Pacific BioScience, Inc.

OC RECLAMATION

HABITAT MITIGATION MONITORING PLAN
PART I – ONSITE ENHANCEMENT

October 2018
Revised September 2021

Prepared for:

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Habitat Mitigation Monitoring Plan

for

OC Reclamation

September 2021
(Revised)

Prepared By: _____ Date: 9/27/21

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October 2018

Prepared By: _____ Date: 10/5/18

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1.0 INTRODUCTION

This habitat mitigation and monitoring plan (HMMP) details onsite enhancement and habitat creation as partial mitigation for impacts to two acres of occupied least Bell's vireo habitat, and one acre of wetland of the state. A separate HMMP (Part II – Offsite Enhancement) was prepared for offsite enhancement to complete the requirements set forth in the associated Low-Effect Habitat Conservation Plan (March 2018) accepted by U.S. Fish & Wildlife Service (Service) and an incidental take permit to be issued by same.

The purpose of the HMMP is to create and/or enhance the native vegetation and wildlife habitats on site as mitigation for project impacts. This plan is a blueprint of the measures to be taken to achieve the project's goals. This HMMP addresses the following issues:

- Habitat enhancement and performance criteria by which replanting success is measured;
- Stream channel and creek flow modifications to ensure enhancement success;
- A planting plan, including an irrigation plan;
- An exotic vegetation management plan;
- Methods to protect the plantings until established;
- A contingency plan in the event performance criteria are not met;
- Within the riparian habitat and adjacent transition areas, habitat will be enhanced through eradication of invasive non-native plants and the planting of native species;
- Only indigenous native plants to be installed in the plan area; and
- Procurement of native seed, cuttings or container plants will be obtained from known sources in the watershed. If however, insufficient seed/plant sources are available or of poor quality, the procurement area can be expanded with agreement by the resource agencies.

This report identifies the protocol to be used to implement the Plan, which incorporates the above requirements. This plan covers 3.36 acres of open space area(s), which incorporates the creek and adjacent transitional areas. There are five aspects of this plan: (1) eradication of exotic plant species; (2) planting native species; (3) site hydrology/irrigation; (4) maintenance; and (5) monitoring to ensure that the Plan's goals are achieved. As mentioned previously, the goals are to replace non-native plant species with native species and to create a self-sustaining native vegetation cover that will enhance wildlife habitat values on the site. In addition, this plan will create an open space area that is visually pleasing to adjacent residents. The maintenance and monitoring program identified herein will determine the immediate and long-term success of the plan.

1.1 Responsible Party

OC Reclamation is responsible for implementing mitigation for the proposed project (Project), including measures identified in the HMMP.

1.2 Project Description

The Project proposes to fill and grade an abandoned pit mine located in the City of Orange. Mining operations stopped in the 1960's. Although the entire project site has been disturbed from past mining operations, natural plant communities now occur in some areas.

Over a five-year period, the Project would fill the exposed mine pit and grade to level most of the surrounding area within the property limits. The southern slope of Santiago Creek at the northern boundary of the property would be re-contoured to allow for widening the creek and an earthen berm would be created separating Santiago Creek from the balance of the site.

As stated, there will be on-site and off-site mitigation required to offset impacts resulting from implementing the proposed project. Onsite mitigation includes creation of riparian habitat along Santiago Creek by expanding an existing bench just above water line and enhancing the remainder of the creek's plant community within the project limits. Offsite mitigation will be conducted at a site known as Saddle creek approximately 10 miles southeast of the project site. Mitigation there will include creation of transitional riparian/upland plant community and enhancing existing habitat by removing non-native plants.

1.3 Hydrology

The Project is within a semi-arid region, and therefore there is little natural perennial surface water. As a result of the variability of rainfall, particularly over the past several years of drought conditions, surface hydrology is limited only to the perennial flow within Santiago Creek and an ephemeral wash created by road surface runoff leading into the mined pit, flowing only during storm events.

Hydrologic regime for the area follows the general Mediterranean climate, with cool, wet winters and warm, dry summers, but is also occasionally influenced by summer monsoons. The average rainfall for the project site is approximately 13 inches annually with most of the rainfall occurring December to March.

1.4 Vegetation

The project site is generally undeveloped with remnants of an historic mining pit. Because the mining operation ceased many years ago, vegetation has grown and now surrounds the mining area. As such, vegetation occurring on the site today is highly disturbed, non-native plants and patchy regrowth areas of native plants. Plant communities include disturbed, eucalyptus semi-natural woodland stands, disturbed black willow thickets, disturbed California sagebrush, and developed. A description of the existing plant communities on-site are below.

Disturbed

Disturbed areas include those that have been physically disturbed and are no longer recognizable as a native or naturalized vegetation association, but continue to retain a soil substrate. Typically vegetation, if present, is nearly exclusively composed of non-native plant species such as ornamentals or ruderal exotic species that thrive in disturbed areas. Examples of disturbed land include areas that have been graded, repeatedly cleared for fuel management purposes and/or experienced repeated use that prevents natural re-vegetation (i.e., dirt parking lots, trails that have been present for several decades), recently graded firebreaks, graded construction pads, construction staging areas, off-road vehicle trails, and old home-sites. Species observed in this plant community include: prickly Russian thistle (*Salsola kali*), telegraph weed (*Heterotheca grandiflora*), sow thistle (*Sonchus oleraceus*), common horseweed (*Conyza canadensis*), summer mustard (*Hirschfeldia incana*), and a sub-dominance of non-native grasses. This land cover typically occurs in areas with regular clearing and grading or poor soils such as along the pit slopes and access roads.

Eucalyptus Semi-natural Woodland Stands

At least nine species of Eucalyptus species occur in California. The genus is native to Australia. It has yellowish-white flowers, narrow, lanceolate leaves and shredding bark in irregular strips. Widespread commercial plantings occurred after 1870 and in the late 1900's for lumber and firewood. Seedlings aggressively invade neighboring areas. Understories in groves of these fast-growing long-lived trees are usually depauperate. A buildup of allelopathic chemicals in the soil and high volumes of debris inhibit the establishment of other plants.

