

contrast of the pipeline with the surrounding landscape. Impacts on KOPs and other viewing areas would be less than significant.

The Alternative T gas pipeline corridor would be in compliance with BLM Class II (corridor segment T5), III (corridor segment T5), and IV (corridor segments T4, C3, T3, T2, and T1) landscapes. This is primarily due to its location adjacent to existing rights-of-way and after implementation of measures described in Section 2.2.8.8.

Short-term impacts resulting from the construction of the pipeline primarily would result from the visibility of equipment and dust related to the construction process from KOPs #1 - Community of Wikieup, #3 - US 93, and #5 - Nettie's Place Residence. The equipment (e.g., backhoes, bulldozers, trucks) and dust could temporarily block views to distant mountain landscapes. These short-term impacts would be moderate and less than significant.

Crossover Segment C2

Corridor segment C2 follows the old US 93 alignment. The scenic quality is Class C desert scrub landscapes and would result in low impacts. Views of this corridor would be limited to the point where it intersects with US 93. Modifications would be noticeable when viewed from a small section US 93 and not noticeable for the remainder of the corridor where there are no sensitive viewers. Impacts to views from US 93 would be low primarily because of the short duration of view and minimal scenic quality of the landscape. Impacts from this corridor would be less than significant.

No-Action Alternative

There would be no impacts on visual resources associated with the No-Action Alternative. The groundwater production and monitoring wells, access roads, and well pads, that were completed on private land and used to identify and test the lower aquifer, would remain.

Mitigation and Residual Impacts

No significant impacts would result from the implementation of the Proposed Action with the actions incorporated to reduce or prevent impacts. There would be no residual significant impacts.

If adopted, the following measures would be implemented to minimize adverse impacts not considered to be significant:

- As necessary to blend with the surrounding weathered rock, the high cut slope north of the proposed power plant site would be coated with penetrating rock stain.
- As necessary to blend with the surrounding weathered rock and soil, larger rocks left on the surface of areas disturbed for the pipeline construction would be coated with penetrating rock stain.

3.10 AREAS OF CRITICAL ENVIRONMENTAL CONCERN

The Federal Land Policy and Management Act directs BLM to manage public lands for multiple purposes. However, BLM has the authority to designate and more restrictively manage some lands to protect some resources such as special status plants and animals, cultural values, scenic values, and wildlife and riparian resources. The *Kingman Area Resource Management Plan* (BLM 1993) defined 12 ACECs for such special management (Figure 3.10-1). Because of their locations, the proposed Big Sandy Energy Project is not projected to have any potential effects on 10 of these 12 ACECs. The Carrow-Stephens Ranches ACEC and the Three Rivers Riparian ACEC were identified as subject to potential impacts and are addressed in this section.

3.10.1 Affected Environment

3.10.1.1 Region of Influence

The region of influence for assessing construction and operation impacts includes the area within the boundaries of the Carrow-

Stephens Ranches and Three Rivers Riparian ACEC. Corridor segment T4, which is a component of the Proposed Action and the Alternative T gas pipeline corridor, crosses the Carrow-Stephens Ranches ACEC, as does corridor segment R4 of the Alternative R gas pipeline corridor. Also, the OPGW option for the substation dual/redundant communication system would cross this ACEC within the right-of-way for the Mead-Liberty 345-kV transmission line. The Three Rivers Riparian ACEC begins about 8.5 miles south of the Project area and extends about 16 to 17 miles south to where the confluence of the Big Sandy River and Santa Maria River form the Bill Williams River. This ACEC was addressed to evaluate whether the pumping of groundwater for the Big Sandy Energy Project could affect the ACEC by reducing surface water flows in the Big Sandy River or could affect the water quality of the Big Sandy River.

3.10.1.2 Existing Conditions

Carrow-Stephens Ranches ACEC

The Carrow-Stephens Ranches ACEC encompasses 542 acres of public land on the west side of the Big Sandy River about 5 to 6 miles north of Wikieup. US 93 and the Mead-Liberty 345-kV and Mead-Phoenix Project 500-kV transmission lines cross the ACEC (refer to Figure 3.10-1).

