

## APPENDIX J PRELIMINARY SITE RESTORATION PLAN

### J.1 INTRODUCTION

Construction activities associated with the proposed Dynergy Morro Bay Power Plant Marine Terminal Decommissioning Project (Project) will result in a temporary disturbance to the Coastal Strand/Beach habitat existing within the beach segment of the Project site. However, there is potential for temporary disturbance to occur to the Dune Mat and Mixed Riparian habitat on the southern bank of Morro Creek, in the immediate vicinity of the beach segment of the Project site. The purpose of this Preliminary Site Restoration Plan (Plan) is to propose a preliminary plan to stabilize, restore, enhance, and preserve hydrologic, vegetation, and faunal habitat function of coastal and riparian habitat impacted by proposed Project activities to the greatest extent feasible. The guidelines within this Plan relating to Dune Mat and Mixed Riparian habitat restoration are contingent on actual disturbance of those habitats. This Plan will be modified and finalized prior to implementation of Project activities.

### J.2 EXISTING SITE CONDITIONS

Coastal Strand/Beach is the only habitat within the proposed disturbance limits. However, the potential exists for adjacent habitats to be disturbed due to the close proximity to the proposed Project site, and as such, these habitats with the potential to be impacted are included in this Plan. A portion of the onshore buried pipelines will be abandoned in place and therefore will not disturb several of the existing vegetation types documented within the Project site including European Beach Grass Sward, Dune Mat, Mixed Dune, Mixed Riparian, Ornamental, and Ruderal habitat areas. All vegetation types and habitats are described in detail in the Biological Resources Survey Report (Appendix N). Classification of the vegetation types and habitats is based primarily on *A Manual of California Vegetation Second Edition* (Sawyer et al., 2009), and site-specific classifications.

Coastal Strand/Beach. Coastal Strand/Beach habitat is comprised of a broad, gradually sloping to flat, sandy beach that extends from low, sparsely vegetated dunes to east to the intertidal zone to the west. Due to regular inundation of saltwater from high tides and wave activity, the Coastal Strand/Beach, does not support any plant communities; however, deposits of kelp detritus and drift wood from extreme high tide periods provide cover for a variety of avifauna and marine invertebrates in portions of this habitat. The amount of available habitat from these deposits of kelp detritus and drift wood debris fluctuates throughout the year based on ocean tides and wave activity. During the winter, high surf usually strips the coastal strand of large amounts of sand and debris, and at times exposes the marine terminal pipelines. Woody debris is also removed during this time, which is typically used as habitat for a number of shorebirds, including Western snowy plover. Conditions following high surf storm events typically re-deposit kelp detritus and woody debris as wave activity lessens and sands are re-deposited back onto the coastal strand. Restoration of this habitat type will consist of backfilling, re-contouring, and re-placing woody debris. No revegetation is necessary.

Dune Mat. Dune mat vegetation occurs on the sandy dunes adjacent to the Coastal Strand/Beach habitat. Dune Mat vegetation located within the Project site consists of an assemblage of plant species adapted to periodic exposures of salt water intrusion due to winter storms and/or extreme high tides and strong sea breezes laden with salt. Adaptations to these conditions typically include prostrate habit, deep taproots, fleshy roots, stems and leaves, and leaves covered with thick mats of hair. Dune adapted vegetation can colonize and stabilize wind formed dunes and are often referred to as pioneer dune communities and/or coastal strand habitat areas. The Dune Mat vegetation in the vicinity of the Project site is comprised of native species including sticky sand verbena (*Abronia maritima*), and beach bur (*Ambrosia chamissonis*), and non-native and/or disturbance adapted species such as iceplant (*Carpobrotus edulis*) and sea rocket (*Cakile maritima*). Sticky sand verbena is California Native Plant

Society (CNPS) California Rare Plant Rank (CRPR) 4.2 species (of limited distribution throughout California) (CNPS, 2015) and is a perennial herb in the Nyctaginaceae (four o'clock) family that occurs in coastal dune habitat at elevations between 0.0 to 328.0 feet (ft) (0.0 to 100.0 meters[m]). This species typically blooms from February to November. Avoidance will be the primary mitigation measure for this species. However, if disturbance is unavoidable, restoration measures will be implemented and are discussed in this Plan.

