

**APPENDIX R**

**NOXIOUS WEED MANAGEMENT PLAN**

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## **NOXIOUS WEED MANAGEMENT PLAN**

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### **INTRODUCTION**

Transwestern Pipeline Company, LLC (Transwestern), is proposing to construct and operate a new pipeline system in Arizona (referred to as Phoenix Lateral) and expand its existing pipeline system in New Mexico. This project will include approximately 260 miles of pipeline that will extend south from Transwestern's mainline near Ash Fork, Arizona, to delivery points in the Phoenix area and will include customer laterals, the Ash Fork Facility, meter stations, taps, and associated aboveground facilities (e.g., launchers, receivers, mainline valves). In New Mexico the project includes about 25 miles of pipeline looping, along with some minor modifications at an existing compressor station. All of these facilities in both Arizona and New Mexico are collectively referred to as the Transwestern Phoenix Expansion Project (Project).

Transwestern has prepared this Noxious Weed Management Plan to identify and control potential occurrences and infestations of noxious weeds on the project. Federal, state, and local agencies recognize that there are species that are not considered controllable because of their widespread distribution. These species are generally not included on lists of noxious weeds. It is the responsibility of the construction contractors (Contractor), working with the project Environmental Inspector(s), to ensure that affected weeds are identified and controlled and that all federal, state, county, other local, and tribal requirements are satisfied.

State agencies with responsibility for weed management maintain official lists of noxious weeds that occur within their state, as well as species to be prevented from introduction into the state. Exotic, invasive, and noxious are terms often used interchangeably to describe weedy species. However, almost any plant species can be "invasive" under the right conditions, and exotic species may not be invasive or noxious. Therefore, in the context of this report, noxious weeds are weed species that are officially listed or otherwise recognized by a state department of agriculture or similar agency. Some of the weeds identified by these agencies occur on this project. This weed management plan provides methods for preventing the spread of noxious weeds during construction and for the management of the disturbed areas of the project after construction. The plan addresses only officially listed noxious weed species, including those encountered during pre-construction weed surveys in the summer of 2006. Other exotics, such as tamarisk in Arizona, will be addressed in the draft Restoration Plan, based on specific agency correspondence and direction.

Transwestern is committed to the prevention, spread, and eradication of noxious weeds during pre- and post-construction related activities associated with the proposed pipeline.

This report includes the results of noxious weed surveys conducted in the summer of 2006 and is intended to inform the agencies concerned with the findings of the first round of weed surveys for this project.

## **REGULATORY COMPLIANCE**

The Arizona Department of Agriculture regulates noxious weeds under ARS Title 3, Chapter 2, whose goal is to “treat, spray, control, suppress or eradicate noxious weeds through a countywide, area-wide or statewide program or programs....”

The New Mexico Noxious Weed Control Act allows for the State of New Mexico to pursue the eradication and control of noxious weeds within its borders.

The Navajo Nation is currently creating an official noxious weed list for their lands. Personal contact was made with Daniela Roth, a botanist with the Navajo Nation Heritage Program, who provided the names of the species listed under the Navajo Nation in Table 1, Appendix A.

By implementing this Noxious Weed Management Plan, the project will be in compliance with Arizona’s ARS Title 3, Chapter 2; the New Mexico Noxious Weed Control Act; and the Navajo Nation’s Heritage Program, in that noxious weeds will be contained, controlled, and eradicated when and where possible within the project.

As required by the Coconino, Kaibab, and Prescott National Forests Environmental Impact Statement for Integrated Treatment of Noxious or Invasive Weeds, any proposed use of herbicides in right-of-way corridors under U.S. Forest Service (Forest Service) jurisdiction would be coordinated, publicly posted, and completed in such a manner that alternative routes would remain accessible until the manufacturer’s re-entry period is met. Limited spray zones are recognized on Forest Service land adjacent to and within 1 mile of private land, recreation sites, trailheads, and scenic overlooks.

## **NOXIOUS WEED MANAGEMENT**

The management of noxious weeds will be considered throughout all stages of the project including:

- Educating all construction personnel regarding the problem areas that have been identified and the importance of preventative measures and treatment methods
- Specific preventative measures to prevent the spread of noxious weeds
- Pre- and post-construction treatment methods to be applied to areas of noxious weed infestation

Following is a description of the measures that may be required for noxious weed management, as directed by the various federal agencies or state quarantine officer.

Applicable measures will be agreed upon prior to the onset of any ground-disturbing activities, and the Noxious Weed Management Plan will be modified accordingly.

### **Identification of Problem Areas**

During construction, areas of concern, identified in Appendix B - Table 2 will be flagged by Transwestern and reviewed by the Biological Monitor or Environmental Inspector. This flagging will alert construction personnel and prevent access into areas until noxious weed management control measures have been implemented, as described below.