This ACEC was designated primarily to protect the historical residences, outbuildings, and other features of the Joseph Carrow and Ray Stephens ranches, but also includes parts of the Carrow-Stephens Wildlife Movement Corridor (BLM 1995). The potential for other aboriginal archaeological sites and Miocene-Early Pliocene fossils also was recognized when the ACEC was designated. A recent survey for the planned upgrading of US 93 discovered four previously unrecorded archaeological sites within the ACEC. These include three scatters of historic trash that may relate to the historic ranches, and a small scatter of pieces of broken aboriginal pottery and flaked stone artifacts. About one-third of the ACEC has yet to be intensively

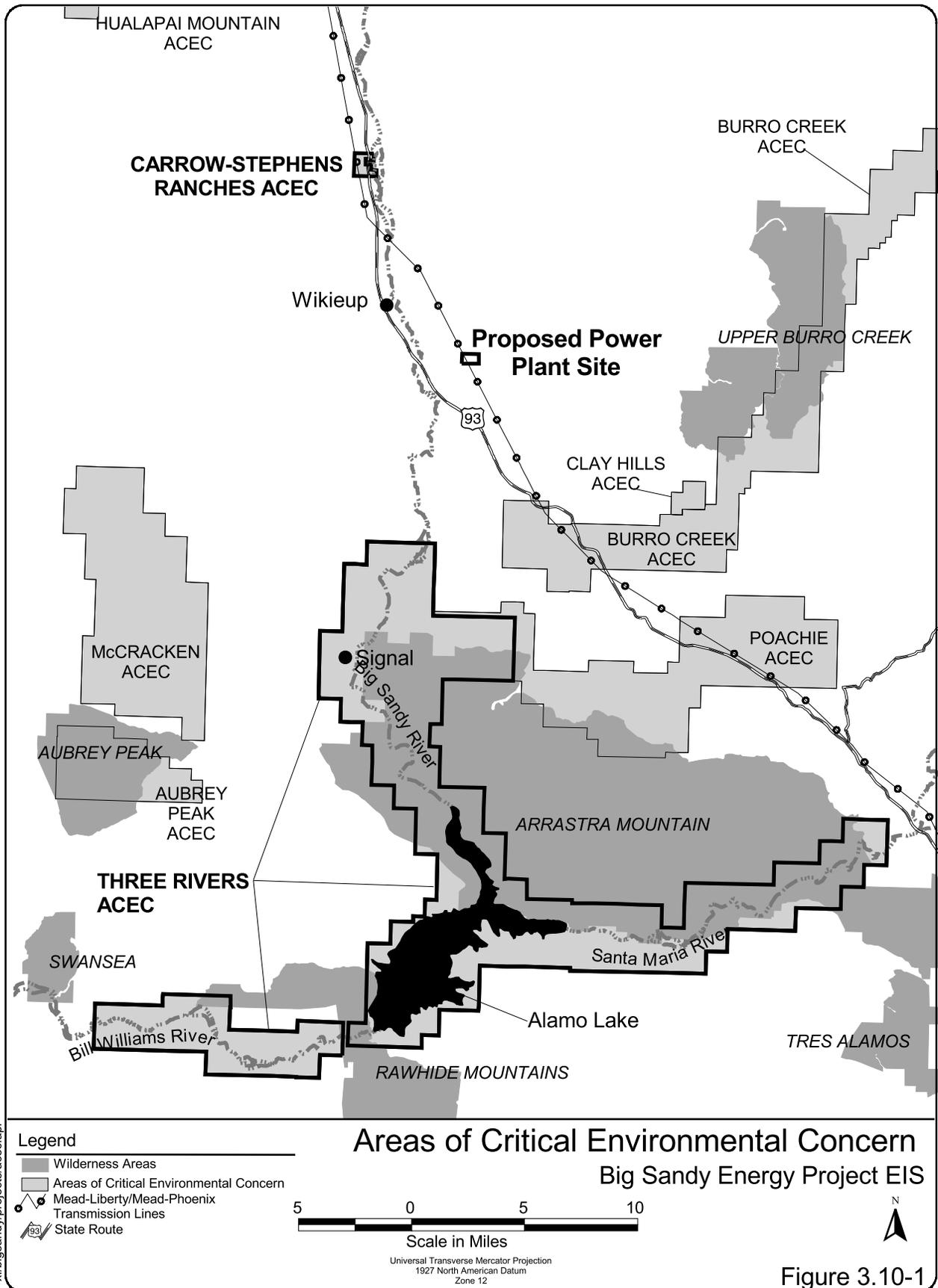
inventoried for cultural resources, but paleontological studies indicate that the ACEC is north of the Big Sandy Formation and therefore has little potential for significant fossils (refer to Section 3.2).

The features of the Carrow Ranch complex include the main house (a two-story adobe built in 1890-91), family cemetery, ruins of a dugout structure, barn, garage, outbuilding, outhouse, corrals, irrigation ditches, road, 1930s cannery shed, and earth-sheltered storage cache (Figure 3.10-2). The foundations of a school also may be present but have not been located. The features at the Ray Stephens Ranch include the main house (adobe building constructed in 1935), five storage sheds, and small orchard. Pieces of wagons and other farming equipment and other artifacts are scattered across both of the ranch complexes.