Mixed Riparian. The vegetation within the Mixed Riparian habitat occurs along the channel and banks of Morro Creek adjacent to the proposed Project site. Vegetation within this section of Morro creek is dominated by a mixture of native and exotic species typically occurring in riparian and wetland habitats, including arroyo willow (*Salix lasiolepis*), white sweet clover (*Melilotus albus*), salt grass (*Distichlis spicata*), sandbar willow (*Salix exigua*), marsh baccharis (*Baccharis glutinosa*), iceplant, and fat-hen (*Atriplex prostrata*).

### **J.3 PROJECT DESCRIPTION**

Decommissioning activities associated with the Project include the removal or abandonment of the onshore segments of the existing 24-inch diameter submarine pipeline, 16-inch diameter submarine pipeline, the cathodic protection system for the two pipelines, and ancillary submarine pipeline components. Removal of the components will result in temporary disturbance to Coastal Strand/Beach habitat due to proposed excavation activities.

As described in Section 2.0 - Project Description, the beach segments of the 24-inch and 16-inch submarine pipelines will be removed in their entirety. Specifically, this will include the excavation and removal of all pipe segments. The pipe segments will be cut into truckable lengths with oxygen-acetylene torches lifted out of the trench(s) with a rough terrain crane or equivalent and then trucked offsite for recycling or disposal at an approved landfill. These combined Project activities would result in approximately 3.09-acre of disturbance to the existing Coastal Strand/Beach habitat within the on-shore Project site and would open up an additional 0.38-acre of beach sands to wind and wave exposure (roughly 3.47-acre total). This disturbance estimate includes areas required for stockpiling overburden materials and equipment access routes, etc. However, it also should be noted that the proposed disturbance involves returning the beach to original contours. Lastly, the removal of the 24-inch and 16-inch submarine pipelines could impact the outlet of Morro Creek if there is a connection to the Pacific Ocean during Project activities. The extent of disturbance, if applicable, will be determined by the Project as-built.

### **J.4 IMPLEMENTATION PLAN**

The focus of this Plan is to revegetate the areas impacted by Project activities. Revegetation will correspond with the habitat types present within the Project site. Restoration activities consist of pre-excavation (activities conducted prior to and during Project activities) and post-excavation (activities conducted following Project activities, including final grading). A general schedule of these activities is shown in Table J.4-1, and further discussed in the following sections.

**Table J.4-1. General Restoration Schedule**

Restoration Activity	Action	Timing
<b>Pre-Excavation Activities</b>		
Delineation of work areas	Flag or stake boundaries of Project impact areas	Prior to Project implementation
Pre-Project surveys	Baseline surveys shall be completed within proposed disturbance area and within reference sites with similar plant composition	Prior to Project implementation
Preservation of native dune vegetation	Native dune vegetation existing within the Project disturbance limits; will be collected and transplanted into containers for temporary storage	Prior to Project implementation
Topsoil/sand salvage and storage	Remove first six to 12 inches of topsoil/sand; stockpile location shall be pre-determined	The start of Project activities
<b>Post-Excavation Activities</b>		
Backfill and topsoil replacement	Excavated area shall be backfilled with soil/sand of similar composition and topsoil replaced	Following Project activities
Re-contouring	Project site shall be re-contoured	Following backfill and topsoil replacement
Surface stabilization and erosion control	Placement of straw plugs (dune), straw waddles, geotextiles, as needed	Following the recontouring of Project site
Eradication of non-native plant species	If necessary, non-native vegetation will be removed	Following completion of Project activities and prior to planting
Seeding/Planting	The area shall be hand seeded or hydroseeded with appropriate seed mix, and container stock shall be planted, as necessary	Following re-contouring the Project site and installation of erosion control measures
Installation of protective fencing	High visibility construction fencing, or similar type, shall be installed around the revegetated area	Following seeding/planting
Irrigation	The restoration areas shall be watered, as necessary, for the first year under the direction of a qualified Biologist	Following seeding
Site Visits	Success Criteria measured with monitoring surveys, focused on seed and planting establishment, component species, and investigation of necessary maintenance needs	Weekly for the first month, monthly for three months, quarterly for the remainder of the year, then annually for second year
Maintenance	Weed eradication, maintenance of protective fencing, maintenance of erosion control measures, as necessary	Periodically for the duration of the two year monitoring period, as necessary
Reporting	Reporting of all maintenance activities completed on site, results of site visits, discussion of success criteria, and photo documentation	Annually

