

- 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

Riparian Deciduous Forest Woodland as described by Minckley and Brown (1994).

Sonoran desertscrub, semi-desert grassland, Great Basin conifer woodland, and xeroriparian vegetation are described in more detail below. Lists of plant species identified in the region of influence are presented in Table 3.11-1. Approximate areas of these vegetative communities are shown on Figure 3.11-1.

Sonoran Desertscrub – Arizona Upland Subdivision

The Arizona Upland Subdivision of Sonoran Desertscrub forms a curving border at the northeastern edge of the Sonoran Desert. Most of this subdivision is on slopes, broken ground, and multi-dissected sloping plains. The subdivision generally is characterized as a scrubland or low woodland of leguminous trees. Several open layers of shrubs and perennial succulents fill in intervening spaces (Turner and Brown 1982). Trees found in the region of influence that are characteristic of this subdivision include blue paloverde, foothill paloverde, honey mesquite, and cat-claw acacia. In some portions of the region of influence foothill paloverde is accompanied by or replaced by crucifixion thorn.

Cacti are an important component of this subdivision. Species present in the region of influence include saguaro, hedgehog cactus, beavertail cactus, and Christmas cholla.

Semi-Desert Grassland

In general, semi-desert grassland is present surrounding the Chihuahuan desert, and in some areas in west-central Arizona. It is a perennial grass-scrub dominated landscape. Semi-desert grassland in the region of influence is bounded at lower elevations by Sonoran Desertscrub and at higher elevations by Great Basin conifer woodland. Although semi-desert grassland is positioned geographically between distinct vegetation communities and shares floral and faunal constituents of these communities, it is a

distinctive and separate biome (Brown 1982a). Grass species present in the region of influence that are characteristic of semi-desert grassland include bush muhly, three-awn, and black grama. Shrub species present include creosote bush, mesquite, crucifixion thorn, and snakeweed. Buckwheats, mallow, whipple cholla, and banana yucca also are common in the region of influence.

Great Basin Conifer Woodland

These woodlands are structurally simple and tend to be present in rocky habitats with thin soil. They are characterized by unequal dominance of Utah juniper and singleleaf piñon. Juniper is generally more prevalent than singleleaf piñon. Great Basin conifer woodland is generally open-spaced (as is the case in the region of influence), except at higher elevations and in less xeric sites (Brown 1982b). Species present in the region of influence that are typical of this community include buckwheats, globe mallow, beavertail cactus, and crucifixion thorn. Common shrubs include barberry, and banana yucca. Turbinella oak is sparsely scattered in this vegetation community.

Xeroriparian Vegetation

Xeroriparian vegetation includes plants that may be limited to, or are noticeably more abundant in, ephemeral washes. This community is present because of higher water availability at drainages, although drainages often provide only seasonal water flow. Xeroriparian communities are dominated by trees that are also present in the adjacent uplands in smaller, shrub-like forms. Vegetation present in these communities is often denser and larger than vegetation found in surrounding areas. Some species present in xeroriparian habitats are not found in surrounding communities. An example of one of these species is the desert willow. Xeroriparian

**TABLE 3.11-1
PLANT SPECIES WITHIN THE REGION OF INFLUENCE**

| Common Name | Scientific Name |
|----------------------------|--------------------------------------|
| Sonoran Desertscrub | |
| Arabian grass | <i>Schismus arabicus</i> |
| Aster | <i>Aster subulatus</i> |
| Barrel cactus | <i>Ferocactus</i> sp. |
| Beavertail cactus | <i>Opuntia basilaris</i> |
| Blue paloverde | <i>Parkinsonia florida</i> |
| Brassica | <i>Brassica</i> sp. |
| Burro-brush | <i>Hymenoclea monogyra</i> |
| Catclaw acacia | <i>Acacia greggii</i> |
| Cheeseweed | <i>Hymenoclea salsola</i> |
| Chia | <i>Salvia columbariae</i> |
| Christmas cholla | <i>Opuntia leptocaulis</i> |
| Creosote bush | <i>Larrea tridentata</i> |
| Crucifixion thorn | <i>Canotia holacantha</i> |
| Desert broom | <i>Baccharis sarothroides</i> |
| Desert chicory | <i>Rafinesquia neomexicana</i> |
| Desert marigold | <i>Baileya multiradiata</i> |
| Desert trumpet | <i>Eriogonum inflatum</i> |
| Dock | <i>Rumex</i> sp. |
| Fairyduster | <i>Calliandra eriophylla</i> |
| Fiddleneck | <i>Amsinckia intermedia</i> |
| Filaree | <i>Erodium cicutarium</i> |
| Five-stamen tamarisk | <i>Tamarix chinensis</i> |
| Four-wing salt bush | <i>Atriplex canescens</i> |
| Globemallow | <i>Sphaeralcea ambigua</i> |
| Goldenhead | <i>Acamptopappus sphaerocephalus</i> |
| Grey thorn | <i>Ziziphus obtusifolia</i> |
| Hedgehog cactus | <i>Echinocereus engelmannii</i> |
| Honey Mesquite | <i>Prosopis glandulosa</i> |
| Jimmyweed | <i>Isocoma pleurifolia</i> |
| Joshua-tree | <i>Yucca brevifolia</i> |
| Lehman's lovegrass | <i>Eragrostis lehmanniana</i> |
| Little leaf paloverde | <i>Parkinsonia microphylla</i> |
| Lupine | <i>Lupinus</i> spp. |
| Machaeranthera | <i>Machaeranthera pinnatifida</i> |
| Mexican poppy | <i>Eschscholtzia mexicana</i> |
| Mohave aster | <i>Xylorhiza tortifolia</i> |
| Mormon tea | <i>Ephedra trifurca</i> |
| Narrowleaf golden weed | <i>Haplopappus linearifolius</i> |
| Ocotillo | <i>Fouquieria splendens</i> |
| Owl clover | <i>Orthocarpus purpurescens</i> |
| Paper Daisy | <i>Psilostrophe cooperi</i> |
| Parry dalea | <i>Marina parryi</i> |
| Phacelia | <i>Phacelia</i> sp. |
| Pincushion | <i>Cheanactis macrantha</i> |
| Popcorn flower | <i>Cryptantha</i> sp. |

