Technical Appendix 8

Animas-La Plata Project
Historic Properties Management Plan

DRAFT

The Animas-La Plata Project
Historic Properties Management Plan

SWCA Draft Report
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1. PROJECT OVERVIEW

The Bureau of Reclamation (Reclamation) is planning the Animas-La Plata Project (ALP) in order to meet the provisions of the Colorado Ute Indian Water Rights Settlement Act. The Final Environmental Impact Statement for the ALP includes commitments by Reclamation to mitigate adverse effects to historic properties resulting from the project in accordance with the Archeological and Historic Preservation Act (AHPA) and the National Historic Preservation Act (NHPA). Subsequently a Draft Supplemental Environmental Impact Statement (DSEIS) was published which presented 10 project alternatives. Of these, Refined Alternative 4 was selected as the preferred alternative.

This Historic Properties Management Plan (HPMP) is designed to provide Reclamation and contractors guidelines and standard operating procedures in order to meet compliance and research goals for the ALP project. A plan developed for an earlier alternative (SWCA 1996) has been partially incorporated into this document. This plan presents an overview of the project and the preferred alternative; summarizes the known Historic Properties in the project area and extrapolates the number and types that may be in the unexamined portions of the project area; summarizes three research designs created for the project; and presents a general project management plan which addresses Refined Alternative 4. In addition, a plan which was developed for the Ridges Basin portion of the project is repeated here.

This document is part of a programmatic agreement for the ALP between the Colorado State Historic Preservation Officer (SHPO), the Advisory Council on Historic Preservation, and Bureau of Reclamation.

REFINED ALTERNATIVE 4

Proposed elements of the Animas-La Plata Project are in southwest Colorado (La Plata, Montezuma, and Archuleta counties) and northwest New Mexico (San Juan County). Project undertakings are proposed for four drainages in Colorado between Mesa Verde and Chimney Rock. From west to east these are the Mancos, La Plata, Animas, and Pine River basins; all flow south into the San Juan River basin. The New Mexico portion of the project would follow the San Juan River. Refined Alternative 4 consists of structural and non-structural elements and comprises the Area of Potential Effect for the project. The structural elements are associated with a reservoir system in Ridges Basin southwest of Durango and the Navajo Nation Municipal Pipeline between Farmington and Shiprock, which would provide water for domestic, municipal, industrial, and recreational uses in Colorado and New Mexico.

The proposed structural elements are listed below. See Map 1 for the location of each proposed structural element.

- Durango Pumping Plant
- Ridges Basin Conduit
- Ridges Basin Dam and Reservoir
- Ridges Basin Recreational Element by a non-Federal Entity
- Navajo Nation Municipal Pipeline
- Electrical Transmission Lines
- Relocations: County Road 211, Gas pipelines

The Durango Pumping Plant would conduct water from the Animas River, via the Ridges Basin Conduit, to the Ridges Basin Reservoir. Construction would include the intake structure, a parking area, a surge chamber, and an electrical switchyard.

Ridges Basin Conduit would be built up Bodo Draw and would end at the crest. From the crest the water would flow down a rock-lined channel to the reservoir. The conduit would be 11,200 feet long, 66 inches in diameter, and be buried up to eight feet below the surface.

Ridges Basin Dam would be built approximately three miles upstream of the Basin Creek and Animas River confluence. The dam would be about 500 feet long and 217 feet high and would create a reservoir with a maximum surface area of 1,500 acres at an elevation of 6,882 feet. In addition, a series of vortex weirs would be built in Basin Creek below the dam to control silt transport. These would be built about every 150 feet for 2.5 miles of Basin Creek.

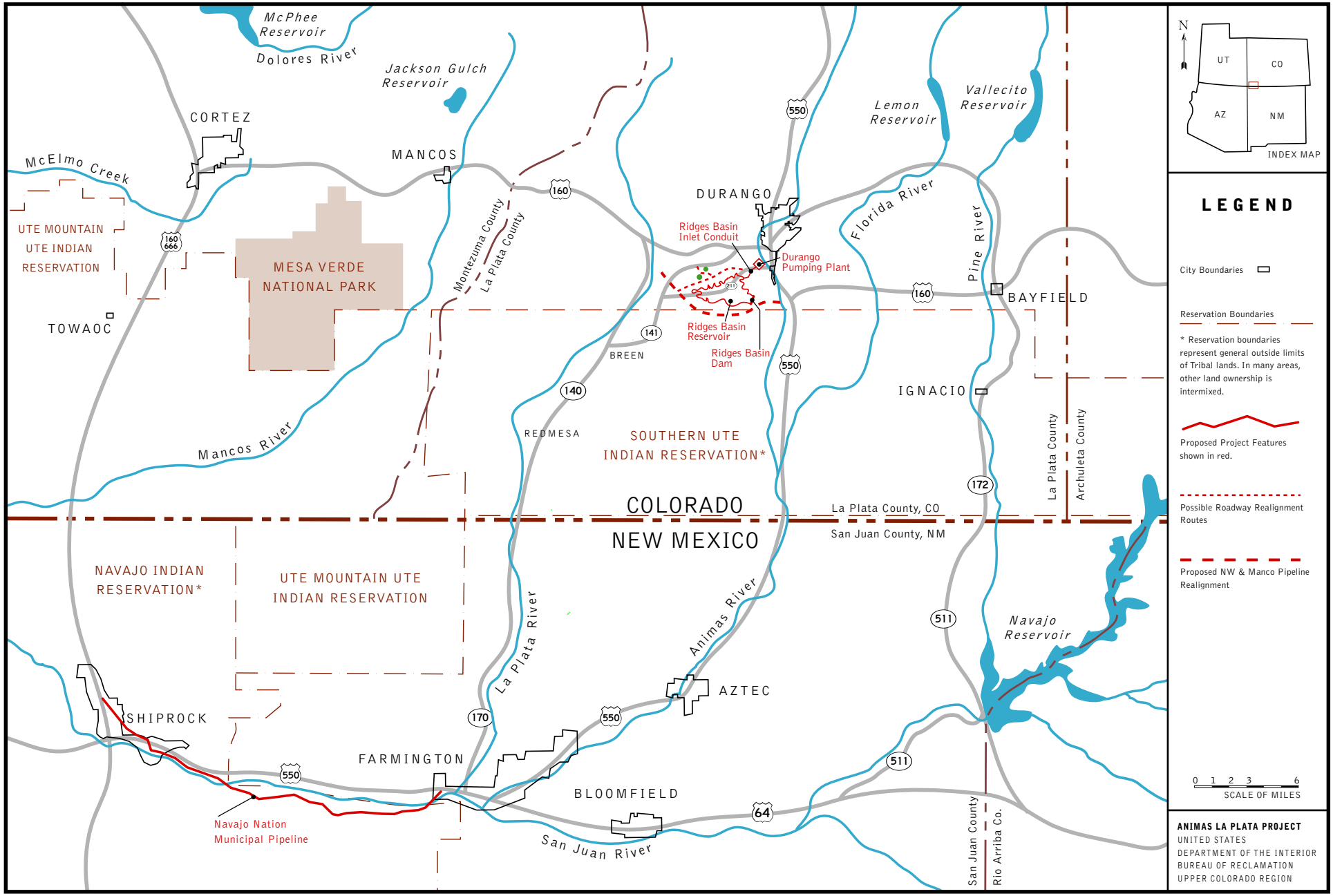
Ridges Basin recreational elements would include 10 miles of hiking trails, 196 camping units, 37 picnic units, boat slips, a boat ramp, an access road, a parking area, a public beach, a fish cleaning station, an entrance station, and an administration building.

The Navajo Nation Municipal Pipeline would replace an existing line from Farmington to Shiprock, New Mexico. This proposed route is approximately 30 miles in length and follows the existing alignment, with a few variations (Shaffrey 2000).

Electrical transmission lines may be needed to deliver power to the project. Western Area Power Administration (WAPA) would conduct a systems study to determine how to deliver electricity. WAPA would then conduct an environmental review.

The non-structural component of this alternative would consist of:

1) A fund to be used by the Colorado Ute Tribes to acquire water rights which are not met by the structural elements; alternatively, the fund could be used for farm development. It has been proposed that the funds be utilized to purchase land and water rights as follows. The location of these irrigated agricultural lands is shown on Map 2.



MAP 1

Location of Structural Components of Refined Alternative 4

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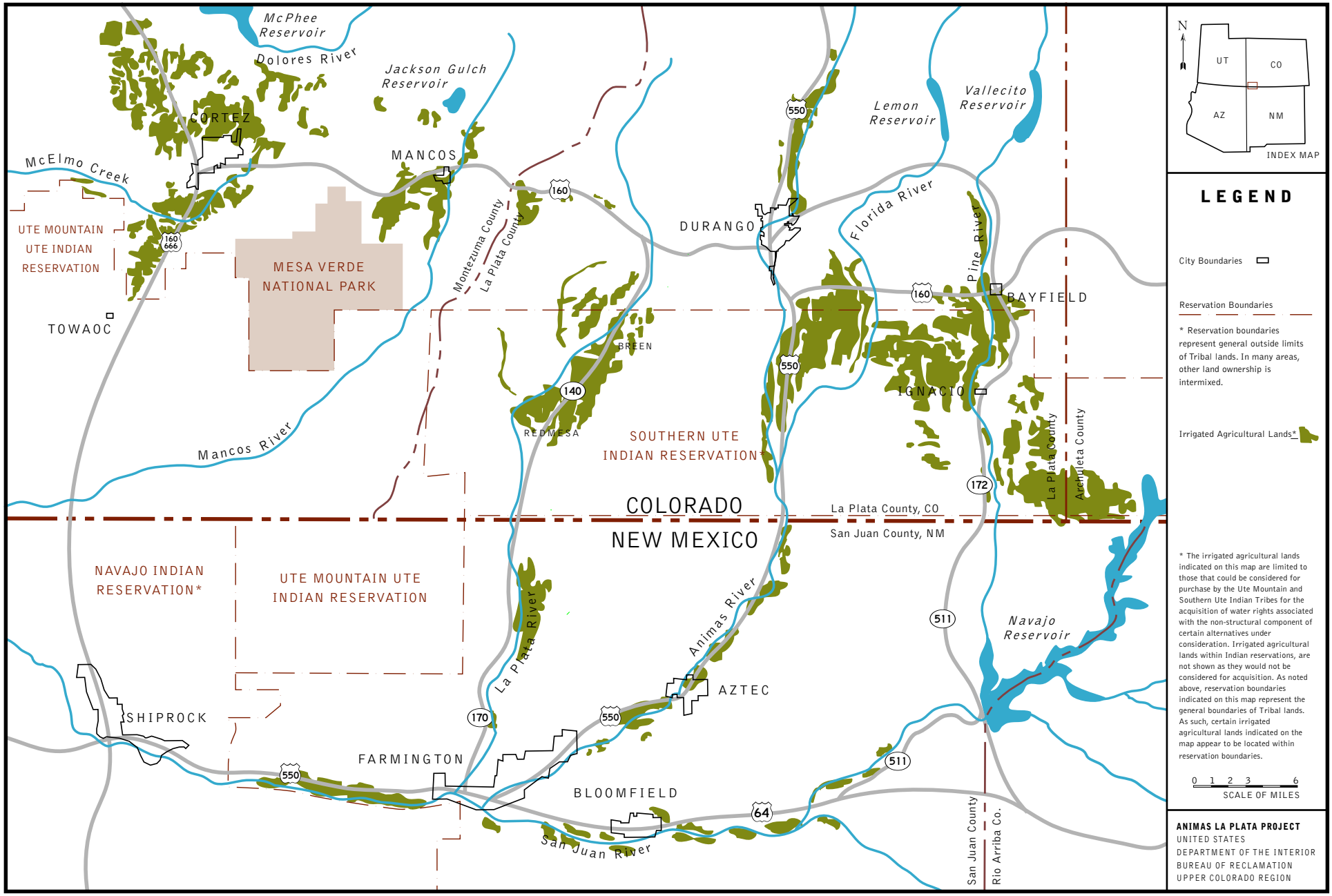

MAP 2

Location of Irrigated Agricultural Lands with Potential to be Purchased for Acquisition of Water Rights

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- Pine River Basin - 2,300 acres
- Animas/Florida River Basins - 2,300 acres
- La Plata River Basin - 2,400 acres
- Mancos River Basin - 3,300 acres

2) The development of a water delivery infrastructure is another element of the non-structural component. Likely conveyance routes were identified to link water sources to future water uses. Possible conveyance routes are listed below. The location of these conveyance routes is shown on Map 3.

- Florida Mesa Lateral
- Sunnyside Lateral
- Durango Municipal and Industrial Pipeline Lateral
- Basin Creek Discharge Lateral
- Coal Mine/Power Plant Lateral
- Breen/La Plata Lateral
- Alkali Gulch Lateral
- Grass Canyon Lateral (includes the Residential Lateral)
- Gas Fired Power Plant Lateral

3) Potential end uses of water delivery are listed in Table 1. Possible locations of these non-binding municipal and industrial water end uses are shown on Map 4.