#### **J.4.1 Pre-Excavation**

##### J.4.1.1 Delineation of Work Areas

The boundaries of all work areas will be clearly identified at the direction of the onsite biological monitor using a combination of high visibility pin-flags, stakes and/or orange nylon construction fencing prior to the initiation of decommissioning. All contractors, subcontractors and equipment operators will be instructed to restrict all activities to these defined areas. Specifically, the use of heavy equipment and vehicles will be restricted to defined staging areas/access points through the Coastal Strand/Beach habitat, and Dune Mat and Mixed Riparian habitat directly south of Morro Creek, as necessary.

##### J.4.1.2 Pre-Project Surveys

A qualified biologist will conduct a botanical resources survey within the potential areas of disturbance within 30 days of Project disturbance. Reference sites may be identified in similar habitat in the vicinity of the Project site, to assist with comparison of overall site conditions during the monitoring period. All vegetation will be identified as native or non-native, and plant cover will be quantified using a reproducible method (i.e., transect surveys). Photo stations will be designated and will be utilized to document pre-Project conditions and progress of restoration for the duration of the monitoring period.

##### J.4.1.3 Preservation of Native Vegetation

If disturbance to vegetation is unavoidable, native plant species will be salvaged from the delineated Project disturbance limits prior to commencement of Project activities. Specifically, selected plants, such as sand verbena and beach bur within the dune habitat will be transplanted by hand into plastic containers. Special consideration will be made to preserve the root systems and surrounding soil of each plant during the removal process. Once completed, all collected plants will be retained within the Dynegy Morro Bay Power Plant property facility in a temporary, well-protected and shaded area to avoid desiccation, until the completion of pipeline segment removal activities, or other suitable location. The plants will be watered periodically to promote health and vigor. Plants will then be replanted by hand to the area from which they were removed. All transplanted plants will be closely monitored to document the re-establishment success per the performance criteria discussed in this Plan.

##### J.4.1.4 Topsoil/Sand Salvage

If vegetation avoidance is not feasible, the upper six to 12 inches of topsoil/sand containing native seed will be stockpiled separately and adjacent to the excavation area. This procedure will promote natural regeneration of the disturbed areas by providing a proper seed substrate and a plant/seed source. Topsoil containing non-native iceplant will be disposed of to ensure removal of this highly invasive species. This should include an approximate 20 ft (6.1 m) buffer strip surrounding the work areas to minimize further encroachment. Other invasive species that should be disposed of during this process include, but should not be limited to New Zealand spinach (*Tetragonisa tetragonoides*) and summer mustard (*Hirschfeldia incana*). Additionally, any residual materials and/or miscellaneous trash will be removed from the restoration areas during topsoil/sand salvage. Natural woody beach debris will be retained with the stockpiled topsoil/sand to be used during restoration.

#### **J.4.2 Post-Excavation**

##### J.4.2.1 Backfilling and Topsoil/Sand Replacement

Following pipeline removal, the excavated area will be backfilled and compacted, salvaged topsoil/sand will be replaced and woody beach debris will be scattered throughout the area.