**TABLE 3.11-1
PLANT SPECIES WITHIN THE REGION OF INFLUENCE**

| Common Name | Scientific Name |
|------------------------------|--------------------------------------|
| Purple mat | <i>Nama demissum</i> |
| Rayless goldenrod | <i>Isocoma wrightii</i> |
| Rock gilia | <i>Gilia scopulorum</i> |
| Sacred datura | <i>Datura meteloides</i> |
| Saguaro | <i>Carnegiea gigantea</i> |
| Skeleton weed | <i>Eriogonum deflexum</i> |
| Teddy-bear cholla | <i>Opuntia bigelovii</i> |
| Tobacco | <i>Nicotiana obtusifolia</i> |
| Tumbleweed | <i>Salsola iberica</i> |
| Turpentine bush | <i>Ericameria linearifolia</i> |
| Wallace eriophyllum | <i>Eriophyllum wallacei</i> |
| White brittlebush | <i>Encelia farinosa</i> |
| White bursage | <i>Ambrosia dumosa</i> |
| White rhatany | <i>Krameria grayi</i> |
| White-thorn acacia | <i>Acacia constricta</i> |
| Wire lettuce | <i>Stephanomeria sp.</i> |
| Wolfberry | <i>Lycium sp.</i> |
| Wooly daisy | <i>Eriophyllum lanosum</i> |
| Wooly plantain | <i>Plantago insularis</i> |
| Semi-Desert Grassland | |
| Arizona necklace | <i>Sophora arizonica</i> |
| Banana yucca | <i>Yucca baccata</i> |
| Beavertail cactus | <i>Opuntia basilaris</i> |
| Big galleta | <i>Pleuraphis rigida</i> |
| Big root | <i>Marah gilensis</i> |
| Bladder sage | <i>Salazaria mexicana</i> |
| Black grama | <i>Bouteloua eriopoda</i> |
| Blue paloverde | <i>Parkinsonia florida</i> |
| Brassica | <i>Brassica sp.</i> |
| Brownfoot | <i>Acourtia wrightii</i> |
| Burrobrush | <i>Hymenoclea monogyra</i> |
| Bush muhly | <i>Muhlenbergia porteri</i> |
| Canaigre | <i>Rumex hymenosepalus</i> |
| Catclaw | <i>Acacia greggii</i> |
| Cheeseweed | <i>Hymenoclea salsola</i> |
| Chia | <i>Salvia columbariae</i> |
| Cholla cactus | <i>Opuntia spp</i> |
| Christmas cholla | <i>Opuntia leptocaulis</i> |
| Creosote bush | <i>Larrea tridentata</i> |
| Crucifixion thorn | <i>Canotia holacantha</i> |
| Desert marigold | <i>Baileya multiradiata</i> |
| Desert trumpet | <i>Eriogonum inflatum</i> |
| Fiddleneck | <i>Amsinckia intermedia</i> |
| Filaree | <i>Erodium cicutarium</i> |
| Fluffgrass | <i>Erioneuron pulchellum</i> |
| Fremont barberry | <i>Berberis fremontii</i> |
| Globemallow | <i>Sphaeralcea ambigua</i> |
| Goldenhead | <i>Acamptopappus sphaerocephalus</i> |

