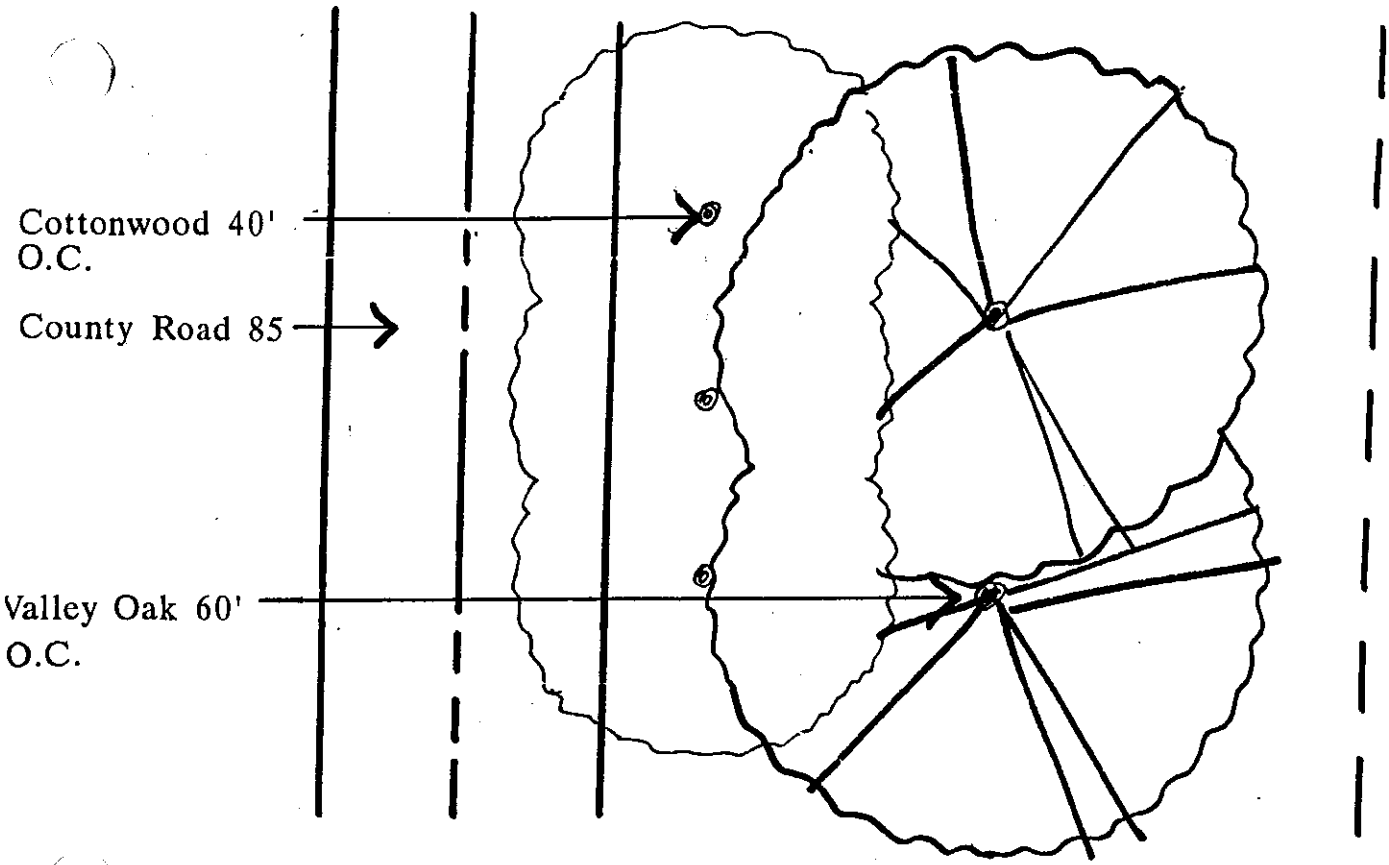
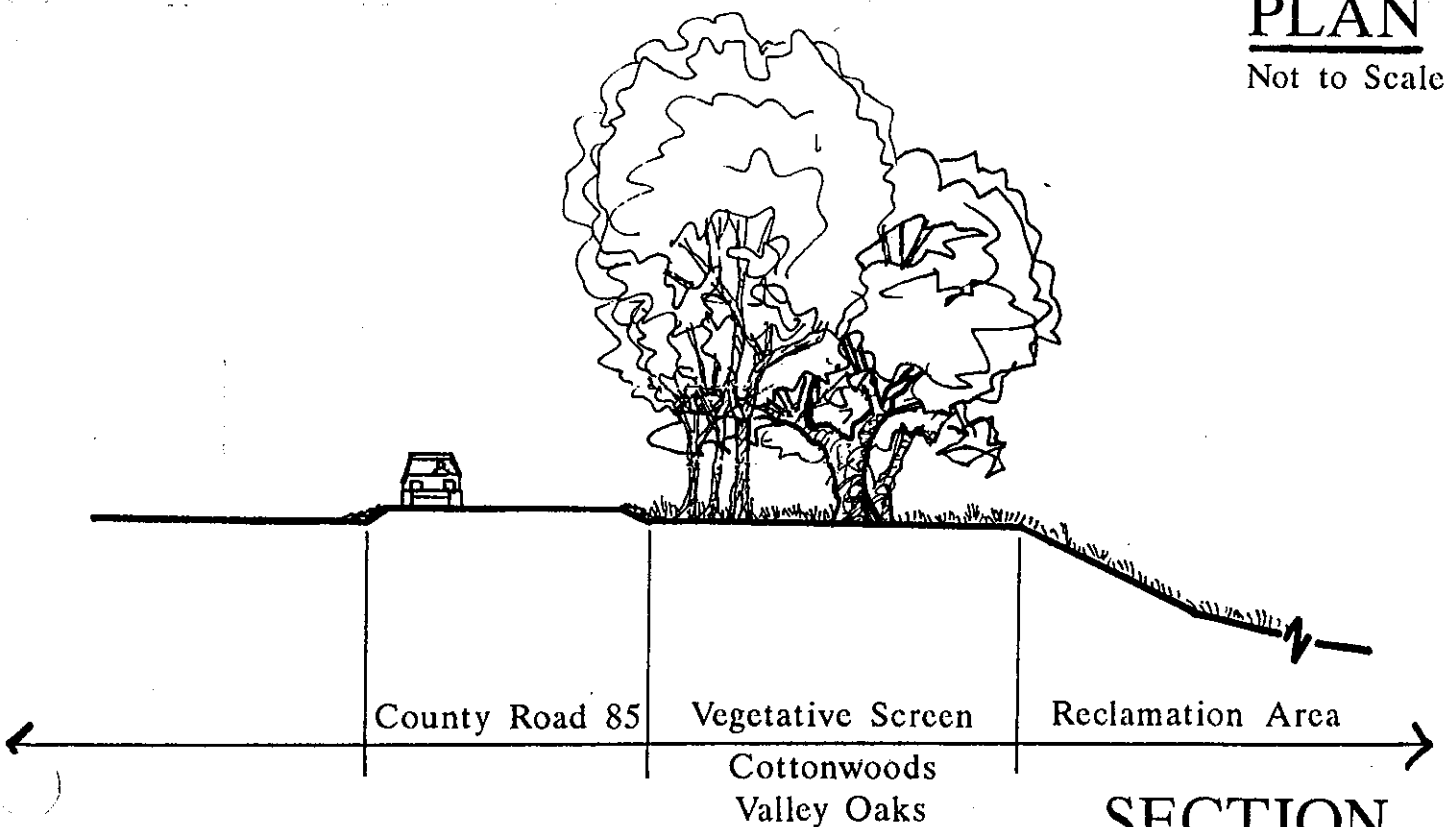