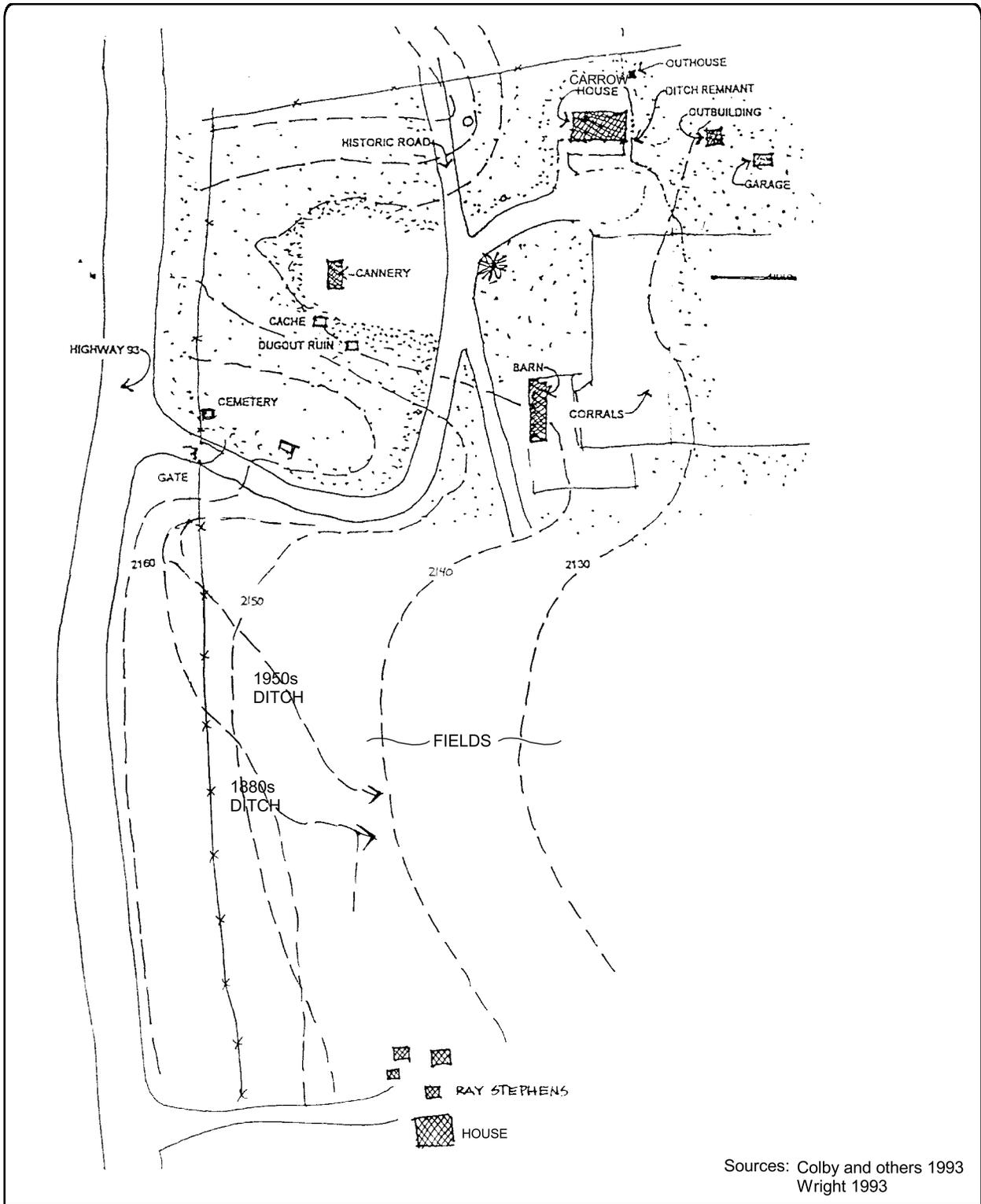
The Carrow family moved onto their ranch in 1882. Crops had been grown at this location adjacent to two springs since at least 1873. The family lived at the ranch for two decades and Joe Carrow became known as one of the most successful farmers in Mohave County.

Two of the Carrow children died in the 1890s and were buried in a family cemetery. At least one other individual, an unidentified Hualapai Indian who apparently worked on the ranch, is buried at the cemetery (Colby et al. 1993:26).

William Stephens settled on a ranch north of the Carrow place in 1894. In 1922 Stephens acquired the Carrow land and combined the ranches. In the 1930s, one of his sons, Ray, built the house south of the Carrow ranch that is now within the ACEC.



