

## Table of Contents

10	Historical and Cultural Properties Survey.....	10-1
	10.1 Introduction and Background.....	10-1
	10.2 Sampling Objectives.....	10-2
	10.3 Sampling Frequency.....	10-3
	10.4 List of Data to be Collected.....	10-3
	10.5 Methods of Collection .....	10-3
	10.5.1 Site Definition .....	10-3
	10.5.2 Site Recording.....	10-4
	10.5.3 Isolated Manifestation Recording .....	10-5
	10.5.4 Mapping.....	10-5
	10.5.5 Historical Cultural Properties.....	10-5
	10.6 Parameters to be Analyzed.....	10-6
	10.7 Map Showing Proposed Sampling Locations.....	10-6
	10.8 Laboratory and Field Quality Assurance Plans .....	10-6
	10.9 Discussion in Support of Sampling Proposal.....	10-6
	10.10 References .....	10-7

## List of Figures

Figure 10-1 Aerial Photograph Showing the Proposed Survey Area for Cultural Resources Investigation



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## 10 Historical and Cultural Properties Survey

Several cultural resources surveys have been conducted at the Copper Flat Mine Permit Area (Site) since 1976. The initial surveys were conducted for the 1977 and 1978 environmental assessments (Glover, 1977; BLM, 1978). A subsequent Class III (100-percent pedestrian coverage) cultural resources survey was conducted by Mariah Associates for Gold Express in 1991 (Evaskovich and Higgins, 1991). In response to comments from the New Mexico State Historic Preservation Officer (SHPO) in August 1995, Alta contracted with Human Systems Research of Las Cruces to resurvey all of the undisturbed portions of the Project not covered by the 1991 survey. The results of this survey were filed with the SHPO in October 1995 (Sechrist and Laumbach, 1995). SHPO representatives have indicated that a new survey of the undisturbed areas may not be needed at this time. Because the most recent survey was conducted more than 10 years ago, the lead federal agency for cultural resource compliance review (Bureau of Land Management [BLM]) and SHPO will review the previous surveys for sufficiency and consistency with current standards for survey investigations. This review will also consider the probability of new sites having become exposed in the interim through processes such as dune formation or movement. If it is determined that a new pedestrian survey is not needed prior to construction, the fieldwork effort for cultural resources likely will be limited to revisiting previously recorded sites to evaluate their current condition and to reassess potential impacts to these resources from the proposed Project.

A number of prehistoric and historic sites eligible for listing in the National Register of Historic Places have been identified at the Site. Where possible, identified sites will be avoided by modifying the design of project components. For sites that might be impacted by the Project, and for which avoidance is not feasible, the New Mexico Copper Corporation (NMCC) will contract with qualified archaeologists to prepare a recovery plan to collect appropriate data and to minimize and mitigate adverse effects to cultural resources resulting from the Project. The recovery plan will be implemented following approval by the BLM and SHPO and prior to construction.

The following subsections assume that a new Class III survey of the undisturbed areas of the Project will be required. They are not applicable if it is determined that no cultural resources survey of the area is necessary at this time.

### 10.1 Introduction and Background

By obtaining knowledge of the local cultural history prior to conducting surveys, cultural resource specialists are better able to identify and interpret findings. Understanding the material and spatial correlates of different culture groups through time ensures that cultural items identified during survey are placed and interpreted in the proper context. The cultural-historical sequence for western Sierra County is generally described in terms of five different time periods:

- Paleoindian (9500 to 6000 B.C.)
- Archaic (6000 B.C. to A.D. 200)
- Formative (A.D. 200 to 1400)
- Protohistoric (A.D. 1400 to 1540)
- Historic (A.D. 1540 to 1960)

Paleoindian sites are poorly represented within the archaeological record for western Sierra County, probably because the basins to the east, north, and south provided better hunting grounds for the mobile hunters of this time period, whose subsistence practices were focused on now-extinct Pleistocene megafauna. However, previous archaeological research in the area has documented evidence of relatively consistent prehistoric

occupation during the Archaic and Formative periods (Evaskovich and Higgins, 1991; Laumbach and Kirkpatrick, 1983; Lekson, 1985; Sechrist and Laumbach, 1995).

