

ORIGINAL



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**MesquitePower**  
A SEMPRA ENERGY DEVELOPMENT

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August 6, 2007

Colleen Ryan, Supervisor  
Document Control Center  
Arizona Corporation Commission  
1200 West Washington Street  
Phoenix, Arizona 85007

Arizona Corporation Commission  
**DOCKETED**

AUG - 8 2007

Re: Mesquite Generating Station  
CEC Decision No. 63232  
Docket No. L-00000S-00-0101  
2006 Annual Report

DOCKETED BY	nr
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Dear Ms. Ryan:

On behalf of Mesquite Power, LLC, I am submitting the annual report outlining the status of the Comprehensive Land Management Plan per Stipulation 12 of the Certificate of Environmental Compatibility. Also included is the status of all of the remaining stipulations as agreed to in 2003.

Attached are thirteen copies of the Annual Report for 2006. Please contact me at (623) 386-8520 should you have any questions or need additional information.

Sincerely,

John A. Sowers  
Plant Manager

cc: Mike Gallagher, Sempra Generation  
Marilyn Teague, Sempra Global

DOCKET CONTROL  
AZ CORP COMMISSION

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Certificate of Environmental Compatibility  
2006 Annual Status Report  
Mesquite Power Project  
Docket No. L-00000S-00-0101

Submitted to

Arizona Corporate Commission

by

Mesquite Power, LLC

August 2007

## **Executive Summary**

The Arizona Corporate Commission, on recommendation by the Line Siting Committee, approved a Certificate of Environmental Compatibility (CEC) for the construction of the Mesquite Generating Station, a 1,250-megawatt (MW) natural gas fired, combined cycle power plant. Stipulation 12 of the CEC requires Mesquite Power, LLC to submit an annual report outlining the implementation status of the Comprehensive Land Management Plan that was included with the application for this certificate. In June, 2003, Mesquite Power agreed to voluntarily submit a comprehensive overview of compliance to all the stipulations of the CEC.

The construction of the facility was completed in 2004. Block 1 of the facility was turned over to operations on May 20, 2003 and Block 2 of the facility was turned over to operations on November 12, 2003. Landscaping was started in November 2003 and was completed in Summer 2004. Five (5) permanent production wells supply water to the plant for operations and the revegetation project at the water property.

The status of the implementation of the Comprehensive Land Management Plan is documented in the separate status report included as an attachment to this report.

## List of Attachments

Attachment 1..... Status Report on the Comprehensive Land Management Plan

# Certificate of Environmental Compatibility 2006 Annual Status Report

## 1.0 Introduction

The Arizona Corporate Commission, on recommendation by the Line Siting Committee, approved a Certificate of Environmental Compatibility (CEC) for the construction of the Mesquite Generating Station, a nominal 1,250-megawatt (MW) natural gas fired, combined cycle power plant. Stipulation 12 of the CEC requires Mesquite Power, LLC to submit an annual report outlining the implementation status of the Comprehensive Land Management Plan that was included with the application for this certificate. In June, 2003, Mesquite Power agreed to voluntarily submit a comprehensive overview of compliance to all the stipulations of the CEC.

## 2.0 Compliance with the Stipulations

The following is the status of the project relative to the stipulations from CEC Decision # L-00000S-00-0101.

### **Stipulation 1**

*The applicant and its assignees will comply with all existing applicable air and water pollution control standards and regulations, and with all existing applicable ordinances, master plans and regulations of the State of Arizona, the County of Maricopa, the United States, and any other governmental entities having jurisdiction.*

Mesquite Power is in compliance with all applicable air and water pollution control standards and regulations.

### **Stipulation 2**

*This authorization to construct the Mesquite Project will expire five (5) years from the date the Certificate is approved by the Arizona Corporate Commission ("Commission") unless construction of the Mesquite Project is completed to the point that the Mesquite Project is capable of operating at its rated capacity by that time; provided, however, that prior to such expiration Applicant or its assignee may request that the Arizona Corporation Commission extend this time limitation.*

Both power blocks were operating commercially as of December, 2003. The outstanding construction issues such as fencing, asphalt, and landscaping were completed in Summer, 2004.

**Stipulation 3**

*Applicant shall meet all applicable requirements for groundwater use set forth in the Third Management Plan for the Phoenix Active Management Area existing as of the date Applicant first begins withdrawing groundwater in connection with the Project. Applicant shall limit its aggregate annual withdrawal of groundwater to (i) 7,500 acre feet for the Mesquite Project site, and (ii) such additional volumes available within its Type 1 Groundwater Right as may be needed to implement the portion of the Comprehensive Land Management Plan provided for at Condition 11 (ii) below.*

The five (5) permanent productions wells have been supplying water to the plant for operations and irrigation. The wells were converted to non-exempt wells in an Active Management Area and all reports required by ADWR are current.

The well spacing has resulted in a limitation on the amount of water each well can pump annually as follows:

	<u>Annual Limit</u>	<u>2006 Usage</u>
Well no. 55-587025 (#1)	1,500 acre-feet	<b>1,384</b> acre-feet
Well no. 55-587026 (#2)	1,615 acre-feet	<b>1,309</b> acre-feet
Well no. 55-587021 (#3)	2,150 acre-feet	<b>1,924</b> acre-feet
Well no. 55-587022 (#4)	1,370 acre-feet	<b>1,132</b> acre-feet
Well no. 55-587023 (#5)	1,370 acre-feet	<b>995</b> acre-feet

A total of **6,744 acre-feet** of water was used for the plant therefore not exceeding the 7,500 acre-feet of annual withdrawal allowed. In addition to the plant use, approximately **33** acre-feet of water was used in 2006 for irrigation for the water property revegetation project and maintaining two ponds to be used in a proposed wildlife habitat.