Disturbed *Salix gooddingii* Woodland Alliance (Black Willow Thickets)

Disturbed black willow thickets are characterized as areas permanently or periodically inundated by water that have been significantly modified by human activity. Disturbed black willow thickets include portions of riparian habitat with an element of non-native species such as tamarisk (*Tamarix* spp.), but include native species such as: mule fat (*Baccharis salicifolia*), and cattails (*Typha* spp.).
Within the project site, this habitat was observed in the base of the pit and along the northern boundary bordering Santiago Creek. This habitat type observed on site was dominated by willows with some mule fat intermixed along the upland areas and cattails in the low-lying areas. The Santa Ana Regional Water Quality Control Board One determined one acre of this plant community is wetland of the state.

Disturbed California Sagebrush

California sagebrush scrub is a series of habitat classification that include areas of fairly open cover dominated by California sagebrush (*Artemisia californica*) and intermittent California buckwheat (*Erigonum fasciculatum*) and sage (*Salvia* spp.). Classifications vary by geographic location; however, species composition is typically similar. California sagebrush is found in coastal regions of Southern California. It is typically found on upland sites such as steep slopes, with shallow and

rocky soils. Distribution includes along the coastal base of the Transverse and Peninsular ranges from central Los Angeles County south to beyond the Mexican border.

The California sagebrush habitat within the project site is found along the northern and eastern portion of the site. The presence of non-native vegetation interspersed indicates significant disturbances in the past. As such, it is classified as low quality California sagebrush habitat with intermixed non-native grasses.

Developed

Developed land cover is classified as areas that have been constructed upon or otherwise physically altered to an extent that native vegetation is no longer supported and retains no soil substrate. Developed land is characterized by permanent or semi-permanent structures, pavement, or hardscape, and landscaped areas that often require irrigation. Areas where no natural land is evident because a large amount of debris or other materials have been placed upon it may also be considered developed (e.g., car recycling plant, quarry). Characteristic vegetation includes unvegetated or landscaped with a variety of ornamental (usually non-native) plants. Developed areas within the project limits are the access roads and existing structures.

1.5 Soils

The project site is mapped as containing four soil series. A soil series is a group of soils with similar profiles. These profiles include major horizons with similar thickness, arrangement, and other important characteristics. These four soils series are:

> **168 – Modjeska gravelly loam, 0 to 2 percent slopes**: consists of deep, well-drained soils formed in mixed alluvium. Found on the coastal plain of southern California at elevations of 200 to 1,500 feet and often cultivated. Typically a grayish-brown or brown gravelly loam or gravelly fine sandy loam with less than one percent organic matter (Soil Survey Staff 2015).
>
> **185-Pits**: consists of open excavations from which soil and underlying material, mostly sand and gravel, have been removed for construction. Present land use is construction material, idle land, or ground water recharge if these areas are in a streambed (Soil Survey Staff 2015).
>
> **194-San Emigdio fine sandy loam, 0 to 2 percent slopes**: consists of very deep, well-drained soils that formed in dominantly sedimentary alluvium. Found on fans, floodplains, and narrow valleys at elevations of 100 to 2,000 feet and often historically cultivated or grassland. Typically a light- brownish gray fine sandy loam with many very fine roots throughout (Soil Survey Staff 2015).

197-Soboba gravelly loamy sand, 0 to 5 percent slopes: consists of deep, excessively drained soils that formed in alluvium from predominantly granitic rock sources. Found on alluvial fans and floodplains at elevations of 25 to 3,700 feet and historically annual grass pasture. Typically a grayish brown stony loamy sand that is loose and very friable with many fine roots and interstitial pores (Soil Survey Staff 2015).

2.0 QUALIFICATIONS OF ENHANCEMENT PERSONNEL

The project biologist will be responsible for the supervising all aspects of the enhancement and habitat creation from site preparation to maintenance, monitoring and ultimately agency signoff. The project biologist must have at least three years of experience in dealing with native habitat enhancement along the southern coast of California. The biologist also shall be familiar with all native plant species to be installed on the project site as well as the sensitive species, which may occur.

The enhancement contractor will be responsible for the proper installation and maintenance of the enhancement areas. The contractor will have a working knowledge of the existing habitats on site, and will be familiar with all of the native plant species to be installed. The enhancement contractor, as with the project biologist, shall have at least three years of experience in dealing with native habitat enhancement along California's southern coast. A separate contractor maybe used for initial site preparation/installation and maintenance; however, we recommend that the same company complete all of the work. Regardless of the number of contractors used to complete the project, all must satisfy the above prerequisites.

3.0 WEED ERADICATION

One of the main goals for the open space areas is to remove introduced, weedy species from the preserved areas and to encourage the growth and establishment of a native plant cover. The term "weed" is variously defined in the literature. For the purposes of this project, we consider a weed to be an alien plant species that is introduced as a result of human activities or disturbances and becomes established to the detriment of native plant species. Special-status species appear to be particularly vulnerable to the changes created by non-native, weedy invaders, which is why weed control must be part of all enhancement projects.

Although there are patches of native plants on the site, much of the site is dominated by introduced grasses, forbs, shrubs, and eucalyptus trees, which will generally out-compete and replace native species if action is not taken to eradicate or control them. In order to create a self-sustaining cover of native plant species, competition from introduced species must be reduced. Methods of weed management may differ

between the creek and transitional zones in both technique and intensity. The goal of weed management is not to eliminate all weeds from the site, which would be very difficult or impossible, but rather to control weeds to the point that native plant communities can become established, be self-sustaining, and persist.