PLAN

Not to Scale



SECTION

ZENTNER ZENTNER

Vegetative Screening

FIGURE 13

II. CONSTRUCTION PROGRAM

A. RESTORING MINED AGGREGATE LANDS

1. Background

Many unreclaimed aggregate mines have relatively low habitat values; dry pits, especially, due to the high permeability of the substrate, tend to be dominated by exotic, drought-tolerant weeds and significant expanses of barren land. Wet pits tend to have higher values. Euliss (1984) found that migrating waterfowl consistently preferred large expanses of open water in the winter at the Kern Refuge, apparently because of the high visibility afforded of potential predators. Wet pits are also important for many resident species, though, if only because of the presence of perennial water in a Mediterranean climate. This demand is evidenced by the high wildlife use in those portions of the Cache Creek channel with perennial water. Similarly, Zentner and Zentner surveys have documented relatively high wildlife use in the existing mining ponds on Cache Creek sites, even as these are being actively mined.

Over the past few decades, interest in the re-use or modification of and planning for the use of aggregate pits as wildlife habitat has increased. Significant research on practical applications has been concluded at the Sevenoaks Reserve in West Kent, England. Sevenoaks consists of 4 mined ponds approximately 124 ac in extent, first established as a reserve in 1956. The Great Linford Reserve, also in England, was established in 1971 and consists of 89 ac of wildlife habitat within a 740 ac active mining zone. Sevenoaks was a mined pit that was later enhanced to provide more significant wildlife use. In contrast, Linford has actually incorporated wildlife-enhancing features into its mining reclamation program prior to mining, monitored the results of these strategies and then incorporated the results into subsequent mining phases.

