Response to CEC Data Requests Set Three: No. 211

Revised Application for Certification (08-AFC-8)

for

HYDROGEN ENERGY CALIFORNIA

Kern County, California

DOCKET
08-AFC-8
DATE JAN 13 2011
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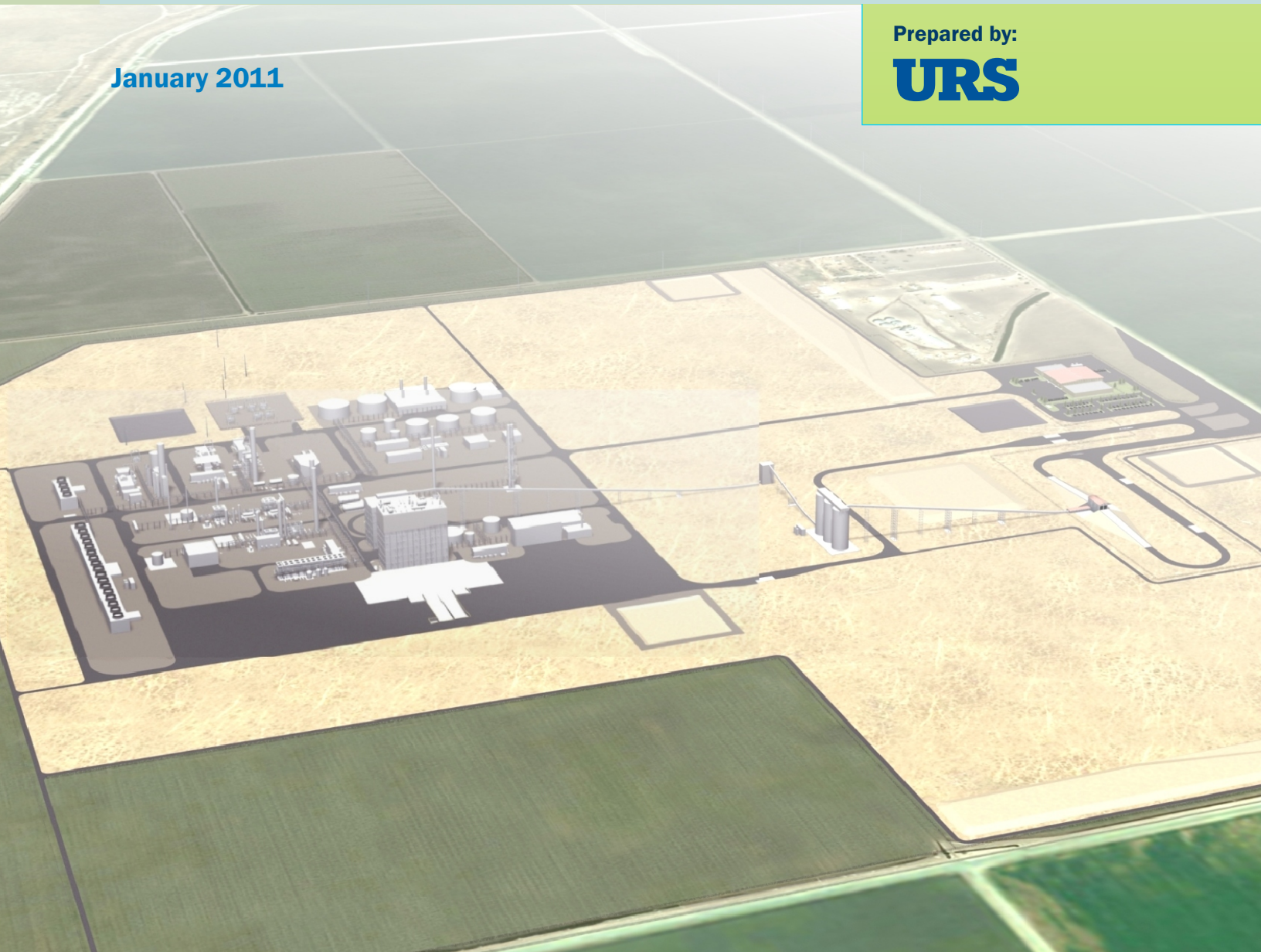
Prepared for:
Hydrogen Energy California LLC

hydrogen energy

Submitted to:
California Energy Commission

Prepared by:
URS

January 2011



Technical Area: Visual Resources
Author: Jeanine Hinde

BACKGROUND

Conceptual On-site Landscaping Plan

The Revised Application for Certification (revised AFC) prepared by the project applicant characterizes visual impact susceptibility and severity as "high" at key observation point (KOP) 1 and identifies a significant impact to visual resources at this location (see Tables 5.11-3 and 5.11-5 and p. 5.11-25 in the revised AFC). The revised AFC for the project includes a visual resources mitigation measure (VRMM-2) recommending preparation of a conceptual landscaping plan that includes on-site plantings to screen views of the project site (see p. 5.11-41 of the revised AFC). The visual resources section of the revised AFC does not provide a conceptual landscaping plan or visual simulations that Energy Commission staff need to assess the adequacy of on-site landscaping to screen views of the project site from KOP 1. Staff has concluded that additional project information is necessary before a significance conclusion can be reached for the impact at KOP 1. The Final Staff Assessment will include an assessment of the effectiveness of proposed on-site landscaping and other proposed conditions of certification to mitigate the impact at KOP 1.

DATA REQUEST

211. Please provide an electronic copy of a conceptual on-site landscaping plan for review by staff. The primary purpose of the plan is to show how landscaping at the project site will contribute to screening views to the maximum extent feasible for the view from KOP 1. Consistency with applicable sections of Chapter 19.86, Landscaping, of the Kern County Zoning Ordinance is required <http://www.co.kern.ca.us/planning/pdfs/ZO/2010_zo_updates.pdf.>). To ensure that the information provided in the on-site landscaping plan will allow for a thorough assessment of this impact, the plan will need to include these elements, at a minimum:

- ***Information on the type of plant species proposed; their size, quantity, and spacing at planting; expected height at 5 years and maturity; and expected growth rates. Staff requires preparation of this information by a qualified professional arborist or botanist familiar with local growing conditions.***
- ***Conceptual planting plan.***
- ***Use of landscaped earthen berms and/or other built screening devices to maximize the effectiveness of landscaping at the site. Electronic copies of 11-inch by 17-inch color photographic simulations at life size scale showing the landscaping 5 years after planting and at maturity from the viewpoint for KOP 1.***

RESPONSE

A conceptual landscape plan has been provided as Attachment 211-1.

ATTACHMENT 211-1

Hydrogen Energy California, Kern County Power Project
Landscape Plan

Date: January 2011

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1.0 General Overview

The San Joaquin Valley is characterized by a Mediterranean climate of mild, rainy winters and hot, dry summers that see no rainfall for several months. The proposed Hydrogen Energy California (HECA) project site is located near the town of Buttonwillow in the Western San Joaquin Valley. The site has saline, alkaline soils typical of the Western San Joaquin Valley. The temperature variations range widely from freezing conditions in the winter to temperatures exceeding 100 degrees Fahrenheit in the summer. The project site is currently surrounded by active agricultural land that focuses on the production of forage crops such as alfalfa.

Plants native to the inland areas of California have adaptations to survive the fluctuating climactic conditions of the projectarea. Some have small leaves, allowing them to lose less water from transpiration. Others go dormant, sometimes even in the summer due to a lack of water, but then come back once favorable weather conditions return. Several plant species can exclude and even remove salts through special adaptations in their roots, stems, and leaves. Wildlife, such as birds and insects, also play a part in sustainable landscapes. They visit the plants during blooming, pollinating flowers and dispersing seeds.

1.1 Landscape Concept

Landscape concept will create an aesthetically pleasing landscape of drought tolerant and native plants which will require minimal supplemental watering and maintenance. The concept will demonstrate compliance with Chapter 19.86, Landscaping, of the Kern County Zoning Ordinance.

All regionally native plants specified shall come from local genetic sources as much as feasible for the project. Other drought tolerant plants specified have been screened against the California Department of Food and Agriculture Noxious Weed List and the California Invasive Plant Council Inventory Database and are not on any of these lists so as to prevent the spread of undesirable, weedy species.

Key landscape design items include the development of layered landscaped buffers and drought tolerant and native plant material used to create a self-sustaining landscape concept.

The following plant composition represents a variety of species that are known to do well in the saline and arid conditions of the Western San Joaquin Valley.

2.0 Landscape Design Elements

2.1 Landscape Vegetated Buffer Strips

Landscape vegetated buffer strips are part of the project drainage system meant to filter and convey clean stormwater to percolation basins. Open area storm water typically flows through the buffer strips and drains to percolation basins strategically located around the site. These buffer strips incorporate a series of elements that can reduce water velocity, associated erosion and filter stormwater particulates. These elements include native grasses and groundcovers, wood mulch, rip-rap, rock, and other landscape treatments.

2.2 Native Grass Seed Mix

Selected native grass seed mix for vegetated buffer strips contains a mix of selected native grasses which grow 6 to 12 inches tall with a root system that penetrates the soil to 3 feet deep. These deep roots stabilize the soil to protect the open areas against erosion.

2.3 Low Growing Groundcovers

Low growing native groundcovers will also be used with the buffer strips to reduce stormwater velocity and filter stormwater particulates and to reduce site erosion. See table 2-1 below for proposed groundcovers.

Table 2-1
Groundcovers

Botanical Name	Common Name
Achillea millefolium	white yarrow
Ambrosia pumila	San Diego ambrosia

2.4 Erosion Controlled Vegetated Open Space Areas

Selected large open areas will be over seeded with a native landscape cover to assist in control of project site dust and erosion. These areas will be initially cleared of trash and debris and overseeded with native seed mix and allowed to return to a natural area requiring little to no long-term maintenance.

2.4.1 Native Vegetated Open Space Seed Mix

Selected areas on the site will be seeded with a native open space seed mix. This mix consists of native bunch grasses that will create a cohesive self-sustaining native vegetative cover which will require minimal to no long-term maintenance. See Table 2-2 below for proposed Open Space Seed Mix species.