#### J.4.2.2 Re-contouring

Following backfill and replacement of salvaged topsoil/sand, the area will be re-contoured to a grade similar to pre-excavation and adjacent conditions. Natural elevations and contours of the existing dunes, located north and south of the excavated pipeline corridor, will be emulated to the extent feasible. If disturbance to the southern bank of Morro Creek is unavoidable, the area will be re-contoured as necessary.

#### J.4.2.3 Surface Stabilization and Erosion Control

To provide immediate surface stabilization and reduce the risk of large-scale sand blowouts throughout the adjacent Dune Mat habitat, clean rice (*Oryza sativa*) straw plugs (free of non-native/invasive species) will be planted vertically at approximate 3.0 ft (0.9m) intervals in a checkerboard fashion. Specifically, the rice straw will be planted in offsetting rows situated perpendicular to the prevailing northwesterly wind direction to provide further stabilization. Rice straw is the preferred material due to the high silica content and decomposes slowly even in moist soils. Baled or bound straw of any species may contain many seeds unless it is specifically harvested for conservation or cleaned after harvest. Wheat, oat, or rye straw, can also be used, but only clean bright straw is recommended (Bainbridge, 1995).

Placing straw upright in the soil is one of the best methods for protecting denuded areas and encouraging plant establishment. This treatment increases water capture and retention; provides safe sites for seeds and seedlings; traps blowing dust; slows water erosion; and provides moisture and a source of organic matter to the below-ground soil ecosystem. The rice straw plugs are intended to improve restoration success by enhancing the survival of seedling, plantings, and transplants. The rice straw plugs provide an effective windbreak for the seedlings and provide a vertical condensation surface for fog, which will run down the straw, providing moisture to the seedlings/plantings in summer months. Rice straw plugs have been used successfully at other coastal restoration sites, including the Guadalupe Dunes and Oso Flaco Lake in San Luis Obispo County, and at Point Conception in Santa Barbara County.

Due to the limited amount of disturbance expected to occur on the southern bank of Morro Creek during pipeline removal activities, surface stabilization efforts are expected to be minimal. However, erosion control measures will include installation of jute-netting, straw wattles, and/or silt fencing, as necessary. All erosion control devices will be free of plastic.

### **J.5 PLANTING PLAN**

A plant palette has been developed based upon the composition of vegetation identified within the Dune Mat and Mixed Riparian habitats within the Project site. The planting plan includes the use of salvaged vegetation and application of native seed mix for erosion control and revegetation. The species included in the plant palette may be altered during the monitoring period in the event certain plant species are not successful. Restoration methods and plant palette composition are discussed in the following sections.

#### **J.5.1 Dune Mat Restoration**

Methods to restore the dune habitat may include seeding with seed collected onsite (refer to Table J.5.-1), planting of salvaged plant material, and planting of nursery grown seedlings. Plant species will include sticky sand verbena and beach bur. Plant material and procedures to be utilized may consist of the following:

- Salvaged Plants: An effort will be made to salvage and care for the plants collected prior to project implementation. If feasible, a temporary covered outdoor area within the Morro Bay

Power Plant property may be utilized to care for the salvaged plants. Otherwise, an offsite nursery will be used. Salvaged plant material installations would be focused on the windward side of newly created hummocks to further encourage immediate surface stabilization;

- Seed Application: Seed will be collected onsite and/or within the vicinity (Estero Bay) prior to excavation activities. Collected seed will be inserted by hand on the leeward side of the vertically installed rice straw. The site-specific seed mix displayed in Table J.5-1 will be utilized. A portion of the collected seed may be utilized for nursery propagation, as necessary; and
- Nursery Grown Seedlings: Collected seed will be delivered to a qualified nursery, or to the temporary protected area within the Morro Bay Power Plant property, for propagation. All propagated seeds will be grown to four-inch container nursery stock and planted on the leeward side of the vertically installed rice straw throughout the impact areas. Nursery stock installations would be focused on the windward side of newly created hummocks to further encourage immediate surface stabilization.

