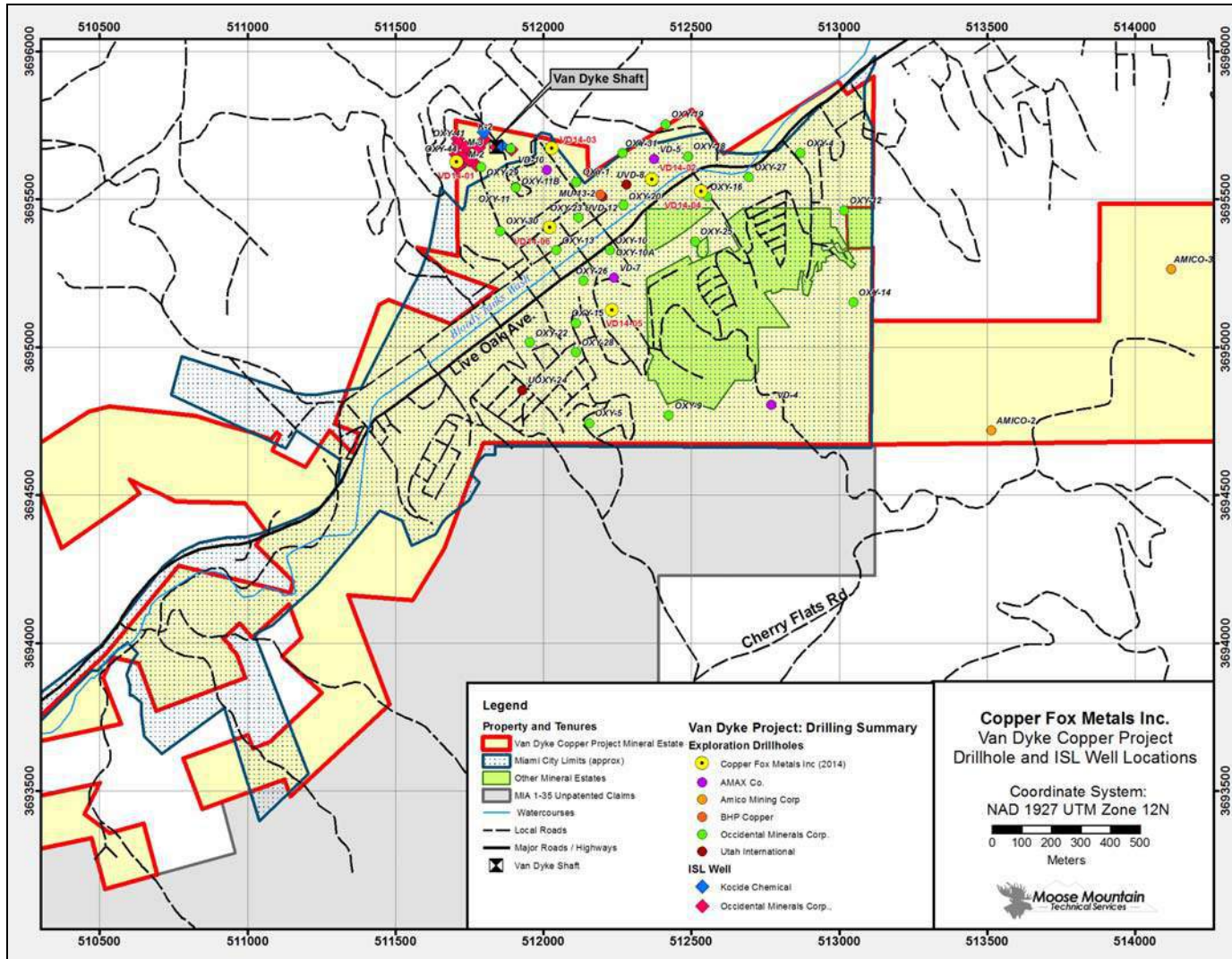
Drilling campaigns completed prior to Copper Fox's acquisition of the Project, for which abundant exploration data exists, are believed to have been conducted using industry best management practices consistent with the era in which the work took place. Significant mineralized intersections for historical exploration drillholes are listed in Table 10-2 (results for Total Copper) and Table 10-3 (results for Acid Soluble Copper). The drill intersections provided do not represent the true thickness of the deposit.

**Table 10-1 List of Historic Drillholes, Van Dyke Project**

Year	Hole Identification Range	Exploration Company	Drillhole Type	Number of Holes Drilled	Reported Meters Drilled
1916-1917	V-1 to V-3	Van Dyke Copper	unknown	3	unknown
1947	Amico-1 to Amico-4	AMICO	Churn	4	unknown
1964	Freeport-1 & Freeport-2	Freeport Sulphur	unknown	2	unknown
1967(?)	Sho-Me-1 & Sho-Me-2	Sho-Me Copper / Van Dyke Copper	unknown	2	unknown
1968-1974	OXY-1 to OXY-31, OXY-33	Occidental Copper	Core	34	19,825.0
1972-1973	VD-1 to VD-7, VD-9, VD-10, VD-16	AMAX	Core	9	5,367.8
1975	C-UOXY-24, UVD-8, UVD-11 to UVD-14, UCV-17, LC-UVD-1	Utah International	Core	8	4,184.9
1976-1978	OXY-41 & OXY-42	Occidental Copper	Core	2	832.1
1978	OXY-44 to OXY-48, M-1 to M-5	Occidental Copper	Core; ISL Monitoring Wells	10	3,384.3
1988	K-1 to K-5	Kocide Chemical	ISL Wells	5	unknown
2013	MU-13-2	BHP Copper	RC	1	1,166.5
2014	VD14-1 to VD14-6	Copper Fox Metals	Core	6	3,211.7

## 10.2 Copper Fox 2014 Drilling

Copper Fox completed a drilling program on its Van Dyke project from late-March to mid-June, 2014. The program consisted of six PQ diameter diamond drillholes with an aggregate length of 3,211.7m. The holes were drilled across the Van Dyke copper deposit, covering a west-to-east distance of approximately 825m and a north-south distance of approximately 500m. Table 10-4 lists the coordinates 2014 Copper Fox drillholes. Figure 10-2 shows the locations of the six 2014 drillholes.



**Figure 10-1 Exploration Drillhole and ISL Well Locations, Van Dyke Copper Project**

**Table 10-2 Historical Drillhole Intersections for Total Copper, Van Dyke Copper Deposit (using a cut-off grade of 0.10% Total Cu)**

Drillhole ID	Easting NAD27	Northing NAD27	Length (m)	From (m)	To (m)	Interval (m)	Grade T_Cu (%)
OXY-1	512111.0	3695558.0	901.29	314.86	340.46	25.6	0.463
and				375.21	422.15	46.94	0.356
and				713.23	872.49	159.26	0.189
OXY-2	512344.4	3695155.3	573.79	402.64	419.1	16.46	0.428
and				463.3	494.69	31.39	0.956
OXY-3	512638.4	3695268.6	694.03	591.92	650.14	58.22	0.404
OXY-4	512869.3	3695656.1	965.00	616.31	628.5	12.19	0.302
and				645.87	680.31	34.44	0.156
OXY-5	512155.3	3694742.6	738.84	-	-	-	-
OXY-6	512369.0	3695563.5	631.24	376.12	583.69	207.57	0.597
OXY-7	512447.1	3695431.2	618.74	396.24	543.46	147.22	0.502
OXY-8	512030.4	3695670.1	489.51	313.94	404.77	90.83	0.563
OXY-9	512424.3	3694768.4	690.07	-	-	-	-
OXY-10	512224.3	3695327.5	537.36	339.85	379.17	39.32	0.766
and				406.91	501.4	94.49	0.355
OXY-11	511906.7	3695540.7	446.23	307.85	380.7	72.85	0.372
OXY-12	513017.0	3695462.7	806.81	659.89	673.3	13.41	0.461
OXY-13	512046.6	3695327.0	484.63	304.19	437.69	133.5	0.225
OXY-14	513048.3	3695151.4	835.15	-	-	-	-
OXY-15	512109.9	3695081.1	495.91	405.69	457.5	51.82	0.545
OXY-16	512542.5	3695514.5	440.13	-	-	-	-
OXY-16B	512535.5	3695523.3	651.66	453.24	625.75	172.52	0.274
OXY-17B	511889.8	3695672.1	520.60	306.63	471.83	165.2	0.467
OXY-18	512488.8	3695645.2	705.92	399.29	644.35	245.06	0.294
OXY-19	512413.4	3695754.1	785.16	729.39	785.16	55.78	0.149
OXY-20	512270.3	3695481.1	552.91	335.58	348.38	12.8	0.537
and				373.68	537.97	164.29	0.359
OXY-21	512351.5	3695033.9	532.79	481.28	498.35	17.07	0.869
OXY-22	511954.7	3695015.6	589.48	406.6	491.03	84.43	0.159
OXY-23	512118.2	3695437.6	466.34	336.8	466.34	129.54	0.291
UOXY-24	511928.1	3694853.9	452.93	-	-	-	-
OXY-25	512512.5	3695357.5	607.77	435.86	606.25	170.38	0.512
OXY-26	512134.6	3695224.8	483.11	359.05	425.5	66.45	0.217
OXY-27	512694.5	3695575.5	690.07	524.26	661.42	137.16	0.351
OXY-28	512110.7	3694982.5	527.61	410.26	505.66	95.4	0.193
OXY-29	511789.1	3695608.6	502.31	228.14	250.55	22.41	0.136
and				260.6	501.09	240.49	0.379
OXY-30	511854.9	3695393.0	265.18	-	-	-	-
OXY-31	512267.1	3695656.0	605.03	509.01	553.21	44.2	0.216
OXY-32	519756.7	3693219.7	1,005.84	676.66	708.96	32.31	0.104
VD-1	512452.6	3695216.9	601.37	555.04	592.53	37.49	0.587
VD-3	512017.0	3695402.8	431.29	256.03	282.24	26.21	0.516
and				308.76	324.00	15.24	0.617
and				344.73	398.68	53.95	0.405
VD-4	512771.1	3694804.6	840.33	-	-	-	-
VD-5	512374.3	3695635.7	618.74	417.27	450.8	33.53	0.549



Drillhole ID	Easting NAD27	Northing NAD27	Length (m)	From (m)	To (m)	Interval (m)	Grade T_Cu (%)
				524.56	582.47	59.91	0.516
VD-6	512350.7	3695353.3	562.66	361.49	509.63	148.13	0.342
VD-7	512238.8	3695234.6	508.41	388.01	508.41	120.4	0.251
UVD-8	512281.2	3695549.3	580.03	427.97	556.41	128.44	0.181
VD-9	512622.8	3695391.8	626.67	547.12	576.99	29.87	0.336
VD-10	512011.6	3695599.4	491.64	310.29	349.3	39.01	0.573
				366.67	395.63	28.96	0.540
UVD-11	512230.0	3695125.5	465.12	386.18	459.33	73.15	0.433
UVD-12	512200.1	3695509.6	530.35	358.14	511.15	153.01	0.291
UVD-13	512381.1	3695414.4	515.87	378.56	472.44	93.88	0.461
UVD-14	512530.5	3695275.5	627.43	521.06	597.1	76.04	0.461
VD-16	512734.3	3695178.0	686.71	548.64	569.98	21.34	0.149
and				609.6	624.84	15.24	0.120
UVD-17	512777.3	3695461.8	460.25	-	-	-	-

**Table 10-3 Historical Drillhole Intersections for Acid Soluble Copper, Van Dyke Copper Deposit (using a cut-off grade of 0.05% Acid Soluble Cu)**

Drillhole ID	Easting NAD27	Northing NAD27	Length (m)	From (m)	To (m)	Interval (m)	Grade AS_Cu (%)
OXY-1	512111.0	3695558.0	901.29	315.77	340.46		0.285
and				398.98	420.62	21.64	0.132
OXY-2	512344.4	3695155.3	573.79	402.64	419.1	16.46	0.345
and				463.3	494.69	31.39	0.472
OXY-3	512638.4	3695268.6	694.03	594.97	611.43	16.46	0.131
OXY-4	512869.3	3695656.1	965.00	616.31	624.08	7.77	0.184
and				675.74	649.38	26.37	0.071
OXY-5	512155.3	3694742.6	738.84	-	-	-	-
OXY-6	512369.0	3695563.5	631.24	376.12	582.17	206.05	0.480
OXY-7	512447.1	3695431.2	618.74	396.24	541.93	145.69	0.429
OXY-8	512030.4	3695670.1	489.51	320.04	345.34	25.30	0.161
				374.29	439.22	64.92	0.504
OXY-9	512424.3	3694768.4	690.07	-	-	-	-
OXY-10	512224.3	3695327.5	537.36	339.85	379.17	39.32	0.654
and				426.72	460.55	33.83	0.283
and				473.96	489.51	15.55	0.207
OXY-11	511906.7	3695540.7	446.23	334.67	352.35	17.68	0.151
OXY-12	513017.0	3695462.7	806.81	659.89	673.3	13.41	0.433
OXY-13	512046.6	3695327.0	484.63	395.63	434.34	38.71	0.170
OXY-14	513048.3	3695151.4	835.15	-	-	-	-
OXY-15	512109.9	3695081.1	495.91	405.69	455.07	49.380	0.517
OXY-16	512542.5	3695514.5	440.13	-	-	-	-
OXY-16B	512535.5	3695523.3	651.66	450.49	604.72	154.23	0.207
OXY-17B	511889.8	3695672.1	520.60	336.19	396.85	60.66	0.480
OXY-18	512488.8	3695645.2	705.92	408.74	442.57	38.83	0.719
and				469.09	524.26	55.17	0.144
and				574.55	588.26	13.72	0.223
OXY-19	512413.4	3695754.1	785.16	-	-	-	-

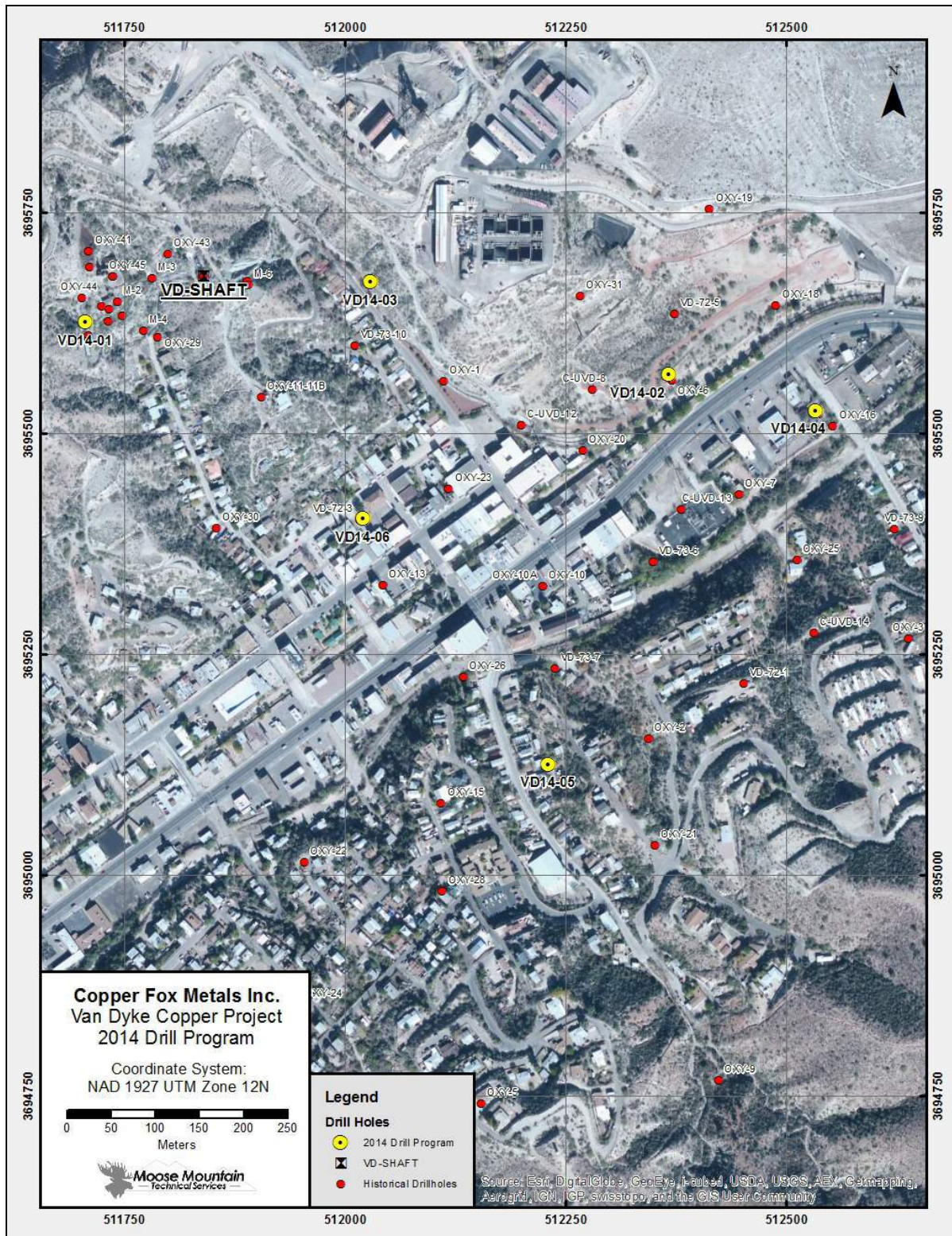
**Copper Fox Metals Inc.  
Van Dyke Copper Project**

Drillhole ID	Easting NAD27	Northing NAD27	Length (m)	From (m)	To (m)	Interval (m)	Grade AS_Cu (%)
OXY-20	512270.3	3695481.1	552.91	335.58	348.39	12.81	0.532
and				428.85	528.52	99.67	0.217
OXY-21	512351.5	3695033.9	532.79	-	-	-	-
OXY-22	511954.7	3695015.6	589.48	408.74	491.03	82.29	0.094
OXY-23	512118.2	3695437.6	466.34	374.29	429.77	55.48	0.238
UOXY-24	511928.1	3694853.9	452.93	-	-	-	-
OXY-25	512512.5	3695357.5	607.77	437.39	584.3	146.91	0.434
OXY-26	512134.6	3695224.8	483.11	359.05	379.17	20.12	0.250
OXY-27	512694.5	3695575.5	690.07	521.21	655.32	134.11	0.253
OXY-28	512110.7	3694982.5	527.61	411.78	424.28	12.50	0.518
OXY-29	511789.1	3695608.6	502.31	268.22	366.67	98.45	0.508
OXY-30	511854.9	3695393.0	265.18	-	-	-	-
OXY-31	512267.1	3695656.0	605.03	527.3	551.99	24.69	0.155
OXY-32	519756.7	3693219.7	1,005.84	-	-	-	-
VD-1	512452.6	3695216.9	601.37	555.04	571.20	16.15	0.406
VD-3	512017.0	3695402.8	431.29	256.03	282.24	26.21	0.446
and				308.76	317.91	9.15	0.859
and				356.92	394.11	37.19	0.271
VD-4	512771.1	3694804.6	840.33	-	-	-	-
VD-5	512374.3	3695635.7	618.74	417.27	450.80	33.53	0.506
				524.56	582.47	57.91	0.325
VD-6	512350.7	3695353.3	562.66	361.49	459.64	98.15	0.304
				480.97	500.48	19.51	0.302
VD-7	512238.8	3695234.6	508.41	388.01	449.28	61.26	0.262
UVD-8	512281.2	3695549.3	580.03	455.52	544.07	88.54	0.149
VD-9	512622.8	3695391.8	626.67	-	-	-	-
VD-10	512011.6	3695599.4	491.64	-	-	-	-
UVD-11	512230.0	3695125.5	465.12	391.67	447.75	56.08	0.374
UVD-12	512200.1	3695509.6	530.35	414.22	477.93	63.71	0.180
UVD-13	512381.1	3695414.4	515.87	380.39	411.48	31.09	0.636
and				417.73	448.67	30.94	0.400
UVD-14	512530.5	3695275.5	627.43	-	-	-	-
VD-16	512734.3	3695178.0	686.71	554.74	573.02	18.28	0.130
UVD-17	512777.3	3695461.8	460.25	-	-	-	-

**Table 10-4 Coordinates of the 2014 Copper Fox Drillholes**

Twin Drillhole ID	Original Drillhole ID	Easting (NAD27)	Northing (NAD27)	Elev (m)	Total Depth	Base of Gila	Base of Oxide
VD14-01		511707.4	3695625.5	1067.0	639.17	140.36	379.48
VD14-02		512367.1	3695566.3	1032.2	602.28	381.40	598.02
	OXY-6	512369.0	3695563.5	1032.8	631.24	376.12	580.64
VD14-03		512029.4	3695671.1	1051.7	453.24	301.14	433.61
	OXY-8*	512030.4	3695670.1	1053.1	489.51	301.75	440.74
VD14-04		512534.0	3695525.3	1029.6	642.21	416.66	620.27
	OXY-16B	512535.5	3695523.3	1034.7	651.66	416.66	608.99
VD14-05		512231.1	3695125.3	1049.4	468.48	374.14	448.21
	CUVD-11	512230.0	3695125.5	1045.4	465.12	364.24	447.75
VD14-06		512021.8	3695403.5	1037.2	405.51	249.02	383.74
	VD 72-3	512014.5	3695399.4	1038.5	431.29	246.89	394.11

\*original drill collar not located; March 19/14 regression to UTM from mine coordinates used (Tim Marsh, June 02, 2014).



**Figure 10-2** Locations of the 2014 Copper Fox Drillholes

### Drilling Procedures

All of the 2014 sites selected for drilling required minor to moderate amounts of earth work to provide relatively level, cleared areas from which to drill and, in some cases, to improve or re-establish access. Drill sites were built using local contractors under constant on-site direction from Copper Fox personnel. All of the 2014 drillholes were vertical and the drill, once moved to the collar location, was checked and confirmed for proper position and alignment by Copper Fox personnel. Prior to the start of drilling, large sound barriers were erected at each site to reduce the amount of noise disturbance for local residents (Plate 10-1). Some of the holes were required to be zero discharge; all water-laden cuttings were pumped from a drill collar collection tank to a centrifuge. The centrifuge separated water from solids and reused the water for drilling.

The 2014 holes were drilled by Layne Christensen Company using a two-step process. Drillhole pre-collars were drilled with an Ingersoll-Rand T-4W reverse circulation (RC) drill which cased through the alluvium into Gila Conglomerate. Once into Gila Conglomerate, the RC drill was replaced by an Atlas-Copco CT-20 diamond drill using PQ-sized tooling. The truck-mounted drill produced 85 mm (3 3/8") diameter core and advanced each hole to the desired depth. The locations of all six drillholes were surveyed with a Trimble XH GPS and differentially corrected to an estimated accuracy of 0.1m.

Downhole geophysical surveys (including Caliper, Gyro, E-logs, Magnetic susceptibility, Flowmeter and Televiewer) were completed by Southwest Exploration Services, LLC, to better define the geotechnical characteristics of the rocks and hydrogeology of the deposit.



**Plate 10-1** Large Sound Barrier Erected to Reduce Impact of Drilling for Local Residents, Hole **VD14-01**

Copper Fox hired Knight Piésold Ltd. (KP) to maintain a 24-hour presence at the drill. KP engineers collected the core directly from the drillers and completed a geotechnical assessment of the core before securing it for transport to the logging facility. Drill core was delivered to the logging facility by KP at the every shift change.

### **Drillhole Descriptions and Comparison of Twins to Originals**

All six holes drilled by Copper Fox in 2014 are located on mineral estate lands that it owns, and all but one hole are located on surface tenure owned or controlled by other parties. The first 2014 hole, VD14-01 was drilled within an area previously tested by several historical drillholes in the vicinity of the underground workings and in-situ leaching pilot program. The remaining five 2014 holes, VD14-02 through VD14-06, were drilled to 'twin' selected historical drillholes.

The main intent of the 2014 drilling program was 1) to verify the accuracy of previously captured historical data for a specific number of historical drillholes, and 2) once verified, proceed with the estimate of a NI 43-101 compliant mineral resource for the Project using all pertinent historic data and new 2014 data.

Drillhole VD14-01 was drilled 140m west-southwest of the Van Dyke shaft. It was not intended to twin a particular historical drillhole, but rather to evaluate an area that had been the subject of pilot ISL testing programs. VD14-01 was collared approximately 40m west of any previously drilled exploration hole. While not located close enough to any pre-existing hole to be considered a twin, VD14-01 is situated an estimated 20.5 meters south-southwest of ISL hole OXY-46, and the two holes can be generally compared. The latter was a diamond drillhole that was used as a well for injecting dilute sulphuric acid (H<sub>2</sub>SO<sub>4</sub>) into the rock mass (Huff, 1979). Records show that it intersected modest chrysocolla and minor tenorite over a 79.55m interval (270.97-350.52 m) that graded 0.26% acid soluble copper (Clary et al., 1981).

Drillhole VD14-01 penetrated the base of the Gila Conglomerate at a depth of 140.4m and stayed in moderately to intensely brittley deformed and oxidized Pinal Schist to its faulted basal contact at a depth of 368.3m. Schultz Granite extended from the fault to the oxide/sulphide boundary and contact with Pinal Schist at a depth of 379.5m. Pinal Schist extended from the oxide/sulphide boundary to its faulted basal contact with Schultz Granite at a depth of 576.1m. Schultz was encountered to the end of the hole at a depth of 639.2m.

The oxidized rock mass penetrated by VD14-01 encountered cuprian allophane and a variety of cuprite called chalcotrichite, minerals known to be common by-products of copper leaching operations (Jansen and Taylor, 2003). These observations are consistent with a volume of rock that has been the subject of ISL. Below the oxide/sulphide boundary, VD14-01 encountered appreciable amounts of molybdenite and minor chalcopyrite in narrow quartz veins and quartz stockworks to the end of the hole.

Drillhole VD-14-02 was drilled to twin and verify historic hole OXY-6 and was collared within 3 meters of the old hole. It is located in the north-central part of the property, north of Highway 60 on surface tenure owned by BHP. VD-14-02 drilled through Gila Conglomerate and into well-mineralized intrusion breccia from 381.30 to 441.35m. Fractured, brecciated and locally milled Pinal Schist was encountered from 441.35 to the end-of-hole at 602.28m. Mineralization in the upper part of the hole, within the

intrusion breccia, consisted of malachite (up to 4% of the rock mass locally) and cuprian allophane. Mineralization in the lower part of the hole was dominated by allophane, minor cuprite and occasional patchy malachite. In contrast, copper mineralization in OXY-6 was dominated throughout by chrysocolla and malachite, but no allophane. Of particular note is that a well-mineralized interval of chrysocolla and malachite logged in the lower mineralized section of OXY-6 has been replaced in VD14-02 primarily by cuprian allophane, traces of cuprite and occasional blebs of native copper. The marked change in mineralogy between the original hole and twin hole suggests that the lower part of the mineralized interval has been negatively affected by acidic solutions that stripped some of the copper. The solutions may have incidentally escaped from other leaching operations.

Drillhole VD-14-03 was drilled to twin and verify the results of historic hole OXY-8. It is also located on surface tenure owned by BHP just outside the administrative boundary of the town of Miami on Miami Avenue. VD14-03 was collared within 3 meters of OXY-8 and encountered the base of the Gila Conglomerate at a depth of 301.14m and the base of secondary copper mineralization at a depth of 433.61m. The geology and style of mineralization of the two holes are similar, consisting of highly fractured Pinal Schist carrying strong secondary copper mineralization dominated by chrysocolla with patchy malachite, azurite and tenorite. In VD14-03, minor allophane and cuprite were observed as fracture coatings in the upper part of the mineralized interval, but were not observed in the lower part of the zone. Overall, the observations and data collected for VD14-03 are consistent with the information recorded for the original hole.

Drillhole VD-14-04 was drilled to twin and verify the results of historic hole OXY-16B. The drill site is located just 60 meters south of Highway 60 in a privately-owned, gated compound on Latham Boulevard in the east-central part of the deposit. The hole encountered the base of the Gila Conglomerate at a depth of 416.66m and the base of the secondary copper zone at a depth of 620.27m. The geology and mineralogy correlate well between the holes, but VD14-04 carries consistently higher grades than the original hole.

Drillhole VD-14-05 was drilled to twin and verify the results of historic hole CUVD-11. The drill site is located in the backyard of an Adonis Avenue residence in the south-central part of the deposit. The hole encountered the base of the Gila Conglomerate at a depth of 374.14m and the base of the secondary copper zone at a depth of 448.21m. The geology and mineralization are correlative between twin and original hole. In VD14-05, secondary copper mineralization starts at 400.81m with azurite and occasional tenorite noted to a depth of 434.34m at which point minor allophane and cuprite start to appear in addition to the other copper minerals. Azurite is particularly abundant between 438.91-445.00m.

Drillhole VD-14-06 is situated in the middle of the town of Miami in a parking lot immediately behind Town Hall in the approximate center of the deposit (Plate 10-2). Approval to proceed with drilling of the hole was granted unanimously by Mayor and Council. VD14-06 was drilled to twin and verify the results of historic hole VD72-3, and is located within 10m of the old collar location. It encountered the base of the Gila Conglomerate at a depth of 249.02m and the base of the secondary copper zone at a depth of 383.74m. Both twin hole and original hole intersected weakly to moderately mineralized granite porphyry immediately below the capping Gila Conglomerate. The two holes remained in mineralized

intrusion until encountering its brecciated and faulted footwall contact with the underlying Pinal Schist. Mineralization does not extend beyond the contact into the schist below.



Plate 10-2 Drilling of Hole VD14-06 from a Parking Lot Located in the Center of Miami, Arizona

### 10.3 Results

#### Total Copper and Acid Soluble Copper – 2014 Drilling

All of drillhole VD14-01 and the lower part of drillhole VD14-02 showed the effects of being subjected to post-mineralization acidic solutions either intentionally or incidentally. Both drillholes still intersected broad intervals of mineralization that returned significant grades of total copper and acid soluble copper. Each of the remaining four drillholes, VD14-03 through VD14-06, intersected broad zones of secondary copper mineralization averaging significant grades of total copper and acid soluble copper that are consistent with their respective historic twin drillhole.

Drillhole VD14-01, despite being drilled in an area that had been leached, returned 139.9m averaging 0.33% Total Copper and 0.24% Acid Soluble Copper. In addition, the hole was drilled well beyond the base of the secondary copper zone and into weakly disseminated and quartz veinlet hosted chalcopryite+/-molybdenite mineralization. The sulphide zone averaged 0.164% Cu over 241.20m.

Hole VD14-02, drilled in an area that has not been subjected to any intentional ISL, showed the effects of such a process, particularly in the bottom half of the hole where allophane and cuprite occupied sites once resided by chrysocolla and malachite. The impact of this incidental leaching of copper is



dramatically lower copper values in the lower 120m of the interval. The upper 84m of the mineralized interval was not impacted.

Results for all of the 2014 Copper Fox drillholes are listed in Table 10-5.

**Table 10-5 2014 Diamond Drill Intersections, Van Dyke Copper Project**

Drillhole ID	From (m)	To (m)	Interval (m)	Total Copper (%)	Acid Soluble Copper (%)
VD14-01	246.9	368.4	121.5	0.357	0.249
VD14-02	375.2	591.6	216.4	0.444	0.359
incl	375.2	398.1	22.9	1.41	1.299
incl	413.6	458.7	45.1	0.447	0.418
incl	486.2	590.1	103.9	0.394	0.249
VD14-03	315.5	434.7	119.2	0.681	0.391
VD14-04	452.3	598.0	145.7	0.376	0.316
VD14-05	401.3	448.1	46.8	0.583	0.528
VD14-06	249.0	383.7	134.7	0.346	0.246
incl	249.0	281.6	32.6	0.749	0.631

**Cyanide Soluble Copper – 2014 Drilling and Historic Core Reanalysis**

Cyanide soluble copper (CuCN) analytical results for 2014 drillholes and drill core pulps from two historical drillholes were reviewed and are summarized below.

**CuCN Data Summary for 2014 Drillholes (VD14-01 to VD14-06):**

- 768 total core samples analyzed for cyanide soluble copper (CuCN);
- values ranged from a minimum of <0.001% to a maximum of 0.861% CuCN;
- 57 samples had values of less than detection (<0.001% CuCN);
- 71 samples had values of greater than 0.05% CuCN;
- the mean average value for the 711 samples that had values > detection was 0.035% CuCN.

**CuCN Data for Drill Core Pulps Analyzed by Skyline (OXY-23 & 26)**

- 163 total pulp samples analyzed for cyanide soluble copper (CuCN);
- values ranged from a minimum of <0.001% to a maximum of 0.536% CuCN;
- 1 sample had a value of less than detection (<0.001% CuCN);
- 5 samples had values of greater than 0.05%;
- the mean average value for the 162 samples that had values > detection was 0.022% CuCN.

The cyanide soluble copper results suggest that a small but significant fraction of mineralization that does not report to an acid soluble assay consists of potentially leachable secondary copper sulphide species.

Cyanide soluble copper analysis should be completed on all remaining drill core and/or drill core pulps from historic drillholes and should be a standard analytical technique used in any future drilling programs.

### **Gold, Silver and Molybdenum – 2014 Drilling and Historic Core Reanalysis**

The results for other metals of potential economic interest from 2014 drilling and from reanalysis of historic drill core and drill core pulps were reviewed and evaluated. A summary of the results for gold, silver and molybdenum is shown in Table 10-6.

#### **2014 Drilling**

Gold values ranged from less than detection to a high of 187 ppb Au. Higher gold values occurred in relative isolation from one-another. The best sustained interval of weakly anomalous gold mineralization occurred in drillhole VD14-04 where a 40.7m intersection starting at a depth of 466.5m averaged 15 ppb Au.

Silver values ranged from less than detection to a high of 3.6 ppm Ag. There were no intersections of consistently elevated silver.

Molybdenum values ranged from less than detection to 1000 ppm Mo or more in three of the six 2014 drillholes. The best sustained interval of molybdenite mineralization occurred in drillhole VD14-01 where a 230.6m interval starting at a depth of 379.2m averaged 256 ppm Mo. Elevated rhenium values coincide with strong molybdenum values. The interval starts at the oxide/sulphide interface and correlates with fractured to sheared and brecciated to milled Pinal Schist and competent Schultz Granite that carry molybdenite and minor chalcopyrite in narrow quartz veins and quartz stockworks.

#### **Historic Drill Core and Drill Core Pulps**

Gold values returned from the analysis of drill core and drill core pulps assembled from eight holes ranged from less than detection to a high of 2674 ppb Au. Elevated gold values, in all cases, were sporadic and generally occurred as isolated anomalies. The highest gold value occurred in drillhole OXY-26 where a 1.2m interval starting at a depth of 306.0m graded 2674 ppb Au and 60.2 ppm Ag.

Silver values ranged from less than detection to a high of 60.2 ppm Ag. There were no intersections of consistently elevated silver values. The highest silver values generally coincide with elevated gold values.