The most prevalent archaeological sites in the general area are related to historical mining activities. Gold was discovered in the Hillsboro area in 1877 (Harley, 1934) and subsequent historical mining sites include test pits, shafts, stone-walled cabins, dugouts, tent bases, and abandoned settlements (Sechrist and Laumbach, 1995).

An historical Apache occupation in the area is indicated by the identification of a chipped-glass artifact during a previous survey (Bussey and Naylor, 1975) and the presence of gun-ports in a stone cabin at another site (Evaskovich and Higgins, 1991).

Four previous surveys have been conducted within the vicinity of the proposed project area:

- A reconnaissance survey of approximately 6 square miles was conducted by the New Mexico State University Cultural Resources Management Division (CRMD) in 1975 (Bussey and Naylor, 1975).
- A survey of the power line and water line corridors providing utilities to the mine, an access road, and related industrial sites was performed by the CRMD in 1977 (Breathauer and Hoyt, 1977).
- A Class III (100-percent coverage) pedestrian survey of 147 hectares (363.3 acres) on the eastern slope of Animas Peak was conducted by Evaskovich and Higgins in 1991.
- A 229-hectare (565-acre) Class III pedestrian survey of the Copper Flat area was conducted by Human Systems Research, Inc. (HSR) in 1995 (Sechrist and Laumbach, 1995).

This latter survey is of particular interest for the purposes of the current investigation, as 16 archaeological sites and 212 isolated occurrences were documented at that time. Ten of these sites are historical artifact scatters with associated mining and/or habitation features. These include one standing structure, one stone foundation, one tent camp, one mine tunnel, two locations identified as potentially containing graves, and several artifact scatters. The remaining sites consist of 4 flaked-stone artifact scatters, 1 site with evidence of both prehistoric and historic occupations, and 1 prehistoric petroglyph site. The flaked-stone artifact scatters were reported as likely representing Archaic remains based on the presence of diagnostic artifacts and the overall technological attributes of the assemblages (Sechrist and Laumbach, 1995).

NMCC expects that the sites recorded during HSR's 1995 survey will comprise the majority of the cultural resources identified during the current investigation. However, a few new sites may be discovered; these will likely be consistent in type to those previously recorded.

## 10.2 Sampling Objectives

Because the project area includes federally administered land and entails land modification activities, the proposed activity is subject to Section 106 of the National Historic Preservation Act (NHPA, P.L. 89-665, as amended). The NHPA requires consideration of the effects that a proposed undertaking may have on historic properties as defined by this legislation.

The purpose of the cultural resource investigation will be to locate and assess all cultural resources and historic properties within the area of potential effects (APE). The APE—and any potential sampling strategy—will be defined in consultation with the BLM and SHPO. However, surveys conducted for land-modifying undertakings are typically intensive (100-percent pedestrian coverage) and sampling is not a common strategy. That said, standard transect intervals vary between 5 and 15 meters (m) (16 and 49 feet [ft]) and may be considered a limited opportunity to increase or decrease the degree of field review. As with the definition of the APE, the width of the proposed survey intervals will be determined in consultation with the BLM and SHPO. In addition, a large percentage of the project area has been extensively disturbed by previous mining activities and the

agencies may consider a less-intensive sampling strategy (e.g., 30-m [98-ft] transects) in these areas, or may eliminate them from the survey entirely.

### 10.3 Sampling Frequency

As stated above, NMCC anticipates conducting an intensive pedestrian survey of the APE that will be limited to a single-episode field investigation and recording effort. Transects may vary, but are likely to be 15 m (49 ft) in width for the entire APE. This technique is the standard for all cultural resource investigations on BLM property and on lands administered by the State of New Mexico.

### 10.4 List of Data to be Collected

Unless otherwise directed by the BLM and SHPO, no artifacts or other cultural materials will be collected during the proposed investigation. All data will be recorded in the field and all cultural materials will be left in place.