Table J.5-1 identifies the proposed timing of restoration and maintenance activities required for a successful restoration effort.

**Table J.5-1. Dune Habitat Restoration Schedule**

Action	Timing
Collect seeds from the immediate area, if feasible	Summer/Fall
Deliver seed to nursery, or protected area, for propagation as necessary	Following collection
Identification and salvage of native plant species determined to be unavoidable during excavation	Prior to excavation or grading
Removal and temporary storage of topsoil	Prior to excavation or grading
Backfill excavations and re-create dune hummock habitat to the extent feasible. Replace topsoil as necessary	Following complete removal of beach segment
Install rice straw plugs throughout disturbed area	Upon re-creation of naturally spaced dune hummocks
Insert native seed mix into small depressions on leeward side of vertical rice straw. Plant nursery container stock and salvaged plant materials on leeward side of vertically placed rice straw. Focus all planting efforts on windward side of recreated dunes to encourage immediate stabilization.	Upon installation of rice straw
Irrigate (manually or with drip irrigation system)	As needed, through first dry season
Maintenance (primarily weed abatement)	Periodically until performance criteria are met

J.5.1.1 Dune Habitat Seed Collection

To maintain the integrity of the Dune Mat habitat, all efforts will be made to collect the seed stock from the Project site. As discussed above, the Dune Mat habitat is expected to be avoided; however, if disturbance is unavoidable, then the impact acreage will be documented. If feasible, seed will be collected from plants within the Project site and adjacent areas. A portion of the Dune Mat seed mix may be stored for direct application to the Project site during restoration of the area, and the remainder may be utilized for offsite nursery propagation and additional reseedings (as necessary) during the maintenance phase discussed below. All seed unavailable in appropriate quantities onsite will be acquired from surrounding areas of Estero Bay where access and permission to collect seed has been granted and/or purchased from a commercial seed source from a local distributor, such as S&S Seeds. Table J.5-2 summarizes the proposed seed mix components and seed collection schedule.

**Table J.5-2. Dune Habitat Seed Mix Collection Schedule**

Species	Common Name	Collection Period (Months)	Collection Locations	Amount (lbs.)	Storage / Time of Application
<i>Abronia maritima</i> <i>Camissonia cheiranthifolia</i> <i>Ambrosia chamissonis</i> <i>Atriplex leucophylla</i>	Sand verbena Beach evening primrose Beach bur Beach salt bush	Sept-Oct. May-June Aug-Sept. May-Nov.	Project site / Estero Bay	TBD	Indoors in cool, dry conditions / Fall-Winter following completion of Project activities
TBD To be determined; based on actual acres disturbed.					

**J.5.1.2 Dune Habitat Container Stock Planting**

Portions of the dune habitat will be replanted with salvaged plants and/or nursery grown plant materials, as necessary. The salvaged and nursery stock planting will be concentrated on the re-created dunes to promote immediate stabilization. The quantity of plantings will be determined based on actual disturbance acreage and the density will be determined by comparison to reference site vegetation density. The propagation schedule with estimated quantities and specific densities for planting is displayed in Table J.5-3.

**Table J.5-3. Dune Habitat Plant Propagation Schedule**

Species	Common Name	Plant Material Quantities	Estimated Propagation Period	Plant Spacing (feet apart)
<i>Abronia maritima</i> <i>Ambrosia chamissonis</i> <i>Camissonia cheiranthifolia</i>	Sand verbena Beach bur Beach evening primrose	TBD	Approximately 7 months	Random spacing on leeward side of rice straw bundles
TBD To be determined; based on actual acres disturbed.				

