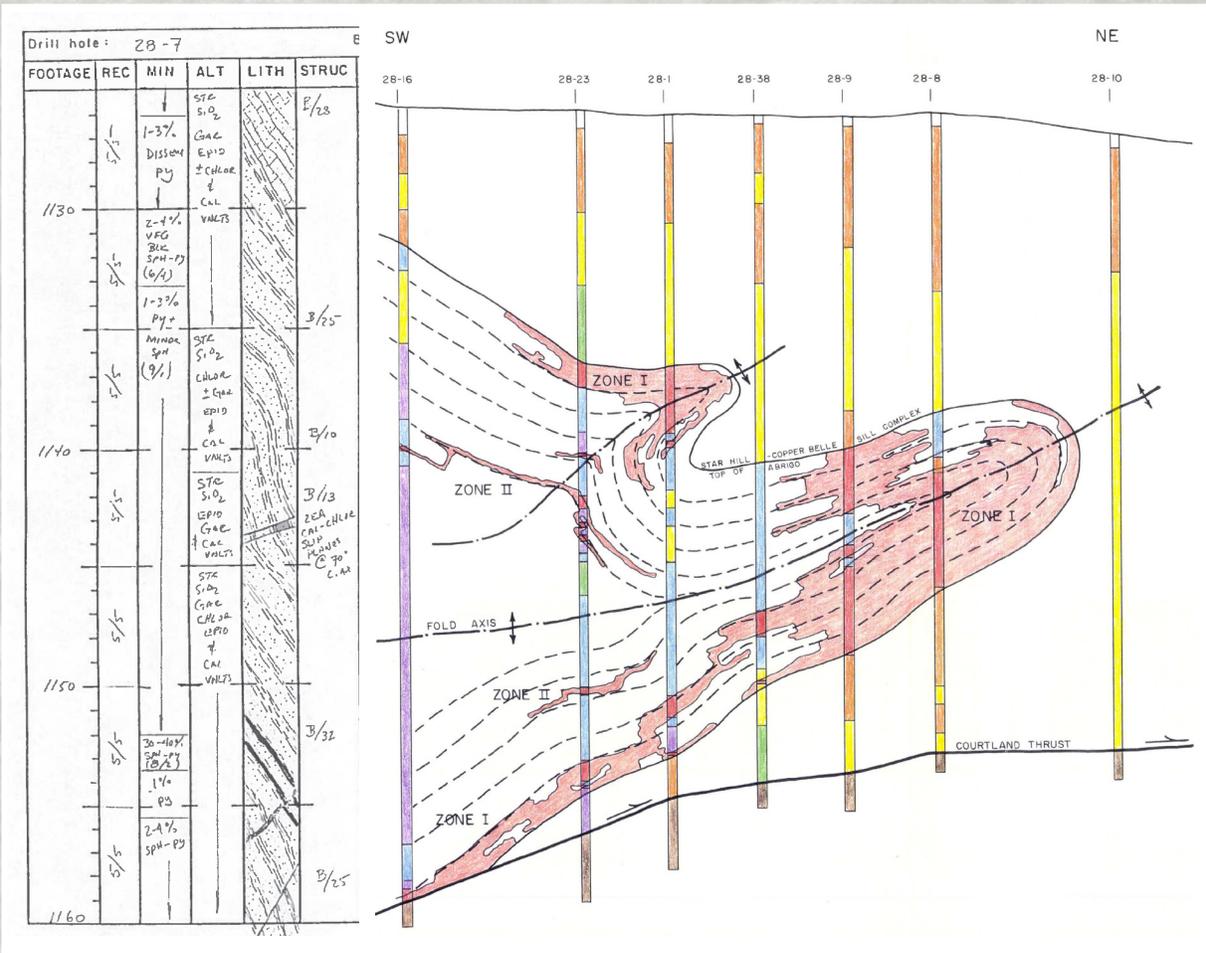


Drill core data for the Courtland-Gleeson area, Turquoise mining district and southern Dragoon Mountains, Cochise County, Arizona

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Cover Image: Left: Graphical drill log page from drill hole 28-7 (this report). Right: Geologic cross section through the Star Hill area from Santa Fe Pacific Gold Corporation Report (available at <http://docs.azgs.az.gov/SpecColl/2012-01/2012-01-0076.pdf>).



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Abstract

The Arizona Geological Survey (AZGS) is determined to provide digital access to geological data whenever possible. As part of these efforts, archival data associated with drill core from the Courtland-Gleeson area has been scanned and tabulated as part of this data set. This data set comprises drill logs, assays, company reports and maps, core photos, geophysical studies, and correspondence. The tabulated drill data represents 25,935 m (85,087 feet or 16.1 miles) of drilling for lithology, alteration, mineralization, structure, and assays across 113 drill holes. Two geologic maps originally made by exploration geologists were digitized to provide context for the drill holes. The tabulated data is available as a set of spreadsheets, and also available as an interactive webmap, where direct links are provided to the original files from which this data set was generated.