### **Data Collection**

As noxious weeds were located, their general locations were recorded using a geographic positioning system (GPS). Additionally, specimen plants, i.e. those plants that visually represent a specific species, were photographed. In some instances, where large numbers of individuals were found over extensive areas, the boundaries of colonies were recorded instead of individual GPS points. Habitat type (biome) and coexisting plants also were noted.

### **Personnel**

Prior to the initiation of construction activities, all construction personnel will be instructed on the importance of controlling noxious weeds. As part of the start-up activities, the Contractor will provide information and training regarding noxious weed management. The importance of preventing the spread of noxious weeds in areas not infested and controlling the proliferation of weeds already present will be emphasized.

The weed management plan, presented below, shall be carried out by a biologist or weed management specialist with the following types of qualifications:

- Training and experience in native plant taxonomy/identification
- Training and experience in field ecology and plant community mapping
- Possession of a Commercial Applicator's License for herbicides from the Arizona and New Mexico agriculture departments
- Training in weed management or Integrated Pest Management (IPM) with an emphasis in weeds
- Experience in coordination with agency and private landowners

### **Timing of Management**

#### **Pre-Construction**

Pre-construction treatment of noxious weed populations will consist of weed removal or spraying (with land management or private land-owner approval) prior to construction. The Contractor will use compressed air to remove seeds, roots, and rhizomes from the equipment, prior to transport from the weed treatment site.

### **Construction**

During construction, weed management will consist of isolating the developed soils containing the seed bank over the affected areas, with designated machine(s) to a maximum depth of 6 inches and a minimum depth of 3 inches depending on soil type. This soil will be stockpiled adjacent to the work area and replaced in approximately the same location from where it was removed. The parts of the equipment that are in contact with this soil will be cleaned with compressed air prior to leaving a noxious weed site. No cleaning of other construction equipment shall be required.

Equipment washing in the field has not proven to be effective at controlling the spread of weeds. In order to prevent the spread of noxious weeds that could be transported from other locations, effective washing of equipment prior to arrival at the construction site should be done with compressed air or a high-pressure steam cleaner, on a hard surface with controlled drainage. Field-washing conditions do not meet these criteria and, in fact, may create seedbed and watering conditions that are very favorable to seed germination. No spraying of equipment with pre-emergent chemicals shall be required. Use of such chemicals may affect the success of natural revegetation.

### **Post-Construction**

Post-construction management will consist of treatments as described below in the Treatment Methods section. Post-construction management will be implemented by a biologist or weed-management specialist and required at the end of each growing season for five years after final project acceptance. The growing season shall be defined by the life spans of the invasive weeds. In addition, the weed management specialist shall monitor invasive weed populations, which extend off the right-of-way. Extra monitoring areas off the right-of-way shall not exceed 10 acres.

### **Coordination**

The biologist or weed management specialist will coordinate with the authorized officer of the jurisdiction involved for the approval of recommended treatment methods. For private land, the weed management specialist will contact the landowner to inform him/her of any noxious weeds found on the private land in question. If treatment is requested by the landowner, and approved by the local field office of the Natural Resources Conservation Service (NRCS), the weed management specialist will treat and monitor the weed population, as allowable by the landowner. Large pre-existing infestations of noxious weeds, off the right-of-way, will not be treated under this management plan. In addition, the biologist or weed management specialist shall submit annual reports on weed treatment areas and methods to the authorized officer of

the land jurisdiction involved, and in the case of private land, to the appropriate office of the NRCS.

## **METHODS**

This section provides a description of acceptable weed control methods within the limits imposed by the permit stipulations. Any weed population that occurs on the proposed pipeline right-of-way will be treated using a single- or combined-treatment method. Only weed populations that occur within the construction footprint will be treated.

### **Prevention Methods**

Prevention is the most effective, efficient, and long-term strategy for the management of noxious and invasive plant species. Preventing invasions by new plant species and quickly detecting invasions that occur allows for immediate eradication measures to be implemented. The following preventative measures will be used to inhibit the spread of noxious weeds along the pipeline right-of-way and at ancillary facilities:

- All movement of construction vehicles, other than on the right-of-way, will be restricted to pre-designated access. All construction sites and access roads shall be clearly marked or flagged at their outer limits prior to the onset of any surface-disturbing activity. All personnel shall be informed that their activities must be confined within the marked or flagged areas.
- Prior to arrival at the work site, all Contractor vehicles and equipment will be cleaned using high-pressure equipment (compressed air or water power wash). The location of vehicle-cleaning stations will be identified by the Contractor and reviewed by the appropriate jurisdictional agency for approval. Power washing with water will be done before vehicles enter the project right-of-way. Power washing will be done at a location where wash water and solids will be returned to an authorized disposal facility.
- The Contractor, with Environmental Inspector oversight, will ensure that vehicles, equipment, and personnel are free of soil, debris, and plant parts capable of transporting noxious weed seeds, roots, or rhizomes before the vehicles, equipment, and personnel are allowed use of access roads to the construction footprint.
- The pipeline right-of-way has been inspected for noxious weeds, and localities of their occurrence have been recorded. Prior to the clearing of vegetation on the right-of-way and facilities, infestations will be flagged for reference in clearing the right-of-way and for post-construction monitoring.
- In areas where infestations have been identified or noxious weeds noted in the field, the Contractor will stockpile cleared vegetation and the seed bank for preservation in

the adjacent area. This will eliminate the transport of soil-born noxious weed seeds, roots, or rhizomes from the infested site. During reclamation, the Contractor will return the seed bank and vegetative material from infestation sites to the areas from which they were stripped.