Mesquite Power, LLC continues to submit periodic status reports to the ADWR for the modifications being implemented at Mesquite Generating Station in order to meet the requirements of the 3rd Management Plan of the Phoenix Active Management Area. As the ADWR is aware, groundwater quality issues have restricted the cooling tower cycles of concentration that could be attained with the originally installed equipment. In particular, operational silica levels are substantially higher than the test levels on which the original water treatment system design was based. Since ADWR was initially notified in December 2003, significant progress has been made on researching, testing, and optimizing the strategy to overcome the limitations.

**Stipulation 4**

*Applicant will provide to the Commission, not more than 12 months prior to the commercial operation of the plant, a technical study regarding the sufficiency of transmission capacity from the plant to the wholesale electric market.*

Stipulation requirements met in 2003.

**Stipulation 5**

*The plant interconnection must satisfy the Western Systems Coordinating Council's ("WSCC") single contingency outage criteria (N-1) without reliance on remedial action such as generator unit tripping or load shedding.*

Stipulation requirements met in 2003.

**Stipulation 6**

*Applicant will within fifteen (15) days of reaching such an agreement, submit to the Commission an interconnection agreement with the transmission provider with whom it will be interconnecting.*

Stipulation requirements met in 2003.

**Stipulation 7**

*Applicant or one of its affiliates will become a member of WSCC, or its successor, and file a copy of its WSCC Reliability Criteria Agreement or Reliability Management System (RMS) Generator Agreement with the Commission.*

Stipulation requirements met in 2003.

**Stipulation 8**

*Applicant will use commercially reasonable efforts to become a member of the Southwest Reserve Sharing Group, or its successor, thereby making its units available for reserve sharing purposes, subject to competitive pricing.*

This was provided to the ACC in a letter dated July 11, 2003.

**Stipulation 9**

*Applicant will use low profile structures, moderate stacks, neutral colors, compatible landscaping, and low intensity directed lighting for the plant.*

The plant was designed and constructed using low profile structures, moderate stacks, and neutral colors. The landscaping involved the replanting of many mesquite trees removed from the site during construction. The outdoor lighting was designed and constructed by the engineering, procurement, and construction (EPC) contractor in accordance with Maricopa County and International Dark-Sky Association recommendations. The plant construction is complete and no other lighting is to be installed.

**Stipulation 10**

*Applicant will operate the Project so that during normal operations the Project will not exceed (i) HUD residential noise guidelines or (ii) OSHA worker safety noise standards.*

Noise emissions performance testing was performed on Block 1 on July 9, 2003 and Block 2 on November 10, 2003. To support compliance with OSHA worker noise exposure limits, in-plant sound pressure level measurements were conducted throughout the facility and those areas that experienced sound levels above 85 dBA during normal peak load operation were identified. In addition, A-weighted (L90) sound level measurements were taken at six property boundary locations during simultaneous base load operation of both power blocks.

**Stipulation 11**

*Applicant will implement its Comprehensive Land Management Plan as presented to the Committee in hearing Exhibit A-13 for the plant site and the 3,000 acre Water Property that includes:*

- (i) Installation of a professionally designed landscape plan for the entrance of the facility and along Elliot Road.*
- (ii) Implementation of a comprehensive revegetation program designed to restore portions of the water property with plant communities similar to the adjacent desert lands.*
- (iii) Where feasible, the development of ongoing working relationships with the Phoenix Zoo, Southwest Wildlife Rehabilitation and Educational Foundation, Inc. and Arizona Game and Fish Department to develop alternative land uses for the water property that can be beneficial to the community and consistent with an "open space" land use designation; and*

In 2004, Mesquite Power, LLC evaluated proposals from three consultants for the design and development of an enhanced wildlife habitat consistent with the Comprehensive Land Management Plan. Logan Simpson Design, Inc. of Tempe was selected for project submittal and Mesquite Power has focused efforts with Arizona Game and Fish Department, Wildlife for Tomorrow, the University of Arizona, and Logan Simpson Design in preparing a conceptual design in 2005. Presentation of this design to Maricopa County occurred in 2006 with construction scheduled for 2007.

**Stipulation 12**

*Applicant will submit annual reports (for 10 years) to the Commission setting forth the status of implementation of the Comprehensive Land Management Plan and any feasible alternative land uses which may have been identified and agreed upon by Applicant and the aforesaid organizations. The first annual report shall be filed one year from the date this Certificate is approved by the Commission.*

The status of the implementation of the Comprehensive Land Management Plan is documented in the Status Report on the Comprehensive Land Management Plan provided in **Attachment 1**.

This annual report also voluntarily provides the status of all the stipulations.