Location and Brief Overview

The study area includes the southern Dragoon Mountains in Cochise County, southeastern Arizona (Fig. 1). Elevations vary across the study area from 7150 feet in the Dragoon Mountains to 4400 feet in the southeast. The area lies within the Sonoran Desert with large areas of relatively open desert in the adjacent southern San Pedro and Sulphur Springs Valleys punctuated by thick brush zones along major washes.

Early workers in the area include Wilson (1927) and Gilluly (1956) who sought to provide a better understanding of the geology of the famed mining districts in southeastern Arizona. The Courtland-Gleeson area hosts Jurassic porphyry copper mineralization and carbonate replacement mineralization in the adjacent Paleozoic carbonate units with an unclear temporal relation to caldera formation (Lipman and Hagstrum, 1992; Lang, 2001).

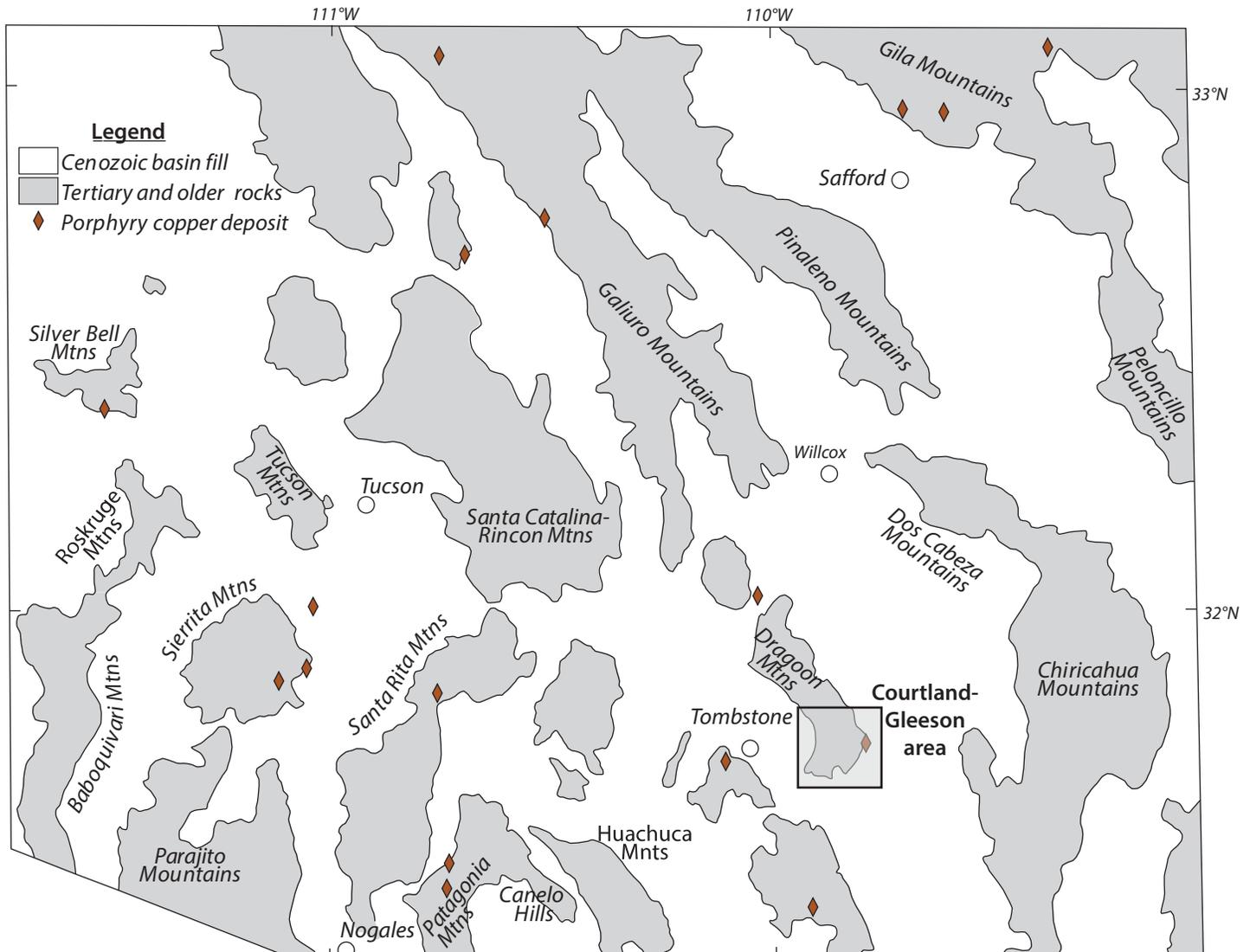


Figure 1. Generalized map of southeastern Arizona, showing location of key towns and cities, porphyry copper deposits, mountain ranges, and the Courtland-Gleeson area in the southeastern quarter of the map (modified from Lipman and Sawyer, 1985).