The types of properties or data that may be encountered during the survey of the Site include, but are not limited to, archaeological sites, historical cultural properties (historical period buildings, structures, or objects over 50 years old), historical districts, and isolated manifestations (IMs). An assessment will be made for each resource as to its potential eligibility for nomination to the National Register of Historic Places (NRHP).

### 10.5 Methods of Collection

Prior to conducting the survey, cultural resource specialists will complete a pre-field records review of the New Mexico Cultural Resources Information System (NMCRIIS) database, to obtain information about previously recorded archaeological sites and surveys in the project area and vicinity. In addition, current listings of the NRHP and the New Mexico State Register of Cultural Properties (NMSRCP) will be consulted to determine the known presence of any listed cultural properties or districts within and in the vicinity of the project area. We will also consult with the BLM Las Cruces Field Office to compare the BLM's records with the findings from the other databases.

Resource locations shown on the Hillsboro, NM (1985) and Skute Stone Arroyo, NM (1961) 7.5-minute U.S. Geological Survey (USGS) quadrangle maps will be obtained through the use of Global Positioning System (GPS) receivers. Universal Transverse Mercator (UTM) coordinates will be obtained using both North American Datum (NAD) 27 and NAD 83 projections on a Trimble GeoXM GPS receiver with a positional accuracy of less than 1 m (3.28 ft). Shapefiles of the project area will be created using a geographic information system (GIS) and uploaded to the Trimble GeoXM for cross-referencing purposes. Using ArcPad software, surveyors will follow project boundaries to ensure adequate coverage of the entire survey area. The survey will be conducted by walking parallel transects spaced 15 m (50 ft) apart throughout the entire survey corridor. The GPS-derived locations for IMs and sites will be verified by reference to landscape features and landmarks shown on the USGS quadrangles. All GPS data will then be differentially corrected for sub-meter accuracy.

#### 10.5.1 Site Definition

The definition of a site will follow current BLM guidelines (BLM, 2005), which state that a site is a physical location of past human activities or events, and which further define IMs as sites with fewer than 10 artifacts or a single, undatable feature. Features that may have datable remains, such as deflated thermal features, are also recorded as IMs if they retain little or no integrity and have no associated artifacts.

Following BLM guidelines, sites will be further classified as to whether they are Category 1 or 2, following the current definition in the above-cited guidelines. Category 1 sites are defined as those whose significance lies

solely in their potential to yield information under NRHP eligibility Criterion D. These sites are further defined as having small numbers of artifacts (fewer than 15). In addition, they may be classified as containing few or no features (such as soil stains), with no potential for buried cultural deposits (either demonstrated through limited testing or through surface observations—such as when a given site is on bedrock). Category 2 sites are defined as all other sites not falling under the definition of Category 1 sites (BLM Manual Supplement H-8100-1, New Mexico, Oklahoma, and Texas).

### 10.5.2 Site Recording

All sites will be recorded on Laboratory of Anthropology (LA) Site Record forms. Previously recorded sites are updated using the same form. Supplemental analysis forms are used to record prehistoric and historic artifacts, provide adequate descriptive information for each assemblage, and assign cultural/temporal affiliation, if possible.

Cultural and temporal affiliations will be assigned to sites with diagnostic artifacts and/or features on the basis of widely accepted type descriptions. Complete projectile points and point fragments will be sketched in the field for later typological classification, or to confirm in-field classification. Personnel do not, as a general practice, sketch all diagnostic sherds in the field. Because typological classification of these artifacts is based on numerous technological attributes (e.g., paste color and texture, temper type and size, surface smoothing or polish, and use of mineral or carbon paint) that cannot be efficiently represented in a field sketch for later analysis (in contrast to the primarily morphological attributes of projectile point types), we rely instead on professional experience to conduct in-field analysis of ceramics. Our field crews use field manuals that provide ceramic type descriptions and completed ceramic analysis forms that include entries for typological classification and for various technological and design attributes for artifacts that cannot be confidently classified as to type.