# ATTACHMENT 1

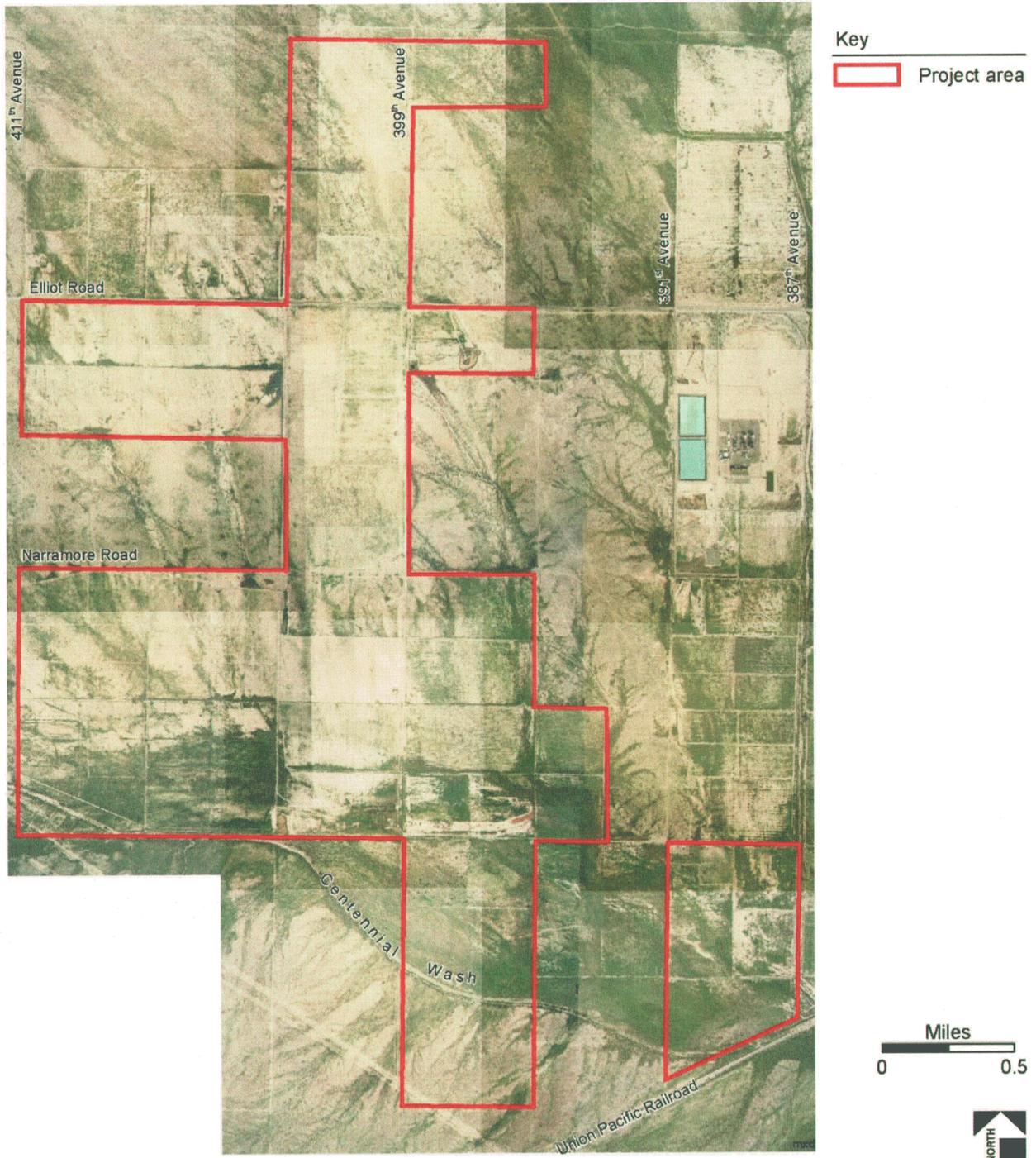
## Status Report on the Comprehensive Land Management Plan

# **Report to the Arizona Corporation Commission on the Mesquite Power/University of Arizona Desert Revegetation Experimental Planting**

Prepared by M.M. Karpiscak and T.M. Bean  
30 January 2007

## **Introduction**

As part of the land management plan for the Mesquite Power Project, in 2001 the University of Arizona began to study the implementation of a comprehensive revegetation program to restore a large portion of the Mesquite Power water property with self-sustaining native plant communities similar to the adjacent, unfarmed desert lands. The primary purpose of the revegetation program is to return these former agricultural lands to beneficial use as open space that will attract wildlife and enhance the surrounding environment. The scope of the project is large: approximately 3,000 acres of retired agricultural land exists on the site, having lain fallow for a period of 10-20 years. These properties were acquired for their water rights and are located about 2 miles west of the Mesquite Power generating facility. The project site is situated within the lower Colorado subdivision of the Sonoran Desert. This portion of the Sonoran Desert is the most arid and therefore the most difficult to revegetate. Revegetation of such harsh environments is a difficult and slow process, but by studying our successes and failures in this project we have an opportunity to improve our success in additional plantings at this location and to establish a sound scientific and practical basis for future revegetation plantings in low desert environments in Arizona and the southwest. An aerial photograph showing an outline of the overall site is presented in Figure 1.



**Figure 1. Aerial Photograph of the Mesquite Power Water Property (Logan Simpson Design Inc.).**

## Background

An estimated 850 square miles of abandoned farmland exists in the Gila and Santa Cruz River Valleys of Arizona (Jackson et al., 1991). Much of this barren land is dominated by exotic annuals such as Russian thistle (*Salsola kali*) and London rocket (*Sisymbrium irio*) (Karpiscak, 1980), existing in stark contrast to native desert lands dominated by creosotebush (*Larrea tridentata*) and saltbush (*Atriplex* spp.). This land is often associated with environmental problems such as dust pollution, a loss of wildlife habitat, accelerated soil erosion and downstream flooding caused by rapid runoff from barren surfaces, Russian thistle blowing onto roadways and adjacent properties, and auto accidents during dust storms. A typical retired farm field in the Sonoran Desert is shown in Figure 2. Until recently, there has been little interest in restoring the lowland scrub that is native to this part of the Sonoran Desert, likely due to a general lack of knowledge about its ecology. Few studies have been done of the lowland desert vegetation, that of Shantz and Piemeisel (1924) to evaluate the soils and vegetation for their agronomic potential and that of Karpiscak (1980) to study the process of secondary succession on abandoned farmland, are the most well known.