Sources of Data

The Arizona Geological Survey (AZGS) has long served as an archival repository for geological data in Arizona. From 1992 to 2016, AZGS actively maintained a repository of donated mineral exploration drill core from across Arizona called the AZGS Core Repository (Duncan and Spencer, 1993). Some of the core was accompanied by unpublished reports, drill logs, and assays, but often without documentation beyond the drill core itself. The physical drill core component of the archive is currently in storage due to financial and space limitations; however, the accompanying data from the Courtland-Gleeson area was especially well-documented, complete with copious reports, drill logs, assays, and core photos, and thus selected for digitization.

The data included in this synthesis is derived from multiple sources. The bulk of the drill core data herein is from Santa Fe Pacific Gold Corporation's exploration work in the last 1980's-early 1990's. Additional drill core data reflects donated material from work conducted by Bear Creek Mining, Mineral Exploration Company, CAP II, and ASARCO. Much of this was undigitized, though some was previously available through the AZGS Mine Data website (minedata.azgs.arizona.edu).

Drill hole locations were determined from geo-

referenced maps. In some instances, there was conflicting locations for drill hole locations from different maps. The conflicting information was attributed to: 1) a matter of scale, where more detailed maps were given preference over larger-scale maps, and 2) miscommunication about drill hole locations of past exploration work. Aerial imagery was utilized to help validate potential locations. Also included are the locations of numerous drill holes for which AZGS does not have any data in its archives. These drill holes would be included in Table 8. Drill Hole Location and Orientation Data, but would lack available drill logs (column H). We note them so that if users have data in their own collections, they might relate them to this project, or if willing, share data with AZGS for a future updated version of this report. The full list of known drill holes is only available in Table 8. Locations are determined from best available data, but accuracy of locations are not guaranteed and exploration geologists working in this district should confirm all data contained in this report before making exploration and financial decisions.

Data: What is included, how it is made available, and caveats

The resultant data from this project is made available in the following formats: an ArcOnline webmap, two map plates, and tabulated spreadsheets.