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Carrow-Stephens Ranches ACEC
 Big Sandy Energy Project EIS



Figure 3.10-2

The cannery shed and storage cache are remnants of the Big Sandy Cooperative Canning and Marketing Association. These facilities were developed with assistance of a New Deal self-help program during the Great Depression. The canning of locally grown fruits, vegetables, and beef began in 1936 and continued for several years.

The Carrow-Stephens Ranches ACEC stands as a monument to the first generation of ranchers in the Big Sandy Valley, and BLM objectives for this ACEC focus on public interpretation, education, and recreation. The National Park Service completed an assessment of the site conditions in 1993 (Colby et al. 1993), and BLM has programmed additional funds to stabilize the Carrow ranch house. BLM is seeking additional funds and partners for development of the site for recreational and educational opportunities. Within the next 5 to 10 years, the Arizona Department of Transportation (ADOT) plans to upgrade US 93 within the ACEC, but would reroute the highway about 1,200 feet west of the existing alignment to reduce impacts on the historic ranches within the ACEC.

Three Rivers Riparian ACEC

The Three Rivers Riparian ACEC covers 32,043 acres. The ACEC boundaries encompass the riparian zones where the Big Sandy River and Santa Maria River join to create the Bill Williams River and upland areas that surround this confluence. Alamo Dam, built across the upper Bill Williams River, creates Alamo Lake within this ACEC (refer to Figure 3.10-1).

The northern, eastern, and western boundaries of this ACEC are located along the Big Sandy River, Santa Maria River, and Bill Williams River, respectively. The northern boundary is north of Burro Creek, in T14N, R13W; the eastern boundary is in T12N, R9W; and the western boundary is in T9N, R15W. The boundaries of this ACEC abut the Arrastra Mountain Wilderness and the Rawhide Mountains Wilderness.

This ACEC was designated to protect riparian habitat because these habitats are limited and have been degraded throughout the Southwest. The riparian areas along the Big Sandy, Santa Maria, and Bill Williams rivers provide habitat for birds, fish, wildlife, and insects—some of which are threatened or endangered, State-listed, or BLM sensitive species (refer to Section 3.14). In addition to its importance for wildlife, the ACEC includes valuable scenic and recreational resources. Scenic resources include the riparian vegetation and diversity of terrain. The free-flowing stream provides opportunities for water-based recreation, and BLM has proposed portions of the Big Sandy River within the ACEC for inclusion in the Wild and Scenic River system.

3.10.2 Environmental Consequences

3.10.2.1 Identification of Issues

The following issues were identified during the scoping and preparation of this Draft EIS:

- potential effects of the Project on goals and objectives for the Carrow-Stephens Ranches ACEC and Three Rivers Riparian ACEC
- potential effects on archaeological and historical resources in the Carrow-Stephens Ranches ACEC
- potential effects on riparian areas in the Three Rivers Riparian ACEC as a result of any reduction in surface water flows
- potential effects on water quality in the Three Rivers Riparian ACEC due to spills or stormwater or wastewater discharges

3.10.2.2 Significance Criteria

Any Project effects on the Carrow-Stephens Ranches ACEC and Three Rivers Riparian ACEC that are inconsistent with the BLM Kingman Area RMP goals, objectives, and management prescriptions for these ACECs would be considered significant.

3.10.2.3 Impact Assessment Methods

The assessment of impacts relied heavily on the cultural resource studies (refer to Section 3.15) and hydrological analyses (refer to Sections 3.4 and 3.5) conducted for this Draft EIS. Goals, objectives, and management prescriptions for the Carrow-Stevens Ranches ACEC and Three Rivers Riparian ACEC (BLM 1995) were reviewed for potential conflicts with the Proposed Action. In addition, for the Carrow-Stevens Ranches ACEC, maps of the proposed and alternative pipeline corridors and descriptions of the pipeline construction and maintenance activities were compared with previously prepared maps of the Carrow and Stephens ranches. Cultural resource specialists also visited that site.

3.10.2.4 Actions Incorporated into the Proposed Action to Reduce or Prevent Impacts

The Proposed Action includes the following measures to reduce or prevent potential adverse environmental impacts on ACECs:

- Disturbed areas would be revegetated in accordance with the Reclamation Operation Maintenance Plan for BLM-Managed Lands (refer to Section 2.2.8.9 and Appendix B) to minimize impacts on and promote revegetation of native plants. The plan includes salvage and transplanting of selected species. Quarterly visual inspections and annual leak detection inspections of the pipeline would be conducted on foot and no roadway would be maintained along the pipeline through the ACEC.
- A detailed evaluation of any effects to the Carrow-Stevens Ranches ACEC from construction of a natural gas pipeline or installation of an OPGW would be conducted in accordance with the terms of the Programmatic Agreement developed for the Project in compliance with Section 106 of the National Historic Preservation Act.