**TABLE 3.11-1
PLANT SPECIES WITHIN THE REGION OF INFLUENCE**

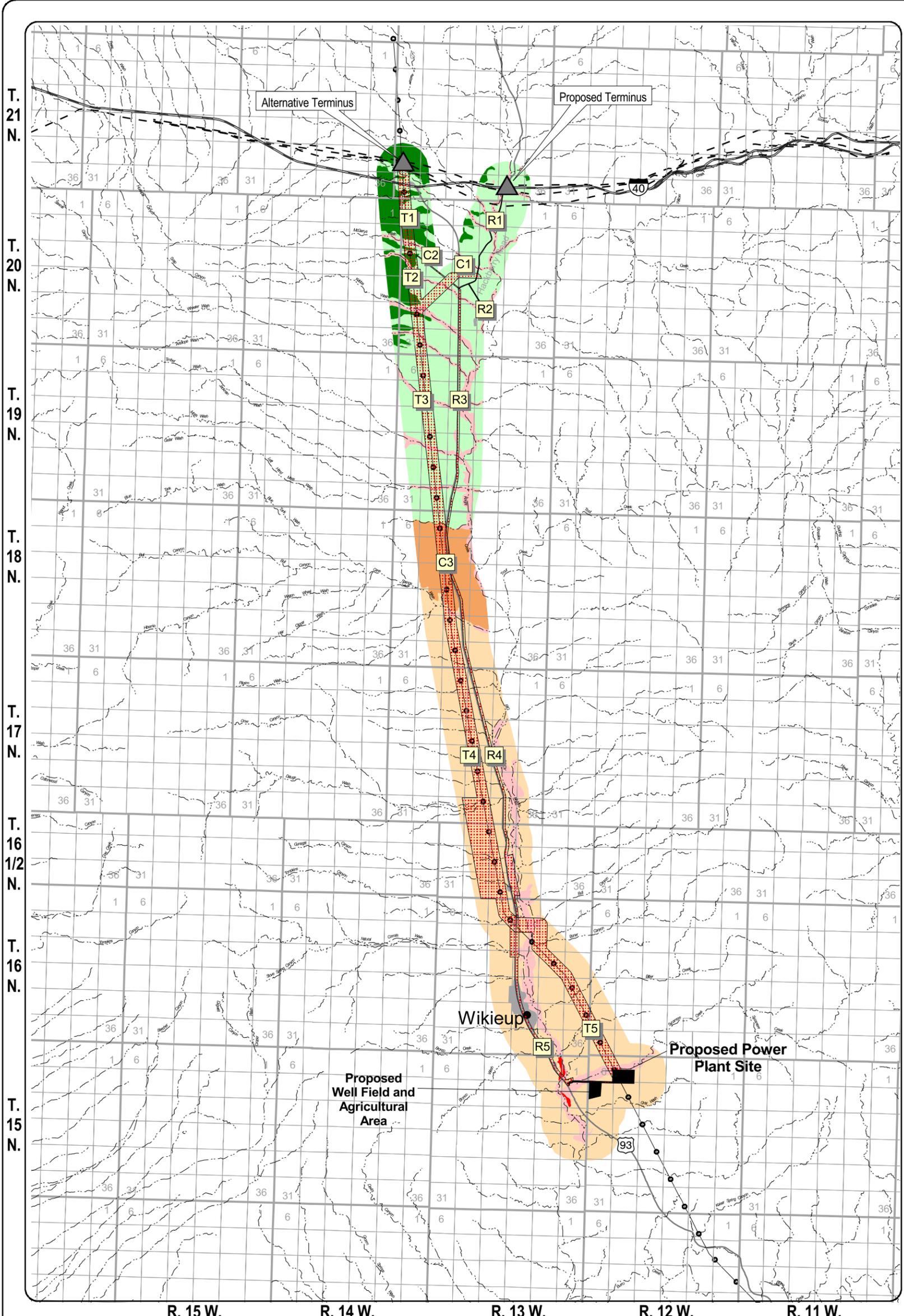
| Common Name | Scientific Name |
|-------------------------------------|----------------------------------|
| Groundsel | <i>Senecio multiflora</i> |
| Guara | <i>Gaura</i> sp. |
| Hairy grama | <i>Bouteloua hirsuta</i> |
| Hill locust | <i>Lotus humistratus</i> |
| Indian ricegrass | <i>Oryzopsis hymenoides</i> |
| Joshua-tree | <i>Yucca brevifolia</i> |
| Lehman's lovegrass | <i>Eragrostis lehmanniana</i> |
| Locoweed | <i>Astragalus</i> sp. |
| Lupine | <i>Lupinus</i> spp. |
| Mexican poppy | <i>Eschscholtzia mexicana</i> |
| Narrowleaf golden weed | <i>Haplopappus linearifolius</i> |
| Needle grass | <i>Stipa</i> sp. |
| Oneseed juniper | <i>Juniperus monosperma</i> |
| Paintbrush | <i>Castilleja</i> spp. |
| Paper flower | <i>Psilostrophe cooperi</i> |
| Phacelia | <i>Phacelia</i> sp. |
| Pincushion | <i>Cheanactis</i> sp. |
| Popcorn flower | <i>Cryptantha</i> spp. |
| Prickly-pear cactus | <i>Opuntia</i> sp. |
| Primrose | <i>Camissonia clauiformis</i> |
| Purple mat | <i>Nama demissum</i> |
| Rayless encelia | <i>Encelia frutescens</i> |
| Red brome | <i>Bromus madritensis</i> |
| Rock gilia | <i>Gilia scopulorum</i> |
| Sacred datura | <i>Datura meteloides</i> |
| Snakeweed | <i>Gutierrezia sarothrae</i> |
| Tansy mustard | <i>Descuraniana</i> sp. |
| Telegraph plant | <i>Heterotheca camphorata</i> |
| Three-awn grass | <i>Aristida</i> sp. |
| Tumbleweed | <i>Salsola iberica</i> |
| Turbinella oak | <i>Quercus turbinella</i> |
| Turpentine bush | <i>Ericameria linearifolia</i> |
| Twist flower | <i>Streptanthus cordatus</i> |
| Wallace eriophyllum | <i>Eriophyllum wallacei</i> |
| Whipple cholla | <i>Opuntia whipplei</i> |
| White brittlebush | <i>Encelia farinosa</i> |
| White bursage | <i>Ambrosia dumosa</i> |
| White ratany | <i>Krameria grayi</i> |
| Wild buckwheat | <i>Eriogonum fasciculatum</i> |
| Wolfberry | <i>Lycium</i> sp. |
| Wooly plantain | <i>Plantago insularis</i> |
| Yucca | <i>Yucca</i> sp. |
| Great Basin Conifer Woodland | |
| Algerita | <i>Berberis haematocarpa</i> |
| Arizona necklace | <i>Sophora arizonica</i> |
| Banana yucca | <i>Yucca baccata</i> |
| Beavertail cactus | <i>Opuntia basilaris</i> |
| Bladder sage | <i>Salazaria mexicana</i> |