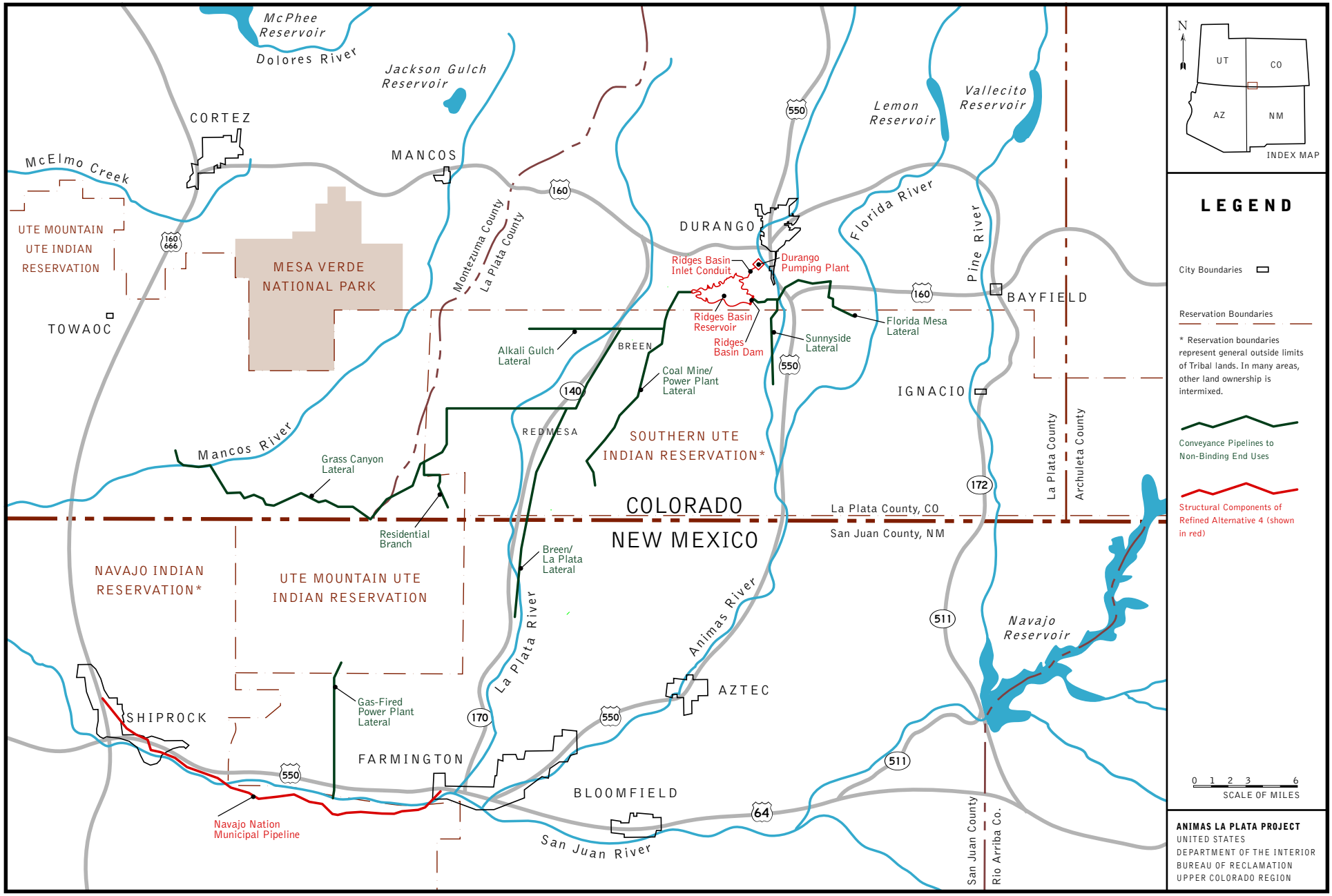
Table 1
Refined Alternative 4
Future Water Uses and Acreage Affected

Water User	Future Water Use	Size of Development	Land Required (acres)
Southern Ute Indian Tribe	Florida Mesa (Highway 172) Housing	200 housing units at 1,500 square feet (sf) each	50
Southern Ute Indian Tribe	Animas Basin (La Posta) Housing	200 housing units at 1,500 sf each	50
Southern Ute Indian Tribe	La Plata Basin (Red Mesa) Housing	200 housing units at 1,500 sf each	50
Southern Ute Indian Tribe	Animas Industrial Park	500,000-sf light industrial complex	15
Southern Ute Indian Tribe	Ridges Basin Golf Course and Resort	300 room hotel, casino and golf course	220
Southern Ute Indian Tribe	Coal Mine	Unknown	Unknown
Southern Ute Indian Tribe	Coal-Fired Power plant	1000 MW	220
Southern Ute Indian Tribe	Livestock and Wildlife	Small stock ponds or water tanks	10

Table 1 (continued) Refined Alternative 4 Future Water Uses and Acreage Affected			
Ute Mountain Ute Tribe	La Plata Basin (Johnson) Housing	200 housing units at 1,500 sf each	50
Ute Mountain Ute Tribe	Mancos Canyon Golf Course and Resort	300 room hotel and golf course	200
Ute Mountain Ute Tribe	La Plata Basin (Hesperus) Resort and Golf Course	300 room hotel, golf course and dude ranch	350
Ute Mountain Ute Tribe	Gas-Fired Power Plant	500 MW	20
Ute Mountain Ute Tribe	Livestock and Wildlife	Small stock ponds or water tanks	10
Colorado Ute Tribes	Durango - M&I lease/sale	500,000-sf light industrial complex	15
Colorado Ute Tribes	Bloomfield - M&I lease/sale	Public water system	10+
Colorado Ute Tribes	Farmington - M&I lease/sale	Public water system	10+
Colorado Ute Tribes	Florida Mesa - M&I lease/sale	Vacation housing on 35 acre plots	350
Colorado Ute Tribes	Red Mesa Plateau - M&I lease/ sale	Residential housing @ 1500 sf each	50
Colorado Ute Tribes	Kirtland - M&I lease/sale	Public water system	10+
Colorado Ute Tribes	Aztec - M&I lease/sale	Residential housing at 2,000 sf each	50
Navajo Nation	Navajo Nation Shiprock Tribal Use	Tribal water supply	100
Animas-La Plata Water Conservancy District	M&I uses	Rural and city water supply	2 @ 10+
San Juan Water Commission	M&I uses	Rural and city water supply	4 @ 10+

SUMMARY

Therefore, a variety of effects to historic properties are possible from implementation of this project. These would include damage by construction, inundation, shoreline erosion, and vandalism. Less obvious effects are also possible, for example, alteration of site integrity by removing water from an historic homestead, and livestock and grazing activities.



MAP 3
Potential Water Conveyance Routes for Non-Binding Tribal M&I End Uses Under Refined Alternative 4

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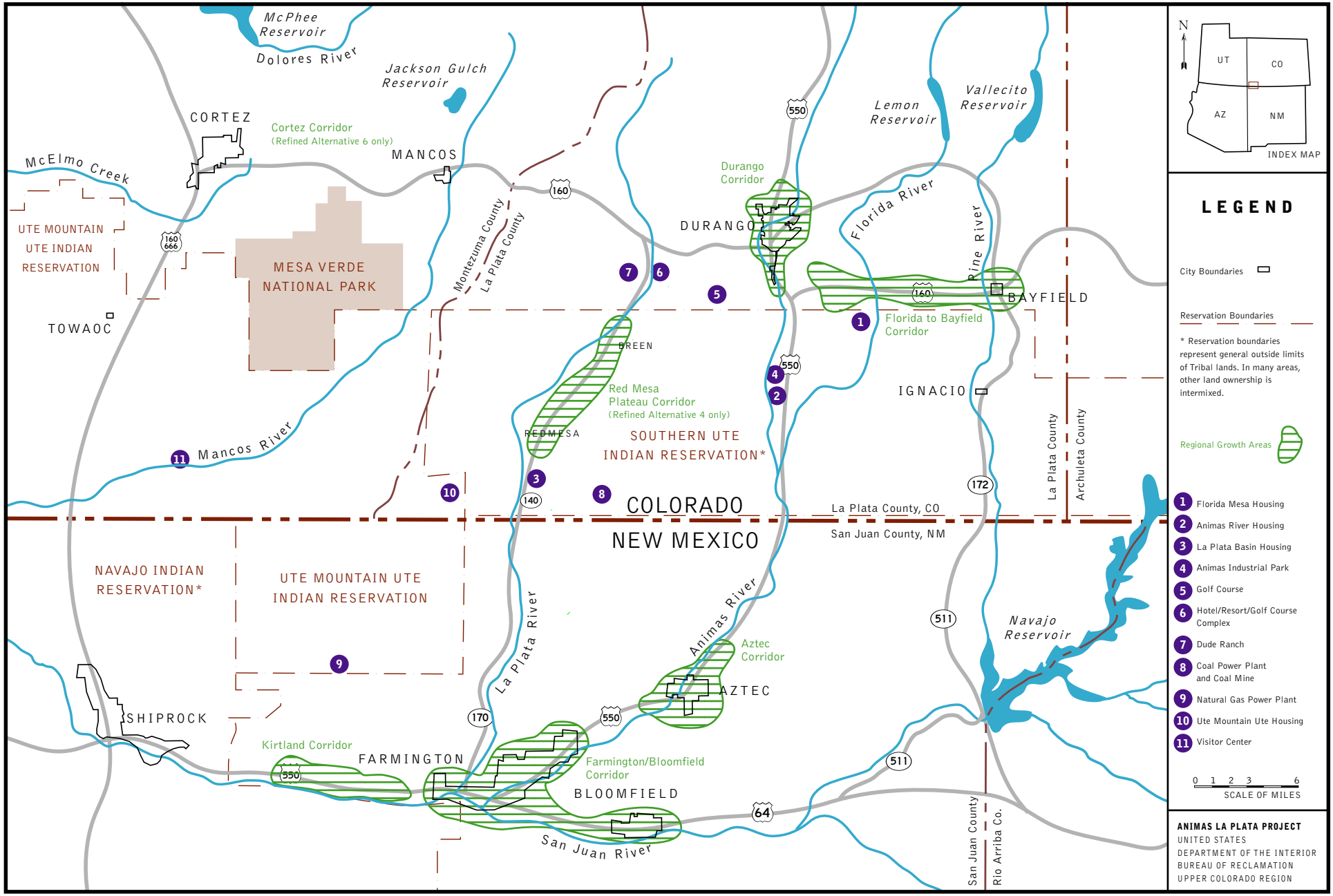

MAP 4

Possible Locations of Colorado Ute Tribe Non-Binding M&I Water End Uses

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2. HISTORIC PROPERTIES

Historic properties include prehistoric and historic sites, structures, districts, and Traditional Cultural Properties, which are listed in or eligible for inclusion on the National Register of Historic Places. Eligible properties are those on the Register or that meet National Register of Historic Places eligibility criteria (36 CFR 60.4). Traditional Cultural Properties are tangible, bounded, and associated "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" (Parker and King 1990).

Based on regional investigations it is anticipated that the project area will encompass numerous heritage resources from a variety of temporal periods and cultural affiliations. Summaries of the historic properties associated with the Ridges Basin and Navajo Nation Pipeline portions of the project are presented below. In addition, data from previous investigations are used to extrapolate the number and type of historic properties which may be encountered in the Mancos, La Plata, Animas, and Pine River Basins.

RIDGES BASIN

Previous investigations of the Ridges Basin and Upper Wildcat Canyon area (Winter et al. 1986) identified 196 sites. Of these, 190 sites are in the Refined Alternative 4 project area. The majority (152) are prehistoric sites and the remainder (38) are historic (SWCA 1994).

Prehistoric Sites

Survey data indicates that the 152 prehistoric sites contain at least 179 occupational components. By cultural period these were assigned as follows: 31 Archaic components, 16 Basketmaker II components, 119 Pueblo I components, 5 Pueblo II or III components, and 8 protohistoric components (Fuller 1989; Winter 1986). These designations are tentative and would be refined by further investigations. Based on investigations of sites adjacent to the project area (Fuller 1988) and in the Dolores River valley (Kane 1986), most of the Archaic components in the project area probably date to the Late Archaic period (2000 B.C. and A.D. 100). However, projectile points of Early, Middle, and Late Archaic age have been recorded in the project area (Winter et al. 1986). Investigations to the northeast (Fuller 1988) indicate that the Basketmaker II components probably date between 200 and 400 A.D. and that the Pueblo I components may date between 750 and 840 A.D. The protohistoric sites may date to the late fourteenth/early fifteenth century entry of the Athapaskans into the Southwest, but are more likely the remnants of more recent Ute use of the area.

Historic Sites

SWCA (1994) evaluated the eligibility of historic sites in the Ridges Basin portion of the project area. Previous investigations documented 37 historic sites in the area and SWCA identified another during evaluation. Of the 38 sites, 23 were evaluated as ineligible to the National Register, 9 as eligible, and it was recommended that 6 be archaeologically tested to determine their eligibility. These sites represent three activities that affected the project area: railroads, mining, and agriculture.

Rail transportation operated in Ridges Basin from 1890 to 1951 and is related to both the mining and agriculture. In 1890 Otto Means began construction of a narrow grade line from Ridge way to Durango, Colorado. The Rio Grande Southern was completed two years later, and the line passed through Ridges Basin. The original purpose of the railroad was transportation of ore, and the initial segment of the railroad

was completed between Durango and Porter, a mining community in Ridges Basin. The Rio Grande Southern continued to operate after the end of the mining era by carrying passengers, mail, light freight, and serving stockmen between Ridge way and Durango until 1951.

Coal was mined from 1886 to circa 1930 in Ridges Basin. The Porter Mine and the associated community was highly successful, and site 5LP517 represents the remains of the town. At the turn of the century Porter had 55 miners, 27 of whom had wives and children in residence. Another mining operation, the Gates Mine, was developed in the project area between 1910 and 1930. Little is known about the mine, however, coal production was limited, and the Gates Mine seems to represent the last instance of mining development within the project area. Site 5LP566 appears to be the remains of the mine.

The third historic activity in Ridges Basin is Euroamerican ranching and farming. The first documented ranch is the "Two Cross" ranch, owned by Colonel George Thompson, which had summer headquarters in Ridges Basin in circa 1880. Ridges Basin was homesteaded extensively during the late nineteenth and early twentieth centuries. During the twentieth century the homesteads were sold numerous times, and the majority of the land became the property of the Harper, Bodo, and Kikel families. These landowners continued to raise cattle and cultivate crops into the modern era.

Of the nine historic sites recommended as eligible for the National Register, seven are agricultural (5LP182, 5LP190, 5LP191, 5LP192, 5LP494, 5LP502, and 5LP579); one with is associated with railroads (5LP519); and one has both coal mine and railroad elements (5LP517).

Of the 23 sites recommended as ineligible for the NRHP, 16 are agricultural (5LP445, 5LP456, 5LP469, 5LP477, 5LP479, 5LP485, 5LP500, 5LP514, 5LP516, 5LP520, 5LP522, 5LP563, 5LP584, 5LP605, 5LP606, and 5LP617); two are coal mine or geologic test sites (5LP566 and 5LP623); and five are of indeterminate function (5LP480, 5LP493, 5LP507, 5LP526, and 5LP590). Fourteen of the agricultural sites are corrals, irrigation features, or erosion control devices that have been adequately recorded and appear to have no potential to yield significant information, while 5LP445 and 5LP456 are of insufficient age to be considered eligible.

Six historic sites are recommended for testing. Each site appears to have potential for subsurface remains. The suspected subsurface remains need to be located and examined before determinations of eligibility can be made (Stein and Ballagh 1995).

Traditional Cultural Properties

A number of properties were identified as having cultural value to traditional communities in the ALP Project area. These properties were identified through archival research, as well as through consultations with the 26 Indian tribes identified as having possible cultural affinity with the project area. The cultural properties include the Old Ute Trail, a prehistoric-historic trail through Ridges Basin, puebloan habitation and ceremonial archaeological sites throughout the project area, and a traditional Jemez collecting area in an undisclosed location (SWCA 1996).

The Old Ute Trail

A four-mile long segment of the Old Ute Trail passes through Ridges Basin. The segment is part of a longer trail that runs between Ignacio and Towaoc, Colorado. The trail enters Ridges Basin from the east along Basin Creek and traverses the proposed Ridges Reservoir Dam location. The trail follows Basin Creek until it intersects with County Road 211. The trail then coincides with County Road 211 and runs west through Ridges Basin. After leaving Ridges Basin, the trail runs west to the Mancos River Valley and continues towards Towaoc.

Primarily the Old Ute Trail linked the Weeminuche Utes (Ute Mountain Utes) in the west and the Capota and Mouache Utes (Southern Utes) to the east. The trail was used for trading, hunting, social visits, or communication between bands. However, it was also used by the Jicarilla Apaches, Tiwa Pueblo and Tewa Pueblo to the southeast (SWCA 1996).

The Old Ute Trail may have been used by puebloan peoples since prehistoric times. According to Earl Morris, the trail corridor was chest deep in some places indicating long use (Morris 1939). The trail may have been part of the Chacoan road system, which linked the major commercial and political center at Chaco Canyon in northwest New Mexico with outlying communities and trading centers in the Southwest. The Chaco road system was part of a larger trail network that was used by puebloan people for a variety of reasons, including hunting, exploration, and trade. It may also have been used for migration from the Mesa Verde and Chaco Canyon regions.