In contrast to the 2014 drillholes, the re-assayed historic drillholes did not encounter significant, nor consistent molybdenum values

**Table 10-6 Summary of Other Metals of Potential Economic Interest, Van Dyke Copper Project**

2014 Drillhole ID	Au (ppb)		Ag (ppm)		Mo (ppm)	
	Min	Max	Min	Max	Min	Max
VD14-01	< 5	26	< 0.1	3.2	< 0.1	> 1000
VD14-02	< 5	187	< 0.1	3.6	3.2	640
VD14-03	< 5	49	< 0.1	2.4	5.8	1001
VD14-04	< 5	166	< 0.1	2.8	4.8	1000
VD14-05	< 5	81	< 0.1	2.8	0.5	42
VD14-06	< 5	58	< 0.1	0.4	1.1	652
Historic Drillhole ID	Au (ppb)		Ag (ppm)		Mo (ppm)	
	Min	Max	Min	Max	Min	Max
OXY-6	< 5	230	< 0.1	0.87	2.4	292
OXY-8	< 5	1705	< 0.1	1.9	4.7	198
OXY-15	< 5	48	0.03	0.28	2.29	29.2
OXY-17B	< 5	25	0.01	5.99	7.57	208
OXY-23	< 5	23	< 0.1	2.7	4.4	171
OXY-26	< 5	2674	< 0.1	60.2	4.9	200
OXY-27	< 5	20	< 0.1	0.75	2.4	89.6
VD-73-6	< 5	174	0.01	0.48	2.84	170

#### 10.4 Diamond Drilling Summary and Interpretation

MMTS visited the Project during active diamond drilling activities and observed drilling, core handling, and core logging and sampling procedures. Locations and elevations of the six Copper Fox drillholes have been surveyed to sub-meter accuracy. Locations and elevations for a selection of historical drillholes have been positively identified and also surveyed to sub-meter accuracy. The locations and elevations for the remainder of the historic drillholes have been translated from old mine grid coordinates to UTM NAD 27 coordinates using iterative regression. MMTS believes that the exploration procedures implemented by Copper Fox meet or exceed current industry best management practices and standards.

All six of the 2014 Copper Fox drillholes were completed to their desired depth and encountered geology, alteration and mineralization consistent with a secondary or exotic copper deposit. Each drillhole penetrated the base of the post-mineral Gila Conglomerate, passed through broad intervals of secondary copper mineralization and the oxide/sulphide contact, and was terminated in unoxidized, weakly to non-mineralized Pinal Schist. Mineralization is hosted primarily by variably broken to shattered or brecciated Pinal Schist, and by intrusive breccia and granite porphyry of the Schultz Granite.

The first drillhole was not a twin of any historic hole, but was drilled to evaluate an area that had been the subject of ISL. It encountered minerals that are common by-products of ISL, but still returned important intervals of supergene and hypogene copper mineralization. Each of the five twin drillholes successfully intersected its target enabling comparisons to be made with its historic equivalent hole. One of the five twin holes encountered the effects of incidental leaching which resulted in a marked reduction in the overall grade of the grade of the twin versus its original hole. The four remaining twin drillholes encountered intervals of copper mineralization consistent with those of their respective original holes.

MMTS is of the opinion that the 2014 Copper Fox drill program,

- 1) generated analytical results that are suitable for use in resource estimation;
- 2) where both historic drillholes and 2014 drillholes exist, data for the 2014 holes will be used for resource estimation;
- 3) confirmed that the northwest part of the property, west of the Van Dyke shaft, was affected by historic ISL testing and/or small-scale mining that removed a percentage of the available soluble copper from a volume of mineralized rock;
- 4) identified an area of possible incidental leaching in the north-central part of the property, in the vicinity of drillhole OXY-6 and twin VD-14-02, that reduced the amount of secondary copper in the mineralized interval, and impacts the use of historical data for OXY-6;
- 5) the remainder of the analytical results from historic drilling programs are believed to be suitable for use in resource estimation.

## 11 Sample Preparation, Analyses and Security

All drill core was transported from drill sites by a representative of Copper Fox and stored in a secure storage area until it was logged. Sample security was provided by Copper Fox personnel who abided by rigorous chain of custody practices.

### 11.1 Drill Core Handling Procedures

Drill core handling procedures from drill to laboratory consisted of the following:

- PQ core was transferred from five foot core tubes into heavy, waxed cardboard core boxes by a member of the drill crew;
- A geotechnical technician, provided by Knight Piésold Ltd. (KP), labelled the core boxes with drillhole number and the interval (from – to) contained in each box, and placed a wooden block marked with the depth in feet at the end of each run of core;
- The technician then listed the length of each core run and the length of core recovered on the reverse side of the block. Core recovery and Rock Quality Designation (RQD) measurements were then recorded by the technician;
- Following collection of this data, lidded core boxes were stacked on pallets, secured, and transported by staff of Copper Fox to its core logging facility in the town of Miami, Arizona;
- At the core logging facility, core boxes were laid out in order to ensure all boxes were present, and to ensure markers were correctly located and labelled;
- Core was geologically logged using large-format custom hard-copy forms designed for the Project; data was later entered into an electronic database;
- The geologist determined the core to be sampled by marking it with bright coloured wax crayons to indicate the start and end of each sample interval. Each sample interval was tagged with a unique identification number, and the data was recorded; the geologist marked samples for density measurements approximately every 100 feet;
- Core was photographed sequentially from collar to ‘End of Hole’ in both dry and wet conditions;
- Lids were then placed back on the core boxes and a shipment of core boxes was prepared for transportation to the lab;
- Each shipment consisted of one or more batches of samples, described below;
- Accompanying each shipment were a) a signed Chain of Custody form, b) a Sample Record form (one form for each batch of samples), c) bagged and tagged standards and blanks for insertion as prescribed into each batch of samples, and d) a Laboratory Requisition form;
- Core was shipped to Skyline Assayers & Laboratories (Skyline Labs) in Tucson, Arizona for splitting, sampling and analysis utilizing a truck from Skyline’s commercial fleet;
- Each shipment of core was placed on wooden pallets, shrink-wrapped, loaded onto the truck, fastened securely with tie down straps, and driven directly to Skyline’s gated compound for unloading and processing;
- Skyline’s receiver logged receipt of the core boxes into the company’s tracking system.

Layout and tagging of core samples were as follows:

- For twinned drillholes, effort was made to match, to the extent reasonable, the sample intervals of the historic drillhole being twinned. Core sampling typically began immediately below the base of the Gila conglomerate and extended well into the footwall of copper oxide zones and into hypogene mineralization if present;
- Samples were typically 5 feet in length, but may have been adjusted in the case of a geologic contact, discontinuity, change in mineralization or because of a significant interval of low or no-recovery;
- Marking of samples started nominally 20 feet above the first sign of significant mineralization;
- Listed on the retained part of the pre-numbered sample tags are: drillhole ID, core footage, box number and batch number, or standard or blank identifier;
- For routine drill core samples, two of the detachable pre-numbered tags were removed from the tag booklet and stapled into the core box at the start of the interval to be sampled (one of which will be detached during sampling at the lab and used to label the prepared sample; the other tag will remain affixed to the core box along with the retained half-core);
- For duplicate samples, two pairs of pre-numbered tags were stapled to the start of the duplicate sample interval;
- For standards and blanks, one of the pre-numbered tags was placed in the sample bag along with the appropriate standard or blank packet.

Drill core sampling procedures were as follows:

- Core boxes to be sampled were laid out in numerical order, and lids removed;
- Core marked for density measurements was located, removed for measurement, and returned to the core box prior to core cutting / splitting for geochemical analysis;
- Sections of competent core were halved using a diamond saw, with half-core being placed in a pre-numbered bag with the matching pre-numbered sample tag and the other half returned to the core box
- Sections of intensely fractured core were collected, bagged with the sample tag, crushed, and split into halves with one-half of the sample being bagged with the sample tag and the other bagged half being placed back into the core box;
- Once sampling was complete, lids were placed back onto core boxes, core boxes were cross stacked on wooden pallets, shrink wrapped and moved by forklift to an inactive area within the gated and locked storage compound to await their return to Copper Fox's core storage facility in Miami, AZ;
- Sample batches were assembled as per the Sample Record forms provided and completed by inserting the standards and blanks as prescribed;
- All samples were entered into Skylines's Laboratory Information Management System (LIMS) and the three-letter prefix BUR (reserved for samples from Copper Fox's Van Dyke Copper Project) was added to each unique sample number;
- Samples were then advanced for preparation and analysis.

## 11.2 Analytical Methods

Copper Fox used ALS Minerals (ALS) in Reno, Nevada, for the analysis of the first batch of historic drill core and drill core pulps. Later in the year, Copper Fox used Skyline Assayers and Laboratories (Skyline) in Tucson, Arizona, for a second batch of historic drill core pulps.

Copper Fox used Skyline for the analysis of all core sampled from the 2014 diamond drilling program, with the exception of a eight short whole core samples which were analyzed by SGS Metcon/KD Engineering (SGS) in Tucson, Arizona, as part of a preliminary in-situ leach study. Check sampling of 2014 core analysis was conducted by Inspectorate America Corporation (Inspectorate) in Reno, Nevada, with the exception of one sample that, because of its high grade, was sent to Inspectorate's Vancouver facility for analysis.

Skyline has ISO/IEC 17025:2005 certification for FA, AAS, ICP-OES and ICP-Mass Spectroscopy ("MS"). MMTS has no information regarding analytical laboratories used prior Copper Fox's involvement in the Project. All samples from the Copper Fox drilling program as well as most of the historic drilling and underground channel sampling data were used in the mineral resource estimate.

ALS has ISO 9001:2008 accreditation for quality management and ISO/IEC17025:2005 accreditation for gold assay methods. SGS and Inspectorate also maintain ISO 9001:2008 accreditation for quality management system certification.

The Quality Assurance/Quality Control ("QA/QC") program described in the following sections was designed to allow for verification of analytical results from historical exploration programs for which there were no laboratory analytical certificates.

### 11.2.1 Sample Preparation and Analysis – Skyline

Upon arrival at Skyline's Tucson lab, samples are lined-up based on the sample identification supplied by Copper Fox. Extra samples, missing samples, damaged containers, illegible sample IDs, or possible cross contamination are noted and reported to the lab manager, who in turn will contact the client for instructions. If needed, samples are dried at 105°C for 8-24 hours. Each batch of samples is assigned a Job Number consisting of 3 letters followed by a 3 or 4 digit number. The 3-letter prefix identifies the client (in the case of Copper Fox the 3-letter prefix was BUR) and the number is assigned sequentially to each batch of samples submitted by the client. Sample IDs are digitally recorded, and corresponding adhesive-backed labels and laboratory worksheets are generated for each Job. Each label and laboratory worksheet contains an Item Number (assigned sequentially to the samples based on the client's transmittal form) and the Sample Identity for each sample. Samples are labeled, checked for proper sample IDs, and then lined up for sample reduction.

The entire sample is reduced in a jaw crusher to a nominal 75% minus 10 mesh. The crushed material is then transferred back into the original sample bag. The crushed product is then riffle split, re-blended and re-split three times. One half of the final split is further reduced (if needed) by the same process using a Jones riffle splitter until a final split of 200-300 grams is obtained. Any remaining minus 10 mesh material is poured back into the original labeled sample bag. The 200-300 gram split is then pulverized in a ring and puck mill to a nominal 95% minus 150 mesh product. The pulverized material is then

placed in a manila envelope, to which a sample ID label has been affixed. The pulps for the entire job are then located on a numbered shelf in the pulp storage room, which is recorded on the job file cover sheet. Preparation equipment is cleaned between each batch of samples using river rock and silica sand. The preparation equipment is cleaned between samples using compressed air. The Sample Preparation supervisor randomly selects samples of the crushed material and pulverized product for a screen analysis to insure that this protocol is observed.

### 11.2.1.1 Analytical Procedures

The following laboratory procedures, used to analyze 2014 drill core samples and historic drill core pulps from two holes, were provided by Skyline.

#### Total Copper

Weigh 0.2000 to 0.2300 grams of sample into a 200 mL flask. Weigh samples in batches of 20. At end of each rack, weigh the first and last sample as checks plus 2 standards. In the last rack of the entire job add the tenth sample of every previous rack. Add 10.0 mL HCl, 3.0 mL HNO<sub>3</sub> and 1.5 mL HClO<sub>4</sub> to each flask. Place on a medium hot plate (about 250°C). Digest to near dryness until the only remaining acid present is HClO<sub>4</sub>. Remove from the hot plate and cool. Add about 30 to 40 mL DI water and 10.0 mL HCl. Bring to a rolling boil and remove from hot plate. Cool the flask and contents to room temperature, dilute to the mark (200 mL) with DI water, stopper and shake well to mix. Read the solutions for copper by Atomic Absorption (AA) using standards made up in 5% hydrochloric acid.

#### Sequential Leach

##### *Acid Soluble Component*

Weigh 0.2500 to 0.2600g of sample into a 50 mL centrifuge tube. Weigh samples in batches of 16. At end of each rack, weigh the first and last sample as checks plus 2 standards. In the last rack of the entire job add the tenth sample of every previous rack. Add 10mL 5% H<sub>2</sub>SO<sub>4</sub>, cap and shake for one hour at room temperature. Centrifuge and decant the supernatant solution into a 100mL flask. Wash the residue once by adding 40mL deionized water to centrifuge tube and shaking for 5 minutes. Centrifuge and decant the supernatant solution into the 100mL flask. Dilute the 100mL flask to the mark with deionized water, stopper and shake well to mix. Read samples on AA using 0.5% H<sub>2</sub>SO<sub>4</sub> calibration standards.

##### *Cyanide Soluble Component*

Add 10mL of 10% NaCN solution to the residue. Cap and shake for 30 minutes at room temperature. Centrifuge and decant the supernatant solution into a 100mL flask. Wash the residue once by adding 40mL deionized water to centrifuge tube and shaking for 5 minutes. Centrifuge and decant the supernatant solution into the 100mL flask. Dilute the 100mL flask to the mark with deionized water, stopper and shake well to mix. Read samples on AA using 1% NaCN calibration standards.

### 11.2.2 Sample Preparation and Analysis – ALS

Historic drill core from one hole (OXY-27) and historic drill core pulps from five holes (OXY-6, OXY-8, OXY-15, OXY-17B and VD-73-6) were submitted to ALS. Upon receipt, core samples were logged into the ALS tracking system, weighed, dried and crushed until > 70% passed through 2 mm (9 mesh). A split of up to 250g was collected and pulverized until > 85% passed through a 75 micron (200 mesh) screen. All



pulps were further split to separate 0.5g sample for analysis of 51 elements by aqua regia digestion using an ICP-MS instrument (ALS method ME-ICP41), a 1g sample to analyze for soluble copper content using sulfuric acid/ferric sulfate leach with an atomic absorption finish (ALS method Cu-AA08q), and a 30g sample for analysis of gold by fire assay with an atomic absorption finish (ALS method Au-AA23). Method ME-ICP41 has a lower detection limit for copper of 0.2 ppm Cu and an upper detection limit of 10000 ppm Cu. Samples with greater than 10000 ppm Cu were re-analyzed using an ICP-OES instrument (ALS method Cu-OG46). This technique has an upper detection limit of 40% Cu.

### **11.2.3 Sample Preparation and Analysis – SGS**

Eight whole core samples, ranging from 1.04 - 1.43m in length, were submitted to SGS for analysis and simulated in-situ leach testing. Each sample of drill core was visually inspected and a representative section measuring approximately 0.64m was selected and removed for pressure leach testing. The remainder of each core sample was dried and crushed to 100% minus 10 mesh. A 1000 g split of this material was evaluated for its mineralogical content, and a second 1000 g split was pulverized. Splits of the pulverized material were submitted for multi-element ICP analysis including copper (SGS method A0002AR), total copper (SGS method A0001Cu), total iron (SGS method A0001Fe), and sequential copper analyses (SGS method A0001SeqCu) in which acid soluble, cyanide soluble and residual copper are determined. The resulting head screen assays for the eight samples were compiled with the Skyline data to provide complete analytical records for the six 2014 drillholes.

### **11.2.4 Sample Preparation and Analysis – Inspectorate**

A total of 93 pulps, including 8 CRS and 8 blanks, from the 2014 diamond drilling program were submitted to Inspectorate for check analysis. Procedures used for total copper and soluble copper analysis were intended to mimic, as closely as possible, the procedures used by Skyline. For all samples, splits weighing 0.5g were submitted for 30-element analysis using aqua regia digestion with ICP finish (method AR330) and for sequential copper leaching analysis (methods LH402 and LH403), and splits weighing 30g were submitted for gold analysis by fire assay with an atomic absorption (AA) finish (method FA430). Samples with greater than 0.3% Cu were re-analyzed using ore grade method AR410 (0.1g split digested in 100ml of aqua regia, with AA finish). One sample with greater than 20% Cu was re-analyzed using classical titration (assay method GC820).

## **11.3 Quality Assurance/Quality Control Procedures**

### **11.3.1 Quality Assurance/Quality Control Procedures - Skyline**

Quality Assurance/Quality Control (QA/QC) samples used by Copper Fox include blanks, certified reference standards (CRS) and core sample duplicates. Copper Fox used five different CRS for its 2014 drill program. Three CRS were purchased from Ore Research and Exploration P/L, Bayswater North, Australia (OREAS) and two CRS were purchased from CDN Resource Laboratories, Ltd., Langley, B.C. Canada (CDN). The blank material used was a commercially available blank (CDN-BL-10) purchased from CDN.

Copper Fox inserted QA/QC samples into the sample stream on a per batch basis. Each batch of samples typically consisted of two CRS (including low to medium value for total copper (CuT) and a low to medium value for acid soluble copper (CuAS) along with values low to medium values for gold, silver and

molybdenum), one blank, one duplicate and twelve core samples, or twelve pulp samples, as per the list shown below:

- #1: Standard (CDN-CM-26 or CDN-CM-27)
- #2: Standard (OREAS-901 or OREAS-902 or OREAS-904)
- #3: Blank (CDN-CM-10)
- #4 though N-1: unknown, drill samples
- N: Duplicate of N-1
- N=16, thus 12 unknowns and 4 controls per batch.
- Value of N (size of batch) depends on size of the sample tray used by the lab

### Blanks Analysis

Copper Fox submitted 80 pulp blanks to Skyline to monitor sample preparation during the 2014 drilling program. All of the blanks returned total copper values of less than the detection limit (< 0.01% Cu) for the analytical method used; for plotting purposes they have been assigned a value of 0.005% Cu (Figure 11-1). All but six of the blanks returned acid soluble copper values of 0.005% Cu or lower. The six highest values range from 0.006 to 0.011% Cu and were returned in consecutive batches. Of the six, one sample certainly constitutes a failure because it returned a value of 0.011% Cu, a value greater than the CuT value for that sample. The consecutive nature of the six high samples, followed by a run of samples that returned CuS values below detection (<0.001% Cu) may suggest that lab recognized procedural inadequacies and made improvements. Overall, the results indicate generally good sample preparation at Skyline.

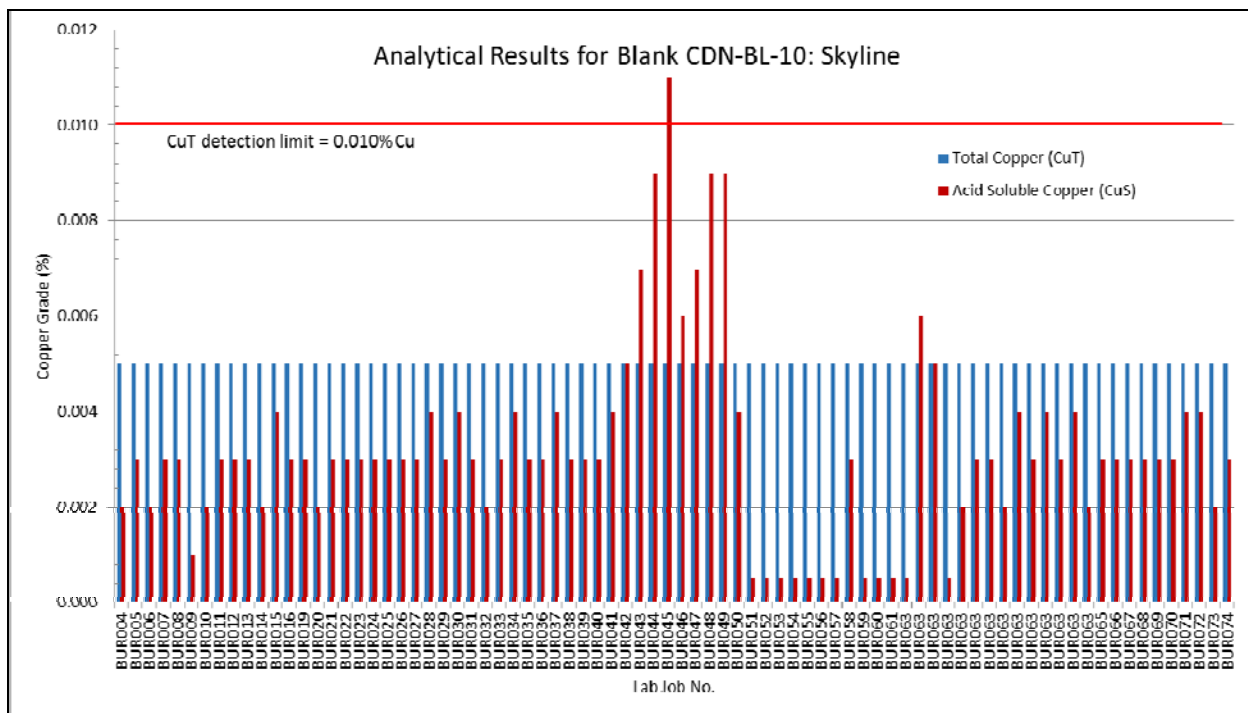


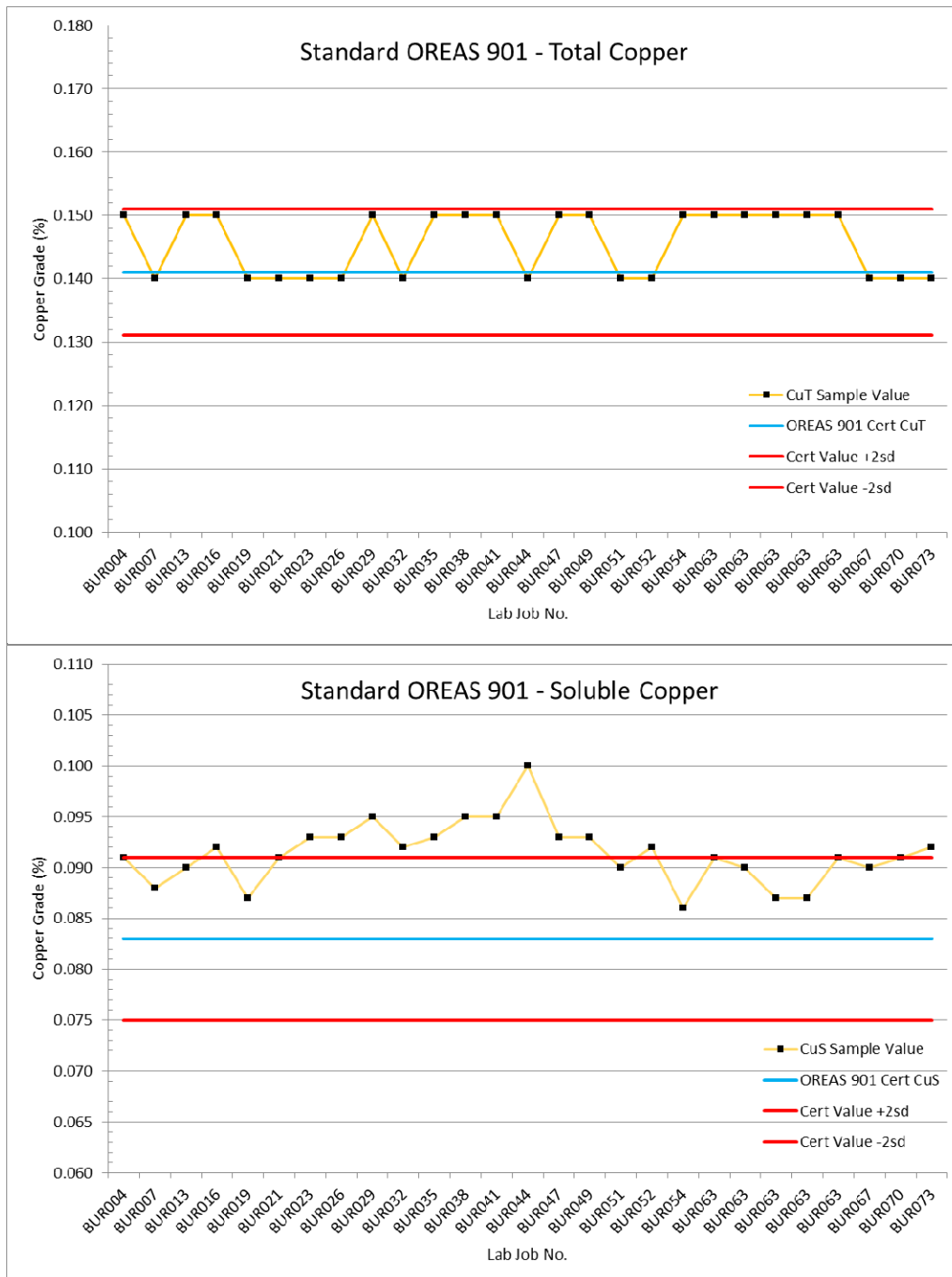
Figure 11-1 Analytical Results for Blank CDN-BL-10, Skyline Lab

## **Standards Analysis**

A total of 160 certified reference standards were submitted as part of the 80 sample batches that were processed and analyzed by Skyline. The CRS in each batch included one of two porphyry copper-gold (+/-molybdenum+/-silver) sulphide standards and one of three transitional to oxide copper standards and covered a range of total copper and acid soluble copper values.

The red horizontal lines on the following Figures are +/-2 standard deviations from the mean or certified value for each standard used.

The CuT values for standard OREAS 901 plot at or above the certified value, but all within the range of +/-2 standard deviations. All of the CuS values for standard OREAS 901 plot above the certified value with 13 of 27 samples plotting beyond +2 standard deviations, one of which plots beyond +3 standard deviations (Figure 11-2). A slightly positive bias is indicated by the acid soluble data for OREAS 901.



**Figure 11-2 Total Copper (CuT) and Acid Soluble Copper (CuS) Results for CRS OREAS 901 at Skyline**

The CuT values for standard OREAS 902 are distributed approximately evenly about the certified value without any apparent bias and within the range of +/- 2 standard deviations (Figure 11-3). All of the CuS

values for standard OREAS 902 plot consistently above the certified value and two samples plot just beyond 2 standard deviations. Results are acceptable.

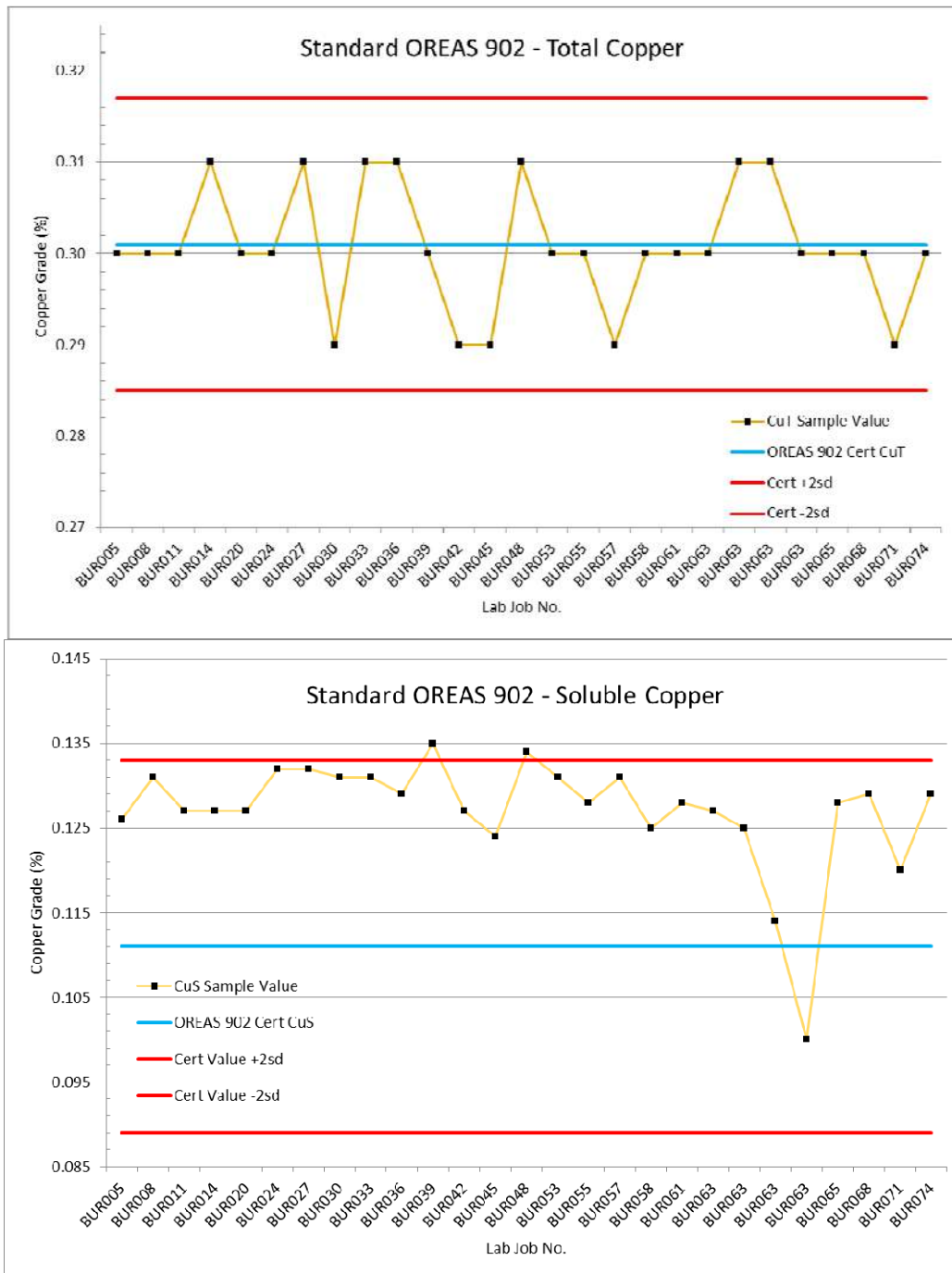
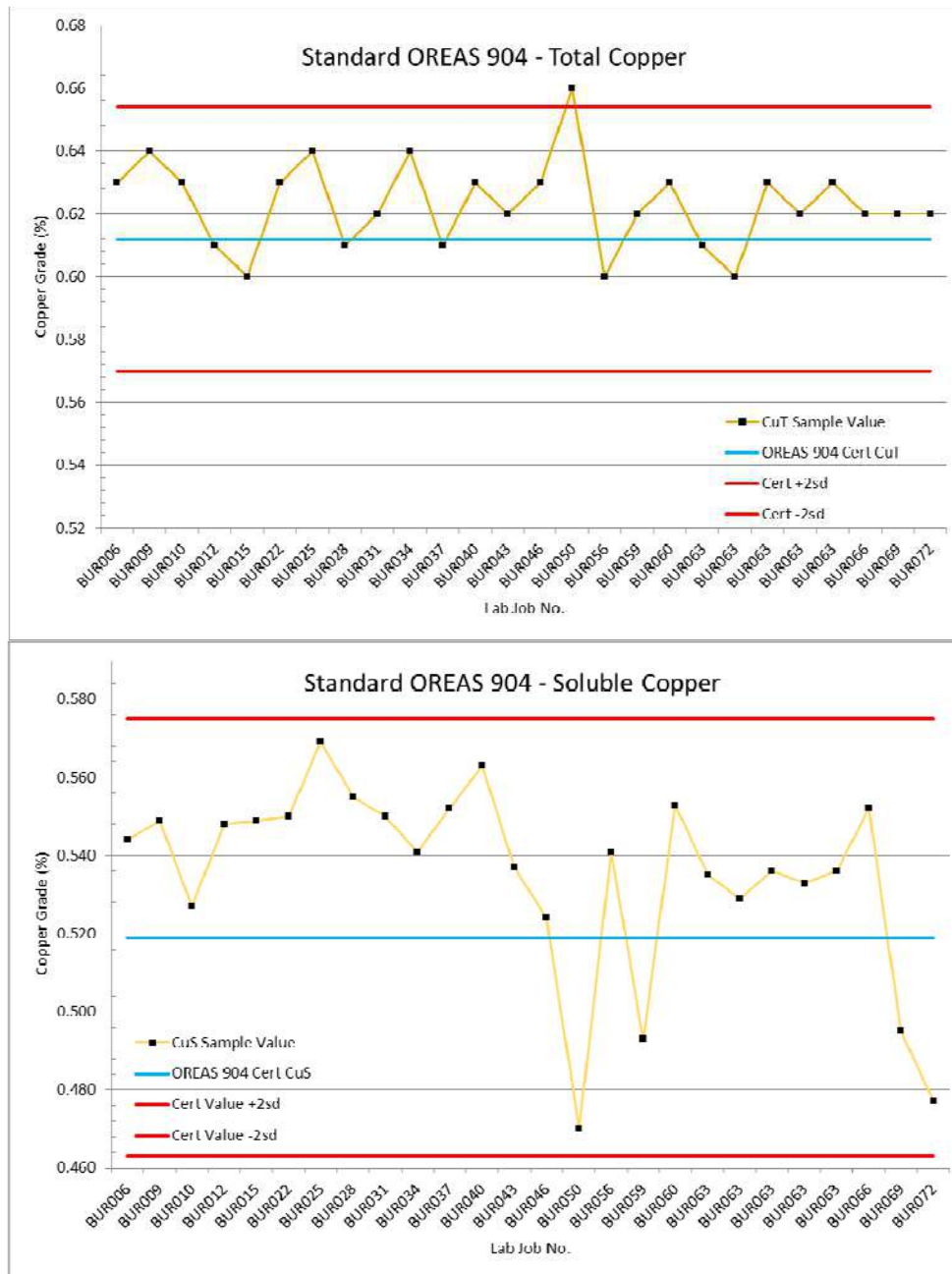


Figure 11-3 Total Copper (CuT) and Acid Soluble Copper (CuS) Results for CRS OREAS 902 at Skyline

The CuT values for standard OREAS 904 are distributed approximately evenly about the certified value without any apparent bias and, with one exception, within the range of +/-2 standard deviations (Figure 11-4). The CuS values for standard OREAS 904 are distributed somewhat erratically about the certified value, but are all within the range of +/-2 standard deviations. Results are acceptable.



**Figure 11-4 Total Copper (CuT) and Acid Soluble Copper (CuS) Results for CRS OREAS 904 at Skyline**

The CuT values for standard CDN-CM-26 plot within two 'between lab' standard deviations of the certified value with one exception; the one exception lies within 3 standard deviations of the certified value and is considered an outlier (Figure 11-5). A total of 33 of the 40 analyses of standard CDN-CM-27 plot within of two 'between lab' standard deviations of the certified value. The remaining 7 analyses of the standard plot within 3 standard deviations of the certified value (Figure 11-6).