**TABLE 3.11-1
PLANT SPECIES WITHIN THE REGION OF INFLUENCE**

| Common Name | Scientific Name |
|------------------------------|--------------------------------------|
| Brownfoot | <i>Acourtia wrightii</i> |
| Bush muhly | <i>Muhlenbergia porteri</i> |
| California buckwheat | <i>Eriogonum</i> sp. |
| Chia | <i>Salvia columbariae</i> |
| Cholla cactus | <i>Opuntia</i> spp. |
| Clematis | <i>Clematis</i> sp. |
| Colorado four-o'clock | <i>Mirabilis multiflora</i> |
| Combur | <i>Pectocarya</i> sp. |
| Crucifixion thorn | <i>Canotia holacantha</i> |
| Desert ceanothus | <i>Ceanothus greggii</i> |
| Desert globemallow | <i>Sphaeralcea ambigua</i> |
| Desert needlegrass | <i>Stipa speciosa</i> |
| Desert trumpet | <i>Eriogonum inflatum</i> |
| Fiddleneck | <i>Amsinckia intermedia</i> |
| Filaree | <i>Erodium cicutarium</i> |
| Fluffgrass | <i>Erioneuron pulchellum</i> |
| Fremont barberry | <i>Berberis fremontii</i> |
| Fremont phacelia | <i>Phacelia fremontii</i> |
| Goldenhead | <i>Acamptopappus sphaerocephalus</i> |
| Goosefoot | <i>Chenopodium berlandieri</i> |
| Graythorn | <i>Ziziphus obtusifolia</i> |
| Hairy grama | <i>Bouteloua hirsuta</i> |
| Large yellow desert primrose | <i>Oenothera primaveris</i> |
| Locoweed | <i>Astragalus</i> sp. |
| Lotus | <i>Lotus</i> sp. |
| Mexican poppy | <i>Eschscholtzia mexicana</i> |
| Mountain mahogany | <i>Cercocarpus montanus</i> |
| Narrowleaf golden weed | <i>Haplopappus linearifolius</i> |
| Oneseed juniper | <i>Juniperus monosperma</i> |
| Paintbrush | <i>Castilleja</i> spp. |
| Phacelia | <i>Phacelia</i> sp. |
| Popcorn flower | <i>Cryptantha</i> sp. |
| Primrose | <i>Camissonia clauiformis</i> |
| Red brome | <i>Bromus madritensis</i> |
| Salsify | <i>Tragopogon porrifolius</i> |
| Silver puffs | <i>Uropappus lindleyi</i> |
| Singleleaf pinyon | <i>Pinus monophylla</i> |
| Small-headed snakeweed | <i>Gutierrezia sarothrae</i> |
| Three-awn grass | <i>Aristida</i> sp. |
| Turbinella oak | <i>Quercus turbinella</i> |
| Turpentine bush | <i>Ericameria linearifolia</i> |
| Utah juniper | <i>Juniperus osteosperma</i> |
| Vervain | <i>Verbena</i> sp. |
| Wallace eriophyllum | <i>Eriophyllum wallaceii</i> |
| White ratany | <i>Krameria grayi</i> |
| Wild buckwheat | <i>Eriogonum fasciculatum</i> |
| Winterfat | <i>Ceratoides lanata</i> |
| Wooly plantain | <i>Plantago insularis</i> |

**TABLE 3.11-1
PLANT SPECIES WITHIN THE REGION OF INFLUENCE**

| Common Name | Scientific Name |
|---------------------------|---------------------------------|
| Woolly-fruited bursage | <i>Ambrosia eriocentra</i> |
| Xeroriparian Areas | |
| Arabian grass | <i>Schismus arabicus</i> |
| Blazing star | <i>Mentzelia jonesii</i> |
| Brassica | <i>Brassica</i> sp. |
| Burro brush | <i>Hymenoclea monogyra</i> |
| Catclaw acacia | <i>Acacia greggii</i> |
| Cheeseweed | <i>Hymenoclea salsola</i> |
| Chia | <i>Salvia columbariae</i> |
| Cream cups | <i>Platystemon californicus</i> |
| Crucifixion thorn | <i>Canotia holacantha</i> |
| Desert broom | <i>Baccharis sarothroides</i> |
| Desert dandelion | <i>Malacothrix glabrata</i> |
| Desert willow | <i>Chilopsis linearis</i> |
| Dock | <i>Rumex</i> sp. |
| Fiddleneck | <i>Amsinckia intermedia</i> |
| Filaree | <i>Erodium cicutarium</i> |
| Fluffgrass | <i>Erioneuron pulchellum</i> |
| Fremont barberry | <i>Berberis fremontii</i> |
| Gilia | <i>Gilia hutchinsifolia</i> |
| Lotus | <i>Lotus</i> sp. |
| Lupine | <i>Lupinus</i> spp. |
| Mexican poppy | <i>Eschscholtzia mexicana</i> |
| Owl clover | <i>Orthocarpus purpurascens</i> |
| Phacelia | <i>Phacelia</i> spp. |
| Popcorn flower | <i>Cryptantha</i> spp. |
| Primrose | <i>Camissonia clauiformis</i> |
| Purple mat | <i>Nama demissum</i> |
| Rabbitbrush | <i>Chrysothamnus nauseosis</i> |
| Red brome | <i>Bromus madritensis</i> |
| Rock gilia | <i>Gilia scopulorum</i> |
| Sacred datura | <i>Datura meteloides</i> |
| Seep willow | <i>Baccharis glutinosa</i> |
| Spreading fleabane | <i>Erigeron divergens</i> |
| Tansy mustard | <i>Descuraniana</i> sp. |
| Thistle | <i>Cirsium</i> sp. |
| Tidy-tips | <i>Layia glandulosa</i> |
| Tobacco | <i>Nicotiana obtusifolia</i> |
| Turbinella Oak | <i>Quercus turbinella</i> |
| Turpentine bush | <i>Ericameria linearifolia</i> |
| Wallace eriophyllum | <i>Eriophyllum walacei</i> |
| Western honey mesquite | <i>Prosopis glandulosa</i> |
| Wolfberry | <i>Lycium</i> sp. |
| Woolly-fruited bursage | <i>Ambrosia eriocentra</i> |

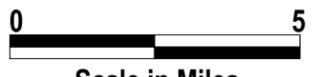


Legend

- Resource Components**
- Disturbed/Urban Area
 - Great Basin Conifer Woodland
 - Semidesert Grassland
 - Transition between Arizona Upland and Semidesert Grassland
 - Arizona Upland
 - Sonoran Riparian: Deciduous Riparian
 - Xeroriparian Vegetation

- 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
 - Proposed Plant Facilities
- General Reference**
- Existing Pipelines
 - Mead-Liberty/Mead-Phoenix Transmission Lines
 - Stream/River
 - Interstate
 - U.S. Route

Vegetation
Big Sandy Energy Project EIS



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

Figure 3.11-1

x:\big sandy\projects\biology.apr

communities provide habitat for wildlife, corridors for wildlife movement, and greater water availability than in surrounding areas.