**J.5.2 Morro Creek Restoration**

The primary method for restoration of the Mixed Riparian habitat will consist of topsoil/sand replacement and application of a native seed mix. The seed mix will be comprised of species that occur within the riparian habitat in the immediate vicinity of the Project site. Table J.5-4 summarizes the proposed timing of restoration and maintenance activities required for a successful restoration effort.

**Table J.5-4. Morro Creek Restoration Schedule**

Action	Timing
Collect seeds from the immediate area, if feasible	Summer/Fall
Removal and temporary storage of topsoil in areas containing native vegetation	Prior to excavation
Removal (hand-pulling) of iceplant may be conducted in areas containing large numbers of native plants	Prior to excavation
Backfill excavations and replace topsoil and re-contour, as necessary	Following complete removal of beach segment
Hand broadcast seed along creek bank using Morro Creek seed-mix described in Table J-5-5	Following re-contouring
Install jute-netting or equivalent over re-seeded areas, if necessary	Immediately following seed broadcasting
Irrigate (manually or via water truck with hoses).	Through first dry season
Maintenance (mostly weeding).	Periodically until success criteria are met

Due to the small area of disturbance that may occur within the Morro Creek area, it is anticipated that the seed will be hand broadcast and the topsoil will be scarified with a rake or other device to ensure that seed has been appropriately interspersed into the sand/soil. If necessary, the seed mix will be augmented with a commercial seed source from a local distributor, such as S&S Seeds. Table J.5-5 summarizes the proposed seed mix components and seed collection schedule.

**Table J.5-5. Morro Creek Seed Mix Collection Schedule**

Species	Common Name	Collection Period (Months)	Collection Locations	Amount (lbs.)*	Storage / Time of Application
<i>Ambrosia chammisonis</i> <i>Baccharis glutinosa</i> <i>Salix lasiolepis</i> <i>Distichlis spicata</i>	Beach bur Marsh baccharis Arroyo willow Salt grass	Aug-Sep Jun-Oct Feb-May Jul-Aug.	Project site/ Estero Bay	TBD	Indoors in cool, dry conditions / Fall-Winter following completion of Project activities
TBD To be determined; based on actual acres disturbed.					

## **J.6 IRRIGATION**

Planting and seeding should occur during the fall and winter months to take advantage of winter rains to promote establishment of vegetation. However, it may be necessary to provide an additional water source in the event that drought conditions continue. A temporary drip line system and/or water truck with a pump could be utilized. The restoration areas will be irrigated, as necessary, throughout the monitoring period. During the rainy season, irrigation frequency will be reduced to an as-needed basis to allow the plants to naturalize their water intake. Once the plants have become established and are showing signs of growth (i.e., new leaves, buds, etc.), and meet the success criteria outlined in this Plan, irrigation would be terminated.

## **J.7 MAINTENANCE**

The following maintenance activities will be implemented as needed:

- General weed abatement;
- Installation and maintenance of erosion control measures and protective fencing, and
- Adjustments to irrigation schedule.

Non-native/invasive species removal will be conducted as needed to reduce competition from species such as iceplant. Erosion control materials (i.e., jute netting, straw wattles, etc.) will be maintained as necessary. Temporary fencing may be installed along the perimeter of the restoration area with informative signage to keep the public from entering the restoration area until completely restored. The fencing will be maintained as necessary.

## **J.8 MONITORING**

### **J.8.1 Methods**

Monitoring methods will consist of a qualitative botanical survey focused on the identification of plant species within the restoration areas, and visual analysis of seedling development and container stock establishment. Once plants have emerged or become established, a quantitative method such as a survival survey (i.e., count and record the number of mortalities) may be utilized to determine success. In addition, photographs will be taken at established photo stations, and need for maintenance will be assessed periodically. To ensure that the initial revegetation efforts are implemented successfully, the restoration areas will be monitored weekly for the first four weeks following initiation of revegetation efforts. Subsequent monitoring will be conducted monthly for three months, then quarterly, or as needed, for the remainder of the two year monitoring period.