- The Contractor will use compressed air to remove seeds, roots, and rhizomes from the vehicles and equipment used for clearing and grading, prior to transport from the infested site. Similarly, the equipment used to redistribute the seed bank, along with equipment used in restoration activities within the area after seed bank redistribution, will be cleaned. This will minimize the potential transport of invasive, non-native weeds to other areas of the right-of-way.
- The Contractor will implement the reclamation of disturbed land immediately following construction, as outlined in the Restoration Plan. Continuing revegetation efforts will ensure adequate vegetative cover to prevent the establishment of invasive, non-native weeds.
- Cleaning sites will be recorded using GPS equipment, and this information will be reported to the local contact person or agency.
- The Contractor will not apply fertilizer to reclaimed areas, unless directed to by the property owner, project field supervisor, or jurisdictional agency, because fertilizer can enhance the growth of invasive, non-native weeds. Procedures for the application of fertilizer will be identified where needed.
- The Contractor will ensure that straw bales used on the project for sediment barrier installations or mulch distributions are certified weed-free. Fiber bales made from wood excelsior may be used in lieu of or in conjunction with weed-free straw bales.

Follow-up long-term monitoring also is an important preventative measure. Weed monitoring will be conducted annually for five growing seasons following construction activities, to ensure that noxious species do not establish a foothold along the pipeline right-of-way.

### **Treatment Methods**

Transwestern will implement noxious-weed control measures, in accordance with existing regulations and agency requirements. Pre-construction activities, with respect to noxious weed populations, will consist of removing populations from the right-of-way during grading and clearing in preparation for construction. Post-construction control measures can include one or more of the following methods (that may be implemented during restoration activities):

- Treatment methods will be based on species-specific and area-specific conditions (e.g., proximity to water or riparian areas, agricultural areas, and time of year) and will

be coordinated with the appropriate agency manager and Biological Monitor or Environmental Inspector. If areas are not seeded until the following spring, because of weather or scheduling constraints, all undesirable vegetation will be eradicated before seeding. While this is an available treatment method, it is unlikely to be used on this project.

- Disking or other mechanical treatments that would disturb the soil surface within native habitats will be avoided in favor of herbicide application, which is an effective means of reducing the size of noxious-weed populations, as well as preventing the establishment of new colonies. It is anticipated that herbicides will be used to control noxious weed populations on this project.
- Seed selection will be based on site-specific conditions and the appropriate seed mix identified for those conditions, as presented in the Restoration Plan or by direction from the appropriate agency. This activity will be undertaken to a limited extent on this project.

### **Eradication**

Complete eradication of large areas where infestations are already established may not be possible, because the area is likely to be re-invaded from adjacent land unless there are physical barriers that isolate the area. Eradication is most likely possible when the species has just begun to invade and establish itself in a new area, which highlights the importance of early detection and the post-construction monitoring program. Eradication over large areas on this project will not likely be an issue because no large infestations of any noxious weed species were documented during pre-construction weed surveys.

### **Biological Controls**

The use of native plant species to out-compete noxious species is an effective, long-term weed control method. Noxious weed species will usually grow in disturbed areas reseeded with native vegetation; however, after a few years these weeds cannot compete and die off. In areas where noxious weeds have been allowed to flourish, the weeds may out-compete the native species. In these areas, a more vigorous approach will be needed to rid the area of the noxious weeds. The use of native pure live-seed mixes will help to encourage a healthy and strong revegetated site. Use of pure live-seed mixes is specified in the Restoration Plan. Seeding at a few locations is the only biological control being proposed for this project.

### **Herbicide Application and Handling**

Herbicide application will be based on information gathered from the applicable management agencies. Before application, the Commercial Applicator will obtain a Pesticide Use Permit (PUP) from the local authorities (state and federal agencies). The PUP may contain additional

terms and conditions that go beyond the scope of this management plan. A licensed Commercial Applicator will perform the application in accordance with applicable laws, regulations, and permit stipulations. All herbicide applications must follow United States Environmental Protection Agency label instructions.

### **Herbicide Spills and Cleanup**

All reasonable precautions will be taken to avoid herbicide spills. In the event of a spill, cleanup will be immediate. Commercial Applicators will keep spill kits in their vehicles and in herbicide storage areas, to allow for quick and effective response to spills.