Table 2-2
Open Space Mix

Botanical Name	Common Name
Poa secunda	pine bluegrass
Aristida ternipes var. hamulosa	hook three-awn
Lasthenia californica	Goldfields
Lupinus bicolor	pygmy lupine
Elymus elymoides	bottlebrush squirreltail
Castilleja exserta	owls clover
Gilia tricolor	tricolor gilia
Lotus purshianus	purshings lotus

2.4.2 Native Annual Wildflower Mix

Annual wildflowers will be blended into the open space mix areas to provide seasonal color and create a natural aesthetically pleasing open space that blends with the surrounding area. See Table 2-3 below for proposed Native Wildflower Seed Mix species.

Table 2-3
Native Wildflowers Mix

Botanical Name	Common Name
Coreopsis calliopsidea	leafstem tickseed
Nemophila menziesii	baby blue eyes
Eschscholzia californica	California poppy
Gilia capitata	globe gilia
Clarkia elegans/unguiculata	mountain garland
Collinisia heterophylla	Chinese house
Phacelia campanularia	California bluebells

2.5 Trees

Native and drought tolerant trees will be planted to provide visual buffers between the power plant and surrounding properties. These trees are selected to unify the visual buffers with the greater natural landscape of the San Joaquin Valley.

2.6 Visual Screen/Buffer

Large fast growing drought tolerant trees will be planted along portions of the perimeter of the project site to act as a visual buffer between the power plant and the adjacent properties. Buffer trees will also serve as a windbreak to reduce wind erosion and dust movement within and from the site. See Table 2-4 below for proposed Buffer Tree species.

Table 2-4
Buffer Trees

Botanical Name	Common Name
Cupressus arizonica nevadensis	Piute cypress
Pinus brutia	Calabrian pine
Populus fremontii	Fremont cottonwood

2.7 Native Trees

Native trees will be used throughout the site to create a native landscape that will tie into the surrounding landscape. Native trees were specifically selected for their form, color, and accent flowers to provide an aesthetically pleasing landscaping that will change with the project climate seasons. See Table 2-5 below for proposed Native Tree species.

Table 2-5
Native Trees

Botanical Name	Common Name
Chilopsis linearis	desert willow
Prosopis pubescens	screwbean mesquite
Psorothamnus spinosus	smoke tree

2.8 Accent Trees

Accent trees will be added to project entry points and visual focal points to provide visual statement within the project site. Accent trees are selected for their distinct form and/or color to provide dramatic visual accents to the landscape treatments. See Table 2-6 below for proposed Accent Tree species.

Table 2-6
Accent Trees

Botanical Name	Common Name
Chilopsis linearis	desert willow
Cupressus arizonica nevadensis	Piute cypress
Psorothamnus spinosus	smoke tree
Pistachia chinensis	Chinese pistache

2.9 Native/Drought Tolerant Landscape Areas

The Key Landscape concept for the landscape buffer areas is to create a native landscape which will create an aesthetically pleasing landscape which is self-sustaining and provides a visual screening of the interior elements of the power plant from the surrounding areas.

2.10 Landscape Border Plantings

See Table 2-7 below for proposed Landscape Border plant species.

Table 2-7
Plants

Botanical Name	Common Name
Chrysactinia Mexicana	diamantia daisy
Dasylirion wheeleri	blue stool
Fallugia paradoxa	Apache plume
Hesperaloe parviflora	red yucca
Leucophyllum frutescens	cenizo
Opuntia basilaris	beavertail
Opuntia violaceae 'Santa Rita'	purple prickly pear
Sphaeralcea ambigua	globe mallow
Vaquelinia californica	Arizona rosewood

2.11 Project Site and Accent Areas

Project site and specific accent areas will be designed using colorful trees and plants to accent the specific areas and define the space. Also, additional groundcovers and mulches will be added to enhance the landscape design and visual project aesthetics. See Table 2-8 below for proposed Project Site and Accent Area Tree species.

Table 2-8
Project Site and Accent Area Trees

Botanical Name	Common Name
Pistachia chinensis	Chinese pistache
Prosopis pubescens	screwbean mesquite
Psorothamnus spinosus	smoke tree

2.12 Water Conservation Statement

The project site has been designed using native and drought tolerant landscape plant material that is aesthetically pleasing and requires minimal supplemental water until they are established.

Landscape design and irrigation system will be designed using water conservation devices and controllers and installed to meet the California State AB1881 Model Water Efficient Landscape

Ordinance. Landscape water supply will come from existing on site water wells or provided by local water purveyor.

2.13 Stormwater Percolation Basins

The sloping sides of stormwater percolation basins will be seeded using low growing native grasses that will reduce erosion, filter stormwater particulates, and allow for water percolation into the soil substrate. The bottom will be kept clear of vegetation for annual maintenance. See Table 2-9 below for proposed Native Mix species.

Table 2-9
Native Mix

Botanical Name	Common Name
Vulpia microstachys	small fescue
Muhlenbergia microsperma	annual muhly
Leymus triticoides Rio	creeping wildrye
Achillea millefolium	white yarrow
Festuca idahoensis	Idaho fescue
Dactylis glomerata 'Rushmore'	orchard grass

2.14 Landscape Buffer Concept

A landscape buffer has been designed to create an aesthetically pleasing visual landscape and to provide a natural visual buffer for the project site from the surrounding areas. Design elements include earthen landscape berms, large, fast growing screen trees, layered native and drought tolerant landscaping, and perimeter security fencing. The proposed landscaping will create a layered landscape design that provides a mixture of trees and shrubs arranged in a layer format providing foreground, middle ground, and background plantings integrated together to form a natural project screening concept.

2.14.1 Earthen Berms

Large landscape berms ranging from 8 feet to 10 feet in height have been added along portions of the power plant property to provide additional visual screening of the interior of the power plant from the surrounding areas.

2.14.2 Layered Landscaping

Landscape buffer has been designed using a layered landscape concept to create a visually pleasing landscape and also form a dense visual buffer between the project site and surrounding areas.

2.14.3 Fast Growing Trees

Drought tolerant trees were selected for their fast growth rates and screening characteristics to provide a visual buffer between the project site and surrounding areas.

2.14.4 Site Fencing

Project site security perimeter fencing will consist of a chain link fence with 3 strand barbed wire anchored on extension arms. Also, perimeter fencing for the controlled area will consist of a standard chain link fence.

2.15 Inactive Feedstock Storage

This specific area on the project site has been designated to stockpile feedstock material as a backup supply for use only in circumstances where supply sources have been constrained. Feedstock storage material will be covered with a landscape vegetative mat that will prevent erosion and minimize infiltration of stormwater into the pile.

2.16 Planting Legend

See Table 2-10 below for proposed planting species.

Table 2-10
Planting Legend

Botanical Name	Common Name	Size	Quantity	Spacing	Plant Size (at 5 years)	Plant Size (at 15 years)
Trees						
Chilopsis linearis	desert willow	36" box	65	See Plan	15' X 15'	20' X 15'
Cupressus arizonica nevadensis	Piute cypress	48" box	80	See Plan	30' X 20'	40' X 20'
Pinus brutia	Calabrian pine	48" box	85	See Plan	35' X 25'	50' X 30'
Pistachia chinensis	Chinese pistache	36" box	45	See Plan	25' X 20'	40' X 30'
Populus fremontii	Fremont cottonwood	48" box	150	See Plan	50' X 25'	70' X 30'
Prosopis pubescens	screwbean mesquite	36" box	65	See Plan	20' X 20'	25' X 25'
Psorothamnus spinosus	smoke tree	36" box	35	See Plan	15' X 20'	15' X 30'
Shrubs/Perennials						

Table 2-10
Planting Legend

Botanical Name	Common Name	Size	Quantity	Spacing	Plant Size (at 5 years)	Plant Size (at 15 years)
Chrysactinia Mexicana	diamantia daisy	1 gallon	500	3'-0" O.C.	1' X 2'	1' X 2'
Dasylirion wheeleri	blue sotol	1 gallon	150	6'-0" O.C.	4' X 4'	4' X 4'
Fallugia paradoxa	Apache plume	5 gallon	200	4'-0" O.C.	4' X 4'	4' X 4'
Hesperoaloe parviflora	red yucca	5 gallon	200	8'-0" O.C.	4' X 4'	4' X 4'
Leucophyllum frutescens	cenizo	5 gallon	200	8'-0" O.C.	6' X 6'	6' X 6'
Opuntia basilaris	beavertail	Pads	300	24" O.C.	1' X 2'	1' X 2'
Opuntia violaceae 'Santa Rita'	purple prickly pear	Pads	300	24" O.C.	6' X 6'	6' X 6'
Sphaeralcea ambigua	globe mallow	1 gallon	500	4'-0" O.C.	2' X 3'	2' X 3'
Vaquelinia californica	Arizona rosewood	5 gallon	500	20'-0" O.C.	8' X 10'	10' X 15'
Vines						
Vitis girdiana	desert wild grape	5 gallon	75	See Plan	2'	10' X 30'
Groundcovers						
Achillea millefolium	white yarrow	Flats	70 sq. ft.	18" O.C.	2'	18' X 2'
Ambrosia pumila	San Diego ambrosia	Flats	70 sq. ft.	18" O.C.	2'	18' X 2'
Accent Native Grasses						
Achnatherum speciosa	desert needlegrass	1 gallon	200	3'-0" O.C.	3' X 3'	3' X 3'
Aristida purpurea	purple three awn	1 gallon	200	3'-0" O.C.	3' X 3'	3' X 3'
Juncus patens	spreading rush	1 gallon	250	2'-0" O.C.	2' X 2'	2' X 2'
Muhlenbergia rigens	deer grass	1 gallon	200	3'-0" O.C.	3' X 3'	3' X 3'
Poa secunda	pine bluegrass	1 gallon	250	2'-0" O.C.	3' X 3'	3' X 3'

Table 2-10
Planting Legend

Botanical Name	Common Name	Size	Quantity	Spacing	Plant Size (at 5 years)	Plant Size (at 15 years)
Sporobolus airoides	alkali sacaton	1 gallon	250	3'-0" O.C.	3' X 3'	3' X 3'

2.17 Site Area Summary

The site area summary is provided in Table 2-11 below.