The revegetation of former agricultural lands is a complex process involving many challenges and often resulting in limited success. This is in part because the establishment of arid adapted vegetation on reclaimed agricultural lands is an evolving science and there is a general lack of an established proven methodology. Few documented examples exist of attempted revegetation efforts on retired farmland (Jackson *et al.*, 1991; Munda, 1986) and even fewer on a site as large as the project area (Thacker and Cox, 1992). Other concerns include the management of dust and invasive weeds, salt cedar (*Tamarix chinensis*) in particular.



**Figure 2. A typical un-revegetated field prior to planting. This small part of one field was left un-planted to use as a control site to compare to fields that were to be planted. Note the lack of any perennial plant cover in foreground. The March 2002 planting is visible in the background.**

Undisturbed or long-fallowed agricultural soils can develop a physical soil crust that limits the amount of dust that is capable of becoming airborne. Any soil-disturbing event breaks this crust and can increase the potential for dust problems and also provides an establishment site for invasive weeds. If not managed carefully, any irrigation used to establish native species can further aid in the establishment of undesired species. Additionally, new seedlings or transplants of native species can be particularly attractive to wildlife and losses to herbivory should be expected.

## Inventory of Adjacent Unfarmed Areas

The unfarmed areas to the east and west of the site were inventoried by the University of Arizona to provide an estimate of local vegetation parameters. Vegetative density on these areas was estimated at 102 plants per acre and vegetative cover was estimated at four percent using line transects and the nearest individual distance method as described by Barbour *et al.* (1998). Average plant spacings were estimated at 21 feet from any random point to the nearest individual plant. The most abundant species on the adjacent unfarmed lands is creosote bush, which comprises about 60 percent of all plants on the inventoried areas. White bursage (*Ambrosia dumosa*) is the second most abundant species, comprising about 25 percent of all plants on the inventoried areas. Other important species occurring on the adjacent lands include velvet mesquite (*Prosopis velutina*), wolfberry (*Lycium exsertum*), desert saltbush (*Atriplex polycarpa*), diamond cholla (*Opuntia ramosissima*), catclaw acacia (*Acacia greggii*), white ratany (*Krameria grayii*), big galleta (*Pleuraphis rigida*), and fluffgrass (*Dasyochloa pulchella*), among others. Plant species were identified according to Kearney and Peebles (1960).

### 3.0 The "Target" Plant Community

One challenge in revegetation of retired croplands in this region is determining the pre-disturbance (target) plant community. Reliable personal accounts are rare since much of the land was cleared more than 30 years ago, and any aerial photographs are of an inappropriate scale to accurately determine the plant species present. Often, the only clues that remain are the plant communities on lands adjacent to the cropland, although croplands in the Southwest typically are located adjacent to ephemeral watercourses (washes) and are lower in elevation and probably of a slightly different soil type than the areas that remain unfarmed. Early research by Shantz and Piemiesel (1924) in central Arizona supports this observation, stating

that the best lands for agriculture were the desert saltbush-dominated shrub communities adjacent to washes, which transitioned into creosote bush-dominated communities as distance from a wash and elevation increased. As a bet-hedging strategy, we decided to select common species from both communities in composing the species list for our revegetation project efforts.

## **Plant Material Sources**

Unfortunately, many of the native species found in inventory are not yet commercially available. Of those that are, many are not readily available in sufficient quantities for a project of this scale. Special arrangements have been made with large nurseries specializing in desert plants, but orders must be made up to a year in advance. None of the available plant materials are source identified. Some researchers suggest that most desirable plant materials for use in restoration efforts would come from the primary restoration gene pool (Booth and Jones, 2001), which includes those populations that are genetically connected to local populations. Custom seed collection is very expensive and can be an unreliable source of seed during dry years. Others have argued that locally collected plant materials may no longer have an evolutionary advantage for revegetation of highly disturbed sites because current conditions are quite different from those found prior to its being brought into agriculture. In this effort the same plant species as those growing naturally on adjoining sites or in some instances on the revegetation site itself were used in the planting, their origins, however, are from various Arizona locals.

## Initial Plantings 2002

On March 6, 2002, approximately 50 acres of retired farmland was hand-planted using a mixture of 15 species of native shrubs, forbs, and grasses using rose pot transplants (Table 1). Rose pot transplants, measuring 2 x 2 x 3 inches, are commonly sold by wholesale nurseries to retail outlets, where they are then planted into larger size containers and sold to the consumer after a short period of growth. A seed mixture of 12 native species was hand-seeded (Table 1). The entire field was drip irrigated using a system designed after vegetable production in the Yuma area. Planting rates for transplants were 200 plants per acre, or double the vegetation density found on the adjacent unfarmed areas. This was to compensate for the higher mortality of the smaller transplant size. Seed was applied at a rate of 15 lbs per acre to selected areas (a two foot radius around each drip emitter) within a portion of the field. Seed was applied in known amounts and proportions to selected emitters, and this should allow us to estimate germination and establishment rates by species. With this information, we will be better able to predict the expected species composition of a given seed mix under similar field conditions. Some species have much higher survival rates than others, probably reflecting their higher tolerance to being transplanted from such a small container, which may be related to their specific root physiology. Top performers include all *Atriplex* spp. (saltbush species), *Prosopis velutina* (mesquite), *Lycium exsertum* (wolfberry), and *Pleuraphis rigida* (big galleta) (Table 2). Initial germination and establishment of the seeded portions of the field was high, making it difficult to properly inventory the resulting stands. *Atriplex lentiformis* (quail brush), has performed consistently well across all treatments. There was poor establishment of *Larrea tridentata* (creosote bush) from seed and transplants, which is a dominant species in surrounding unfarmed areas.