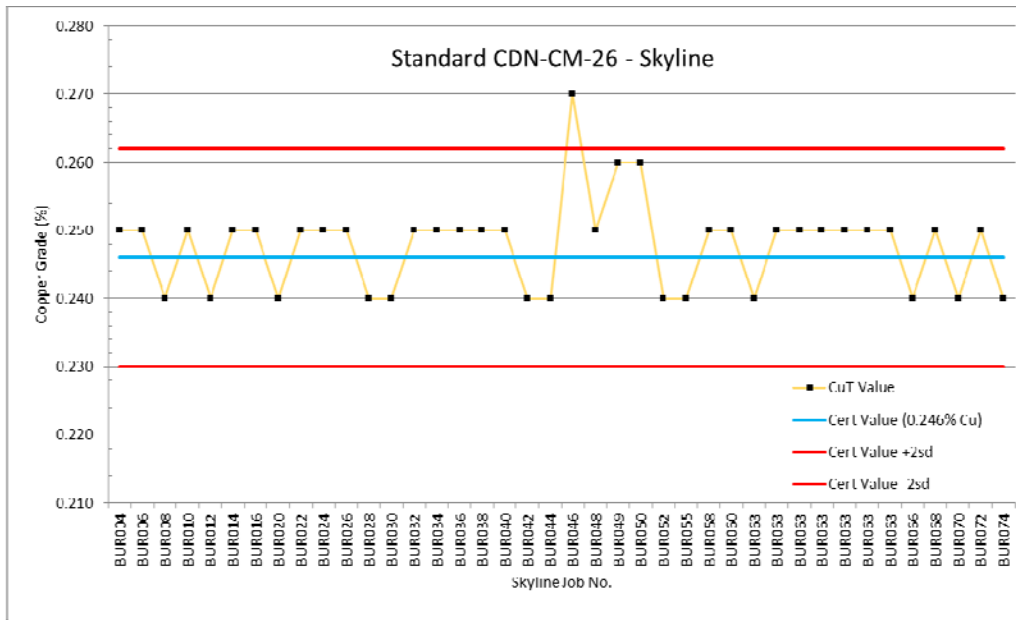


Figure 11-5 Total Copper (CuT) Values for Standard CDN-CM-26

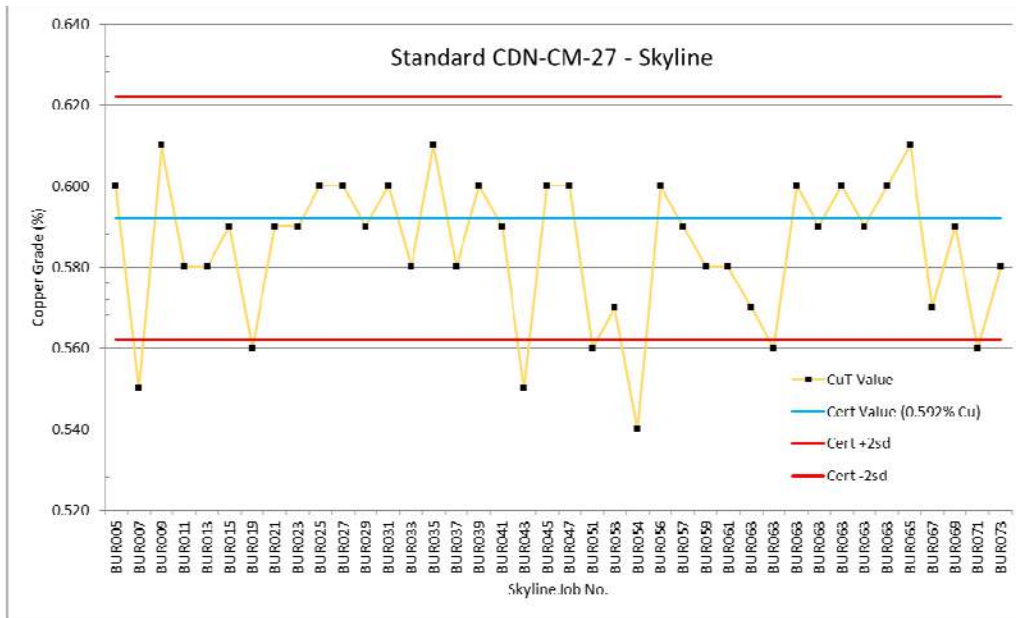


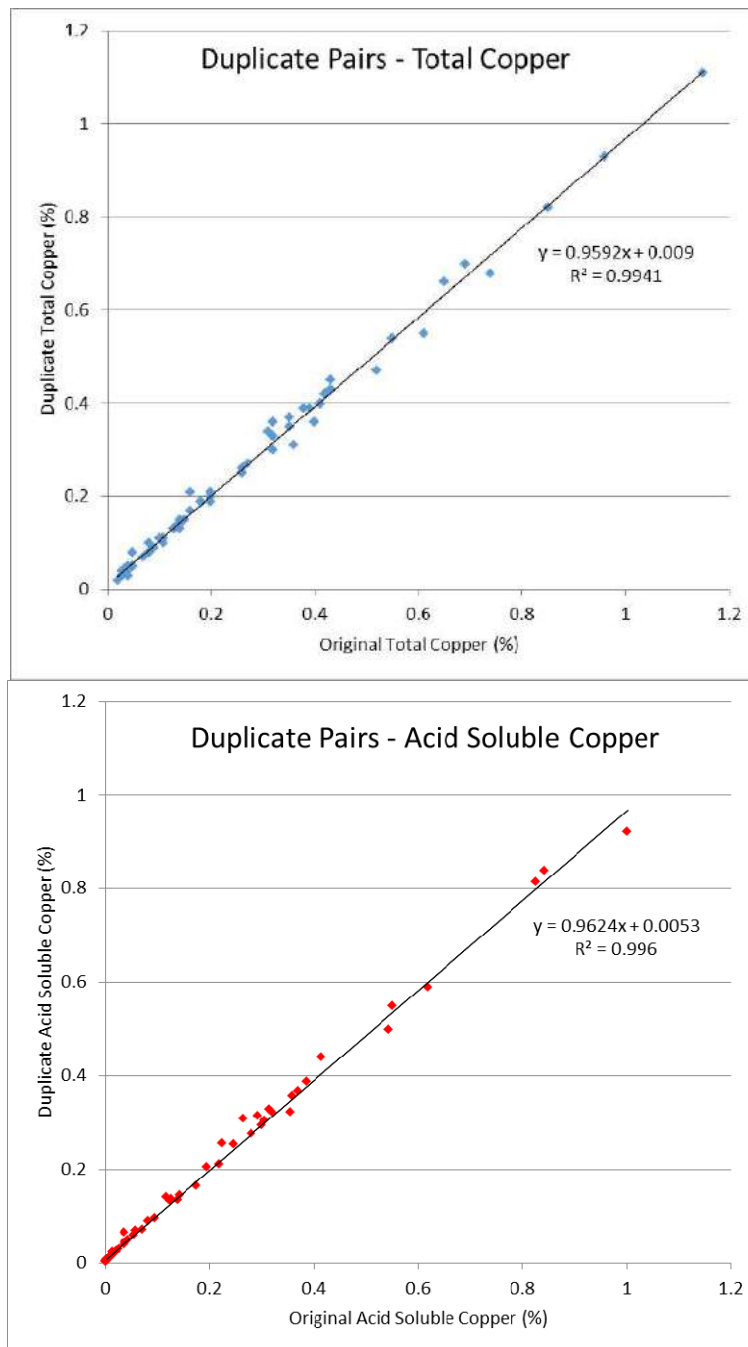
Figure 11-6 Total Copper (CuT) Values for Standard CDN-CM-27

The soluble copper (CuS) values for the three OREAS CRS consistently plot above the certified value and occasionally beyond + two standard deviations from it suggesting a slight positive bias.

#### **Drill Core Duplicates**

Drill core duplicates are used to monitor sample batches for switched samples, data variability due to laboratory error and homogeneity of sample preparation. Results for total copper in original sample versus duplicate sample and for acid soluble copper in original sample versus duplicate sample are shown in Figure 11-7. The data presented on the figures plot close to a 45° slope as indicated by r values that are close to 1; results are acceptable.



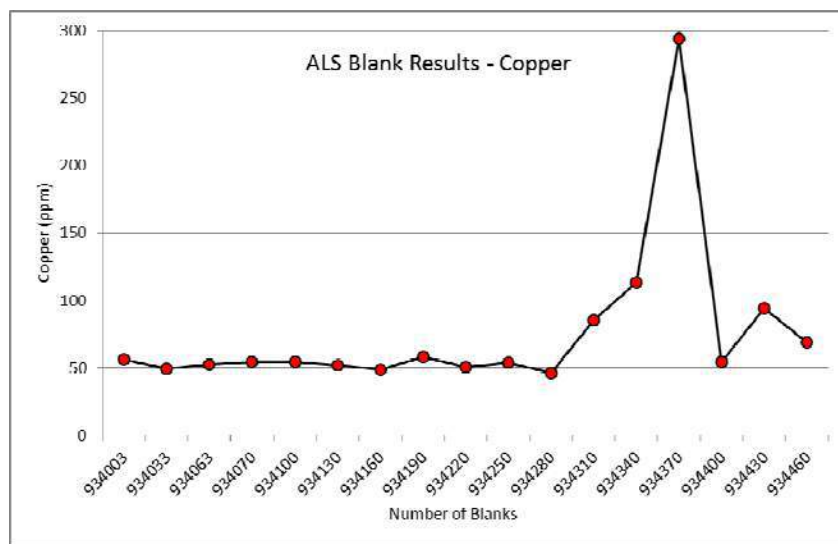


**Figure 11-7 Total Copper (CuT) and Acid Soluble Copper (CuS) Duplicate Analysis**

**11.3.2 Quality Assurance/Quality Control Procedures - ALS**

ALS analyzed the initial batch of drill core pulps and drill core from selected historical drillholes. The blank and standards inserted into the sample stream were the same as those used in sample batches submitted to Skyline. A review of the results for blank CDN-BL-10 identified 4 out of 17 that reported

excessively high values (Figure 11-8). The elevated copper values in the blanks likely resulted from carry-over during pulverization. A review and comparison of data from samples that followed the blanks in the analytical sequence with historical data failed to identify any enrichment. Therefore the amount of carry-over is believed to have had minimal effect and re-submission of the sample batches was not necessary. The ALS analytical data does confirm that adequate care and proper procedures were used to obtain reliable total copper and acid soluble copper values for the Van Dyke project.



**Figure 11-8 Copper Blank Analysis**

A total of 31 CRS were analyzed along with the drill core and drill core pulps. Only one of the standard samples returned a value outside of the 'between lab' two standard deviations. Of note is that most of the CRS results plot between the certified value and near to + two standard deviations from it, suggesting a slight positive, albeit acceptable bias.

#### 11.4 Adequacy of Sample Preparation, Security and Analytical Procedures

MMTS concludes that the sample preparation, security and analytical procedures utilized by Copper Fox meet or exceed current industry best management practices.

Continued use of a comprehensive QA/QC program is recommended to insure that all analytical data can be confirmed to be reliable. The consistent, positive bias observed for acid soluble copper results for certified reference standards OREAS-901, OREAS 092 and OREAS 904 from all three labs used in 2014 suggests that analytical procedures used were more aggressive in extracting soluble copper than those used to establish the certified values for each CRS. A review of commercially-available acid soluble copper (CRS) should be conducted, and Copper Fox should consider developing one or more of its own acid soluble copper (CRS) developed from local oxide copper mineralization.

Overall, the analytical data confirms that adequate care and proper procedures were used to obtain reliable total copper and acid soluble copper results values for the Van Dyke Copper Project.

## **12 Data Verification**

Copper Fox's 2014 exploration program of drillhole twinning and re-analysis of existing stored drill core and drill core pulps was designed to provide a modern data set that could be compared with, and used to verify, the historic results. In order to provide a resource estimate for the Van Dyke Copper Project, it was necessary to verify and integrate as much of the historic data as possible.

An audit of the historic exploration database obtained from Copper Fox was completed by MMTS. This included a review of all available information provided in the form of electronic files and of full-size hard electronic and hard copy versions of the detailed historical drillhole logs and plan maps.

The historic drillhole database was built from data and descriptive information recorded on copies of detailed and comprehensive, large format hard copy geological logs for 45 of holes. These hand-written logs list analytical results for total copper and acid soluble copper in percent (up to 3 significant figures), and sparse analytical data for molybdenum in parts per million (up to 3 significant figures), data that has been carefully compiled in Copper Fox's electronic files. Laboratory certificates for the historic drillholes have not been located.

Verification of available historic data was conducted utilizing two principal methods. Firstly, boxed drill core and drill core pulps retained from drilling completed from 1968-1975 were examined to identify drillholes with complete or near complete physical records, and therefore suitable for sampling and re-analysis. Drill core pulp samples from seven holes and drill core samples from one hole, representing complete or near complete mineralized intervals, were collected and submitted for analysis. Secondly, a six-hole diamond drilling program was completed. It included twinning of five historical drillholes, and drilling of one hole to assess an area west of the Van Dyke Shaft where ISL had been conducted in the late 1970s and late 1980s.

Laboratory certificates for the historic drillholes have not been located, but analytical data was recorded on detailed and comprehensive, large format hard copy geological logs for 45 of the holes. These hand-written logs list analytical results for total copper, acid soluble copper and in some cases molybdenum, data that has been carefully compiled in Copper Fox's electronic files.

### **12.1 Historic Drill Core and Drill Core Pulp Re-analysis**

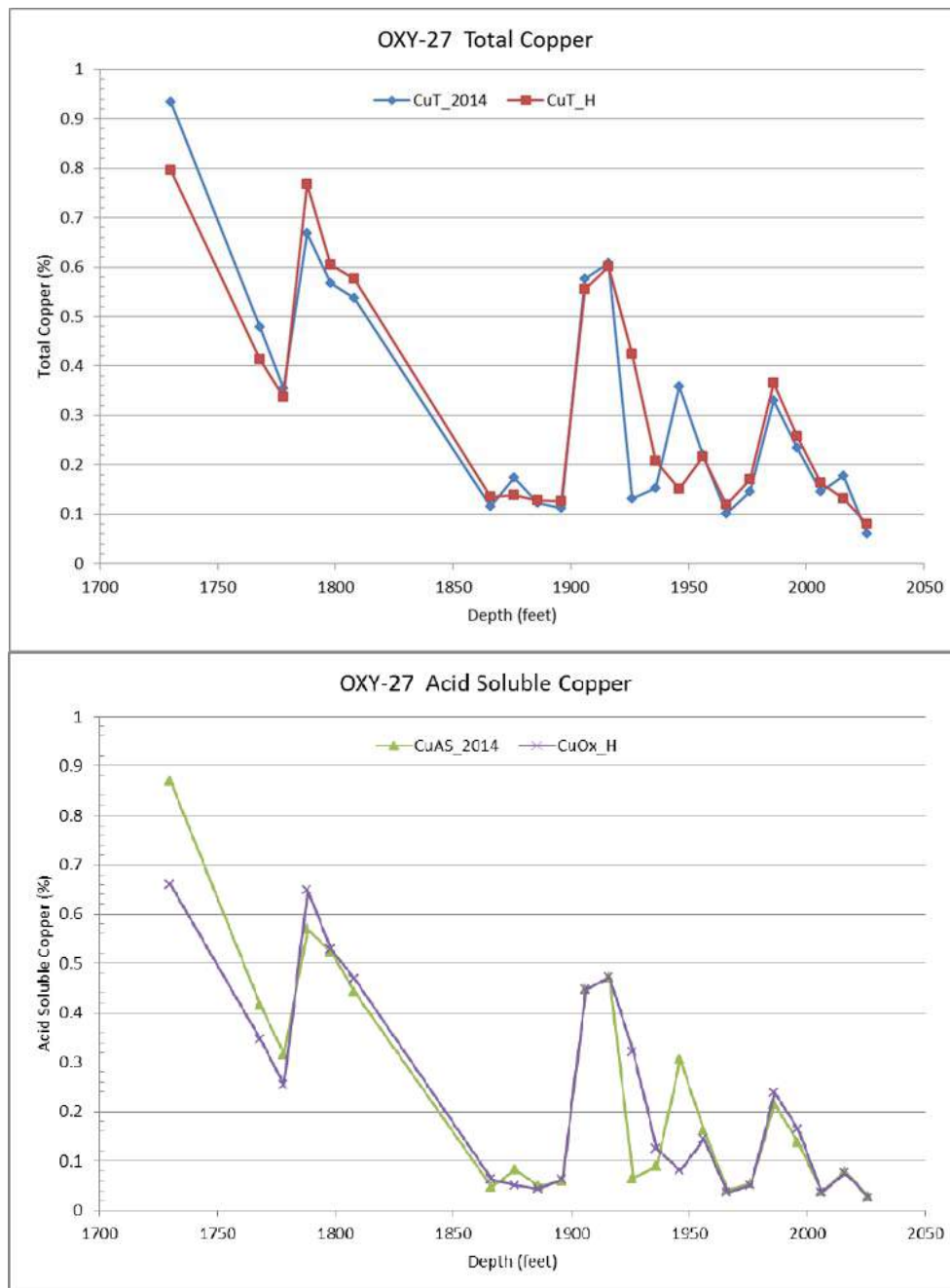
Late in 2013, MMTS selected six historic drillholes for review and comparison with detailed geological logs. Core boxes for each hole were laid out by Copper Fox staff at its core logging facility so that the geology, mineralization and sample intervals could be verified. The previously sampled historic drill core was stored in standard waxed cardboard core boxes on shelves in a locked building and adjacent sea cans. Each core box had previously been well-labelled with 'Drillhole ID', and 'From' and 'To' intervals measured in feet. Drillhole run marker blocks were occasionally found resting on top of the halved core and could not be relied upon for accuracy. As well, the original core collected was locally so intensely fractured, particularly in well-mineralized intervals, that it could not be halved in a conventional manner. Instead, each core run was bagged and fed through a jaw crusher; the resulting sample was homogenized and fed through a riffle splitter to provide two sample halves – one for submittal to the lab and the other for return to the core box. Core recoveries were found to be consistently good to

excellent, although occasional zones of poor recovery are apparent. Overall, although the occasional core box was missing, the data recorded on the logs correlated well with the drill core for each hole examined, and no issues of concern were identified.

MMTS also examined core at random from several other holes as part of its account of the stored core boxes and stored drill core pulps from the 1968-1975 exploration programs. Drill core pulps were stored in well-labelled heavy manila envelopes, organized numerically in cardboard trays and stored on shelving in Copper Fox's office facilities. This review determined that specific historic drillholes are suitable for drill core and/or drill core pulp sampling and re-analysis. Core for drillhole OXY-27, among others, was found to be near complete and therefore suitable for re-analysis. Complete or near complete suites of drill core pulps were identified for a number of holes including OXY-6, OXY-8, OXY-15, OXY-17B, VD-73-2, and OXY-23 and OXY-26. Drill core pulps from the latter two holes were analyzed at Skyline, and the core and all other drill core pulps were analyzed at ALS. A total of 560 historic drill core and drill core pulp samples were collected and re-analyzed for a suite of 51 elements, including copper by three methods to determine total copper and acid soluble copper contents, and gold by fire assay/AA finish. Results from the historic drill core and drill core pulp re-analysis and diamond drilling programs were then compared on a sample by sample basis and on a mineralized interval by mineralized interval basis to evaluate the consistency and reproducibility of the total copper and acid soluble copper values.

#### **Historical Drill Core – ALS**

Shuffling of the contents of individual OXY-27 core boxes, including the location of drill measurement blocks, required that re-sampling of core be conducted on a core box by core box basis. The clearly legible 'from' and 'to' measurements recorded on each core box became the new sample intervals. A total of 23 of these intervals coincided with original OXY-27 sample intervals and can be directly compared (Figure 12-1). Based on these 23 sample-pairs, re-sampling of drillhole OXY-27 returned 100% of the original total copper value and 107% of the original acid soluble copper value. Two samples appear to have been switched (either in the boxes before Copper Fox's sampling or possibly at the lab). The effect of the switch is only to change the position of the values within the mineralized interval, but there is no other effect. With the exception of the suspected switched samples, overall correlation of the individual results is acceptable.

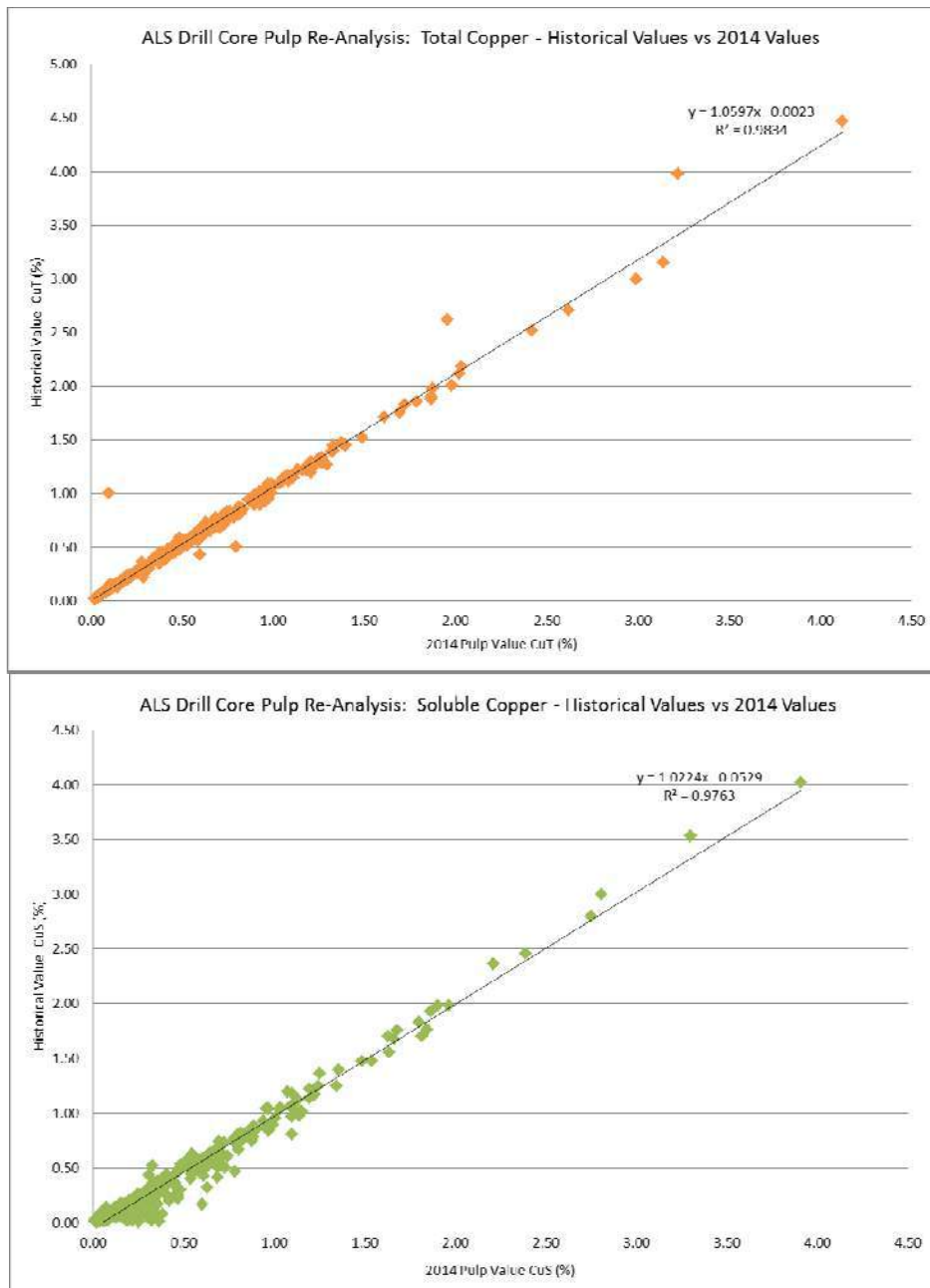


**Figure 12-1 Sample-by-sample Comparison of Re-analyzed Core ('2014') versus Historical Values ('H') for both Total Copper (CuT, above) and Soluble Copper (below)**

*Samples believed to have been switched are apparent at depths of 1925' and 1950'*

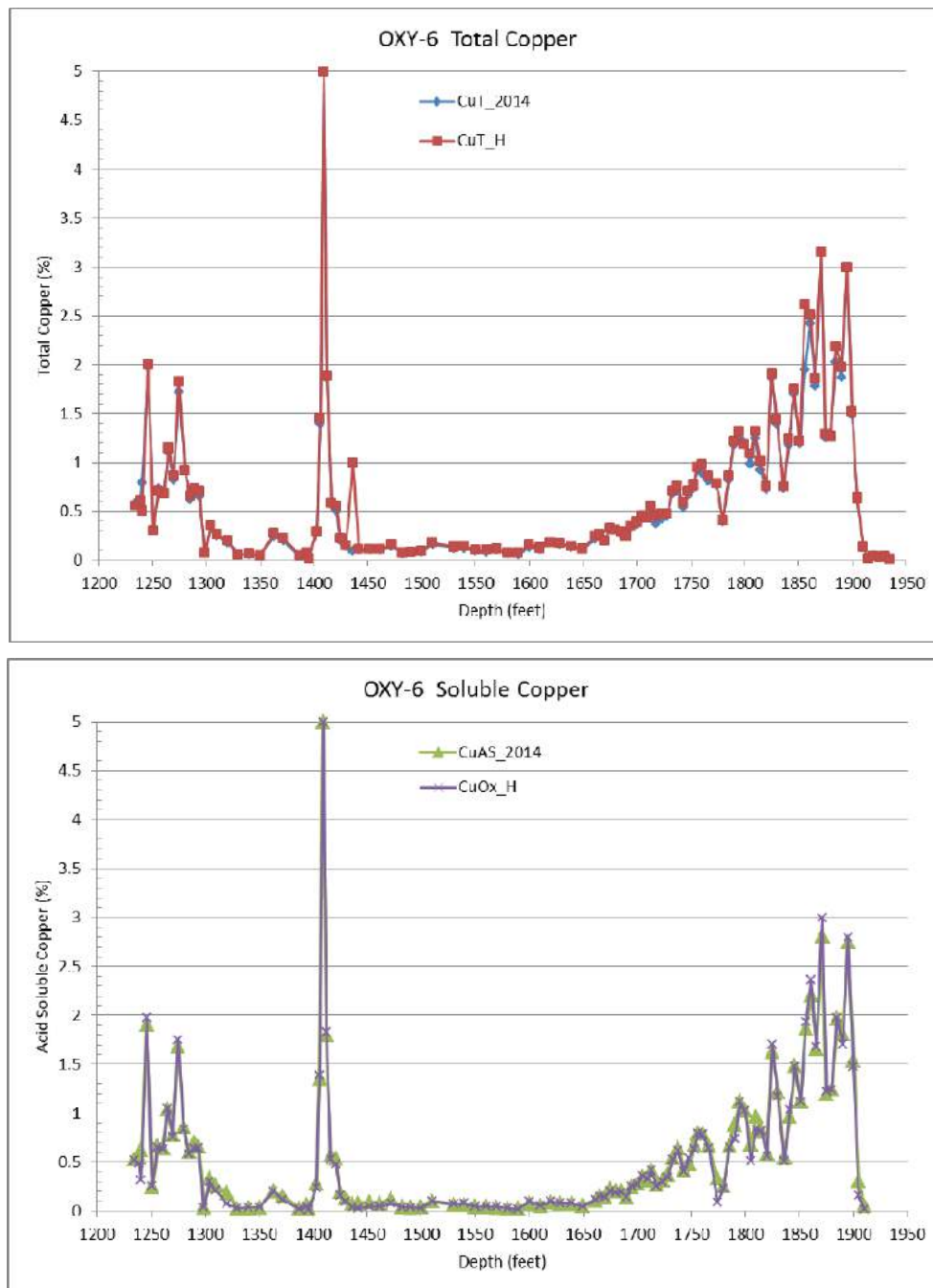
**Drill Core Pulps – ALS and Skyline**

All of the data from the re-analysis of drill core pulps could be compared directly with the original total copper values and soluble copper values on a sample by sample basis. Figure 12-2 compares all drill core pulps analyzed by ALS and demonstrates that there is a strong correlation between data sets.



**Figure 12-2 Re-analyzed Drill Core Pulps show Strong Reproducibility for Total Copper with Rare Outliers; re-analyzed drill core pulps show bias toward higher values at lower Soluble Copper concentrations**

Figure 12-3 through Figure 12-9 compare new data with original values and show that there is limited variability on a sample by sample basis, even at higher grades where one might expect greater differences in grades due to a 'nugget' effect. The patterns in the figures below are very similar, but the new acid soluble copper values commonly are slightly elevated with respect to the original values.



**Figure 12-3 Sample-by-sample Comparison of Re-analyzed Drill Core Pulps for Drillhole OXY-6 shows Strong Reproducibility for both Total Copper (above) and Soluble Copper (below)**

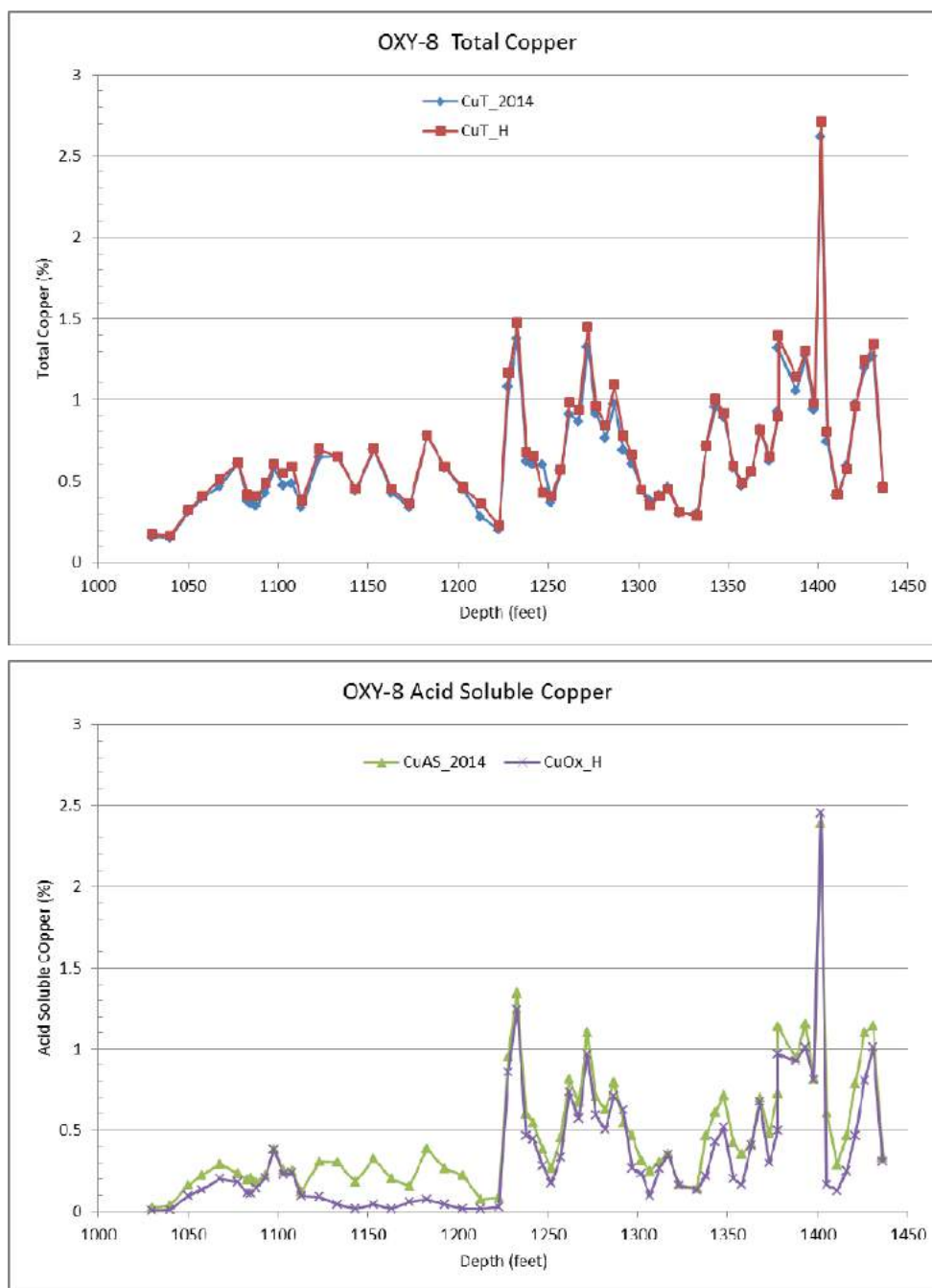
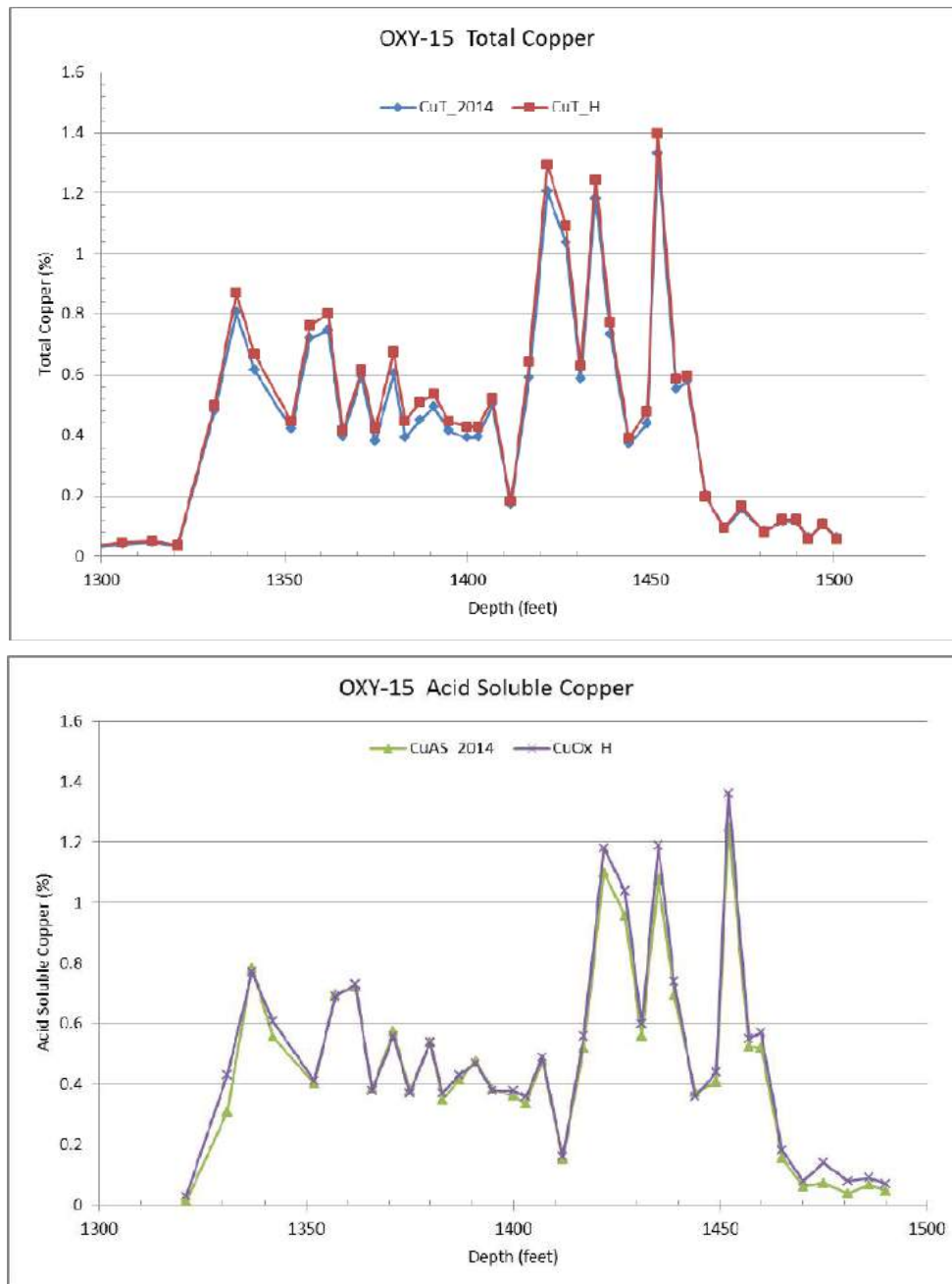
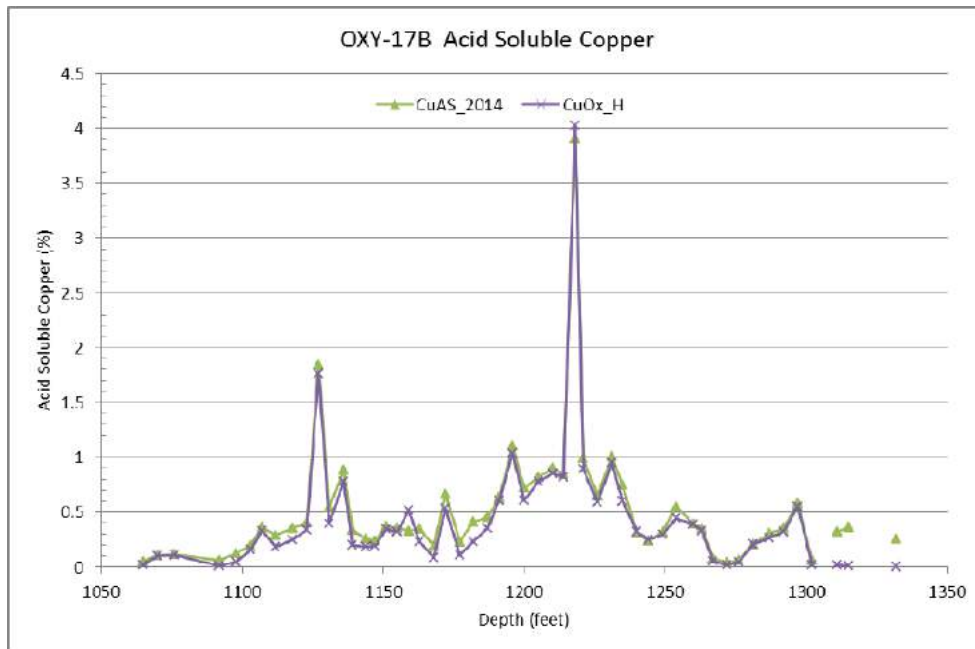
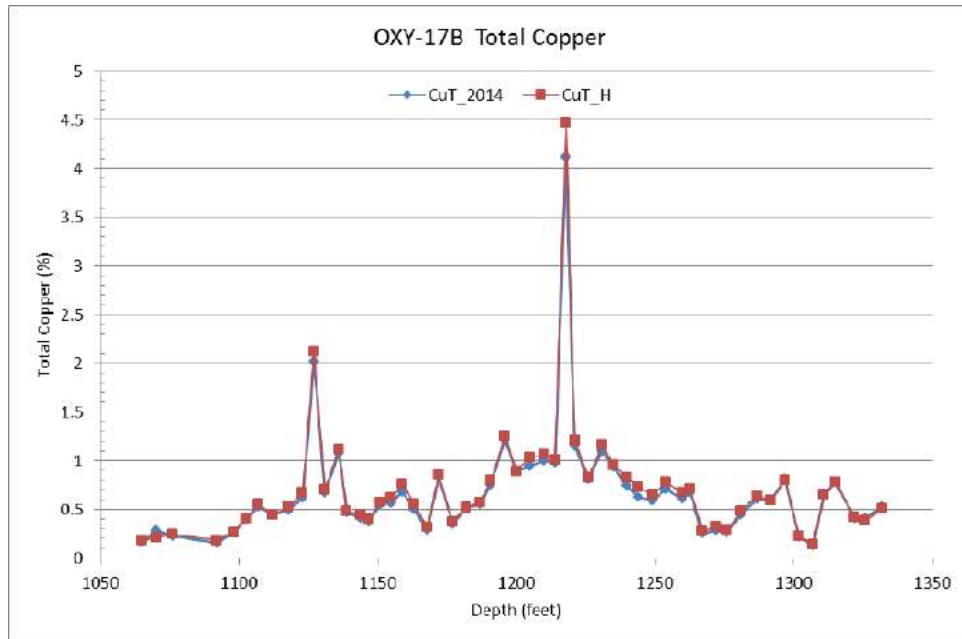