Species Protected Under Arizona Native Plant Law

Several native plant species present in the region of influence are not special status species as defined and discussed in Section 3.14, but are protected under the Arizona Native Plant Law. Saguaros, banana yuccas, Joshua trees, and ocotillo are listed by the Arizona Department of Agriculture (ADA) as *salvage-restricted*. Plants in this category have a high potential for damage by theft or vandalism. Blue paloverdes, foothill paloverdes, honey mesquites, and banana yucca are listed as *harvest-restricted*. These species are subject to excessive harvesting or overcutting because of the intrinsic value of their by-products, fiber, or woody parts. Crested saguaros, which are listed as *highly safeguarded*, may be found anywhere saguaros are present. Species in the highly safeguarded category include plants whose prospects for survival in this state are in jeopardy, plants that are in danger of extinction throughout all or a significant portion of their ranges, or plants that are likely to become jeopardized or in danger of extinction (ADA 1999).

Under the Arizona Native Plant Law, protected species may not be legally possessed, taken or transported from the growing site without a permit from ADA. If protected native plants will be cleared, the land owner or owner's agent must provide written notification to the ADA. In addition, Federal and state agencies have their own mitigation requirements for ADA-protected plant species.

3.11.2 Environmental Consequences

3.11.2.1 Identification of issues

The following issues were identified as the basis for the assessment of impacts:

- Removal of plant species protected under the Arizona Native Plant Law
- Reduction of habitat for listed and special status species
- Removal of xeroriparian vegetation

3.11.2.2 Significance Criteria

Xeroriparian vegetation is relatively uncommon within Arizona vegetation communities. Therefore, impacts on vegetation by the Proposed Action and alternatives would be considered significant if unmitigated loss of xeroriparian vegetation would occur.

3.11.2.3 Impact Assessment Methods

Current conditions were evaluated using existing resources, such as a vegetation map and report prepared by Greystone (2000) and several reconnaissance surveys. Impacts to individual vegetation communities were evaluated by comparing acreages that would be disturbed with the total amount of those communities present within the state. Because xeroriparian habitats are relatively rare within native vegetation communities, impacts to xeroriparian communities were evaluated by determining if any removal of xeroriparian vegetation would occur.

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

The Proposed Action includes the following measures to reduce or prevent potential adverse impacts to vegetation:

- Reclamation plans have been developed for private, state, and BLM-managed lands and would be implemented on the selected pipeline route. Revegetation of native plants in areas of temporary disturbance would be completed in accordance with the Reclamation Operation Maintenance Plan for BLM-Managed Public Lands and

Reclamation Plan for State and Private Lands (Appendix B). Two-tracks constructed for access to the pipeline would be reseeded. All other areas of temporary disturbance in the proposed power plant site vicinity or along the pipeline route would be subject to salvage of native plant species and reseeded.

- The Reclamation Plan for BLM-Managed Public Lands stipulates that if reseeded on BLM-managed land is determined to be unsuccessful, a second attempt would be made.
- Native vegetation protected by the Arizona Native Plant Law is present throughout the region of influence. All areas of potential disturbance, including the proposed power plant site, substation, evaporation ponds, access road, and pipeline route, would be subject to pre-construction surveys to identify species listed under the Arizona Native Plant Law. Surveys for these species would be conducted according to the procedures detailed in Section 2.2.8.10. Protected plant species from all disturbed areas would be salvaged and transplanted, although the Arizona Native Plant Law does not require the salvage of protected plants from private land. Plants salvaged from state and private lands would be transplanted to ADOT project sites. Protected plants on BLM-managed public lands would be salvaged, stored in nursery areas, and transplanted in the pipeline corridor, as specified in Section 2.2.8.9 Reclamation and salvage procedures for protected plants on private and BLM-managed public lands are described in the Reclamation Operation Maintenance Plan for BLM-Managed Public Lands and Reclamation Plan for State and Private Lands, respectively (Appendix B).
- As noted in Section 2.2.8.9, measures to reduce the impacts of clearing of native vegetation include revegetation of temporarily disturbed areas. The overall intent of these reclamation activities is to

reestablish a vegetative cover that is similar to pre-construction conditions and consistent with adjacent vegetation communities. Revegetation procedures are described in the Reclamation Operation Maintenance Plan for BLM-Managed Public Lands and Reclamation Plan for State and Private Lands (Appendix B).

- The reclamation plans propose revegetation of impacted ephemeral stream channels with appropriate xeroriparian native plant species. Revegetation procedures would be as described in the Reclamation Operation Maintenance Plan for BLM-Managed Public Lands and Reclamation Plan for State and Private Lands.

3.11.2.5 Impact Assessment

Proposed Action

The proposed Project would physically disturb approximately 621 acres. Plant communities present within the region of influence are characteristic of Sonoran desertscrub, semi-desert grassland, and Great Basin conifer woodland. Impacts on these vegetation communities are summarized in Table 3.11-2.