This agreement defines a consultation process for avoiding or mitigating any identified adverse effects on significant cultural resources (refer to Section 2.2.8.11.).

- The Proposed Action contains measures designed to monitor groundwater levels and provide water to augment shallow groundwater and surface water flow in the Big Sandy River sufficient to prevent changes to these hydrologic systems which may otherwise occur as a result of the Project. Therefore, no changes to shallow groundwater levels or surface water flows in the Big Sandy River are predicted as a result of the Project.

3.10.2.5 Impact Assessment

Proposed Action

Carrow-Stephens Ranches ACEC

The Kingman Area Resource Management Plan defined 5 objectives and 13 management prescriptions for the Carrow-Stephens Ranches ACEC. One objective and two management prescriptions are relevant for the impact analysis. Objective 1 stipulates that surface disturbance be minimized. Prescription 8 stipulates that within the US 93 corridor, new rights-of-way are to be confined to the area west of the highway. The Resource Management Plan subsequently was amended to eliminate this prescription and BLM now considers any proposed new rights-of-way on a case-by-case basis. Prescription 10 stipulates that native plants not be removed from the ACEC.

The Proposed Action would involve the installation of a 16- to 20-inch-diameter pipeline within corridor segment T4, which includes the western portions of the Carrow-Stephens Ranches ACEC. Typically, corridor segment T4 extends 1,000 feet to the east and west of the existing rights-of-way for the transmission lines. However, the corridor is expanded to 4,000 feet west in the vicinity of the Carrow-Stephens

Ranches ACEC to accommodate design of a specific alignment that would avoid any encroachment into this ACEC (Figure 3.10-3).

Cultural resource surveys of the portion of corridor segment T4 that overlaps with the ACEC are limited to the right-of-way and access road for the Mead-Phoenix Project 500-kV transmission line and the western edge of the proposed realignment corridor for US 93. No archaeological or historical sites have been found by these surveys. This suggests a low probability for archaeological and historical sites in the remainder of the ACEC, but much of corridor segment T4 within the ACEC remains unsurveyed. Location of the pipeline in this western portion of the ACEC would be consistent with the BLM objective of minimizing impacts on the historic ranches in the ACEC, but construction would involve removal of native plants, which would not be consistent with BLM Prescription 10 and therefore would be a significant impact. An alignment within the corridor that completely avoids the ACEC would have no impacts on the ACEC.

Three Rivers Riparian ACEC

The Kingman Area Resource Management Plan defined 8 objectives and 21 management prescriptions for the Three Rivers ACEC. One objective and one management prescription are relevant to the assessment of impacts of the Proposed Action. Objective 3 is to obtain minimum instream flow to support aquatic and riparian habitat values. Prescription 19 states that the riparian area condition evaluation inventory and monitoring must be continued.

The Proposed Action would not directly disturb any area within the boundaries of the Three Rivers Riparian ACEC.

The Proposed Action contains measures designed to monitor groundwater levels and provide water to augment shallow groundwater and surface water flow in the Big Sandy River sufficient to prevent changes to these hydrologic

systems which may otherwise occur as a result of the Project. Therefore, no changes to shallow groundwater levels or surface water flows in the Big Sandy River are predicted as a result of the Project. Therefore, no impact on the instream flows, aquatic resources, or riparian conditions of the ACEC are anticipated.

The analysis of spills and stormwater and wastewater discharges concluded that the proposed use of best management practices would avoid significant impacts on the quality of surface water and groundwater (refer to Sections 3.4.2.5 and 3.5.2.5). Therefore the Proposed Action would have no significant impacts on the quality of surface water and groundwater within the Three Rivers Riparian ACEC.

Alternative R Gas Pipeline Corridor

Carrow-Stephens Ranches ACEC

The impacts of this alternative on the Carrow-Stephens Ranches ACEC would not differ from the Proposed Action except that the Alternative R gas pipeline route would use corridor segment R4 through the ACEC. Corridor segment R4 is widened through the ACEC to include the 200-foot-wide US 93 right-of-way, as well as the typical corridor width extending 400 feet to the east of the highway right-of-way. This corridor modification is intended to accommodate installation of the pipeline in the US 93 right-of-way to avoid impacts to other parts of the ACEC. ADOT plans to eventually relocate this segment of US 93 up to 1,200 feet to the west to move the highway farther from the historic ranches, and therefore is amenable to this strategy. The corridor also is widened to 1500 feet east of the US 93 right-of-way south of Gunsight Canyon. This modification is intended to accommodate the proposed realignment of US 93 east of the current roadway in the southeastern part of the ACEC.