3.1 Pre-Project Eradication

Prior to planting and seeding activities, it is necessary to remove as much of the exotic (non-native) plant material from the enhancement areas as possible. The non-native plant cover will be removed, including the introduced, weedy species in the transitional areas. This will allow the native plantings to become established without having to compete with exotic plants for resources. Weed management can occur in a number of ways, including chemically through the use of herbicides, mechanically through the use of mowing equipment, or by hand clearing. In addition, non-native trees will be removed from the site with as little damage to existing native plants as possible. Due to the disturbed nature of the site and the large number of introduced weed seeds in the upper layers of the soil, topsoil does not need to be salvaged, but it is suggested.

Weed removal will be pursued aggressively. Irrigation will be installed around the perimeter of the planting and seeded area. The irrigation system will be activated for three consecutive days at one hour per day. This will allow the weed seeds in the soil to germinate. The new immature weed cover will be treated with appropriate herbicide prior flowering and seed production. In areas where there are dense patches of weeds, herbicide will be applied, and the dead weeds will be removed. In areas where weeds are sparse, removal of dead weeds is unnecessary. This "grow-kill" process of watering and herbicide applications will be completed at least two additional times for a total of three.

Weed eradication in the creek area will be mostly by hand removal. Noxious weeds, such as Harding grass, milk thistle [*Silybum marianum*], smilo grass, and fennel will be targeted for aggressive eradication. Mechanical removal and herbicide application may be used in cases where hand weeding is not effective, such as with the removal of Bermuda grass. Any weeding, other than by hand, in creek areas must be approved by the project biologist and follow California Department of Pesticides Regulation certified Pest Control Advisor (PCA) recommendations for herbicide application.

<u>Chemical Removal</u>

Because the enhancement area includes portions of a creek, herbicide use will be restricted and used only under the conditions listed below. All herbicide and pesticide use will be in conformance with the manufacturers recommendations. The use of herbicides will be prohibited when:

- Wind speeds exceed 5 m.p.h.;

- Rainfall has occurred or is expected to occur within the following 48 hours; and/or
- Standing or flowing water exists in immediate area identified for eradication

Other limitations and regulations regarding herbicide use include the following:

- Only herbicides approved for aquatic areas will be used (glyphosate-based chemicals such as Rodeo™);
- A backpack or hand held sprayer with a nozzle adjustment would be used to adequately control the direction of the spray;
- Colored dye will be added to the herbicide to easily identify spray location;
- No native plants will be targeted;
- Treated plants will not be disturbed until the herbicide has had adequate opportunity to take effect (two to four weeks); and
- Removal activities will be monitored in the schedule identified herein, with further removal activities to be conducted in accordance with this schedule.

If surfactants are required, they will be restricted to non-ionic chemicals (such as Agri-Dex), which are approved for aquatic use. Herbicides will be applied as recommended by a PCA and according to manufacturer's label recommendation. Pesticides will be applied under the direction of a licensed pest control applicator (i.e., a person holding a Qualified Applicator's License and Certificate). Herbicides will be utilized in accordance with the schedule identified below. Both herbicides and pesticides will be applied only after consultation with the project biologist.

Hand Removal

If the use of herbicides cannot occur in accordance with the provisions identified above, removal activities will occur by hand. Vegetation removed from the site will not be stockpiled in the open space areas overnight.

Mechanical Removal

Mechanical removal of non-native weeds will occur on a limited basis in the enhancement area. The goal of mechanical removal is to remove the weedy cover, thatch, and seed pool from large areas that are inaccessible to scraping during initial weed eradication.

Mechanical removal will consist of using a line trimmer or brush mower to cut weedy grass and forb species. Mechanical cutting will always be accompanied by hand raking and removal of cut material. A chain saw will be used as necessary for the removal of identified non-native trees. Care will be taken to avoid all native plant species to the extent practicable when using mechanical means.

4.0 PLANTING AND SEEDING

The planting and seeding will occur as generally described in the HCP. A more detailed narrative description of planting and seeding in the project area, as well as plant and seed procurement, is provided below.

4.1 Enhancement Areas

Two distinct areas subject to enhancement efforts are: 1) willow thicket mulefat scrub; and 2) LBV transitional foraging habitat.

4.1.1 Willow Thicket/Mulefat Scrub

Enhancement will consist primarily of removing the exotic plant species and planting with native species indigenous to the area. The species diversity of the thicket scrub areas will be enhanced by planting indigenous species known to occur in nearby similar habitat areas, such as the species listed in Table l. This list is not intended to be restrictive. Other plants can be used providing they are native to the area and are typically found within a willow thicket or mulefat scrub community.

Success of plantings rests in the ability to understand site conditions such as soil, topography, water availability, and sun; and then predict which plant communities and plants will thrive naturally. This can be challenging, so it is important to maintain flexibility. This Plan outlines areas of plantings, but won't identify specific locations of individual plants. It is intended that individual plants will be installed, then evaluated periodically for success or failure. Adjustments shall be made accordingly.

Container size for each species can vary depending on appropriateness for the species and availability. Generally, one-gallon size plants are best because of their ability to adapt, although smaller or larger can be used. Cuttings of willows can be used from nearby plants.

Table 1: Plant Palette for Enhanced (Willow Thicket/Mulefat Scrub)

Species	Container Size for Planting (gallon)	Plant Spacing (on-center spacing in feet)
Arroyo willow (*Salix lasiolepis*)	1 or cuttings	5-20
Black willow (*Salix nigra*)	1 or cuttings	5-20
Cottonwood (*Populus fremontii*)	15	20
Gooding's willow (*Salix gooddingii*)	1 or cuttings	5-20
Mulefat (*Baccharis salicifolia*)	1	8-10
Red willow (*Salix laevigata*)	1 or cuttings	5-20
Sycamore (*Platanus racemosa*)	15	20

Following site preparation, irrigation will be installed around the perimeter of the site, and container plants will be installed.