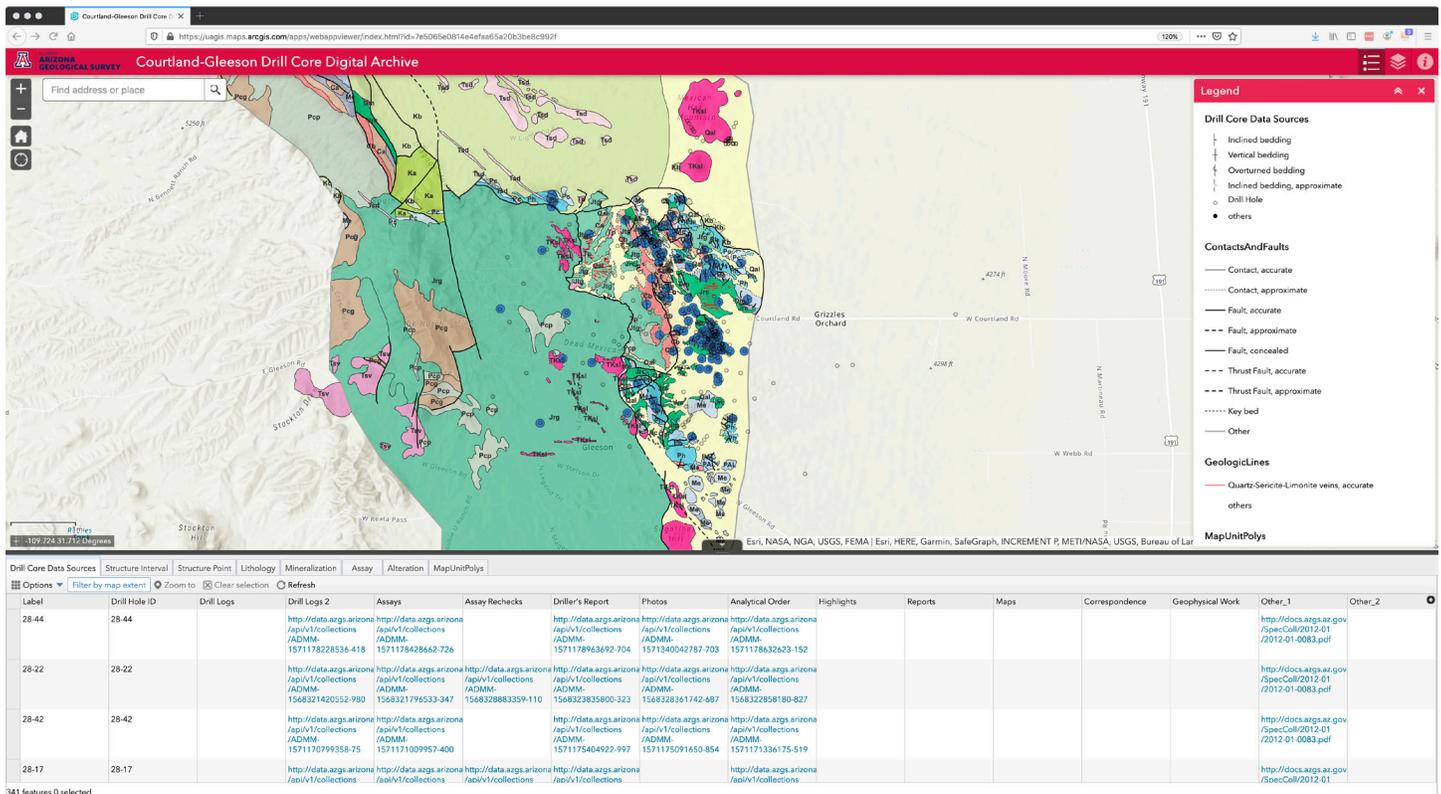


Figure 2. Screenshot of Courtland-Gleeson Drill Core Digital Archive webmap.

The ArcOnline webmap is an interactive viewer where all of the drill core data is displayed as a user aid for readers. Upon opening the webmap and agreeing to the terms and conditions, the geologic map with drill hole locations will be displayed in the top of the screen with the legend along the righthand side. Along the bottom of the screen will be a table with a series of tabs along its top margin (Fig. 2). The first tab, Drill Core Data Sources, provides download links for the original data sources for each drill hole. There is wide variability in the amount of available data for each drill hole. The next six tabs (Structure Interval, Structure Point, Lithology, Mineralization, Assay, and Alteration) provide the tabulated data for each category.

The two map plates are derived from past mineral exploration efforts in the Courtland-Gleeson. The plate covering the southern Dragoon Mountains is derived from a Santa Fe Pacific Gold Corporation map, while the Courtland-Gleeson map is from a Bear Creek Mining map.

The tabulated drill data is provided as a set of workbooks comprising seven categories displayed in the webmap, as well as an eighth spreadsheet detailing the location, azimuth, inclination, and total depth of each drill hole. Survey data describing down-hole deviation that may or may not occur with each drill hole was unavailable. Each spreadsheet has a key for abbreviated terminology as a second tab. The tabulated data is provided for exploration geologists and other interested parties to import into the software of their choice. However, the tabulated data may require effort on the user's part to configure into the exact specifications for their particular software. The author provided quality assurance/quality control (QAQC) on data tabulation throughout the project; however, given the large size of this data set, this information should be considered preliminary because it has not been thoroughly edited or checked for completeness or accuracy. The original material with links provided in the Data Sources spreadsheet should be consulted to verify the data to the satisfaction of each user.

Mineralization data was originally reported in paper logs as total percentage of ore minerals, either as a single value or a range, with the ore minerals listed in decreasing proportion summed to 100%. The proportional abundances were converted to percentages for each ore mineral, and in some cases are reported beyond their true precision. An example original entry of 40% py > gl > cpy 75/22/3, would be tabulated as 30% pyrite, 8.8% galena, and 1.2% chalcopyrite.

Two caveats to consider with this data: 1) the variation in descriptions and uniformity between different data sources, and 2) the lack of applied interpretation. The majority of the tabulated data was derived from drilling by Santa Fe Pacific Gold which utilized a systematic stratigraphy. Only a portion of the older drilling efforts were tabulated, due to the lack of a defined rock units, and in some cases rock descriptions, to which to classify the drill hole lithology (e.g., if a drill log reported limestone, it's not clear with which unit the limestone would correlate). We provide access to the original logs through this data release and encourage interested parties to examine proximal drill holes to see how rock types might be expected to correlate and project into these uncertain drill holes. The other major component to bear in mind is that every effort was made to apply no additional interpretation beyond what was included by the original workers. Only in instances of obvious conflict or lack of data (e.g., multiple potential locations for drill holes or unlabeled map polygons) were additional resources consulted or inferences made to supply information beyond what the original workers provided.

Acknowledgements

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This project would not be possible without the generosity and forethought of geologists over the last half-century who entrusted the Arizona Geological Survey with their exploration data following exploration project closures and company restructurings. Many, if not most, names are unfortunately unknown, but the geologists of Bear Creek, ASARCO, Santa Fe Pacific Gold, Minex, and CAP II are thanked for their significant time and effort they put into collecting this data.

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