Proposed Power Plant, Substation, Access Road, and Associated Facilities

Construction activities at the proposed power plant site, substation, and evaporation ponds would affect approximately 56 acres. The proposed plant access road construction would impact 21 acres, well pad sites and well pad access roads would impact 26 acres, and the proposed agricultural activities would impact 107 acres, for a total of 108 acres. Of these 108 acres, 34 acres would not be impacted by permanent facilities. These areas would be reclaimed through regrading and revegetation, as described in the Reclamation Plan for State and Private Lands, but this restoration process would require several years. The remaining 74 acres of non-sensitive vegetation would be permanently lost. All of this area is within the Arizona

**TABLE 3.11-2
IMPACTS ON VEGETATION COMMUNITIES**

| Vegetation Community | Total Acres of Disturbance* | Acres of Permanent Disturbance* | Acres of Temporary Disturbance* |
|-------------------------------------------------------------------------------------------------|------------------------------------|----------------------------------------|----------------------------------------|
| Power Plant and Associated Facilities (Substation, Evaporation Ponds, Access Road, etc.) | | | |
| Sonoran deserts scrub | 108 | 74 | 34 |
| Semi-desert grassland | 0 | 0 | 0 |
| Great Basin conifer woodland | 0 | 0 | 0 |
| Proposed Gas Pipeline Corridor | | | |
| Sonoran deserts scrub | 252 | 30 | 222 |
| Semi-desert grassland | 145 | 17 | 128 |
| Great Basin conifer woodland | 9 | 1 | 8 |
| Alternative R Gas Pipeline Corridor | | | |
| Sonoran deserts scrub | 251 | 30 | 221 |
| Semi-desert grassland | 142 | 17 | 125 |
| Great Basin conifer woodland | 0 | 0 | 0 |
| Alternative T Gas Pipeline Corridor | | | |
| Sonoran deserts scrub | 251 | 27 | 224 |
| Semi-desert grassland | 104 | 11 | 93 |
| Great Basin conifer woodland | 63 | 7 | 56 |
| Crossover Segment C2 | | | |
| Sonoran deserts scrub | 0 | 0 | 0 |
| Semi-desert grassland | 12 | 0 | 12 |
| Great Basin conifer woodland | 0 | 0 | 0 |
| OPGW Installation | | | |
| Sonoran deserts scrub | 2.5 | 0 | 2.5 |
| Semi-desert grassland | 2.5 | 0 | 2.5 |
| Great Basin conifer woodland | 0 | 0 | 0 |
| Agricultural Activities | | | |
| Sonoran deserts scrub | 107 | 107 | 0 |
| Semi-desert grassland | 0 | 0 | 0 |
| Great Basin conifer woodland | 0 | 0 | 0 |

* Acreages are approximate and impacts were attributed to the most abundant vegetation type within each corridor segment. If two or more vegetation types are present, impacts were split proportionately between these vegetation types. Xeroriparian vegetation is present along ephemeral drainages in all three listed vegetation communities (refer to Section 3.12.2.1).

Upland Subdivision of Sonoran desertscrub. Vegetation in these areas has been previously disturbed by livestock grazing.

The proposed power plant site, associated substation, evaporation ponds, and agricultural activities are located on land that encompasses several ephemeral drainages. Removal of this vegetation along these drainages would constitute a significant impact on xeroriparian vegetation. The exact area of impacted xeroriparian vegetation cannot be estimated because of variable widths of this vegetation and discontinuous distribution along the washes. Descriptions of, and impacts on, these drainages are described in Section 3.12.2.

The proposed access road to the plant site would impact the xeroriparian vegetation along Sycamore Creek and several small ephemeral channels. Unmitigated removal of this vegetation would represent a significant impact. Description of, and impacts on these drainages are described in Section 3.12.2.

Sonoran desertscrub is extensive in Arizona and removal of 108 acres would not negatively impact this community on a regional level. Measures developed to reduce impacts to native vegetation and incorporated into the Proposed Action would reduce the loss of ADA-protected plants and may promote the revegetation of areas of temporary disturbance.

Communication Facilities

The OPGW option for the Proposed Action would pass through areas of Sonoran desertscrub, semi-desert grassland, and Great Basin conifer woodland. Because this line would be installed on existing structures, the OPGW would have no permanent impact on vegetation communities in this vicinity. However, up to 5 acres would be temporarily disturbed for construction activities. The area disturbed would be reclaimed in accordance with either the Reclamation Operation Maintenance Plan for BLM-Managed Public Lands or the Reclamation

Plan for State and Private Lands (refer to Appendix B).

The microwave dishes would be installed on existing towers and would have no impact on vegetation.

Proposed Gas Pipeline Corridor Plant communities present along the proposed natural gas pipeline corridor include Great Basin conifer woodland, semi-desert grassland, and Sonoran desertscrub. Construction of the pipeline within this corridor would impact approximately 406 acres, as detailed below. Up to 48 acres would be permanently disturbed to provide a 10-foot wide two-track (refer to Section 2.2.5).

Native vegetation along corridor segment R1 is mostly semi-desert grassland. A few small areas of Great Basin conifer woodland are present at the northern end and western edge of this corridor segment. Ongoing cattle grazing has impacted vegetation along this corridor segment. Because the alignment through this corridor segment is within Hackberry Road, the disturbance to vegetation is estimated to be approximately 24 acres, assuming that the 90-foot-wide disturbed area would be wider than the existing roadway. Native vegetation along corridor segment C1 is primarily semi-desert grassland. Great Basin conifer woodland is present near the intersection of corridor segments C1 and T3. On-going livestock grazing has impacted the vegetation in these communities. Construction activities along this corridor segment would disturb approximately 31 acres. Construction and maintenance of a two-track in this corridor segment would result in permanent disturbance of approximately 3 acres.

Native vegetation along corridor segment T3 is mainly semi-desert grassland, with a few small patches of Great Basin conifer woodland and xeroriparian vegetation. This corridor segment has experienced impacts on vegetation as a result of on-going livestock grazing. Construction activities within corridor segment T3 would result in the disturbance of 94 acres.

Construction and maintenance of a two-track in this corridor segment would result in permanent disturbance to 10 acres.

