Draft Instructions for Acequia Detail Form

It is important to record acequias because:

- Acequias are historic structure that may be eligible for or listed on the National Register of Historic Places (NRHP) or the State register of Cultural Properties;
- Acequias are historic structures that may be the subject of or affected by undertakings;
- Acequias may be Traditional Cultural Properties;
- Acequias are associated with broad patterns of history, may be associated with important people from the past, and/ormay be unique or typical examples of engineering;
- Acequias have information potential on the scale and extent of social, economic and political systems, or subsystems within larger social, political, economic entities.
- Features on acequias provide information on land use, land tenure, modification, redesign, and changes in technology.

Historic Cultural Properties Inventory (HCPI) Base Form and the Acequia Detail Form

There are two forms needed to record acequias; the Historic Cultural Properties Inventory (HCPI) Base Form and the Acequia Detail Form.

The HCPI Base Form (base form) records basic information about all types of cultural properties, other than archaeological sites. The Base Form is necessary for assigning an HCPI registration number and includes the determination of eligibility and assessment of effect necessary for Section 106 consultations. The instructions for the base form can be found at http://www.nmhistoricpreservation.org/documents/hcpi-forms.html

The Acequia Detail Form documents the condition (integrity) of an acequia to make a determination of eligibility and an assessment of effect. The NRHP's *integrity criteria* provides the structure for the Acequia Detail Form:

- *Location*-where is it?
- *Setting*- geomorphology/landforms, local topography, and the built built environment.
- *Design*- how the irrigation structure fits the topography ting to move water from a source to arable soil. It all includes elements of topography, hydrology, seasonal variation, climate, soils. It also depends on engineering skills, available materials, the potential scale of the delivery system, and the scale of the workforce and organizational skills.
- *Materials*- locally available, composite (concrete), manufactured, repurposed materials.

- *Workmanship*- skilled, unskilled, tools, machinery
- *Association*-period of significance, historic contexts, chronological, ethnic, social, commercial, political.
- *Feeling*- a subjective judgment, or emotional response to the relationship of the acequia to its physical, cultural-historical, and social environment.

The detail form is meant to expedite the documentation of an acequia in the field. Check boxes prompt the recorder to identify the elements that are necessary to evaluate the integrity of an acequia system using the standard integrity criteria: location, setting, design, materials, workmanship, association, and feeling. It is assumed that that the pre-field project scoping also attempted to identify ditches in the area of potential effect (APE). Note that many topographic maps depict named acequias and irrigation ditches in general. Topographic maps also illustrate "gauging stations" or " stream gauges" which are sure signs that acequias originate on the stream.

The instructions use the terms acequia, ditch, and canal interchangeably as shown in the *Surface Water Irrigation Organizations in New Mexico* (New Mexico Office of the State Engineer 1987) However, not all irrigation ditches are supplied by surface water (streams, reservoirs). In the Pecos River Valley artesian wells and springs provided ground water for irrigation from about 1880 until the 1950s. In many other parts of the state, surface water may be supplemented by capturing or redirecting runoff into reservoirs or into small scale ditches.

Additional Resources
Archival- information on acequias may be obtained from the Office of the State Engineer, from the acequia associations, historic maps and aerial photos, soil surveys, and climatic data. The Historic Preservation Division (HPD) has developed a historic context for acequias (Ackerly 1996) that is a valuable source for information on acequias. It should be used with caution because the evaluation and management standards integrated into the context were not adopted by the HPD. Last, local informants and their oral histories and may corroborate or supplement information obtained from archival sources.

HISTORIC ACEQUIA INVENTORY DETAIL FORM

The detail form begins with Section 6, whereas the HCPI Base form ends with Section 5.

Section 6. LOCATION- Location- geographic projections, land survey systems, plss

6.a. On the HCPI Base Form the UTM coordinates serve as a datum to identify the approximate center point for the portion of the acequia registered with ARMS. It should include as much of the structure as can be determined by looking at aerial imagery (e.g. NMCRIS map server or Google Earth), which should be mapped on the map server when the HCPI number is registered. On the detail form, the UTM coordinates provide additional information and includes the entire portion of the acequia that falls within a project APE. For example, if a 400 ft. wide project APE crosses an acequia, the UTM coordinates represent the edges of the survey corridor. If the survey corridor runs parallel to and overlaps with an acequia, the UTM coordinates represent the

beginning and end points where the acequia and APE coincide. You may obtain these GPS coordinates from the GIS (e.g. ArcGIS /ArcMap) applications, the ARMS map, or GoogleEarth.