4.1.2 LBV Transitional Foraging Habitat

This enhancement area will be addressed similarly to willow thicket mulefat scrub with the removal of exotic plant species and planting with native species indigenous to the area. The species diversity of the transitional foraging areas will also be enhanced by planting indigenous species known to occur in nearby similar habitat areas, such as the species listed in Table 2 and Table 3. Again, this list is not intended to be restrictive and adjustments to the plant palette can be made as needed. Generally, one-gallon size plants are best because of their ability to adapt. Seeds should be collected from plants occurring on site. However, due to the limited size and seed sources on site, collected seed may be supplemented with purchased seed. Purchased seed must come from a reputable seed supplier (such as but not limited to S&S Seeds) and must have been collected locally from the designated region near the site. Seeds should be collected from the site prior to ground disturbance throughout the year; however the period between January and September (depending on the species, amount of rainfall, and temperature) should be the best times to collect seeds. Because seed production varies among species and from year to year, a botanist or other qualified individual should make monthly collecting visits. The goal is to collect the maximum amount of seed at full maturity.

Table 2: Plant Palette for Enhanced (LBV Transitional Foraging Habitat)

Container Plants		
Species	**Container Size for Planting (gallon)**	**Plant Spacing (on-center spacing in feet)**
Black elderberry (*Sambucus nigra*)	15	15
California fan palm (*Washingtonia filifera*)	10	15
California rose (*Rosa californica*)	1	8-10
Coyote brush (*Baccharis pilularis*)	1	8-10
Deergrass (*Muhlenbergia rigens*)	1	8-10
Giant wild rye (*Elymus condensatus*)	1	8-10
Mulefat (*Baccharis salicifolia*)	1	8-10

Table 3: Seed Mix for Enhanced (LBV Transitional Foraging Habitat)

Seed Mix	
Species	**Lbs/Acre**
Blue eyed grass (*Sisyrinchium bellum*)	2
California bee plant (*Scrophularia californica*)	2
Caterpillar phacelia (*Phacelia cicutaria*)	2
Coast range melic (*Melica imperfecta*)	2
Douglas' nightshade (*Solanum douglasii*)	2
Fiddleneck (*Amsinckia menziesii*)	2
Ladies' tobacco (*Pseudognaphalium californicum*)	2
Lupine (*Lupinus bicolor*)	2
Ragweed (*Ambrosia psilostachya*)	2
Small fescue (*Vulpia microstachys*)	2
Wild canterbury bells (*Phacelia minor*)	2

4.2 Created Riparian Area

The created riparian area is similar to the plant composition of the enhanced LBV transitional foraging habitat, however, there will be a greater emphasis on willow cuttings with adjacent mulefat along the edges as this most closely represents the plant community existing on site. The created bench will mimic the existing characteristics of Santiago Creek and the willow and mulefat plantings will benefit from the consistent water that the creek provides. The plant palette for the created riparian area is presented in Table 4 below. Willow cuttings will be installed abundantly throughout the created riparian area and one-gallon container size mulefat plants will be installed at the higher elevations.

Table 4: Plant Palette for Created Riparian

Species	Container Size for Planting (gallon)	Plant Spacing (on-center spacing in feet)
Arroyo willow (*Salix lasiolepis*)	1 or cuttings	5-20
Black willow (*Salix nigra*)	1 or cuttings	5-20
Gooding's willow (*Salix gooddingii*)	1 or cuttings	5-20
Mulefat (*Baccharis salicifolia*)	1	8-10
Red willow (*Salix laevigata*)	1 or cuttings	5-20

4.3 Wetland Waters of the State

Excavation of two shallow ponds will occur adjacent to Santiago Creek at the base of the southern slope, but above the high-water mark of the creek. This area will be planted around the perimeter of the ponds similar to Created Riparian Area with willow species, except without mulefat. One or more of these willow species may be planted onsite, provided at least black willow, as this species is found currently onsite. See Table 4 Plant Palette for Created Riparian above for willow species, container size, and spacing.

4.4 Planting Techniques

Container stock plants will be installed in the enhancement and created areas. The recommended plant palette is presented in the tables above; however, other suitable native, indigenous plant species may be added as recommended by the consulting biologist. Prior to plant installation, untreated jute netting will be installed on the banks of the channel to reduce sediment erosion. In areas where jute netting has been installed, openings will be created to allow container stock plant installation. If site conditions warrant, gopher baskets will be placed around shrub and tree plantings.

Fertilizers will only be used in extraordinary situation with approval from the project biologist. All plantings will be placed in a randomly spaced natural pattern. The average planting densities will be determined based on the center spacing criteria specified in Tables 1, 2 and 4.

Methods to Protect Plantings Until Established

In areas where the project biologist determines that burrowing animals (e.g., gophers, squirrels, etc.) may affect plantings, chicken wire or gopher cages will be placed around the rootball, including the bottom. Cages will be placed a sufficient distance away from the rootball so as not to impede growth and will use a wire mesh no larger than 0.5 inch. Similar techniques would also be used on trees. In order to protect plantings from grazing herbivores, above-ground cages, approximately two to three feet tall will be anchored to the ground in such a way that animals cannot gain access to the plants. Fencing or caging will be conducted under the direction of the project biologist and their use would be based on the severity of damage to plantings. Some damage or use is expected as the plants will be providing some wildlife habitat enhancements.

5.0 SITE HYDROLOGY/IRRIGATION

Santiago Creek is perennial with flow varying during the year, but limited to approximately 6,000 acre-feet per hour during high flow by an upstream dam. The excavated bench along the creek will be at an elevation relative to the creek for the plants to reach once mature. See Appendix A - Figures for the grading plan. In

addition to the creek, the natural slope of the site and immediate vicinity allows for rainfall and nuisance water to flow into channels that will enter the excavated bench, helping irrigate long term. Through proper design practices consisting of creation of a bench, permanent on-site drainage channels, and temporary irrigation as discussed below, the plan's goal is to enhance and establish drainage conditions as much as possible so that riparian habitat conditions can be created along the creek.

5.1 Temporary Irrigation

A temporary overhead irrigation system will be installed to ensure that the enhancement plantings and created areas are able to become established. See Appendix A – Figures for suggested design of this system. Irrigation will occur when natural moisture conditions are inadequate to ensure survival of plants. Irrigation will be phased out through the spring/summer of the third year unless the project biologist determines that current conditions threaten survival of the plantings. For the enhancement effort to be considered successful, native plantings must survive and grow for at least two years without supplemental water.