Corridor segment C3 is in a transition zone between semi-desert grassland and Sonoran desertscrub. The vegetation in this corridor segment includes species that are characteristic of both of these communities. Construction activities along corridor segment C3 would disturb 20 acres. Construction and maintenance of a two-track in this corridor segment would result in permanent disturbance to 2 acres.

Native vegetation along corridor segment T4 is characteristic of the Arizona Upland Subdivision of Sonoran desertscrub. As on other corridor segments, native vegetation has been impacted by on-going livestock grazing activities. Pipeline construction activities within this corridor segment would result in disturbance to 153 acres of native vegetation. Construction and maintenance of a two-track in this corridor segment would result in permanent disturbance to 17 acres.

Vegetation along corridor segment R5 is also representative of the Arizona Upland Subdivision of Sonoran desertscrub. Construction of the pipeline in this corridor segment would result in the disturbance of 84 acres of vegetation. Construction and maintenance of a two-track in this corridor segment would result in permanent disturbance to 11 acres.

Semi-desert grassland, Great Basin conifer woodland, and Sonoran desertscrub are extensive in Arizona and disturbance of 406 acres would not adversely impact these communities on a regional level. Measures developed and incorporated into the Proposed Action to reduce impacts on native vegetation would reduce the loss of ADA-protected plants and may promote the revegetation of areas of temporary disturbance. Reseeding would also promote the revegetation of xeroriparian communities impacted by the pipeline.

Continued disturbance, such as livestock and off-road vehicles, would severely limit the germination and long-term establishment of plants (Burgess and Graves 1983). Even when revegetation efforts are successful, complete rehabilitation of plant communities is very slow. A study of natural revegetation of pipeline routes in the Mohave desert predicted that plant biomass recovery to predisturbance conditions could take as long as 100 years (Lathrop and Archbold 1980). Although revegetation efforts may decrease recovery time, complete rehabilitation is not expected to occur quickly.

The proposed pipeline corridor crosses many small drainages, most of which support xeroriparian vegetation. This vegetation would be cleared within a 90-foot corridor around the gas pipeline. Permanent removal of any xeroriparian vegetation would constitute a significant impact. Descriptions of, and impacts on, these drainages are discussed in Section 3.12.2.

Alternative R Gas Pipeline Corridor

Plant communities present along the alternative natural gas pipeline corridor include semi-desert grassland, Great Basin conifer woodland, and Sonoran desertscrub. Construction of this route would impact approximately 393 acres, as detailed below. Approximately 47 acres would be permanently disturbed to provide a 10-foot-wide two-track. Corridor segments R1, C3, and R5 are described above under the proposed corridor.

Native vegetation along corridor segment R2 is characteristic of semi-desert grassland. On-going cattle grazing has impacted vegetation along this corridor segment. Construction activities along corridor segment R2 would disturb up to 9 acres. Because the alignment through this corridor segment is within Hackberry Road, the disturbance to vegetation is estimated to be approximately 5 acres. Native vegetation within corridor segment R3 is representative of semi-desert grassland. On-going livestock grazing has impacted the vegetation in this corridor segment.

Construction activities within this corridor segment would impact 103 acres. Construction and maintenance of a two-track in this corridor segment would result in permanent disturbance to 11 acres.

Native vegetation on corridor segment R4 is representative of the Arizona Upland Subdivision of Sonoran desertscrub. Pipeline construction activities within this corridor segment would impact 153 acres. Construction and maintenance of a two-track in this corridor segment would result in permanent disturbance to 17 acres.

Semi-desert grassland, Great Basin conifer woodland and Sonoran desertscrub are extensive in Arizona and disturbance to 393 acres would not negatively impact these communities on a regional level. As stated for the proposed corridor, measures incorporated into the Proposed Action to reduce impacts to native vegetation would reduce the loss of ADA-protected plants and may promote the revegetation of areas of temporary disturbance. Reseeding would also promote the revegetation of xeroriparian communities impacted by the pipeline. Successful reseeded of native plants is more likely when further disturbance to impacted areas does not occur.

The alternative corridor crosses small drainages, many of which support xeroriparian vegetation. This vegetation would be cleared within a 90-foot corridor around the gas pipeline. Permanent removal of xeroriparian vegetation would constitute a significant impact. Descriptions of, and impacts on, these drainages are discussed in Section 3.12.2.

Alternative T Gas Pipeline Corridor

Plant communities present along the transmission line corridor include semi-desert grassland, Great Basin conifer woodland, and Sonoran desertscrub. Construction of this route would impact 418 acres, as detailed below. Approximately 45 acres would be permanently disturbed to provide a 10-foot wide two-track.

Corridor segments T3, C3, and T4 are described above under the proposed corridor.

Vegetation along corridor segment T1 is characteristic of Great Basin conifer woodland, interspersed with small patches of grasslands. Ongoing cattle grazing has impacted vegetation along this corridor segment. Construction of the natural gas pipeline in this corridor segment would impact 41 acres. Construction and maintenance of a two-track in this corridor segment would result in permanent disturbance to 4 acres.

Native vegetation along corridor segment T2 included areas of Great Basin conifer woodland interspersed with areas of semi-desert grasslands. On-going cattle grazing has also impacted vegetation along this corridor segment. Construction of the pipeline in this corridor segment would impact 24 acres. Construction and maintenance of a two-track in this corridor segment would result in permanent disturbance to 3 acres.

Native vegetation along corridor segment T5 is representative of the Arizona Upland Subdivision of Sonoran desertscrub. Pipeline construction activities within this corridor segment would impact 86 acres of vegetation. Construction and maintenance of a two-track in this corridor segment would result in permanent disturbance to 9 acres.