## **MONITORING AND RECORD KEEPING**

### **Monitoring**

Detailed notes taken during pre-construction, construction, and post-construction will be vital in assessing the effectiveness of the plan's prescribed treatments. A biologist or weed-management specialist will monitor the project and any other areas of disturbance that are associated with the construction of this project for the first 5 years following construction. Noxious weed surveys will be conducted to determine whether construction activities have resulted in the introduction of any noxious weed species to the right-of-way that were not present prior to the start of construction. In the first growing season following construction, surveys will be conducted during the spring bloom and again in late summer, following the onset of the summer rains. The following 2 years, weed surveys will be conducted annually in late summer, in association with the routine maintenance and inspection of the pipeline. Any individuals or populations of officially listed weeds discovered will be destroyed. The monitoring form, in Appendix G of the Restoration Plan, includes data collection for noxious weeds and for invasive species.

### **Report Submittal**

A biologist or weed management specialist will submit an annual report to the jurisdictional agencies. Reports will include weed mapping information, as well as methods of treatment applied. The reports will include details such as types of herbicide, rate, approximate acreage treated, and target species.

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## APPENDIX R-A

### STATE LISTED NOXIOUS WEEDS

| TABLE 1<br>STATE-LISTED NOXIOUS WEEDS POTENTIALLY OCCURRING IN PROJECT AREA |   |         |            |               |
|---|---|---------|------------|---------------|
| Common Name   | Scientific Name                             | Arizona | New Mexico | Navajo Nation |
| Russian knapweed  | <i>Acroptilon repens</i>                    | x       | x          |               |
| Jointed goatgrass   | <i>Aegilops cylindrical</i>                 | x       | x          |               |
| Camelthorn  | <i>Alhagi pseudalhagi</i>                   | x       | x          |               |
| Alligator weed  | <i>Alternanthera philoxeroides</i>          | x       |            |               |
| Onionweed   | <i>Asphodelus fistulosus</i>                |         | x          |               |
| Red Brome   | <i>Bromus rubens</i>                        |         |            | x*            |
| Cheatgrass  | <i>Bromus tectorum</i>                      |         |            | x             |
| Lens-podded hoary cress   | <i>Cardaria chalapensis</i>                 | x       |            |               |
| Whitetop  | <i>Cardaria draba</i>                       | x       | x          |               |
| Hairy whitetop  | <i>Cardaria pubescens</i>                   | x       |            |               |
| Plumeless thistle   | <i>Carduus acanthoides</i>                  | x       |            |               |
| Musk thistle  | <i>Carduus nutans</i>                       |         | x          |               |
| Southern sandbur  | <i>Cenchrus echinatus</i>                   | x       |            |               |
| Field sandbur   | <i>Cenchrus incertus</i>                    | x       |            |               |
| Purple starthistle  | <i>Centaurea calcitrapa</i>                 |         | x          |               |
| Diffuse knapweed  | <i>Centaurea diffusa</i>                    |         | x          |               |
| Iberian starthistle   | <i>Centaurea iberica</i>                    | x       |            |               |
| Spotted knapweed  | <i>Centaurea maculosa</i>                   | x       | x          |               |
| Maltese starthistle   | <i>Centaurea melitensis</i>                 |         | x          |               |
| Yellow starthistle  | <i>Centaurea solstitialis</i>               | x       | x          |               |
| Squarrose knapweed  | <i>Centaurea squarrosa</i>                  | x       |            |               |
| Sicilian starthistle  | <i>Centaurea sulphurea</i>                  | x       |            |               |
| Rush skeletonweed   | <i>Chondrilla juncea</i>                    | x       |            |               |
| Blue mustard  | <i>Chorispora tenella</i>                   |         |            | x             |
| Canada thistle  | <i>Cirsium arvense</i>                      | x       | x          |               |
| Bull thistle  | <i>Cirsium vulgare</i>                      |         | x          |               |
| Poison hemlock  | <i>Conium maculatum</i>                     |         | x          |               |
| Field bindweed  | <i>Convolvulus arvensis</i>                 | x       | x          |               |
| Creeping wartcress  | <i>Coronopus squamatus</i>                  | x       |            |               |
| Dudaim melon  | <i>Cucumis melo</i>                         | x       |            |               |
| Dodder  | <i>Cuscuta spp.</i>                         | x       |            |               |
| Fuller's teasel   | <i>Dipsacus fullonum</i>                    |         | x          |               |
| Sandwort drymary  | <i>Drymaria arenarioides</i>                | x       | x          |               |
| Anchored water hyacinth   | <i>Eichhornia azurea</i>                    | x       |            |               |
| Floating water hyacinth   | <i>Eichhornia crassipes</i>                 | x       |            |               |
| Russian olive   | <i>Elaeagnus angustifolia</i>               |         | x          |               |
| Quackgrass  | <i>Elytrigia repens</i>                     | x       |            |               |
| Annual wheatgrass   | <i>Eremopyrum triticeum</i>                 |         |            | x             |
| Leafy spurge  | <i>Euphorbia esula</i>                      | x       | x          |               |
| Sweet resinbush   | <i>Euryops sunbcarnosus subsp. Vulgaris</i> | x       |            |               |
| Halogeton   | <i>Halogeton glomeratus</i>                 | x       | x          |               |
| Texas blueweed  | <i>Helianthus ciliaris</i>                  | x       |            |               |
| Hydrilla  | <i>Hydrilla verticillata</i>                | x       | x          |               |
| Black henbane   | <i>Hyoscyamus niger</i>                     |         | x          |               |
| Morning glory   | <i>Ipomoea spp.</i>                         | x       |            |               |
| Three-lobed morning glory   | <i>Ipomoea triloba</i>                      | x       |            |               |