6.0 MAINTENANCE

Following completion of initial grading, the project biologist will train the maintenance crew and supervise maintenance of the enhancement and creation program. This will guarantee that the site receives quality maintenance and that the crew will be able to properly distinguish introduced from native plant species. The maintenance workers will be provided a complete list of plants found on the site (with color photographs). Maintenance will occur for a period of five years, after which the project will be evaluated per for success. If the project does not meet the performance criteria, maintenance will continue until met.

Maintenance activities will consist primarily of weeding, irrigation repair, and plant and seed replacement. The success of the enhancement will rely heavily on the ability of the maintenance personnel to keep weeds out of the enhancement areas. Removing the existing seed bank during initial weed removal will help limit natural weedy seed germination; however, the use of irrigation will encourage additional germination. Therefore, infrequent use of the irrigation and removal of germinating weed seeds will reduce weed growth significantly. The indigenous native seeds and container stock plantings used on the site will be drought tolerant and adapted to the natural rainfall patterns on site. These plants should readily become established; however, container stock plants that do not survive will be replaced in kind, and seeded areas will be reseeded as necessary following installation. Final decisions regarding planting and reseeding will be the responsibility of the project biologist.

6.1 Exotic Vegetation Management

Weeds will be removed initially as described in Chapter 3. Scraping the topsoil/thatch in areas dominated by exotic grasses and forbs prior to project initiation will help to reduce weed cover in the long term by reducing the seed bank, although salvaging topsoil can also provide a benefit. If topsoil is removed, it must be replaced. During the maintenance period, weeds will be hand-removed by a crew trained and supervised by the project biologist. Weed removal will occur throughout the year but will take place more frequently during the winter and early spring when seed germination of introduced annuals is greatest. Following initial weed removal, the goal of the maintenance effort is to remove exotic weeds before they have set seed so that new seeds are not added to the seed bank. With continued maintenance, the goal is to eventually reduce weed cover to the point that maintenance is no longer necessary.

Some weed species will be very difficult if not impossible to eliminate from the site. Some of these are small annual grasses and forbs that have become naturalized in California's grasslands. These should not preclude native plant establishment on the site as they are often found growing with California native grasses in nature. Some tolerance will be given to these species. However, highly invasive noxious weed species will be specifically targeted for eradication. These exotic weeds will have a significant impact on the establishment of native plant species on site if they become established. These targeted, zero tolerance weedy species include Harding grass, smilo grass, giant reed [*Arundo donax*], pampas grass [*Cortaderia* spp.], sticky eupatorium [*Ageratina adenophora*], umbrella plant [Cyperus involucratus], fennel, Bermuda grass, bull thistle [*Cirsium vulgare*], star thistles [*Centaurea* spp.], Italian thistle, poison hemlock, fennel, kikuyu grass (*Pennisetum clandestinum*), periwinkle, Cape-ivy, and eucalyptus seedlings.

7.0 MONITORING AND PERFORMANCE ASSESSMENT

Regular monitoring of the enhancement area will allow the progress of the enhancement effort to be assessed and adjusted to ensure success. In order to determine the success of the enhancement effort, performance criteria have been established. In addition, a contingency plan has been created in the event that the performance criteria are not met.

7.1 Monitoring Scheduling and Procedures

The enhancement and created areas will be monitored on a regular basis to determine the success of the program. Monitoring will also provide the maintenance personnel with recommendations and make sure goals are being met. Monitoring will be conducted by a qualified botanist familiar with the local flora and vegetation

and with experience in native habitat enhancement. Maintenance monitoring will consist of carefully examining the enhancement areas on foot, collecting photo documentation from established points, and evaluating the progress of the project. After each visit, the project biologist will write a short report summarizing findings and identifying any maintenance actions that need to occur. The monitoring reports will be sent to the project owner and the maintenance personnel. Maintenance needs identified in the reports will be completed before the next scheduled maintenance event. The biological monitoring schedule is presented in Table 5. However, if the project biologist determines that more frequent visits are needed, the schedule below can be modified to ensure the goals of the plan are met.

The project biologist will quantitatively sample the vegetation in the enhancement areas each year and provide annual technical reports summarizing the results of these investigations. Annual vegetation sampling will occur from April to July and will coincide with the flowering period and annual peak plant growth in the enhancement areas.

Pre-project and monitoring surveys will include sampling the vegetation following the California Native Plant Society (CNPS) protocol using the point intercept (line transect) and belt transect sampling methods. Photographic documentation of each transect and other representative views of the enhancement project will also be included. The following is a synopsis of the CNPS protocol: line transects include vegetation data collected along a line transect with no width. A belt transect collected date along a transect line with width (total of 5 m wide). Both, if employed correctly, provide reliable vegetation data.

Permanent transects will be established in each of the enhancement and created riparian areas and GPS readings along the transect will be recorded. Six transects will be established in the enhancement and created riparian areas: two in the enhanced willow thicket/mulefat scrub area adjacent to Santiago Creek, two within the enhanced LBV transitional foraging habitat, and two within the created riparian area. Due to the small size of the site, transect lengths may have to be reduced from 50 m, as specified by CNPS. The two ends of each line transect will be marked with a three-foot rebar stake covered with white PVC pipe. Every 50 centimeters (cm) along a line transect (beginning at the 50 cm mark and ending at 25 m), a point will be projected into the vegetation. Each species intercepted by the point is recorded. Multiple species may intercept a single point; therefore, combined vegetation cover can exceed 100 percent. Vegetation layers are categorized into herb (less than 60 cm), shrub (60 to 300 cm) and tree (greater than 300 cm) strata. Percent cover of all species (native and non-native) will be calculated for each strata in the enhanced and created areas that are sampled. While performance criteria do not specify criteria by vegetation layer, evaluation of this data can help to evaluate the restoration and enhancement of the site. All species occurring within each transect will be recorded and the data used to determine species cover, density, frequency, and diversity. Photographic documentation of the site will be conducted by taking

one photograph of each enhancement area transect. Photographic points will be taken near each marker facing toward the opposite marker.