Table 2-11
Site Area Summary

Area	Acres
Total Project Area	473
Landscape Entry & Buffer Areas (8.4%)	**40**
Kern County Zoning Ordinance requires 5% of total area to be landscaped	23.65
(Above areas are estimates used for reference for design concept only)	

APPENDIX A

Plant Information

Hydrogen Energy California, Kern County Power Project

Appendix A
Plant Information

January 2011

ACHILLEA MILLEFOLIUM

WHITE YARROW

FAMILY: ASTERACEAE (ASTERS)

ORIGIN: CA NATIVE.

LIFE CYCLE: PERENNIAL RHIZOMATOUS HERB.

DIMENSIONS: 18 INCHES TALL BY 2 FEET WIDE.

SALT TOLERANCE: TOLERANT.

ALKALINE TOLERANCE: TOLERANT.

EXPOSURE: FULL SUN TO PARTIAL SHADE.

USDA HARDINESS ZONE: 3A-9B.

WATER REQUIREMENTS: TWICE A MONTH.

BLOOM TIME: APRIL TO OCTOBER.

ABOVE: Field of white yarrow in full bloom.

RIGHT: White yarrow filling in the gaps between native bunch grasses.

MAINTENANCE: NONE WHEN ESTABLISHED. FUNCTIONS WELL AS A LOW MAINTENANCE GROUNDCOVER. MAIN MAINTENANCE DURING ESTABLISHMENT REQUIRES THE REMOVAL OF WEEDS. MAINTENANCE WILL TAPER OFF ONCE ESTABLISHED.

LANDSCAPE APPLICATIONS: THIS IS A NATIVE RHIZOMATOUS GROUNDCOVER THAT NATURALLY GROWS IN THE ALKALI SINKS THAT WERE COMMON IN THE WESTERN SAN JOAQUIN VALLEY. THE LOW, DENSE COVER PROVIDED BY THIS SPECIES IS IDEAL FOR FILLING IN BETWEEN AND UNDER GRASSES AND SHRUBS WITHIN A LANDSCAPE.

MINIMUM SIZE/MINIMUM SPACING: PLUG/6 INCHES O.C.

OTHER: TOLERANT TO LIGHT FOOT TRAFFIC.

AMBROSIA PUMILA

San Diego Ambrosia

FAMILY: ASTERACEAE (ASTERS)

ORIGIN: CA NATIVE.

LIFE CYCLE: PERENNIAL RHIZOMATOUS HERB.

DIMENSIONS: 18 INCHES TALL BY 2 FEET WIDE.

SALT TOLERANCE: MODERATE.

ALKALINE TOLERANCE: TOLERANT.

EXPOSURE: FULL SUN TO PARTIAL SHADE.

USDA HARDINESS ZONE: 7A-10B.

WATER REQUIREMENTS: TWICE A MONTH.

BLOOM TIME: APRIL TO OCTOBER.

MAINTENANCE: LOW. PERIODIC LIGHT PRUNING TO REMOVE SPENT BLOOMS IF DESIRED FOR AESTHETIC PURPOSES.

ABOVE: San Diego ambrosia forms a dense mat that keeps weedy species from sprouting.

RIGHT: The blooms of San Diego ambrosia are not highly conspicuous.

LANDSCAPE APPLICATIONS: A SPREADING, MAT FORMING GROUNDCOVER THAT CAN COVER A DESIRED AREA WITHIN ONE YEAR. THIS PLANT FORMS DENSE COLONIES THAT SERVE AS AN EFFECTIVE WEED INHIBITOR.

MINIMUM SIZE/MINIMUM SPACING: 4 INCHES (ROSEPOTS)/ 8 INCHES O.C.

OTHER: WELL ADAPTED TO PERIODIC DROUGHTS AND INUNDATIONS. ORIGINALLY A VERNAL POOL PLANT. THIS SPECIES IS CULTIVATED FOR ITS FINE SILVER FOLIAGE.

ARISTIDA PURPUREA

PURPLE THREE AWN

FAMILY: POACEAE (GRASSES)

ORIGIN: CA NATIVE.

LIFE CYCLE: PERENNIAL BUNCH GRASS.

DIMENSIONS: 3 FEET TALL BY 3 FEET WIDE.

SALT TOLERANCE: TOLERANT.

ALKALINE TOLERANCE: TOLERANT.

EXPOSURE: FULL SUN TO PARTIAL SHADE.

USDA HARDINESS ZONE: 8-10.

WATER REQUIREMENTS: ONCE A MONTH.

BLOOM TIME: APRIL TO OCTOBER.

MAINTENANCE: LOW. OCCASIONAL WEEDING DURING ESTABLISHMENT.


(Source: www.flickr.com)

ABOVE: Mature, purple, three awns with ripe seed heads.

RIGHT: The seed heads are the source of this grasses name.


(Source: www.calphotos.com)

LANDSCAPE APPLICATIONS: PURPLE THREE AWN IS A PERENNIAL BUNCH GRASS THAT DOES VERY WELL IN POOR SOILS AND HIGH HEAT. MASSES OF THIS SPECIES CONSISTENTLY DISPLAY PURPLE TONES THROUGH THE YEAR.

MINIMUM SIZE/MINIMUM SPACING: PLUGS/10 INCHES O.C.

OTHER: SELF SEEDS. HIGHLY DROUGHT TOLERANT.

CHILOPSIS LINEARIS

DESERT WILLOW

FAMILY: BIGNONIACEAE (TRUMPETS)

ORIGIN: CA NATIVE.

LIFE CYCLE: DECIDUOUS SHRUB TO SMALL TREE.

DIMENSIONS: 20 FEET TALL BY 15 FEET WIDE.

SALT TOLERANCE: MODERATE.

ALKALINE TOLERANCE: MODERATE.

EXPOSURE: FULL SUN TO PARTIAL SHADE.

USDA HARDINESS ZONE: 8A-9B.

WATER REQUIREMENTS: TWICE A MONTH.

BLOOM TIME: MAY TO SEPTEMBER.

MAINTENANCE: LOW. LIGHT STRUCTURAL PRUNING TO ENCOURAGE APPROPRIATE BRANCHING. WHEN PLANTED.

ABOVE: Mature desert willow in full display.

RIGHT: The blooms of the desert willow come in several color variations.

LANDSCAPE APPLICATIONS: AN ORNAMENTAL SMALL TREE WITH SHOWY BLOOMS DURING THE SUMMER MONTHS. AN IDEAL ACCENT AND MASSING TREE FOR QUICK, SHOWY DISPLAYS.

MINIMUM SIZE/MINIMUM SPACING: SEE LANDSCAPE PLAN.

OTHER: RHIZOMATOUS; FORMS DENSE CLUMPS OVER TIME.

CHRYSACTINIA MEXICANA

DIAMANTIA DAISY

FAMILY: ASTERACEAE (ASTERS)

ORIGIN: DESERT SOUTHWEST.

LIFE CYCLE: EVERGREEN SHRUB.

DIMENSIONS: 1 FEET TALL BY 2 FEET WIDE.

SALT TOLERANCE: TOLERANT.

ALKALINE TOLERANCE: TOLERANT.

EXPOSURE: FULL SUN TO PARTIAL SHADE.

USDA HARDINESS ZONE: 7A-11.

WATER REQUIREMENTS: ONCE A MONTH.

BLOOM TIME: MAY TO SEPTEMBER.

MAINTENANCE: LOW. LIGHT PRUNING TO REMOVE SPENT BLOOMS.

ABOVE: The masses of yellow daisy-like flowers are long-lived.

RIGHT: The diamantia daisy retains a low compact form naturally.

LANDSCAPE APPLICATIONS: DENSE, AROMATIC SHRUB IS AN IDEAL MASSING AND ACCENT PLANT IN XERISCAPE GARDENS. THE FOLIAGE AND BLOOMS ARE AROMATIC AND REQUIRE NO PRUNING TO MAINTAIN FORM.

MINIMUM SIZE/MINIMUM SPACING: 1 GALLON/3 FEET O.C.

OTHER: RHIZOMATOUS; FORMS DENSE CLUMPS OVER TIME.

CUPRESSUS ARIZONICA NEVADENSIS

PIUTE CYPRESS

FAMILY: CUPRESSACEAE (CYPRESSES)

ORIGIN: CA NATIVE (KERN COUNTY).

LIFE CYCLE: EVERGREEN CONIFER.

DIMENSIONS: 40 FEET TALL BY 20 FEET WIDE.

SALT TOLERANCE: MODERATE.

ALKALINE TOLERANCE: TOLERANT.

EXPOSURE: FULL SUN.

USDA HARDINESS ZONE: 5B-11.

WATER REQUIREMENTS: ONCE A MONTH (SUMMER).

BLOOM TIME: N/A.

MAINTENANCE: NONE REQUIRED AFTER ESTABLISHMENT. LIGHT AESTHETIC PRUNING.

LANDSCAPE APPLICATIONS: PIUTE CYPRESSES GROW QUICKLY TO 15 FEET IN THEIR FIRST TWO YEARS. THIS SPECIES CAN BE USED A SCREENS, INFORMAL MASSINGS, AND AS ACCENT TREES. WELL KNOWN FOR ITS SILVER METALLIC BLUE NEEDLES.

MINIMUM SIZE/MINIMUM SPACING: SEE LANDSCAPE PLAN.

OTHER: RHIZOMATOUS; FORMS DENSE CLUMPS OVER TIME.

ABOVE: Mature.

RIGHT: The light blue cones of the Piute cypress become prevalent around July.

DASYLIRION WHEELERI

BLUE SOTOL

FAMILY: RUSCACEAE (RUSCAS).

ORIGIN: DESERT SOUTHWEST.