Figure 12-4 Sample-by-sample Comparison of Re-analyzed Drill Core Pulps for Drillhole OXY-8 shows Strong Reproducibility for Total Copper (above); new values for Soluble Copper (below) are consistently higher than the corresponding historical values

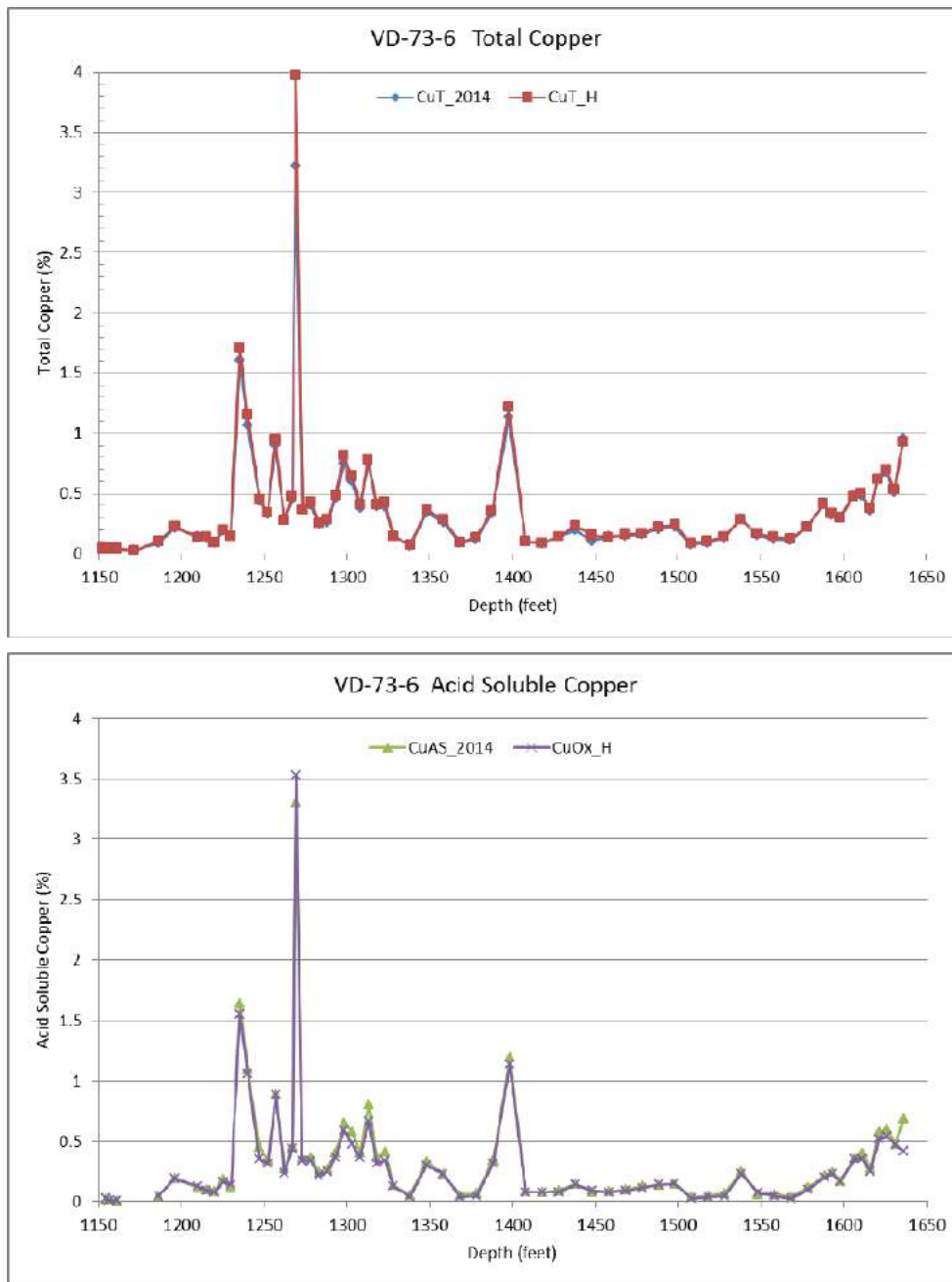




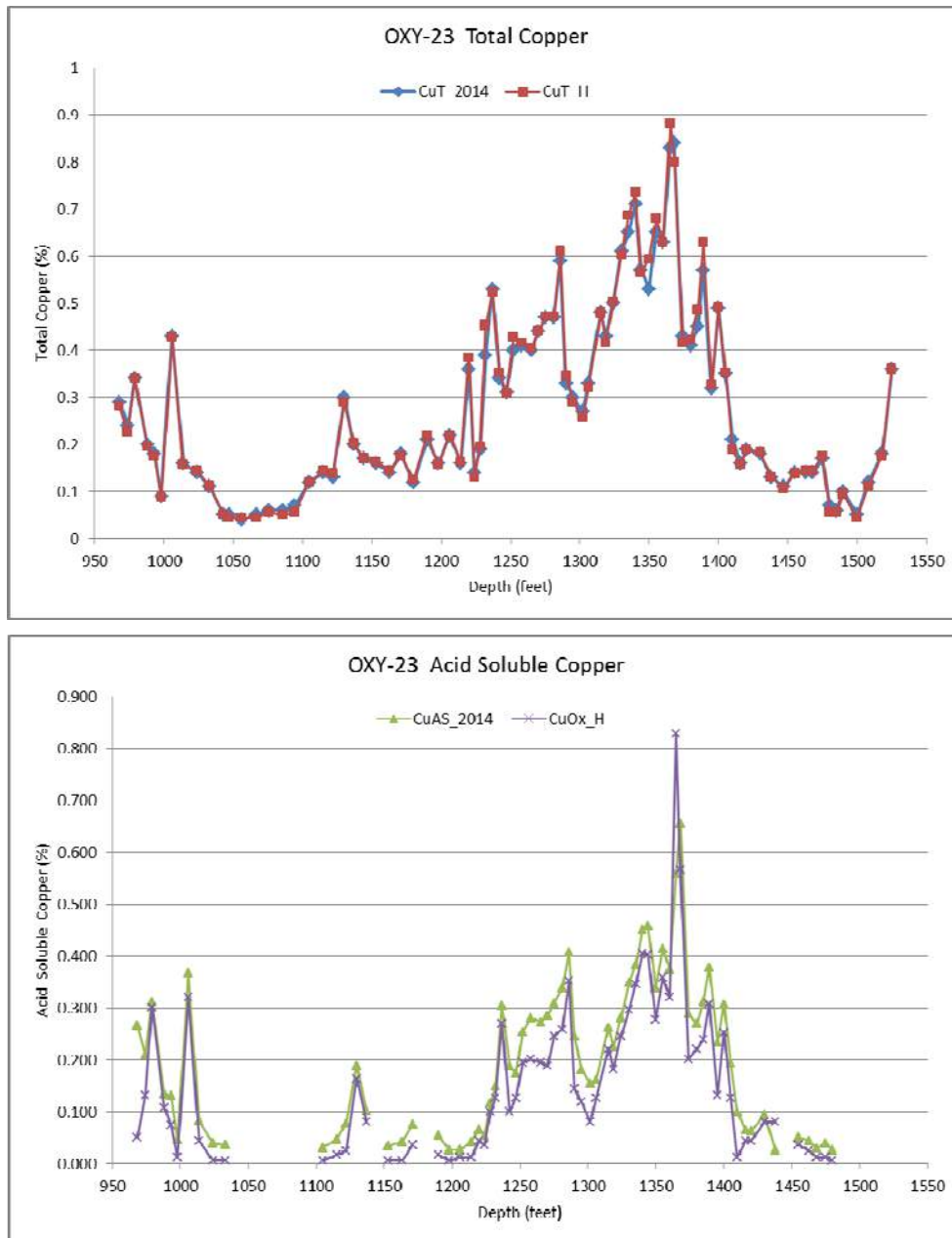
**Figure 12-5 Sample-by-sample Comparison of Re-analyzed Drill Core Pulps for Drillhole OXY-15 shows Strong Reproducibility for Total Copper (above) and Soluble Copper (below) with historic values consistently incrementally higher than the new values**



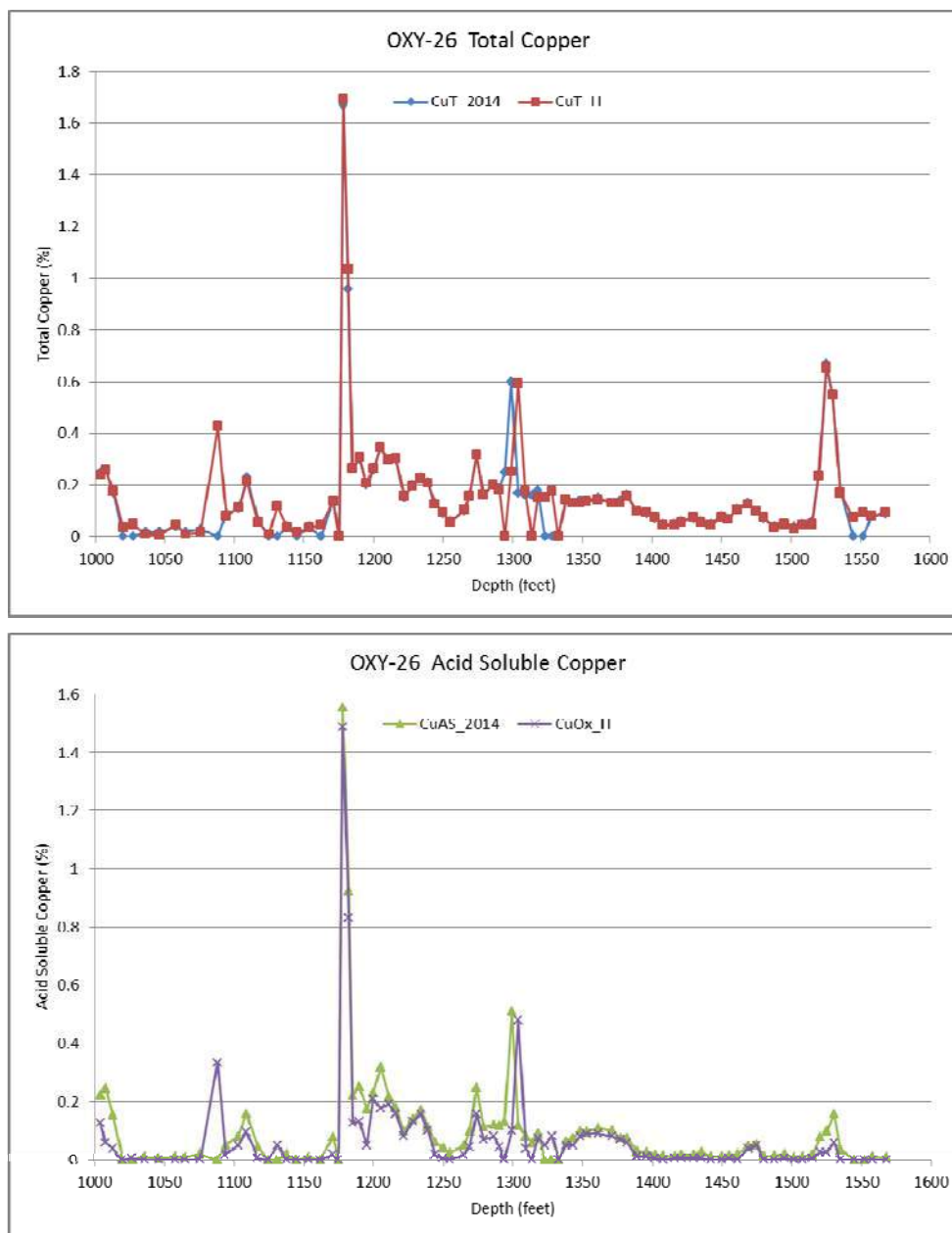
**Figure 12-6 Sample-by-sample Comparison of Re-analyzed Drill Core Pulps for Drillhole OXY-17B shows Strong Reproducibility for both Total Copper (above) and Soluble Copper (below)**



**Figure 12-7 Sample-by-sample Comparison of Re-analyzed Drill Core Pulps for Drillhole VD-73-6 shows Strong Reproducibility for both Total Copper (above) and Soluble Copper (below)**



**Figure 12-8** Sample-by-sample Comparison of Re-analyzed Drill Core Pulps for Drillhole OXY-23 shows Strong Reproducibility for Total Copper (above) and Soluble Copper (below) with new values consistently incrementally higher than original historic values. Gaps represent areas of missing samples or results below detection



**Figure 12-9 Sample-by-sample COXY-26 shows Generally Strong Reproducibility for Total Copper (above) and Soluble Copper (below) with new values consistently incrementally higher than original historic values**

A comparison of weighted averages for continuously mineralized intervals of identical length for each of the historic drillholes that were sampled and re-analyzed is presented in Table 12-1. Data for Total Copper shows excellent reproducibility on an interval by interval basis (100% are within 8% of the original composited value). Data for Acid Soluble Copper shows a higher range of variability on an interval by interval basis, but the re-assays are consistently higher (50% are within 8% of the original

composited value, and 50% range from 13% to 53% higher than the original composited value). The consistently higher acid soluble copper values in the re-assay data may be attributable to more complete digestion of soluble copper minerals in today's laboratory procedures.

**Table 12-1 Comparison of Weighted Averages: 2014 Drill Core and Drill Core Pulp Re-analysis versus Original Results**

Van Dyke Drillhole ID	From (m)	To (m)	Interval (m)	Total Copper (%)			Acid Soluble Copper (%)		
				2014 Pulp	Original	2014/Orig	2014 Pulp	Original	2014/Orig
OXY-6 and	376.12	460.25	84.13	0.444	0.456	97.4%	0.418	0.390	107.2%
	463.30	583.69	120.39	0.670	0.706	94.9%	0.556	0.546	101.8%
OXY-8 and	313.94	404.77	90.83	0.533	0.563	94.7%	0.334	0.222	150.5%
	406.30	439.22	32.92	0.861	0.883	97.5%	0.704	0.544	129.4%
OXY-15	402.64	455.07	52.43	0.503	0.537	93.7%	0.458	0.489	93.7%
OXY-17B	324.61	396.85	72.24	0.662	0.699	94.7%	0.482	0.427	112.9%
VD-73-6	359.97	497.13	137.16	0.341	0.367	92.9%	0.299	0.278	107.6%
OXY-23 and	295.05	466.34	171.29	0.255	0.256	99.6%	-	-	-
	362.71	441.05	78.34	-	-	-	0.277	0.181	153.0%
OXY-26 and	359.05	394.41	45.36	0.213	0.215	99.1%	0.166	0.126	131.7%
	407.82	470.92	63.10	0.123	0.120	102.5%	-	-	-
Drillhole ID	(m)	(m)	(m)	2014 Core	Original	2014/Orig	2014 Core	Original	2014/Orig
OXY-27	527.3	620.57	93.27	0.408	0.407	100.2%	0.329	0.308	106.8%

2014 weighted averages for CuT range from 92.9 - 102.5% of historical weighted averages

2014 weighted averages for CuS range from 93.7 - 153.0% of historical weighted averages

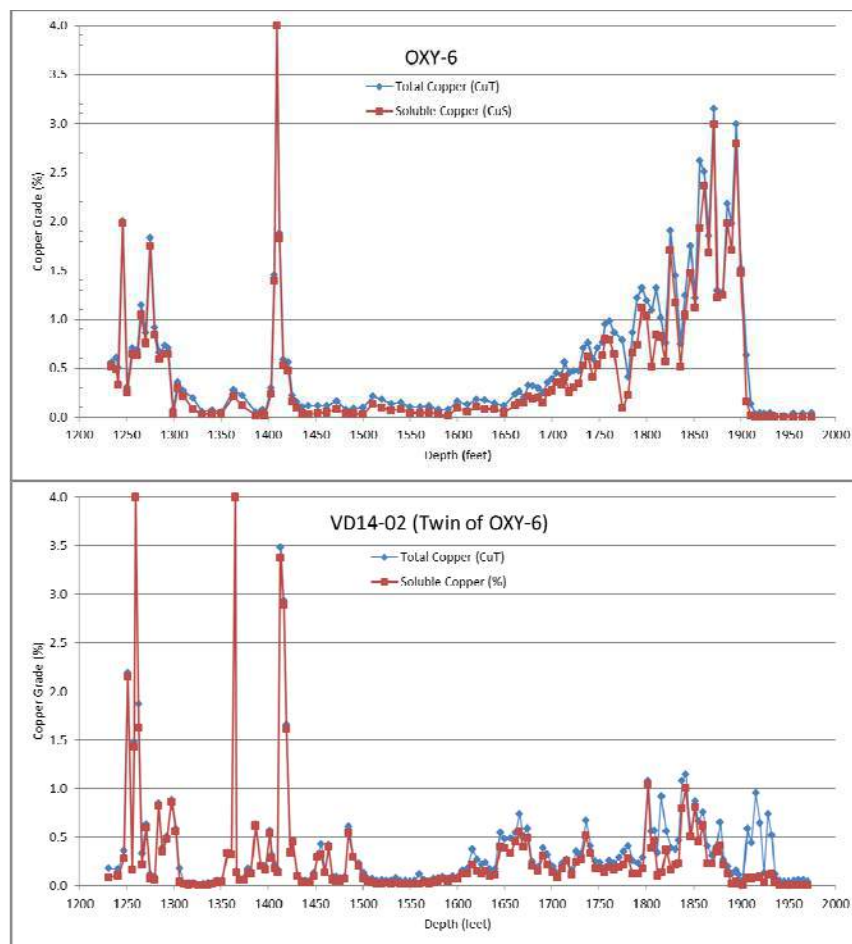
Overall, the new data produced from the re-analysis of selected historical drill core and drill core pulps correlated strongly with the original values for total copper. However the new acid soluble copper values were consistently higher than the historical values. The variances in the latter may be the result of 40 years of oxidation that affected stored historic drill core and drill core pulps. Also, modern acid soluble copper or sequential copper analytical methods, such as the use of a ferric-bearing leachate, may be more aggressive, and therefore extract more copper, than the techniques used four decades ago. The re-analysis of a selection of historical drill core and drill core pulps verify that earlier operators followed proper procedures and used adequate care to obtain reliable results.

## 12.2 Twin Drillholes

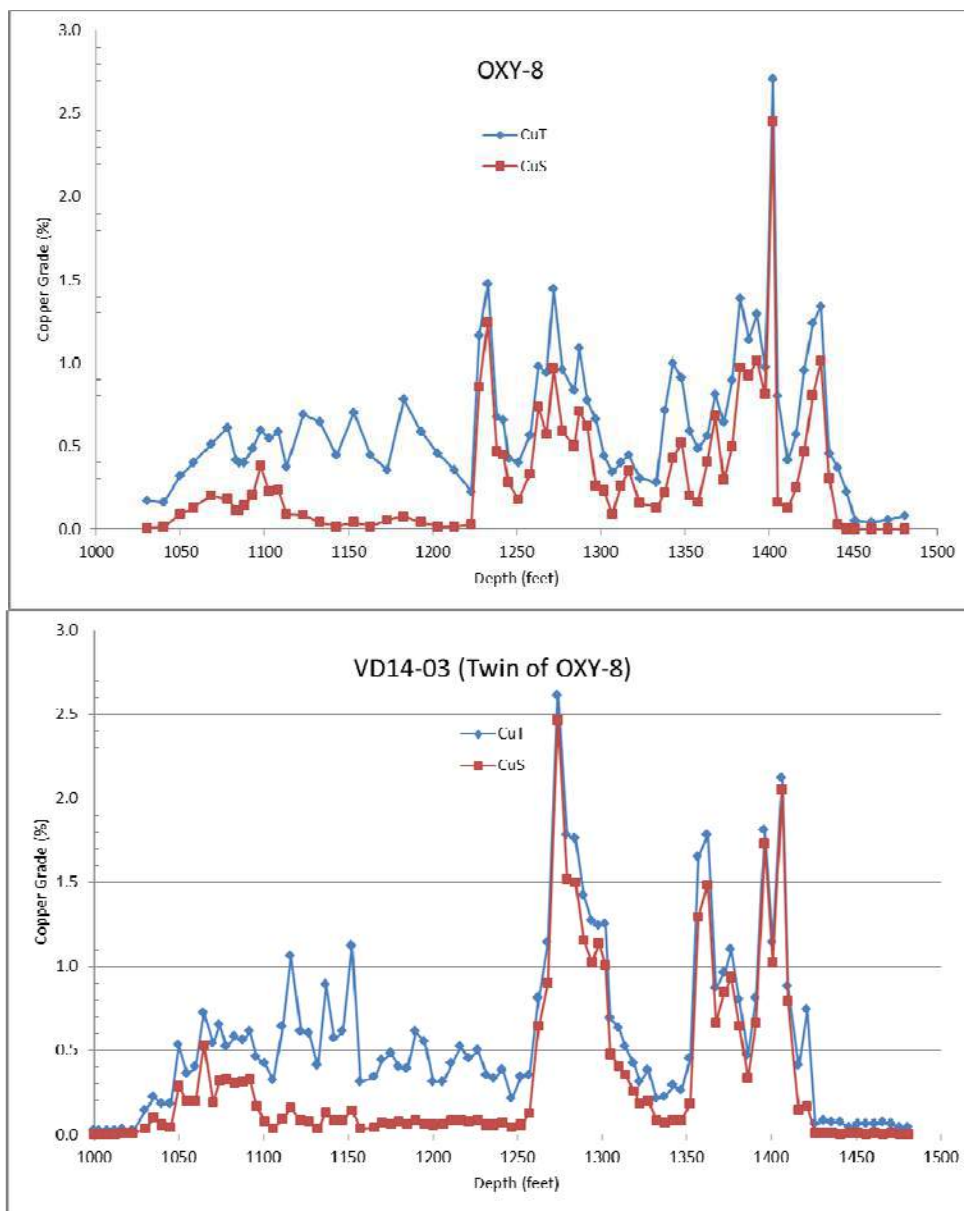
Each of the five 2014 twin holes was drilled within 10m of its respective original collar location, and at the same inclination (-90°) as its historic counterpart, creating five 'twin pairs' of drillholes that could be directly compared. The twin pairs were compared on the basis of lithology, mineralization, and total copper and acid soluble copper grades. A summary of these comparisons is listed in

Table 12-2 and Table 12-3. Figure 12-10 through Figure 12-14 compare total copper and acid soluble copper with depth for the five twin pairs.

The first twin pair (OXY-6:VD-14-2) showed a good correlation of copper grades for the upper 84m of the mineralized interval with several multi-percent spikes at approximately the same depths. However the lower 120m of the mineralized interval in the twin hole is markedly different in mineralogy and in grade from that of the original hole. The four remaining twin pairs correlate well to very well and provide a high level of confidence in the historic data for those areas of the deposit.



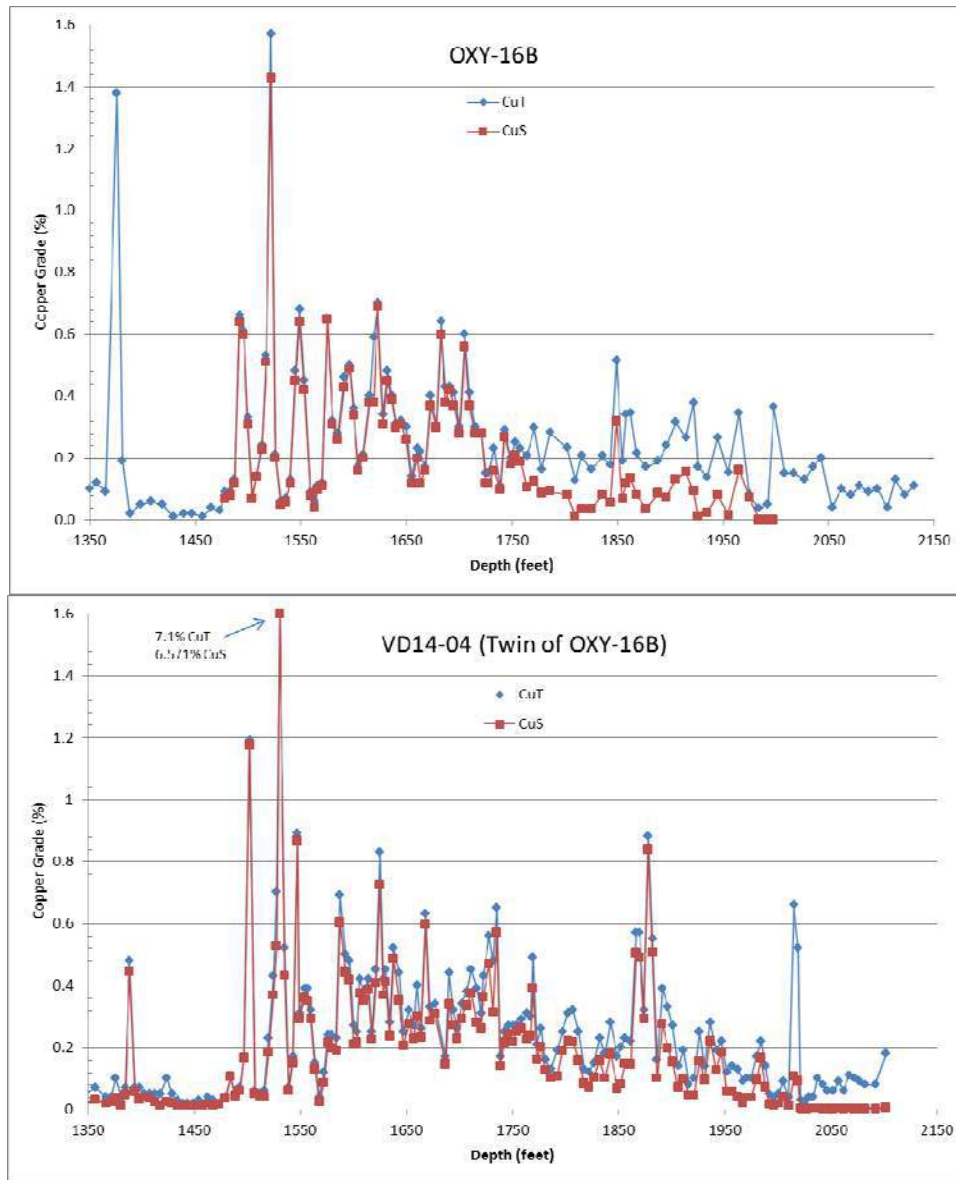
**Figure 12-10 Comparison of Grade versus Depth for Drillhole OXY-6 and its Twin VD14-02**  
Both holes carry erratic values in their upper sections with individual sample values up to 8% in OXY-6 and 20% in VD14-02. Mid-section values are weak in both holes. The lower section of VD14-02 is significantly depleted in copper relative to OXY-6. All copper values > 4% have been cut to 4% for plotting purposes.



**Figure 12-11 Comparison of Grade versus Depth for Drillhole OXY-8 and its Twin VD14-03**

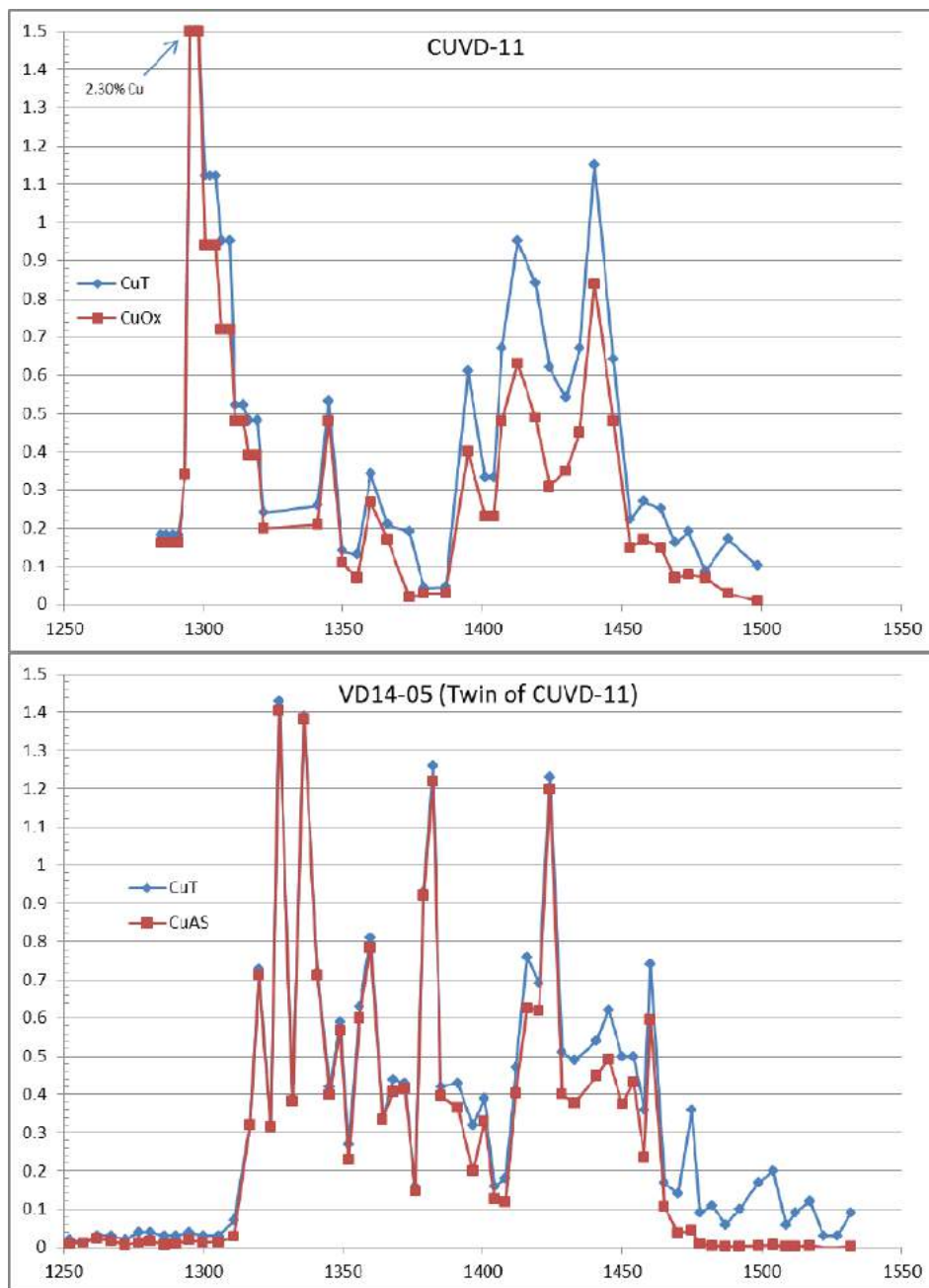
Both holes show consistently weaker values in upper sections, followed by stronger, albeit somewhat erratic values in lower sections. The lower section of stronger values in VD14-03 is 44 feet narrower than that of OXY-8.