**TABLE 1  
STATE-LISTED NOXIOUS WEEDS POTENTIALLY OCCURRING IN PROJECT AREA**

| <b>Common Name</b>      | <b>Scientific Name</b>                     | <b>Arizona</b> | <b>New Mexico</b> | <b>Navajo Nation</b> |
|-------------------------|--|----------------|-------------------|----------------------|
| Dyer's woad             | <i>Isatis tinctoria</i>                    |                | <b>x</b>          |                      |
| Broad leaved pepperweed | <i>Lepidium latifolium</i>                 |                | <b>x</b>          |                      |
| Dalmation toadflax      | <i>Linaria genistifolia var. dalmatica</i> | <b>x</b>       | <b>x</b>          |                      |
| Yellow toadflax         | <i>Linaria vulgaris</i>                    |                | <b>x</b>          |                      |
| Purple loosestrife      | <i>Lythrum salicaria</i>                   | <b>x</b>       | <b>x</b>          |                      |
| Burclover               | <i>Medicago polymorpha</i>                 | <b>x</b>       |                   |                      |
| Spike water milfoil     | <i>Myriophyllum spicatum</i>               |                | <b>x</b>          |                      |
| Serrated tussock        | <i>Nassella trichotoma</i>                 | <b>x</b>       |                   |                      |
| Scotch thistle          | <i>Onopordum acanthium</i>                 | <b>x</b>       | <b>x</b>          |                      |
| Branched broomrape      | <i>Orobanche ramosa</i>                    | <b>x</b>       |                   |                      |
| Torpedo grass           | <i>Panicum repens</i>                      | <b>x</b>       |                   |                      |
| African rue             | <i>Peganum harmala</i>                     | <b>x</b>       | <b>x</b>          |                      |
| Buffelgrass             | <i>Pennisetum ciliare</i>                  | <b>x</b>       |                   |                      |
| Common purslane         | <i>Portulaca oleracea</i>                  | <b>x</b>       |                   |                      |
| Austrian fieldcress     | <i>Rorippa austriaca</i>                   | <b>x</b>       |                   |                      |
| Giant salvinia          | <i>Salvinia molesta</i>                    | <b>x</b>       |                   |                      |
| Tansy ragwort           | <i>Senecio jacobaea</i>                    | <b>x</b>       |                   |                      |
| Carolina horsenettle    | <i>Solanum carolinense</i>                 | <b>x</b>       |                   |                      |
| Tropical Soda Apple     | <i>Solanum viarum</i>                      | <b>x</b>       |                   |                      |
| Perennial sowthistle    | <i>Sonchus arvensis</i>                    | <b>x</b>       |                   |                      |
| Puna grass              | <i>Stipa brachychaeta</i>                  | <b>x</b>       |                   |                      |
| Witchweed               | <i>Striga spp.</i>                         | <b>x</b>       |                   |                      |
| Athel tamarisk          | <i>Tamarix aphylla</i>                     |                | <b>x</b>          |                      |
| Smallflower tamarisk    | <i>Tamarix parviflora</i>                  |                | <b>x</b>          |                      |
| Salt cedar              | <i>Tamarix spp.</i>                        |                | <b>x</b>          |                      |
| Water-chestnut          | <i>Trapa natans</i>                        | <b>x</b>       |                   |                      |
| Puncture vine           | <i>Tribulus terrestris</i>                 | <b>x</b>       |                   |                      |
| Siberian elm            | <i>Ulmus pumila</i>                        |                | <b>x</b>          |                      |

Source:

Arizona: Prohibited, Regulated and Restricted Noxious Weeds

New Mexico: New Mexico Department of Agriculture 1999 State List

Navajo Nation: personal communication with Daniela Roth, Botanist with Navajo Nation Heritage Program

\*Not on either state's noxious weed list, but being considered by Navajo Nation

## APPENDIX R-B

### INVENTORY OF NOXIOUS WEEDS WITHIN THE PROJECT AREA

Pre-construction field surveys were conducted from June through October of 2006 to identify existing noxious weed infestations within the rights-of-way in Arizona (the Phoenix Lateral) and New Mexico (Loops A and B) and did not include access roads or other ancillary facility/construction locations. Biologists familiar with the pre-identified potentially occurring noxious weed species traveled along the centerline of the proposed pipeline corridor and recorded the species, location, and number of noxious weeds as they were encountered.