LIFE CYCLE: EVERGREEN CLUMPING SUCCULENT.

DIMENSIONS: 4 FEET TALL BY 4 FEET WIDE.

SALT TOLERANCE: TOLERANT.

ALKALINE TOLERANCE: TOLERANT.

EXPOSURE: FULL SUN.

USDA HARDINESS ZONE: 8A-11.

WATER REQUIREMENTS: NONE IN SUMMER.

BLOOM TIME: MAY TO NOVEMBER.

MAINTENANCE: NONE REQUIRED AFTER ESTABLISHMENT.

LANDSCAPE APPLICATIONS: THE BLUE SOTOL IS AN IDEAL ACCENT PLANT IN XERISCAPE GARDENS. THE PLANT HAS BEEN USED AS ACCENT MASSSINGS ON SLOPES AND BORDERS ALONG AREAS WITH HIGH REFLECTED HEAT (I.E. PARKING LOTS).

MINIMUM SIZE/MINIMUM SPACING: SEE LANDSCAPE PLAN.

OTHER:DIES AFTER BLOOMING.

(Source: www.flickr.com)

ABOVE: Blooming blue stools have prominent bloom stalks.

RIGHT: The blades of the blue sotol have serrated edges.

(Source: www.deserttropicals.com/gilaflora/plantsale.html.com)

FALLUGIA PARADOXA

APACHE PLUME

FAMILY: ROSACEAE (ROSES).

ORIGIN: CA NATIVE, DESERT SOUTHWEST.

LIFE CYCLE: PERENNIAL EVERGREEN SHRUB.

DIMENSIONS: 4 FEET TALL BY 4 FEET WIDE.

SALT TOLERANCE: MODERATE.

ALKALINE TOLERANCE: TOLERANT.

EXPOSURE: FULL SUN TO PARTIAL SHADE.

USDA HARDINESS ZONE: 5-10.

WATER REQUIREMENTS: ONCE A MONTH.

BLOOM TIME: MAY TO DECEMBER.

MAINTENANCE: LOW. PERIODIC LIGHT STRUCTURAL PRUNING TO MAINTAIN FORM.

ABOVE: Mature Apache plume in full seed plume display.

RIGHT: White blooms of Apache plumes appear in early spring.

LANDSCAPE APPLICATIONS: DENSE MOUNDING SHRUB IDEAL FOR NATURALIZED, LOW WATER AREAS. A GREAT SHRUB TO BE USED FOR BROAD LANDSCAPE APPLICATIONS. HIGHLY DROUGHT TOLERANT ONCE ESTABLISHED. TOLERATES ONLY PERIODIC SUPPLEMENT SUMMER IRRIGATION AND REQUIRES GOOD DRAINAGE.

MINIMUM SIZE/MINIMUM SPACING: SEE LANDSCAPE PLAN.

OTHER: SEEDS ARE SPREAD BY THE WIND. BLOOM TIME IS ADAPTED TO SUMMER MONSOON SYSTEMS TYPICAL THROUGH THE SPECIES RANGE.

HESPERALOE PARVIFLORA

RED YUCCA

FAMILY: AGAVACAE (AGAVES).

ORIGIN: DESERT SOUTHWEST.

LIFE CYCLE: EVERGREEN CLUMPING SUCCULENT.

DIMENSIONS: 4 FEET TALL BY 4 FEET WIDE.

SALT TOLERANCE: TOLERANT.

ALKALINE TOLERANCE: TOLERANT.

EXPOSURE: FULL SUN.

USDA HARDINESS ZONE: 7-10.

WATER REQUIREMENTS: ONCE A MONTH (SUMMER).

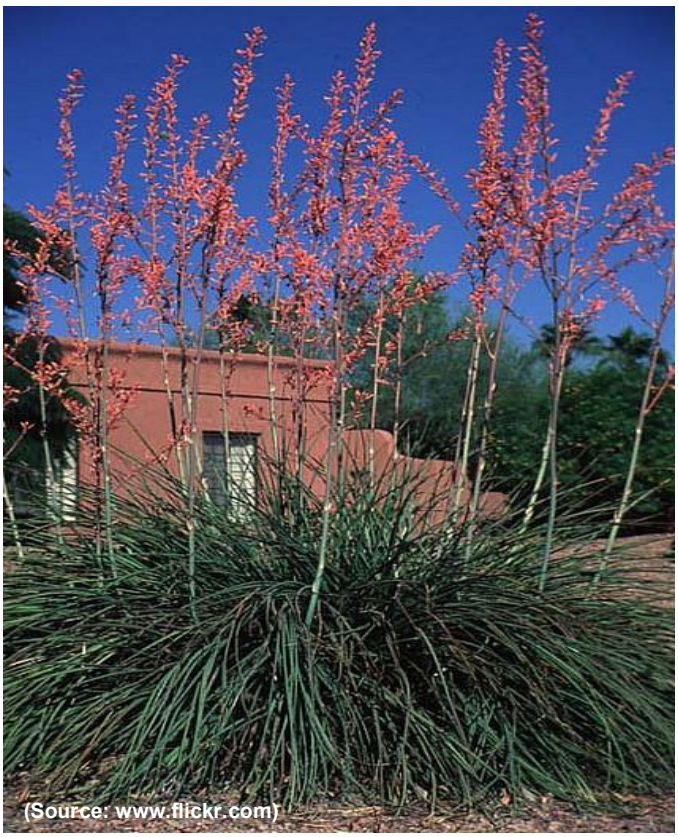
BLOOM TIME: MARCH TO JULY.

MAINTENANCE: LOW. REMOVE SPENT BLOOM STALKS FOR AESTHETIC PURPOSES.

LANDSCAPE APPLICATIONS: DENSE MOUNDING SUCCULENT USEFUL FOR GROUNDCOVERS AND AS ACCENT PLANTS. EXTREMELY HARDY.

MINIMUM SIZE/MINIMUM SPACING: SEE LANDSCAPE PLAN.

OTHER: RHIZOMATOUS; FORMS DENSE CLUMPS OVER TIME.



ABOVE: Mature red yuccas begin to form clumps.

RIGHT: Red tubular blooms of the red yucca appear en masse.

JUNCUS PATENS

SPREADING RUSH

FAMILY: JUNCACEAE (RUSHES)

ORIGIN: CA NATIVE.

LIFE CYCLE: PERENNIAL RUSH.

DIMENSIONS: 2 FEET TALL BY 2 FEET WIDE.

SALT TOLERANCE: TOLERANT.

ALKALINE TOLERANCE: TOLERANT.

EXPOSURE: FULL SUN TO PARTIAL SHADE.

USDA HARDINESS ZONE: 7-10.

WATER REQUIREMENTS: TWICE A MONTH.

BLOOM TIME: MARCH TO JULY.

MAINTENANCE: NONE AFTER ESTABLISHMENT.

ABOVE: Mature spreading rush.

RIGHT: small seedheads of the spreading rush.

LANDSCAPE APPLICATIONS: DENSE, SPREADING RUSH THAT WORK WELL IN BIOSWALES, DRAINAGES, AND OTHER LOW SPOTS. EXCELLENT USE AS A SPECIMEN OR LANDSCAPE MASSING PLANT.

MINIMUM SIZE/MINIMUM SPACING: SEE LANDSCAPE PLAN.

OTHER : RHIZOMATOUS; FORMS DENSE CLUMPS OVER TIME.

LEUCOPHYLLUM FRUTESCENS

CENIZO

FAMILY: SCROPHULARIACEAE (FIGWORTS)

ORIGIN: DESERT SOUTHWEST.

LIFE CYCLE: PERENNIAL EVERGREEN SHRUB.

DIMENSIONS: 6 FEET TALL BY 6 FEET WIDE.

SALT TOLERANCE: TOLERANT.

ALKALINE TOLERANCE: TOLERANT.

EXPOSURE: FULL SUN.

USDA HARDINESS ZONE: 5-10.

WATER REQUIREMENTS: TWICE A MONTH.

BLOOM TIME: MARCH TO APRIL.

MAINTENANCE: LOW. PERIODIC LIGHT STRUCTURAL PRUNING TO MAINTAIN FORM.

ABOVE: Mature Cenizo with blooms.

RIGHT: Individual flowers are small but make up for in mass.

LANDSCAPE APPLICATIONS: DENSE MOUNDING SHRUB IDEAL FOR NATURALIZED, LOW WATER AREAS. A GREAT SHRUB TO BE USED FOR BROAD LANDSCAPE APPLICATIONS. HIGHLY DROUGHT TOLERANT ONCE ESTABLISHED. TOLERATES ONLY PERIODIC SUPPLEMENT SUMMER IRRIGATION AND REQUIRES GOOD DRAINAGE. KNOWN FOR ITS COLOR MASS BLOOMS FROM SPRING INTO FALL.

MINIMUM SIZE/MINIMUM SPACING: SEE LANDSCAPE PLAN.

OTHER: SEVERAL CULTIVARS AVAILABLE.

MUHLENBERGIA RIGENS

DEER GRASS

FAMILY: POACEAE (GRASSES)

ORIGIN: CA NATIVE.

LIFE CYCLE: PERENNIAL BUNCHGRASS.

DIMENSIONS: 3 FEET TALL BY 3 FEET WIDE.

SALT TOLERANCE: MODERATE.

ALKALINE TOLERANCE: TOLERANT.

EXPOSURE: FULL SUN TO PARTIAL SHADE.

USDA HARDINESS ZONE: 8-10.

WATER REQUIREMENTS: TWICE A MONTH.

BLOOM TIME: APRIL TO OCTOBER.

MAINTENANCE: LOW. PERIODIC RAKING TO REMOVE DEAD MATERIAL IF DESIRED FOR AESTHETICS.

ABOVE: Deer grass can completely cover an area when planted closely.

RIGHT: The elongate seed spikes of deer grass are impressive in the wind.