Species cover and diversity also will be evaluated through the use of the belt transect data. Establishment of plant species from the seed mix will be determined by comparing the species seeded with the species observed. All plant species observed that were not planted or seeded will be considered part of the natural recruitment on the site. Container stock plant establishment will not be determined with transect data. All installed native plants will be flagged at the time of planting, and dead individuals will be replaced every six months as needed. Plant replacement will be at the discretion of the project biologist and will be monitored during regular maintenance (Table 5) visits. Plant replacement will be based on the cover of native species rather than the number of surviving container stock because there may be cases where native cover is high and container stock survivorship is low. In this case, replacement of container stock is not necessary.

Table 5: Biological Monitoring Schedule

Biological Monitoring Schedule		
YEAR(S)	**FREQUENCY**	**NUMBER OF VISITS**
1 and 2	Every other month	6
3 and 4	Every other month December through May	5
5	Quarterly	4

7.2 Performance Criteria

Performance criteria will be evaluated annually for five years and compared to the established performance criteria shown on Table 6. If the performance criteria are not met during one of the monitoring periods, remedial actions will be taken to correct it. If the cover and diversity requirements are not met, replacement plantings will be made to achieve these requirements.

Table 6: Performance Criteria

Performance Criteria					
Year	**1**	**2**	**3**	**4**	**5**
Enhanced (Willow thicket/Mulefat Scrub)					
Percent Cover by Native Species (canopy)**	20	35	70	80	85*
Percent Cover by Weeds (canopy)	15	15	12	8	8
Species Richness	2	3	3	4	5
Enhanced (LBV Transitional Foraging Habitat)					
Percent Cover by Native Species (canopy)**	20	35	70	80	85*
Percent Cover by Weeds (canopy)	15	15	12	8	8

Species Richness	5	5	7	7	9
Created Riparian					
Percent Cover by Native Species (canopy)**	30	45	70	80	85*
Percent Cover by Weeds (canopy)	15	10	10	5	5
Species Richness	2	3	3	3	4
Wetland Waters of the State					
Percent Cover by Native Species (canopy)**	30	45	70	80	85*
Percent Cover by Weeds (canopy)	15	10	10	5	5
Species Richness	2	3	3	3	4

*Annual non-native grasses will not be considered when measuring success criteria as they are now ubiquitous in nature
**Areas of the site include a sandstone substrate and plants that do not grow in these areas should not be factored into the percent cover.

As described previously, qualitative and quantitative baseline vegetation data will be collected using the sampling transects established for monitoring and discussed previously. Changes in the vegetation will be evaluated and compared annually with the baseline data and with data collected the previous years. Each year's data will be compared to the established performance criteria for native and non-native plant cover. If the performance criteria are not meet for any year, remedial action will be taken to correct it. This data will be included in the annual reports and the final report.

7.3 Contingency Plan If Performance Criteria Are Not Met

The re-evaluation will review the appropriateness of the native species selected. If it is determined that changes are necessary, the plan will be modified to incorporate these changes and replanting undertaken. If final performance criteria are not met at the end of year five and it is determined those success criteria are still attainable, maintenance and monitoring will continue.

7.4 Monitoring Report

In accordance with this plan for documenting and reporting the physical and biological "as built" condition of the site will be prepared within 30 days of completion of the initial restoration activities. The report will describe the field implementation of the approved restoration program in narrative and photographs, and report any problems in the implementation and their resolution.

The initial installation report and the annual report will be prepared by the project biologist and submitted to the resource agencies by January 1 of each year for five years after planting. The report will include the evaluation of the performance criteria, observations regarding the general health of the site, and any maintenance activities. Photos of the enhancement areas, copies of the monitoring reports, and collected data will be included in appendices as appropriate.

Enhancement Schedule

An enhancement schedule is proposed as a guide to determine appropriate milestones for the Plan's success. This schedule may be modified as appropriate after consultation with the appropriate agencies. Maintenance will occur per Table 5, and initial weed removal will begin in spring/summer. Installation of native plantings should occur in the fall, and the first annual data collection will occur in spring/summer of the following year. Remedial planting and seeding, if necessary, will occur for the first time in fall of the following year and will continue as needed. The final annual monitoring report will be submitted by January 1, five years after project initiation; however, the project may be completed earlier if final performance criteria are met.

8.0 ADAPATIVE MANAGEMENT

8.1 Responsible Party

The Applicant, OC Reclamation, will be responsible for implementing, maintaining and monitoring all adaptive management procedures.

8.2 Initiating Procedures

If during the 5-year monitoring period, a destructive natural occurrence damages at least 25% of the plantings, reconstruction of structures and replanting with monitoring shall occur.

If any performance standard is not met in any year, the Project Biologist will prepare an analysis of the cause of failure and propose remedial action for approval by the resource agencies. If the mitigation site has not met one or more of the success criteria, the responsible party's maintenance obligation shall continue until resource agencies give final approval.

8.3 Alternate Locations for Mitigation

Sufficient areas for enhancement and creation is available at the locations presented here so alternate locations are unnecessary.

8.4 Funding

The Applicant will provide the funding for planning, implementation, maintenance, and monitoring of all contingency measures that are required. Financial assurance will be provided in the form of bonding as established by the PAR.

9.0 LONG TERM MANAGEMENT

This section describes the long-term management program for enhancement and creation of habitat for the OC Reclamation project.

9.1 Responsible Party for Long-Term Management of the Mitigation

The responsibility for long-term management of the on-site mitigation area will be upon OC Reclamation. It is expected that OC Reclamation will contract and provide funding to Rivers and Lands Conservancy who will carry out an on-going maintenance and management program to ensure the long-term success of the mitigation site.