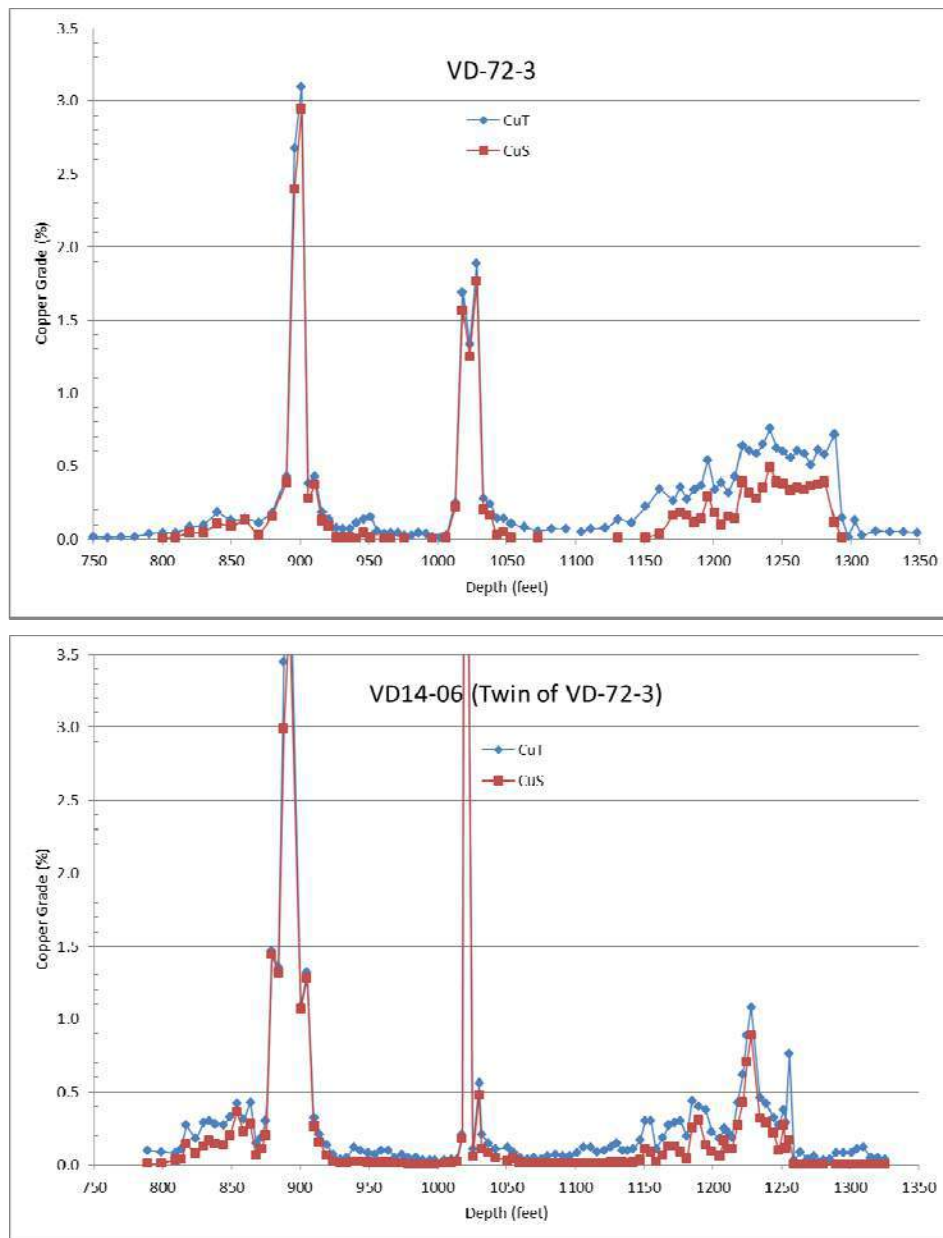
**Figure 12-12 Comparison of Grade versus Depth for Drillhole OXY-16B and its Twin VD14-04**

The plots illustrate the similarity in width and grade of the mineralized zone. Local higher grade copper spikes occur at approximately the same position in each hole. Each hole demonstrates that the strength of CuS mineralization weakens with depth, and that the holes terminate in CuT grades of greater than 0.1% Cu.



**Figure 12-13 Comparison of Grade versus Depth for Drillhole CUV D-11 and its Twin VD14-05**

Both holes show weaker copper values mid-section (although this feature is more pronounced in CUV D-11) that are flanked by sections with stronger values. The higher grade interval in CUV D-11 is approximately 25 feet wider in than in OXY-8, but the average grade for the mineralized intervals are comparable.



**Figure 12-14 Comparison of Grade versus Depth for Drillhole VD-72-3 and its Twin VD14-06**

The plots illustrate the similarity in width and grade of several bands of mineralization. Two high grade copper spikes occur at about the same position in each hole. The CuS zone in hole VD-72-3 appears to extend to a greater depth than the similar zone in its twin hole.

**Table 12-2 Comparison of Drillhole Log Data for Five Twin Pairs of Drillholes**

Drillhole ID	Easting (NAD27)	Northing (NAD27)	Elev (m)	Total Depth	Base of Gila	Base of Oxide
Original OXY-6	512369.0	3695563.5	1032.8	631.24	376.12	580.64
Twin VD14-02	512367.1	3695566.3	1032.2	602.28	381.40	598.02
Original OXY-8*	512030.4	3695670.1	1053.1	489.51	301.75	440.74
Twin VD14-03	512029.4	3695671.1	1051.7	453.24	301.14	433.61
Original OXY-16B	512535.5	3695523.3	1034.7	651.66	416.66	608.99
Twin VD14-04	512534.0	3695525.3	1029.6	642.21	416.66	620.27
Original CUVD-11	512230.0	3695125.5	1045.4	465.12	364.24	447.75
Twin VD14-05	512231.1	3695125.3	1049.4	468.48	374.14	448.21
Original VD 72-3	512014.5	3695399.4	1038.5	431.29	246.89	394.11
Twin VD14-06	512021.8	3695403.5	1037.2	405.51	249.02	383.74

*\*original drill collar calculated by regression to UTM from mine coordinates (Tim Marsh, March 19, 2014).*

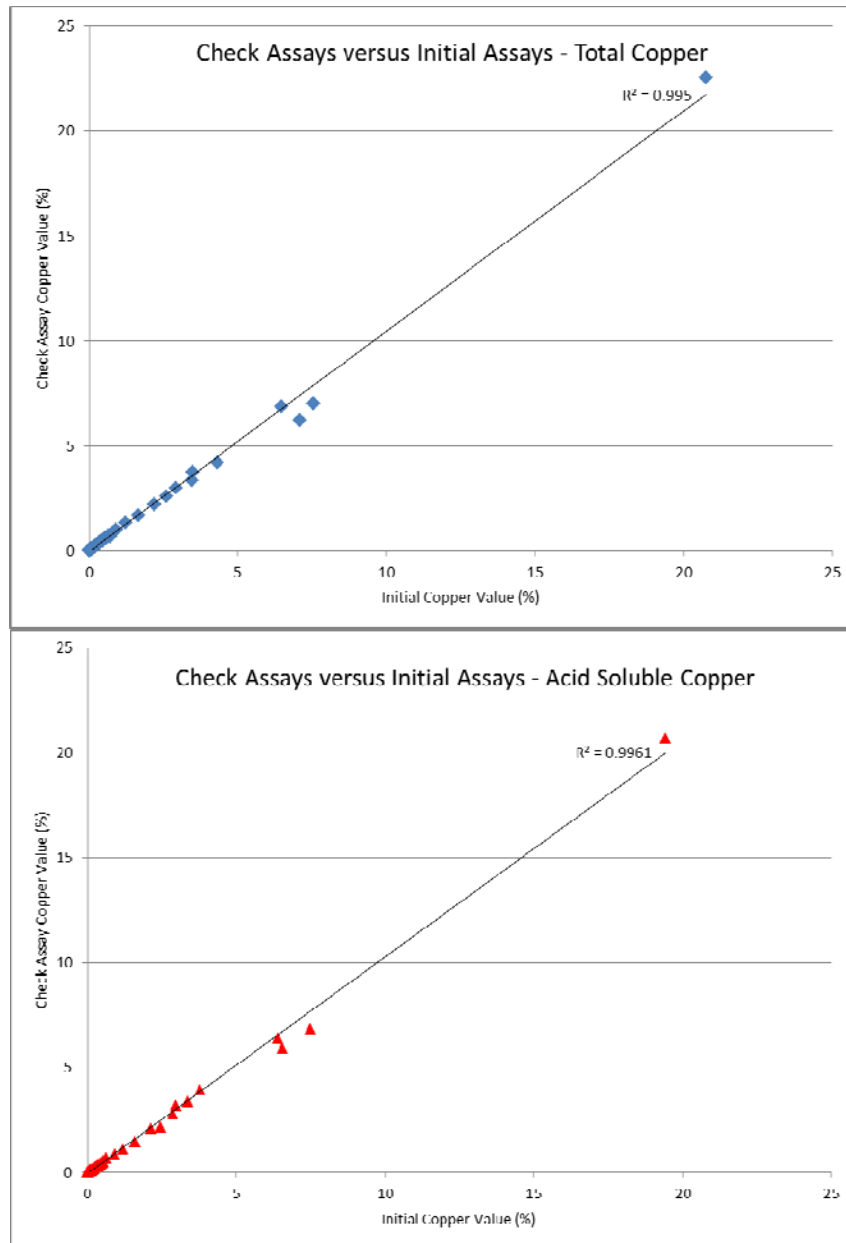
**Table 12-3 Comparison of Analytical Results for Five Twin Pairs of Drillholes**

Drillhole ID	From (m)	To (m)	Interval (m)	CuT (%)*	CuS (%)*
Original OXY-6	376.12	460.25	84.13	0.456	0.390
and	463.30	583.69	120.39	0.706	0.546
Twin VD14-02	375.21	458.72	83.51	0.636	0.585
and	486.16	590.09	103.93	0.394	0.249
Original OXY-8	313.94	439.22	125.28	0.64	0.304
Twin VD14-03	313.94	439.22	125.28	0.652	0.372
Original OXY-16B	450.49	604.72	154.23	0.285	0.207
Twin VD14-04	452.32	607.16	154.84	0.361	0.302
Original C-UVD-11	391.67	459.33	67.66	0.433	0.318
Twin VD14-05	401.30	448.10	46.80	0.583	0.528
Original VD-72-3	249.94	398.68	145.69	0.329	0.209
incl	249.94	292.91	42.98	0.351	0.282
and incl	308.76	324.00	15.24	0.617	0.525
and incl	344.73	395.63	50.90	0.425	0.202
Twin VD14-06	240.49	383.70	134.70	0.346	0.246
incl	240.49	281.64	41.15	0.613	0.503
and incl	310.29	318.82	8.53	0.628	0.556
and incl	337.11	383.74	46.63	0.302	0.156

*\*calculated using a 0.05% CuT cut-off grade*

### 12.3 2014 Drill Core Check Analysis

A total of 77 pulps from the 2014 diamond drilling program were submitted to Inspectorate for check analysis. This total represents approximately 10% of the entire suite of core samples analyzed earlier in the program by Skyline. Results of the check assay program are shown in Figure 12-15. These results compare reasonably well with the initial analytical data for the 2014 drillholes and confirm the veracity of the Skyline data.



**Figure 12-15** Check Assays versus Initial Assays for Total Copper (above) and Acid Soluble Copper (below)

### 12.4 Adequacy of Data

The verification program determined that the historical data captured from hard-copy drillhole logs, cross-sections and maps, and unpublished private reports, are valid and generally representative of the Van Dyke Copper Project.

The data generated from the re-analysis of drill core and drill core pulps generally correlated well with the historic data recorded on drillhole logs and compiled in electronically. Total copper content of the

re-analyzed historic drill core and drill core pulps correlates very well with the original data. Acid soluble copper content of the re-analyzed historic drill core and drill core pulps is consistently higher than the original data. This may suggest that modern soluble copper analysis techniques are more thorough than techniques of the late 1960s and early 1970s. Overall, the re-analysis demonstrated that the historic data set is acceptable and representative of the Van Dyke Copper Project.

The drillhole twinning program, consisting of five twin pairs of holes, also verified the integrity of the historic drillhole data. In all cases lithology could be correlated between the twin pairs. The style of mineralization was found to be similar in all twin pairs, with mineralization occurring in moderately to intensely fractured and brecciated Pinal Schist and to a lesser extent in porphyritic quartz monzonite of the Schultz Granite. With one exception, mineralogy (malachite, azurite, chrysocolla, tenorite and cuprite) and total copper grades correlate well between twin pairs. The exception, VD14-02 drilled as twin of OXY-6 in the north-central part of the Project, intersected a mineralized interval with similar widths as the original hole, but one in which the lower 120m consists of different copper-bearing minerals, and carries markedly lower total copper and acid soluble copper grades. No physical evidence or records exist to suggest that the area was intentionally leached. One possible explanation for observations is that the intensely fractured zone which hosts the mineralization acted as a conduit for latent solutions which resulted in incidental leaching and removal of previously deposited secondary copper minerals. None of the other historic holes drilled in the vicinity of OXY-6 were twinned, so the possible impact of any incidental leaching outboard of OXY-6 is unknown. The issue of incidental leaching is believed to be limited in its extent.

The only non-twin hole drilled in 2014 confirmed that the area immediately west of the Van Dyke shaft was the subject of ISL. However, this drillhole intersected significant grades of acid soluble copper over meaningful widths within the leached horizon indicating that not all of the copper was removed from this area of the Project.

All of the historic drillhole data, with the exception of that for OXY-6, is suitable for use in the calculation of a resource estimate for the Van Dyke Copper Project. All of the 2014 drillhole data is suitable for use in the calculation of a resource estimate for the Van Dyke Copper Project.

## 13 Mineral Processing and Metallurgical Testing

SGS E&S Engineering Solutions Inc. (SGS) completed a preliminary In-Situ Copper Leaching Simulation Study on mineralized samples from the Van Dyke oxide copper deposit. The main objectives of the preliminary metallurgical study were to evaluate copper dissolution kinetics, total copper extraction and acid consumption on the drill core samples at a nominal pressure of approximately 120 psi for 120 days (Gantumur, 2014). The following description of the metallurgical test work is taken from the report prepared by SGS.

### 13.1 Introduction

The eight drill core samples submitted for metallurgical testing are designated by diamond drillhole number (i.e. VD14-02) and by depth in the drillhole (i.e. 1801.9' - 1805.3').

The drill core samples were recorded and prepared according to SGS in-house procedures. The samples were visually inspected and representative sections of the core regarding grade and mineralogy were selected for testing. Mineralogical examination and Induced Couple Plasma ("ICP") analysis, to determine total copper, total iron and sequential copper analyses, were completed on all samples.

The indicated total copper and total iron assays were used to track indicated total copper and total iron extractions along with gangue acid consumptions during the leach cycle. On completion of the test work the copper and iron head assays were calculated using the copper and iron assays of the leach residues and copper and iron assays from the pregnant leach solutions. This calculated head grade was used to determine the copper dissolution kinetics, total copper extraction and acid consumption in the simulated in-situ leach testing.

### 13.2 Sample Preparation and Indicated Head Assays

Eight drill core samples were logged in and prepared for testing using the following steps:

- Each drill core was visually inspected and sections thought to represent the typical grade and mineralogy of the core were selected and cut for pressure leach testing.
- The cut sections (approximately 25 inches long altogether) were wrapped in "mosquito net" and heat shrink tube to seal the core.
- The wrapped core was placed inside a stainless steel vessel, sealed with paraffin wax and subjected to pressure leach testing at 120 to 160psi to simulate the in-situ leach process.
- The remaining pieces of the drill core were weighed and dried, and the dry weight of each drill core was recorded for moisture determination. The moisture content of each drill core was used to calculate the dry weight of the drill core section used for testing.
- The dry samples were stage crushed to 100% minus 10 mesh and a 1,000 gram sample was split and submitted for mineralogical examination.
- Another 1,000 gram sample from the minus 10 mesh material was split, pulverized and a portion was submitted for total copper, total iron, sequential copper determination and 30 Element ICP Scan. This head sample is not a representative of the entire drill core, but the assay results were used as indicated head sample for the drill cores.
- The copper and iron assays determined on the head samples were used to calculate the indicated copper and iron extractions for each sample submitted for testing during leach cycle.

Table 13-1 summarizes the indicated head assay results for the eight drill core samples received by SGS.

**Table 13-1 Head Screen Assays**

Test No.	Sample ID	Assays in (%)		Sequential Copper Analysis (%) <sup>(1)</sup>		
		Total Cu	Total Fe	As.Cu	CNs.Cu	Residual Total Cu
PRT-01	VD14-02 (1801.9 - 1805.3)	0.333	2.08	0.219	0.018	0.093
PRT-02	VD14-02 (1266.6 - 1270.6)	1.08	0.355	1.04	0.019	0.021
PRT-03	VD14-03 (1161.5 - 1165.4)	0.321	1.5	0.03	0.219	0.071
PRT-04	VD14-04 (1682.0 - 1686.7)	0.283	1.5	0.254	0.014	0.014
PRT-05	VD14-05 (1437.0 - 1440.7)	0.72	2.43	0.62	0.02	0.079
PRT-06	VD14-06 ( 896.0 - 900.5)	0.91	0.255	0.85	0.014	0.031
PRT-07	VD14-06 (1021.0 - 1025.5)	1.52	0.52	1.43	0.021	0.056
PRT-08	VD14-06 (1231.0 - 1234.5)	0.84	1.00	0.7	0.019	0.119

Remarks: (1) AsCu = acid soluble copper, CNsCu = cyanide soluble copper, ResCu = residual total copper.

The Total Copper grade in the head samples ranged approximately from 0.3 - 1.5% and the Iron content ranged from approximately 0.26 - 2.43%. The highest copper grade of 1.52% was observed in sample VD14-06 (1021.0' – 1025.5') tested in the PRT-07 and the lowest total copper grade of 0.333% was observed in sample VD14-02 (1801.9-1805.3) tested in the PRT-01. The calculated soluble copper distribution in the drill core samples are shown in Table 13-2.

**Table 13-2 Calculated Total Soluble Copper**

Test No.	Sample ID	Solubility (%)		
		As.Cu	CNs.Cu	Total Soluble Cu
PRT-01	VD14-02 (1801.9 - 1805.3)	66.36	5.45	71.82
PRT-02	VD14-02 (1266.6 - 1270.6)	96.3	1.76	98.06
PRT-03	VD14-03 (1161.5 - 1165.4)	9.38	68.44	77.81
PRT-04	VD14-04 (1682.0 - 1686.7)	90.07	4.96	95.04
PRT-05	VD14-05 (1437.0 - 1440.7)	86.23	2.78	89.01
PRT-06	VD14-06 ( 896.0 - 900.5)	94.97	1.56	96.54
PRT-07	VD14-06 (1021.0 - 1025.5)	94.89	1.39	96.28
PRT-08	VD14-06 (1231.0 - 1234.5)	83.53	2.27	85.8

The estimated percentage of soluble copper in the head samples ranged from 72 - 98% of the total copper (Soluble copper is sum of acid soluble copper and cyanide soluble copper). Samples VD14-02 (1266.6-1270.6), VD14-04 (1682.0 - 1686.7), VD14-05 (1437.0 - 1440.7), VD14-06 (896.0 - 900.5), VD14-06 (1021.0 - 1025.5) and VD14-06 (1231.0 - 1234.5) showed high solubility in sulfuric acid and ranged from approximately 84 - 96%. The acid soluble copper content indicates copper minerals that are associated with oxide copper mineralization such as malachite, azurite and tenorite.

Cyanide soluble copper content indicates copper minerals that are associated with secondary copper sulfide mineralization and bornite. Sample VD14-03 (1161.5–1165.4) showed the highest copper solubility in cyanide which may indicate that approximately 68% of the total copper contained in the sample is associated with chalcocite, covellite or bornite copper mineralization.

The Residual Copper indicates copper mineralization that is associated with primary sulfide copper mineralization, which is not soluble in sulfuric acid solution and cyanide solution, such as chalcopyrite.



ICP analyses were conducted on the head samples of the eight drill core samples to determine the concentration of other element present in the mineralization are summarized in Table 13-3.

**Table 13-3 ICP Scan on Head Samples**

Elements		VD14-02 (1801.9 - 1805.3)	VD14-02 (1266.6 - 1270.6)	VD14-03 (1161.5 - 1165.4)	VD14-04 (1682.0 - 1686.7)	VD14-05 (1437.0 - 1440.7)	VD14-06 ( 896.0 - 900.5)	VD14-06 ( 1021.0 - 1025.5)	VD14-06 (1231.0 - 1234.5)
Ag	ppm	<1	3	1	<1	<1	<1	<1	<1
Al	ppm	13,380	7,836	11,510	11,530	13,320	8,434	9,118	15,230
As	ppm	2	44	<1	<1	<1	<1	<1	<1
Ba	ppm	81	435	61	93	73	67	78	112
Bi	ppm	<1	<1	<1	<1	<1	<1	<1	<1
Ca	ppm	1,390	726	1,173	1,343	1,243	1,340	1,020	2,595
Cd	ppm	<1	<1	<1	<1	<1	<1	<1	<1
Co	ppm	9	<1	9	9	17	<1	<1	3
Cr	ppm	86	66	99	74	62	15	21	15
Cu	ppm	3,563	12,320	3,727	3,061	8,189	9,309	15,190	8,498
Fe	ppm	22,330	4,938	18,470	17,110	28,580	3,003	5,710	10,710
Hg	ppm	<1	<1	<1	<1	<1	<1	<1	<1
K	ppm	6,674	3,851	6,133	7,646	6,145	5,590	4,861	5,151
La	ppm	24	27	30	40	43	12	24	14
Mg	ppm	4,102	1,052	3,936	4,240	4,896	612	1,045	3,273
Mn	ppm	127	46	157	85	180	26	31	66
Mo	ppm	33	95	86	12	<1	<1	<1	<1
Na	ppm	2,722	2,494	2,433	2,508	3,084	3,499	3,777	3,913
Ni	ppm	98	79	95	101	77	5	6	17
P	ppm	356	179	250	470	133	130	125	212
Pb	ppm	6	29	18	15	19	2	2	<1
Sb	ppm	<1	<1	<1	<1	<1	<1	<1	<1
Sc	ppm	2	1	2	2	1	<1	<1	<1
Sr	ppm	12	102	34	4	24	54	105	106
Ti	ppm	740	124	763	659	1,135	59	114	333
Tl	ppm	<1	<1	<1	<1	<1	<1	<1	<1
V	ppm	25	8	24	25	30	2	4	10
W	ppm	<1	<1	<1	2	2	<1	<1	<1
Zn	ppm	69	37	55	90	118	25	22	45
Zr	ppm	8	8	7	7	8	<1	<1	<1

The ICP analysis indicates that copper, aluminum, iron, potassium, magnesium and sodium are the most abundant elements in the samples. Mercury was not detected in the samples and low concentrations of arsenic were detected in the VD14-02 (1801.9 - 1805.3) and VD-14-02 (1266.6-1270.6) samples.

### 13.3 Mineralogical Analysis

The Center for Advanced Mineral and Metallurgical Processing (CAMP) of the University of Montana completed mineralogical analysis on the eight samples submitted to SGS. The results of the mineralogical analysis are:

- Chrysocolla was most often the primary copper-bearing mineral and malachite was relatively common in the oxide samples.

- Native copper was present at significant levels in a few samples, while azurite and chalcocite were primary copper minerals in one sample each.
- Native copper was found at 0.05% in the deeper VD14-02 (1266.6-1270.6) sample.
- Azurite was the primary mineral (verified by XRD) in VD14-05 (1437-1440.7) where it was 1.3%, modally, and occurred with native copper at 0.23%. The only sample with any appreciable sulfide content was VD14-03 (1161.5-1165.4) where chalcocite was the primary copper mineral at 1.0%. This ore could possibly be considered a “mixed” oxide/sulfide ore.
- Chrysocolla was most often the primary copper-bearing mineral and malachite was relatively common in this set of oxide ore samples. Native copper was present at significant levels in a few samples, while azurite and chalcocite were primary copper minerals in one sample each.
- Chrysocolla was associated with the major gangue phases, but seemed to be more strongly associated with potassium feldspar. The carbonates, malachite and azurite were much larger grained and more liberated than chrysocolla. Malachite P80’s were 130 to 150  $\mu$ m and azurite was 150  $\mu$ m. Liberation for the carbonates increased with decreasing sieve size reaching 80 to greater than 90% in the -400 mesh fractions. Malachite tended to be associated with chrysocolla as well as the major gangue phases. Chalcocite grain size was also relatively larger at 150  $\mu$ m in VD14-03 (15948) where it was the main copper phase. It was associated with the sulfides chalcopyrite and pyrite, iron oxide and the gangue minerals.
- The gangue mineralogy was typically composed of major quartz, muscovite and potassium feldspar, with minor biotite, iron oxide, kaolinite, and albite.

#### 13.4 Pressure Leach Tests (PRT)

Eight PQ size drill core samples were subjected to leaching under a nominal pressure of pressure 120psi to maintain carbonates in solution for 120 days under locked cycle type of leaching regime. The purpose of the metallurgical test work conducted under a nominal pressure of 120psi was to simulate the underground hydraulic pressure in the in-situ leach process and maintain in solution any carbonate.

Table 13-4 summarizes the metallurgical results. Specific details related to the test conditions, daily solution volumes and daily copper and irons assays, pH and ORP measurements were also recorded during the test work.

The pressure leach tests (PRT) were conducted using a 26 inch long by 4 inch diameter pressurized stainless steel vessels in locked cycle regime for 120 days. The purpose of pressure (nominal pressure of 120psi) inside the vessels was to simulate the underground hydraulic pressure in in-situ leach process.

**Table 13-4 Locked Cycle Column Testing**

Test No.	Sample ID	Metallurgical Products	Vol/Wt (l/kg)	Copper Assay		Iron Assay		Extraction (%)		Gangue Acid Consumption	
				gpl	%	gpl	%	Cu	Fe	Kg/tonne	Kg/kg Cu
PRT-01	VD14-02 (1801.9 - 1805.3)	Feed Solution Pregnant Solution Leach Residue Calculated Head <sup>(1)</sup> Head Assay <sup>(2)</sup>	90.32	1.02		0.72					
			90.26	1.3		0.85					
			8.16		0.16		2.11	65.37	6.23	26.32	8.64
					0.47		2.23				
		Assay <sup>(2)</sup>	8.24		0.33		2.08				
PRT-02	VD14-02 (1266.6 - 1270.6)	Feed Solution Pregnant Solution Leach Residue Calculated Head <sup>(1)</sup> Head Assay <sup>(2)</sup>	88.82	0.79		0.33					
			88.11	1.81		0.34					
			8.12		0.95		0.46	53.88	1.61	7.84	0.72
					2.03		0.46				
		Assay <sup>(2)</sup>	8.21		1.08		0.36				
PRT-03	VD14-03 (1161.5 - 1165.4)	Feed Solution Pregnant Solution Leach Residue Calculated Head <sup>(1)</sup> Head Assay <sup>(2)</sup>	89.52	0.65		0.83					
			89.87	0.73		0.95					
			8.64		0.27		2.1	23.93	5.70	19.81	23.69
					0.35		2.2				
		Assay <sup>(2)</sup>	8.74		0.32		1.5				
PRT-04	VD14-04 (1682.0 - 1686.7)	Feed Solution Pregnant Solution Leach Residue Calculated Head <sup>(1)</sup> Head Assay <sup>(2)</sup>	89.25	0.97		0.61					
			89.01	1.27		0.67					
			9.00		0.09		2.11	77.01	2.88	15.01	5.13
					0.38		2.16				
		Assay <sup>(2)</sup>	9.07		0.28		1.5				
PRT-05	VD14-05 (1437.0 - 1440.7)	Feed Solution Pregnant Solution Leach Residue Calculated Head <sup>(1)</sup> Head Assay <sup>(2)</sup>	90.06	1.02		0.87					
			89.21	1.22		1.02					
			8.56		0.25		2.92	45.09	4.95	23.41	12.24
					0.42		2.88				
		Assay <sup>(2)</sup>	9.12		0.72		2.43				
PRT-06	VD14-06 ( 896.0 - 900.5)	Feed Solution Pregnant Solution Leach Residue Calculated Head <sup>(1)</sup> Head Assay <sup>(2)</sup>	89.58	0.86		0.35					
			88.89	1.72		0.39					
			7.88		0.15		0.19	86.63	20.32	10.03	1.12
					1.04		0.22				
		Assay <sup>(2)</sup>	8.42		0.91		0.26				
PRT-07	VD14-06 (1021.0 - 1025.5)	Feed Solution Pregnant	88.03	0.95		0.36					

		Solution Leach Residue	87.84	1.41		0.39					
		Calculated Head <sup>(1)</sup> Head	7.85		0.19		0.3	73.37	10.05	10.16	2.01
		Assay <sup>(2)</sup>			0.69		0.33				
			7.97		1.52		0.52				
PRT-08	VD14-06 (1231.0 - 1234.5)	Feed Solution Pregnant	89.09	1.03		0.49					
		Solution Leach Residue	88.34	1.56		0.59					
		Calculated Head <sup>(1)</sup> Head	7.22		0.17		0.67	78.96	14.36	25.15	4.2
		Assay <sup>(2)</sup>			0.76		0.74				
			7.66		0.84		1.00				

Remarks: <sup>(1)</sup> Metal Content Extracted Plus Metal Content in Leach Residue

<sup>(2)</sup> Indicated Head Assay

Table 13-5 summarizes the metallurgical results. Specific details related to the test conditions, daily solution volumes and daily copper and irons assays, pH and ORP measurements were also recorded during the test work.

**Table 13-5 Pressure Leach Test**

Test No.	Sample ID	Leach Cycle (Days)	kl/t	Calculated Head Assays		Cumulative Extraction		Gangue Acid Consumption (kg/kg Cu)
				Cu (%)	Fe (%)	Cu (%)	Fe (%)	
PRT-01	VD14-02 (1801.9 - 1805.3)	126	10.95	0.47	2.23	65.37	6.23	8.64
PRT-02	VD14-02 (1266.6 - 1270.6)	125	10.73	2.03	0.46	53.88	1.61	0.72
PRT-03	VD14-03 (1161.5 - 1165.4)	124	10.28	0.35	2.2	23.93	5.7	23.69
PRT-04	VD14-04 (1682.0 - 1686.7)	124	9.81	0.38	2.16	77.01	2.88	5.13
PRT-05	VD14-05 (1437.0 - 1440.7)	124	9.79	0.42	2.88	45.09	4.95	12.24
PRT-06	VD14-06 ( 896.0 - 900.5)	124	10.56	1.04	0.22	86.63	20.32	1.12
PRT-07	VD14-06 (1021.0 - 1025.5)	124	11.02	0.69	0.33	73.37	10.05	2.01
PRT-08	VD14-06 (1231.0 - 1234.5)	124	11.54	0.76	0.74	78.96	14.36	4.2

Copper extractions ranged from 86.63 - 23.93% after 120 days of leaching and 2 to 7 days of rinse cycle using site water. The highest copper extraction of 86.63% was observed on sample VD14-06 (896.0-900.5) evaluated in test PRT-06.

Samples VD14-03 (1161.5-1165.4) showed the lowest copper extraction of 23.93%. The copper contained in sample VD14-03 (1161.5-1165.4) showed the lowest solubility in sulfuric acid and the highest solubility in cyanide which may indicate that the main copper mineralization could be chalcocite and covellite.

Gangue sulfuric acid consumption ranged from 0.72kg/kg Cu to 23.69kg/kg Cu after applying acid credits that was contained in the PLS and Feed solutions. The highest sulfuric acid consumption of 23.69kg/kg Cu was observed in sample VD14-03 (1161.5-1165.4). Ferric generation will be required for dissolving the cyanide soluble copper contained in this sample.

Figure 13-1 depicts the summary of cumulative copper extractions obtained on the eight drill core sample.

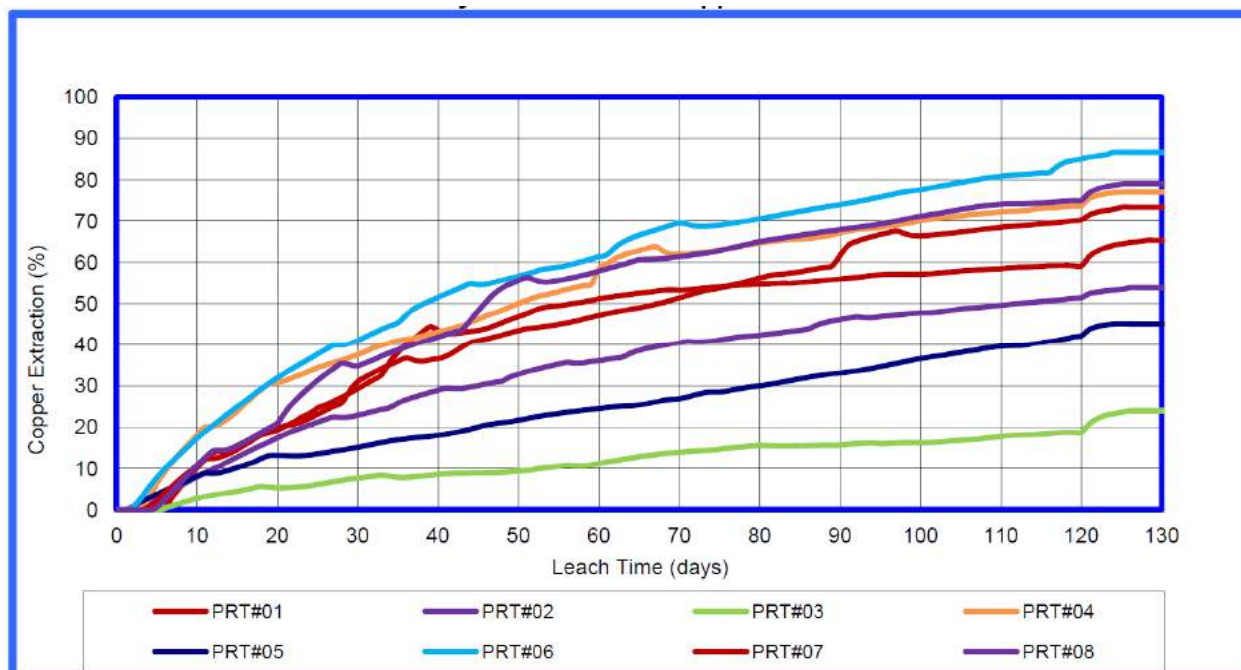


Figure 13-1 Summary of Cumulative Copper Extractions

### 13.5 Calculated Head Assays

On completion of the leach cycle, the copper and iron content of the leach residue from each sample was analyzed. The copper and iron assays analyzed in the leach residues and the amount reported in the pregnant leach solutions were used to calculate the head grades for the eight samples tested. The calculated head grade was used to determine the copper dissolution kinetics, total copper extraction and acid consumption in the simulated in-situ leach testing. Table 13-6 summarizes the calculated head assay results for the eight samples tested inside the pressurized vessel.

Table 13-6 Calculated Head Screen Assays

Test No.	Sample ID	Assays in (%)	
		Total Cu	Total Fe
PRT-01	VD14-02 (1801.9 - 1805.3)	0.47	2.23
PRT-02	VD14-02 (1266.6 - 1270.6)	2.03	0.46
PRT-03	VD14-03 (1161.5 - 1165.4)	0.35	2.20
PRT-04	VD14-04 (1682.0 - 1686.7)	0.38	2.16
PRT-05	VD14-05 (1437.0 - 1440.7)	0.42	2.88
PRT-06	VD14-06 ( 896.0 - 900.5)	1.04	0.22
PRT-07	VD14-06 (1021.0 - 1025.5)	0.69	0.33
PRT-08	VD14-06 (1231.0 - 1234.5)	0.76	0.74

The following comments relate to the head assay results obtained on the drill core samples subjected under leach.

- Total copper grade in the head samples ranged approximately from 0.35 - 2.03%.
- The highest copper grade of 2.03% was observed on the VD14-02 (1266.6' – 1270.6') sample tested in PRT-02.

- The lowest total copper grade of 0.35% was observed on VD14-03 (1161.5-11165.4) tested in PRT-03.
- Iron content was ranged from approximately 0.22 - 2.88%.

### 13.6 Rinse Cycle

At the completion of 120 days of leach cycle, the PRT tests were subjected to a rinse cycle using site water at three times the pore volume of the core samples tested.

The pore volume is equal to the water volume used to saturate the loaded PRT vessel. The length of rinse cycle ranged from 2 to 7 days due to the pore volume of the drill core tested. PRT-01 had the highest pore volume, thus it was rinsed for a longer period. The following Table summarizes the duration of the rinse cycles for each PRT test.

**Table 13-7 Rinse Cycle Duration**

Test No.	PV	3x PV	# of Days to rinse	
PRT-01	1,610	4,830	6.71	7
PRT-02	750	2,250	3.13	4
PRT-03	1,200	3,600	5	5
PRT-04	850	2,550	3.54	4
PRT-05	540	1,620	2.25	3
PRT-06	470	1,410	1.96	2
PRT-07	780	2,340	3.25	4
PRT-08	960	2,880	4	4

### 13.7 Leached Drill Core Preparation and Residue Assays

At the completion of rinse cycle, the pressure leach vessels were drained, unloaded and the leached drill core samples were unwrapped, weighed and dried in a laboratory oven at 100°C. The dried weight for each sample was recorded and the samples were stage crushed to 100% minus 10 mesh and a 1,000 gram sample was split, pulverized and a pulverized portion was submitted for total copper, total iron and sequential copper analysis (Table 13-8).