LANDSCAPE APPLICATIONS: A UNIFORMLY DENSE EVERGREEN BUNCH GRASSTHAT DOES WELL IN HIGH HEAT SITUATIONS WITH OCCASIONAL WATERING. THIS SPECIES IS GREAT FOR LANDSCAPE GROUNDCOVERS AND BIOSWALES.

MINIMUM SIZE/MINIMUM SPACING: SEE :LANDSCAPE PLAN.

OTHER: RHIZOMATOUS; FORMS DENSE CLUMPS OVER TIME.

OPUNTIA BASILARIS

BEAVERTAIL CACTUS

FAMILY: CACTACEAE (CACTUS)

ORIGIN: CA NATIVE.

LIFE CYCLE: EVERGREEN SUCCULENT.

DIMENSIONS: 1 FEET TALL BY 2 FEET WIDE.

SALT TOLERANCE: TOLERANT.

ALKALINE TOLERANCE: TOLERANT.

EXPOSURE: FULL SUN TO PARTIAL SHADE.

USDA HARDINESS ZONE: 5-11.

WATER REQUIREMENTS: NONE TO ONCE A MONTH.

BLOOM TIME: MAY TO DECEMBER.

MAINTENANCE: NONE.

LANDSCAPE APPLICATIONS: AN EXTREMELY LOW MAINTENANCE.

MINIMUM SIZE/MINIMUM SPACING: SEE LANDSCAPE PLAN.

OTHER: FORMS EXTENSIVE LOW CLUMPS.

ABOVE: Mature beaver tail cactus in full bloom.

RIGHT: Pink blooms of beavertail appear in spring.

OPUNTIA VIOLACEAE 'SANTA RITA'

PURPLE PRICKLY PEAR


(Source: www.flickr.com)

FAMILY: CACTACEAE (CACTUS)

ORIGIN: DESERT SOUTHWEST.

LIFE CYCLE: PERENNIAL EVERGREEN SUCCULENT.

DIMENSIONS: 6 FEET TALL BY 6 FEET WIDE.

SALT TOLERANCE: TOLERANT.

ALKALINE TOLERANCE: TOLERANT.

EXPOSURE: FULL SUN TO PARTIAL SHADE.

USDA HARDINESS ZONE: 5-11.

WATER REQUIREMENTS: None to ONCE A MONTH.

BLOOM TIME: MAY TO AUGUST.

MAINTENANCE: LOW. PERIODIC REMOVAL OF PADS TO FORM PLANT SIZE.

ABOVE: The pads of the purple prickly pear become more intense with cool weather.

RIGHT: Yellow blooms begin early spring.


(Source: www.davesgarden.com)

LANDSCAPE APPLICATIONS: A DENSE, COLORFUL SUCCULENT CACTUS THAT CAN BE USED AS BOTH AN ACCENT PLANT AS WELL AS A LANDSCAPE GROUNDCOVER. GREAT FOR SECURITY PLANTINGS.

MINIMUM SIZE/MINIMUM SPACING: SEE LANDSCAPE PLAN.

OTHER: PADS EASILY FORM NEW PLANTS.

PINUS BRUTIA

CALABRIAN PINE

FAMILY: PINACEAE (PINES)

ORIGIN: TURKEY.

LIFE CYCLE: EVERGREEN CONIFER.

DIMENSIONS: 50 FEET TALL BY 30 FEET WIDE.

SALT TOLERANCE: TOLERANT.

ALKALINE TOLERANCE: TOLERANT.

EXPOSURE: FULL SUN.

USDA HARDINESS ZONE: 5B-11.

WATER REQUIREMENTS: TWICE A MONTH.

BLOOM TIME: N/A.

MAINTENANCE: LOW. PERIODIC STRUCTURAL PRUNING TO MAINTAIN OPTIMUM SCAFFOLD STRENGTH.

LANDSCAPE APPLICATIONS: AN EVERGREEN CONIFER WELL ADAPTED TO POOR SOILS AND HIGH SUMMER TEMPERATURES. DOES WELL AS A SCREENING TREE, PARKING MEDIAN TREE, AND AS A QUICK GROWING WINDBREAK.

MINIMUM SIZE/MINIMUM SPACING: SEE LANDSCAPE PLAN.

OTHER: RESISTANT TO HIGH LEVELS OF SODIUM.

ABOVE: Mature Calabrian pine.

RIGHT: Cones appear on mature trees in late fall.

PISTACHIA CHINENSIS

CHINESE PISTACHE

FAMILY: ANACARDIACEAE (SUMACS)

ORIGIN: CHINA.

LIFE CYCLE: DECIDUOUS TREE.

DIMENSIONS: 40 FEET TALL BY 30 FEET WIDE.

SALT TOLERANCE: MODERATE.

ALKALINE TOLERANCE: TOLERANT.

EXPOSURE: FULL SUN.

USDA HARDINESS ZONE: 5B-11.

WATER REQUIREMENTS: ONCE A MONTH.

BLOOM TIME: DECEMBER TO JANUARY.

MAINTENANCE: LOW. PERIODIC STRUCTURAL PRUNING TO MAINTAIN GOOD BRANCHING STRUCTURE.

ABOVE: Fall foliage of the Chinese pistache.

RIGHT: Chinese pistache consistently show fall colors in southern California.

LANDSCAPE APPLICATIONS: AN OVAL SHADE TREE WHICH IS TOLERANT TO EXTREMES IN SOIL COMPOSITION AND WEATHER CONDITIONS. GOOD FOR SCREENING AND AS AN ACCENT TREE WITH DRAMATIC FALL COLORS.

MINIMUM SIZE/MINIMUM SPACING: SEE LANDSCAPE PLAN.

OTHER: STRONG ROOT SYSTEM MAKES IT RESISTANT TO HIGH WINDS.

POPULUS FREMONTII

FREMONT COTTONWOOD

FAMILY: SALICIACEAE (WILLOWS)

ORIGIN: CA NATIVE.

LIFE CYCLE: DECIDUOUS TREE.

DIMENSIONS: 70 FEET TALL BY 30 FEET WIDE.

SALT TOLERANCE: MODERATE.

ALKALINE TOLERANCE: MODERATE.

EXPOSURE: FULL SUN.

USDA HARDINESS ZONE: 5B-11.

WATER REQUIREMENTS: TWICE A MONTH.

BLOOM TIME: JANUARY TO FEBRUARY.

MAINTENANCE: LOW. PERIODIC STRUCTURAL PRUNING TO PROMOTE GOOD STRUCTURE.

ABOVE: Mature Fremont cottonwood.

RIGHT: Leaves of Fremont cottonwoods are highly efficient photosynthesizers.

LANDSCAPE APPLICATIONS: AN EXTREMELY FAST GROWING TREE WHICH IS USEFUL AS SCREENS, ALONG SWALES, AND AS SHADE TREES. THIS TREE HAS THE POTENTIAL TO GROW 30 FEET IN ITS FIRST YEAR (HTTP://WWW.WILDFLOWER.ORG/PLANTS/RESULT.PHP?ID_PLANT=POFR2).

MINIMUM SIZE/MINIMUM SPACING: SEE LANDSCAPE PLAN.

OTHER: RELATIVELY DROUGHT TOLERANT ONCE ESTABLISHED.

PROSOPIS PUBESCENS

SCREWBEAN MESQUITE

FAMILY: FABACEAE (LEGUMES)

ORIGIN: CA NATIVE.

LIFE CYCLE: DECIDUOUS TREE.

DIMENSIONS: 25 FEET TALL BY 25 FEET WIDE.

SALT TOLERANCE: HIGHLY TOLERANT.

ALKALINE TOLERANCE: HIGHLY TOLERANT.

EXPOSURE: FULL SUN.

USDA HARDINESS ZONE: 7-10.

WATER REQUIREMENTS: ONCE A MONTH.

BLOOM TIME: JULY TO AUGUST.

MAINTENANCE: LOW. PERIODIC LIGHT STRUCTURAL PRUNING TO MAINTAIN FORM.

ABOVE: Mature Apache plume in full seed plume display.

RIGHT: White blooms of Apache plumes appear in early spring.

LANDSCAPE APPLICATIONS: A TOUGH LANDSCAPING TREE USEFUL FOR PARKING MEDIANS, SWALES, ALLEES, AND NATURALIZED LANDSCAPES. IT CONSISTENTLY PROVIDES QUALITY SHADE DURING THE SUMMER MONTHS.

MINIMUM SIZE/MINIMUM SPACING: SEE LANDSCAPE PLAN.

OTHER: INFREQUENT, DEEP WATERS AT THE DRIPLINE OF THE TREE WILL ENCOURAGE A WELL DEVELOPED ROOT SYSTEM RATHER THAN TOP HEAVY GROWTH. THE CENTRAL TAPROOT OF THIS SPECIES CAN DESCEND OVER 50 FEET TO FIND GROUNDWATER.

PSOROTHAMNUS SPINOSUS

SMOKE TREE

FAMILY: FABACEAE (LEGUMES)

ORIGIN: CA NATIVE.

LIFE CYCLE: DECIDUOUS TREE.

DIMENSIONS: 15 FEET TALL BY 30 FEET WIDE.

SALT TOLERANCE: TOLERANT.

ALKALINE TOLERANCE: TOLERANT.

EXPOSURE: FULL SUN.

USDA HARDINESS ZONE: 7-10.

WATER REQUIREMENTS: ONCE A MONTH.

BLOOM TIME: JUNE.

MAINTENANCE: LOW. PERIODIC LIGHT STRUCTURAL PRUNING TO MAINTAIN FORM.

ABOVE: Mature smoke tree in full bloom.

RIGHT: The fragrant blooms of smoke trees can be detected for a half a mile in the summer.

LANDSCAPE APPLICATIONS: A SMALL TREE WITH LIGHT SILVER FOLIAGE IDEAL FOR XERISCAPE LANDSCAPES. DOES WELL AS AN ACCENT TREE, ALONG THE EDGES OF SWALES, AND IN FORMAL ALLEES. THE TREE TOLERATES PERIODIC INUNDATION AND LONG PERIODS OF DROUGHT.