9.2 Long-term Financing Mechanism

Funding for the ongoing management activities within the mitigation site will be based on an estimate generated by a Property Analysis Record (PAR) or a PAR equivalent. A non-wasting endowment to ensure revenue is sufficient to operate management activities will be estimated by the PAR. Long-term management financing may also be established through a funding account.

9.3 Management Activities

Long-term management program shall include:

9.3.1 Site Inspection

The mitigation site shall be inspected annually by the monitoring entity to detect any significant degradation within the area and inspect for vandalism. Vandalism shall be reported to the Sheriff as appropriate.

9.3.2 Signage and Fencing

Signs, if present, will be inspected for degradation and replaced promptly by the monitor. Fencing and gates may require repair or replacement from time to time but shall not be installed in a manner that impedes wildlife movement.

9.3.3 Removal of Trash and Debris

The mitigation site shall be kept free of trash and debris. Trash and debris removal will occur annually between September 1st and February 15th to avoid impacts to nesting birds. Care shall be given to avoid impacting native plants. All dead limbs and tree fall shall be left in place.

9.3.4 Revegetation

Revegetation of plant species may become necessary from time to time.

9.3.5 Non-native Plant Species Removal

Non-native perennial plant species shall be removed from the mitigation site annually. This may require more than one visit during the growing season. Typically two or three visits timed appropriately according to plant maturity is necessary to remove plant material before they become reproductively mature.

10.0 FINANCIAL ASSURANCES

OC Reclamation is responsible for the costs for the mitigation site including costs of land acquisition, implementation of HMMP, monitoring during the 5 years, and long-term maintenance and remediation.

11.0 COMPLETION OF COMPENSATORY MITIGATION

11.1 Notice of Completion

The Applicant will notify the resource agencies in writing when the monitoring period is complete and success criteria are met. If the success criteria have been met at the end of the five-year monitoring period, the enhancement and creation will be considered successful. If not, the maintenance and monitoring program will be extended one year at a time and remedial measures that are approved by the resource agencies will be implemented. Only those areas that fail to meet the success criteria will require additional monitoring. This process will continue until the fifth year criteria are met or until the resource agencies agree that the mitigation has met its intended goals.

Final success criteria will not be considered to have been met until a minimum of two years after supplemental irrigation has ceased. Should the revegetation effort meet all goals prior to the end of the five-year monitoring period, the resource agencies, at their discretion, may terminate the monitoring effort and release the

bond. At that time, the Applicant will be released from further maintenance and monitoring requirements of the mitigation.

11.2 Agency Confirmation

Following receipt of the final annual monitoring report, the resource agencies will contact the Applicant as soon as possible to schedule a site visit to confirm the completion of the mitigation effort. The mitigation will be considered complete and successful with a site visit by the resource agencies and a written confirmation that success criteria were met.

It is critical that resource agency staff review annual reports and provide comment in a timely manner so deficiencies they note can be addressed immediately and prior to the end of the approved program.

12.0 REFERENCES

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[USACE 1986b] November 13, 1986. 33 CFR 328.3(b), 51 FR 41250.
[USACE 1986c] November 13, 1986. 33 CFR 328.3(e), 51 FR 41250.

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[USACE 2008b] Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region, Version 2.0. September 2008. J.S. Wakely, R.W. Lichvar, and C.V. Noble, eds., US Army Engineer Research and Development Center, Vicksburg, MS.

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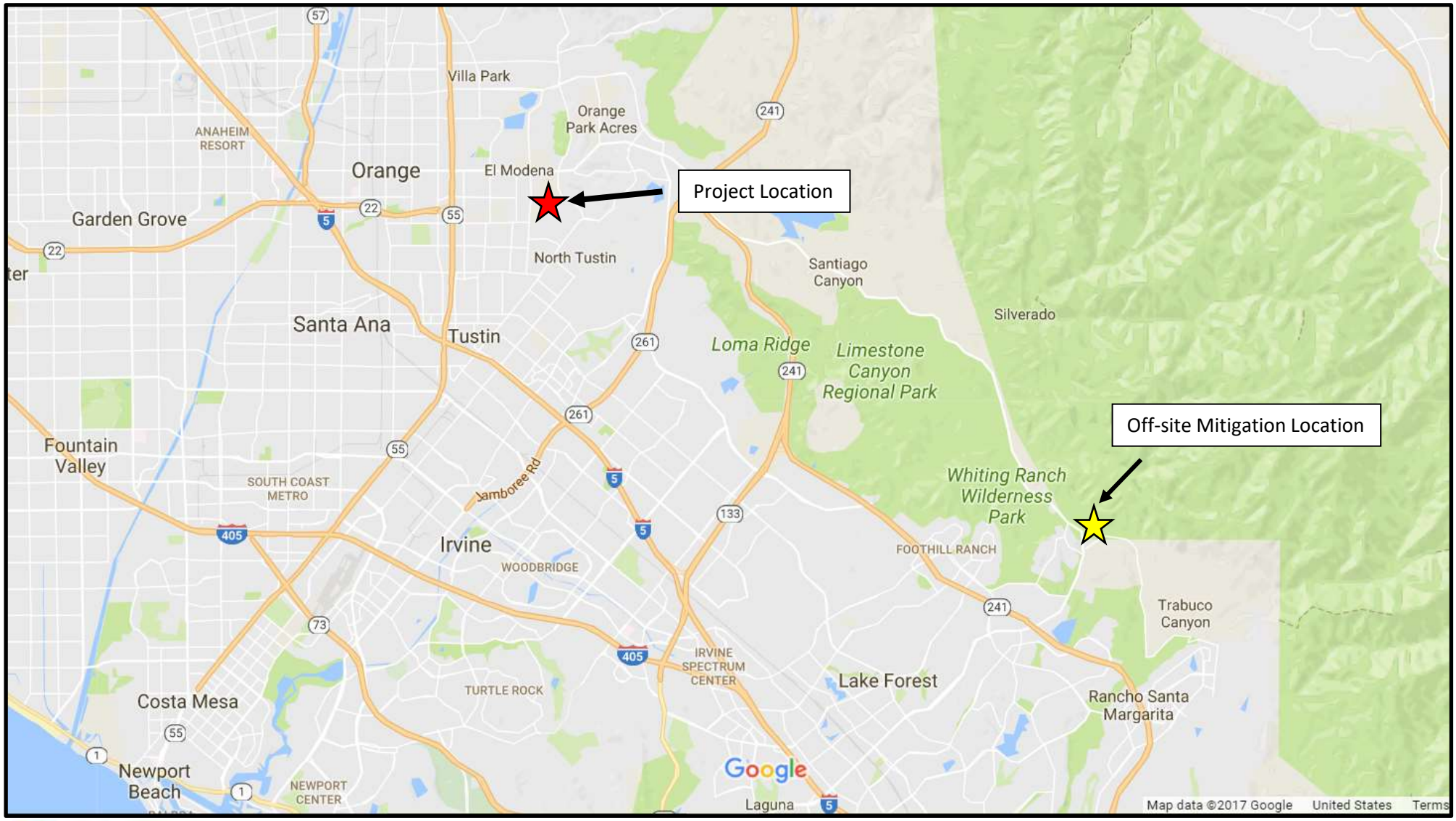
Aerial photography taken and provided by Trevor Wood of Chandler's Sand & Gravel, LLC