Almost all of the portion of corridor segment R4 corridor that overlaps the ACEC has been inventoried for cultural resources. Other than the Carrow and Stephens Ranches, the only other

recorded resource is a segment of the Hillside to Kingman Highway, which was built in 1924. This road has been evaluated as eligible for the National Register of Historic Places for its potential to yield important information. This historic road is on the west side of US 93 through the ACEC. Installation of the pipeline on the west side of US 93 is likely to damage segments of this road.

The historical ranch buildings and other features that are the focus of BLM's public interpretation planning are all located east of US 93 (refer to Figure 3.10-2). Construction of the pipeline east of the right-of-way through the clusters of buildings and other features at the Carrow Ranch and Stephens Ranch would be counter to BLM objectives for the ACEC and therefore a significant impact.

The existing US 93 roadway is centered within the right-of-way, and installation of the pipeline within the right-of-way would temporarily disturb most of the area between the shoulder of the highway and the edge of the right-of-way. There are segments of an unlined irrigation ditch within the US 93 right-of-way. This ditch was cleaned, repaired, and used to irrigate fields of the Carrow-Stephens Ranches into the 1970s (Stephens, personal communication, 2001), but the alignment may date from the 1880s. Installation of the pipeline within the right-of-way is likely to damage as much as 200 to 300 feet of the ditch. A culvert beneath the highway crosses the ditch at this location. Although highway construction has compromised the historical integrity of the ditch, additional disturbance is likely to be considered an adverse effect as defined by regulations implementing the National Historic Preservation Act.

The family cemetery at the Carrow Ranch is the most sensitive resource subject to potential direct construction impacts. The cemetery is on a ridge that extends into the right-of-way. The three recognizable graves in the cemetery are just east of the right-of-way fence. Any direct construction impacts on the graves in the cemetery would be a significant impact.

The construction and maintenance of US 93 has not disturbed the entire right-of-way, so installation of the pipeline would alter terrain and vegetation that has remained intact along the margins of the highway right-of-way. After the pipeline is installed, the disturbed areas would be graded to blend with adjacent topography.

There would be no aboveground pipeline facilities within the ACEC to introduce visual intrusions, but the terrain and vegetation disturbed by construction would leave an unnatural scar that would take several years to recover to a more natural condition. Requirements to inspect and maintain the pipeline in a safe condition do not allow large vegetation to grow above the pipeline. Therefore, the disturbed and unnatural vegetation pattern above the pipeline is likely to be a long-term effect noticeable from the historic Carrow Ranch complex. This alteration of vegetation would be relatively minor compared to the disturbances introduced by US 93 but removal of native vegetation is counter to Prescription 10 and therefore a significant impact. The pipeline also may hinder the restoration of the current US 93 alignment to more natural contours if it is abandoned.