Within the past two decades, strategies developed at these projects and others in England have become widespread in the US. One of the first US projects to emphasize reclamation for habitat was White Rocks in Colorado which began restoration planning in 1972 (prior to mining activities) and won a joint Wildlife Society/National Sand and Gravel Association award for wildlife habitat improvements in 1984. The Max McGraw Wildlife Foundation in Kane County, Illinois, began pre-construction restoration planning at approximately the same time and won the same award in 1986 for its work with local gravel mining.

By comparison, widespread restoration of wetlands and wildlife habitat has been an emphasis only sporadically in California until more recent periods. At the Ball Ranch along the San Joaquin River in Fresno County, RMC Lonestar and the landowner have cooperated with the California Department of Fish and Game (CDFG) to enhance mined ponds for fisheries and recreational uses, and most recently CDFG has purchased several of the older ponds (ca. 50 yrs old) for habitat uses. Ballinger (1990) studied other mined pits along the San Joaquin River and found 31 species of birds in 1988 surveys on the San Joaquin River ponds. In Pleasanton, RMC

has also encouraged research on several older pits that have developed as significant wildlife habitat. These pits were mined in the early 1970s and allowed to naturally revegetate over the last two decades. At this time, they have extensive cover by native plant communities and Zentner and Zentner has documented over 43 species of birds on-site.

3. Design Principles

These projects and related research has defined a number of important strategies for increasing habitat values and wildlife use (see Harrison 1970; Street 1982; Toburen 1974; Stoeker 1982; Milne 1974; and Watmough 1983 for useful summaries).

1. Provide a diversity of habitat types and plant communities, including islands, peninsulas, and gently sloping shelves on the shoreline. Habitat diversity promotes vegetation diversity which, in turn, provides for greater and more varied wildlife use and more resiliency within the system to withstand environmental shocks.

2. Create long, irregular shorelines. Irregular shorelines provide multiple protected sites for nesting pair territories, ranging from large species such as waterfowl and shorebirds to smaller organisms such as amphibians.

3. Construct shallow terraces just below the waterline that are periodically exposed. Periodic exposure tends to significantly increase invertebrate populations and provide habitat for a variety of aquatic plants. These are extremely important elements of a complete ecosystem that will support aquatic elements (fish and amphibians) as well as more terrestrial components (birds and reptiles).

4. Provide dense, tall plant cover at the shoreline. Trees at the water's edge provide roosting and nesting habitat near a food source while the tree leaves provide an important source of organic material that, in turn, promotes higher productivity of organisms within the open water and marsh zones.

5. Ensure secure roosting sites, including constructed floating islands. Even densely planted slopes provide little security for ground-nesting birds; predators will use the cover to prey on nest sites. Islands or other floating or anchored elements in open water have been shown to provide significant nesting and roosting sites for waterbirds due to the security from predation.

In a useful study on gravel ponds along the San Joaquin River in Fresno County, Ballinger (1990) found that bird densities in wet pits were highest on gently sloped vegetated shores; that beaver-induced mortality of shoreline trees had a possibly significant and deleterious effect on pond productivity (due presumably to the reduction in near-shore woodland species); that predators such as coyotes, crows, and raptors probably had significant effects on waterfowl

young due to the absence of islands; and that changing water levels and flooding and exposure of near-shore habitats can provide important bird feeding areas.

B. HABITAT DESCRIPTIONS

1. Open Water

The open water system of the restored lands will vary in depth significantly, from quite shallow depths to 30 to 40 feet of water. Generally, the slope of the lands from ALW to the basin bottom will be 1.5:1 except where submerged peninsulas will be created adjacent to the peninsulas.

The target for the open water component of the restoration zone is the creation of a diverse aquatic system including fish and amphibians. The basic elements of this system will include shoreline and aquatic plantings and the introduction of important species. Vegetative restoration will consist of planting of aquatic species such as the California hibiscus (*Hibiscus californica*) and Sanford's arrowhead (*Sagittaria sanfordii*) on 10' centers on the submerged peninsulas. These will be 1-gallon or equivalents in size. Wildlife restoration will consist of the introduction of native fish (such as the rare Sacramento perch), amphibians (including the listed red-legged frog) and associated reptiles (such as the western pond turtle). These species are not great migrators and without introduction might not colonize this habitat for several decades.

2. Freshwater Marsh

Typically, marshes occur between the annual high and low water levels in a zone of alternating inundation and exposure. Groundwater, the primary support for wetlands in the restoration zones, has a range of approximately 10 feet in the project site between AHW and ALW. In a highly permeable soil, such as the project site's native soil, marsh will be restricted to the lowest zone of inundation/exposure at or near the ALW line; woodland species will dominate the remainder of the zone between AHW and ALW. In a less permeable soil, such as can occur with the deposition of fines in the restoration zone, the marshes will grade between wet meadows near AHW through seasonal marshes in the mid-range, and perennial marshes at the lowest edge of the zone.