Evidence also exists that the Old Ute Trail was used by the Dominguez-Escalante Expedition on their pioneering trek into Colorado and Utah in 1776. The journals and maps produced by the expedition are the first written records of the geography, natural resources, and inhabitants of the region (Chavez and Warner 1974; O'Rourke 1980). While the Spaniards did not find the route, their use of it opened the region to subsequent Euroamerican exploration and occupation. Much of the route followed by the Dominus-Escalante Expedition became an established trading trail between New Mexico and California during the nineteenth century. First Spanish, then Mexican, and finally American traders utilized what became known as “the Old Spanish Trail.”

Due to its significant role in the history of the Southwest, the Ridges Basin segment of the Old Ute Trail is recommended as eligible for nomination to the National Register of Historic Places under Criterion A, a site that is associated with events that have made a significant contribution to the broad patterns of our history; Criterion B, a site that is associated with the lives of persons significant in our past; and Criterion D, a site that has yielded or is likely to yield information important to prehistory or history.

Puebloan Habitation and Ceremonial Sites

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Of the 152 sites identified in Ridges Basin, most have puebloan habitation and ceremonial components. Of these, 52 are recommended as eligible to the National Register as TCP’s because the sites are identified by puebloan groups as being: ancestral homes which contain buried ancestors and are imbued with the spirit of those ancestors, representative of migration routes from place of origin to present-day homes, and important to the retention of cultural identities.

Jemez Traditional Collecting Area

Project researchers were not able to gather sufficient information about the Jemez traditional collecting area to make a determination of eligibility for nomination to the National Register. Precise location of the area is unknown; however, other information gathered about the site indicates that it may meet the criterion of eligibility for nomination to the National Register. Jemez representatives have indicated that the previous ALP Project design would not impact the site (SWCA 1996), however consultation is needed to determine if Refined Alternative 4 could effect this site.

NAVAJO NATION MUNICIPAL PIPELINE

This water pipeline would parallel an existing line from Farmington to Shiprock, New Mexico. Survey of the alignment identified 13 sites; 12 have been recommended as eligible for the NRHP, and one is potentially eligible. Initial analysis indicates that these 13 sites contain 19 components which are temporally distributed as follows: Basketmaker II (1), Pueblo II (9), Pueblo III (8), and one of unknown age (Shaffrey 2000). As noted above, the habitation sites may be identified as TCP's because they are identified as puebloan ancestral homes, which may contain buried ancestors and the spirit of those ancestors, represent ancestral migration routes, and play a role in the retention of cultural identities.

MANCOS, LA PLATA, ANIMAS, AND PINE RIVER BASINS

Specific lands to be acquired in these drainages have not yet been identified or surveyed for historic properties. To determine what type and how many historic properties may be present, the following numbers were extrapolated from an archaeological inventory of 8,800 acres in the Mancos and La Plata drainages (Chenault et al.1996). All numbers are rounded off to the nearest whole. It is anticipated that historic properties in these drainages will be similar to known sites and that components of all ages will be represented, however, site frequencies may not be uniform. Specifically, the site frequency in the Mancos drainage was one site per ten acres (2240 acres/222 sites), while in the La Plata drainage the frequency was one site per 44 acres (6560 acres/150 sites). The following extrapolations are based on these results, with the higher frequency used for the Mancos and the lower frequency used for the La Plata, Animas, and Pine River Basins.

- Pine River Basin (2,300 acres) 52 sites
- Animas River Basin (2,300 acres) 52 sites
- La Plata River Basin (2,400 acres) 55 sites
- Mancos River Basin (3,300 acres) 330 sites

The projected total number of sites, on lands to be acquired in these four drainages, is 489. Of the sites identified by Chenault et al.(1996), 61 percent were determined eligible, 35 percent as potentially eligible, and 4 percent as not eligible for inclusion on the National Register of Historic Places. Applying these percentages to the projected number of sites (489) correlates to 298 eligible sites, 171 potentially eligible sites, and 20 not eligible sites. In addition, 66 percent of the sites found by Chenault et al. are puebloan habitation sites and may be Traditional Cultural Properties. Therefore 323 of the projected sites may be eligible for TCP status. It is anticipated that six percent of the sites (29) will have historic components. In addition, for the entire project area, the frequency of isolated finds was one per 66 acres; extrapolating to156 isolated finds.

This overview of known sites (Ridges Basin 190 + Navajo Nation Pipeline 13 = 203) and estimated sites (489) indicates that approximately 700 sites will be found in the project area. It is anticipated that the prehistoric sites will vary in age (Paleoindian, Archaic, Ceramic) and function (open camp, village, seasonal occupation, resource procurement, Traditional Cultural Properties etc.). In addition, protohistoric Ute and Athapaskan occupation and historic Euro-American sites are present.

3. RESEARCH DESIGNS

Since 1989 three research designs have been developed for this project (SWCA 1996). All are summarized below. The designs by CASA and NAU were written for an earlier project proposal, however, the NAU design emphasizes the Ridges Basin portion of the project, and the SWCA design is generalized for the region. All three were edited for clarity and to reflect the most recent project proposal. For example, a section the CASA Design which focused on the La Plata Distribution System, which is no longer a part of the proposal, was removed. Further, the SWCA Design included a methods section which has been incorporated into the general treatment plan.

CASA RESEARCH DESIGN (1989)

CASA stated that the goal of this research design and data recovery plan was to present the current knowledge of historic properties in the primary project impact areas, to identify major research issues that may be addressed considering the types of resources present, to detail specific research topics and questions that are pertinent to these larger issues, and to propose data recovery strategies appropriate for mitigating impacts to these resources.

This design is organized to reflect the pattern of prehistoric occupation in the Durango area. Previous research indicates that occupation of the area was episodic in nature, with substantial hiatuses separating periods of occupation. Considering that the pattern evident is not one of a long-term adaptation, characterized by gradual changes in subsistence, settlement, and demographic patterns, CASA feels that the project does not require an integrated approach. It is recommended that smaller mitigation modules be implemented, focusing on individual sub-samples that correspond to discrete prehistoric or historic periods of occupation. These periods include the preceramic period (Archaic and Basketmaker II periods), the Pueblo I period (A.D. 750 to 825 intense use of the area), the Protohistoric period (Navajo and/or Ute occupants), and the Historic period (Euro-american occupants).

A separate research design is proposed for each of the four main periods of occupation. Each design includes a description of the historic properties base, a review of the general research context, and a presentation of specific research topics and questions. Each research design chapter contains a data recovery plan addressing proposed individual studies and presentation of the overall research strategy for each period. Also, each data recovery plan includes the proposed levels of data recovery, analytical approaches, and reporting efforts that may be appropriate for mitigation of impacts to these different classes of resources. Although the distribution system is likely to affect sites from all four periods, a fifth research module was developed for the distribution system, based on the fact that work in the Basin will be the first and foremost area addressed.

CASA suggested that this four design approach would have advantages for Reclamation planners in that the mitigation program could be divided into modular units. The Bureau could manage the entire program under a single contract, or issue contracts that correspond to individual research designs. Although there are undoubtably sites which contain different prehistoric periods or components, previous investigations indicates that such situations are relatively rare. Therefore, it is probably feasible to conduct a mitigative strategy for the Animas-La Plata project that involves multiple researchers and multiple contractors, if Bureau planning for this project indicates that such a strategy is desirable. Alternatively, a single mitigative operation can also be implemented where preceramic, Pueblo, protohistoric, and historic period research designs are combined under one research team.

Two key assumptions underlie the structure of this research design and data recovery plan; these are based on discussions held with Bureau archaeologists, environmental planners, and geologists. The first assumption is that all sites within the Ridges Basin Reservoir takeline will be equally subject to destruction by project construction activities. The second assumption is that the Wheeler Borrow Area will be used for construction of the Ridges Basin Reservoir dam.

Non-staged Alternative

The research design and data recovery plan described above is an idealized staged approach, where data gathered during initial, exploratory stages are used to reformulate research questions and to allow more accurate sampling to occur during later, more intensive data recovery stages. Considering the uncertainty surrounding the project schedule, timing, and budget appropriations, an alternative to this staged approach must be addressed. Although CASA felt that the benefits of a staged approach outweighed the costs, a nonstaged alternative could be implemented if Congress appropriates funds, forcing construction and historic properties mitigation programs to proceed.

A nonstaged approach does not necessarily require the elimination of exploratory data recovery, but it may necessitate less discrete, in terms of time and function, data recovery. CASA suggested that multiple crews be utilized concurrently on a single research module. While several crews could engage in full-scale block excavations of the most imminently threatened sites, other crews can conduct exploratory excavations on various classes of sites that may not be threatened until later in the construction program, in order to provide a sampling framework for selecting the next generation of sites for intensive block excavations. Such a concurrent approach, as opposed to a staged approach, loses some effectiveness as there will be no intervening analytical or evaluative periods between fieldwork stages. However, in the case of an accelerated project schedule, a concurrent approach allows for some incorporation of feedback into the site selection process. CASA recommended supplementary data recovery plans be prepared just prior to project start-up. At that time, decisions will have been made concerning use of previous borrowed materials, construction scheduling will have been tied to budgetary schedules, and other plans related to implementing on-the-ground construction activities can be reviewed. Ideally, the archaeological contractor(s) should have the opportunity to consider these types of constraints prior to commencing with the data recovery effort.

Preceramic Research Topics

Although CASA combined Archaic and Basketmaker II sites into one module, a distinction between Archaic research topics and Basketmaker II research topics was made.

Archaic Research Topics

1. site structure and settlement patterns,
2. subsistence modeling,
3. mobility and interareal relationships,
4. chronometrics, and
5. Late Archaic agriculture.

Basketmaker II Research Topics

1. chronometrics,
2. site variability and settlement structure,
3. subsistence system modeling, and
4. case study comparison.

Preceramic Sites Data Recovery Plan

A phased data recovery approach, consisting of potentially non-overlapping phases of data recovery, is proposed as an idealized attempt to utilize information to structure subsequent recovery efforts. Information from an initial phase can be compiled, synthesized, and used to structure further research questions, to allocate efforts on sites where potential yields are higher, to make informed sampling decisions, and to target key data categories required for succeeding data recovery phases. CASA estimated that over 86.0 10-person crew weeks would be needed for data recovery at 59 preceramic sites in the project area. Again CASA felt that the phased approach will result in more information per unit of work and improved sampling decisions.

Archaic Sites

The main research questions and goals identified for the Archaic period revolve around site variability and the implications of that variability for settlement-pattern studies, subsistence modeling, mobility strategies, and chronological sequencing. In order to pursue these research topics, data recovery strategies will need to be tailored towards (1) defining how this variability is expressed in the archaeological record and (2) what the variability between sites, artifact assemblages, biocultural remains, or catchment situations means in terms of the various settlement, subsistence, or organizational strategies used by the Archaic inhabitants of this area.

To ensure that data recovered from the Ridges Basin Archaic sites may allow such inferences to be made and supported, a strategy involving two stages of field work, analysis, and reporting were proposed. Phase I would consist mostly of non-intensive strategies designed to better define variability between sites: to illustrate under what conditions subsurface deposits, features, or structures may be expected; to recover artifact assemblages that may be compared across classes of sites; and to better define the relationship of different site classes to catchment characteristics. Phase II is based on analysis of Phase I data and reformation of research questions in light of analyses. Phase II will utilize problem-oriented, block-and-sample excavations to collect data that are targeted for retrieval by Phase I analyses.

Basketmaker II Sites

The main research goals identified by CASA for the Basketmaker II period were to define systemic relationships. These relationships are expressed in terms of settlement variability, subsistence system reconstruction, demographic patterns, relationships of the system to characteristics of the natural environment, and assemblage variability. But one of the main goals is to generate comparative statements between the project area Basketmaker II cultural system and other contemporaneous systems that are well defined in Utah, Arizona, and New Mexico.

To define the Basketmaker II system, a program will be required that will fully sample this variability, both in terms of functional or size-related factors and location factors. Phase I would include intensive mapping and data recovery operations at a representative sample of the total number of sites. Phase I data would then be applied during Phase II to investigate a broader sample of less intensively investigated sites.

Pueblo I Research Topics

For this period, CASA presented several large-scale research questions and data recovery procedures, as noted below:

1. Definition of community structure, patterns, and organization.
2. Examination of variability among communities at the organizational, temporal, and functional levels.
3. Examination of the conditions under which major transformations towards system complexity occurred.
4. Examination of the locality-level (supracommunity level) organization that may have been extant during this occupation.
5. Examination of large-scale mobility patterns that relate to periodic Anasazi colonization and abandonment of certain locales.

Pueblo I Sites Data Recovery Plan

Data recovery will be implemented in three phases. Phase I consists of exploratory data recovery strategies designed to meet the following goals:

1. site structure documentation through augering, trenching, or test excavations,
2. identification of site condition, data preservation, and abandonment mode,
3. higher-resolution site-surface mapping,
4. controlled collection of assemblage data from surface and/or subsurface contexts, and
5. recovery of dating samples and refinement of chronological models.

Phase II involves intensive data recovery activities, including block excavations of selected sites or discrete site areas, as well as other techniques, such as probability sampling, blading, and lower intensity techniques.

Phase III is concerned with problem-oriented limited excavations, and is designed to respond to data needs that develop during Phase II. Problem-oriented testing may focus on particular feature or structure types, certain types of activity areas, further screened recovery from refuse deposits, or additional probability sampling necessary for increasing the accuracy of populations estimates. Problem-oriented "surgical strikes" may involve limited excavations, block excavations, and/or further sampling within specific communities as required to complete data recovery efforts.

Specialized studies that are considered separately from the three phases of field data recovery include environmental studies needed for development of baseline characterizations of resource supply variables and synthetic studies required for drawing data from mid-level studies and addressing primary research topics

for final project reporting. Environmental studies are suggested to address the following topics: abiotic resource distributions, biotic resource distribution, and agricultural potential.

Ceramic Analysis

A program of rigorous analysis and extensive comparison will aid in our understanding of the protohistoric occupation of southwest Colorado, illuminating the various ethnic groups' relationships with the landscape and with each other.

Research and Data Recovery Approach

Attempts will be made to dichotomize protohistoric adaptations in terms of traveler strategies versus processor strategies (Bettinger and Boumhoff 1982). In the case of possible protohistoric components superimposed on primarily prehistoric sites, CASA recommends that data be collected under a strategy focusing on recovery and analysis of the prehistoric biocultural assemblage and structural characteristics, but that evidence for protohistoric occupations be appropriately interpreted as the opportunity is presented. Such data can then be used to test the alternative models of Ute and Navajo culture history and behavioral adaptations defined previously. Through examination of written documents and the use of interviews with Native informants, general trends in land use, settlement, and cultural interaction may be defined, and these trends can be used to complement the site-specific analyses conducted as part of the archaeological data recovery program.

Protohistoric Period Research Topics

This section is divided on the basis of known protohistoric and historic peoples--Ute and Navajo. Then each of these subheadings is broken down into more discrete research orientations.