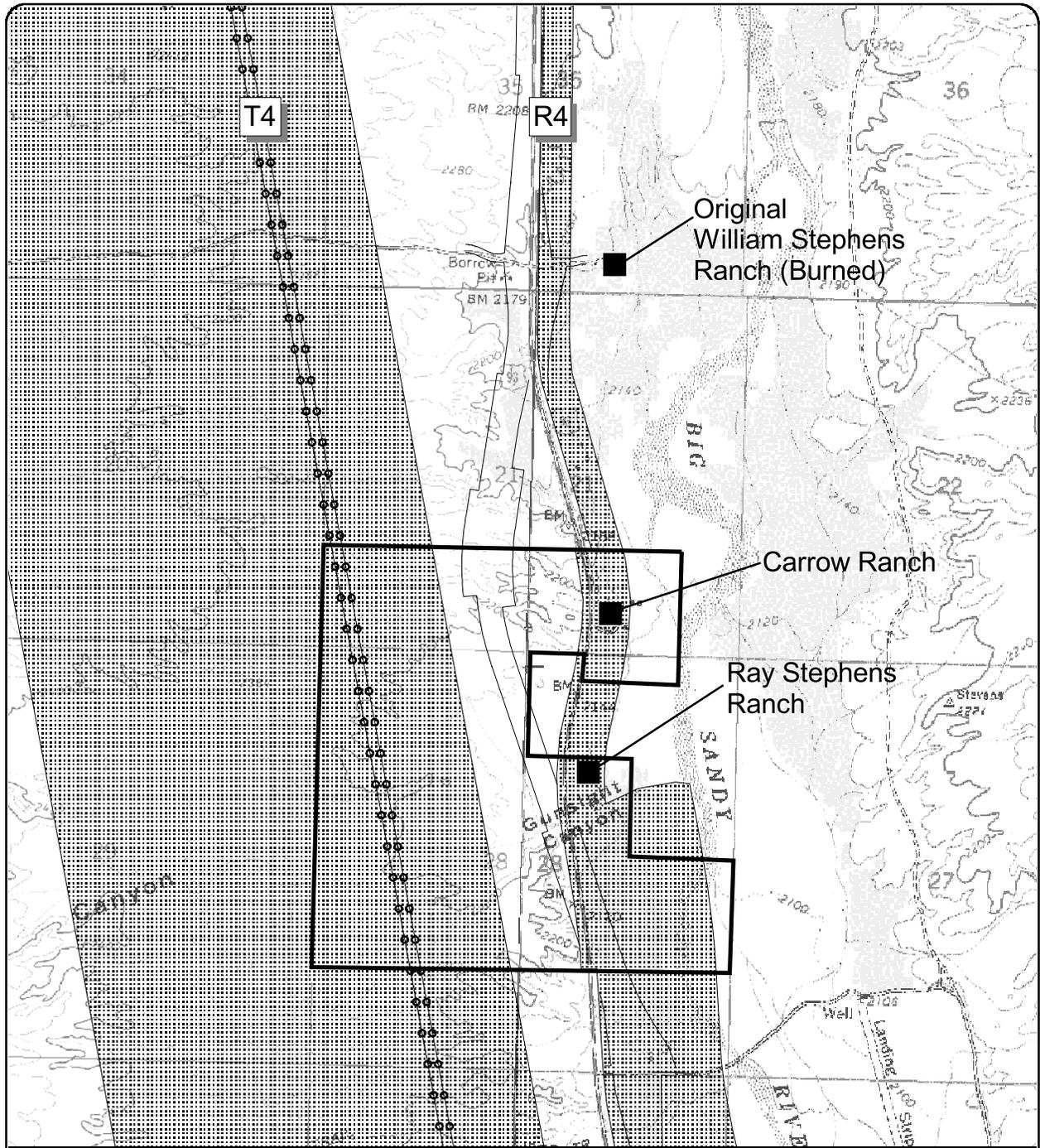
Three Rivers Riparian ACEC

As with the Proposed Action, the Alternative R gas pipeline corridor would not directly disturb any area within the boundaries of the Three Rivers Riparian ACEC, and would have no significant impacts on the quality or quantity of surface water and groundwater within this ACEC.

Alternative T Gas Pipeline Corridor

Carrow-Stephens Ranches ACEC

The Alternative T gas pipeline corridor would use the same corridor segment T4 as the Proposed Action. As discussed above, construction of the pipeline within the portion of the corridor that overlaps the ACEC would involve removal of native plants, which is not

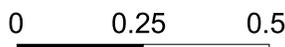


Legend

- Resource Components**
- Carrow-Stephens Ranches ACEC
- U.S. 93 Realignment
- Project Components**
- Pipeline Corridor Segments
- Proposed Pipeline Corridor - R1, C1, T3, C3, T4, R5
- Alternative R Corridor - R1, R2, R3, C3, R4, R5
- Alternative T Corridor - T1, T2, T3, C3, T4, T5
- General Reference**
- Mead-Liberty/Mead-Phoenix Transmission Lines
- Stream/River
- U.S. Route

Relation of Natural Gas Pipeline Corridors to Carrow-Stephens Ranches ACEC

Big Sandy Energy Project EIS



Scale in Miles
 Universal Transverse Mercator Projection
 1927 North American Datum
 Zone 12



Figure 3.10-3

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consistent with BLM Prescription 10 and therefore would be a significant impact. This wide corridor segment is intended to accommodate an alignment that would completely avoid the Carrow-Stephens Ranches ACEC and have no impacts on the ACEC.

Three Rivers Riparian ACEC

As with the Proposed Action, the Alternative T gas pipeline corridor would not directly disturb any area within the boundaries of the Three Rivers Riparian ACEC, and would have no significant impacts on the quality or quantity of surface water and groundwater within this ACEC.

Communication Facilities

Carrow-Stephens Ranches ACEC

One option for the alternative substation dual/redundant communications system would involve installation of an OPGW as a replacement of one of the static wires on the existing Mead-Liberty 345-kV transmission line. This line passes through the Carrow-Stephens Ranches ACEC about 0.5 mile or more to the west of the historic ranches. Installation of the fiber optic line is not expected to require any new roads, but heavy trucks require pads about every three miles to pull and tension the OPGW. These pads involve disturbance of only a fraction of an acre. No more than one pad, at most, would be within the ACEC and it would be sited to avoid vegetation.

