

*Non-native Invasive Plant Species Survey for*  
**San Luis Solar Site in San Luis, Arizona**

Prepared for:

**Arizona State Land Department  
1616 West Adams  
Phoenix, AZ 85007**

At the Request of:

**SEPV16, LLC  
21900 Burbank Blvd, Suite 300  
Woodland Hills, CA 91367**

Prepared by:

**NEI Environmental  
1851 W. 24th Street  
Yuma, AZ 85364**

NEI Project No. 011-0049  
Application No. 03-115144  
Applicant SEPV16, LLC

April 2011



# TABLE OF CONTENTS

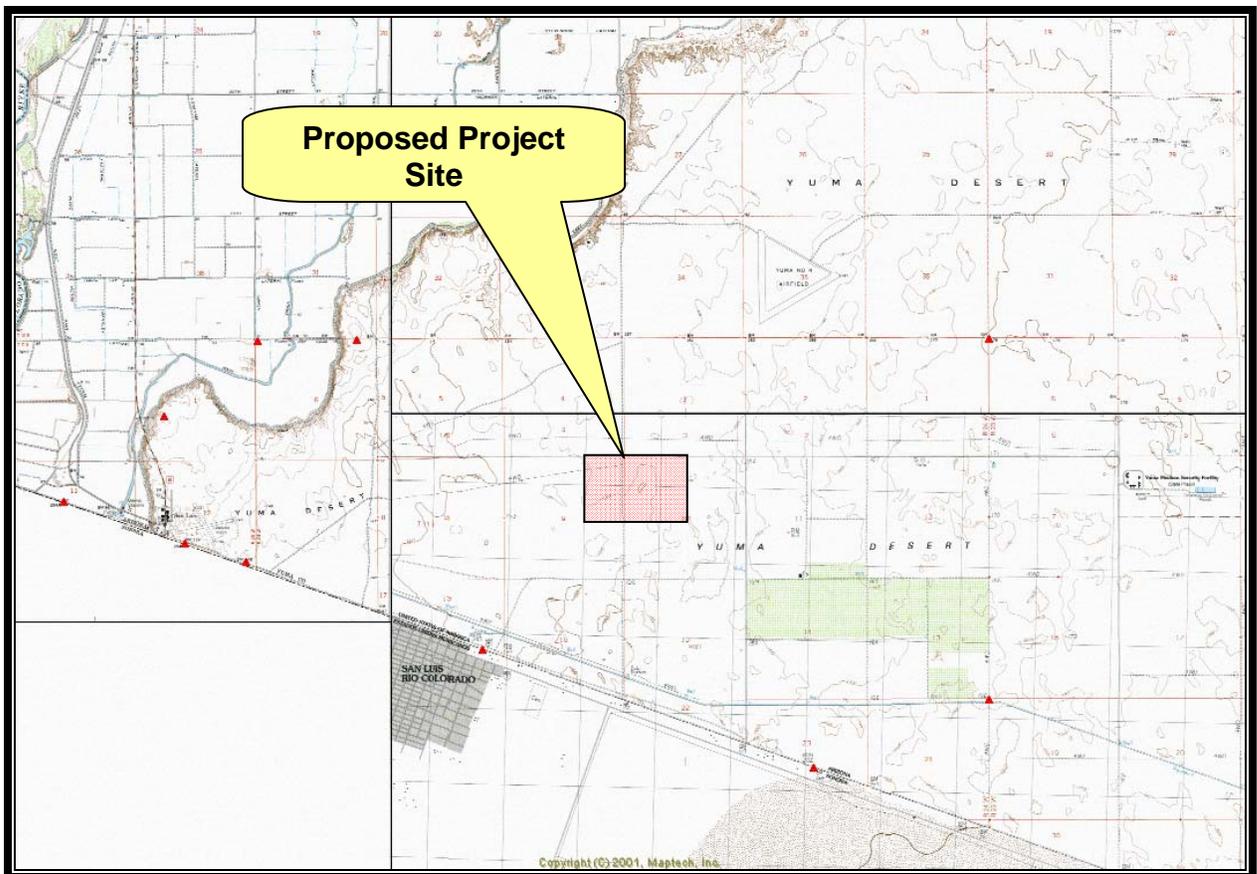
|                        |  |          |
|------------------------|--|----------|
| <b>1.0</b>             | <b>Introduction</b> .....  | <b>1</b> |
| 1.1                    | Survey Area .....  | 1        |
| 1.2                    | Ecology .....  | 1        |
| <b>2.0</b>             | <b>Methods</b> .....   | <b>2</b> |
| <b>3.0</b>             | <b>Results</b> .....   | <b>3</b> |
| <b>4.0</b>             | <b>Discussion and Recommendations</b> .....                          | <b>3</b> |
| <b>5.0</b>             | <b>References</b> .....  | <b>4</b> |
| <b>6.0</b>             | <b>Appendices</b> .....  | <b>5</b> |
|                        | Appendix 1: Prohibited, Regulated, and Restricted Noxious Weeds..... | 6        |
| <b>List of Figures</b> |  |          |
|                        | Figure 1: Location Map.....  | 1        |
| <b>List of Tables</b>  |  |          |
|                        | Table 1: Plant Species Observed During Survey .....                  | 3        |