**Table 13-8 Summary of Residue Assay Results**

Test No.	Sample ID	Analysis		Sequential Copper Analysis <sup>(1)</sup>			(% Soluble Copper <sup>(2)</sup> )
		Cu (%)	Fe (%)	ASCu (%)	CNCu (%)	ResCu (%)	
PRT-01	VD14-02 (1801.9 - 1805.3)	0.163	2.11	0.024	0.002	0.137	15.95
PRT-02	VD14-02 (1266.6 - 1270.6)	0.95	0.46	0.9	0.017	0.025	97.35
PRT-03	VD14-03 (1161.5 - 1165.4)	0.269	2.1	0.027	0.17	0.067	74.62
PRT-04	VD14-04 (1682.0 - 1686.7)	0.088	2.11	0.07	0.002	0.015	82.76
PRT-05	VD14-05 (1437.0 - 1440.7)	0.248	2.92	0.165	0.006	0.078	68.67
PRT-06	VD14-06 ( 896.0 - 900.5)	0.148	0.19	0.125	0.002	0.02	86.39
PRT-07	VD14-06 (1021.0 - 1025.5)	0.186	0.3	0.154	0.003	0.025	86.26
PRT-08	VD14-06 (1231.0 - 1234.5)	0.169	0.67	0.055	0.002	0.106	34.97

Remarks: <sup>(1)</sup> As.Cu = acid soluble copper, CNs.Cu = cyanide soluble copper, ResCu = residual total copper. <sup>(2)</sup> % Soluble Copper = [(asCu + CNsCu)/(asCu + CNsCu + ResCu)\*100]

The following comments relate to the sequential copper analyses conducted on the leached residue samples. Plate 13-1 through Plate 13-6, show residual oxide copper mineralization in six of the core test samples after being unloaded from the pressure leach vessels.

The results of the preliminary test work show that 15 to 96% of the total copper contained in the leached residue is soluble in sulfuric acid and that 1 to 64% the total copper contained in the leached residue is soluble in cyanide.

The percentage of leachable copper that remained in the residue ranged from 16 to 97% and this could be due to the lack of solution diffusion, mass transfer or solution channeling in the test vessel.

The test results for PRT-03 VD14-03 (1161.5-1165.4) demonstrate significantly different results than the other seven samples tested. The leach residue in this sample shows that approximately 10% of the total copper contained in the leached residue is soluble in sulfuric acid and approximately 64% of the total copper contained in the leached residue is soluble in cyanide. Approximately 75% of leachable copper was left un-leached in the residue; this could be due to the lack of ferric iron generation during the leaching process, solution diffusion, mass transfer or solution channeling in the test vessel.

## 13.8 Conclusions and Recommendations

### 13.8.1 Conclusions

- Copper extractions ranged from approximately 86.63 - 23.93% after 120 days of leaching and 2 to 7 days of rinse cycles. The highest copper extraction of 86.63% is observed on sample VD14-06 (896.0-900.5) in PRT-06 Test.
- Samples VD14-03 (1161.5-1165.4) showed the lowest copper extraction of 23.93%. The copper contained in sample VD14-03 (1161.5-1165.4) showed the lowest solubility in sulfuric acid and the highest solubility in cyanide which may indicate that the main copper mineralization may be chalcocite and covellite.
- Gangue sulfuric acid consumption ranges from 0.72 kg/kg Cu to 23.69 kg/kg Cu after applying acid credits that was contained in the pregnant leach solution (“PLS”) and Feed solutions. The highest sulfuric acid consumption of 23.69 kg/kg Cu was observed in sample VD14-03 (1161.5-1165.4). Ferric generation will be required for dissolving the cyanide soluble copper contained in this sample.
- Drill cores tested in PRT-06 and PRT-07 showed that center of the drill cores were not leached due to the lack of diffusion and mass transfer.

### 13.8.2 Recommendations

- Additional testing is recommended to evaluate the effect of ferric iron addition on dissolution of the secondary copper mineralization (cyanide soluble copper).
- Additional testing is recommended to evaluate the effect of surfactant addition on dissolution of the un-leached soluble copper.
- ICP Scan should be conducted on the final pregnant solution samples



Plate 13-1a and b

Unload Photos for Test PRT-01



Plate 13-2a and b

Unload Photos for Test PRT-02



Plate 13-3a and b Unload Photos for Test PRT-03



Plate 13-4a and b

Unload Photos for Test PRT-04



Plate 13-5a and b

Unload Photos for Test PRT-05



Plate 13-6a and b

Unload Photos for Test PRT-06



## 14 Mineral Resource Estimates

The Mineral Resource estimate for the Van Dyke deposit is prepared by Susan Bird, P.Eng of Moose Mountain Technical Services (MMTS). The resource model is built using MineSight<sup>®</sup>, an industry standard in geologic modeling and mine planning software. The three dimensional block model has block dimensions 30m x 30m x 10m and is rotated 25 degrees to the north-east to cover the extent of the mineralized zone and have an orientation consistent with the general strike of the deposit. The block size has been chosen to conform to the expected mining method of In-Situ Leach (ISL).

Total copper (TCu), and acid soluble copper oxide, (CuOx), grades are interpolated within geologic solids by ordinary kriging (OK). The geology has been interpreted in section and plan, with fault surfaces and solids of the zones used to restrict the interpolation volumes during ordinary kriging. The resource is classified as Inferred according to the CIM Definition Standards (CIM, 2014).

### 14.1 Introduction

The Van Dyke deposit is a copper oxide deposit that includes both an Oxide and Mixed zone. The term Mixed in the context of this Item of the report is defined as a zone surrounding the Oxides and that contains both oxide and sulfide Cu bearing minerals in a ratio of less than 50% oxides: sulfides. Chalcocite is the primary sulfide in the mixed zone.

Six new holes have been drilled in 2014, five of which are twin holes and one within the area of previous underground and in situ leach (ISL) mining. The purpose of the 2014 drilling is to validate the historic assays and to provide specific gravity measurements and metallurgical samples. In addition, re-assaying of historic pulps was done in 2014 as further validation of the historic grade values.

A three dimensional geologic model has been created using both the historic dhs and underground samples. The geologic model includes interpretation of the Gila Conglomerate-Pinal Schist boundary, five major faults, and the oxide and mixed zones. A block model of the deposit has been created using the geologic boundaries to create domains and zones to constrain the interpolation of total copper (TCu) and acid soluble copper (CuOx) by domain and zone. Two zones per block are included with the percent of the block within each zone used to define the resource.

Statistical analysis (cumulative probability plots, histograms, and classic statistical values) of the assay data is used to confirm the domain selection and to determine if capping of metal grades for variography and interpolation is necessary. Assay data is then composited into 5m intervals, honoring the domain and zone boundaries. Composite statistics have been compiled for comparison with assay data. The composites are used to create correlograms for TCu, and CuOx grades using the MSDA module of the MineSight<sup>®</sup> software, thus establishing rotation and search parameters for the block model interpolation, as well as kriging parameters.

Validation of the model is completed by comparison of the block values with de-clustered composite values (Nearest Neighbor values corrected for change of support). A volume-variance correction factor is applied to the de-clustered data to calibrate the model using Grade-Tonnage curves. Further model

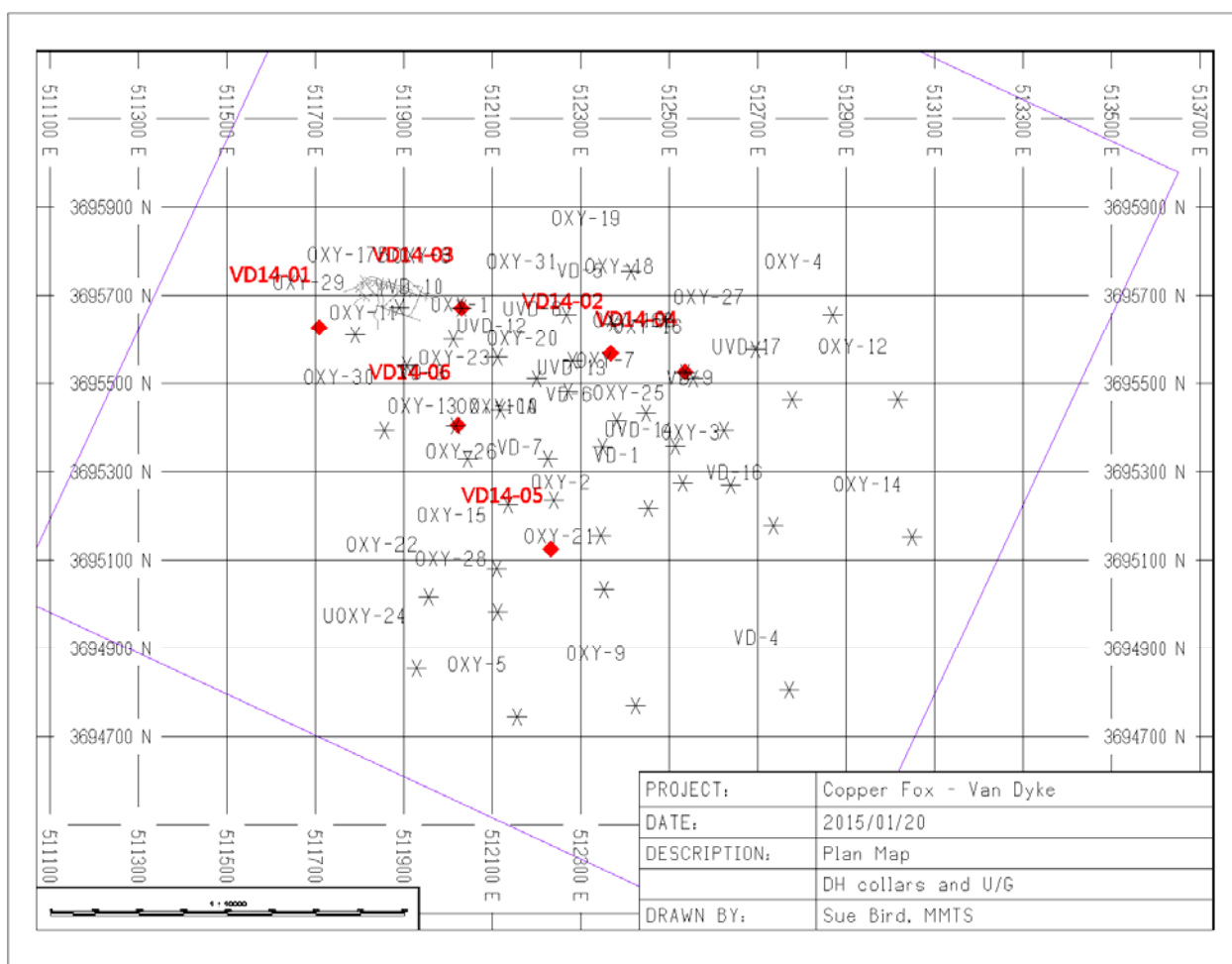
validation is completed through comparisons of Swath Plots, Cumulative Probability Plots (CPP), as well as by a visual inspection of assay and modelled values in section and plan across the mineralization.

## 14.2 Data Set

### 14.2.1 Historic Drilling, Underground Sampling and 2014 Drilling

The following outlines the data available for use in the interpolation of copper grades. Assay data within the Van Dyke model bounds includes 35 historic drillholes, historic channel samples from underground workings on three level, re-assayed historic drill core and core pulps, analytical results from recent metallurgical test work, and data from 6 drillholes completed in 2014. Five of the 2014 holes were twinned holes used to validate historic assay values. The total length of core sampled for TCu is 11,220m from drilling, with an additional 1,424m of underground sampling.

Figure 14-1 is a plan view of the drillhole collars (red are 2014 drillholes), the underground sampling area and the model boundary (in blue).



**Figure 14-1 Drillholes within the Modelled Van Dyke Deposit**



### 14.2.2 Twinned Hole Analysis

Twinned assay values were compared from five new and five historic holes. These drillholes are identified in Table 14-1 below. Analysis shows that the historic data generally shows lower grades than the 2014 assay data, indicating use of the historic grades may be conservative. Exceptions to this are the lower portions of two historic holes, OXY-6 and UVD-11, which are to be removed from the resource estimates going forwards for reasons given in this section.

**Table 14-1 Twin Holes for Comparison**

Twin	Historic
VD14-02	OXY-6
VD14-03	OXY-8
VD14-04	OXY-16B
VD14-05	UVD-11
VD14-06	VD-3

The compared grades are composited on 10m intervals. Each hole was analyzed by downhole depth for grade ratios (TCu<sub>new</sub>/TCu<sub>old</sub>), the difference in CuOx ratio [(CuOx/TCu)<sub>new</sub>-(CuOx/TCu)<sub>old</sub>], and the difference in CuOx grade (CuOx<sub>new</sub>-CuOx<sub>old</sub>). Figure 14-2 shows the downhole grade comparisons for VD14-03 with the historic OXY-8, indicating the typically higher grades for the new DH assay data for both TCu and CuOx. It is apparent that the ratios of new to old grades generally indicate a ratio above 1 showing the historic grades to be conservative.

The exception to the generally higher grades for the current drilling is found at the bottom of the twin drillholes VD14-02 (OXY-6) and VD14-05 (UVD-11). Figure 14-3 illustrates the VD14-05 and UVD-11 twinned holes, and indicates that the current drilling has lower TCu, CuOx and CuOx/TCu. Although this isolated grade discrepancy may be due to geologic changes between the holes (i.e. fault structures), it is considered prudent to remove these two historic holes (OXY-6 and UVD-11) for the resource estimates going forward.

Additional drilling will be required to further determine anomalies between the historic and current data.

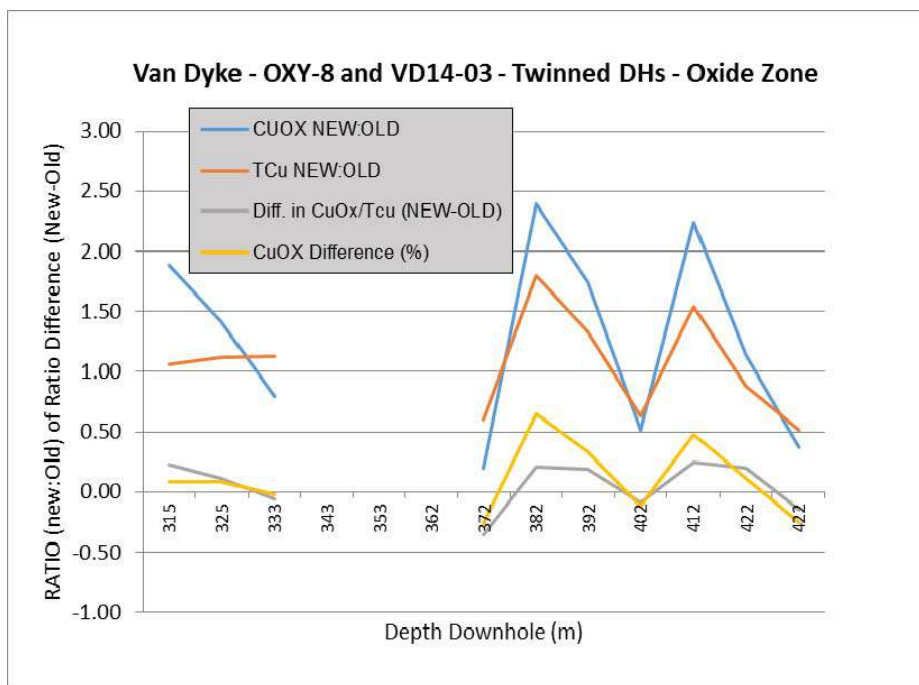


Figure 14-2 Downhole Comparison of VD14-03 and Twin OXY-8

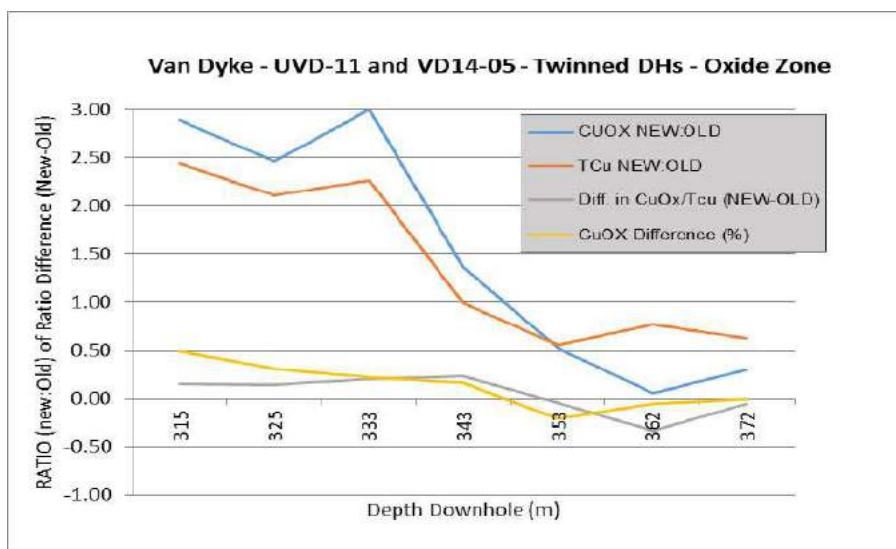


Figure 14-3 Downhole Comparison of VD14-05 and Twin UVD-11

### 14.3 Geologic Model

The oxide copper mineralization and surrounding mixed oxide-sulphide copper mineralization has been interpreted on 15 sections that are oriented perpendicular to the strike of the deposit (N25E).

Four major faults within and adjacent to the deposit are also modeled. The Miami East, Porphyry, and Azurite faults slightly offset the oxidized mineralization and tend to concentrate the copper oxide

grades. The Van Dyke fault has been modelled to constrain the mineralization to the north. Mineralization remains open to the west and southwest.

The Gila conglomerate surface defines the upper boundary to the mineralization, as all mineralization is within the Pinal Schist or a minor Porphyritic intrusion. Comparison of grades within these two rock types did not indicate discrete differences. Therefore, the geologic model is defined by Domains based on the faults and on Zones based on the oxide and Mixed zone interpretations. An additional Domain has been created within the area of the previous underground workings, as higher grade oxide/mixed zone.

Solids of oxide and of mixed oxide-sulphide copper mineralization were created and used to code the assays, composites and the three-dimensional block model. Surfaces of the faults have been used to create domain boundaries and also used to code the assays, composites and block model. The block model has been created to encompass all of the drillholes and channel samples available, within 30mx30mx10m (vertical) blocks.

Wireframes for both the oxide and mixed oxide-sulphide copper mineralization are based on a 0.05% TCu cut-off. Oxide copper mineralization is defined by the ratio  $ASCu/TCu > 50\%$ , and mixed oxide-sulphide copper mineralization is defined by  $TCu > 0.05\%$  with a ratio of  $ASCu/TCu$  of  $< 50\%$ .

A three dimension view of the resulting fault surfaces and oxide solids is illustrated in Figure 14-4. A section illustrating the assignment of Domains is shown in Figure 14-5, with domains defined as follows:

- Domain 1 – west of the Miami East Fault
- Domain 2 – between Miami East and Porphyry Faults
- Domain 3 – between Porphyry and Azurite Faults
- Domain 4 – East of the Azurite Fault
- Domain 5 – high grade zone within Domain 2 defined by drilling and underground channel samples
- Domain 6 – un-mineralized rock above the Gila Conglomerate/Pinal Schist boundary and / or north of the Van Dyke Fault

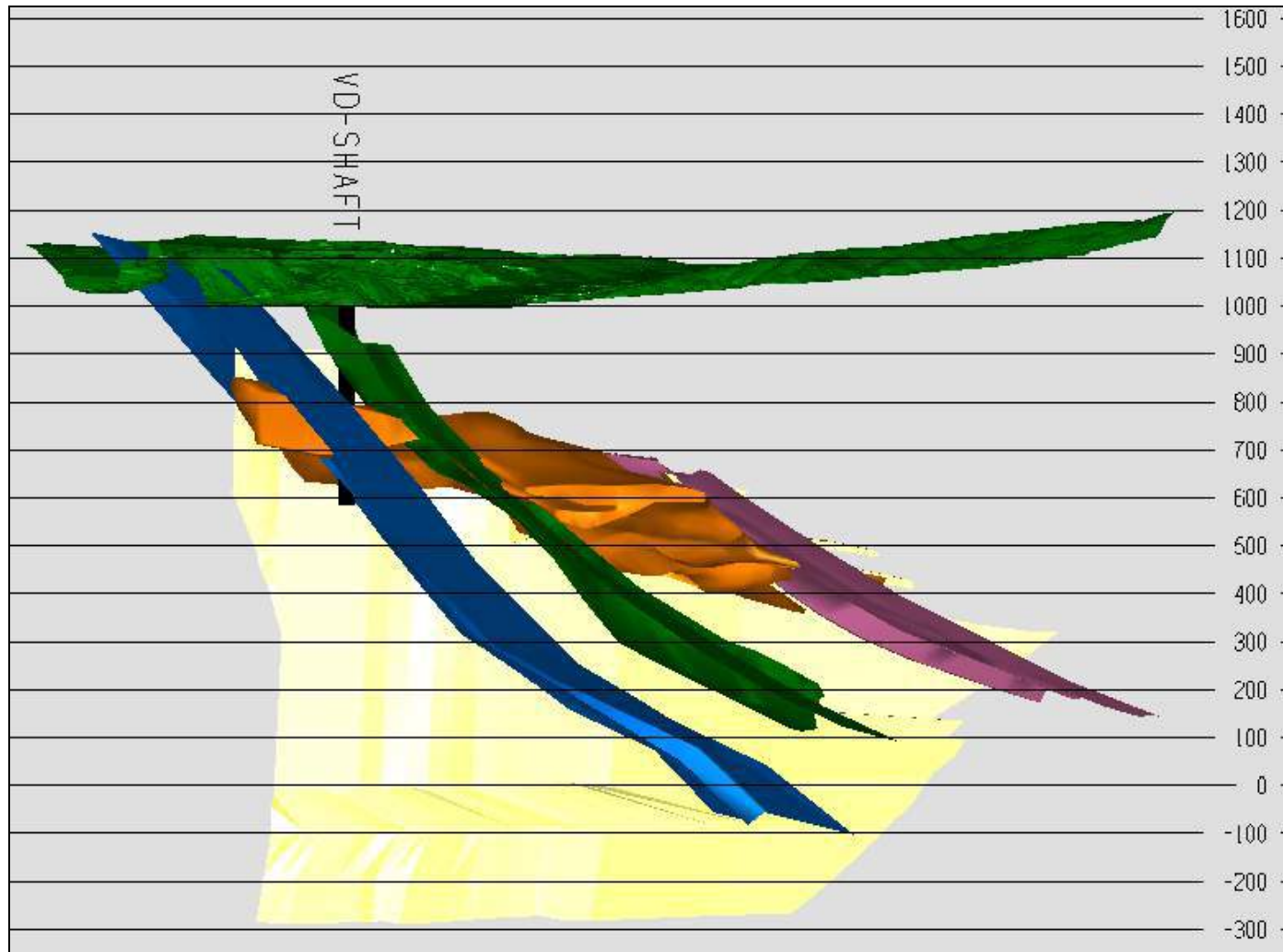


Figure 14-4 3D View of Geology Looking N 35E, Dip-5 - Topography, Major Faults Surfaces and Oxide Solids (orange)

Major Faults as follows: Blue: Miami East, Green: Porphyry, Pink: Azurite, Yellow: Van Dyke

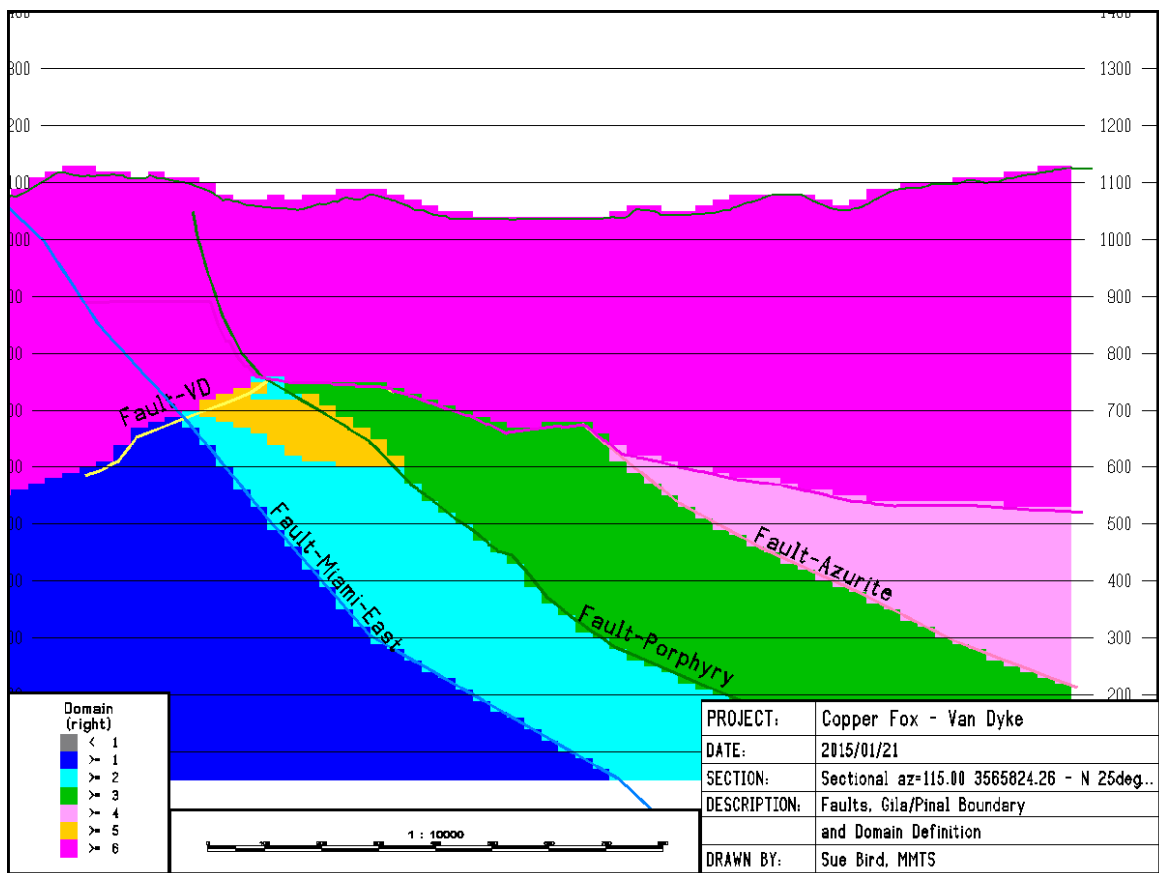


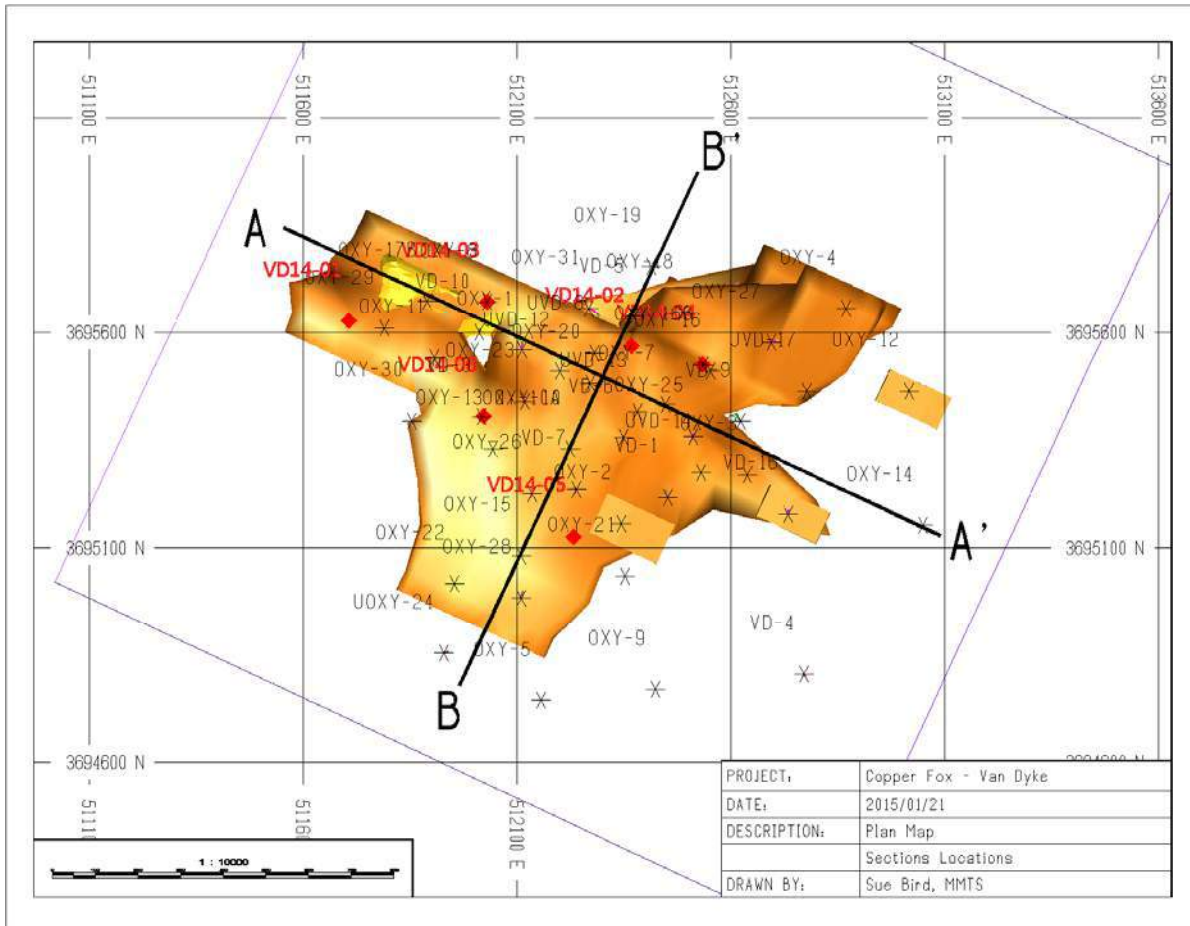
Figure 14-5 Cross Section looking N25E - Domains

## 14.4 Exploratory Data Analysis – Assay Data

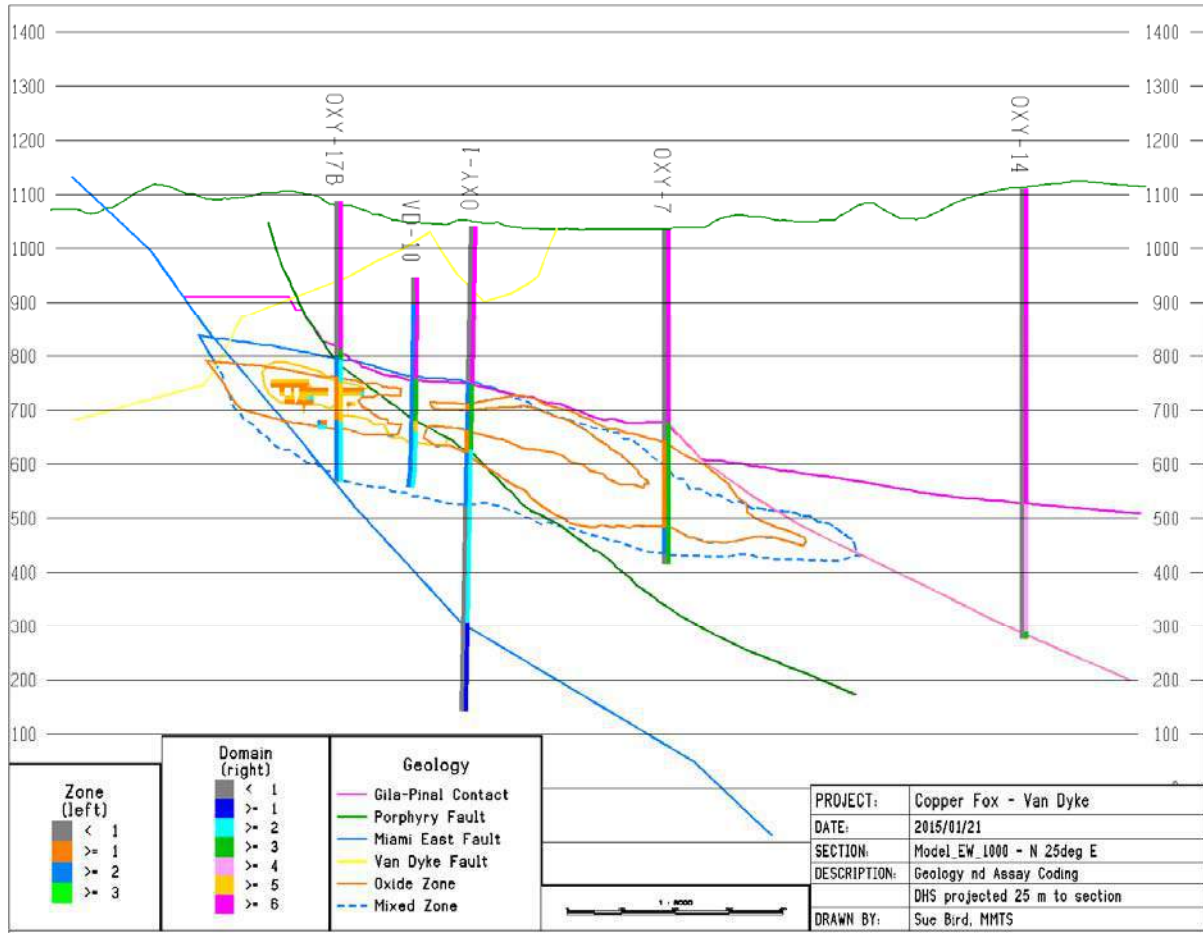
### 14.4.1 Assay Coding

The assay data has been tagged by domain and zone for use in determining capping values, for compositing and eventually in block matching during interpolation. The assay coding using the geologic surfaces and solids is illustrated in the cross-section (A-A') looking N25E of Figure 14-7, and the long-section (B-B') in Figure 14-8. A plan view of the locations of sections A-A' and B-B' is found in Figure 14-6 which also plots the oxide solids (in orange), the drillholes locations and model bounds (in blue) for reference.