6.b. Estimate the length of the acequia lateral that falls within the APE. You may use measuring tool in ARMS, ArcGIS/ARCMap, or GoogleEarth, or do it the old-fashioned way with a 7.5 min quadrangle and a scale.

6.c. Estimate the percentage of the *entire* acequia lateral that falls within the project APE. This is important for assessing the project's potential effects to the acequia. To get this number divide the length of acequia in the APE (section 6.b) by the length of the acequia. Limit your estimate to the lateral on the detail form.

Section 7. SETTING.

This section provides information important to understanding the acequia's place in the natural landscape, the cultural landscape it serves, and the acequia's integrity of design and engineering. The section is divided into sections for large landforms, smaller-scale topography, and the cultural setting.

7.a. **General Landform-** chose one that best describes the large-scale physical landscape that surrounding the acequia. Your choice should be based on in-field observations, but should match the topography illustrated on 7.5 minute topographic maps.

7.b. **Local topography**- This section includes the most common topography for acequias, but is not exclusive. Choose the best topographic setting. If the setting is complex, use the other/description line to elaborate.

7.c **Built setting**- This section provides more options than the base form. Options for village plaza and linear villages refer primarily to traditional Hispanic settlement forms. Choose village plaza if the acequia flows thru or adjacent to a village plaza. Choose linear village if the houses are adjacent to the acequia, which usually flow parallel to a road. Suburban areas are near or within cities. Fields have been formally or informally subdivided for residential lots, or where existing fields are surrounded by residential lots. Rural setting implies that few or no buildings are located near the acequia alignment in the project APE. Isolated acequias are rural and appear abandoned and aren't associated with easily defined settlement pattern, fields, or other structures.

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7.d. **Field forms**-
Long lots are the typical Hispanic irrigated field form. The long axis of the irrigated field runs perpendicular to the flow of water in the ditch, whereas the short or often narrow axis of the field is parallel to the ditch.

Rectangular: rectangular fields that do not fit the long lot configuration. They may be generally square or rectangular and need not be uniform in size. The orientation of rectangular fields may vary in relation to the flow of the ditch. Irregular lots are often interspersed among rectangular lots, but in the minority, or may be subdivided in generally rectangular to square plots.

Irregular fields are just that, irregular. They may be found along narrow strips of land between a ditch and a floodplain, or related to modern earth moving technology, land management practices, and patterns of land ownership.

Bordered or waffle gardens: are traditional pueblo method of defining planting beds in small fields.

Residential property describes settings where the ditch irrigates grass covered yards, kitchen or ornamental gardens, and trees. These can be observed in cities, suburbs, around plazas, and cordilleras. It is not meant to imply the ditch is supplies only residential settings, but that is what is observed in the project APE.

"Terraced" can have two meanings. It can describe the relationship among fields on sloping terrain. Or it can describe the subdivisions within a single field. The down-slope edge of the terrace may be supported by a few courses of dry laid rock or it may bordered by an earthen berm. Field observations or historical research may show that narrow terraces were planted with fruit trees. This may also the case on long lots where fruit trees are planted nearest the acequia. Modern equipment is currently used to construct large terraced fields on land that was recently uncultivated.

Destroyed and abandoned fields may not have readily apparent patterns of division except when examined with aerial photography or other documents.

7e. Crop types describes what is observed cultivation patterns, crops, or may reported by people with local knowledge. Crop rotation may result in varied observations overtime.

DESIGN –Ditch details Section 8

8.a Acequias convey water from an abundant source, such as a river or reservoir, though channels that decrease in size until they arrive at the irrigated fields. Section 8 is intended to type

The Main ditch or the Acequia Madre is the largest canal in a system. It originates at the water source and supplies lateral ditches. Mains and acequias madres are often named and illustrated on topographic maps. Acequias built before the advent of modern earth moving technology often follow the topographic contours along valley edges and terraces or benches that define valley flood plains, and are defined by a single berm on the downslope side of the ditch. Ditches constructed with modern machinery are often relatively straight and perched on a substantial double berm that is raised above the ground level, and which is wide enough to provide passage for a truck or backhoe.

Named Laterals- are second order irrigation ditches that originate on main canals or acequia madres and supply third order laterals, or field ditches. Local informants can often provide

names for short segments of laterals no identified on maps. Named laterals that originate on irrigation district main canals are often centuries-old acequia madres that have been incorporated into the large irrigation systems (e.g. Middle Rio Grande Conservancy District, Elephant Butte Irrigation District).

Unnamed / field laterals are often very short and may belong to the landowners**.**

Drain –desague Drains return excess water to the river**.** In traditional Hispanic systems, desagues may be at the terminus of an acequia madre, or where a field lateral ends near the watercourse. Drains typical of the large irrigation/conservancy districts may be as large or larger than the main canals. Drains are usually easy to identify because the ditch bottom is below or near the ground level, they often lack berms, and are usually are bordered by one or maintenance road. They may drain into larger order drains.