## 1.0 Introduction

The purpose of this report is to document the results of a non-native invasive plant species survey conducted for the proposed SEPV16, LLC Solar Site to be located in San Luis Arizona. The results of the survey will establish a baseline for non-native invasive species for the proposed project's environmental assessment report.

### 1.1 Survey Area

The area surveyed consists of approximately 240 acres of undeveloped desert land as well as agricultural land and is located in Sections 9 and 10, Township 11 South, Range 24 West, Gila of the Salt River Baseline and Meridian (see Figure 1).



**Figure 1: Location Map**  
Proposed Solar Site in San Luis Arizona



### 1.2 Ecology

The biotic community in this area is classified as Sonoran Desertscrub and occurs within the Lower Colorado River Valley subdivision of the Sonoran Desert (Brown, 1994). The vegetation composition in the area is characterized as

Creosote Bush-White Bursage series (Brown, 1994). Vegetation is moderate on Parcel Number 777-01-38A and 777-01-38B and adjacent lands.

Parcel Number 777-01-037 consists of a circular agricultural field planted in alfalfa. The land is irrigated by a center pivot irrigation system plumbed to a well located off site.

The soil at the project site consists of Superstition sand. This deep, somewhat excessively drained soil is on the old terrace of the Colorado River. It formed in mixed sandy alluvium. Elevation is 100 to 600 feet. The average annual precipitation ranges from 2 to 4 inches, the average annual air temperature ranges from 72 to 76 degrees F, and the average freeze-free period ranges from 250 to 325 days. Typically, the surface layer is light brown silt loam about 5 inches thick. The underlying material to a depth of 60 inches or more is light brown and pink sand and contains few to many soft lime masses. In some places the surface layer is loamy sand. Included with this soil mapping are small areas of Rositas sand. The permeability of this Superstition soil is rapid. Surface runoff is very slow. The hazard of soil blowing is high. Available water capacity is low to moderate.

## 2.0 Methods

A list of Prohibited, Regulated, and Restricted Noxious Weeds was obtained from the Arizona Department of Agriculture (see Appendix 1). The Natural Resource Conservation Service was contacted and provided a list of non-native invasive species likely to occur in the project area (see Table 1).

**Table 1: Non-native invasive species likely to occur in the project area**

| San Luis Solar Site |                              |
|---------------------|------------------------------|
| Common Name         | Scientific Name              |
| Punctervine         | <i>Tribulus terrestris</i>   |
| Buffelgrass         | <i>Pennisetum ciliare</i>    |
| Sahara Mustard      | <i>Brassica tournefortii</i> |
| Sand Burs           | <i>Cenchrus incertus</i>     |
| Camelthorn          | <i>Alhagi maurorum</i>       |
| African Rue         | <i>Peganum harmala</i>       |

The pedestrian survey was conducted by Mark Galate on March 15, 2011 and April 6, 2011. The survey area was 240 acres. The entire area was walked except for the

The pedestrian survey was conducted by Mark Galate on March 15, 2011 and April 6, 2011. The survey area was 240 acres. The entire area was walked except for the agricultural field on Parcel number 777-01-037 which was actively growing alfalfa. Each species occurrence was compared to these lists.

Plants observed during the site visit are listed in Table 2.