### RESULTS

A total of 35 noxious weed locations, representing 10 species, were found along or adjacent to the length of the project rights-of-way during the survey. The weeds encountered are discussed below in the following table.

| <b>TABLE 2<br/>NOXIOUS WEED SPECIES FOUND WITHIN THE ARIZONA<br/>AND NEW MEXICO RIGHTS-OF-WAY</b> |                               |               |         |              |         |                  |
|---|-------------------------------|---------------|---------|--------------|---------|------------------|
| Common Name   | Scientific Name               | From Location |         | To Location* |         | Milepost         |
|   |                               | UTM X         | UTM Y   | UTM X        | UTM Y   |                  |
| <b>Arizona</b>  |                               |               |         |              |         |                  |
| Scotch thistle  | <i>Onopordum acanthium</i>    | 375919        | 3847412 |              |         | 33.05            |
| Bull thistle  | <i>Cirsium vulgare</i>        | 393188        | 3776746 |              |         | 84.65            |
| Knapweed  | <i>Centaurea</i> spp.         | 394360        | 3771937 | 394766       | 3771281 | 87.65-88.41      |
| Buffelgrass   | <i>Pennisetum ciliare</i>     | 394420        | 3769326 | 394304       | 3769359 | 89.65-89.75      |
| Common purslane   | <i>Portulaca oleracea</i>     | 355418        | 3727138 | 360019       | 3727054 | 126.0-131.38     |
| Puncture vine   | <i>Tribulus terrestris</i>    | 344340        | 3722586 | 364543       | 3727005 | 126.0-139.98     |
| Red brome   | <i>Bromus rubens</i>          | 355418        | 3727138 | 357291       | 3727095 | 131.38-132.81    |
| Common purslane   | <i>Portulaca oleracea</i>     | 344368        | 3722605 | 364531       | 3726989 | 132.82-139.98    |
| Halogeton   | <i>Halogeton glomeratus</i>   | 327988        | 3685061 | 328248.5     | 3691434 | 163.52-167.57    |
| Buffelgrass   | <i>Pennisetum ciliare</i>     | 33691         | 3677891 | 330950       | 3680099 | 171.55-173.72    |
| Salt cedar  | <i>Tamarix</i> sp.            | 335042        | 3677148 |              |         | 174.75**         |
| Salt cedar  | <i>Tamarix</i> sp.            | 335559        | 3677235 |              |         | 175.08**         |
| Common purslane   | <i>Portulaca oleracea</i>     | 362526        | 3673652 | 346236       | 3677762 | 181.82-192.43    |
| Puncture vine   | <i>Tribulus terrestris</i>    | 362526        | 3673652 | 346236       | 3677762 | 181.82-192.43    |
| Buffelgrass   | <i>Pennisetum ciliare</i>     | 434378        | 3643234 | 435154       | 3643599 | 239.98-244.31    |
| Buffelgrass   | <i>Pennisetum ciliare</i>     | 437909        | 3643476 |              |         | 246.07           |
| <b>New Mexico</b>   |                               |               |         |              |         |                  |
| Salt cedar  | <i>Tamarix</i> sp.            | 771857        | 4066614 | 772367       | 4068519 | 0.12-1.72 Loop A |
| Puncture vine   | <i>Tribulus terrestris</i>    | 771857        | 4066614 | 772367       | 4068519 | 0.12-1.72 Loop A |
| Russian Olive   | <i>Elaeagnus angustifolia</i> | 771856        | 4066880 |              |         | 1.51 Loop A      |
| Knapweed  | <i>Centaurea</i> spp.         | 771856        | 4066880 |              |         | 1.51 Loop A      |
| Bull thistle  | <i>Cirsium vulgare</i>        | 771856        | 4066880 |              |         | 1.51 Loop A      |

**TABLE 2**  
**NOXIOUS WEED SPECIES FOUND WITHIN THE ARIZONA**  
**AND NEW MEXICO RIGHTS-OF-WAY**

| Common Name   | Scientific Name               | From Location |         | To Location* |       | Milepost     |
|---------------|-------------------------------|---------------|---------|--------------|-------|--------------|
|               |                               | UTM X         | UTM Y   | UTM X        | UTM Y |              |
| Salt cedar    | <i>Tamarix sp.</i>            | 771856        | 4066880 |              |       | 1.51 Loop A  |
| Knapweed      | <i>Centaurea spp.</i>         | 771857        | 4066614 |              |       | 1.68 Loop A  |
| Bull thistle  | <i>Cirsium vulgare</i>        | 771857        | 4066614 |              |       | 1.68 Loop A  |
| Salt cedar    | <i>Tamarix sp.</i>            | 771857        | 4066614 |              |       | 1.68 Loop A  |
| Knapweed      | <i>Centaurea spp.</i>         | 771572        | 4065336 |              |       | 2.53 Loop A  |
| Salt cedar    | <i>Tamarix sp.</i>            | 768254        | 4062804 |              |       | 5.38 Loop A  |
| Salt cedar    | <i>Tamarix sp.</i>            | 765911        | 4059358 |              |       | 8.0 Loop A   |
| Russian Olive | <i>Elaeagnus angustifolia</i> | 765005        | 4058477 |              |       | 8.83 Loop A  |
| Bull thistle  | <i>Cirsium vulgare</i>        | 727815        | 3949417 |              |       | 82.92 Loop B |

\*Local populations occur where "to locations" do not exist.  
\*\*Salt Cedar is a listed noxious weed in New Mexico and not Arizona.