Ute Culture Historical Research Questions

1. Does Ute occupation of this region represent cultural continuity or does the traditional migration argument more accurately describe the occupation ?
2. Are ties demonstrable between tool kits, assemblages, or manufacturing traditions during the protohistoric/historic period and earlier traditions for this region?
3. Are there resource preferences that characterize specific localities and/or particular periods?
4. What is the origin and function of Ute pottery?
5. Will these findings, when compared to other regions, be able to document local groups or band differences among the Ute people of the project area?
6. Can tipi rings be identified in the project area, and do they represent a special adaptation by one group?
7. Can rock art define Ute and Navajo use of an area through time?

Ute Behavioral Research Questions

1. Do technological similarities (if established) between Archaic and Protohistoric/historic traditions represent either (1) normative forms of behavior? or (2) similar adaptive behavior to the same or similar ecological region?

2. What types of interaction existed between the Ute and other hunters and gatherers? horticulturalists? and pastoralists? Can an exchange network be defined? and, if so, what is the significance of this network for the adaptation made by both of these groups?
3. What ecological and social roles played a part in the development of this exchange system(s)?
4. What is the structure of Ute communities through time? Does the overall settlement pattern for the Ute change on a temporal basis?
5. Can specific resource areas be defined for individual bands or local groups? Do these resources imply seasonal or long-term usage?

Navajo Culture Historical Research Questions

1. What are the dates and cultural chronology for the Navajo occupation of the Animas-La Plata drainage?
2. Is there evidence for the Gobernador Phase in Colorado? How do the Colorado settlements compare to the Navajo Reservoir and Gobernador communities?
3. Is there evidence to identify Pueblo refugees among the Navajo population? Can examination of Pueblo ceramic types at these sites reveal whether Pueblo refugees were present or whether the ceramics were obtained by trade?
4. When were these settlements abandoned? Is there evidence for hostilities between other protohistoric groups and the Navajo population? Is there evidence for drought or climatic shifts during this late period of the Gobernador Phase in Colorado?
5. Can research on the Animas-La Plata project more clearly define the Dinetah Phase and its associated ceramic and lithic artifact inventory?

Navajo Behavioral Research Questions

1. Does the archaeological record reflect the Navajo transition from hunting and gathering to horticulture? Can the transition from a dependence on horticulture to pastoralism be documented?
2. What types of interaction occurred between the Navajo and other hunters and gatherers? with horticulturalists?
3. If trade can be documented, what was the significance of this exchange system(s)?
4. All of the obsidian from the Division of Conservation Archaeology test work in the La Plata area is from either Obsidian Ridge or Polvadera Peak in the Jemez Mountain region of New Mexico. Can this source be documented for the Animas-La Plata Project area as well? Does the utilization of the resource imply control over this resource or exchange with Pueblo groups in the Jemez Mountain area?
5. Does the structure of Navajo communities change through time? Does the overall settlement pattern for the Navajo change through each of the cultural historical phases? How do these patterns compare and contrast with other areas?
6. Can specific resource areas be defined for local groups, bands, and larger communities? Do these resource areas imply seasonal or long-term usage?

Historic Period Research Topics and Data Recovery Plan

CASA presented two approaches to historical research, the traditional narrative, and the new social history. The historic sites identified in Ridges Basin consist primarily of homesteads and mining-related sites; sites utilized and inhabited by the working class rather than the elite. In most respects, a bottom-up or social history approach to research is more closely aligned with anthropology than top-down approaches. Information from documentary sources can be combined with archaeological data so that "each body of data is used to inform the other in such a way as to arrive at conclusions that neither data set could provide alone (Deetz 1988)."

Three research topics that focus on themes of everyday life and living conditions in satellite mining camps or rural homesteads include the following: (1) analysis of camp demography and ethnicity; (2) everyday life and economic conditions in coal-mining settlements; and (3) rural settlement, land use, and social conditions in Ridges Basin.

Demography and Ethnicity

1. Who lived in the mining camps? How many people occupied the town of Porter? and what was the demographic (age and sex) composition of this population? Were these occupants primarily immigrant male laborers? or were intact, domestic groups present that typified other small settlements of this time?
2. What was the ethnic composition of Porter's inhabitants? Was Porter a “melting pot” containing various ethnic groups? or were groups segregated on the basis of racial or cultural variables?
3. What material attributes correlate with ethnicity? and how accurate are documentary sources and archaeological indications in providing information on this subject?
4. Are there indications that segments of the Porter community served specialized functions?
5. What roles did women play in Porter? What roles did Native Americans play?

Everyday Life and Economic Conditions

1. What kinds of housing were used in Porter? Are there class, ethnic, or other distinctions in this small sample?
2. What community, social, and recreational facilities are present?
3. How did Porter's inhabitants subsist? Are there differences that may relate to status, class, or ethnicity?
4. What evidence is there for integration of the local economy with regional and/or national economic conditions?
5. What were the relationships between labor and management at the Porter Mine? Were inhabitants of Porter laborers who chose to live close to work? Was Porter a “company town” organized by the Porter Fuel Company?
6. How were working conditions in relation to other industries of that era?
7. What were wage rates in the Porter mine? How do these compare with other regional industries during that era?

Settlement, Land Use, and Social Conditions

1. What was the demographic and ethnic composition of inhabitants of homesteads in the project area? Where did they come from? What was the role of women in these situations? Can the presence of women be documented archaeologically (Stein 1988:7)?
2. What relationship did the pre-1910 "homesteaders" have with the Porter Fuel Company? Were these bonafide homesteads, or were these entries a corporate plan to acquire mineral resources or development lands?
3. What kinds of status differences are reflected in these sites? Do these differences reflect environmental differences in this area?
4. What was the nature of interaction between the occupants of these sites and nearby communities of Porter and Durango?
5. What were the food procurement, distribution, and processing systems used by these residents?
6. What were the day-to-day living conditions or quality of life like on these homesteads? How did these change from 1900 to 1940?

Research Approach

The overall approach proposed for mitigation of impacts to historic period sites on the Animas-La Plata Project is adapted to the needs of social history research. This strategy focuses on populations rather than individuals. Two complementary approaches include documentary research and problem-oriented archaeological data recovery. Given an assumption that the historic era, between A.D. 1880 and the present, is well documented, even in regard to social history themes. CASA proposed that documentary sources be examined to answer research questions posed in this section, and that a second stage of field data recovery be designed and implemented to fill the data gaps exposed in the documentary record.

Phase I: Documentary Research

Phase I documentary research is designed and proposed as an attempt to write a social history of the project area with a particular emphasis on satellite mining camps such as Porter, and on rural settlement themes that pertain to homesteading events in places such as Ridges Basin.

Phase II: Historic Archaeological Research

Phase II is proposed as a problem-oriented data recovery and analytical approach towards filling gaps exposed by Phase I documentary research. Historic archaeology will serve as an opportunity to recover data that cannot be gleaned from the historic record.

NAU RESEARCH DESIGN (1992)

The research design specifically concerns all sites within the project takeline in Ridges Basin and all sites within the primary impact zones on Blue Mesa. NAU identified six general research topics and seven data classes to pursue these research topics. For each period represented among the sites in the project area (Holocene Hunter-Gatherers, Early Agriculturalists, Settled Villagers, Protohistoric) the six general research topics aid in the identification of important current research issues.

General Research Topics

1. site formation processes,
2. site chronology,
3. paleoenvironmental conditions,
4. activities at individual sites,
5. local demography and community organization, and
6. regional demography and community interactions.

Data Classes

Archaeobotany

Studies of plant remains will contribute significantly to the interpretation of site formation histories, site chronology, paleoenvironmental conditions, and human activities at individual sites, and will also contribute to the study of local demography and community organization. Plant remains will be recovered in the process of collecting flotation, pollen, phytolith, radiocarbon, and tree-ring samples from archaeological sites; and in soil cores and packrat midden samples taken from natural deposits. The botanical materials recovered will include charred remains of plant parts that had been used for food, for fuel, or in artifacts and structures; pollen and phytoliths brought onto sites in harvested plant parts; pollen, phytoliths, fungal spores, and naturally charred plant parts as natural soil inclusions; plant parts incorporated into packrat middens; and charred fragments of basketry and other woven objects.

Six broad factors affect the contents of archaeobotanical assemblages:

1. composition of the natural vegetation, the source of most plant parts,
2. cultivation of native and nonnative species by people living in the area,
3. human disturbances of the natural landscape, which can change the species composition of the natural vegetation,
4. preferential collecting of plant species and plant parts by people,
5. the ways people used different kinds of plant parts, that affected their likelihood of preservation, and
6. postdepositional destruction of plant materials through weathering, trampling, and other processes (Lopinot 1984)

Archaeozoology

Vertebrate (amphibian, reptile, bird, and mammal) and invertebrate (terrestrial and aquatic mollusks) faunal remains will provide data on human behavior and paleoenvironments, and will contribute directly or indirectly to most of the research topics outlined in this proposal. NAU proposed to collect basic data on the following topics:

1. animal taxa present and the relative abundance of these taxa,
2. skeletal part abundance,
3. bone damage,
4. age distributions and mortality profiles of various taxa,
5. seasonality, and

6. mean individual size.

Geological and Pedological Samples

Investigations of various aspects of local and regional soils and physiography will be pursued in the following ways:

1. Studies of the soils and alluvial stratigraphy of the project area will aid in the evaluation of climatic change models and models of site formation processes. Erosional, transportational, depositional, and weathering processes as they relate to both natural (dunes, rivers, alluvial fans, lakes, glaciers, paleosols, etc.) and cultural (middens, cultural lag deposits, borrow pits, agricultural features, etc.) deposits in the project area. Cultural materials (sherds, flakes, ground stone, etc.) will be examined for the effects of various geologic processes, to help pursue questions about site integrity and post abandonment processes of site modification.
2. Questions about settlement practices will be pursued through studies of soils and alluvial stratigraphy; site topographic location, physiographic position, and aspect; and site proximity to bedrock exposures and water. Analyses of soil quality can also be carried out both within and outside of the suspected locations of prehistoric agricultural fields, to evaluate whether prehistoric cultivation took place.
3. Studies of local bedrock formations and Quaternary stratigraphy will help identify possible source locations for the clays and tempers used in the local pottery, and for stone materials used to make tools and as building materials.

Stone Artifacts

Many aspects of prehistoric human behavior, especially as they relate to technology, economy, and subsistence, can be derived from stone tools and debitage. These aspects include, but are not limited to:

1. preferred raw material for particular tools,
2. energy expended to obtain material (i.e., local procurement, long-distance procurement through trade, etc.),
3. technological procedures and level of skill necessary to manufacture the desired end product,
4. variability of tool types and their by-products,
5. use of tools for particular subsistence and economic tasks,
6. reuse and rejuvenation of tools, and
7. exhaustion and discard of these tools.

In order to derive this information, the analyses need to be comparative and focus on characteristics of assemblages, or statistically valid samples, from defined archaeological contexts. Such characteristics as artifact density, relative proportions of debitage and tool types, or attributes, central distributional tendencies, and other related data are important for assemblage interpretation.

Ceramic Artifacts

The analysis of ceramic artifacts will play a central role in the study of Pueblo I sites. The major cultural variables that contribute to the formation of ceramic assemblages include the size of the assemblage used by each household, the number of households, the range of functional classes, breakage and replacement rates, and duration of occupation. A model of ceramic assemblage formation incorporating each of these different variables has been developed (Mills 1989a) that will be used to help assess some of the cultural variables underlying the formation of ceramic assemblages in the project area.

Stylistic variation in ceramics traditionally provides one of the best means of relative chronological control. For the Pueblo I period, a major goal of the ceramics analysis will be to establish a relative chronology for sites within the project area. Ceramic analysis will play a crucial role in establishing site occupation spans and contemporaneity, as well as providing data for investigating questions concerning the character and scale of activities carried out at individual Pueblo I sites. Interpretations of variation in the activities carried out at different sites will rest heavily on the identification of functional variation in ceramic vessels.

Basic descriptive data on the technology of ceramic production used by Pueblo potters at different sites in the project area can be collected to inform on production activities, including characterization of clays, tempering materials, and pigments. Very little technological work has been conducted on the ceramics of the Durango area and major contributions to understanding production activities in this part of the Southwest are possible.

Ceramic analysis will aid in the study of relative population size and duration of site occupation among Pueblo I sites in the project area. This research will build on the patterns identified at individual sites, to look at variation within the entire project area. Comparisons of the ranges of activities carried out among coeval sites will be accomplished using the functional data collected about individual sites. Data on procuring raw materials and on stylistic practices are also useful sources of information about how the people of neighboring sites interacted. Two different approaches will be used to guide interpretations about regional interaction: analysis of the sources of nonlocally manufactured pottery through raw material sourcing and analyses of regional stylistic variation. Additionally, similarities and differences in the use of individual design attributes and patterns of design layout, between sites in the project area and in surrounding regions, will provide information on the social ties of the local Pueblo I communities to other communities.

Architecture

Analyses of features and architecture will contribute most directly to our understanding of household and local community organization, demography and chronology, and indirectly to our understanding of paleoenvironmental change, especially the depletion of wood used for construction and fuel. Several factors can be recognized that contribute to the size, form, location, construction, remodeling, contents and other traces of use, and frequency of structures and features at sites (McGuire and Schiffer 1983; Gilman 1983, 1986):

1. natural availability of raw materials for construction
2. suitability of soils or substrates, on or in which construction may occur
3. season or seasons during which a structure or feature was made to be used
4. number of people and/or the quantity of materials for which a structure or feature was made to be used

5. kinds of activities that took place in and around the structure or feature
6. kinds of activities (e.g. trash disposal) that took place in and around structures or features after they ceased to be used for their original purpose.

There is considerable architectural variation in the Ridges Basin remains--ranging from ephemeral surface structures to pithouses to one-room and multi-room masonry pueblos. The nonpuebloan architecture poses two major challenges: (1) to reliably and consistently identify such remains (especially unburned remains); and (2) to distinguish single occupations from multiple reoccupations of a single site area. Research questions for both nonpuebloan and puebloan sites include the following:

1. How can we distinguish residential from nonresidential sites; and storage from residential structures?
2. What kinds of activities took place and how were these activities arranged in space within settlements?
3. How did individual residential sites grow and change, and what do these changes reveal about their demographic histories?
4. How many people occupied an individual residential site during a given episode of site use?
5. Were sites architecturally homogeneous, and what does this homogeneity indicate about rates of growth and population composition at individual sites?
6. Does architectural heterogeneity reflect functional differentiation among structures or social differentiation among structure occupants, or some combination of these?

Human Burials and Grave Goods

The first step in the analysis of a burial population is construction of mortality rate models for both sexes and the total population. From these models it is possible to determine age and sex specific mortality rates, age specific life expectancies, and survivorship rates. The shape of the mortality curve and the estimates of different age and sex specific rates provide direct information on overall population.

In addition to age and sex, tabulations of individual stature, and health-related pathologies such as dental caries and hypoplasias, differences in bone density, arthritis, evidence of anemia, and evidence of disease and physical trauma can be made. These skeletal characteristics provide information on dietary and health-related stresses. These pathologies can then be compared for their distribution across the population overall. Such comparisons are used to look for differences in diet and health by individual age, sex, and burial site, and by ritual treatments that may be related to differences in social group membership or status. NAU proposed to collect data on stable carbon isotopes, for further information on diet.