Wet meadows are dominated by grasses with some forbs on sites with limited inundation but lengthy periods (2 to 8 months) of soil saturation. Seasonal marsh is dominated by short-statured forbs such as Baltic rush (*Juncus balticus*) and will occur in areas with 2 to 6 months of inundation and soil saturation within the root zone for some period before and after inundation. Perennial marsh, dominated by tall-statured species such as cattails, will occur in areas with 6 to 12 months of inundation to a depth of 3 feet. These plant communities are adapted to fluctuating water conditions, however, and can survive inundation for several months during flood conditions.

One of the more difficult tasks in wetland creation is ensuring that the marshes do not promote mosquito production. The Sacramento-Yolo Mosquito and Vector Control District has developed guidelines for use in wetland restoration projects. These were used to develop a series of guidelines for this project as detailed below.

1. The banks of areas that retain water after June 1 (the beginning of the optimal mosquito breeding period) will be steep enough to prevent isolated pooling as the water level recedes and to allow wave action and access by predators. Shoreline configuration will not isolate small channels or shallow ponding areas from the main body of water but will instead provide for continuous access by predators, particularly mosquito fish.

2. Dense stands of aquatic vegetation will be limited in shallow areas to lower harborage and enhance wave action. Perennial marsh species, like cattails and bulrushes, in moderate stands generally do not promote mosquito productivity and will function as substrate for predators of mosquitos.

3. Road access will be provided to all wet areas. Access will be allowed for continual larval and adult mosquito surveillance and the continual monitoring of water quality and vegetation density.

Species to be planted in the marsh habitat are shown in Table One from wettest (perennial marshes) to driest (wet meadows).

TABLE ONE

Marsh Planting List

Species	Common Name	# Per Acre
Scirpus acutus	Common tule	25
Typha domingensis	Cattails	15
Scirpus americanus	Three-square	10
Eleocharis palustris	Creeping spikerush	20
Juncus balticus	Baltic rush	10
Carex rostrata	Beaked sedge	5
Equisetum hyemale	Scouring Rush	5
Anemopsis californica	Yerba Mansa	5
Cephalanthus occidentalis	Buttonbush	5

Approximately 100 plants per acre will be installed, averaging on 20' centers. Appendix A contains preliminary construction specifications that will govern installation of these and the other native species; Appendix B contains preliminary maintenance specifications.

The marsh and open water areas are important wildlife habitats, and are also very important as water sources. Some species which will be promoted by expansion of these habitats types by the restoration of adjacent upland habitats include: raccoon, American bittern, great blue heron, great egret, snowy egret, green-backed heron, black-crowned night heron, American coot, swallow species, valley garter snake, aquatic garter snake, Pacific tree-frog, bullfrog, California toad, pied-billed grebe, double-crested cormorant, ruddy duck, belted kingfisher, and many others. Especially important is the provision of habitat for the tricolored blackbird, a special status species.

3. Riparian Woodland

Riparian woodland will occur on the slopes of mined lands between a few feet above AHW to 1 to 2 feet above ALW. The native soils are highly permeable and will support woodland trees and shrubs in this zone over marsh and grass species. Based on the existing soil texture, most of the project site was historically dry wash with very few oaks in the uplands or cottonwoods and willows near perennial water sources. The construction of open basins that intersect groundwater and the provision of irrigation will provide an important opportunity to construct woodland associations in these areas and promote the linkage of Cache Creek woodlands through the project site. Species to be planted in the riparian woodland area (roughly arranged from drier to wetter conditions) are found in Table Two.

TABLE TWO

Riparian Woodland Planting List

Species	Common Name	#/acre
Quercus lobata	Valley oak	82
Rosa californica	Wild rose	36
Leymus triticoides	Creeping wildrye	400
Sambucus mexicana	Blue elderberry	12
Rubus ursinus	Native blackberry	19
Baccharis viminea	Mule fat	6
Vitus californica	Wild grape	16
Cornus stolonifera	Dogwood	16
Populus fremontii	Fremont cottonwood	26
Salix goodingii	Black willow	29
Salix laeviegata	Red willow	29
Salix lasiandra	Arroyo willow	29

Average densities will be over 300 trees and shrubs per acre. The trees and shrubs will be planted in clusters. The woodland will appear relatively dense with occasional grassland openings. Creeping wildrye will be planted in these openings. These species are all adapted to fluctuating water conditions and can survive inundation for several months.

4. Oak Woodland

The highest ground of the restoration zone (between AHW and existing ground level) will be planted in valley oak woodland species. Species to be planted in the oak woodland areas are shown in Table Three.