MINIMUM SIZE/MINIMUM SPACING: SEE LANDSCAPE PLAN.

OTHER: DECLINES WITH REGULAR IRRIGATION AND FERTILIZATION.

SPHAERALCEA AMBIGUA

GLOBE MALLOW

FAMILY: MALVACEAE (MALLOWS)

ORIGIN: CA NATIVE.

LIFE CYCLE: PERENNIAL SUBSHRUB.

DIMENSIONS: 2 FEET TALL BY 3 FEET WIDE.

SALT TOLERANCE: TOLERANT.

ALKALINE TOLERANCE: TOLERANT.

EXPOSURE: FULL SUN.

USDA HARDINESS ZONE: 9-10.

WATER REQUIREMENTS: ONCE MONTH IN WINTER AND EARLY SPRING.

BLOOM TIME: MARCH TO AUGUST.

MAINTENANCE: LOW. PERIODIC PRUNING TO ENCOURAGE NEW GROWTH.

ABOVE: Mature globe mallow in full bloom.

RIGHT: The orange blooms of globe mallows are relatively long lived.

LANDSCAPE APPLICATIONS: A PERENNIAL, DROUGHT TOLERANT SUBSRHUB THAT PRODUCES RELIABLE MASS BLOOMS THROUGH THE SPRING AND SUMMER. THE GLOBE MALLOW IS A GOOD PLANT FOR MASS PLANTINGS IN DROUGHT TOLERANT LANDSCAPES. GREAT TO MIX IN WITH NATIVE BUNCH GRASSES AND SUCCULENTS.

MINIMUM SIZE/MINIMUM SPACING: SEE LANDSCAPE PLAN.

OTHER: NATURALIZES EASILY IN CONDUCIVE CONDITIONS.

SPOROBOLUS AIROIDES

ALKALI SACATON

FAMILY: POACEAE (GRASSES)

ORIGIN: CA NATIVE.

LIFE CYCLE: PERENNIAL BUNCH GRASS.

DIMENSIONS: 3 FEET TALL BY 3 FEET WIDE.

SALT TOLERANCE: HIGHLY TOLERANT.

ALKALINE TOLERANCE: HIGHLY TOLERANT.

EXPOSURE: FULL SUN..

USDA HARDINESS ZONE: 9-10

WATER REQUIREMENTS: TWICE A MONTH.

BLOOM TIME: APRIL TO OCTOBER.

MAINTENANCE: LOW. OCCASIONAL DE-THATCHING MAY BE PERFORMED EVERY FEW YEARS.

ABOVE: Alkali sacaton can be used to cover large natural areas.

RIGHT: Alkali sacaton can be used as accent plants.

LANDSCAPE APPLICATIONS: ALKALI SACATON IS A NATIVE PERENNIAL BUNCHGRASS WELL ADAPTED TO THE CLIMATE AND SOILS OF SAN JOAQUIN VALLEY. THIS GRASS IS HIGHLY TOLERANT OF ALKALINITY AND CONCENTRATED MINERALS AND SALTS. IT IS USEFUL IN BIOSWALES, TREATMENT WETLANDS, AND AS BOTH A GROUNDCOVER AND AN ACCENT PLANT.

MINIMUM SIZE/MINIMUM SPACING: SEE LANDSCAPE PLAN.

OTHER: CAN HANDLE ELEVATED CONCENTRATIONS OF BORON, SELENIUM, AND SODIUM THAT FEW OTHER PLANTS CAN TOLERATE.

VAQUELINIA CALIFORNICA

ARIZONA ROSEWOOD

FAMILY: ROSACEAE (ROSES)

ORIGIN: DESERT SOUTHWEST.

LIFE CYCLE: PERENNIAL EVERGREEN SHRUB.

DIMENSIONS: 10 FEET TALL BY 15 FEET WIDE.

SALT TOLERANCE: MODERATE.

ALKALINE TOLERANCE: TOLERANT.

EXPOSURE: FULL SUN TO PARTIAL SHADE.

USDA HARDINESS ZONE: 7-10.

WATER REQUIREMENTS: ONCE A MONTH.

BLOOM TIME: MAY TO JULY.

MAINTENANCE: LOW. PERIODIC LIGHT PRUNING TO MAINTAIN FORM.


(Source: www.flickr.com)

ABOVE: Mature Arizona rosewood in full bloom.

RIGHT: The white blooms of Arizona rosewood peak in June.


(Source: www.flickr.com)

LANDSCAPE APPLICATIONS: A DENSE EVERGREEN SHRUB THAT CAN BE USED AS A NON-TOXIC REPLACEMENT FOR OLEANDER (*NERIUM OLEANDER*). IDEAL FOR SCREENS, MASS LANDSCAPING, AND HEDGES.

MINIMUM SIZE/MINIMUM SPACING: SEE LANDSCAPE PLAN.

OTHER: LEAVES ARE NATURALLY GLOSSY GREEN.

VITIS GIRDIANA

DESERT WILD GRAPE

FAMILY: VITACEAE (GRAPES)

ORIGIN: CA NATIVE.

LIFE CYCLE: DECIDUOUS TENDRIL VINE.

DIMENSIONS: 10 FEET TALL BY 30 FEET WIDE.

SALT TOLERANCE: TOLERANT.

ALKALINE TOLERANCE: TOLERANT.

EXPOSURE: FULL SUN TO PARTIAL SHADE.

USDA HARDINESS ZONE: 5-10.

WATER REQUIREMENTS: TWICE A MONTH.

BLOOM TIME: MARCH TO APRIL.

MAINTENANCE: LOW. PERIODIC THINNING TO INFLUENCE HEIGHT AND/OR GROWTH DIRECTION.

LANDSCAPE APPLICATIONS: A LARGE DECIDUOUS VINE THAT ATTACHES TO SURFACES WITH TENDRILS. THE DESERT WILD GRAPE IS TOLERANT TO HEAT, COLD, AND ALKALINE SOILS. WITH OCCASIONAL WATERING, DESERT WILD GRAPES CAN FILL A DESIRED AREA WITHIN TWO GROWING SEASONS. A PERFECT VINE TO SCREEN FENCES AND WALLS. DESERT WILD GRAPES CAN BE USED AS A TRAILING GROUNDCOVER.


(Source: www.laspilitas.com)

ABOVE: Mature Apache plume in full seed plume display.

RIGHT: Desert wild grape leaf.


(Source: www.calphotos.com)

MINIMUM SIZE/MINIMUM SPACING: SEE LANDSCAPE PLAN.

OTHER: EDIBLE PURPLE GRAPES FROM JULY TO SEPTEMBER.

APPENDIX B

Landscape Concept Plan
Landscape Planting Concept
Landscape Visual Simulations

Landscape Concept

Landscape concept will create an aesthetically pleasing landscape of drought tolerant and native plants which will require minimal supplemental watering and maintenance.

Key landscape items include development of layered landscaped buffers and drought tolerant and native plant material used to create a self-sustaining landscape concept.

Landscape Vegetated Buffer Strip

Landscape vegetated buffer strip are part of the project drainage system meant to filter and convey clean stormwater to percolation basins. Open area stormwater typically sheet flows through the buffer strip and drains to percolation basins strategically located around the site. These buffer strips incorporate a series of elements that can reduce water velocity, associated erosion and filter storm water particulates. These elements include native grasses and groundcovers, wood mulch, rip-rap, rock and other landscape treatments.

Native Grass Seed Mix

Selected native grass seed mix for vegetated buffer strips contains a mix of selected native grasses which grow 6 to 12 inches tall with a root system that penetrates the soil to 3 feet deep. These deep roots stabilize the soil to protect the open areas against erosion.

Low Growing Groundcovers

Low growing native groundcovers will also be used with the buffer strips to reduce stormwater velocity and filter storm water particulates and to reduce site erosion. See below for proposed low growing groundcover species.

Ground Covers

Botanical Name	Common Name
Achillea millefolium	White yarrow
Ambrosia pumila	San Diego ambrosia

Erosion Controlled Vegetated Open Space Areas

Selected large open space areas will be over seeded with a native landscape cover to assist in control project site dust and erosion. These areas will be initially cleared of trash and debris and overseeded with native seed mix and allowed to return to a natural area requiring little to no long term maintenance.

Native Vegetated Open Space Seed Mix

Selected areas on the site will be seeded with native open space seed mix. This mix consists of native bunch grasses which will create cohesive self-sustaining native vegetative cover which will require minimal to no long-term maintenance. See below for proposed native vegetated open space seed mix species.

