**Title 33 – Property**

**Chapter 1 – Landmarks and Surveys**

**Article 3 – Arizona Plane Coordinate System**

33-131 Arizona Plane Coordinate System

A. The Arizona Plane Coordinate System (hereinafter “AzPCS”) is the system of plane coordinates which has been established by the U.S. National Geodetic Survey (hereinafter “NGS”) for defining and stating the positions or locations of points on the surface of the earth in this state. The AzPCS is a subset of the national State Plane Coordinate System (hereinafter “SPCS”) and AzPCS and SPCS may be interchangeable terms. The AzPCS is divided into zones of geographic similarity across the state.

B. The AzPCS is a component of the U.S. National Spatial Reference System (hereinafter “NSRS”) as updated and published by the NGS. The NSRS is a national coordinate system that defines the elements of latitude, longitude, height, scale, gravity, and orientation throughout the United States.

C. In any map, report of survey, or geospatial document in which the AzPCS is utilized, the system shall be designated "Arizona Plane Coordinate System ", and appropriate metadata shall be included. “Metadata” for the purpose of this chapter, must include the NSRS reference frame, epoch date, and the name of the appropriate AzPCS zone.

33-132 Coordinates of system

A. The plane coordinates of a point on the earth's surface, to be used in the position or location of such point in the appropriate zone of the AzPCS, shall consist of two distances, expressed in feet and decimals of a foot (foot value 0.3048 meter exact). One of these distances, to be known as the "X-coordinate", or “Easting”, shall give the position in an east-and-west direction, and the other, to be known as the "Y-coordinate", or “Northing”, shall give the position in a north-and-south direction. Coordinates in the AzPCS shall be computed from the NSRS latitude and longitude or vice versa using algorithms and mathematical formulas consistent with those published by NGS. The use of the term “Arizona Plane Coordinate System” or “AzPCS” on any map, report of survey, or geospatial document must be limited to data that is referenced as described above and must have no additional scaling, rotating, translating or other modifications.

B. For the purpose of more precisely defining the AzPCS, the definitions of the NSRS as approved, published and amended/updated by the NGS are adopted.

C. Orthometric heights, when reported must conform to standards adopted by NGS for points included in the NSRS. Additional metadata must be included to document the orthometric heights, when determined and reported on the map, report of survey, or geospatial document in which the AzPCS is utilized.

33-133 Ground markings of the NSRS; accuracy standards; geodetic control stations

A. The position of the AzPCS shall be marked on the ground by geodetic control stations which have been established in conformity with standards and specifications adopted by the NGS for points included in the NSRS.

B. A geodetic control station consists of a bronze, brass, or other metal disc imbedded in concrete or cemented into a hole drilled into a rock outcrop, stainless steel rods driven to refusal and cased in ground access lids, measuring piers and/or antenna masts for direct placement of surveying instruments, or other stable objects suitable for long-term perpetuation of coordinates.

C. Geodetic control stations must be established, if practicable, at publicly accessible locations, notwithstanding limitations to physical access governed by ARS 33-104. D; with public access to data and raw observables from automated observation sites; in accordance with NGS guidelines when applicable.

33-134 Map Data located in more than one zone

If data to be defined by a single description extends into one or more adjacent zones, the position of all points must be referred exclusively to one (1) of the zones, the zone which is used being specifically named in the map, report of survey, or other document in which the AzPCS, is utilized.

33-135 Reliance of purchaser or mortgagee not required

Nothing contained in this article requires any purchaser or mortgagee to rely on any land description, any part of which depends exclusively on the AzPCS.

33-136 Public lands survey descriptions; conflicts; control

If coordinates based on the AzPCS, are used to describe a tract of land which in the same document is also described by reference to a subdivision, line or corner of the United States public land surveys, the description by coordinates shall be construed as supplemental to the basic description of the subdivision, line or corner contained in the official field notes and plat filed of record, and in the event of a conflict the description by reference to the subdivision, line or corner of the United States public land surveys prevails over the description by coordinates.

33-137 Recording, filing, publishing extensions and densifications of the ground marking system

A. Extensions and densifications of the ground marking system of the AzPCS, must be executed in conformity with the standards and specifications of NGS for data to be included in the NSRS.

B. The results of these surveys must be published by a competent department of the federal government, such as NGS, or a surveyor or engineer qualified to practice in this state, in which case the survey results must bear a certification to the effect that the standards, specifications, and guidelines of NGS have been followed, and a statement referenced in 33-131 C shall be included on the face of the published map, report of survey, or geospatial document in which the AZPCS, is utilized.

C. Extensions and densifications of the ground marking system must use relevant NGS standards, specifications, guidelines and recommendations for data to be included in the NSRS. Such extensions and densifications must be integrated with previously established geodetic control stations that are connected to and consistent with the NSRS. Coordinates determined for new stations must have positional accuracies consistent with those published by NGS for NSRS stations in the vicinity of new stations .

D. The results of geodetic control station surveys are public domain and shall be duly recorded in either the office of the county recorder of the county where the geodetic control station is situated; the publicly accessible database of NGS, or both. Notwithstanding the data being public domain physical access to geodetic control stations shall be governed by ARS 33-104.D,

33-138 Recording prerequisite

Coordinates based on the AzPCS, must not be presented to be recorded in any public land records, map, report of survey, or geospatial document unless the recording document also contains the descriptions of not less than two geodetic control stations within the NSRS published by NGS, and which shall not exceed six miles from the nearest point or line of the land survey.