TABLE THREE

Oak Woodland Planting List

Species	Common Name	#/acre
Pinus sabiniana	Gray pine	3
Quercus wizlensii	Interior live oak	6
Quercus lobata	Valley oak	43
Aesculus californica	California buckeye	5
Sambucus mexicana	Blue elderberry	10
Rubus ursinus	California blackberry	8
Baccharis pilularis	Coyote bush	10
Rosa californica	Wild rose	15
Nasella pulchra	Purple needlegrass	300
Leymus triticoides	Creeping wildrye	100

Average densities will be 100 trees and shrubs per acre. However, these trees and shrubs will be planted in clusters of six to seven trees or shrubs. The clusters will typically consist of a single species, although mixed groupings, *e.g.*, valley oak-elderberry would also occur. Gray pine will be planted as individuals at the higher points on the site. Clusters of trees and shrubs will be planted 25 to 50 feet apart with native grasslands in between the clusters and within the openings.

The riparian and oak woodland habitats are important wildlife habitat types. The species which will be promoted by expansion of the riparian and oak woodland habitats includes: dusky-footed woodrat, mule deer, great horned owl, screech owl, Lewis woodpecker, ruby-crowned kinglet, western bluebird, blue-gray gnatcatcher, solitary vireo, California king snake, California night snake, white-tailed kite, Cooper hawk, Swainson's thrush, hermit thrush, blue-gray gnatcatcher,

cedar waxwing, Hutton's vireo, orange-crowned warbler, common yellow-throat, black-headed grosbeak, rufous-sided towhee, dark-eyed junco, Pacific rubber boa, coachwhip, sharp-tailed snake, ring-necked snake, California toad, Pacific tree-frog, and many others. Especially important, and targets for restoration, are the Swainson hawk and burrowing owl, both special status species.

C. PHASING

Habitat restoration will occur in the same phases as the mining. However, restoration of the creek portion of any mined parcel will occur prior to or concurrent with mining of that parcel while mined land reclamation will occur immediately following the cessation of mining on that parcel. Accordingly, for any of the parcels covered by this plan, the phasing sequence will consist of: (1) restoration of that portion of the creek; (2) mining the parcel; and (3) reclamation of that parcel. This phasing program assumes that either a County plan for Creek restoration or the Creek restoration program proposed in this plan will be approved; should neither plan be approved by the time of mining or an alternative developed by the County (such as payment of an in-lieu fee to promote creek restoration), then this Creek restoration would not occur.

D. OWNERSHIP AND FINANCING

CCA already has title to or options on all of the land within the proposed mining and reclamation program. CCA shall be responsible for all construction, monitoring and maintenance of the reclamation project. CCA shall monitor all habitat construction, maintenance, and monitoring work within the reclamation area until that work is determined to be successfully completed by the County. CCA shall remain responsible for the success of the restoration efforts unless the County or its designee, at its option, assumes this responsibility.

III. MONITORING PROGRAM

A. INTRODUCTION

Monitoring is divided into two phases. The first phase involves monitoring of the construction project to ensure its compliance with the approved mitigation program and relevant permits. The second monitoring phase will be a study of changes to the habitats after construction to show whether or not the existing and created vegetation is developing as intended. Each phase of mining will require its own monitoring program as detailed in this plan.

This section of the mitigation program provides the general requirements for the monitoring program, specific monitoring parameters, performance standards for determining post-construction success, and a discussion of proposed remedial actions that may be warranted if the performance standards are not met.

B. CONSTRUCTION MONITORING

Construction of all or any portion of this project will be completed by CCA. CCA shall require a performance bond from any other contractor performing the construction work. Additionally, all construction in the project area that affects either preserved or created habitats shall be monitored by a qualified ecologist with proven experience in the areas of habitat development and restoration, hereafter termed the "Ecological Monitor" (EM).

During the construction phase, it is the responsibility of the EM to ensure that the project is built in accordance with the approved mitigation program, relevant permits, and any other documents approved as a part of this project. The EM shall inspect all aspects of habitat construction that relate to implementation of the mitigation program and shall keep a daily construction log of all relevant construction activities. The EM shall immediately notify CCA whenever construction deviates from the approved permits and mitigation program.

When necessary, the EM shall notify CCA of any changes required in the relevant project permits due to adverse site or other conditions encountered during construction. Within six months of completion of each phase of the restoration project, the EM shall sign a copy of the construction log and as-builts, certify that the project was built in accordance with the relevant permits, send a copy of the signed as-builts to the relevant permitting agencies and request, in writing, inspection of the project. If the permitting agencies do not respond within 30 days, project construction shall be deemed complete and constructed in accordance with the relevant permits.