Once an overall population model is developed, and data on pathologies and dietary indicators are consolidated, additional analyses become possible. Variation in health, stature, and diet across the population, against individual age at death, sex, and mortuary ritual treatment can be examined. NAU suggested use of the method developed by Buikstra et al. (1986; Konigsberg et al. 1989) for assessing fertility rates, for example, as a way to examine the relationship between fertility rates, maize consumption, weaning practices, and sedentism.

Finally, NAU proposed to collect data on a wide variety of nonmetric or epigenetic traits. Such traits are used to examine the genetic relationships within and among the members of different possible social groups in a community, sometimes referred to as biological distance relationships (Birkby 1982). Biodistance

estimates may be used to assess whether some kinds of social status were passed down within family lines (e.g., hereditary offices), and may help pursue questions about social differences in health and diet within the local population. The data collected will be compared with collections from around the general region in order to assess genetic affiliation and further illuminate regional interaction.

Research Methods

A basic tenet of any data collection strategy is the need for a representative sample of the statistical population. Combining probabilistic and nonprobabilistic techniques, NAU recommended that representative and statistically sound samples of cultural remains and evidence of paleoenvironmental conditions from (1) all geographical and ecological zones, (2) all time periods, and (3) the full range of variation in site content for each time period be recovered from the project's impact areas. Initial sampling decisions will be based on: previous archaeological studies in the project area, on the goals outlined in the above Research Design, those sites designated by Reclamation, and to lay the groundwork for future investigations. Sampling decisions will continue to be guided by the research design, but the results of the project's previous field and laboratory investigations will provide a critical frame of reference. NAU proposed an initial combination of extensive and intensive data recovery efforts to examine the full range of potential variation. Recovery will inform sampling and data recovery decisions in subsequent years and give special attention to sites in Reclamations's Priority 1 management zone.

Significant Dimensions of Variability

Three kinds of variability, content, time, and space, form the dimensions along which the Ridges Basin site universe can be ordered into meaningful groups, or "strata," for the application of statistically and logically valid sampling procedures. The use of sampling, or applying knowledge gained from examining only a portion of the site universe to the entire universe, is valid only to the extent that universe can be demonstrated (or safely assumed) to be homogeneous with respect to important characteristics. In this case, those important characteristics are archaeological content, temporal, and spatial variability.

Archaeological content exposed on the site surfaces is used to define major categories of sites. The presence or absence of architecture; the kinds of architectural remains; the extent, nature, and relative density of surface artifacts of various categories; and area over which these are distributed are used to produce such "site type" groupings as "habitation," "large nonhabitation," and "single-unit pueblos." Variability in ceramic and projectile point content are used to recognize broad temporal-cultural site groupings: Archaic, Basketmaker II, Pueblo I, and protohistoric.

Modern ecological variability in the Ridges Basin Project area is expected to correlate with its prehistoric variability, and is a factor in appropriately interpreting the archaeological record. Major topographic and physiographic features are used to separate the Ridges Basin Project area into distinct ecological zones that may also vary by elevation. The soil and vegetation differences would have affected prehistoric use.

Ridges Basin Site Matrix

The lack of architecture in Archaic sites results in very few ways to divide them into meaningful types on the basis of surface evidence alone. None, for example, can be recognized as "habitation" sites. Site area has been selected as an obvious distinction, with possible behavioral significance, on which to base the

separation of Archaic sites into large and small "nonhabitation" sites, with 1,500 sq. meters as the division point.

For Basketmaker II site components the same large/small distinction is recognized as with Archaic components, but the addition of Basketmaker pithouse architecture makes it possible to distinguish "habitation" from "nonhabitation" sites. Because they are relatively few, habitations sites are not further separated on the basis of size. The very few Ridges Basin site components may suggest a minimal use of the area by later Pueblo II and Pueblo III populations.

The major occupation of the Ridges Basin/Blue Mesa area was clearly by Pueblo I populations. The important Pueblo I site types recognized in the Ridges Basin site universe are as follows:

1. Sherd and lithic "scatters"
2. Similar such artifact scatters with the addition of sufficient construction "rubble" and trash accumulation to suggest possible seasonal habitations or field house sites.
3. Single or,
4. Multiple expressions of a basic pueblo consisting of rectangular or arc-shaped rubble scatter representing a roomblock, a pit structure depression, and a trash midden deposit (Fuller 1989:49).

There is sparse evidence of non-Euroamerican protohistoric use of the Ridges Basin Project area. Given the importance of ethnographic data and consultation with the descendant tribes, NAU recommended no work on protohistoric sites during preliminary fieldwork. Rather, consultation with the tribes will be conducted to determine what they would like to learn from data recovery and what data recovery techniques are most appropriate for collecting those data. Based on this knowledge, NAU proposed a protohistoric sampling program to be implemented during later phases of the project.

Sampling Criteria

NAU and Reclamation were concerned that the sample selection criteria produce a statistically valid means of predicting population characteristics, and that potential bias due to known population non-randomness be identified and controlled. The division of the Ridges Basin site component populations into the time, space, and site type units described in the matrix proposed above is a useful way to control the nonrandom character of the population at this stage of our knowledge. Making certain that the initial sample of sites for examination comes from all sampling strata (site types) should appropriately distribute observations across the full range of important variability in the entire site population. As knowledge of this variability improves, the research and sampling designs can be reexamined and modified as needed and as required by Reclamation.

In any stratum with more components than can be examined within time and budget constraints, a sample of the components will be selected to represent the entire stratum. Two factors are of concern in making this selection: the number of site components selected as the sample and the manner in which the sample is selected. The number of site components required to adequately represent any sampling stratum depends primarily on three factors:

1. size of the sampling stratum,.
2. variability within the site components,.

3. degree of statistical certainty with which the results can be extended to the entire sampling stratum.

Selection of an appropriate number of site components from each of the proposed Ridges Basin matrix strata will distribute observations across the entire range of known variability along the dimensions that define the strata. In addition, the selection of an appropriate sample of site components from strata too large to observe completely will permit the secure extension of our knowledge from samples to the entire strata.

Selecting Samples

Site types in the Ridges Basin site matrix with fewer than five representativess will not be sampled; instead all will be excavated as the database for interpreting the strata. The first selection criterion discriminates between Reclamation's Priority 1 and 2 areas (sites below 7,000 ft) and Priority 3 sites that lie above 7,000 ft. Because sites below 7,000 ft. are to suffer maximum impacts, NAU designated these sites the primary focus of project data-retrieval efforts. Sites above 7,000 ft are above the reservoir and will be less heavily impacted and should be preserved to the extent possible. Priority 1 and 2 sites will, wherever possible, be selected to represent site strata, and in fact most such sites will be targeted for some level of data recovery. NAU suggested avoidance of Priority 3 sites, except (1) to gain basic information about sampling strata that are inadequately (or not at all) represented by Priority 1 and 2 sites, (2) to investigate the role of altitude on the prehistoric use of the project area, or (3) to explore the site variability among site clusters, or "communities." By including components representing all strata in the initial fieldwork, basic information on all strata could be gathered. Necessary sampling, scheduling, and data recovery decisions during succeeding years of the Ridges Basin Project can be made more efficiently on the basis of such hard data.

Field Methods

The NAU research plan includes two basic levels of fieldwork effort: Site Evaluation and Site Recovery.

Site Evaluation

1. Surface collection
2. Mapping
3. Augering
4. Subsurface mechanical test excavation
5. Subsurface manual test excavation

Site Recovery

1. Site stratification
2. Sampling
3. Intensive excavation

Applying Data Recovery Strategies

Several principles will determine the application of data recovery techniques to the Ridges Basin site components matrix. These principles are intended to produce the most complete and reliable data set possible within the time and budgetary constraints established by Reclamation. NAU will focus data recovery on Priority 1 and 2 sites; they will make every effort to adequately represent all known variability in the recovered data set; and they will maintain data-set integrity by retrieving statistically sound samples and subsamples. Specifically:

1. All Priority 1 and 2 sites will undergo site evaluation surface collection.
2. NAU anticipates most Priority 1 and 2 site components will either contain subsurface deposits or require additional testing to determine their presence, and a minimum of 50% of the components in each site matrix stratum are expected to undergo preliminary testing. For most of these sites, this will terminate the data recovery.
3. Priority 3 sites will be selected for "site evaluation" only to provide critical information on site matrix strata that are otherwise inadequately known, and to extend the sample from most strata into the higher elevations of the project area.
4. Approximately 25% to 50% of the tested sites in each site matrix stratum will be recommended for "site recovery." Only sites with demonstrated in situ deposits will undergo excavation, and several small site matrix strata are quite likely to have no such sites. Priority 3 sites may occasionally be recommended for site recovery.

Data recovery begins prior to excavation and includes archaeobotanical and molluscan data recovery, and geoarchaeological data recovery, in addition to standard archaeological data recovery.

Field Laboratory Processing

NAU proposed to staff and equip a field laboratory in Durango to serve as the point of transition between field crews and the analysis and interpretation team. Analytic samples would be catalogued and appropriately processed and/or transferred to either the analysis laboratory or subcontracted analytic specialists. Transferred materials or samples to subcontracted analytic specialists would be tracked via signed lists of all items or samples. All materials and transfers would be entered into the computer tracking system.

Laboratory Methods

Archaeobotany

Laboratory analytical methods for archaeobotanical and other paleoenvironmental plant remains include the processing of both pollen and plant macrofossils, as well as phytolith analysis.

Archaeozoology

NAU proposed examination of vertebrate and invertebrate animal remains, each of which requires slightly different methods of analysis. In addition, NAU proposed to collect packrat middens for laboratory analyses.

Geoarchaeology

Soil samples will be collected from three kinds of locations in the project area: from archaeological sites, from areas of suspected prehistoric farming, and from the stratigraphic profile trench across Ridges Basin. The methods for preparing and characterizing the samples will be essentially the same for all three types. Assessments will be made of preservation conditions, raw material types and their natural sources, and soil taxonomy and morphology.

Stone Artifacts

Stone artifacts will certainly be among the most numerous items recovered during the project, and the research team would direct considerable attention to their analysis. Because stone tools will be an important part of all site-type and time-period assemblages, these artifacts will be processed in three steps: collection and recording, general analysis, and specialized analysis.

Ceramic Artifacts

Ceramic artifacts will be processed using standard laboratory techniques. Unique provenience designation will be maintained throughout the processing. Use and alteration will be identified, along with raw material types and temper analysis. Taxonomic and stylistic variation will be examined in order to illuminate locational and temporal origins.

Human Remains

The analysis outlined by NAU remains tentative, depending upon ongoing discussions involving the Bureau of Reclamation and interested Native American groups. NAU proposes to carry out two kinds of analyses directly on human burials: morphological analyses of the surviving skeletal elements from individual interments, and chemical analyses of small samples of bone from individual interments. The resulting data will in turn be analyzed statistically for demographic patterns. Data on burial locations and treatments in relationship to the age, gender, and health will also be analyzed statistically for evidence of social variation, along with data on the artifacts recovered (if any) with the burials. NAU accepts Reclamation's lead role in determining whether other concerns may override research concerns in the treatment of burials and grave-associated objects from the project area. NAU's proposed methods would be conducted only with the consensus of all concerned parties.

Using Existing Collections

Archaeological investigations both within the Ridges Basin Project boundaries and in the surrounding areas have produced large quantities of materials and data for comparison with our own findings. Many of the collections from these previous projects are readily accessible, and their restudy will significantly influence NAU's investigations in two ways. First, older collections exist from sites at which investigations will be conducted, and information on these collections may help understand the histories of the individual sites. Second, previously recovered collections can be used as reference collections with which to develop artifact typologies and analytical strategies prior to field investigation.

Data Integration and Evaluation

The ultimate goal of any archaeological project is to bring together the data from all field and laboratory investigations in order to develop and test interpretations about the past. Different kinds of data come with their own strengths and weaknesses, and provide different and, often complementary information on the past. Every attempt will be made to integrate the information from the project's field and laboratory investigations.

Interaction between members of the research team will be facilitated so that information can be transmitted between the field and the laboratory: NAU proposed use of Geographic Information System (GIS) and seriation .

Interpretation can become problematic when researchers look for data to support one particular interpretation or another. Therefore, NAU feels that "we learn more about the past by looking for data that might allow us to discriminate among alternative, competing interpretations--rejecting some while sustaining others for further study." NAU's goals are twofold: to identify or develop as many alternative questions and interpretations for investigation as possible, and to identify ways to use as many different kinds of data as possible to evaluate these interpretations.

Research Dissemination

Professional meetings provide an opportunity for researchers to receive feedback from colleagues. Presentations of project goals, methods, and interpretive ideas at such meetings invite open comment and debate on whether a project is doing all it can to be an effective, productive scientific endeavor. Researchers who plan to present papers at professional meetings will, through the Project Director, request permission from Reclamation prior to scheduling any such presentation. Researchers who do present papers will, through the Project Director, submit four copies of each paper to Reclamation. The project will retain a copy of all presented papers.

In addition, at least one symposium or group presentation could be held at national or regional conferences. The symposium would be prepared, if accepted, as an effort to summarize and invite professional comment on the project.

Researchers may also submit papers for professional publication. These papers will cover advances made by the project in analytical methods, project and resource management, and our understanding of local and regional prehistory.

Large archaeological projects can provide opportunities for graduate and undergraduate students, to carry out research under the guidance of the research team. Large projects also attract students from different colleges and universities who wish to participate in the field studies and carry out independent studies of project data. Students would not carry out contractually required project work as a way to fulfill thesis or dissertation requirements, however, students who propose additional research that would not interfere with contract activities or requirements would be encouraged. Project data could be made available to students with the stipulation that the student must agree to all provisions of the contract affecting rights to data, permission to present papers or publish articles, and submission of copies of the resulting written work both to Reclamation and to the project.

Large archaeological projects should actively seek feedback from professional colleagues, so that the project's goals, methods, and interpretive ideas are held up to the highest standards of the professional community. A Peer Review Panel, composed of professionals who are not members of the project research team, would provide a fresh perspective on the project. This panel would have three responsibilities: (1) to visit the field investigations and to provide comments on the appropriateness of field and laboratory methods; (2) to review drafts of the Research Design and Field and Laboratory Manuals, and provide comments on their soundness and quality; and (3) to periodically review the project's progress from one year to the next, and comment on the need for or appropriateness of changes in research methods and questions. The cost of such a Peer Review Panel is small compared with the importance of the feedback they can provide during crucial junctures in a project (NAU 1991).