**Table 2: Plant Species Observed During Survey**  
San Luis Solar Site

| <b>Common Name</b> | <b>Scientific Name</b>       |
|--------------------|------------------------------|
| Creosote Bush      | <i>Larrea tridentata</i>     |
| Desert Planitain   | <i>Plantago ovata</i>        |
| Crinkle Mat        | <i>Tiquilia plicata</i>      |
| Desert Triumph     | <i>Eriogonum inflatum</i>    |
| Desert Lavender    | <i>Hyptis emoryi</i>         |
| Russian Thistle    | <i>Salsola iberica</i>       |
| Spanish Needles    | <i>Palifoxia aridia</i>      |
| Sahara Mustard     | <i>Brassica tournefortii</i> |
| Four-Wing Saltbush | <i>Atriplex canescens</i>    |
| Common Dandelion   | <i>Taraxacum officinale</i>  |
| Bermuda Grass      | <i>Cynodon Dactylon</i>      |
| Sixweeks Fescue    | <i>Vulpia octoflora</i>      |

### **3.0 Results**

No prohibited, regulated, or restricted noxious weeds were identified within the project site.

### **4.0 Discussion and Recommendations**

While no prohibited, regulated, or restricted noxious weeds, as listed in Appendix 1, were found during the surveys, the non-native invasive Sahara Mustard (*Brassica tournefortii*) was found on the outer edges of the agricultural field located on Parcel Number 777-01-037. Even though Sahara Mustard is not listed as a prohibited, regulated, or restricted noxious weed, it should be eradicated when feasible to prevent the possible spread of this non-native invasive weed. There is the potential for other non-native invasive species to occur in the area. Conditions have been dry

for some time, except on Parcel Number 777-01-037, prior to the survey and, therefore, were not optimal for locating and identifying plants. For instance, non-native invasive species could potentially occur within the seed bank.

To reduce the possibility of spreading non-native invasive species potentially occurring within the project site to uncontaminated areas, all earth-moving and hauling equipment should be washed at a designated location before leaving the construction site. In addition, to prevent the introduction of non-native invasive species to the subject site, all earth-moving and hauling equipment should be washed at the contractor's storage facility before entering the construction site. Furthermore, all disturbed soils that will not be landscaped or otherwise permanently stabilized by construction should be seeded using species native to the project vicinity.

## 5.0 References

Arizona Department of Agriculture. 2011.

<http://www.azda.gov/PSD/quarantine5.htm>.

Brown, D. E. (editor). 1994. Biotic Communities: Southwestern United States and Northwestern Mexico. University of Utah Press.

Center for Invasive Species and Ecosystem Health Web 2011, *Cynodon Dactylon*, Accessed online at

<http://www.invasive.org/browse/subinfo.cfm?sub=5484> (Accessed April 2011).

Desert Museum Web 2011, *Brassica tournefortii*, Accessed online at

[http://www.desertmuseum.org/invaders/invaders\\_saharamustard.php](http://www.desertmuseum.org/invaders/invaders_saharamustard.php)

(Accessed April 2011).

Howard, Janet L. 2003. *Atriplex canescens*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Accessed online at

<http://www.fs.fed.us/database/feis/plants/shrub/atrcan/all.html> (Accessed April 2011).

Images of desert Plaintain Web 2011, *Plantago ovata*, Accessed online at

<http://www.bing.com/images/search?q=desert+plaintain&view=detail&id=E41541716FE72EF162E183528622FE50A3AFE9B8&first=1&FORM=IDFRIR>

(Accessed April 2011).

Natural Resources Conservation Service Web 2011, *Larrea tridentata*, Accessed online at

<http://plants.usda.gov/java/profile?symbol=LATR2> (Accessed April 2011).