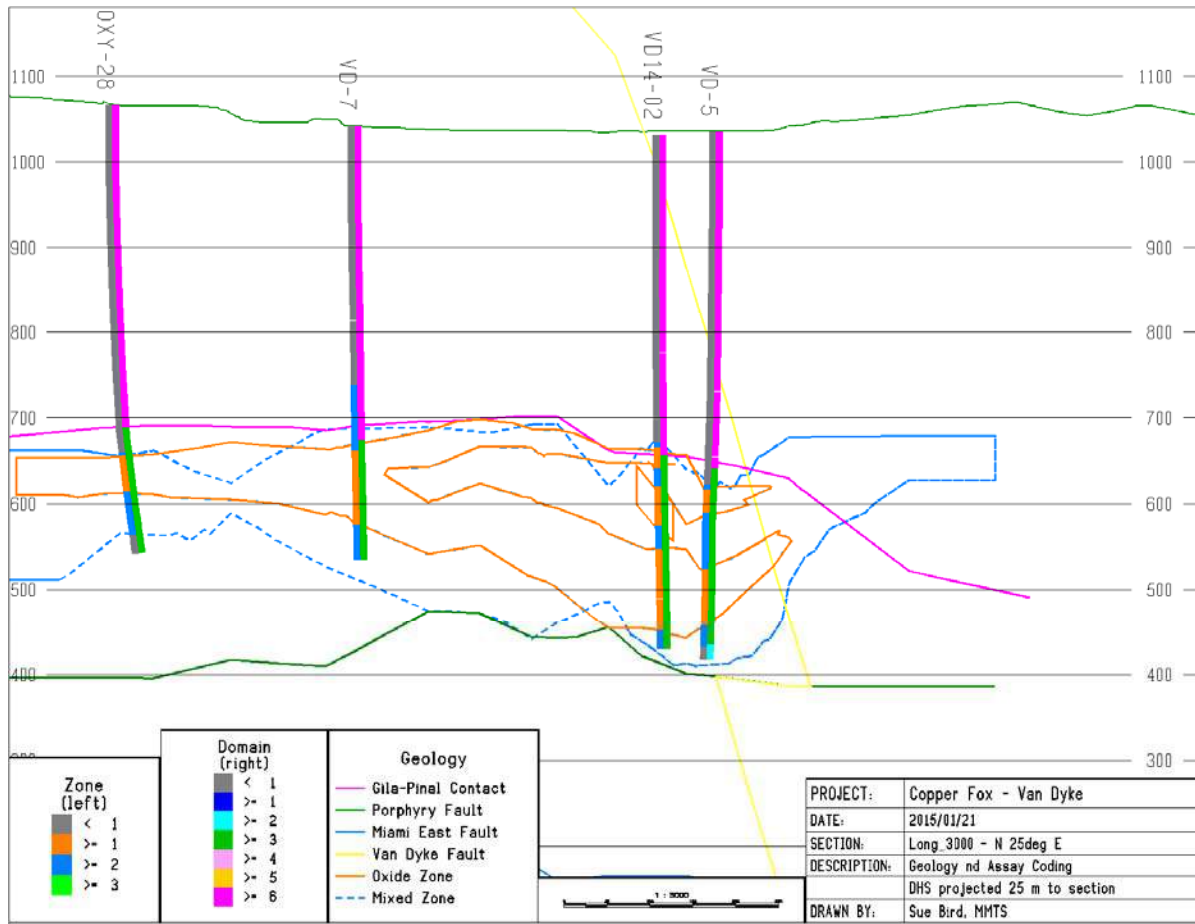
The sections plot both the oxide the mixed boundaries, the drillholes, as well as the major faults, and Gila Conglomerate / Pinal Schist surface boundary.



**Figure 14-6 Plan Indicating Section Locations A-A' and B-B' relative to Oxide Solids and Model Bounds**



**Figure 14-7 Section A-A' – Cross Section Looking N25E – Faults, Gila/Schist Surface, Oxide and Mixed Oxide Solid Boundaries**



**Figure 14-8 Section B-B' – Long Section Looking N65W – Faults, Gila/Schist Surface, Oxide and Mixed Oxide Solid Boundaries**

### 14.4.2 Assay Capping and Compositing

Cumulative probability plots are used to determine that the grades are lognormally distributed and to define the capping of high grade outliers by domain and zone. The capped data is then composited for use in the interpolation. The capped values of assays and composites are compared to validate the compositing procedure used. This section summarizes the results of this analysis. Figure 14-9 through Figure 14-12 show the CPP plots for TCu and CuOx respectively, by domain and zone.



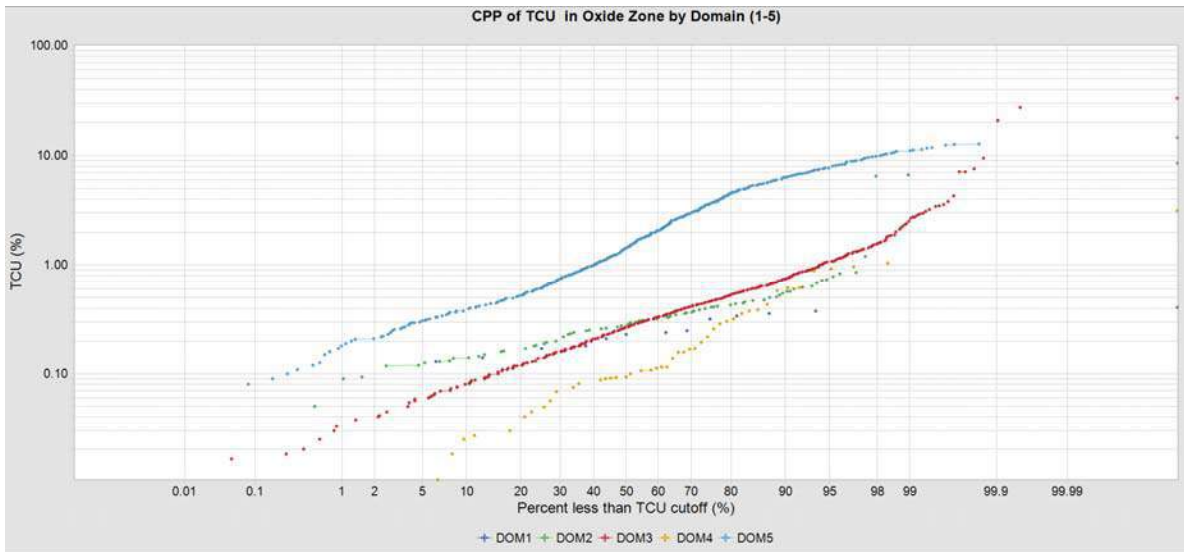


Figure 14-9 CPP Plot Assays – TCu for the Oxide Zone

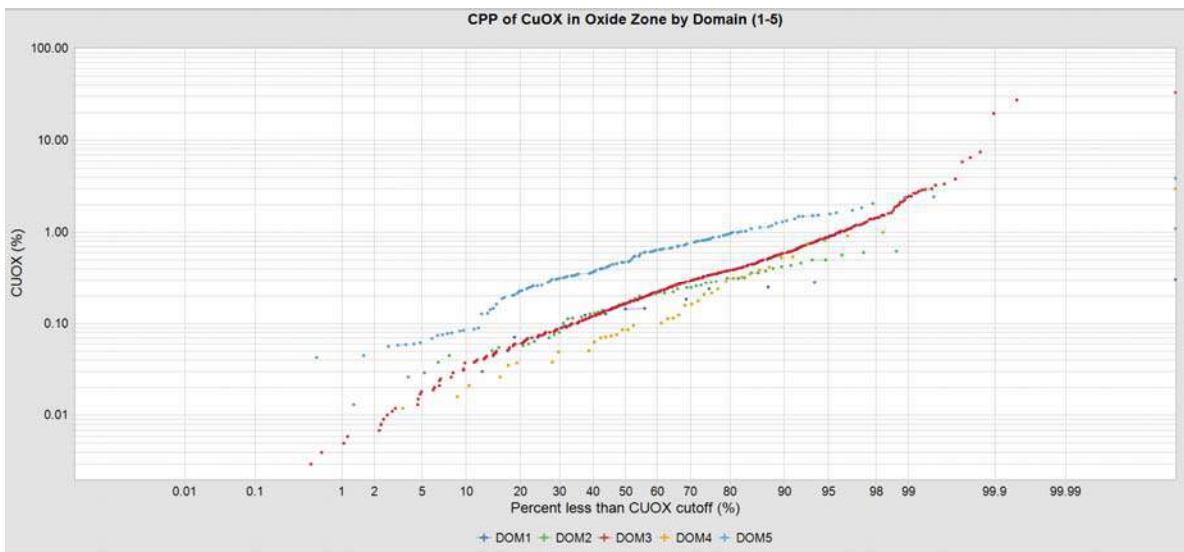


Figure 14-10 CPP Plot Assays – CuOx for the Oxide Zone

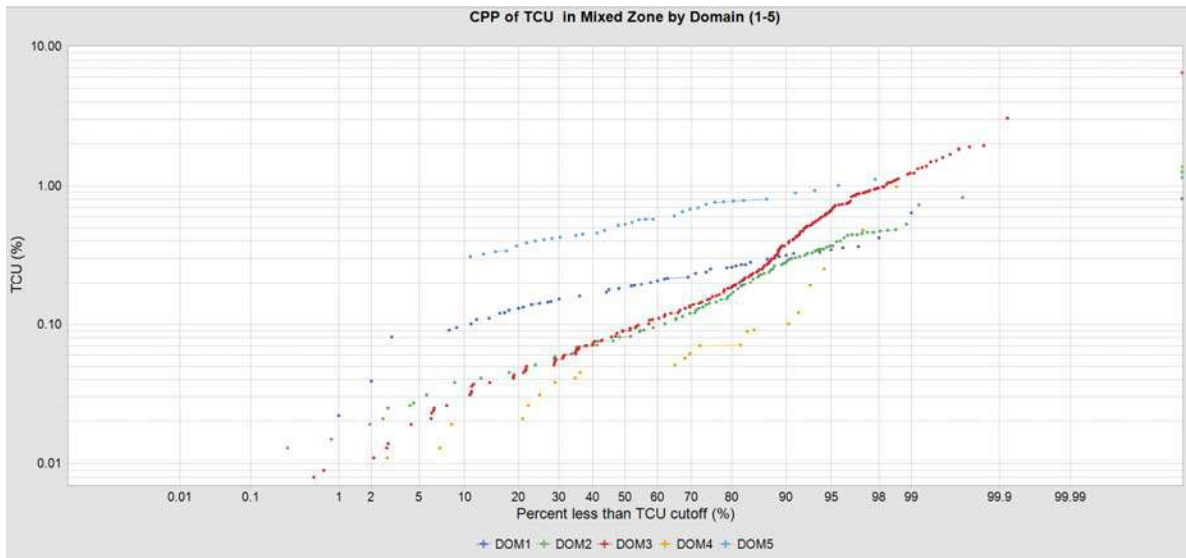


Figure 14-11 CPP Plot Assays – TCU in the Mixed Zone

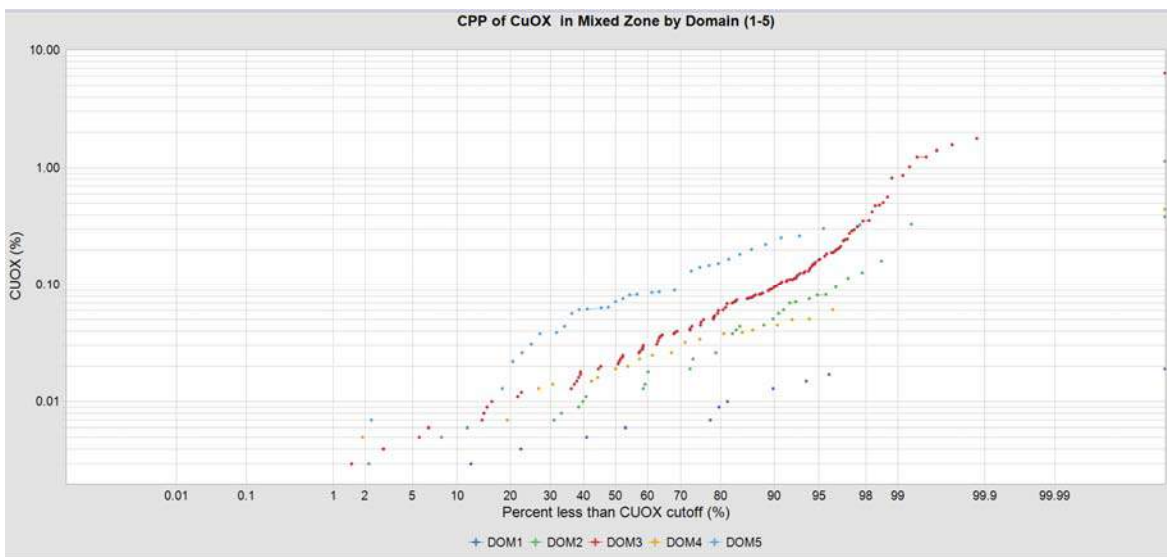


Figure 14-12 CPP Plot Assays – CuOx in the Mixed Zone

Based on the CPP plots, values at which to cap the assay grades have been defined for domains that illustrate a break in grades at the upper end of the distribution. Capping is considered necessary for TCU and CuOx values as indicated in the Table below by Zone and Domain. The capped, composited values are used for variography.

**Table 14-2 Capping Values of Assays during Compositing**

Zone	Domain	TCu (%)	# Values Capped	CuOx (%)	# Values Capped
Oxide	1	---	---	---	---
	2	2.5	0	2.5	0
	3	4.5	1	2.8	2
	4	1.1	1	2.5	1
	5	3.0	1	2.5	1
Mixed	1	---	---	---	---
	2	1.0	1	1.0	1
	3	3.0	1	3.0	0
	4	1.0	1	1.0	0
	5	1.0	---	---	---

### 14.4.3 Specific Gravity Data

Specific gravity measurements have been done for the 2014 drillholes. Samples are measured by Copper Fox prior to shipment, and also by Skyline using ASTM Method C127-01. The friability of the Gila Conglomerate required kerosene-based immersion in order to limit expansion of the clay component. The Gila conglomerate samples were sent to Mountain States R&D for this process.

The average specific gravity below the Gila Conglomerate (within the Pinal Schist and porphyritic units) is 2.60. This is the value used for all or and waste blocks in the reporting of the resource.

### 14.5 Compositing and Composite Statistics

Compositing of grades has been done as 5m fixed length composites and honoring the Domain and Zone boundaries. Table 14-3 and Table 14-4 compare the assay and composites statistics for domain for the oxide and mixed zones respectively.

**Table 14-3 Summary Statistics by Domain – Oxide Zone**

OXIDE ZONE					
	CuOx				
ASSAYS:	DOM1	DOM2	DOM3	DOM4	DOM5
Num Samples	16	77	1939	57	186
Min (%)	0.029	0.012	0.001	0.011	0.042
Max (%)	0.307	1.1	2.8	2.5	2.5
Weighted mean (%)	0.164	0.221	0.267	0.231	0.613
COMPOSITES	DOM1	DOM2	DOM3	DOM4	DOM5
Num Samples	10	37	588	25	51
Min (%)	0.029	0.039	0.002	0.015	0.061
Max (%)	0.239	1.1	2.18	0.853	1.732
Weighted mean (%)	0.164	0.218	0.262	0.229	0.599
DIFFERENCE	DOM1	DOM2	DOM3	DOM4	DOM5
Weighted mean	0.0%	1.4%	1.9%	0.9%	2.3%

**Table 14-4 Summary Statistics by Domain – Mixed Zone**

MIXED ZONE					
	TCU				
ASSAYS:	DOM1	DOM2	DOM3	DOM4	DOM5
Num Samples	100	356	1275	72	46
Min (%)	0.021	0.012	0.006	0.01	0.31
Max (%)	0.812	1	3	1	1.159
Weighted mean (%)	0.201	0.113	0.153	0.082	0.585

COMPOSITES	DOM1	DOM2	DOM3	DOM4	DOM5
Num Samples	40	152	505	34	17
Min (%)	0.087	0.024	0.006	0.01	0.377
Max (%)	0.457	0.578	1.494	0.986	0.874
Weighted mean (%)	0.202	0.111	0.149	0.077	0.588

DIFFERENCE	DOM1	DOM2	DOM3	DOM4	DOM5
Weighted mean	-0.5%	1.8%	2.6%	6.1%	-0.5%

## 14.6 Variography

Correlograms have been created within the oxide and mixed zone at 30 degree azimuth intervals and 15 degree plunges over the entire directional sphere. Due to lack of data in Domains 1 and 4, only domains 2 and 3 are used to define the variogram parameters for domains 1 through 4. The major and minor axes for all domains followed the generally south-easterly down dip and north-easterly strike directions of the mineralization.

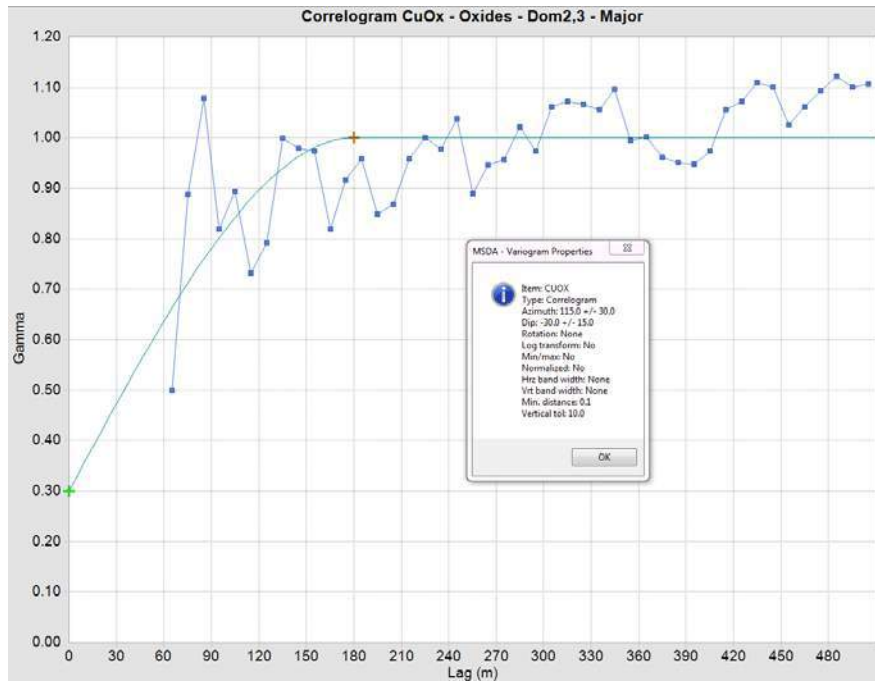
Downhole variograms of all DH data are used to define the nugget in each domain and zone.

The resulting variogram parameters are given in Table 14-5 for TCu and CuOx respectively. Note that the Rotation is given as ROT=Rotation of the azimuth from north of the major axis, DIPN=Plunge of the major axis in the ROT direction, DIPE=Plunge of the minor axis as an east axis (down is negative).

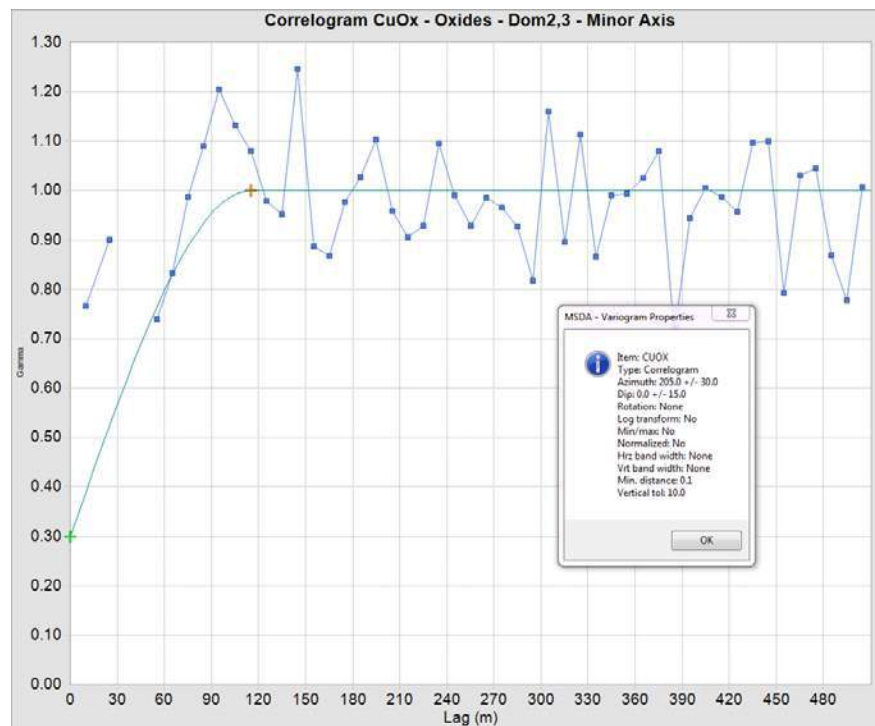
**Table 14-5 Variogram Parameters**

Zone	Element	Nugget	Axes Rotation (degrees)	Sill1	Range1 (m)			Sill2	Range2 (m)		
					Major	Minor	Vertical		Major	Minor	Vertical
Oxide	CuOx	0.3	115/-20/0	0.7	160	115	60	0	---	---	---
	TCu	0.3	115/-25/0	0.7	135	120	30	0	---	---	---
Mixed	CuOx	0.3	115/-10/-10	0.7	150	150	20	0	---	---	---
	TCu	0.3	115/-25/0	0.7	140	140	30	0	---	---	---
Dom5	both	0.3	115/-20/-20	0.6	65	45	10	0.1	205	100	20

The major and minor axes of the variogram model for CuOx in the Oxide Zone (represented with Domains 2 and 3) are illustrated in Figure 14-13 and Figure 14-14 below.



**Figure 14-13 Variogram Model for CuOx Oxide Zone Major Axis**



**Figure 14-14 Variogram Model for CuOx Oxide Zone Minor Axis**

## 14.7 Block Model Interpolation

The coordinate system used for all Van Dyke project files is NAD27. The block model limits and block size are as given in Table 14-6.

**Table 14-6 Block Model Limits**

Direction	Origin	Length (m)	Block Dimension (m)	# of Blocks
Easting	511020	1980	30	66
Northing	3695020	1980	30	66
Elevation	50	1250	10	120

Interpolation of TCu, and CuOx is done by Ordinary Kriging (OK). Interpolation is restricted by the geologic boundaries, with composites and block codes required to match within each domain and zone. There are two zones per block, with a block percent of each zone. The final grades used in the resource estimate are the weighted average grades of the block grades in each zone. The

Interpolation is done in four passes based on the variogram parameters. Search criteria for each pass for TCu and CuOx by domain are summarized in Table 14-7 and Table 14-8.

**Table 14-7 Interpolation Search Distances by Domain**

Domain	Zone	Element	Axes Rotation (degrees)	Interpolation Pass	Search Distance (m)		
					Major	Minor	Vertical
1-4	Oxide	CuOx	115/-20/0	1	40	29	15
				2	80	58	30
				3	160	115	60
				4	500	500	100
	TCu	115/-25/0	1	34	30	8	
			2	68	60	15	
			3	135	120	30	
			4	500	500	100	
	Mixed	CuOx	115/-10/-10	1	38	38	5
				2	75	75	10
				3	150	150	20
				4	500	500	100
TCu	115/-25/0	1	35	35	7		
		2	70	70	15		
		3	140	140	30		
		4	500	500	100		
5	TCu / CuOx	115/-20/-20	1	33	22	5	
			2	65	45	10	
			3	103	50	10	
			4	500	500	100	

**Table 14-8 Composite Restriction during Interpolation**

Interpolation Pass	Search Composite Restrictions				
	Min # Comps	Max # Comps	Max Comps / DH	Min # DHs	Min # Quadrants
1	6	16	2	3	4
2	4	16	2	2	3
3	3	12	2	2	1
4	2	8	2	1	1

### 14.8 Resource Classification

Due to the preliminary nature of the Van Dyke project, the resource has been classified as Inferred. This is consistent with the CIM Definition Standards, in that:

*“It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.” (CIM, 2014)*

It is considered that further drilling is required to further validate the historical data. The five twinned holes drilled in 2014, indicated that current assaying methods have overall higher grades than was found historically. It is therefore expected that this trend will continue to improve the historic result as further drilling is undertaken.

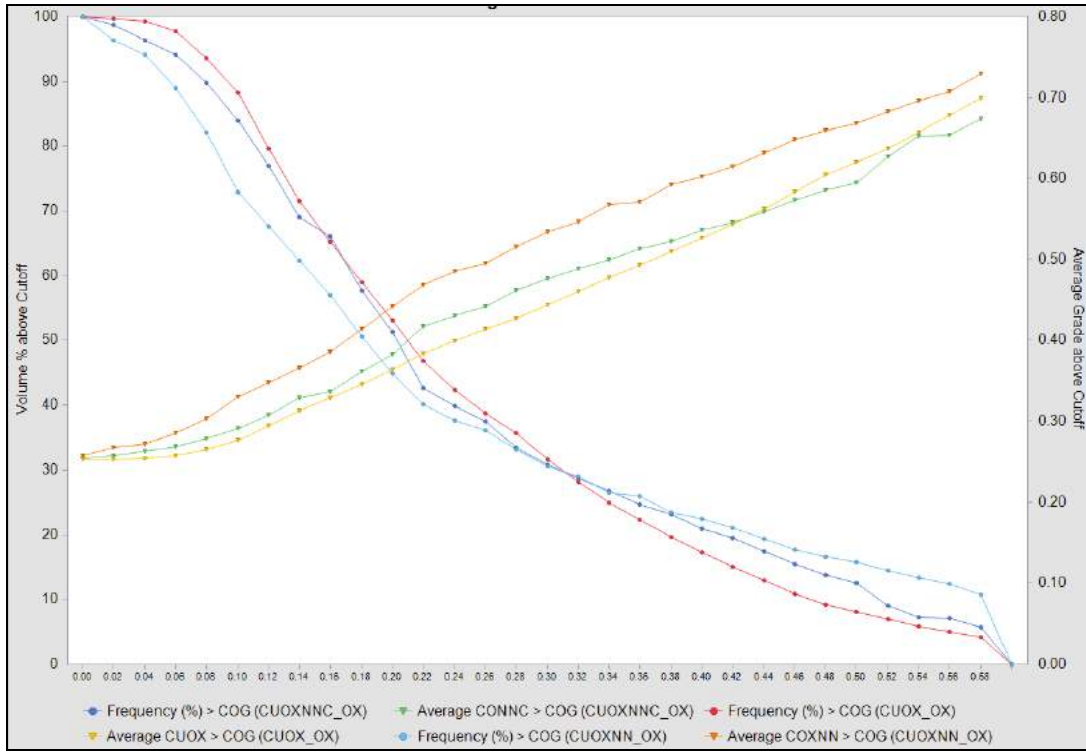
### 14.9 Block Model Validation

Validation of the model is completed by comparison of the Ordinary Kriged (OK) grades, with Nearest Neighbor (NN) interpolated block value, which has been corrected for the Volume-Variance effect due to the change in sample size from composite to block. Validation is completed through inspection and analysis of swath plots, grade tonnage curves, mean grade comparisons, comparison of CPP plots, and a visual inspection in section and plan across the property.

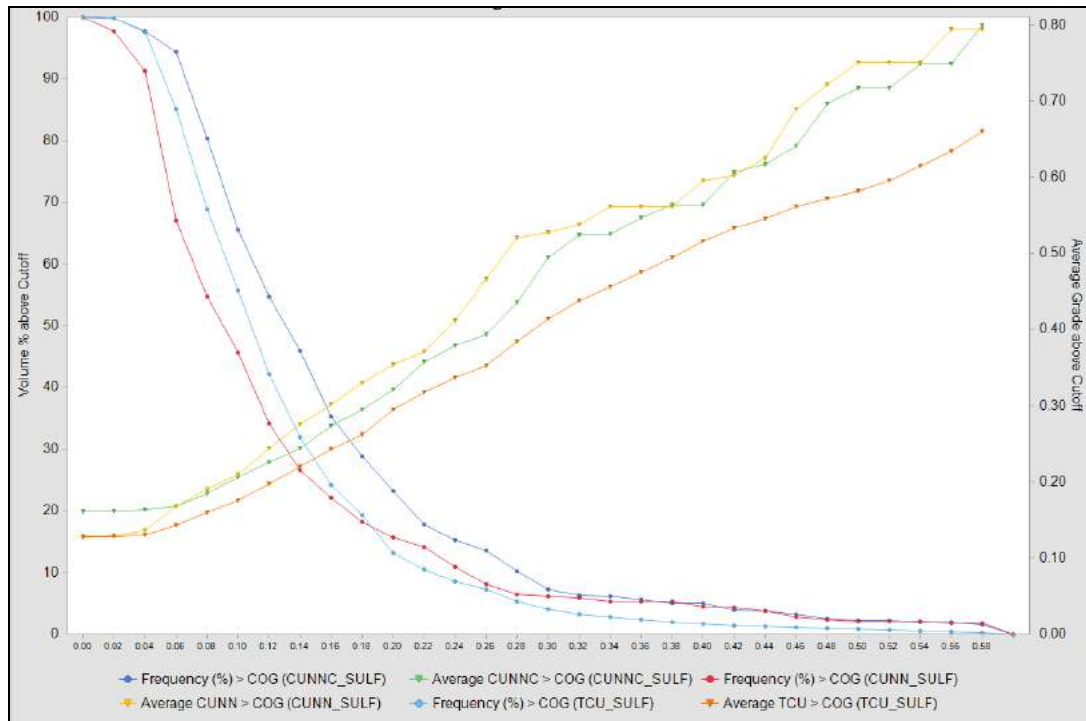
#### 14.9.1 Volume-Variance Correction

Grade-Tonnage curves have been constructed for each metal to check the validity of the change of support in the grade estimations. The Nearest Neighbour (NN) grade estimates are first corrected by the Indirect Lognormal (ILC) method using the Block Variance, the weighted mean and Coefficient of Variation (C.V.) values of the NN model for TCu and CuOx in each of the two zones. The corrected values for TCu and CuOx in each zone have been plotted and compared to the kriged (OK) value. These plots have been used in each of the 5 domains, to aid in determining appropriate interpolation parameters. See Figure 14-15 and Figure 14-16 for an example in oxide and mixed layers respectively.

The comparison tables for tabulated values for the NN-Corrected model versus Ordinary Kriged block values are summarized below in Table 14-9. Results are included for the zone1 block values for CuOx in the Oxide Zone, and zone 2 block values for TCu in the Sulfide zone.



**Figure 14-15 Tonnage-Grade Curves for CuOx in Oxides – Comparison of Interpolation Methods**



**Figure 14-16 Tonnage-Grade Curves for TCu in Mixed Zone – Comparison of Interpolation Methods**



Table 14-9 Comparison for NNC vs OK Grades

Method	Parameter	CUOX-OK (oxide zone)	TCu-OK (mixed zone)
OK	Num Samples	8914	14204
	Min (%)	0.01	0.02
	Max (%)	1.21	1.17
	Mean (%)	0.274	0.145
Method	Parameter	CUOX-NNC (oxide zone)	TCu-NNC (mixed zone)
NNC	Num Samples	8914	14204
	Min (%)	0.01	0.02
	Max (%)	0.97	1.12
	Mean (%)	0.278	0.152
DIFFERENCE			
Weighted mean (%)		-1.4%	-4.7%

### 14.9.2 Comparison of Cumulative Probability Plots

The entire distribution of interpolated block grades is compared to the Nearest Neighbour (NN) and NN-corrected distributions for TCu, and CuOx using Cumulative Probability Plots. Each comparison indicates good correlation throughout the grade range. The CPP plots for CuOx and TCu, are given in Figure 14-17 and Figure 14-18.

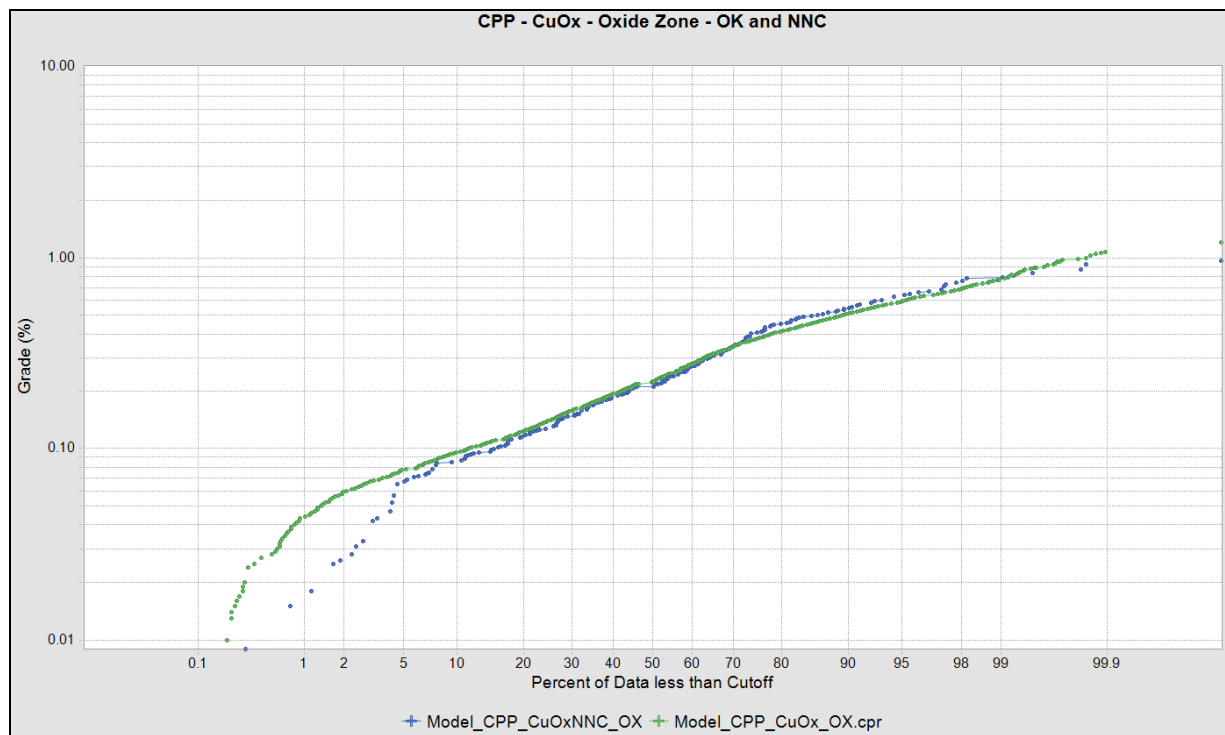


Figure 14-17 Comparison of CuOx-OK (green) with CuOx-NNC (blue) - Oxide Zone

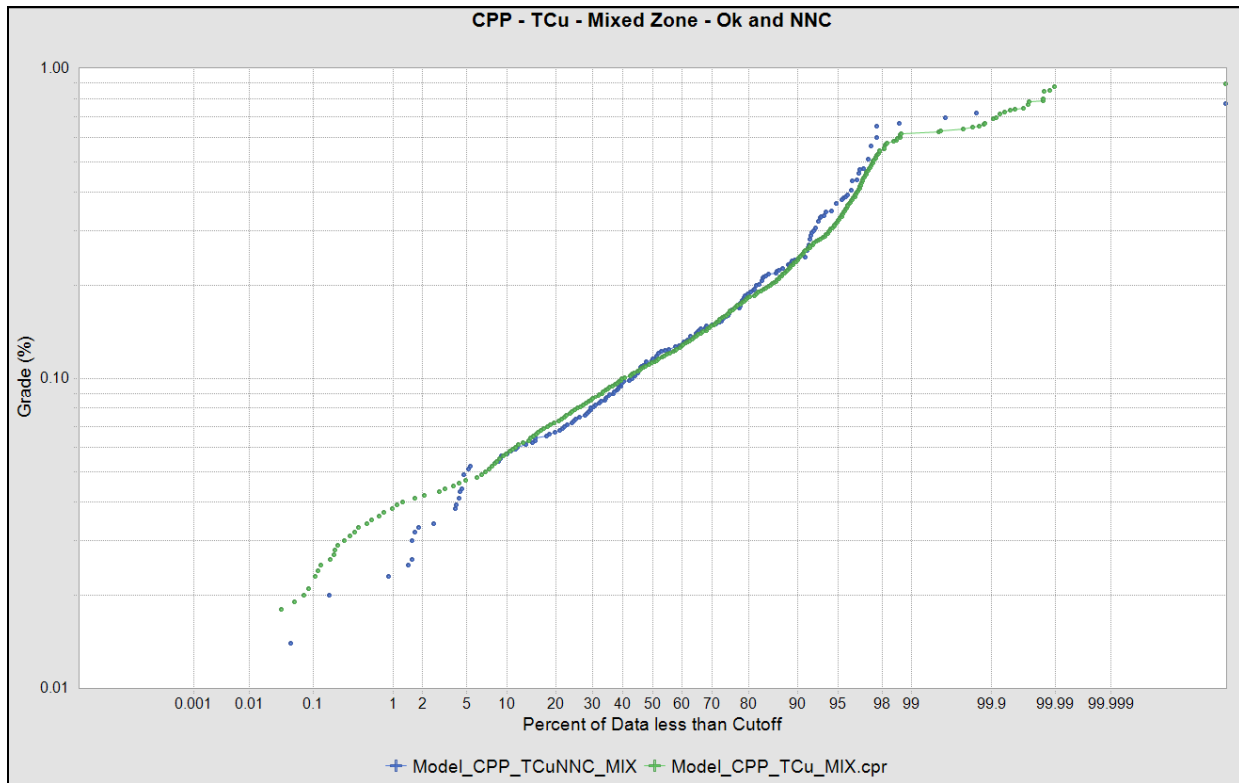
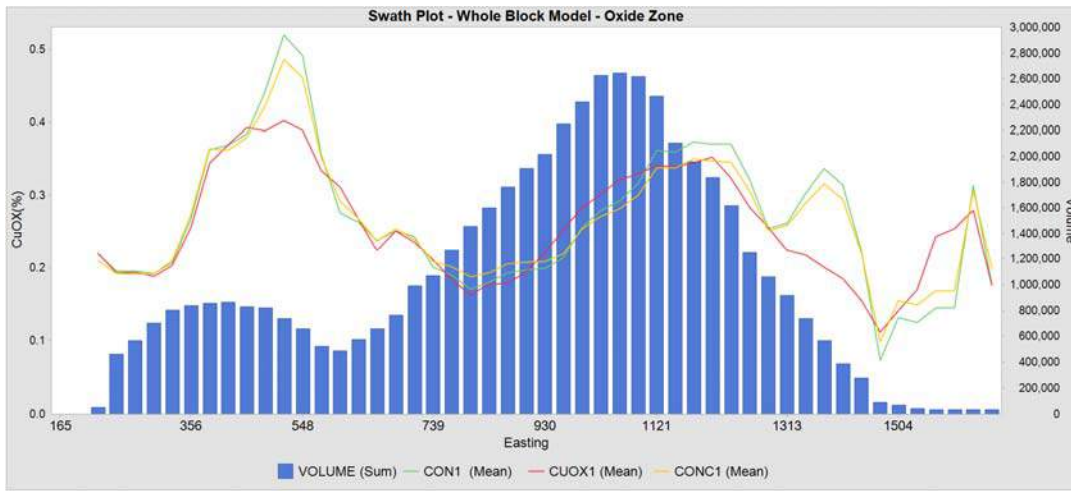


Figure 14-18 Comparison of TCu-OK (green) with TCu- NNC (blue) - Mixed Zone

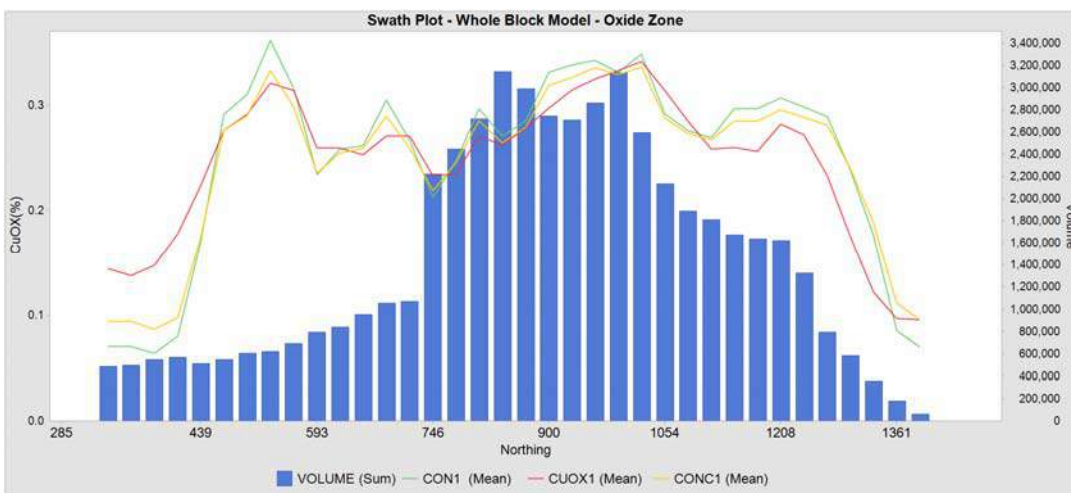
### 14.9.3 Swath Plots

Swath plots by zone are created in an along strike (N25E), across strike (N115E) and in vertical directions to compare the OK grades, the Nearest Neighbour (NN), and Nearest Neighbour-correct (NNC) grades. Acid soluble copper oxide grades in the oxide zone (CuOx) are illustrated in Figure 14-19 through Figure 14-21, with total copper (TCu) in the mixed zone plotted in Figure 14-22 through Figure 14-24. The bar graph in each plot indicates the volume of blocks used for the swath plot averaging.