### **J.8.2 Personnel**

Qualified Biologists will be used to conduct all monitoring activities. Personnel turnover for this Project will be minimized to the extent feasible to ensure continuity of activities and methodology is maintained. Qualified personnel includes staff that have experience in native plant restoration and implementing erosion control Best Management Practices.

### **J.8.3 Annual Reports**

Monitoring of the restoration areas will be conducted for two years, or more if success criteria have not been met. Reports will be submitted annually following Project completion. Annual reports will include a discussion of pre-Project and existing conditions and will include the following (as a minimum):

- Names and qualifications of all monitoring personnel and report preparers;

- Photographs;
- Discussion of monitoring methods, revegetation and maintenance activities, and dates;
- Discussion of all problems encountered, including storm related damages (if any);
- Recommendations to achieve and or modify the success criteria, if necessary, based on actual Project site conditions; and
- Recommendations to minimize future mortality, excessive weeds, herbivory losses, slow growth, and human impacts.

### **J.9 AS-BUILT CONDITIONS**

Pre-Project site conditions will be documented prior to Project initiation. Following completion of Project activities, a qualified Biologist will document as-built conditions of the actual impact area. This documentation will include the difference between the proposed and final impact area, the type and acreage of each impacted habitat, and the type and amount of seed mix and/or planted container stock installed as part of the revegetation activities. All as-built conditions will be documented in the annual report. Documentation of as-built conditions will assist in the success of the ongoing revegetation process for a comparison analysis. Dynegy will inform all agencies involved of any substantial deviations from the Restoration Plan.

### **J.10 SUCCESS CRITERIA**

Restoration efforts are focused on the establishment of vegetative cover that will provide sufficient stabilization of the dune habitat within the Project site. Due to the dynamic and often extreme conditions (i.e., wave action, high winds, moving sand, etc.) of the coastal environment, a two-fold revegetation approach consisting of seed application and nursery stock planting will be implemented to increase the potential for successful vegetation establishment. The restoration areas will be considered successful if the following criteria have been met:

- Percent total vegetation cover. Vegetation cover within the restoration areas will be compared to that of corresponding reference sites. The percent vegetation cover value of the restoration areas will be equal or greater than that of the corresponding reference site at the end of the two year monitoring period. Reference sites will be selected during the first annual monitoring event. Percent plant cover will be evaluated based on line transect surveys, or best available science.
- Plant composition. The plant composition of the restoration areas will be similar to the corresponding reference sites, which will likely include both native and non-native species. The native plant composition criterion is a measure of native species richness, not percent cover, and will be calculated by dividing the number of native species by the total number of species present.

In the event that the cover and composition requirements have not been met during the two year monitoring period, replacement reseeding and/or replanting will be initiated to achieve these requirements and the success criteria extended an additional year. All replacement reseeding and/or replanting areas shall be monitored with the same cover and composition requirements. If deemed necessary due to unforeseen site constraints, success criteria may be adjusted to incorporate site conditions that provide sufficient dune stabilization.

### **J.11 ADAPTIVE MANAGEMENT MEASURES**

In the event the success criteria are not being met, a qualified Biologist may recommend adaptive management methods to increase success within the restoration areas. These adaptive management methods will be presented to appropriate regulatory agencies to approve changes of the Preliminary Restoration Plan. Adaptive management methods are important to incorporate into a plan to account for unexpected changes in the Project, surrounding land uses, weather impacts, etc. Adaptive management methods may include changes in the planting palette, changes to the re-contoured grade, or changes in the irrigation plan. All changes in the Plan will be documented in the annual report.

### **J.12 LITERATURE CITED**

- Sawyer, John O., Keeler-Wolf, Todd, Evans, Julie M. 2009. A Manual of California Vegetation Second Edition. California Native Plant Society. Berkeley, CA.
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