Specific information will be distributed to regional libraries where it will be available to interested parties. The project will produce a publishable Research Design and Field and Laboratory Manuals. In addition, an annual Technical Report will contain descriptive information on how each site was excavated, what kinds of deposits, structures, and features were encountered, and what kinds of materials were recovered. These reports will contain the preliminary results of laboratory studies as well, including basic tabulations of artifact types, plant and animal remains, results of dating assays, and other tabular information to the extent that these are available. An introduction to each Technical Report will discuss how the sites and materials excavated fit into the overall research design, as this design evolves from one year to the next. In an effort to make the information contained in these reports more usable to archaeologists and interested public, the sites can be grouped into three temporal categories: preceramic (including Archaic and Basketmaker sites), puebloan (including all prehistoric puebloan sites), and protohistoric (including the results of the archaeological investigations at protohistoric sites and of the ethnographic research). Thus, Technical Reports as well as material-specific and topical volumes will be published after field investigations are complete.

Separate technical reports will be prepared on the results of analyses of individual data classes: plant remains, animal remains, geological and pedological samples, stone artifacts, ceramic artifacts, architecture, nonarchitectural features, and human burials, as well as individual synthetic monographs on the preceramic, ceramic, and protohistoric periods. It is likely that separate technical reports will be prepared for the analysis of pollen and macrobotanical remains, and that structures and features will be discussed together in a single volume. These analytical technical reports will cover the materials and data recovered from all field and laboratory investigations, and so will be prepared only after the final season of fieldwork. A final, synthetic report, or set of reports, will conclude the project. This effort will bring together the results of all field and laboratory investigations and comparative information from other research in the region, to address the full range of questions and issues raised in the project's research design. This synthesis of project results will be prepared only after completing the final season of field work and at least the drafts of the analytical technical reports described above.

These technical reports will be distributed to various institutions and libraries around the region, including but not limited to Fort Lewis College, Durango Public Library, Anasazi Heritage Center, and San Juan Archaeological Center.

Educational Outreach and Research Participation Programs

Reporting results and activities to the professional and public communities stands as one of the central responsibilities of large-scale research projects. In the reporting process, the public at large and professional communities are equally important and deserving of the products of publicly funded research.

Educational outreach consisting of programs and literature could be provided "off-site." Such programs involve visits, lectures, and exhibits to interested groups and schools. Outreach also includes scholarships and work opportunities. Research participation provides opportunities for interested people and groups to take part in scientific archaeological fieldwork.

Archaeologists increasingly recognize the need to inform and educate the public about what archaeologists do, how they go about doing it, and what they learn. The positive public relations benefits of such information programs have proved to be well worth the costs. The Ridges Basin Project/Animas-La Plata Project provides an excellent chance to develop an educational program involving the Ute Mountain Tribe, the Southern Ute Tribe, various Pueblo and Athapaskan groups, and communities in southwest Colorado, northwest New Mexico, and northern Arizona. These programs will foster positive, cooperative attitudes about archaeology in general, and about the ALP Project in particular. In addition, these local information programs will invite public involvement in scheduled, unobtrusive ways.

Archaeologists recognize the importance of engaging the public by making archaeology more accessible. Like any archaeological endeavor, public education programs require good planning and effective execution (Smith and McManamon 1991). To this end, NAU contacted tribal groups, individuals, civic leaders, and educators to plan outreach activities and research participation opportunities. Many ideas and questions developed from our contacts are described and addressed in the following plan. In addition, the public outreach plan will be consistent with national and regional goals outlined by the Four Corners Governor's Conference and the Society for American Archaeology's Save the Past for the Future: Action for the '90s Plans (Proceedings from Four Corners Governor's Conference 1990; Society for American Archaeology 1990).

The proposed research participation programs will provide opportunities for the public to see and participate in research. Some preliminary public and educational outreach ideas include providing tours of archaeological activities, experiential programs, development of slide presentations and brochures, trail networks, and school programs.

Tours, educational programs and public awareness campaigns through brochures, slide presentations, and trail networks will target the public at large. In addition, a research participation site will be designated for the lay public and supervised by trained project personnel for use in educational programs. Participants in these programs can include students, teachers, volunteers, elder hostel groups, and members of the Colorado Archaeological Society.

Research will be disseminated to the general public in several ways. A newsletter will be developed to provide basic information about the archaeological research in Ridges Basin, summarize available opportunities for public participation in our research, and give contact names and telephone numbers. A slide presentation will be developed and regularly updated for showing to local civic, tribal, school, and/or professional groups. These presentations, given to the local and tribal communities, will explain the project and the archaeological recovery phases.

In cooperation with regional agencies, efforts will be made to link the archaeology of Ridges Basin with the development of local and regional tourism trail networks. The Ute Trail, designated by the Bureau of Land Management, was founded on ethnographic information collected from elders north of the project area. Both the Ute Mountain and Southern Ute Tribes have expressed an interest in expanding this trail to the south. In order to link with the Ute Trail, supplementary protohistoric and ethnographic information, as well as oral histories, must be compiled for this region. In addition to the Ute Trail, the Trail of the Ancients is being developed by the Four Corners Heritage Council. This trail should increase the tourism and visibility of archaeological activities and projects in the Four Corners area. Linking Ridges Basin to these trail networks will enhance support for the project in local communities, provide jobs for tour guides from the Ute Tribes, and raise public awareness of preservation problems.

The Archaeological Project staff will provide educational outreach opportunities and foster positive project-community interaction through schools and civic programs. These programs are intended to educate, disseminate research, and stimulate discussion of the delicate balance between development of natural resources and preservation of historic properties. Science and/or social science classes, school archaeology and/or anthropology clubs, and guidance and career counselors will be approached about cooperative programs. Both the Ute Mountain and the Southern Ute Tribes have expressed interest in coordinating summer youth programs with the project. Planned workshops will provide teachers with supplementary curriculum materials and background information on incorporating archeology in their curricula. Such teacher workshops would ultimately reach, either directly or indirectly, a very wide audience of teachers, administrators, children, and parents.

The proposed programs will articulate with existing Ute Mountain and Southern Ute educational programs and other local programs. We will also seek to employ Native Americans (especially from the adjacent Southern Ute and nearby Ute Mountain Reservations) in field and field laboratory positions. The possibility of recruiting high school age students from reservations surrounding the project area will be examined. Fieldwork will provide summer employment for tribal participants, while Northern Arizona University may provide academic support for those who wish to continue on for an undergraduate or graduate degree in anthropology.

In the course of Educational Outreach and Research Participation programs, several administrative concerns would remain foremost. First, all visitor activities would be carefully scheduled and supervised to minimize impacts on field and laboratory activities, to maintain security for project materials, and to abide by Reclamation safety regulations in construction zones. Visitors would be limited to specific times and sites, and guided through only designated portions of sites. Second, sensitivity to Native American concerns that no human remains and/or grave goods be displayed would be absolutely respected. Third, all public outreach activities will be thoroughly discussed and coordinated with Reclamation before committing any personnel time or project resources. All press and other information releases will be submitted to Reclamation for prior approval.

SWCA RESEARCH DESIGN (1993)

SWCA created a research design to guide archaeological survey, excavation, reporting, and monitoring, primarily for the Dolores Project and the Animas-La Plata Projects (SWCA 1993). This research design incorporates the problem domains of the research design that guided the Dolores Archaeological Program (DAP) (Kane 1983; Kane et al. 1983; Knudson et al. 1986), with some revision and the addition of other research topics current to archaeology in the Four Corners area (e.g., Wilshusen 1991). Utilization

of the research topics, along with standardized archaeological procedures for survey and excavation results in consistent, comparable, and pertinent data.

Research Domains

Six general domains are addressed by SWCA's research design: settlement patterns, economy and adaptation, paleodemography, social organization, interaction and exchange, and chronology. These six domains will be used to guide the research for all cultural periods.

Settlement Patterns

Settlement pattern studies seek to measure the number and distribution of sites, as well as the variability in site function and morphology, both synchronically and diachronically. With enough data from a large enough area, settlement pattern studies allow for the interpretation of the functional relationships among contemporaneous sites and thus address the topic of settlement systems. Research questions include the following:

1. What is the range of variability in settlement morphology within the study area?
2. What is the temporal range represented by the sites in the study area?
3. Do patterns of site form, function, and temporal distribution co-vary with environmental variables?

Economy and Adaptation

Economy and adaptation studies are concerned with how occupants of the study area adapted to the environment and obtained and processed needed subsistence materials. This domain seeks to answer questions about resource availability and utilization, including hunting, gathering, and agricultural subsistence, as well as nonfood resources such as building materials and lithic and ground stone materials. Research questions include the following:

1. What resources were available in the area in each temporal unit?
2. What does the evidence of diet indicate about the seasonal scheduling of food production and procurement?
3. What were the basic social organizational attributes of the subsistence systems identified for each temporal unit?

Paleodemography

Paleodemography is the study of prehistoric or protohistoric population of the project area during each temporal period. Of primary interest is the total population size of the area, the number of households represented, the number of people per household, and the number and population of inter-household units and of sites. Settlement studies are integral to addressing these questions and for supplying population estimates. Research questions include the following:

1. How many people lived in the study area during each temporal unit?
2. Over time, are there changes in population size or differences in growth curves that can be defined for individual communities?

3. What evidence is there for aggregation or dispersal?

Social Organization

The domain of social organization is concerned with how prehistoric, protohistoric, or historic inhabitants of the study area organized their society: how political, economic, and religious groups were structured and how they functioned. Information about size and configuration of architectural features, types of surface artifacts, and settlement pattern data are used. Research questions include the following:

1. What social groups can be defined within the study area?
2. What information about group integration can be recovered archaeologically?
3. In terms of social organization, how was production of each major class of material goods organized?

Interaction and Exchange

The subject of interaction and exchange is the interaction between populations of the project area and populations outside the project area. This interaction can take the form of exchange of material items or of ideas and information, as well as the movements of individuals, as in the case of exogamous marriage. Research questions include the following:

1. Based on the definition of exotic items and expectations of the project area assemblages, what specific items or features found in the project data may be identified as "exotic?"
2. What mechanisms for extraregional relationships can be used as models for investigating the project area relationships with neighbors and distant contacts?
3. For each of these models, what are the artifactual/architectural/contextual data that would be expected if the modeled mechanism was employed?

Chronology

Finally, the domain of chronology is concerned with identifying the temporal placement of archaeological sites and isolated finds. Questions of temporal range, length of occupation, and the extent of utilization for each period are analyzed within this domain. Research questions include the following:

1. What is the temporal range represented by cultural remains in the study area?
2. Were occupations in the project area short-lived or did they cover substantial periods of time?
3. During which period was use of the project area most extensive?

These six domains provide the research orientation for archaeological investigations and are addressed by analysis of survey and excavation data. Standardization of survey and excavation will provide consistent and comparable data, and facilitates the study of the individual domains. The procedures and methods for the exploration of the above research questions are outlined below.

4. MANAGEMENT

GENERAL PLAN

The Research Designs above offer research topics but don't address compliance with Federal legislation. In order to be an effective management tool this plan seeks to incorporate research questions within the framework of applicable legislation. In particular, the provisions of the Native American Graves Protection and Repatriations Act and Sections 106 and 110 of the National Historic Preservation Act should be used to determine management and treatment of historic properties. As lead agency the authority to implement and administer this plan will reside with the Bureau of Reclamation. On Tribal or State lands additional consultation would be conducted to determine if alternate implementation or administrative procedures are needed. Implementation of this plan is largely dependent on project scheduling, however, it may be possible to start some before a Record of Decision has been signed. If possible NAGPRA agreements and consultation to identify Traditional Cultural Properties should begin early.

NATIVE AMERICAN GRAVES PROTECTION AND REPATRIATION ACT AGREEMENT

In order to meet the provisions of NAGPRA and implementing regulations 43 CFR Part 10, it is recommended that a Programmatic Agreement, in consultations with UMU, SUIT, puebloan groups, and the Navajo Nation, be developed for all phases of archaeological investigation (survey, test excavations, excavation, and monitor). This agreement will define the respectful and appropriate treatment of human remains, sacred items and items of cultural patrimony. The archaeological contractor, in consultation with the Reclamation archaeologist, shall ensure that human remains and items of cultural patrimony are treated in a dignified, respectful, and professional manner and as efficiently as possible.

Until a Programmatic Agreement has been implemented, the following course of action is recommended for all discoveries (excavation and monitor) of human remains.

- work shall cease in the immediate vicinity of the discovery,
- remains will be protected from any potential disturbance (including vandalism or theft) after their discovery,
- human remains shall be covered and not exposed to public view,
- Reclamation shall be notified within 24 hours and Reclamation will then notify the Hopi, Zuni, Navajo, and Ute tribes and state agencies (police, sheriff, coroner, and. SHPO) in order to make a determination of jurisdiction,
- any activity which could damage the discovery or hinder evaluation must halt, until
- the discovery can be evaluated and a treatment plan agreed upon and implemented.

NATIONAL HISTORIC PRESERVATION ACT

The other legislation most applicable to this plan is the NHPA because the accompanying implementing regulations (36 CFR 800) specify the compliance process. The basic steps of this process are: determination of Area of Potential Effect, Identification of Historic Properties, Determination of Eligibility, Determination of Effect, and Mitigation. Each is presented below with a discussion of recommended methods.

Area of Potential Effect

The Area of Potential Effect (APE) for the Ridges Basin portion of the project has been defined but if project plans change, the APE should be adjusted accordingly. Lands to be acquired in the Pine, Animas, La Plata, and Mancos drainages have not yet been identified. As these purchases are made the APE can be determined. If the APE includes private lands, Reclamation will arrange for access to the property to conduct the following steps.

Identification of Historic Properties

Methods used to identify historic properties include document searches, field inventory, and consultation. Documents which may help identify historic properties (previous investigations, aerial photos, maps, etc.) would be examined. Field inventories consist of archaeology crews walking parallel transects (no more than 20 meters apart) over the entire project area. These pedestrian surveys commonly average 40 acres per person per day; however, the actual acreage depends on topography, site density, vegetation, and weather. Survey of the Animas-La Plata Irrigated Lands (SWCA 1994) averaged 13.9 acres per person per day, due to dense vegetation and high site densities. It is reasonable to conclude that coverage will be closer to 14 than 40 acres per person per day.

Although these survey methods would be followed in most cases, some flexibility is necessary. Disturbed areas, wash bottoms, and steep slopes, may be examined less intensively. In these situations, survey transects would be spaced as deemed appropriate and safe. On the other hand, transect spacing may be reduced when searching for specific sites or site types such as petroglyphs. Portions of the project area previously surveyed by qualified archaeologists will not be resurveyed unless requested by Reclamation. Project maps will indicate the location of all sites and areas in which no historic properties were identified.

All historic properties and isolated finds will be fully documented. Site documentation will include a written description of: location, cultural features, artifact assemblages, site limits, topography, deposition and disturbances. Site maps which indicate these elements will be recorded with a Global Positioning Satellite (GPS) system which would be converted into Geographical Information System (GIS) files. These files would be used to produce site and project maps. Hand drawn maps may be necessary in some cases. Sites will be marked with a PVC pipe and a metal tag with survey data inscribed, and this location will be recorded with the GPS. Photographs of each site and feature will be taken.

Analysis of survey data will sort sites into morphological site types, based on the characteristics observed and documented during survey. Whenever possible, an attempt will be made to derive site function as well, based on artifacts and/or features observed or on previously documented relationships between surface characteristics and excavation data. Chronological placement of sites will also be attempted, using materials documented during the survey. The overall goal of these procedures will be to produce an inventory of sites, sorted into temporal, morphological and, functional site types.