**Table 1: Rose pot transplants used in the Mesquite Power March 2002 planting.**

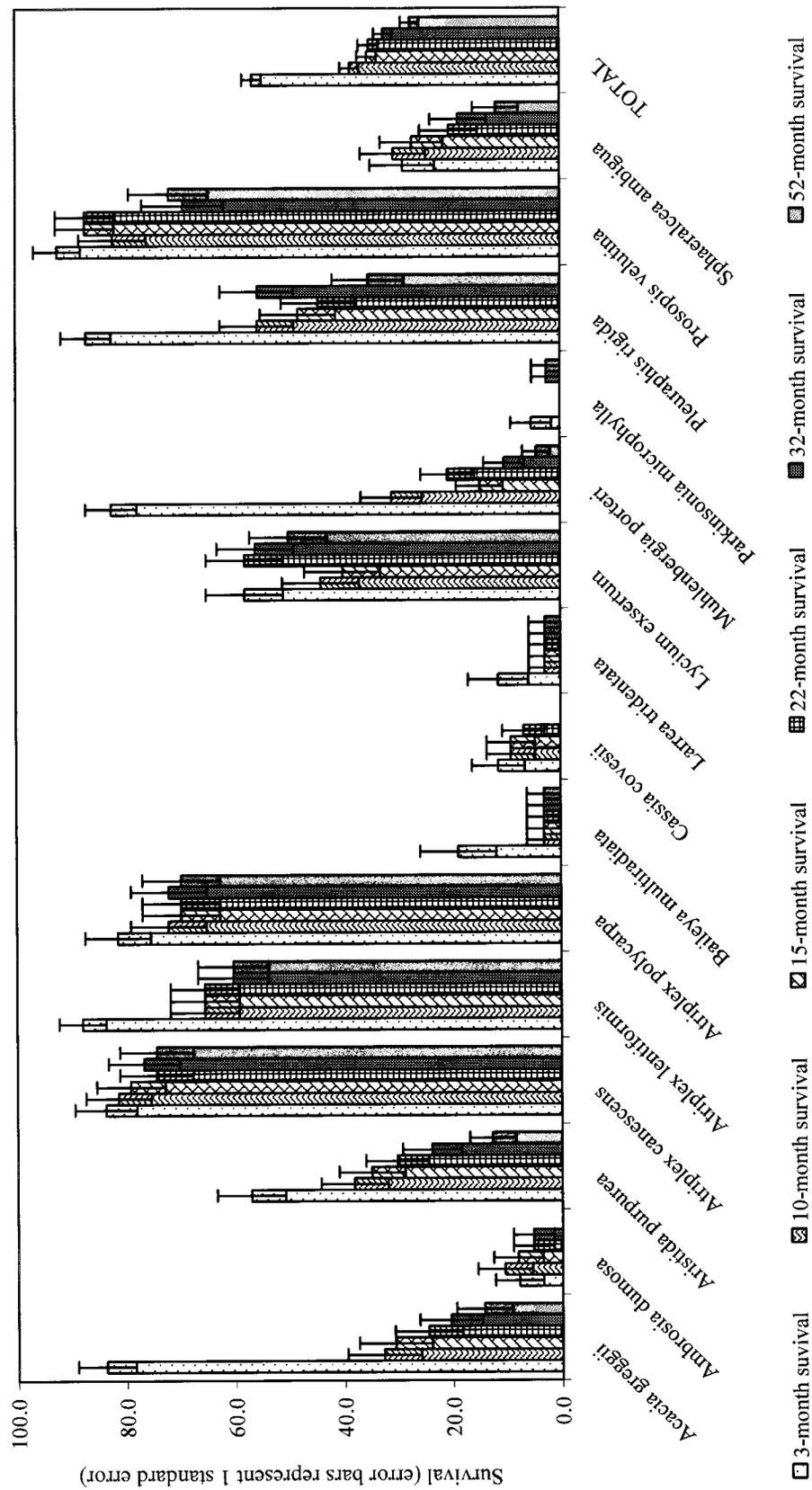
Species	Common name	Transplants: number planted	Seed: grams seeded
<i>Acacia greggii</i>	Catclaw acacia	611	151
<i>Ambrosia dumosa</i>	White bursage	611	234
<i>Aristida purpurea</i>	Purple threeawn	917	378
<i>Atriplex canescens</i>	Fourwing saltbush	611	272
<i>Atriplex lentiformis</i>	Quailbush	611	224
<i>Atriplex polycarpa</i>	Desert saltbush	611	237
<i>Baileya multiradiata</i>	Desert marigold	917	350
<i>Cassia covesii</i>	Desert Senna	917	316
<i>Larrea tridentata</i>	Creosotebush	611	148
<i>Lycium exsertum</i>	Wolfberry	917	Not seeded
<i>Muhlenbergia porteri</i>	Bush Muhly	611	224
<i>Parkinsonia microphylla</i>	Littleleaf paloverde	611	Not seeded
<i>Pleuraphis rigida</i>	Big Galleta	917	Not seeded
<i>Prosopis velutina</i>	Velvet Mesquite	611	154
<i>Sphaeralcea ambigua</i>	Globemallow	617	409
<b>TOTAL</b>		<b>11,000</b>	<b>3,097</b>