C. POST-CONSTRUCTION MONITORING

1. General Requirements

a. Post-construction monitoring of created natural habitats shall occur for five years after reclamation of each unit of a restoration zone. Monitoring and construction may be phased such that segments of the project area are monitored at different times.

b. The results of the monitoring program, including photographs taken along permanent views, shall be submitted in an annual report to the permitting agencies by August 15 of each year.

c. All post-construction monitoring shall be completed at the direction of a EM whose duty is to ensure that the project is monitored and maintained in accordance with the relevant permits.

d. To ensure long-term maintenance practices continue that support the purposes of the mitigation program, a maintenance manual shall be developed during the fifth year of the post-construction monitoring and circulated to the relevant permitting agencies for comments. The manual shall then be finalized and submitted to the county or its designee with the final monitoring report. The manual shall detail maintenance procedures such as erosion control, debris removal, exotic plant eradication, irrigation guidelines, species cultural requirements, and replanting.

2. Monitoring Parameters

a. Vegetation

Mortality rates, vigor, and height of all planted trees and shrubs will be evaluated by field surveys during both the early spring and late summer (the period of early emergence of new growth and that of greatest stress on the planted vegetation, respectively). Each planted tree or shrub will be assigned to one of three height classes: Class 1 plants will be trees 24 inches or less in height, shrubs 12 inches or less in height, and vines 12 inches or less in diameter; Class 2 plants will be trees from 24 to 60 inches in height, shrubs from 12 to 36 inches in height, and vines from 12 to 36 inches in diameter; Class 3 plants will be trees greater than 60 inches in height, shrubs greater than 36 inches in height, and vines greater than 36 inches in diameter. At the same time, the EM will assign each plant to a category of healthy, unhealthy, or dead. Photographs of each type of plant for a representative sample will be included in the monitoring reports. Woodland monitoring shall also include an inventory of all native trees and shrubs that germinate on-site without artificial propagation and reach a height of 36 inches or more. The height, number, and species of these plants shall be reported in the monitoring reports.

Permanent plots marked by rebar or other, permanent markers in marshes and grasslands will be used to assess plant cover, species richness, and the relative cover of wetland and native species. Sampling will use releves in accordance with the procedure described by Mueller-Dumbois and Ellenberg or similar procedure. At least 45 permanent plots, each 10ft x 10ft, will be used to monitor these elements. Plot locations shall be divided equally among those placed on the edges of the proposed habitat and those placed within the interior of the proposed habitat. Within those two areas, locations shall be randomly selected. Sampling will occur once annually during the late spring.

The marsh plots shall also be monitored each month of the wet season for water surface elevation and inundation period for the first two years of the monitoring period. Water surface elevation monitoring shall consist of a permanent marker (the rebar marker noted above may be used) that can be used to define water depth.

b. Wildlife

Bird use will be the only wildlife monitoring completed for this project. Bird surveys shall be completed as set forth below each year during the five-year monitoring period for each restored area. These surveys shall each include at least quarterly, three-hour surveys for each reclaimed unit. Surveys shall include a walk-through around half the perimeter of the wetland area within each reclaimed unit. All bird species shall be noted on survey forms along with the numbers of birds, their location, and their activities.

D. PERFORMANCE STANDARDS

Restoration success shall be evaluated against the following performance standards. For the woodlands, the performance standards require that all trees be healthy and at least 60 inches or taller (Class 3), the same species be represented in the final mix in similar proportions as are currently proposed, and a mortality rate for all plants of no more than 20% below proposed average densities is achieved.

For the marshes, the hydroperiod and depth of water are extremely important to successful construction. This program provides that the hydroperiod and depth must be appropriate to the establishment of the specific wetland type. Plant cover of the marshes must be at least 80%, with at least six species present (the number of species typically found now in a 10ft x 10ft sample of the wetlands).

After completion of the construction program for each portion of the restored zone, the elements noted above will be monitored for a period of five years with monitoring occurring annually. At the end of the fifth year of monitoring for each area, a final evaluation will be completed and provided to the County for review. The monitoring or the relevant component of the monitoring shall be extended, if all or a portion of the habitat restoration is judged to be unsuccessful, until

the unsuccessful portion of the project meets the above performance standards.

E. REMEDIAL ACTIONS

CCA has the responsibility to create a successful restoration program and will manage the restoration areas in an iterative manner, *i.e.*, where the monitoring program shows an area is tending toward an unsuccessful conclusion, the applicant shall take action to correct that trend. These actions would include site modification and/or replanting. For example, a portion of the plantings may fail due to inappropriate elevations (too high or too low). The mortality or lack of vigor in the plants would make this problem and the logical solution evident within the first few years of the monitoring.

Generally, the marsh creation components of the program are relatively immune to post-construction problems if the water surface elevations and hydroperiods established after construction are appropriate. However, woodland plantings will require active maintenance during the monitoring period and are subject to the common problems of many landscape construction projects.