Traditional Cultural Property Consultation

Another method to identify historic properties is consultation. In particular, consultation is required to identify Traditional Cultural Properties (TCP's). This consultation has occurred in the Ridges Basin portion of the project. However, the location of the non-structural portions of the project are not yet known, therefore, it is recommended that as these areas are identified that TCP consultation be undertaken. Groups

which may have cultural affiliations with the project area include: Hispanic, UMU, SUIT, Navajo Nation, and Puebloans. Once identified, treatment plans to avoid or mitigate effects to these properties will be determined in consultation with the appropriate parties.

Determination of Eligibility

During documentation it is often possible to determine if a site is eligible for inclusion on the National Register of Historic Places. The Criteria of Eligibility (36 CFR 800 and 36 CFR 63) are: a) association with events that have made a significant contribution to the broad patterns of history; b) association with the lives of persons significant in our past; c) distinctive characteristics of a time, period, or method of construction, or represents the work of a master, or possesses high artistic values, or represents significant and distinguishable entity whose components may lack individual distinction; and d) potential to yield, information important in prehistory or history. The determination of eligibility will be completed prior to an assessment of effects. Additional investigations may be necessary on some sites to make this determination. Primarily test excavations will be used to gather enough information to accomplish this, however, other methods may be used. For example, controlled surface collection, backhoe trenching, or remote sensing (magnetometer, ground penetrating radar, etc.) could be used. These methods can also serve to identify data gaps which can be addressed during mitigation.

Determination of Effect

All sites which meet the Criteria of Eligibility for the NRHP will be evaluated to determine if the project will effect them. An effect occurs if there is potential to alter the sites NRHP eligibility status. Three types of effect are defined in 36 CFR 800.5, No Effect, Adverse Effect, and No Adverse Effect. Potential effects to historic properties from the ALP Refined Alternative 4 proposal are primarily destruction by construction, however, alteration, change of use, alteration of setting, intrusive elements, neglect, and transfer out of federal ownership are also possible. For example, removing water from an historic homestead may be an Adverse Effect which would need to be resolved.

Resolution of Adverse Effect

When the project is determined to have an adverse effect on an historic property site, consultation to avoid or reduce the effect will be undertaken. This consultation will include Reclamation, the appropriate State Historic Preservation Office, tribal organizations, and the Advisory Council on Historic Preservation. If the undertaking cannot be altered to avoid an adverse effect, excavation may be necessary. Before excavation a site specific treatment plan will be developed. A Memorandum of Agreement to simplify this process would be a useful tool for a project of this size.

Mitigative Excavation

Excavations will use standard methods. An arbitrary reference point would be established for vertical and horizontal control. A transit will be used to establish a metric grid system and all excavation units will be meter units within the grid. Deposits will be excavated by natural strata or arbitrary level when natural strata are not observed. All material will be screened through 1/8 inch mesh, feature fill may require smaller mesh. Three dimensional provenance of in situ artifacts will be recorded. All artifacts (stone, ceramic, etc.) or samples (bone, soil, pollen, radiocarbon, dendrochronological, and archaeomagnetic etc.) will be collected by grid unit and strata (natural or arbitrary). Feature matrix will be collected for floral analyses (micro and

macrobotanical) in order to reconstruct subsistence patterns. All features will be drawn in plan, excavated in cross-section, and draw in profile. Soil and pollen columns samples will be collected for geomorphological and paleoenvironmental analyses.

All materials collected during survey and excavation will be labeled, described, and catalogued. If appropriate, artifacts will be cleaned. Artifacts will be packaged according to the guidelines of the repository (see Appendix %, Anasazi Heritage Center Curation Guidelines). General procedures would include: packing artifacts in inert 4 ml polyethelene bags, storing soil samples in cloth bags, and use of acid-free paper labels. Records of all survey and excavation information would be stored in multiple media and in multiple locations for security Analyses will be completed on all material culture and special samples collected during field investigations. Ceramic, flaked stone, ground stone, and faunal remains will be analyzed and will include a discussion of the methods and results.

Artifact collections and records will be prepared for curation by the archaeological contractor. Preparation and transfer of the collections will be made in accordance with the stipulations outlined in "Curation of Federally-Owned and Administered Archaeological Collections" (36 CFR 79). Historic properties recovered during the Animas-La Plata Project from federally-administered land are the property of the United States Government. Cultural materials recovered from private property belong to the private landowner, except for human remains which fall under the jurisdiction of NAGPRA. Cultural materials from private lands will remain the property of the landowner unless the collection is donated. Collection donation will be solicited from all private landowners whose property will be impacted by historic properties mitigation. All archaeological materials and archival material will be transferred to a permitted repository designated by Reclamation.

MONITOR

In order to protect known historic properites, and discover undocumented properties, archaeological monitor of construction activities will be conducted. Reclamation and the archaeological contractor should determine those areas most likely to contain buried cultural materials, and coordinate with construction contractors to have an archaeological monitor present. In addition, it may be necessary to monitor areas where construction will disturb deposition which could contain certain categories of historic properties, for example, Paleoindian sites. Determination of which areas have or may have subsurface historic properties will be updated as archaeological investigations progress. If needed, protective measures and remedial actions can then be taken to preserve sites or mitigate project effects to sites.

Monitor Procedures

Personnel assigned to monitor construction activities will have the authority to halt construction in the immediate area of an archaeological discovery until assessment and documentation is complete. The construction crews should be informed of the requirements of the law concerning archaeological discoveries, the authority of the archaeological monitors, and the procedures required when a discovery is made. A specific course of action was presented above in case human remains are encountered prior to signed NAGPRA agreements. For all other monitor discoveries the following steps are recommended.

1. work shall cease in the immediate area of discovery,
2. the cultural materials shall be protected from further disturbance,

3. Reclamation will evaluate the discovery for eligibility to the National Register of Historic Places,
4. Reclamation will notify the appropriate SHPO, Council, Hopi, Zuni, Navajo, and Ute tribes of the discovery and afford the SHPO an opportunity to assess the discovery in the field provided that the inspection can be made within forty-eight (48) hours;
5. Reclamation, the SHPOs, and tribal organizations will consult to determine the most appropriate course of action on a case-by-case basis.
6. when agreement is reached, Reclamation shall notify the Council of the discovery and of the measures agreed for treating the discovery, and
7. if Reclamation determines that agreement cannot be reached for treatment measures, Reclamation shall consult with the Council pursuant to provisions in the Programmatic Agreement..

It is expected that some cultural remains discovered by monitor will not require extensive data recovery. In these situations, treatment measures may include plotting the exact location of the discovery, photographing, illustrating, or collecting the discovery, completing descriptive and interpretive recording of the discovery, and/or performing in-field analysis of the discovery. These procedures would result in minimal delay to the construction process.

If monitor discovers cultural deposits that may require more extensive investigation, construction in the vicinity of the discovery will cease until a full assessment or evaluation has been made. The monitor will indicate the boundary of any area that requires further archaeological investigation by marking the perimeter. Construction would continue after a treatment plan is agreed upon and implemented. This plan may include mitigative excavations described above.

POST CONSTRUCTION MONITOR

Following construction of the reservoir it is recommended that yearly examination of the shoreline be conducted. To achieve maximum coverage this examination should take place when the reservoir water level is low. Wave action between the high and low water lines will increase erosion, potentially exposing cultural deposits. Not only would erosion damage the sites but it would make them more visible and vulnerable to vandalism. Recreational opportunities associated with the reservoir may increase awareness of and access to historic properties which remain under Reclamation management, and periodic monitor of these sites is recommended . Documentation of these monitors must determine if and to what extent the sites have been disturbed. If disturbances are identified, plans to protect or mitigate these effects will be developed.

EMERGENCY PROCEDURES

Large construction projects are likely to have emergency situations. Emergency in this case is not intended to include scheduling crises. These may be critical to the project but no change in archaeological investigative procedures is recommended. However, if life or property threatening events occur it is recommended that the monitor procedures presented above be employed if possible. If not feasible, it is recommended that appropriated investigations be conducted after the emergency has been resolved. Appropriate response may be standard survey or monitor which could result in further investigations and mitigation of impact to historic properties. Reclamation should define emergency situations and determine when standard investigative procedures will be changed.

REPORTS

In order to ensure quality investigations, review, consultation, and project status, both annual and technical reports are recommended. Annual reports would allow project progress and status to be evaluated. Technical reports would present the results of all archaeological investigations (survey, test excavation, excavation, and monitor). Both report types would be submitted to Reclamation, the SHPO, the Advisory Council, and tribal organizations, for review and comment. Distribution of these reports for review would gather regional expertise.

The annual reports would detail project status and include acres surveyed, sites documented, site eligibility, sites tested, and sites excavated. The status of the analysis would be included; cataloguing progress, samples which have been submitted for specialized analysis (pollen, radiocarbon, etc.) and projected dates for completion of the necessary technical reports.

To limit redundant reportage, it is recommended that technical reports be organized as follows. Rather than separate reports for each survey can be organized by drainage and year (e.g. Mancos River Basin Survey, 2000). Test excavations can also be grouped by region and year but be subdivided by site (e.g. Test Excavations of Sites 5LP###, 5LP###, and 5LP###, 2000). However, it is recommended that each mitigative excavation be reported separately (e.g. Excavation of Site 5LP###). Monitor reports can be organized by construction activity (e.g. Surface Blading for the Ridges Basin Conduit) or site specific archaeological investigation (e.g. Archaeological Monitor of Site 5LP###). If monitor leads to further investigations or mitigative actions, these would be reported separately. All reports would describe methods, features, artifacts assemblages, deposition, specialized analyses (flora, fauna, radiocarbon etc.), conclusions, and management recommendations. In addition, a project of this scale should produce synthetic reports at the completion of all field work to place the results into regional context. Synthetic reports would be made up of chapters concerning each type of data (flora, fauna, geology, soils, stone and ceramic artifacts, architecture) that would be interpreted by the principle author. If multiple contractors are used to implement this plan, Reclamation should designate one through which the synthetic reports would be coordinated

PLAN REVIEW

To meet project needs and incorporate new information this management plan should be reviewed and updated. Implementation of ALP will take several years, and it is recommended that this plan be reviewed by Reclamation, tribal organizations, the contractors, SHPO's, and the Advisory Council on a yearly basis. Review of the plan should follow submission of the annual report.

OUTREACH

In addition to benefitting the archaeological community, a project of this scale provides the opportunity to include the public in the process and share the results with a large audience. Distribution of project information to tribes, schools, the general public, and professional groups is an important element of this project. Several laws encourage these types of programs: the NHPA directs agencies to administer federally owned, administered, or controlled historic resources in a spirit of stewardship for the inspiration and benefit of present and future generations (16 USC 4701:3) and ARPA states that agencies shall secure, for present and future benefit of the American people, the protection of archaeological resources and sites...and to foster increased cooperation and exchange of information between governmental authorities, the professional, archaeological community, and private individuals (16 USC 4700aa).

As indicated in the NAU Research Design, there are many ways information can be distributed: tours, lectures, presentations, brochures, exhibits, interpretive signs, and technical reports can be used. These programs will explain how and why the investigations occur, the importance of historic preservation, and the results of the project. Interpretive displays at the reservoir may be particularly effective.

In addition, participation in the investigations by the public should be a goal of the project. Programs to involve volunteers and employ local non-professionals would be developed. Employment and participation by local Native American people should be an objective of the plan. To that end programs can be developed to encourage their participation and input.

RIDGES BASIN PLAN

The following plan was developed in 1996 for the previous ALP project proposal and is repeated here.

When Project implementation will result in undesirable effects to historic properties, procedures of data recovery, designed to avoid, reduce, minimize, or mitigate those effects, will be undertaken. The procedures and methods for data retrieval from effected historic properties have been established by the archaeological contractor and are outlined below. "The methods provide for efficient recording, for collecting a range of archaeological and paleoenvironmental samples, for field processing and laboratory analysis, and for data interpretation and integration into useful results" (NAU 1992).

Sampling Design

An "adequate" sampling design, as defined by Reclamation, is required prior to data recovery (Reclamation 1992). The sampling design shall designate "a representative sample of a statistical population" (NAU 1992). Sites have been prioritized by Reclamation in relation to construction schedules, and additional prioritization and organization should occur as appropriate for the archaeological research. The sample of sites selected for mitigation should come from the full range of site content, time periods, and geographical and ecological zones that are present in the project area (NAU 1992). The results of the first year of field work should be used to inform and adjust the sampling strategy for the following years.

Field Methods

Fieldwork will be based upon the research and sampling designs, and will be conducted in two parts, called "preliminary fieldwork" and "excavation and/or intensive study" by Reclamation (Reclamation 1992), and "site evaluation" and "site recovery" by the archaeological contractor (NAU 1992). A brief outline of the proposed field methods for the Project is below; the proposed field methods are detailed in Reclamation (1992) and NAU (1992). Any investigative action or aspect of field or laboratory methodology that is not specifically mentioned here in this outline is not necessarily excluded from the scope of investigation of this project.

Preliminary Fieldwork/Site evaluation

Preliminary field investigations may include, minimally, detailed surface mapping, surface collection, and auguring at all effected sites, and may include subsurface testing (either mechanical or manual, or both) where necessary (Reclamation 1992:C-21, NAU 1992:IV.15-IV.16).

Excavation/Site Recovery

The second phase of field work will include "site stratification, sampling, and intensive excavations" (NAU 1992). Excavations will provide horizontal and vertical controls for the proveniencing of cultural remains and deposits as well as natural stratigraphy. Excavations may proceed in natural levels or arbitrary levels of specified thickness as appropriate to each excavated area. A sample of all excavated soil will be screened through uniform mesh to recover artifacts and other cultural materials; the mesh size may be changed to recover a smaller or larger quantity of material in different contexts. Detailed descriptive recording will be done for each excavated feature and area, including the completion of the appropriate standardized forms (further outlined below), photography, and the creation of profile, plan view, and cross-sectional drawings as necessary to adequately record the feature.

Detailed and thorough written records will be kept for all activities at a site. A system of field forms, designed to record the cultural remains in the project area, will facilitate "thorough, consistent, and efficient field recording" (NAU 1992). The original written records from any site will become part of the permanent site record, and the information used in a computerized data base. The written record of any site will include, but is not limited to: mapping data and site plan maps; logs of surface collection units and artifact densities in collected areas; all records for excavation units; descriptive records of all categories of features; feature plan views, profiles, and cross-sections; photographic logs; logs of all collected artifacts; and logs of all soil and analytical samples taken (NAU 1992).

Field Laboratory Processing

An archaeological field laboratory will be established near the project area. This laboratory will receive all artifacts, samples, photographic materials, field forms, and notes from the field, and will provide both temporary and long-term storage for these items. The laboratory will maintain a computerized system for the tracking of all received materials. At least minimal artifact processing will take place in the field laboratory, including sorting items by material class and provenience unit, cleaning, labeling, and packaging artifacts in appropriate protective materials, and stabilizing and preserving cultural and organic materials as necessary. Artifact and sample analysis will follow, performed by either the laboratory facility designated in the contract or by subcontracted analytic specialists.