**Table 2: Survival of species planted in March 2002 at Mesquite Power after 52 months**

Species	Survival (%)
<i>Acacia greggii</i>	14.3
<i>Ambroisa dumosa</i>	0
<i>Aristida purpurea</i>	12.7
<i>Atriplex canescens</i>	74.4
<i>Atriplex lentiformis</i>	60.3
<i>Atriplex polycarpa</i>	69.8
<i>Baileya multiradiata</i>	3.1
<i>Cassia covesii</i>	0
<i>Larrea tridentata</i>	2.9
<i>Lycium exsertum</i>	50.0
<i>Muhlenbergia porteri</i>	4.4
<i>Parkinsonia microphylla</i>	2.6
<i>Pleuraphis rigida</i>	35.2
<i>Prosopis velutina</i>	71.8
<i>Sphaeralcea ambigua</i>	11.7
AVERAGE	27.4

A late frost was experienced by the plants just prior to planting, and may have increased mortality of certain species, especially *Baileya multiradiata* and *Ambrosia dumosa*. Irrigation was ceased in this field in early spring of 2003, due to the spread of the invasive exotic tree *Tamarix chinensis* (salt cedar), which had become established at more than 30 percent of the emitters in the field. Once irrigation was ceased, no further establishment of *Tamarix* was witnessed, and some of the smaller trees died. Most of the native species planted in this field have not exhibited any signs of drought stress, with the exception of *Atriplex lentiformis*, which was observed to drop leaves during the summer months but later recovered with the onset of cooler temperatures. Many "volunteer" (not intentionally planted) seedlings have been observed-these are most likely the progeny of the transplants. Species that have been particularly successful at reproducing include mesquite, all saltbush species, purple threeawn, big galleta, wolfberry, and desert globemallow. We found an average of at least one volunteer for every 4 emitters surveyed. Trends in species survival over the past 4 years are shown in Figure 3. Although overall survival of planted species continues to be in a slight decline, this is likely an effect of the greater number of short-lived species like the grasses and smaller shrubs that have completed their natural lifecycle but have left offspring behind, as noted above. Survival of the long-lived species like *Atriplex* spp., *Lycium exsertum*, and *Prosopis velutina* has been stable for the past 3 years.

**Figure 3: Survival of species planted from rose pots at Mesquite Power in March 2002**



## **February 2003 Plantings**

Approximately 283 acres were planted with some 60,000 transplants near the end of February 2003. The same methods were employed (drip irrigation, hand planting, rose pot transplants). The species composition remained the same. No seed was used in this planting. Data from the first planting was used to help adjust rates and composition of future seeding mixes, and we hope to incorporate seeding into a future planting. The results from an associated study indicated that larger transplants may be more effective for revegetation than the small rose pot transplants (Bean *et al.* 2004), but data was unavailable until after the order for the smaller transplants had been made. This was not necessarily a problem, as the planting called for double the desired density, so most of the mortality was accounted for. Nonetheless, future plantings will include one-gallon transplants only. Some 1-gallon transplants, however, were available and were planted in selected parts of the field. Results of the planting were satisfactory – creosote bush has done particularly well in this planting (Figure 4). Quantitative data from this planting has not yet been collected because of the rank growth of annual weeds that occurred in 2004 through 2006 (Figure 5). However, now that this growth has largely died off, data collection shall commence in spring 2007.

## **Spring and Fall 2004 Plantings**

A total of 425 acres was scheduled for planting in 2004 using the same mixture of fifteen native species that were transplanted in 2002 (Table 1). The 2004 planting utilized one-gallon size transplants, which was designed to allow us to compare survival between transplants of different container sizes (rose pot vs. one-gallon) on the Sempra Water Property. The planting



**Figure 4: January 2007 view of successful planting made in February 2003. Species like *Atriplex* spp. have done very well from small transplants, but *Larrea tridentata* was planted using larger transplants to ensure sufficient survival, mimicking the plant composition found in nearby undisturbed areas.**

was split between the spring (72 ac) and fall (353 ac) months to compare the differential survival of species planted in different seasons. Seasonal differences in temperatures and animal activity are hypothesized to have significant effects on the survival of the transplants.

We also expected the fall planting to have less germination and establishment of salt cedar because of cooler temperatures, the 2004 planting scheme was designed to allow us to make this



**Figure 5. Photograph Showing Rank Growth of Winter Annual Weeds in 2005 that Prevented Plant Field Counts. This view is of one of the fields planted in 2003.**

comparison. The Fall 2004 plantings, however, were impacted by the very wet Fall and Winter of 2004/2005 and were not completed until the spring of 2005 (Figure 5). As with the February 2003 planting we will now be able to return to the field to quantitatively assess the success of the planting. Qualitatively speaking, this was a successful planting with apparent high survival and establishment of planted species (Figure 6). In addition, a small area of about 40 acres was not planted due to the failure of the irrigation tape that collapsed under the compaction of the soil resulting from the persistent rains that started in October of 2004.