- Natural Resources Conservation Service Web 2011, *Taraxacum officinale*, Accessed online at [http://plants.usda.gov/java/largeImage?imageID=taof\\_001\\_ahp.tif](http://plants.usda.gov/java/largeImage?imageID=taof_001_ahp.tif) (Accessed April 2011).
- Sonoran Desert Naturalist Web 2011, *Tiquilia plicata*, Accessed online at [http://arizonensis.org/sonoran/fieldguide/plantae/tiquilia\\_plicata.html](http://arizonensis.org/sonoran/fieldguide/plantae/tiquilia_plicata.html) (Accessed April 2011).
- Southern Arizona Data Management Program (SADSP) 2004. Descriptions of Arizona Vegetation Represented on the GAP Vegetation Map, the U.S. Geological Survey's Sonoran Desert Research Station in cooperation with the University of Arizona. January 2011. <http://sdrsnet.srn.arizona.edu/data/azgap99/docs/GBKvegdesc.pdf> (Accessed April 2011).
- Southwest Diversity Southwest Environmental Information Network Web 2011. *Vulpia octoflora*, Accessed online at <http://swbiodiversity.org/seinet/taxa/index.php?taxon=3257> (Accessed April 2011).
- Natural Resources Conservation Service Web 2011, *Eriogonum inflatum*, Accessed online at <http://plants.usda.gov/java/profile?symbol=ERIN4> (Accessed April 2011).
- The Plant List, Arizona State College, 2007. *Hyptis emoryi*, Accessed online at <http://www.azarboretum.org/plantlist/desertlavender.htm> (Accessed April 2011)
- USDA Germplasm Resources Information Network, April 2011. *Salsola iberica*, Accessed online at <http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?317252> (Accessed April 2011).
- Epple, Anne O. 1995. *Palifoxia arida*. A field Guide to the Plants of Arizona, The Global Pequot Press.

## **6.0 Appendices**

### **1. Prohibited, Regulated, and Restricted Noxious Weeds**

**Appendix 1: Prohibited, Regulated, and Restricted Noxious Weeds**

Quality... from the land to you


[QuickLinks](#)
[Rules & Regulations](#)
[Boards and Commissions](#)
[FAQ's](#)
[Employment](#)
[Find a Program or Service](#)
[Contact Us](#)

## Prohibited, Regulated and Restricted Noxious Weeds

### PROHIBITED:

The following noxious weeds (includes, plants, stolons, rhizomes, cuttings and seed) are prohibited from entry into the state.

*Acrotilon repens* (L.) DC. -- Russian knapweed,  
*Aegilops cylindrica* Host -- Jointed goatgrass,  
*Alhagi pseudalhagi* (Bieb.) Desv. -- Camelthorn,  
*Alternanthera philoxeroides* (Mart.) Griseb. -- Alligator weed,  
*Cardaria pubescens* (C.A. Mey) Jarmolenko -- Hairy whitetop,  
*Cardaria chalepensis* (L.) Hand-Muzz -- Lens podded hoary cress,  
*Cardaria draba* (L.) Desv. -- Globed-podded hoary cress (Whitetop),  
*Carduus acanthoides* L. -- Plumeless thistle,  
*Cenchrus echinatus* L. -- Southern sandbur,  
*Cenchrus incertus* M.A. Curtis -- Field sandbur,  
*Centaurea calcitrapa* L. -- Purple starthistle,  
*Centaurea iberica* Trev. ex Spreng. -- Iberian starthistle,  
*Centaurea squarrosa* Willd. -- Squarrose knapweed,  
*Centaurea sulphurea* L. -- Sicilian starthistle,  
*Centaurea solstitialis* L. -- Yellow starthistle (St. Barnaby's thistle),  
*Centaurea diffusa* L. -- Diffuse knapweed,  
*Centaurea maculosa* L. -- Spotted knapweed,  
*Chondrilla juncea* L. -- Rush skeletonweed,  
*Cirsium arvense* L. Scop. -- Canada thistle,  
*Convolvulus arvensis* L. -- Field bindweed,  
*Coronopus squamatus* (Forskal) Ascherson -- Creeping wartcress (Coronopus),  
*Cucumis melo* L. var. *Dudaim* Naudin -- Dudaim melon (Queen Anne's melon),  
*Cuscuta* spp. -- Dodder,  
*Drymaria arenarioides* H.B.K. -- Alfombrilla (Lightningweed),  
*Eichhornia crassipes* (Mart.) Solms -- Floating water hyacinth,  
*Eichhornia azurea* (Sw) Kunth. -- Anchored water hyacinth,  
*Elytrigia repens* (L.) Nevski -- Quackgrass,  
*Euphorbia esula* L. -- Leafy spurge,  
*Halogeton glomeratus* (M. Bieb.) C.A. Mey -- Halogeton,  
*Helianthus ciliaris* DC. -- Texas blueweed,  
*Hydrilla verticillata* Royale -- Hydrilla (Florida-elodea),  
*Ipomoea* spp. -- Morning glory. All species except *Ipomoea carnea*, Mexican bush morning glory; *Ipomoea triloba*, three-lobed morning glory (which is considered a restricted pest), and *Ipomoea aborescens*, morning glory tree,  
*Ipomoea triloba* L. -- Three-lobed morning glory,  
*Isatis tinctoria* L. -- Dyers woad,  
*Linaria genistifolia* var. *dalmatica* -- Dalmation toadflax,  
*Lythrum salicaria* L. -- Purple loosestrife,  
*Medicago polymorpha* L. -- Burclover,  
*Nassella trichotoma* (Nees.) Hack. -- Serrated tussock,  
*Onopordum acanthium* L. -- Scotch thistle,  
*Orobanche ramosa* L. -- Branched broomrape,  
*Panicum repens* L. -- Torpedo grass,  
*Peganum harmala* L. -- African rue (Syrian rue),  
*Pennisetum ciliare* (L.) Link -- buffelgrass,  
*Portulaca oleracea* L. -- Common purslane,  
*Rorippa austriaca* (Crantz.) Bess. -- Austrian fieldcress,  
*Salvinia molesta* -- Giant salvinia  
*Senecio jacobaea* L. -- Tansy ragwort,  
*Solanum carolinense* L. -- Carolina horsenettle,  
*Sonchus arvensis* L. -- Perennial sowthistle,  
*Solanum viarum* Dunal -- Tropical Soda Apple,  
*Stipa brachychaeta* Godr. -- Puna grass,  
*Striga* spp. -- Witchweed,  
*Trapa natans* L. -- Water-chestnut,  
*Tribulus terrestris* L. -- Puncturevine.