Semi-desert grassland, Great Basin conifer woodland and Sonoran desertscrub are extensive in Arizona and disturbance to 418 acres would not adversely impact these communities on a regional level. As stated for the proposed and Alternative R gas pipeline corridors, measures incorporated into the Proposed Action would reduce the loss of ADA-protected plants and may promote the revegetation of areas of temporary disturbance. Reseeding also would promote the revegetation of xeroriparian communities impacted by the pipeline. Successful reseeded of native plants is more likely when further disturbance to impacted areas does not occur.

The alternative pipeline corridor crosses many small drainages, many of which support xeroriparian vegetation. This vegetation would be cleared within a 90-foot corridor around the gas pipeline. Permanent removal of any xeroriparian vegetation would constitute a significant impact. Descriptions of, and impacts on, these drainages are discussed in Section 3.12.2.

Crossover Segment C2

Native vegetation within crossover segment C2 is dominated by semi-desert grassland with a small area of Great Basin conifer woodland at the northwest end of the corridor segment. Pipeline construction activities in this corridor segment would impact 25 acres. Because the alignment through this corridor segment is within the old route for US 93, the disturbance to vegetation is estimated to be approximately 12 acres. No additional maintenance pathway would be required in this corridor segment, and there would be no new permanent disturbance to vegetation.

Semi-desert grassland and Great Basin conifer woodland are extensive in Arizona and disturbance to 25 acres would not adversely impact these communities on a regional level. As stated for each corridor, measures developed to reduce impacts to native vegetation would reduce the loss of ADA-protected plants and may promote the revegetation of areas of temporary disturbance. Successful reseeding of native plants is more likely when further disturbance to impacted areas does not occur.

No-Action Alternative

Under the No-Action Alternative, no native vegetation would be cleared. No impacts would occur on species protected under Arizona Native Plant Law or xeroriparian vegetation. The private lands cleared for the groundwater production and monitoring wells that were used to identify and test the lower aquifer would remain.

Mitigation and Residual Impacts

If adopted, the following measures would be implemented to avoid or reduce significant impacts:

- Revegetating impacted ephemeral stream channels within the proposed or alternative gas pipeline corridors with appropriate native plant species would mitigate impacts on xeroriparian vegetation. Revegetation procedures would be similar to those described for native vegetation communities in the Reclamation Operation Maintenance Plan for BLM-Managed Public Lands and the Reclamation Plan for State and Private Lands where applicable. Where possible, transplanted shrubs should be used in the xeroriparian areas to reduce the time for restoration.
- Loss of xeroriparian vegetation along the ephemeral streams eliminated by construction at the well sites and at the agricultural development in Section 7 would be mitigated by planting appropriate native shrub species adjacent to the alternate stormwater channel, following procedures described in the Reclamation Plan for State and Private Lands. Where possible, transplanted shrubs should be used along this channel. Species that should be planted include honey mesquite, desert willow, catclaw acacia, white ratany, and graythorn, where conditions are appropriate.
- Loss of xeroriparian vegetation along the ephemeral streams eliminated by construction of the power plant, substation, and evaporation ponds would be mitigated by planting appropriate native shrub species adjacent to the stormwater diversion channel, following procedures described in the Reclamation Plan for State and Private Lands. Where possible, transplanted shrubs should be used along this channel. Species that should be planted include honey mesquite, desert willow, catclaw acacia,

white ratany, and graythorn, where conditions are appropriate.

- As mitigation for impacts from the access road on xeroriparian vegetation and wildlife habitat in Sycamore Creek, the vegetation on gravel bars adjacent to the roadway would be enhanced. The proposed areas for enhancement would be on the downstream side of the crossing. Habitats in these locations would be most likely to persist through flood events. Potential species that should be added to the vegetation in this floodplain include desert willow, catclaw acacia, honey mesquite, graythorn, wolfberry, and desert broom.
- With the implementation of these measures, there would be no residual significant impacts.

3.12 WETLANDS, RIPARIAN AREAS, AND WATERS OF THE UNITED STATES

This section describes the affected environment and environmental consequences relating to wetlands, riparian areas, and waters of the United States.

3.12.1 Wetlands and Riparian Areas

3.12.1.1 Affected Environment

The following sections describe the current wetland and riparian area conditions; this provides a baseline for the assessment of impacts and environmental consequences.

Region of Influence

The region of influence for assessing impacts on wetlands includes the perennial flow reach of the Big Sandy River, between Wikieup and Granite Gorge, with its associated jurisdictional waters of the United States; a small wetland near the proposed power plant site; the wetland associated with Cofer Hot Spring; and the Big Sandy River marsh. The only riparian area (other than xeroriparian habitats on ephemeral

streams, which are discussed in Section 3.11) of concern for this Project is the riparian area on the Big Sandy River. The Big Sandy River wetland, riparian area, and associated waters of the United States are discussed as a single system.

For the purpose of this Draft EIS, the wetland definition adopted by the U.S. Environmental Protection Agency (EPA) and Army Corps of Engineers (COE) for administering Section 404 of the Clean Water Act was used. According to this definition, wetlands are:

“those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.” (33 CFR 328.3(a)[7])

In accordance with this definition, a given area is designated as under the wetland regulatory jurisdiction of the COE if the hydrology results in inundated or saturated soils during the growing season, hydric soils are present, and the dominant vegetation is hydrophytic (COE 1987). Exceptions to these criteria may be allowed in disturbed conditions.

The jurisdictional authority for wetland protection is derived from several sources, beginning with the Clean Water Act of 1972. Section 404 authorizes the COE to grant permits for activities in wetlands or other jurisdictional waters of the United States, and it gives the COE authority to enforce against violations. Executive Order 11990 directs Federal agencies to take action to minimize the destruction, loss, or degradation of wetlands. Western’s (DOE) regulations to comply with this order are specified in 10 CFR 1022, Compliance with Floodplain/Wetlands Environmental Review Requirements. BLM is responsible for monitoring and preserving wetlands and riparian areas under its administration. Specific