**Figure 6: A representative view of the Fall 2004/Spring 2005 planting taken in early January 2007.**

## **Fall 2005 Plantings**

Plantings for Fall 2005 were scheduled to start in late October 2005 using the same plant palette as was previously used in the Fall 2004/Spring 2005 plantings. All the plants are 1-gallon sized transplants. Table 3 shows the species composition and numbers of transplants to be used in the planting. The area selected to be planted covers some 400 acres just south of Elliot Road and adjoining the planned Education Center development. However, the planting was delayed by a regional shortage of essential irrigation infrastructure components

**Table 3: Occurrence of species planted in Spring 2006 at Mesquite Power.**

Species	Plant Numbers
<i>Acacia greggii</i>	2,243
<i>Ambrosia dumosa</i>	4,486
<i>Aristida purpurea</i>	1,128
<i>Atriplex canescens</i>	4,486
<i>Atriplex lentiformis</i>	1,128
<i>Atriplex polycarpa</i>	10,114
<i>Larrea tridentata</i>	10,107
<i>Lycium exsertum</i>	2,243
<i>Muhlenbergia porteri</i>	1,128
<i>Parkinsonia microphylla</i>	2,243
<i>Pleuraphis rigida</i>	1,128
<i>Prosopis velutina</i>	2,243
<i>Senna covesii</i>	1,128
<b>TOTAL</b>	<b>43,808</b>

caused by the hurricanes that hit the New Orleans region and shut down the resin manufacturing facilities. These components were finally obtained and were installed in early 2006 in preparation for the planting. The planting was completed in the spring of 2006.

## **Fall 2006 Plantings**

Plantings for Fall 2006 were scheduled to start in late October 2006 using the same plant palette as was previously used in the Fall 2004/Spring 2005 and Fall 2005/Spring 2006 plantings. A delay was encountered and because of administrative changes at the company. The actual placement of the plants will take place in early 2007. All the plants are 1-gallon sized transplants. The species composition is the same as shown in Table 3 for the Fall 2005 planting that took place in early 2006. The area selected to be planted covers some 300 acres south of Elliot Road and adjoining the planned Education Center development and the Fall 2005/Spring 2006 planting.

## **Current Status of the Revegetation Program**

A total of approximately 1,200 acres has been revegetated as of the end of 2006 and another 300 acres that was originally scheduled for planting in the Fall of 2006 should be in-place by the end of Spring 2007. This Spring 2007 planting will bring the total planted acreage to about 1,500 acres. The first small experimental planting of 50 acres was made in March 2002, followed by a scaled-up planting of 283 acres in February 2003, and a large-scale implementation planting of 475 acres for Fall 2004/Spring 2005. This in turn was followed an addition 400 acres originally scheduled for the Fall of 2005 that was actual planted in early 2006.

A map showing the locations of individual field plantings, planting dates and the types of plant materials used is presented in Figure 7.

During 2005, the U of A team was able to work with Dr. Raymond M. Turner, a retired Botanist from United States Geological Survey (USGS) in Tucson to establish photography stations on the site to document the long-term vegetational changes. Dr. Turner established 3 photo stations on the property and these were added to the photo collection of the USGS in

2006. This collection contains over 2,000 photographs of the Sonoran Desert some of which have been published in the "Changing Mile" a photographic study that uses matched photographs to evaluate long-term vegetational changes. These sites are in addition to those established by the U of A team specifically for the project.

Excessive growth of annual agricultural weeds is a normal phenomena of recently retired fields, as weed seed banks especially of species such as tumbleweed Russian thistle (*Salsola kali*) can persist for several years. This should be less of a problem in future years as time since last disturbance increases, the soil surface forms a crust and the selected desired plants become fully established. However, the surge in weed growth during 2005 not only delayed and prevented the completion of some of scheduled revegetation activities, it also prevented a quantitative assessment of the success of previously planted fields. The debris from this rank growth continued to make it impossible to survey most sites in 2006. The U of A team was able to make general observations of the status of previous plantings and installed additional project specific photo stations to facilitate the long-term monitoring of the sites, and this information is presented in this report.

Please refer to past reports for additional data and descriptions of previous plantings. The very dry conditions of most of 2006 should provide an excellent opportunity to conduct quantitative assessment of the success of previously planted areas, during the early part of 2007.

Overall the fields that have been planted have shown good establishment of the planted species and there has been observable establishment of additional plants most probably from seed produced by the transplants.