To facilitate relocation, each site will be plotted on the appropriate 7.5-minute USGS quadrangle map and labeled with its LA site number. The location of IMs, site datums, and site boundaries are recorded using a Trimble GeoXM GPS receiver and plotted on the appropriate 7.5-minute USGS quadrangle. Roadcuts and other forms of disturbance are recorded with the GPS receiver at all sites that were designated as having either an eligible or undetermined status regarding inclusion in the NRHP. All GPS data are post-field processed for sub-meter accuracy. The GPS-derived locations for IMs and sites are also verified by reference to landscape features and landmarks shown on the quadrangle maps.

A planview map, drawn to scale, will be prepared for each site and include the following information:

- The assigned LA site number
- The site boundaries and datum location
- A north arrow, scale, and legend
- The location of identified features and the distribution of artifacts
- The location of temporally diagnostic artifacts
- The relationship of site boundaries and cultural remains to known project impact areas, such as roads, and to surrounding environmental features
- The location of photograph points
- The APE boundary

In addition to photographing an overview of the Site, photographs will be taken when necessary for Site documentation, such as when features are visible on sites. Photographs will be logged and their locations plotted on Site sketch maps. Drawings of features and individual diagnostic artifacts will also be produced when applicable.

A site marker will be placed at each of the newly discovered sites. The marker on each site will consist of an aluminum cap attached to a 12-inch piece of rebar. Each marker will be placed within close proximity of the site and noted on the Site planview map.

### 10.5.3 Isolated Manifestation Recording

Locations with fewer than 10 artifacts or a single, undatable feature are considered IMs. Features that may have datable remains, such as deflated or poorly defined thermal features, are also recorded as IMs if they retain little or no integrity and have no associated artifacts. IMs are plotted on the appropriate 7.5-minute USGS quadrangle map and verified with a GPS receiver in the same manner as described for site locations. IMs are documented on IM recording forms. Information recorded for IMs include the area (for IMs consisting of more than one artifact), artifact types, measurements, frequencies, and sketches of diagnostic artifacts.

### 10.5.4 Mapping

Mapping of the project area and its resources will be supported by state-of-the-art equipment, including Trimble GPS receivers with submeter accuracy and a Nikon Total Station, along with the newest software including TerraSync and ArcPad 7x. One of the advantages for this technology is that it allows us to produce archaeological site maps that are more accurate and scalable than those created through traditional methods. Using ArcGIS 9x, geo-referenced digital site data can be related to land-use plans and quickly and cost-effectively display how changes or revisions to any undertaking will affect cultural resources. These highly accurate data will be critical in ensuring that the proposed mining activities are in compliance with Section 106 of the NHPA.

At a minimum, the Universal Transverse Mercator coordinates of all IMs, site datums, features, selected artifacts, and site boundaries will be recorded using a handheld Trimble GPS receiver. All spatial data and descriptive information will be stored on the Trimble unit using TerraSync software and data dictionaries produced with Pathfinder Office software. These files are easily copied to desktop computers in the lab where Site maps and Site plans will be generated using ArcGIS 9x. As directed, all data will be provided in applicable GPS-derived shapefiles. All data distribution and management will be in accordance with applicable regulations such as those found in the BLM Manual (2005), Section 304 of the NHPA, Executive Order 13007, and 43 CFR 7.18.

### 10.5.5 Historical Cultural Properties

In-use historical buildings, structures, and objects will be recorded using the New Mexico Historic Cultural Properties Inventory (HCPI) form. Each building or structure will be photographed and its location recorded with the GPS receiver. Form 1 of the HCPI will be completed for all historical buildings. Form 2 will be completed only for historical buildings that are recommended as being eligible to the NRHP. Acequias will be recorded on the Historic Water Delivery System Inventory Form. These resources will be photographed and their locations recorded with the GPS receiver.

The APE will be evaluated for potential districts and/or landscapes before, during, and after fieldwork using standards outlined in the New Mexico Register (Volume XVI, Issue Number 15, August 15, 2005) and the National Park Service (NPS) National Register Bulletin 30 (McClelland et al., 1999). Other materials used to guide the identification of districts and landscapes include NPS Preservation Brief 36 (Birnbaum, 1994) and the Historic Transportation Corridors thematic issue of Cultural Resource Management (Reilly, 1993). These documents, developed primarily by the NPS, define "landscape," as a site or a district (36 CFR 60.2) in contrast to terms related to eligibility for the NRHP.