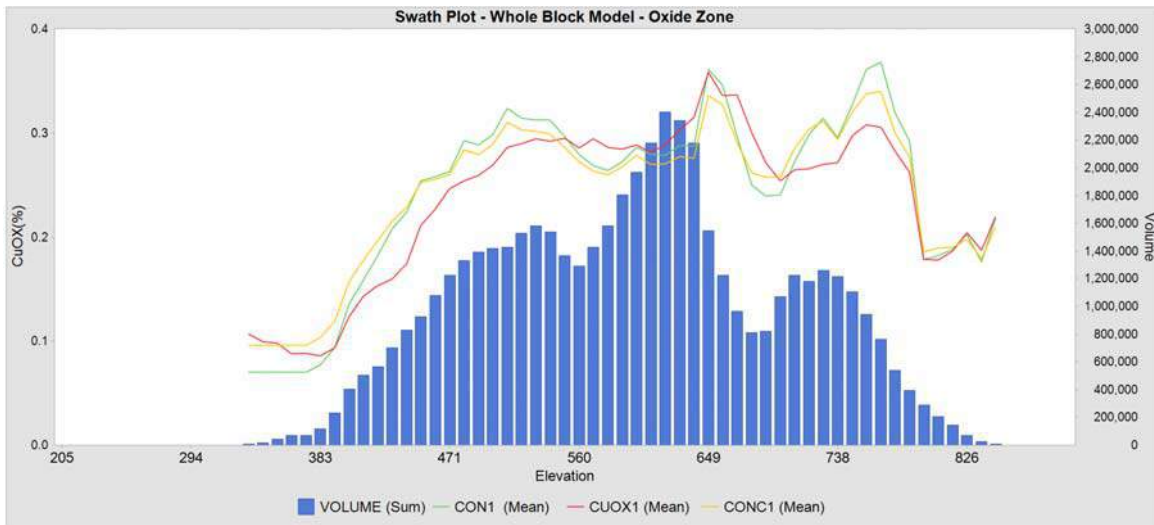
The swath plots indicate no global bias in the kriged values, and good correlation in the main body of the data.



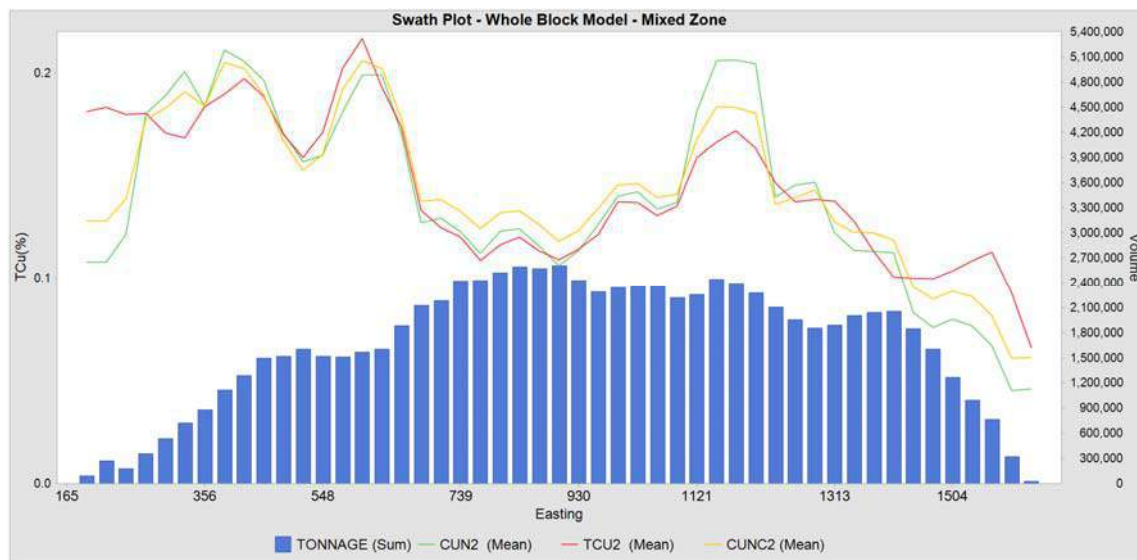
**Figure 14-19 Swath Plot by Easting of CuOx Grade in the Oxide Zone**



**Figure 14-20 Swath Plot by Northing of CuOx Grade in the Oxide Zone**



**Figure 14-21 Swath Plot by Elevation of CuOx Grade in the Oxide Zone**



**Figure 14-22 Swath Plot by Easting of TCu Grade in the Mixed Zone**

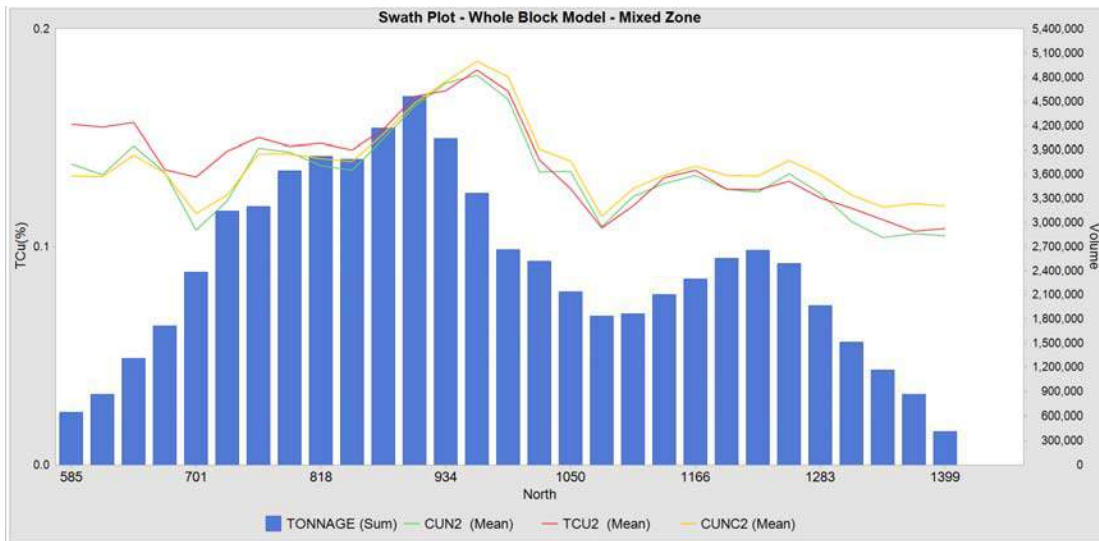


Figure 14-23 Swath Plot by Northing of TCU Grade in the Mixed Zone

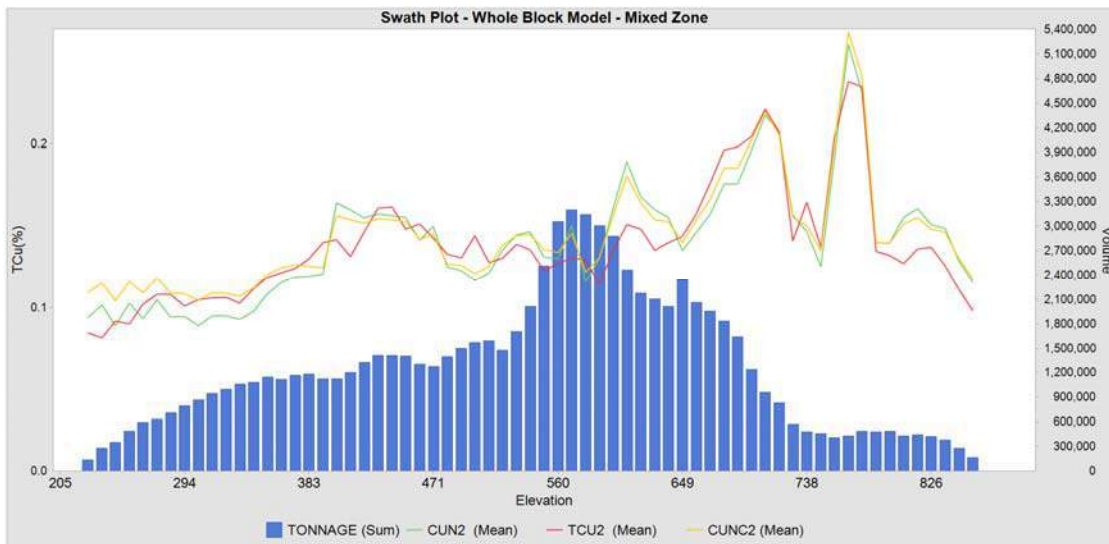
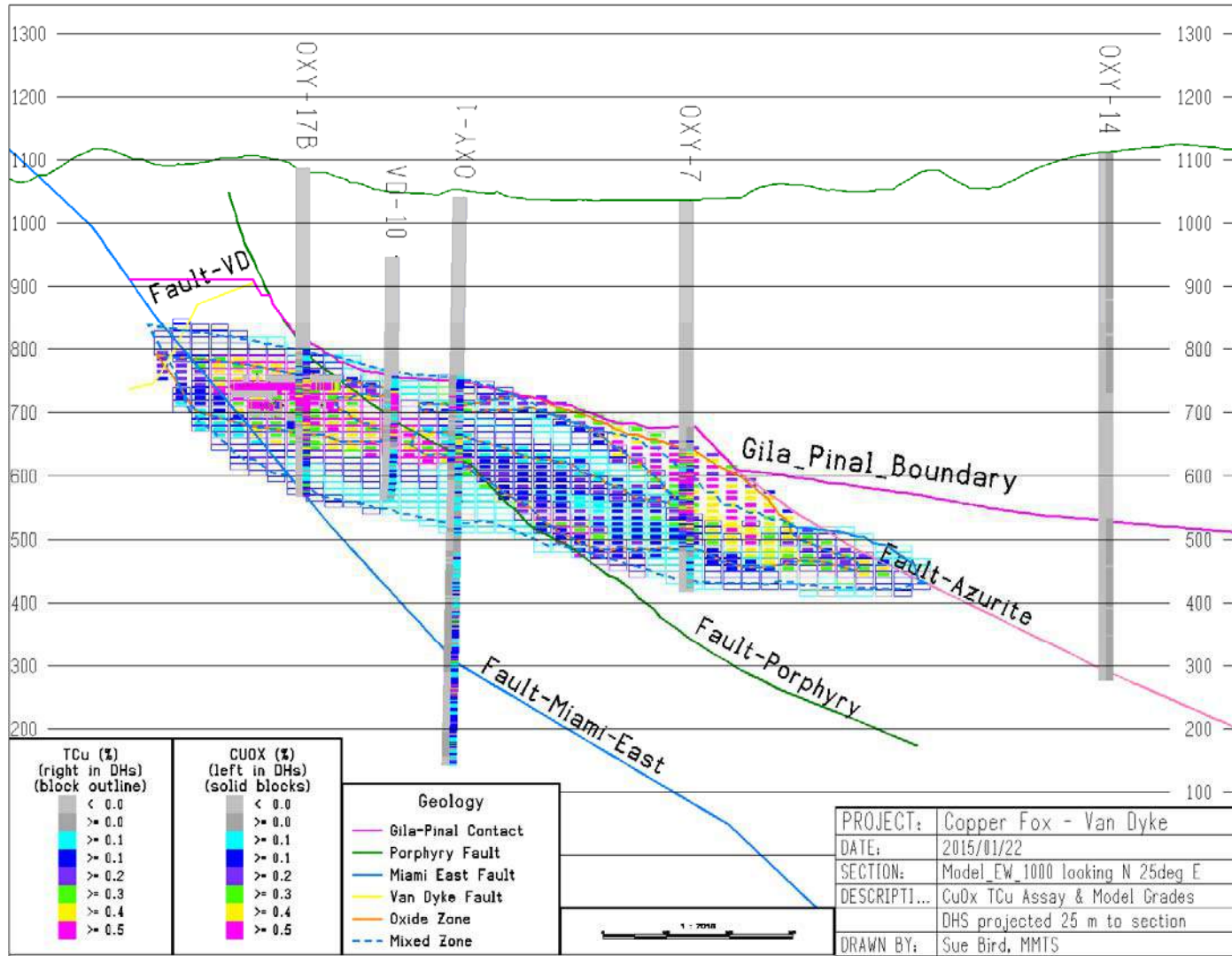


Figure 14-24 Swath Plot by Elevation of TCU Grade in the Mixed Zone

**Visual Validation**

A series of E-W, N-S sections (every 30m) and plans (every 10m) corresponding to the block dimensions have been inspected to ensure that the OK interpolation is representative of the original assay data throughout the model. Figure 14-25 and Figure 14-26 are cross and long sections respectively. These sections are at the same locations as illustrated in the plan of Figure 14-6. Plots throughout the model confirmed that the block model grades corresponded well with the assayed grades.



**Figure 14-25** Cross Section at Model-1000 looking N25E - Model and Assay Grades

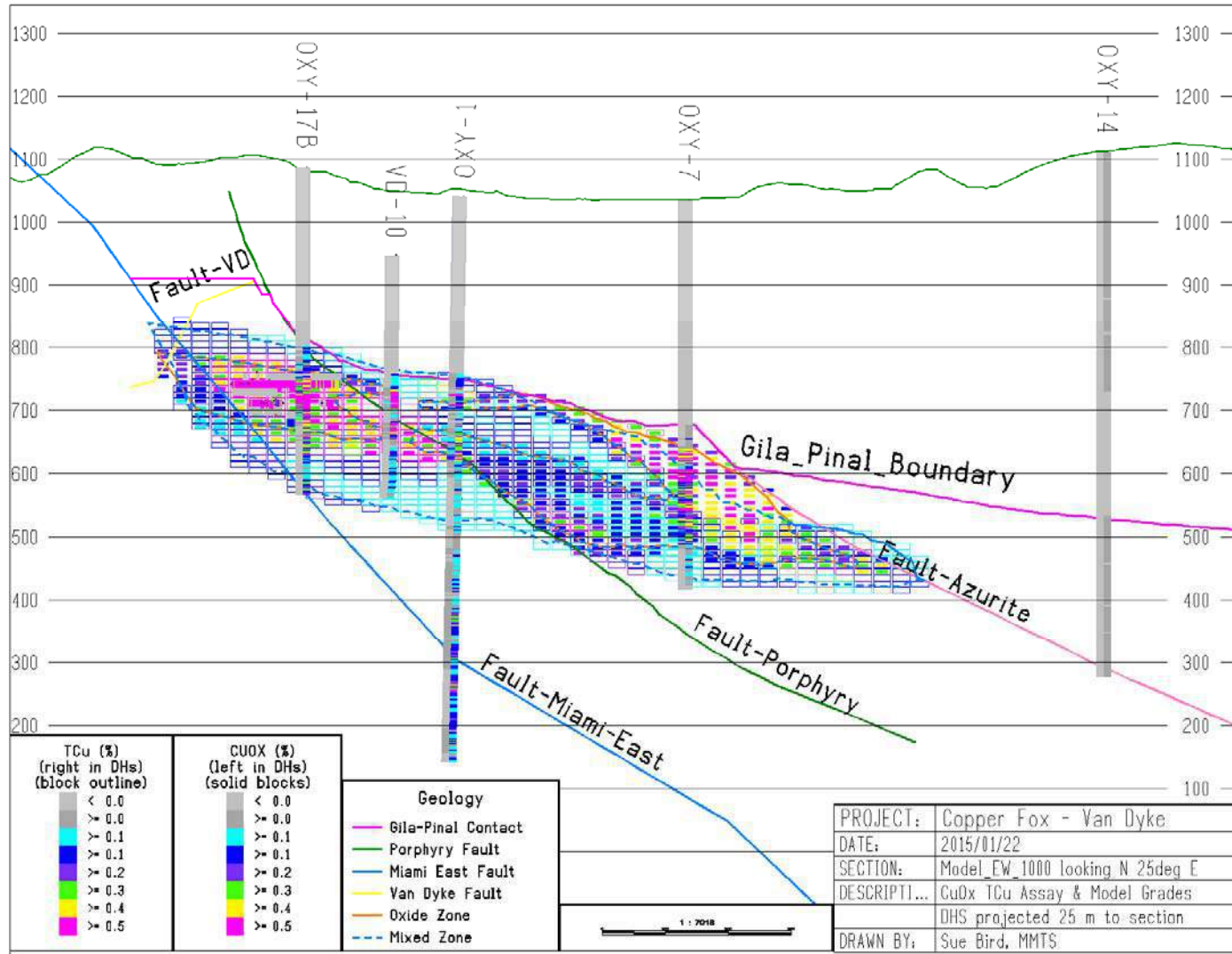


Figure 14-26 Long Section looking N65W - Model and Assay Grades

### 14.10 Van Dyke Resource Estimate

The resource estimate of the Van Dyke deposit has an effective date of December 17, 2014.

The mineral resource is estimated uses criteria consistent with the CIM Definition Standards (2014) and in conformity with CIM “Estimation of Mineral Resources and Mineral Reserves Best Practice” (2003) guidelines. The estimated Inferred mineral resource is categorized and tabulated in Table 14-10.

In order to account for 12.7 Mlbs of Cu removed during historic mining operations, it has been assumed that all previous mining occurred in the Oxide Zone. The tonnage has been reduced by the amount required to reduce the total resource by the mined amount, with the average grades remaining constant.

The Base Case at a 0.05% TCu cut-off is highlighted and is considered an appropriate cut-off for the extraction of copper by eventual in situ leaching, as determined by a literature review of similar properties in Arizona (HDI-Curis, 2013 and Excelsior, 2011). There are no known environmental, permitting, legal, title, taxation, socio-economic, marketing and political or other factors that could materially affect the resource estimate.

**Table 14-10 Resource Estimate for the Van Dyke Deposit**

Zone	Cut-off (TCu %)	Mineralized Tonnage (tonnes)	TCu (%)	ASCu (%)	ASCu/TCu	Total Cu metal (Mlbs)	Oxide Cu metal (Mlbs)
Oxide	0.05	101,524,000	0.416	0.261	0.675	931	579
	0.1	100,637,000	0.419	0.262	0.675	930	577
	0.15	96,424,000	0.432	0.269	0.673	917	567
	0.2	83,982,000	0.469	0.291	0.677	869	534
Mixed	0.05	160,158,000	0.144	0.042	0.327	509	147
	0.1	102,060,000	0.183	0.046	0.274	411	104
	0.15	46,309,000	0.257	0.054	0.218	262	55
	0.2	24,964,000	0.329	0.062	0.180	181	34
Total	0.05	261,682,000	0.250	0.127	0.462	1,440	726
	0.1	202,697,000	0.300	0.153	0.473	1,341	681
	0.15	142,733,000	0.375	0.199	0.525	1,180	622
	0.2	108,946,000	0.437	0.238	0.563	1,050	568



## **15 Mineral Reserve Estimates**

The Van Dyke Copper Project is not an 'advanced property' as defined by NI 43-101; therefore this section is not applicable.

## **16 Mining Method**

The Van Dyke Copper Project is not an 'advanced property' as defined by NI 43-101; therefore this section is not applicable.

## **17 Recovery Methods**

The Van Dyke Copper Project is not an 'advanced property' as defined by NI 43-101; therefore this section is not applicable.

## **18 Project Infrastructure**

The Van Dyke Copper Project is not an 'advanced property' as defined by NI 43-101; therefore this section is not applicable.

## **19 Market Studies and Contracts**

The Van Dyke Copper Project is not an 'advanced property' as defined by NI 43-101; therefore this section is not applicable.

## **20 Environmental Studies, Permitting and Social or Community Impact**

The Van Dyke Copper Project is not an 'advanced property' as defined by NI 43-101; therefore this section is not applicable.

## **21 Capital and Operating Costs**

The Van Dyke Copper Project is not an 'advanced property' as defined by NI 43-101; therefore this section is not applicable.

## **22 Economic Analysis**

The Van Dyke Copper Project is not an 'advanced property' as defined by NI 43-101; therefore this section is not applicable.

## **23 Adjacent Properties**

The Van Dyke project is situated in the Globe-Miami mining district, a historically prominent and current copper producing region in southeastern Arizona. The Van Dyke copper deposit occupies a position within the Miami-Inspiration trend of porphyry copper deposits, two of which are adjacent to the Van Dyke project. The Van Dyke copper deposit is separated from the two adjacent copper deposits by faults which are believed to be predominantly extensional. The structural deformation dismembered what was once a contiguous zone of mineralization.

The Miami Unit (Miami-East) property of BHP Copper, Inc. (BHP) lies north and northeast of the Van Dyke property. It was a leaching-only facility since underground mining was completed in 1959; producing copper through in situ leaching of the former block caved underground mine. Additionally, copper was produced by hydraulic mining and reprocessing of historical tailings. Full-scale operations were discontinued in July, 2001; while the site has been primarily on care-and-maintenance since that time, limited production has occurred, but has been included in the company's annual summaries for the Pinto Valley Unit.

The Inspiration mine of Freeport McMoRan Copper & Gold Inc. (Freeport) is located immediately west and northwest of the Van Dyke property. Freeport is mining towards closure at Inspiration. Current operations include leaching by solution extraction/electrowinning (SX/EW), and a smelter and rod mill that also treat cathodes shipped to Inspiration from several of Freeport's other Arizona copper mines.

The principal orebodies of the Miami-Inspiration trend formed along the intrusive contact equally within fractured to brecciated Proterozoic Pinal Schist and Early Tertiary Schultz Granite. The deposits at Inspiration and Miami Unit consisted of irregular, elongate zones of disseminated supergene copper mineralization in which chalcocite was by far the most important ore mineral until later development of lower grade copper oxide zones became economically attractive.

Mineralization on adjacent properties is not necessarily indicative of the mineralization on the Van Dyke project.

## 24 Other Relevant Data and Information

### 24.1 In-Situ Leaching in Arizona

Arizona has nine historical and current copper ISL projects. ISL recovery methods were employed at the Pinto Valley and Miami-East mines in the Globe-Miami mining district. The large San Manuel copper mine, Pinal County, Arizona, was a successful operation that integrated ISL methods with open pit and underground mining methods.

The Florence Copper project of Taseko Mines Ltd., located approximately 65km southwest of the Globe-Miami area, is currently in the process of environmental permitting for an in-situ leaching production test facility. In December, 2014, the Project received a draft underground injection control permit from the US Environmental Protection Agency. The intent of the Florence Copper pilot-scale facility is to demonstrate that the proposed in-situ copper recovery process can be carried out in an environmentally safe manner that protects the groundwater resources of the area.

At the Van Dyke Copper Project, detailed descriptions of the Phase 1 and Phase 2 ISL tests conducted by Occidental are presented in Huff et al. (1981) and Huff et al. (1988). The later ISL performed at Van Dyke by Kocide is summarized by Beard (1990).

### 24.2 Liabilities and Risks

#### 24.2.1 Environmental Liabilities

The Van Dyke Copper Project, and the town of Miami under which it occurs, are encompassed to the west and north by large mining developments including pits, leach pads, dumps and other mining infrastructure.

The Project itself has been the subject of underground development and in situ leaching in the northwest corner of the Project, and widespread surface exploration drilling. The infrastructure remaining from those activities, all of which occurred prior to 1990, includes access roads, equipment laydown areas, drill sites and steel drillhole collars, a copper cementation plant and ancillary facilities, and the Van Dyke Shaft. Most of the historic drill sites occur within the town of Miami and many are encumbered by town infrastructure.

In 2014, Copper Fox installed a locked gate to prevent road access to the northwest corner of the Project where past activity was concentrated; and access to the Van Dyke Shaft was padlocked. During its 2014 exploration drilling program, the company also upgraded or constructed new access and drill sites.

A preliminary environmental overview of the Project was initiated in 2014. The work is ongoing and the status of the Project with respect to environmental liabilities is not yet known.

### **24.2.2 Information Risk**

This Technical Report was prepared by MMTS who, in the preparation of the report, reviewed historical geological data and laboratory results to develop an understanding of the Project. In 2014, resampling of drill core and drill core pulps from eight historic drillholes and the drilling of six drillholes, five of which twinned historic drillholes, coupled with the use of a robust Quality Assurance/Quality Control program, adequately verified the historical data base.

The results of the work are believed to adequately characterize the deposit at an early stage in its assessment. Note that the shape, length, width, depth, and continuity of the mineralized body may change with additional exploration. The mineralized intervals reported represent core lengths and do not necessarily represent the true thickness of mineralized intervals.

A revised database that includes data generated in 2014 was used to develop a geologic model and to calculate an Inferred Mineral Resource for the Van Dyke copper deposit which complies with the requirements of NI 43-101.

### **24.2.3 Operational Risk**

The business of mineral exploration, development and production by their nature contain significant operational risks. The business depends upon, amongst other things, successful prospecting programs and competent management. Profitability and asset values can be affected by unforeseen technical issues and operational circumstances.

### **24.2.4 Political and Economic Risk**

Factors such as political and industrial disruption, currency fluctuations and interest rates could have an impact on future operations; these risks are beyond the control of the company.

## 25 Interpretation and Conclusions

The Van Dyke Copper Project hosts a copper deposit of significance within the prolific Miami-Inspiration trend of porphyry copper and related deposits. The Van Dyke copper deposit lies at a depth of between 185 and 625m under the town of Miami, Arizona.

The Van Dyke Copper Project has been the subject of limited historic underground development, widespread surface exploration drilling and localized in situ leaching. The activities have contributed immensely to the understanding of the Project and generated a valuable data set that forms the basis for advancing the Project.

A 2014 exploration program completed by Desert Fox Copper Inc., a wholly owned subsidiary of Copper Fox Metals, Inc., included sampling and re-analysis of drill core and drill core pulps from eight historic drillholes and the drilling of six new drillholes, five of which were twins of 1970s era drillholes. The results of this work verified the integrity of the historical exploration data base and contributed modern era data that was used to produce an initial NI 43-101 resource estimate for the Project.

Copper mineralization is hosted primarily by variably quartz-sericite-chlorite altered Proterozoic Pinal Schist and is structurally controlled. Mineralization occurs in fractured to shattered to brecciated schist and minor, equally structurally prepared, porphyritic granodiorite of the Tertiary Schultz Granite.

The overall geometry of the Van Dyke copper deposit is that of a fault-bounded gently east-dipping tabular body. The tabular body is situated in the hanging wall of the Miami East fault, a northerly trending, moderately east-dipping normal fault that truncates the Miami Caved deposit to the west. The Miami fault forms the western limit of the Van Dyke deposit and the similar Azurite fault forms the eastern boundary of the deposit. The Porphyry fault, another northerly trending, east dipping normal fault bisects the central part of the deposit. To the north the Van Dyke copper deposit is constrained by the Van Dyke fault and the northern property boundary.

The principal copper minerals of importance in the deposit are malachite, azurite and chrysocolla; tenorite, cuprite, native copper and chalcocite occur in minor amounts. The secondary minerals occur primarily as bands and crustifications, textures that suggest formation was by filling of open spaces. There are no relict sulphide grains in the upper part of the deposit. Beneath the secondary copper mineralization, there exists a thin, supergene zone. It contains sparse malachite, azurite, chrysocolla and chalcocite and is transitional down-section locally into weakly-developed zones of hypogene mineralization, primarily in the western part of the project area.

The secondary copper mineralization that comprises the majority of the Van Dyke copper deposit is believed to have formed from copper laden solutions that migrated laterally and vertically along interconnected fractures and zones of brecciation from the nearby oxidizing copper deposits. The grade of the secondary copper mineralization is in part a function of how well the country rock was structurally prepared prior to the mobilization and deposition of the secondary copper minerals.

Modeling of the Van Dyke copper deposit determined that the extent of the oxide zone is up to 1100m in strike length, 1300m down dip and averages approximately 100m thick.

The quality and density of data was determined to be suitable for calculation of an inferred resource estimate. There is an Inferred resource of 262 Mt at an average total copper grade of 0.25% TCu within the Patented Claims of the Van Dyke Deposit, at the base case cut-off of 0.05%. The resource at varying TCu cut-off values is presented in the Table below.

**Table 25-1 Inferred Resource of the Van Dyke Deposit**

Zone	Cut-off (TCu %)	tonnes	TCu (%)	CuOx (%)	CuOx/TCu	Total metal (Mlbs)	Oxide metal (Mlbs)
Oxide	0.05	101,524,000	0.416	0.261	0.626	931	579
	0.1	100,637,000	0.419	0.262	0.626	930	577
	0.15	96,424,000	0.432	0.269	0.623	917	567
	0.2	83,982,000	0.469	0.291	0.620	869	534
Mixed	0.05	160,158,000	0.144	0.042	0.289	509	147
	0.1	102,060,000	0.183	0.046	0.252	411	104
	0.15	46,309,000	0.257	0.054	0.212	262	55
	0.2	24,964,000	0.329	0.062	0.189	181	34
Total	0.05	261,682,000	0.250	0.127	0.507	1,440	726
	0.1	202,697,000	0.300	0.153	0.511	1,341	681
	0.15	142,733,000	0.375	0.199	0.532	1,180	622
	0.2	108,946,000	0.437	0.238	0.545	1,050	568

Modeling of the deposit also shows that the deposit is open to the south and southwest, where additional drilling is recommended as outlined in Section 26.

The Van Dyke Copper Project hosts a copper deposit of significance that warrants further detailed assessment and additional exploration aimed at expanding, and upgrading the quality of the resource.

Additional assessments are underway to further the understanding of the deposit as an in situ leach operation. Studies include geotechnical data collection and analysis, and metallurgical testing to help determine the overall recovery values of the deposit through in situ leaching.

## 26 Recommendations

The following recommendations are based upon the review of historic and 2014 data for the Van Dyke Copper Project.

Any remaining stored historic drill core and/or drill core pulps should be assayed in order to further enhance the data set. Cyanide soluble copper analysis should be completed on all remaining drill core and/or drill core pulps and should be a standard analytical technique used in any future drilling programs.

Future drill programs should utilize robust QA/QC procedures similar to those implemented in 2014. The use of drillhole logs that allow for detailed geological descriptions is encouraged, as is the collection of geotechnical data and metallurgical samples.

The purpose of the recommended exploration program is two-fold: 1) to expand the area of mineralization laterally from the present deposit area that is not confined by property boundaries, and 2) to upgrade the quality of the resource from the Inferred category.

- 1) An 8-hole, 4200-metre diamond drill program is recommended to evaluate the untested area south of the Van Dyke Shaft where the deposit is open for possible expansion.
- 2) A 10-hole, 6000-metre program of infill diamond drilling is recommended to provide tighter drill spacing in areas east-southeast of the Van Dyke Shaft and to allow for a higher level of confidence in future resource estimates.

The recommended program has an estimated cost of \$4.675 million (Table 26-1).

**Table 26-1 Summary of Recommended Drill Expenditures**

<b>Drilling</b>	\$3,500,000
<b>Assaying</b>	\$225,000
<b>Geological Staff</b>	\$200,000
<b>Field Work &amp; Contract Labour</b>	\$150,000
<b>Downhole Geophysics</b>	\$50,000
<b>Accommodation &amp; Meals</b>	\$300,000
<b>Field Supplies</b>	\$50,000
<b>Transportation</b>	\$50,000
<b>Travel</b>	\$25,000
<b>Community Relations</b>	\$50,000
<b>Permitting &amp; Legal</b>	\$50,000
<b>Data Compilation &amp; Reporting</b>	\$25,000
<b>Total</b>	<b>\$4,675,000</b>

Additionally, it is recommended that a Preliminary Economic Assessment (PEA) is completed to determine the practicality of the proposed in situ leach method, the layout of injection and recovery wells required for optimum recovery of copper from the oxide zone, and preliminary (scoping level) operating and capital costs as well as project economics for the Van Dyke Copper Project.

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