Association

8.b Ditch cross section. This section describes the condition of the ditch channel as observed during the survey. A rounded cross-section suggests that the ditch contains some sediment, or has not been recently cleaned. It may also be typical of some hand-poured concrete-lined channels. V- shaped cross-sections are typical of concrete lined canals, constructed with forms and/or machinery. An earthen ditch with verticals walls and a flat bottom implies that it has been recently cleaned, and is functioning. Sediments removed by hand cleaning usually form the berm on the downslope side of the ditch.

8c. Cross section dimensions- Measure the depth and width of the visible channel. Do not include the berms.

8d. Lining: this section provides some information on the integrity of design and materials and workmanship of the ditch**.** Earthen linings probably remain the most common material. But irrigators are prompted to conserve water by lining ditches with concrete, or to bury pipe within ditch channels. Concrete and pipe serve to reduce the amount of water lost to evaporation and infiltration, limit the water available to nearby vegetation, and reduce maintenance and repair costs. Piped ditches may be difficult to identify, but the presence of valves, gates, and siphons on the surface give away their location.

8e. Berms- Berms are the linear mounds of soil that border a ditch and result from ditch excavation and maintenance. On abandoned ditches, the berms may be nearly absent due to erosion, obscured by vegetation, or because sediment has completely filled the ditch.

Single berms are characteristic of ditches built along valley slopes and terraces. They are formed when ditches are cleaned and the removed sediment is tossed on the downslope side of the ditch, and serve to reinforce the bank.

Double berms are characteristic of ditches on nearly level terrain, such as on a floodplain or gentle slopes, or on large ditches that are maintained by machinery such as backhoes. They are

also characteristic of ditches that are raised above the surrounding terrain in order to directly traverse level ground, and often replace ditches that follow the contours of natural terrain.

Berm Dimensions: measure the width from the ditch channel to place where the outside edge of the berm blends with the natural topography. Measure the height of the berm from the upper edge of the channel to the top of the berm. These measurements will be approximate.

8f Easement: The easement allows water users and managers to travel along the ditch for maintenance, access to distant fields, and to manage the distribution of water. Easement boundaries may open, fenced on one side to restrict access among adjacent fields , or fenced to limit travel to the easement itself. The access type can be a narrow path along one or both sides of the ditch. Or it might be one or more two-track roads that allow vehicles and machinery to travel along and maintain the ditch. The easement width can be measured or estimated suing a tape, GPS receiver, or aerial photos.

Water control features

The Platted Land Survey System location is described as Township (North or south), Range (East or West), section number parcel or ¼, ¼, ¼. The PLSS location is included because land patented under the Desert Land Act required that applicants irrigate some portion of their land before obtaining title to up to 640 acres of land. Searches of the General Land Office records for land patented under the Desert Land Act will include PLSS data.

Section 9. Water Control Features

Whereas the acequia conducts water from one place to another, water control features stop and/or redirect the flow of water from one canal to another, to fields, and include drains that ultimately return excess water to natural water courses.

9.a Dams may be formal construction of masonry, concrete, or earth, or composite materials. They may serve as both reservoirs and as the primary diversion for large and extensive irrigation systems. Please note that the Spanish word presa may refer to a formal dam and reservoir or to a less formal structure that slows and diverts a natural water course towards the acequia's first (upstream) reach.

9.b Diversion/Headgate (presa, cabecera): Diversions and headgates divert water from a reservoir or watercourse such as river or stream, into the upper most reach of an acequia, or irrigation canal. Diversion structures can be as simple as brush piled in the stream bed, a loose alignment of boulders, or as complicated as a concrete structure with multiple gates, settling tanks, and sluices to flush away accumulated sediments. There is usually only one diversion structure per acequia or canal, although some diversions may serve more than one canal.

9.c Checks (atarque): Checks are structures that when closed stop the flow of water in the ditch, which turns the upstream reach of the acequia into a reservoir. When the acequia is full, water is diverted to lateral acequias or directly into fields the border the ditch. Checks can be very small

or large structures of concrete and steel. Small temporary checks (atarques) are often fashioned from fabric, pieces of wood or ply wood, which may be anchored by cinderblocks, earth, metal frameworks, or rocks.