As suggested by the NPS in Bulletin 30 (McClelland et al., 1999), researchers define any potential landscape through their choices of historical contexts, period or periods of significance, potential boundaries, and

contributing or non-contributing elements. Defined landscapes are more difficult to characterize than buildings or structures with readily definable physical features and boundaries. However, many landscapes do have tangible features and landscape characteristics resulting from human use.

## 10.6 Parameters to be Analyzed

All cultural resources encountered during the investigation will be evaluated in terms of their eligibility for listing in the NRHP, using the implementing regulations provided in 36 CFR Part 60.4. Furthermore, project-specific treatment recommendations will be provided for all NRHP-eligible cultural resources that may be subject to adverse effects from the proposed undertaking. Traditional cultural properties will be evaluated following guidance provided in National Register Bulletin 38 (Parker and King, 1998). Human remains and associated funerary objects will be treated in accordance with the Native American Graves Protection and Repatriation Act. All assessments will be conducted in close consultation with the BLM, SHPO, and other appropriate consulting parties.

In most cases, the treatment recommendations for cultural resources will include the following statement:

*It is recommended that all project-related activities avoid any cultural resources determined to be eligible for inclusion in the NRHP. If total avoidance is feasible, subject to consultation and comment, the proposed undertaking will have no effect on the documented cultural resources. If complete avoidance is not possible, but the undertaking only affects portions of the sites that lack integrity, the proposed undertaking should have no adverse effect on the qualities that qualify the resources for inclusion in the NRHP. However, if avoidance of potentially intact portions of the site areas is not feasible, then one of two actions is recommended to minimize and mitigate potential adverse effects: (1) The project proponent should prepare a testing and data recovery plan per the New Mexico Administrative Code (NMAC) 4.10.8 and to the standards within NMAC 4.10.16, or (2) the project proponent should prepare a monitoring plan prior to construction per NMAC 4.10.17.11. Either plan should be implemented per agency standards, the NMAC, and in consultation with the SHPO and the Cultural Properties Review Committee (if warranted).*

## 10.7 Map Showing Proposed Sampling Locations

Figure 10-1 illustrates the extent of the mine property. All shaded (yellow) areas will be recommended as the APE—and thus the extent of field investigations, should the BLM and SHPO determine that a survey is required.

## 10.8 Laboratory and Field Quality Assurance Plans

Accurate work and timely deliverables will be provided. Reporting will follow the standards in BLM manual H-8100-1, Chapter 1.B.1 and Appendix 2 (2005). In addition, work will be performed in compliance with all aspects of the NMAC, including NMAC 4.10.15.

## 10.9 Discussion in Support of Sampling Proposal

As stated earlier, sampling is not considered a standard strategy for cultural resource investigations in New Mexico. That said, the extent of recent disturbance at the Site may allow for a reduction in the size of the APE defined by the lead and consulting agencies, or a waiver of the requirement to conduct survey. However, within any area that is determined to require survey, NMCC anticipates using a standard 15-m (49-ft) transect interval, which is otherwise defined as an intensive Class III survey. Any modification to the APE, the survey parameters, or the data collection efforts will be the result of consultation with the BLM and the SHPO.