## SURVEYED NOXIOUS WEED SPECIES INFORMATION

### Red Brome (*Bromus rubens*)

*Bromus rubens* is a cool-season annual bunchgrass that characteristically reaches a height between 20 centimeters and 50 centimeters and is tufted (GISI 2007). The inflorescence is erect, with spikelets approximately 2.5 centimeters long with 4 to 11 flowering bracts, each terminating in a red-brown bristle about 19 millimeters long (Parker 1990). Red brome is one of the species being considered for inclusion on the Navajo Nation noxious weeds list.

*B. rubens* was discovered between Mileposts 73 and 80 of the B Loop in New Mexico, on Navajo Nation land.

### Knapweeds and Starthistles (*Centaurea spp.*)

Knapweeds are a group of biennial or short-lived perennial composites (*Asteraceae*) with stout taproots. They have 1 to 20 upright, slender stems that are 30 to 91 centimeters tall, with most branching in the upper half. The flowers are pinkish-purple and solitary at the end of branches (Whitson et al. 2000). Disturbed soils are the preferred habitat for knapweeds and starthistles.

*Centaurea spp.* was located in two areas: north of the San Juan River between Mileposts 0 and 1.5 of the A Loop and in and near Black Canyon City, Arizona, primarily along roadsides and in vacant lots.

### **Bull Thistle** (*Cirsium vulgare*)

The bull thistle is a biennial with a many-branched stem 61 to 152 centimeters tall and a short, fleshy taproot. Leaves form a rosette in their first year and have deeply lobed margins and are cottony on the underside and prickly on the upper surface. Flowers are clustered on the ends of branches, are between 4.5 and 5 centimeters wide, and are deep purple in color. Bull thistles prefer disturbed sites, pastures, and roadsides (Whitson et al. 2000).

*Cirsium vulgare* was found growing in New Mexico, between Mileposts 0 and 9 along Loop A, in riparian zones, grazed fields, and cattle pastures. Bull thistle was found between Mileposts 80.5 and 80.6 (approximately 35° 36.500', 108° 30.500') during field surveys in September 2006. The patch was the width of the right-of-way (100 feet) and ran for approximately 300 feet.

### **Scotch Thistle** (*Onopordum acanthium*)

Scotch thistle is a branched, robust biennial that can grow to heights of more than 8 feet. Main stems may be up to 4 inches thick at the base and have vertical rows of prominent, spiny, ribbon-like leaf material that extend to the base of the flower heads. Leaves can be up to two feet long and one foot wide and are armed with sharp, yellow spines. Globe-shaped flowers are born on branch tips in groups of 2 or 3. Flowers are dark pink to lavender. Scotch thistle can spread rapidly and is very detrimental on rangelands, at times actually preventing movement of cattle when growth is dense.

*Onopordum acanthium* was found growing at roughly Milepost 33 (35°45.590', 112°20.863). The plants were found in an area primarily occupied by grasses in the vicinity of the old railroad grade.

### **Russian Olive** (*Elaeagnus angustifolia*)

*Elaeagnus angustifolia* is a shrub or small tree in the family *Elaeagnaceae*. It can grow up to 9 meters in height and is often thorny. The leaves of *E. angustifolia* are simple, alternate, lanceolate to oblong, 4 to 8 centimeters in length, and are entire along the margins (Hickman 1993). The upper surfaces of its leaves are light green in color and covered with silvery star-shaped hairs, and the lower surface is silvery white and densely covered with scales (Deiter 2000).

*E. angustifolia* was found growing near the San Juan River between Mileposts 0 and 1.5 and in an area dominated by weeds near Milepost 8.0, close to the end of Loop A.

### **Halogeton** (*Halogeton glomeratus*)

Halogeton, a small forb, grows from 7.6 to 30 centimeters in height, with stems that are red when young and turn yellow to white with maturity. Stems are branched from their bases, spreading

first, and then growing vertical. Flowers appear from July to September, and reproduction is from seeds. Seeds germinate quickly if conditions are right or they can remain dormant in the soil for up to 10 years (Parker 1990, USU 2004).

Halogeton was observed east of Casa Grande between Mileposts 251 and 255 in an area dominated by tumbleweed, and near the Palo Verde Nuclear Plant.