The right-of-way for the Mead-Liberty line has not been surveyed for cultural resources, but intensive survey for the adjacent Mead-Phoenix Project 500-kV transmission line and access roads identified no archaeological or historical sites within the boundaries of the Carrow-Stephens Ranches ACEC. These survey results indicate that significant archaeological or historical sites are unlikely to be present in areas that would be affected by the OPGW installation. Therefore, installation of the OPGW is unlikely to significantly impact the ACEC, but

additional intensive survey would be required to confirm that conclusion.

Three Rivers Riparian ACEC

The use of either of the options for the alternative dual/redundant communications systems for the substation would have no effect on the Three Rivers Riparian ACEC.

No-Action Alternative

The Big Sandy Energy Project would not be developed under the No-Action Alternative. Therefore, the natural gas pipeline and the OPGW would not be built and would have no effect on the Carrow-Stephens Ranches ACEC. No impacts on the Three Rivers Riparian ACEC would be expected.

3.10.2.6 Mitigation and Residual Impacts

If adopted, one of the following measures would be implemented to avoid or reduce significant impacts if the Proposed Action or corridor segment T4 is selected for construction:

- To avoid any effects on the Carrow-Stephens Ranches ACEC, the gas pipeline route in corridor segment T4 would not be constructed within the boundaries of this ACEC.

With the implementation of this measure, there would be no residual significant impacts.

- To minimize terrain disturbance within the Carrow-Stephens Ranches ACEC, the design of the specific alignment would be developed and implemented in close coordination with BLM and ADOT.

Even with implementation of this measure, significant impacts would remain.

If adopted, the following measures would be implemented to avoid or reduce significant impacts if alternative pipeline corridor segment R4 is selected for construction:

- The pipeline would be installed so that it would not hinder restoration of US 93 through this ACEC to a more natural topography.
- To minimize impacts on the Carrow-Stephens wildlife movement corridor, additional reclamation efforts, such as replanting removed trees and succulents and revegetating with native seeds, would be undertaken.
- The pipeline would be designed to avoid impacts on the family cemetery immediately adjacent to US 93.
- Disturbance of the historic irrigation ditch within the US 93 right-of-way would be minimized and any construction damage would be repaired.
- Even with the implementation of these measures, significant impacts would remain if corridor segment R4 is selected.

3.11 VEGETATION

This section describes the affected environment and environmental consequences related to vegetation. Special status species are discussed in Section 3.14. Vegetation within wetlands and riparian areas are described in Section 3.12.

3.11.1 Affected Environment

The following sections describe the current vegetative communities; this provides a baseline for the assessment of impacts and environmental consequences.

3.11.1.1 Region of Influence

The region of influence for the analysis of impacts to vegetation consists of an area 0.5 mile around the proposed power plant site and associated facilities, within the proposed and alternative gas pipeline corridors, and along the route of the OPGW installation.

3.11.1.2 Existing Conditions

The vegetation within the region of influence consists of elements that are characteristic of the Arizona Upland Subdivision of the Sonoran Desert, Mohave desertscrub, Semidesert Grassland, and Great Basin conifer woodland. Most of the region of influence has also been mapped as semi-desert grassland (Brown and Lowe 1980). The vegetative communities appear highly ecotonal; that is, they exhibit characteristics of the four major non-riparian biotic communities listed above. Semi-desert grassland areas dominate, but contain many plant species that are characteristic of Mohave and Sonoran desertscrub. Similarly, areas where Sonoran desertscrub elements dominate (e.g. near Wikieup), there are species present that are characteristic of Mohave desertscrub (e.g., Joshua tree). To the northwest, near Interstate 40, where Great Basin Conifer woodlands dominated by juniper occur, there are also elements of Mohave desertscrub, Sonoran desertscrub, and semi-desert grassland interspersed with the woodland elements. The limits of a particular vegetation community are determined to some extent by climate (e.g., minimum seasonal temperatures, minimum seasonal precipitation). Local factors such as elevation, soil type, slope exposure, cold air drainages, and soil porosity interact with climate to dictate local and regional distribution of vegetation.

Overall, the vegetation within the region of influence is a complex mix of species that represent several biotic communities of northwestern Arizona. None of the plant communities present are purely Mohavean or Sonoran in composition. However, no plant communities in the region of influence are predominantly Mohavean, and for the purposes of this Draft EIS desertscrub communities will be referred to as Sonoran, following Brown and Lowe (1980).

Vegetation along the perennial reaches of the Big Sandy River is characteristic of the Sonoran