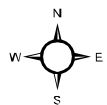
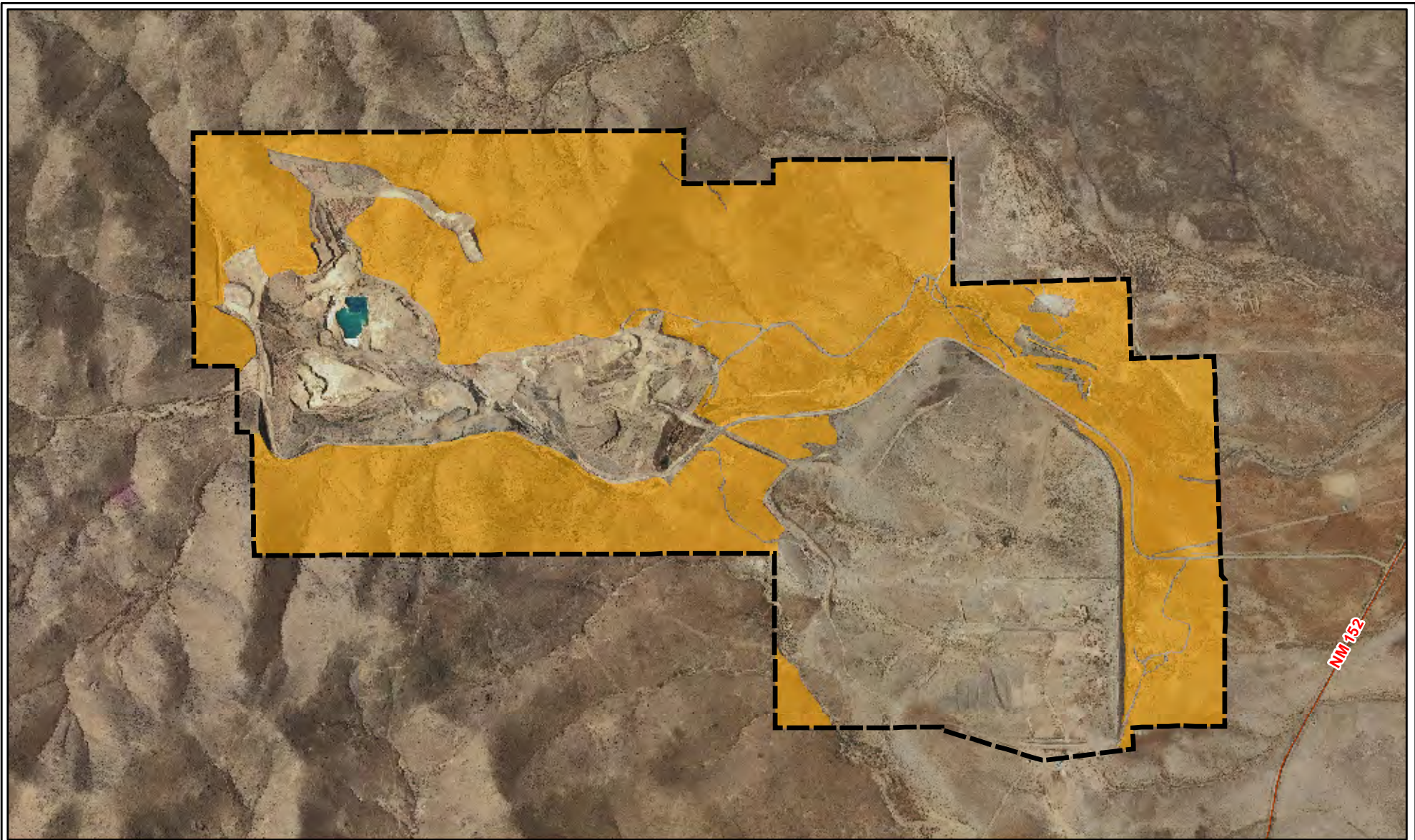


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**Figure**



Mine Boundary:  
Tom Van Bebber  
Survey:

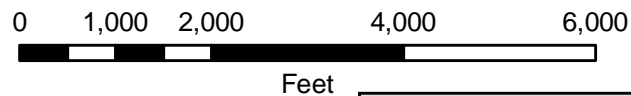
Parametrix

Imagery Information:

-USGS 7.5-Minutes County DOQQ mosaic  
Sierra County, 2009

Projection Information:

-New Mexico State Plane West, NAD 1927



**Legend**



Proposed Mine Permit Boundary



Proposed Cultural Resources Survey Area

**Figure 10-1**  
**Aerial Photograph Showing the**  
**Proposed Survey Area for Cultural**  
**Resources Investigation**  
**New Mexico Copper Corporation**