Open Space Mix

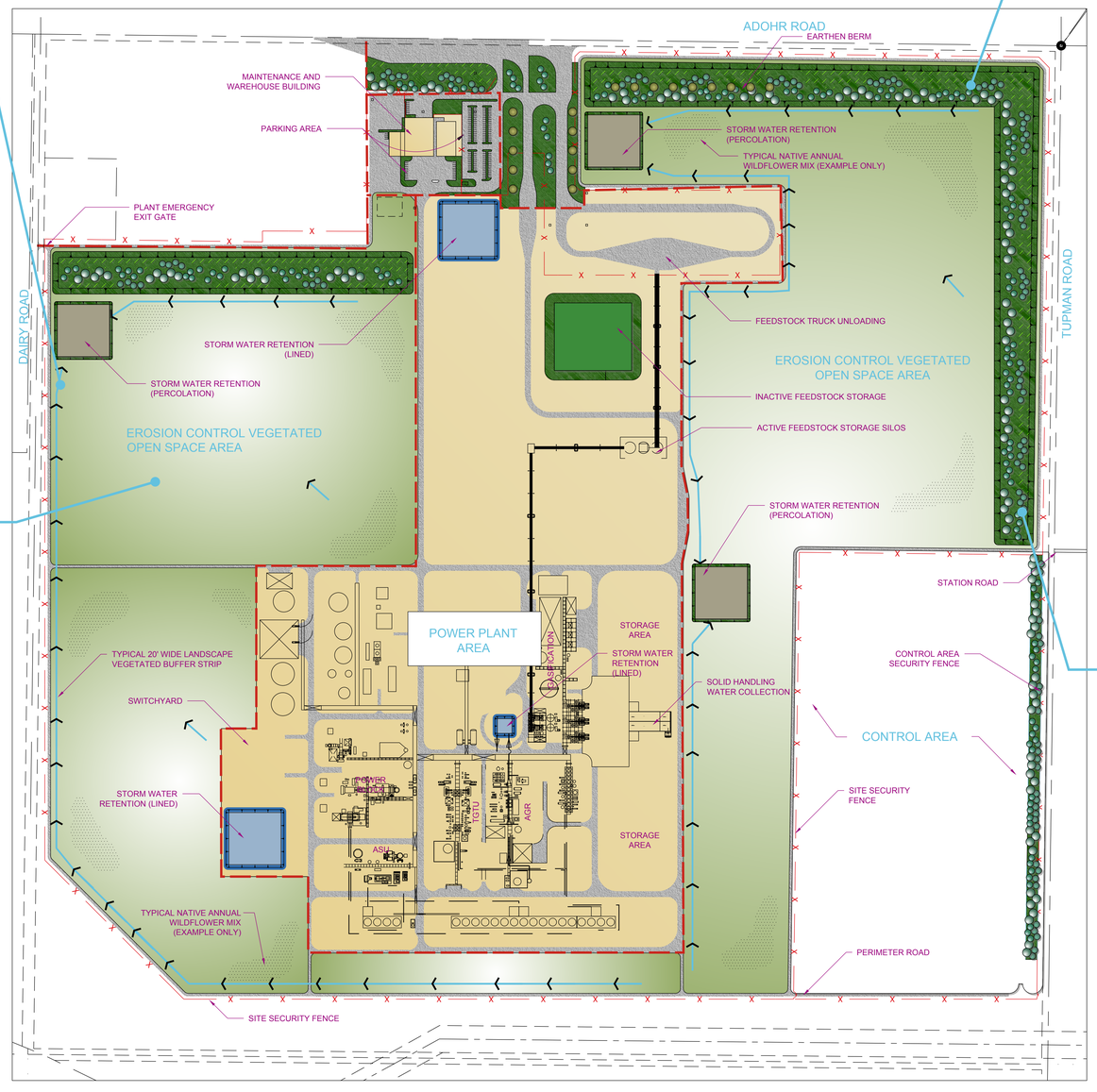
Botanical Name	Common Name
Poa secunda	Pine bluegrass
Aristida ternipes var. hamulosa	Hook three-awn
Lasthenia californica	Goldfields
Lupinus bicolor	Pygmy lupine
Elymus elymoides	Bottlebrush squirreltail
Castilleja exserta	Owls clover
Gilia tricolor	Tricolor gilia
Lotus purshianus	Purshings lotus

Native Annual Wildflower Mix

Annual wildflowers will be blended into the open space mix areas to provide seasonal color and create a natural aesthetically pleasing open space that blends with the surrounding area. See below for native annual wildflower mix species.

Native Wildflowers Mix

Botanical Name	Common Name
Coreopsis calliopsidea	Leafstem tickseed
Nemophila menziesii	Baby blue eyes
Eschscholzia californica	California poppy
Gilia capitata	Globe gilia
Clarkia elegans/unguiculata	Mountain garland
Collinsia heterophylla	Chinese house
Phacelia campanularia	California blubells



Note: Landscape concepts are conceptual and depict basic landscape design intent only. Final landscape planting type and quantities may change at final design.

Trees

Native and drought tolerant trees will be planted to provide visual buffers between the power plant and surrounding properties. These trees are selected to unify the visual buffers with the greater natural landscape of the San Joaquin Valley.

Visual Screen/Buffer

Large fast growing drought tolerant trees will be planted along portions of the perimeter of the project site to act as a visual buffer between the power plant and the adjacent properties. Buffer trees will also serve as a windbreak to reduce wind erosion and dust movement within and from the site. See below for proposed landscape buffer tree species.

Trees

Botanical Name	Common Name
Cupressus arizonica nevadensis	Piute cypress
Pinus brutia	Calabrian pine
Populus fremontii	Fremont cottonwood

Native Trees

Native trees will be used throughout the site to create a native landscape that will tie into the surrounding landscape. Native trees were specifically selected for their form, color and accent flowers to provide an aesthetically pleasing landscaping that will change with the seasons. See below for proposed native tree species.

Trees

Botanical Name	Common Name
Chilopsis linearis	Desert willow
Prosopis pubescens	Screwbean mesquite
Psorothamnus spinosus	Smoke tree

Accent Trees

Accent trees will be added to project entry points and visual focal points to provide visual statement within the project site. Accent trees are selected for their distinct form and or color to provide dramatic visual accents to landscape treatments. See below for proposed landscape border plant species.

Trees

Botanical Name	Common Name
Chilopsis linearis	Desert willow
Cupressus arizonica nevadensis	Piute cypress
Psorothamnus spinosus	Smoke tree
Pistachia chinensis	Chinese Pistache

Native/Drought Tolerant Landscape Areas

The Key Landscape concept for the landscape buffer areas is to create a native landscape which will create an aesthetically pleasing landscape which is self-sustaining and provides a visual screening of the interior elements of the power plant from the surrounding areas.

Landscape Border Plantings

Plants

Botanical Name	Common Name
Chrysactinia Mexicana	Diamantia daisy
Dasylirion wheeleri	Blue sotol
Fallugia paradoxa	Apache plume
Hesperoalloe parviflora	Red yucca
Leucophyllum frutescens	Cenizo
Opuntia basilaris	Beavertail
Opuntia violaceae 'Santa Rita'	Purple prickly pear
Sphaeralcea ambigua	Globe mallow
Vaquelinia californica	Arizona rosewood

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Project Site Entrance and Accent Areas

Project landscape entry and specific accent areas will be designed using colorful trees and plants to accent the specific areas and define the space. Also additional groundcovers and mulches will be added to enhance the landscape design and visual project aesthetics.

Trees

Botanical Name	Common Name
Pistachia Chinensis	Chinese Pistache
Prosopis pubescens	Screw Bean Mesquite
Psorothamnus spinosus	Smoke Tree

Inactive Feedstock Storage

This specific area on the project site has been designated to stockpile feedstock material as a backup supply for use only in circumstances where supply sources have been constrained. Feedstock storage material will be covered with a landscape vegetative mat that will prevent erosion and minimize infiltration of stormwater into the pile.

Stormwater Percolation Basins

The bottom of stormwater percolation basins will be kept clear of vegetation for annual maintenance. The sloping sides will be seeded using low growing native plant material that will reduce erosion and filter stormwater particulates and allow for water percolation into soil substrate. See below proposed stormwater percolation native seed mix species.

Native Mix

Botanical Name	Common Name
Vulpia microstachys	Small fescue
Muhlenbergia microsperma	Annual muhly
Leymus triticoides Rio	Creeping wildrye
Achillea millefolium	White yarrow
Festuca idahoensis	Idaho fescue
Dactylis glomerata 'Rushmore'	Orchard grass

Site Area Summary

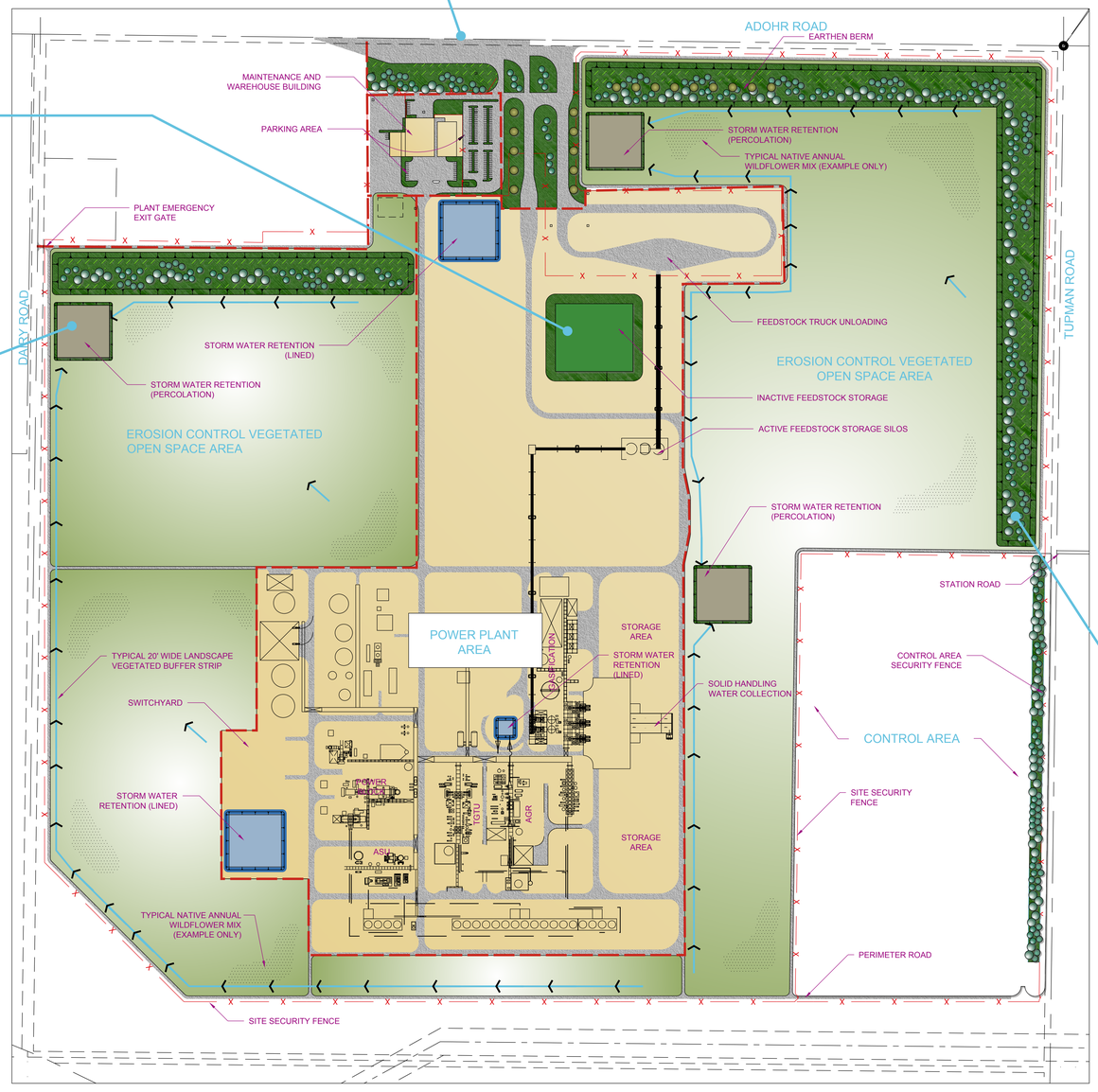
Area	Acres
Total Project Area	473
Landscape Entry Buffer Areas	40

* Kern County zoning ordinance requires 5% of project area to be landscaped = 23.65 Acres
(Above referenced areas are estimates used for design concept only)

Water Conservation Statement

The project site has been designed using native and drought tolerant landscape plant material that is aesthetically pleasing and requires minimal supplemental water while they are established (3-5 years).