Major corrective actions will be taken only after consultation with the permitting agencies and generally will occur after an annual progress report, including recommendations needed to ensure the project meets the performance standards, has been submitted. Where the agencies do not comment within 30 days on the recommendations within the report, the report shall be deemed acceptable and the applicant shall proceed to implement these recommendations. At the end of the fifth year, the monitoring report will summarize the previous reports and evaluate the success of the project against the performance standards. If a major adjustment to the program, i.e., regrading or similar action, has occurred in the recent past, the applicant can request that the final evaluation for all or a specific portion of the project be suspended for a specified period of time.

Where the mitigation program or a portion of the mitigation program fails to meet the performance standard, it will be the applicant's responsibility to correct the unsuccessful portions of the project. Corrective measures will include techniques that have been shown to be successful at this site or other similar areas and could include significant regrading or replanting. These unsuccessful portions of the project will then be monitored until they are shown to meet the same performance standards.

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APPENDIX A

Preliminary Habitat Construction Specifications

I. CONSTRUCTION NOTES

All specifications throughout this document are preliminary in nature and are not to be used for bidding purposes. Before actual construction begins, specifications as to detailed quantities, rates, ratios, and/or cultural practices will be required to construct this plan. The order of operations set forth in these specifications is believed to be the most efficient method of constructing this project; however, changes or adaptations to the order of operations may be necessary to allow for weather conditions or other factors. It is imperative that the created and existing habitat sites (the "habitat areas") not be disturbed by non-habitat construction, such as emplacement of bridges or other structures. This includes using habitat areas as right-of-ways to transport equipment; this does not include use of existing or planned access roads. Communication and coordination between mining and habitat construction is essential. Items such as access to sites, turning on or off utilities, stockpiling materials on project sites, or any situation that might affect each other's operations need to be resolved in advance.

The owner will designate an Ecological Monitor (EM) to ensure that the habitat area is constructed in accordance with the approved mitigation plan. The EM will be responsible for certifying that the project has been built in accordance with the approved mitigation program and permits and will monitor all operations occurring in the habitat areas. The name and phone number of the EM will be given to the owner's project manager for distribution.

B. ORDER OF OPERATIONS

1. Marking Boundaries

The EM will be responsible for having the boundaries of the habitat area located and marked, as well as designating any indigenous material that is to be saved or salvaged. All habitat and salvage areas will be marked so they will be easily identified in the field and will be maintained throughout the construction phase where applicable.

2. Grading

Grading operations must follow local regulations with regard to start and stop times and dust control as required. All grading will be done to meet the requirements of the approved mitigation plan. The EM will monitor grading construction and grade checking.

Any plant material that must be salvaged prior to grading will be done at the direction of the EM. Any excess soil that needs to be transported off site will be coordinated with the owner's project manager.

3. Irrigating

All new plants and cuttings, with the exception of willows, cottonwoods and similar low-terrace species, will be irrigated using a drip irrigation system. Before passing through the polyethylene tubing, all water will be filtered and the pressure reduced. Poly lines may be installed above grade. Six-inch staples or jute hooks will be used to secure poly tubing in place. Staples will be placed every ten feet and one foot on both sides of the planting. All lines must be thoroughly flushed before inserting emitters. Lines will be flushed using flushing end caps. Each planting receives its own emitter. It is very important that each emitter is placed directly over the rootball as the densities of the rootball and indigenous soil are quite different. Pressure testing upon completing the main line and valves will be required. Lateral lines will be left on for a period of at least two hours to visually inspect all leaks. Upon completing the irrigation system, the EM will make a final walk through and verify the system is operating correctly.

4. Planting

All plant material used for this site will be collected from material within the same region. Considerations as to the proximity of the gene pools and planted species vary greatly from one plant species to another, and the EM shall give direction in this area.Plants for this site will need to have been collected, propagated, and grown for at least one growing season prior to planting. Plant material will be free from disease, insects, weeds, and not rootbound. All plant material will be identified correctly as to genus and species. All plant species and quantities will correspond to the planting plan. No substitutions will be allowed without prior permission from the EM. The EM will inspect all plants before planting occurs.

Planting should occur sometime between late fall and early spring (see Operation Schedule). All planting holes should be completely settled so plants will not sink below grade. Holes shall be dug in the soil just big enough to accept the rootball. Osmocote 18-6-12 fertilizer will be dibbled in the hole at the specified rate noted in the planting plan. The plant shall be planted so that the crown is level with grade. The rootball will be covered with 1/4" of soil to prevent a wicking effect from drying out the rootball. A plant emitter shall be placed directly on top of rootball and the plant watered thoroughly. Plants shall all be checked for settling and stress. After the planting has been approved and certified by the EM, shredded bark or similar mulch will be placed to a depth of two inches adjacent to the plant, making sure not to cover the crown of the plant.