1.1 Map of Revegetation Progress

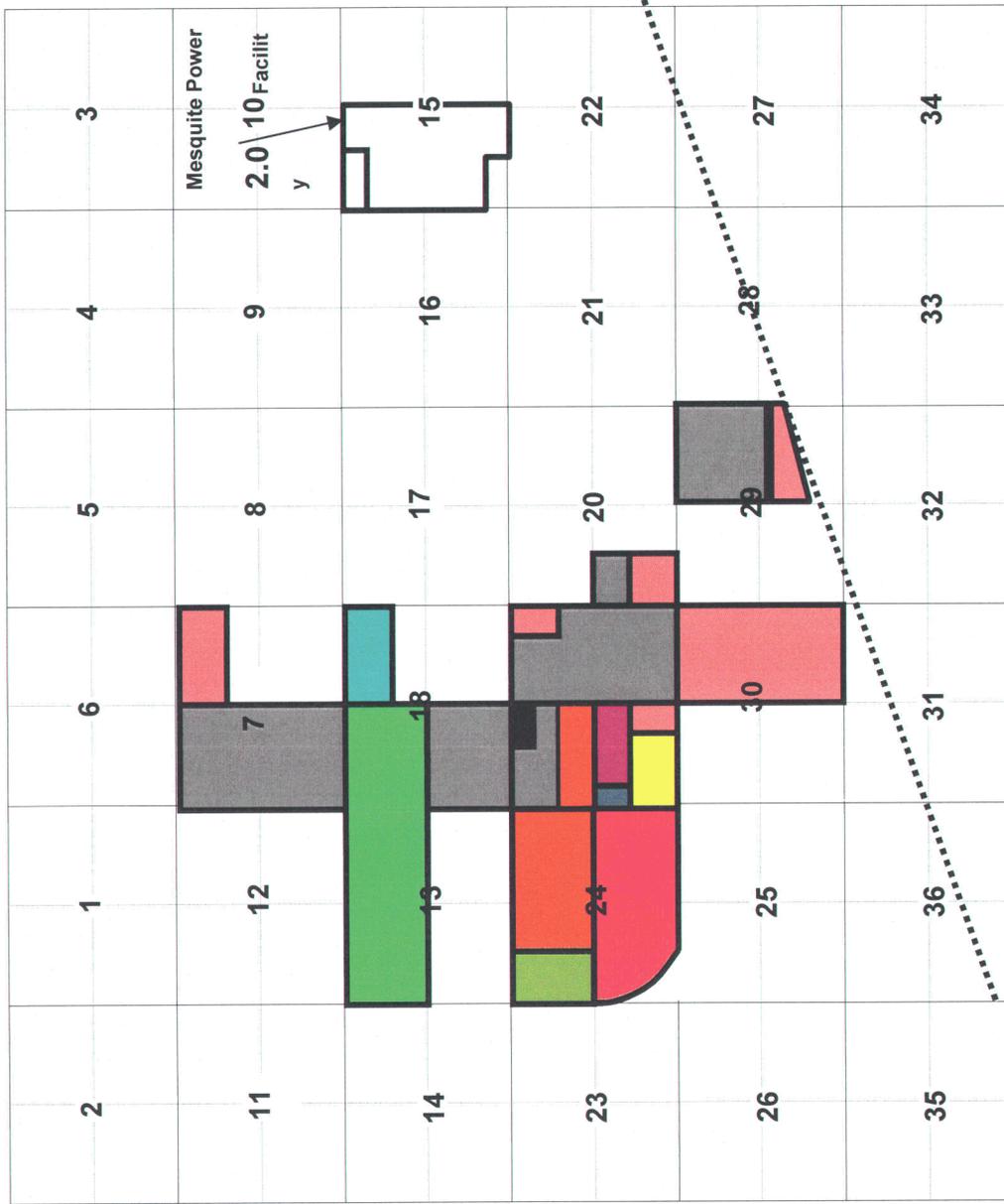
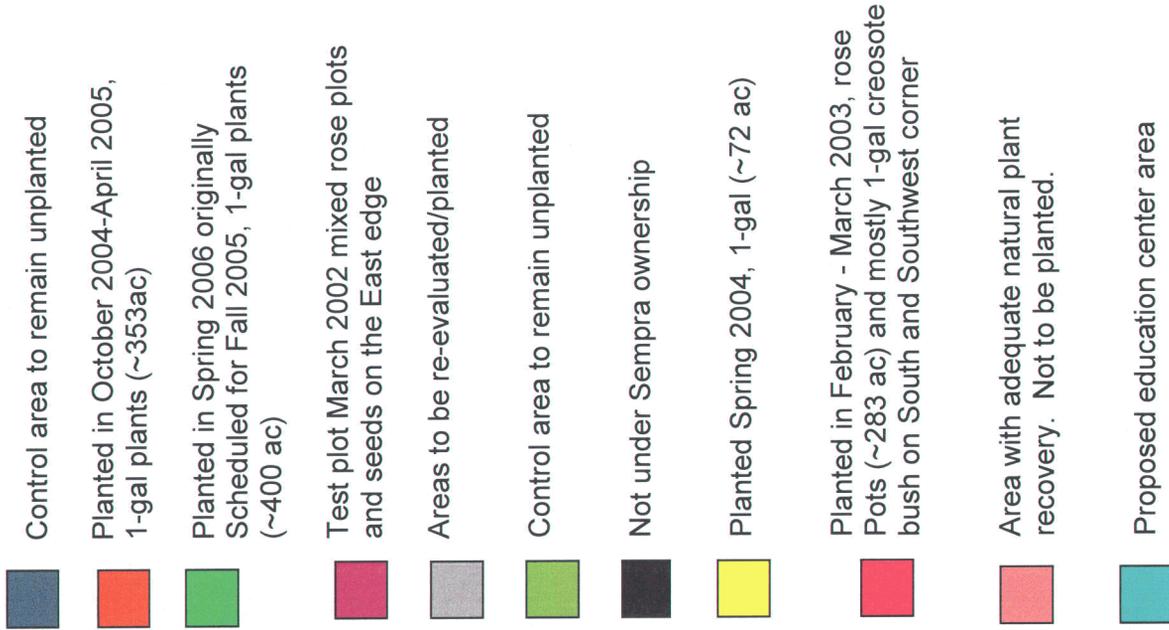


Figure 7. Map showing status of revegetation program at the Mesquite water property.

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