### **Buffelgrass** (*Pennisetum ciliare*)

*Pennisetum ciliare* is a perennial bunchgrass, in the family *Poaceae*, that ranges in height from 10 to 150 centimeters (averaging 70 centimeters) tall. The stems of *P. ciliare* can be decumbent or erect, often forming mats or tussocks. The leaves are bluish green, 5 to 30 centimeters long, and 2.5 to 11.0 millimeters wide, with the upper surface being soft and hairy. Leaf sheaths are glabrous to sparingly pilose, 2 to 7 centimeters in length, and the ciliate ligule is 0.5 to 1.5 millimeters in length (GISI 2007).

Buffelgrass was located in two places along the proposed pipeline route in Arizona, with the first location being the roadside of Interstate 10 between Mileposts 153 and 154. The second occurrence is at scattered locations (Table 3) in the vicinity of Black Canyon City, along roadsides and in vacant lots and fields.

### **Common Purslane** (*Portulaca oleracea*)

Common purslane is a prostrate annual with smooth reddish or flesh-colored stems and branches that radiate out from a central rooting point, often forming vegetative mats. The succulent leaves are shiny, smooth, and tear-shaped, with the widest part at the leaf tip (Whitson et al. 2000). Small, single yellow flowers are borne in leaf axils.

Three areas in Arizona were identified as having *P. oleracea* growing in them. The first location was between Mileposts 244.5 and 255.0, in an area of agricultural fields dominated by tumbleweed. The second location was along Interstate 10, once again in an area dominated by tumbleweed. The third location was in a mesic depression along the transmission line right-of-way near Sun City.

### **Tamarisk** (*Tamarix* spp.)

Tamarisk species are deciduous, loosely branched shrubs, or small trees. The branchlets are slender with minute, appressed scaly leaves. Leaves are ovate to rhombic, sharply pointed to gradually tapering, and 0.5 to 3.0 millimeters long. The margins of the leaves are thin, dry, and membranous. Flowers are pinkish or whitish, borne on finger-like clusters 2 to 5 centimeters

long on the current year's branches, and are grouped together in terminal panicles (Whitson et al. 2000).

Tamarisk is an exotic species that was introduced from Europe (probably Spain) in the 1800s. It is highly invasive in wetland areas and along streams and is included on the noxious weed list in the State of New Mexico, but is not on Arizona's noxious weed list.

Tamarisks were located in several different locations in the project area, but only in two of them are they considered noxious weeds. These two locations were near the San Juan River at approximately Milepost 1.3 of Loop A. Particularly large clusters were present at Kutz Wash.

### **Puncture Vine** (*Tribulus terrestris*)

Puncture vine is a prostrate annual with a shallow taproot that reproduces only by seed. Stems can be erect in pursuit of light but are almost always prostrate. Leaves are opposite and 1 to 3 centimeters long. Flowers are yellow and solitary, on short stalks originating in the axils of the leaves. The seeds are located in burs or nutlets that break apart at maturity and are often transported by attaching themselves to a vector. Seeds remain viable in the soil for several years (Parker 1990).

Puncture vine was observed in two general locations in the project area in Arizona: on roadsides from Highway 85 west to Interstate 10 and near Sun City.

## APPENDIX R-C

### INVASIVE WEED INFORMATION

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#### UNDESIRABLE INVASIVE WEEDS FOUND IN PROJECT AREA

The Arizona State Land Department requested documentation of the invasive weeds found in the project area. In addition to the noxious weed species discussed in the main body of this report, several undesirable invasive species that do not have noxious status also were found along the right-of-way (Table A-1 below). All of these plants are so well established and widespread that control or elimination is virtually impossible, hence they are not usually contained on noxious weed lists. The two *Schismus* species are the overwhelmingly dominant annual plant species in the Mojave and Sonoran deserts following winters of abundant rainfall, making creosote bush flats resemble golf fairways. The Russian thistles are almost as abundant and may be the dominant plant species on disturbed sites for many decades following initial ground disturbance.

| <b>Species</b>               | <b>Common Name</b>         | <b>Right-of-Way</b> |
|------------------------------|----------------------------|---------------------|
| <i>Arundo donax</i>          | Giant reed                 | Arizona             |
| <i>Brassica tournefortii</i> | Sahara mustard             | Arizona, New Mexico |
| <i>Bromus rubens</i>         | Red brome                  | Arizona             |
| <i>Centaurea</i> spp.        | Thistles                   | Arizona, New Mexico |
| <i>Cynodon dactylon</i>      | Bermuda grass              | Arizona, New Mexico |
| <i>Salsola iberica</i>       | Prickly Russian thistle    | Arizona, New Mexico |
| <i>Salsola</i> spp.          | Russian thistle            | Arizona, New Mexico |
| <i>Schismus arabicus</i>     | Arabian schismus           | Arizona, New Mexico |
| <i>Schismus barbatus</i>     | Common Mediterranean grass | Arizona, New Mexico |
| <i>Sorghum halepense</i>     | Johnson grass              | Arizona, New Mexico |
| * <i>Tamarix</i> spp.        | Salt cedar                 | Arizona             |

Invasive plant list provided by: Arizona Wildlands Invasive Plant Working Group 2005.  
\*Salt cedar will be removed, per direction of the Prescott National Forest.