Pole cuttings will be used on certain riparian species. Poles will be 3/4" to 2" in diameter and three feet in length. All cuttings will be taken from young wood and be free of disease. Two feet of cutting will be pounded into the ground and soil tamped around the cutting. Six to 12 inches will be left above grade and the top cut off at a 45 degree angle. Cuttings must be kept moist and planted the same day as they were cut. The EM will monitor the pole cutting operation and give direction as to locations and identification of plant material.

The location of all salvaged material, such as marsh plants that must be transplanted, will be identified by the EM. The method of planting will also be identified by the EM due to the variable site conditions.

5. Seeding

The optimal time for all seeding operations is in the fall. Seed can be planted any time between fall and spring; however, the earlier the seed is planted, the higher the percentage of seed emergence that becomes permanently established. The key will be to get the root zone as deep as possible before summer conditions arrive. The deeper the roots of the seeded material are before summer conditions arrive, the better opportunities these roots will have to follow the subsurface moisture level downward through the soil.

All seed used on this site will be certified as to germination percentage. Seed will be weed-free and disease-free and follow specifications in the planting plan. No substitutions will be made without advance permission from the EM. All rates and ratios will follow specifications in the planting plan and the EM will inspect all seed, soil preparation, calibration ratios, and phases of seeding operations. Soil preparation and seeding techniques will be adopted for each site and outlined in each site's planting plan.

APPENDIX B

Preliminary Maintenance Guidelines

A. INTRODUCTION

All specifications in this maintenance section are general in nature and are not to be used for bidding purposes. This maintenance section will treat all the habitat areas of this project as one area.

B. MAINTENANCE TASK DESCRIPTIONS

1. Weed Abatement

The most significant task in any recently disturbed area will be the control of exotic weeds. The most invasive of these is yellow star thistle (*Centaurea solstitialis*). It is extremely important that exotic weed species are kept under control from the beginning of the maintenance period in an attempt to reduce the seed bank in the soils on site. The EM will be notified in advance before any weed abatement begins. All parties involved in weed abatement tasks will be aware of the mitigation specifications and location of sensitive areas on-site. When mowing with tractor implements, a flail-type mower will be used and a fire extinguisher will be on the tractor at all times.

2. Basin Control

Planting hole weed control is very important, especially during the first two years of maintenance. Weeds in and around plant holes will compete for sunlight, water, and nutrients with the plants. Areas adjacent to the plants will be kept weed free in a four foot diameter circle centered around each plant. Planted trees and shrubs that are closer than six feet will have a weed free strip between them. No use of weed-eating machinery will occur in or around the crown area of the plant so as to prevent girdling.

3. Native Grass Management

The EM will direct the timing of weed abatement as dictated by site conditions and weather. Native grass areas will need to be mowed periodically to promote root growth. Exotic annual grasses in native grass areas will need to be mowed as seed heads are being formed but before seed maturation.

It may be necessary during the first two years of the maintenance period to use integrated pest management techniques and incorporate broadleaf herbicide applications. This may be necessary if invasive exotic weeds become dominant after mowing operations. Herbicide applications will be kept to a minimum and all spraying will be done by a California licensed qualified applicator. All herbicides used will follow the written recommendation of a California licensed pest advisor.

This written recommendation will be kept on file by the EM. No spraying will occur within ten feet of any wetland area.

4. Plant Care

Most plants should require little cultural care, except for irrigation and weed control in the basins. Plants should be fertilized once in the spring of the second and third year of maintenance. Fertilizer will be dibbled into the basin in accordance with specific guidelines contained in the maintenance program. Trees may need to be staked. This decision will be made by the EM. Two eight-foot, pressure-treated stakes, two inches in diameter, will be placed two feet in the ground, one foot on either side of the tree where so directed. One-inch tree-tie tape will be placed in a figure-eight pattern between the tree and stake one foot below the top of the stake.

5. Irrigation

The irrigation system on this site is critical, not only for the target plants, but also regarding irrigation malfunctions, which could allow over watering of nontarget vegetation. A check of the irrigation system should be done during each watering. All irrigation scheduling decisions will be made by the EM. All drip lines and filters shall be flushed as needed. Emitters must be checked regularly for malfunctions, the position of emitter over rootball, and vandalism. Flushing end caps must be checked regularly. Backflow devices and main line systems shall be drained completely at the end of the irrigation season to prevent rupturing due to freezing during the winter season.

Irrigation for plantings is a temporary tool to help establish the created habitat. Water will be decreased every year and ideally will not be needed by the fourth year. Watering the plants should not be used to create lush plants, which will become dependant on regular watering. Deep watering, spaced at the longest time possible before plants show signs of stress, will be used. This watering will encourage plant roots to travel downward into water zones in the soil.