9.d Turnouts (*puertas, gates, or tapboxes*) allows water to pass thru the berm of ditch a lateral ditch or directly into a field. They usually include some sort of conduit to allow water to pass through the ditch berm, a structure to support a gate and the conduit, and the gate that opens to allow water to exit the ditch into the conduit. Turnouts can be of many functional designs and materials including wood, concrete, cinderblock, ceramic or plastic pipe, cast iron, and sheet metal. Of the many types of gates found in New Mexico, the compuerta is an important traditional Hispanic design that is a common feature on acequias. Compuertas include a check, which stops the flow along the higher order ditch, and gate that diverts water to a lateral ditch, or sometines directly into a field. The compuerta functions properly only when one gate is open while the other is closed. Many compuertas are maintained and operated by the individual irrigators, and the location of a compuertas often indicates changes in land ownership and/or water rights. In contrast, irrigation ditches where compuertas are absent may indicate systems that were not designed, maintained or managed under traditional acequia organizational systems. These include structures that are part of large irrigation districts, or privately owned ditches.

9.e Drops are structures that facilitate a rapid change in elevation along ditch alignment. They are often incorporated into combination structures, such as compuertas or checks. Drops need to be durable because they are subject to erosion so they are usually made of masonry or concrete, but may also take advantage of natural rock stratums to facilitate elevational changes.

Combination structures have more than one function. Please describe the elements and choose the appropriate check box. Common types include a check and drop, compuertas with bridges, and dams with an gate or other diversion.

Bridges and culverts: Please describe the type of bridge that crosses a ditch or, the type of culvert that carries irrigation water.

Reservoirs: Describe the reservoir. Include information on reservoir's source of water (e.g. river, spring, acequia, windmill, artesian well, dry arroyo, etc), the approximate dimensions, construction materials, and any associated water control features (gates). In the narrative section, please describe the topographic setting. Reservoirs are often located where than capture runoff to supplement water taken from permanent streams or rivers.

Narrative Section

Summarize and synthesize the information entered into the check boxes in the narrative section. It is important for the reviewer and subsequent researches to read a description of the acequia is important because it summarizes Please summarize the information The narrative section of the form.

Significance and Eligibility

Acequias are usually extend beyond the boundaries of a project, unless there is an undertaking that proposes to rehabilitate the entire structure. In such cases, it will be difficult document the entire acequia and evaluate the integrity of all its physical elements. On the other hand, many or most acequias may be eligible for the NRHP based on a relatively simple reading of the significance criteria A, B, C, and D.

- A: Events or broad patterns of history (e.g. Spanish colonization. Mexican Period)
- B: Relationship to individuals important in history (e.g. Don Juan de Oñate in Northern New Mexico, James Hagerman and Charles Eddy in Southeast New Mexico).
- C: Design and engineering (typical or exceptional)
- D: Information potential

In addition, many acequias may well be eligible for the NRHP as Traditional Cultural Properties. The *National Register Bulletin Guidelines for Evaluating and Documenting Traditional Cultural Properties (Bulletin 38)* (Parker and King 1998:1) *(TCPs)* defines TCPS as properties—including a building, site, or structure; groups of buildings sites or structures forming historic districts; landscapes ; and individual objects—that have traditional cultural significance. Bulletin 38 (Parker and King 1998:1) states that " (a) traditional cultural property … is eligible for inclusion in the National Register because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history and (b) are important in maintaining the continuing cultural identity of the community".

If we use as a guide the The New Mexico Acequia Association's (NMAA) the statement of significance from *El Agua es La Vida* campaign, (http://www.lasacequias.org/el-agua-es-vida/) it is easy to conclude that all the acequias within the association are NRHP eligible as TCPS. Here is the NMAAs' significance statement:

"Acequias Are Our Heritage

- *Acequias have sustained our communities for more than 400 years in New Mexico. During this time acequias been a community-based system for making decisions about water rights.*
- *Water is needed for the well-being of our communities. Our ancestors worked hard so that we would have water for our families and animals, as well as our gardens, cornfields, orchards, and pastures.*
- *Acequias are a vital part of our culture by sustaining our food and farming traditions. To grow crops, we need water flowing in our Acequias. We need water locally for many uses now and in the future. "*

HISTORIC CONTEXTS

Hispanic acequias Juan de Onate ordered the construction of the first Hispanic acequias at Santa Cruz in what is now known as the Espanola Valley first acequias were ordered by

Mexican Period acequias from AD 1825 to 1846 are associated Mexican Period acequias associated with Mexican Period Land grants along the east side of the central mountain chain. The grants were meant to buffer or prevent Texans and U.S. migration/settlement/occupation in the eastern part of the state.
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Territorial period acequias

- Privately owned irrigation ditches
- Desert land Act
- Commercial irrigation associations
- Commercial projects Reclamation projects funded Federal projects

Ethnic
Euro-American ranchers
Mormon communities
Euro-American immigrants