Analytic Laboratory Operations

The analysis of artifacts and samples, as proposed and defined by the archaeological contractor, will involve many fields of study (NAU 1992). Analyses will include, but are not limited to, the following categories:

1. archaeozoology,
2. archaeobotany,
3. geological and pedological samples,
4. stone artifacts,
5. ceramic artifacts,
6. architecture, and
7. human remains

Computer System/Data Processing

A computer data base system will be provided and maintained by the archaeological contractor. At a minimum, this system will be sufficient to "[link] excavation, central laboratory, and specialized laboratory data in a single data system that allows easy data transfer between the word processing, database management, and analytical programs" (NAU 1992). The system must also have sufficient storage space to process and manipulate large quantities of data.

Reports and Research Dissemination

The quality, adequacy, and completeness of the contractor's reports will be the primary measure of the contractor's performance (Reclamation 1992). As required by Reclamation, the contractor will submit three types of reports: progress, annual, and technical reports. Technical reports will include a publishable research design and field and laboratory manuals, descriptive field (site) reports, and a final synthetic report or set of reports. All reports will be submitted in accordance with a schedule determined by the annual work plan. The dissemination of draft reports to the appropriate reviewing agencies (such as the State Historic Preservation Office and the Advisory Council on Historic Preservation) is the responsibility of Reclamation and is detailed in the Amended Programmatic Agreement (*date?).*

In addition to these required reports, the contractor has proposed to disseminate information in other ways, including: presentation to a professional peer review panel; presentations at professional meetings; articles in professional journals; and student theses and dissertations. Reclamation has also proposed to utilize scientific publications, popular reports, videotapes, and educational programs to publicize the results of the Project.

Procedures for In-Place Preservation and Long-Term Management

To the fullest extent possible, historic properties will be preserved in situ, protected from the effects of Project implementation. Sites designated for preservation will be assigned an archaeological monitor during potentially harmful Project activities. Previously unknown historic properties discovered during the course of Project construction will be evaluated and afforded the same protective measures as currently known historic properties. Reclamation will develop a detailed plan for the management of historic properties after construction of the Project is completed. The results of the research conducted for the Project will be made available to the general public in a variety of ways, and there will be opportunity for the public to be involved in the research.

In Situ Preservation

In situ preservation is the preferred course of action for all identified historic properties within the area of potential effects. As stated in the Amended Programmatic Agreement, "[if] the property can be saved from destruction or alteration of those characteristics which make the property eligible for inclusion in the NRHP, Reclamation will take the necessary steps to preserve the property in perpetuity". One "necessary step" may be the establishment of a minimum amount of activity that will be required at sites designated for in situ preservation. This minimum amount of activity could include any of the following, as well as any other activity deemed appropriate by Reclamation for the preservation of a historic property: establishment of a permanent site datum, photography, surface mapping, surface collections, marking the perimeter of the site with flagging or a temporary or permanent fence, and/or the presence of an on-site monitor. Flagging and

temporary fencing will be used to mark sites for avoidance by Project-related construction, machinery and vehicular traffic.

Data Recovery

Efforts will be made to minimize effects to property. If effect to the property can be reduced, avoided, minimized or mitigated, Reclamation will take necessary measures to do so. prior to the initiation of construction activities, Reclamation, in consultation with the SHPO's, Council, and the Tribes, will develop a project specific (general) research design for the recovery of archaeological data. The general research design, included as a part of this plan, shall be used to guide decisions regarding the recovery of archaeological data from historic properties where project effects are unavoidable, shall aid in the development of subsequent scopes of work for issuing archaeological contracts, and shall provide the research orientation of site-specific data recovery efforts. Site-specific data recovery plans shall be developed subsequent to the general research design, and shall be implemented by the Bureau of Reclamation.

Integration of Construction with Treatment of Historic Properties

Reclamation will not initiate any construction for this project that may affect a historic property or a potential historic property until such properties have been located, assessed for eligibility, the effects of the undertaking on the property have been determined, and any field treatment is complete. Reclamation will cooperate with the SHPO's to assure that any required identification, evaluation, and treatment activities are completed as expeditiously as possible and that the stipulations of the Programmatic Agreement are met. Reclamation, in consultation with the SHPO's, shall develop construction schedules, data recovery and treatment strategies in such a fashion as to ensure that the treatment is complete prior to the commencement of construction, while minimizing project delays.

Monitoring Plan

Reclamation will ensure that particular care is taken during construction to prevent effects to historic properties that are designated for in-situ preservation and unanticipated discoveries. Restrictions on construction work will be accomplished by the erection of temporary fences, flagging, and the presence of an on-site monitor.

The archaeological monitoring plan includes some of the actions necessary to protect known historic properties (sites) that have been designated for in situ preservation from the effects of Project construction. This plan outlines how data on impacts to historic properties will be collected. These data will be used to predict the kinds and intensity of site erosion. The monitoring plan requires that sites needing remedial action will be identified, that appropriate remedial actions will be taken at these sites, and that the degree of success of these actions will be evaluated as time goes by.

The process for selecting sites to monitor is based on a priority list, with actively eroding sites being first on the list. Other factors that increase a site's probability of selection for monitoring include site location in a control group outside the area of potential effects, previous remedial actions at the site, high potential for adverse impacts due to non-geomorphological factors, specific tribal concerns, and ongoing cultural or other kinds of research activities.

The monitoring plan requires total station mapping for all sites that are actively eroding, all sites chosen within the control group, and all sites evaluated as requiring yearly monitoring. Total station mapping with direct linkage to geographic control is an excellent technique to depict features, artifact concentrations, diagnostic cultural material, significant natural features, erosional features, and datum points for photo-referencing where appropriate. It will be used to generate the plan form geometry of gully systems and bed elevation. Site topography will be mapped at a contour interval suitable for identifying erosional changes, which may vary by site location. Repeat total station mapping will occur yearly for threatened sites that exhibit active erosion. Appropriate and efficient methods will be employed for mapping sites. These methods may require on-the-ground total station mapping in conjunction with regular monitoring trips. Other less intrusive methods of mapping will be explored, such as repeat aerial photography (stereo photo interpretation) with initial on-the-ground mapping of survey control points. Site locational information and site contour maps will be integrated with appropriate Geographic Information Systems.

Collection of data on artifact density and distribution within artifact recording units is required, as is completion of standardized monitoring forms and use of baseline photographic reference points to make site observations.

Reclamation and the archaeological contractor should coordinate to provide a qualified archaeological monitor at any such designated site that may experience surface or subsurface disturbance from Project-related activities. The monitor may place fencing, flagging, and/or be an on-site presence to divert vehicular and machinery traffic from a site surface. The diversion of traffic may require Reclamation to create, establish or obtain a temporary access corridor on lands directly adjacent to known site areas.

If previously unknown cultural materials are discovered by any contractor conducting a Project-related activity, or are discovered during the course of monitoring, then a previously determined "discovery plan" will begin. This eight-step process is included in the Amended Programmatic Agreement (*date?*). In general, it specifies that first, work shall cease in the immediate area of the discovery and the cultural materials shall be protected from further disturbance. Then, the contractor is responsible for notifying Reclamation of the discovery. Reclamation is thereafter responsible for notifying the appropriate groups and agencies, evaluating the discovery, and determining the appropriate course of action to be taken.

The discovery plan includes procedures that incorporates elements of the NHPA and the NAGPRA. Upon planned archaeological investigation, federal land agents must consult with appropriate Native American groups regarding the treatment and disposition of human remains and other cultural items recovered. The Native American groups must also consent to the excavation and removal of these items. Any disturbance to human remains, sacred objects, or objects of cultural patrimony will be addressed under NAGPRA regulations. Under the NAGPRA, the inadvertent discovery of human remains and other cultural items during a land-disturbing activity requires cessation of the activity. The person conducting the activity must take "reasonable" protection measures and notify the federal agency with management authority over the land. The agency has 24 hours to notify the relevant tribe(s) that the discovery has occurred. The agency receives a formal acknowledgment of the notification (called "certification" in the NAGPRA) and waits 30 days prior to resuming the activity. Disposition of the newly discovered human remains or other cultural items must be resolved in accordance with the ownership provisions of the NAGPRA.

The monitoring plan specifies that remedial actions will be undertaken when monitoring identifies adverse impacts to sites. The type of remedial action will be formulated by the Bureau of Reclamation in consultation with the tribes and in keeping with overall research domains established in the HPMP.

Potential remedial actions may include, but are not limited to, redirection or removal of trails, development of public interpretation, closure of the site to the public, and temporary stabilization. Remedial actions will be implemented as can be scheduled. If immediate action is required, discussions among the Bureau of Reclamation, appropriate tribes, and consultants will formulate acceptable strategies and time frames. If emergency action is required, the land managing agency or tribe is responsible for taking appropriate remedial actions. The other parties concerned should be notified prior to the action, if possible, or as soon after the action as feasible.

A comprehensive program of site testing for sites subject to flooding and erosion will be developed. Stabilization workshops will be designed and coordinated by Reclamation, with the participation of the tribes, to implement the stabilization program and to train staff.

Long-Term Management

The Ridges Basin portion of the project will remain in the administrative jurisdiction of the Bureau of Reclamation. As presented in the Programmatic Agreement (*date?)*, Reclamation will develop, within two years of the completion of construction activities on Project, a long-term management plan for the historic properties in the Ridges Basin area. This plan will specify at a minimum:

1. provisions for in-place preservation (including additional monitoring and remedial measures),
2. means to manage for future recreational development (campgrounds, trails, etc.),
3. means to manage for Operation and Maintenance of Reclamation facilities, and
4. proposed methods for public interpretation and public involvement.

Long-Term Monitoring and Remedial Action

The monitoring of archaeological sites will be frequent and thorough. Approximately four monitoring trips will be made per year, with specific sites chosen for on-the-ground monitoring and documentation by standard forms and repeat photography. Site condition is compared with the previous monitoring episode and recommendations are made regarding site stability and deterioration, as well as regarding remedial actions that should be taken to stabilize the site.

This program is a fundamental part of the HPMP and is necessary in order to identify minimum levels of monitoring needs, as well as to identify and prioritize remedial actions that need to be taken in order to protect or mitigate adverse effects on sites. As sites requiring remedial actions are identified and prioritized, remedial actions is expected to become and increasingly important part of the historic properties program, while the monitoring portion of the program will shrink. Reclamation will program funds for remedial actions and data recovery yearly for sites adversely impacted by the Animas-La Plata Project. Remedial actions are expected to be conducted at prioritized sites every year, although the level and scope of such actions may vary.

Emergency Remedial Actions

Large scale episodes of site destruction are difficult to predict. Some years, large amounts of funding will be required in order to stabilize or conduct data recovery at damaged sites where damage could not be predicted. These unexpected remedial actions will need to be funded by Reclamation from existing program funds. A remediation contingency fund should be established for these kinds of expensive emergencies, if possible. Remediation funds that are not used in annual budgets should be added to this contingency fund.

Repeat mapping of threatened sites is expected to be an increasingly important tool for quantifying and predicting erosion, hence identifying remedial actions that need to be taken. Repeat mapping field work and lab work will be administered, and the results made available for review.

Establishment of Tribal Monitoring Programs

In an effort to facilitate cooperation and shared stewardship responsibility, concerned tribes will be involved in the monitoring process. Tribal elders will be integrated into the review and monitoring process as needed. Tribes will be expected to submit yearly proposals for participation in the program. Past participation and performance in the program will be considered by Reclamation as a criterion for future funding. Tribes will establish long-term monitoring programs for historic properties identified during ethnographic studies and determine level of efforts required for long-term monitoring. Long-term monitoring schedules and criteria will be established by the tribes, with the establishment and maintenance of compatible data bases to be updated with data collected during monitoring trips. In addition to these functions, tribes may also recommend and participate in remedial actions designed to collect data and/or to stabilize or protect places from erosion. Proposals will be solicited at approximately the same time every year, will be reviewed by Reclamation, and will be funded at a level deemed appropriate to meet the requirements of the HPMP.

Procedure for Public Involvement

NAU proposed the development of public information and education programs, in order to increase local awareness of the archaeological work being done in association with the Project, and to encourage good public relations by fostering "positive and cooperative attitudes" towards the Project. The suggested programs are detailed in the research design for the Project and in the technical proposal for data recovery.

In summary, it is proposed that the archaeological contractor should coordinate with the local community, various tribal groups, civic leaders, individuals, and educators, for the creation and implementation of public education programs. It is acknowledged that such programs will require extensive planning and cooperation between various administrative agencies, and that actions should meet with Reclamation approval prior to implementation. All of the activities and programs designed for public involvement in the Project should be unobtrusive, and should not interfere with archaeological or construction work schedules.

"Educational outreach" and "research participation" programs, as defined by the contractor, may include, but are not limited to, any of the following: educational programs involving local tribes and schools; slide presentations and brochures; tours of sites; volunteer participation in excavation of a site designated for such activity; the creation of trail networks; the creation and distribution of a newsletter; summer youth programs; planned workshops; the coordination of the provision of related scholarships and/or graduate

assistantships, in association with local, subcontracted, and/or interested colleges and universities; and press releases.

5. SUMMARY

The Bureau of Reclamation is planning the Animas La Plata project. Several action plans have been proposed, and Reclamation identified Refined Alternative 4 as the preferred alternative. Refined Alternative 4 consists structural and non-structural components in southwest Colorado and northwest New Mexico. An estimated 700 historic properties are in the project area (Ridges Basin, Navajo Nation Pipeline, and in the Pine, Animas, La Plata, and Mancos drainages). Implementation of ALP will effect many sites which are eligible for inclusion on the National Register of Historic Places.

This Historic Properties Management Plan was developed to provide a framework in which Reclamation can take into account the effect of the undertaking on these sites. In order to integrate compliance and research, it is recommended that Native American Graves Protection and Repatriation Act Agreements be developed, and that National Historic Preservation Act Section procedures be followed to identify, evaluate, and resolve effects to historic properties (including Traditional Cultural Properties). In addition, a project of this magnitude, which has the potential to affect many historic properties, makes it possible to address research questions pertinent to regional prehistory. Use of standard archaeological survey and excavation procedures will produce consistent, comparable, and pertinent data in order to address the six general domains (settlement patterns, economy and adaptation, paleodemography, social organization, interaction and exchange, and chronology) in SWCA's research design.

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36 CFR 800: Protection of Historic Properties. Advisory Council on Historic Preservation (Section 106 and Section 110 regulations)
43 CFR 10: Native American Graves Protection and Repatriation Act Regulations

7. ACRONYMS AND ABBREVIATIONS

ACHP - Advisory Council on Historic Preservation
AIRFA - American Indian Religious Freedom Act
ALP - Animas- La Plata project
ARPA - Archaeological Resources Protection Act
APE - Area of Potential Effect
CFR - Code of Federal Regulations
HPMP - Historic Properties Management Plan
NAGPRA - Native American Graves Protection and Repatriation Act
NHPA - National Historic Preservation Act
Reclamation - Bureau of Reclamation
RSA - Reservoir Salvage Act
SHPO - State Historic Preservation Office
SUIT - Southern Ute Indian Tribe
TCP - Traditional Cultural Property
UMU - Ute Mountain Ute