### REGULATED:

The following noxious weeds are regulated (includes plants, stolons, rhizomes, cuttings and seed) and if found within the state may be controlled or quarantined to prevent further infestation or contamination.

*Cenchrus echinatus* L. -- Southern sandbur,  
*Cenchrus incertus* M.A. Curtis -- Field sandbur,  
*Convolvulus arvensis* L. -- Field bindweed,  
*Eichhornia crassipes* (Mart.) Solms -- Floating water hyacinth,  
*Medicago polymorpha* L. -- Burclover,  
*Pennisetum ciliare* (L.) Link -- buffelgrass,  
*Portulaca oleracea* L. -- Common purslane,  
*Salvinia molesta* -- Giant Salvinia \*  
*Tribulus terrestris* L. -- Puncturevine.

\* Added by Director's Administrative Order DAO 99-03 on 8/25/99

### RESTRICTED:

The following noxious weeds are restricted (includes plants, stolons, rhizomes, cuttings and seed) and if found within the state shall be quarantined to prevent further infestation or contamination.

*Acroptilon repens* (L.) DC. -- Russian knapweed,  
*Aegilops cylindrica* Host. -- Jointed goatgrass,  
*Alhagi pseudalhagi* (Bieb.) Desv. -- Camethorn,  
*Cardaria draba* (L.) Desv. -- Globed-podded hoary cress (Whitetop),  
*Centaurea diffusa* L. -- Diffuse knapweed,  
*Centaurea maculosa* L. -- Spotted knapweed,  
*Centaurea solstitialis* L. -- Yellow starthistle (St. Barnaby's thistle),  
*Cuscuta* spp. -- Dodder,  
*Eichhornia crassipes* (Mart.) Solms -- Floating water hyacinth  
*Elytrigia repens* (L.) Nevski -- Quackgrass,  
*Euryops sunbcarnosus* subsp. *vulgaris* -- Sweet resinbush,  
*Halogeton glomeratus* (M. Bieb.) C.A. Mey -- Halogeton,  
*Helianthus ciliaris* DC. -- Texas blueweed,  
*Ipomoea triloba* L. -- Three-lobed morning glory,  
*Linaria genistifolia* var. *dalmatica* -- Dalmation toadflax,  
*Onopordum acanthium* L. -- Scotch thistle.

**The following commodities are hosts or carriers of the prohibited, regulated or restricted plants:**

1. All plants other than those categorized as a regulated or restricted pest;
2. Forage, straw and feed grains;
3. Live and dead flower arrangements
4. Ornamental displays; and
5. Any appliance, construction or dredging equipment, boat, boat trailer or related equipment, or any other vehicle with soil attached or carrying plant debris.

Additional weed species are regulated by the federal government and may not be transported without specific permit. The federal noxious weed list may be obtained at the following web site  
<http://www.aphis.usda.gov/ppq/weed/>