Landscape design and irrigation system will be designed using water conservation devices and controllers and installed to meet the California State AB1881 Model Water Efficient Landscape Ordinance.



Planting Legend

TREES

Botanical	Common Name	Size	Quanity	Spacing	Plant Size @ 5 years	Plant Size @ 15 years
Chilopsis linearis	Desert willow	24" box	120	See Plan	15' x 15'	20' x 15'
Cupressus arizonica nevadensis	Piute cypress	36" box	150	See Plan	30' x 20'	40' x 20'
Pinus brutia	Calabrian pine	48" box	200	See Plan	35' x 25'	50' x 30'
Pistachia chinensis	Chinese pistache	36" box	120	See Plan	25' x 20'	40' x 30'
Populus fremontii	Fremont cottonwood	36" box	250	See Plan	50' x 25'	70' x 30'
Prosopis pubescens	Screwbean mesquite	24" box	100	See Plan	20' x 20'	25' x 25'
Psorothamnus spinosus	Smoke tree	24" box	65	See Plan	15' x 20'	15' x 30'

SHRUBS/PERENNIALS

Chrysactinia Mexicana	Diamantia daisy	1 gal	3,200	3'-0" O.C.	1 x 2'	1 x 2'
Dasylirion wheeleri	Blue sotol	1 gal	3,000	6'-0" O.C.	4' x 4'	4' x 4'
Fallugia paradoxa	Apache plume	5 gal	2,700	4'-0" O.C.	4' x 4'	4' x 4'
Hesperoaloe parviflora	Red yucca	5 gal	2,000	8'-0" O.C.	4' x 4'	4' x 4'
Leucophyllum frutescens	Cenizo	5 gal	3,500	8'-0" O.C.	6' x 6	6' x 6'
Opuntia basilaris	Beavertail	Pads	300	24" O.C.	1' x 2'	1' x 2'
Opuntia violaceae 'Santa Rita'	Purple prickly pear	Pads	300	24" O.C.	6' x 6'	6' x 6'
Sphaeralcea ambigua	Globe mallow	1 gal	3,500	4'-0" O.C.	2' x 3'	2' x 3'
Vaquelinia californica	Arizona rosewood	5 gal	2,800	20'-0" O.C.	8' x 10'	10' x 15'

VINES

Vitis girdiana	Desert wild grape	5 gal	75	See Plan	2'	10' x 30'

GROUNDCOVERS

Achillea millefolium	White yarrow	Flats	10,000 SF.	18" O.C.	2'	18' x 2'
Ambrosia pumila	San Diego ambrosia	Flats	15,000 SF.	18" O.C.	2'	18 x 2'

ACCENT NATIVE GRASSES

Achnatherum speciosa	Desert needlegrass	1 gal	2,000	3'-0" O.C.	3' x 3'	3' x 3'
Aristida purpurea	Purple three awn	1 gal	1,100	3'-0" O.C.	3' x 3'	3' x 3'
Juncus patens	Spreading rush	1 gal	700	2'-0" O.C.	2' x 2'	2' x 2'
Muhlenbergia rigens	Deer grass	1 gal	500	3'-0" O.C.	3' x 3'	3' x 3'
Poa secunda	Pine bluegrass	1 gal	500	2'-0" O.C.	3' x 3'	3' x 3'
Sporobolus airoides	Alkali sacaton	1 gal	400	3'-0" O.C.	3' x 3'	3' x 3'

Landscape Buffer Concept

A landscape buffer has been designed to create an aesthetically pleasing visual landscape and provide a natural visual buffer for the project site from the surrounding areas. Design elements include earthen landscape berms, large fast growing screen trees, layered native and drought tolerant landscaping and perimeter security fencing. Proposed landscaping will create a layered landscape design providing a mixture of trees and shrubs arranged in a layer format providing foreground, middle ground and background plantings integrated together to form a natural project screening concept.

Earthen Berms

Large landscape berms ranging from 8' to 10' in height have been added along portions of the project site to provide additional visual screening of the interior of the project site from the surrounding areas.

Fast Growing Trees

Drought tolerant trees were selected for their fast growth rates and screening characteristics to provide a visual buffer between the project site and surrounding areas.

Layered Landscaping

Landscape buffer has been designed using a layered layout concept to create a visually pleasing landscape and also form a dense visual buffer between the project site and surrounding areas.

Site Fencing

- Project site security fencing will be chain link fence with 3 strand barbed wire anchored on extension arms.
- Perimeter fencing for the controlled area will be standard chain link fence.

Note: Landscape concepts are conceptual and depict basic landscape design intent only. Final landscape planting type and quantities may change at final design.

NOT TO SCALE

1 Tupman Road Landscaping (5-year)

The above reference graph illustration depicts the conceptual view of the proposed landscaping along Tupman Road. Landscape screening improvements include 8'-10' high earthen berms, large fast growing buffer trees and layered landscaping of drought tolerant and native plants providing an aesthetically pleasing landscape and visual buffer. (Plant material shown at 5-years growth.)

4 KOP-1 Residence

Photo #1 Taken in front of KOP-1 residence shows residence and existing landscape buffer.

5 KOP-1 Residence

Photo #2 Took along Station Road looking back at KOP-1 residence.

7 Vicinity Map

Above referenced vicinity map shows proposed power plant location with landscape buffer and KOP-1 Residence location.

2 Tupman Road Landscaping (15-years)

Landscape concept uses a combination of drought tolerant and native plant material which is fast growing reaching most of it's potential growth with in 5-years of installation. (Plant Material shown at 15-years growth)

6 KOP-1 Residence (Plan View)

8 Adohr Road Landscaping (15-years)

The above referenced graphic illustration depicts the conceptual landscape view along Adohr Road. Proposed landscape concept includes earthen berms, large fast growing buffer trees and layered landscaping of drought tolerant and native plants providing an aesthetically pleasing landscape and provide a visual buffer between the power plant and surrounding areas.

3 View Simulation at KOP-1 Residence (15 years)

Visual Simulation depicts a person's view standing 6 feet off of Station Road in front of KOP-1 Residence looking towards proposed power plant. Above referenced exhibit depicts visual simulation of proposed landscaping at 15-years of initial planting. For life size print see Exhibit E.

NOT TO SCALE N

Hydrogen Energy California, Kern County Power Project

Landscape Visual Simulations (Sheet #3)

AECOM

APPENDIX C

Exhibits A, B, C, D, E, F

Tupman Road Landscaping (5-year)

The above reference graph illustration depicts the conceptual view of the proposed landscaping along Tupman Road. Landscape screening improvements include 8’-10’ high earthen berms, large fast growing buffer trees and layered landscaping of drought tolerant and native plants providing an aesthetically pleasing landscape and visual buffer. (Plant material shown at 5-years growth.)

Tupman Road Landscaping (15-years)

Landscape concept uses a combination of drought tolerant and native plant material which is fast growing reaching most of it’s potential growth within 5-years of installation. (Plant Material shown at 15-years growth)

Adohr Road Landscaping (15-years)

The above referenced graphic illustration depicts the conceptual landscape view along Adohr Road. Proposed landscape concept includes earthen berms, large fast growing buffer trees and layered landscaping of drought tolerant and native plants providing an aesthetically pleasing landscape and provides visual buffer between the power plant and surrounding areas.

View Simulation at KOP-1 Residence (15 years)

Visual Simulation depicts a person's view standing 6 feet off of Station Road in front of KOP-1 Residence looking towards proposed power plant. Above referenced exhibit depicts visual simulation of proposed landscaping at 15-years of initial planting. See reference exhibit "E" to show cropped view (life-size scale).

View Simulation at KOP-1 Residence (5 years)

Visual Simulation depicts a person's view standing 6 feet off of Station Road in front of KOP-1 Residence looking towards proposed power plant. Above referenced exhibit depicts visual simulation of proposed landscaping at 5-years of initial planting. See reference exhibit "F" to show cropped view (life-size scale).

Exhibit D

AECOM

View Simulation at KOP-1 Residence (15 years)

Visual Simulation depicts a person's view standing 6 feet off of Station Road in front of KOP-1 Residence looking towards proposed power plant. View simulation (life-size scale) is intended to be viewed 10 inches from viewer's eyes when printed on 11"x17" paper. Above referenced exhibit depicts visual simulation of proposed landscaping at 15-years of initial planting.

Exhibit E

AECOM

View Simulation at KOP-1 Residence (5 years)

Visual Simulation depicts a person's view standing 6 feet off of Station Road in front of KOP-1 Residence looking towards proposed power plant. View simulation (life-size scale) is intended to be viewed 10 inches from viewer's eyes when printed on 11"x17" paper. Above referenced exhibit depicts visual simulation of proposed landscaping at 5-years of initial planting.

Exhibit F

AECOM