Appendix A: Figures



Pacific BioScience, Inc.

LEGEND

Project Site

Off-site Mitigation Location

FIGURE 1

Chandler's Orange Mine

Project/Mitigation Site Locations

Pacific BioScience, Inc.

N

0 175 350
FEET

LEGEND

Project Location

FIGURE 2

Chandler's Orange Mine
Project Location

50' 0 50' 100'

SCALE IN FEET

EXISTING SITE CONDITION ENVIROMENTAL EXHIBIT

CITY OF ORANGE, CALIFORNIA

KWC ENGINEERS
CIVIL ENGINEERING • PLANNING • SURVEYORS
1880 COMPTON AVENUE, SUITE 100 • CORONA, CA. 92881-3370 • 951-734-2130

JN 13.1545.15 R:\13\1545\DWG\EXH\Environmental\1545 Aerial Exh Existing.dwg

E. STACEY LEE LANE

SANTIAGO CREEK

SANTIAGO CREEK

PHASE 1

N.A.P.

N. SANTIAGO BOULEVARD

CANYON STREET

E. SANTIAGO CANYON ROAD

50' 0 50' 100'

SCALE IN FEET

PHASE 1 SITE CONDITION ENVIROMENTAL EXHIBIT

CITY OF ORANGE, CALIFORNIA

KWC ENGINEERS
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50' 0 50' 100'

SCALE IN FEET

PHASE 2 SITE CONDITION ENVIROMENTAL EXHIBIT

CITY OF ORANGE, CALIFORNIA

KWC ENGINEERS
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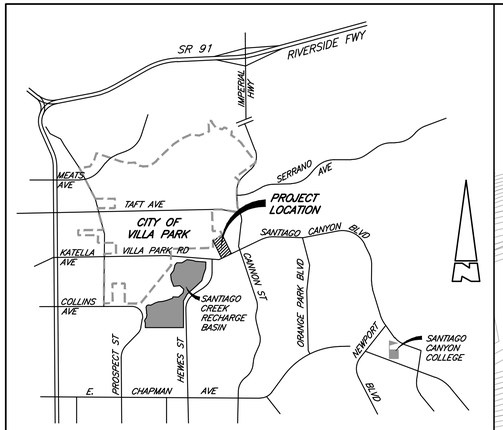
CITY OF ORANGE
WETLAND BASINS
CHANDLER'S SAND AND GRAVEL



VICINITY MAP
N.T.S.

ABBREVIATIONS

CFS	-	CUBIC FEET PER SECOND
EX.	-	EXISTING
EOP	-	EDGE OF PAVEMENT
FL	-	FLOWLINE
PROP.	-	PROPOSED
SD	-	STORM DRAIN
TEMP.	-	TEMPORARY
INV.	-	INVERT
(XXX.X)	-	EXISTING ELEVATIONS
℄	-	PROPERTY LINE

LEGEND

- WETLAND BASIN
- EX. BOUNDARY
- FLOWLINE
- GRADING LIMITS

APN: 370-231-06

SANTIAGO CREEK

EX. FLOWLINE

PROPOSED GRADING LIMITS

GRADING LIMITS

WETLAND BASIN
0.71 AC

BOTTOM
348.5

WETLAND BASIN
0.29 AC

BOTTOM
328.5

FUTURE SD PIPE

FUTURE SD PIPE

TOP OF SLOPE

TOP OF SLOPE

TOP OF BERM

TOP OF BERM

1:1.5 SLOPE

1.5:1 SLOPE

1.5:1 SLOPE

TEMP. 1.5:1 SLOPE

TEMP. 1.5:1 SLOPE

2:1 SLOPE

2:1 SLOPE

2:1 SLOPE

2:1 SLOPE

4:1 SLOPE

4:1 SLOPE

2:1 SLOPE

(360)

(357)

(357)

(355)

(355)

(350)

(340)

(330)

(320)

(330)

(360)

307.50 FL

320.0 FL

324.9 FL

328.73 FL

341.93 FL/INV

342.27 INV

355.80 FL

20' 0 20' 40' 60'
SCALE IN FEET

APRIL 1, 2021

KWC ENGINEERS
CIVIL ENGINEERS ● PLANNERS ● SURVEYORS
1880 COMPTON AVENUE, SUITE 100 ● CORONA, CA. 92881-3370 ● 951-734-2130

J.N. 15.12452.15 R:\15\12452\15\FINAL\EXH\12452 BASIN.dwg

Pacific BioScience, Inc.

0 25 50 100 150 200 Feet

LEGEND

Project Site

Developed

USF&WS Mitigation Area

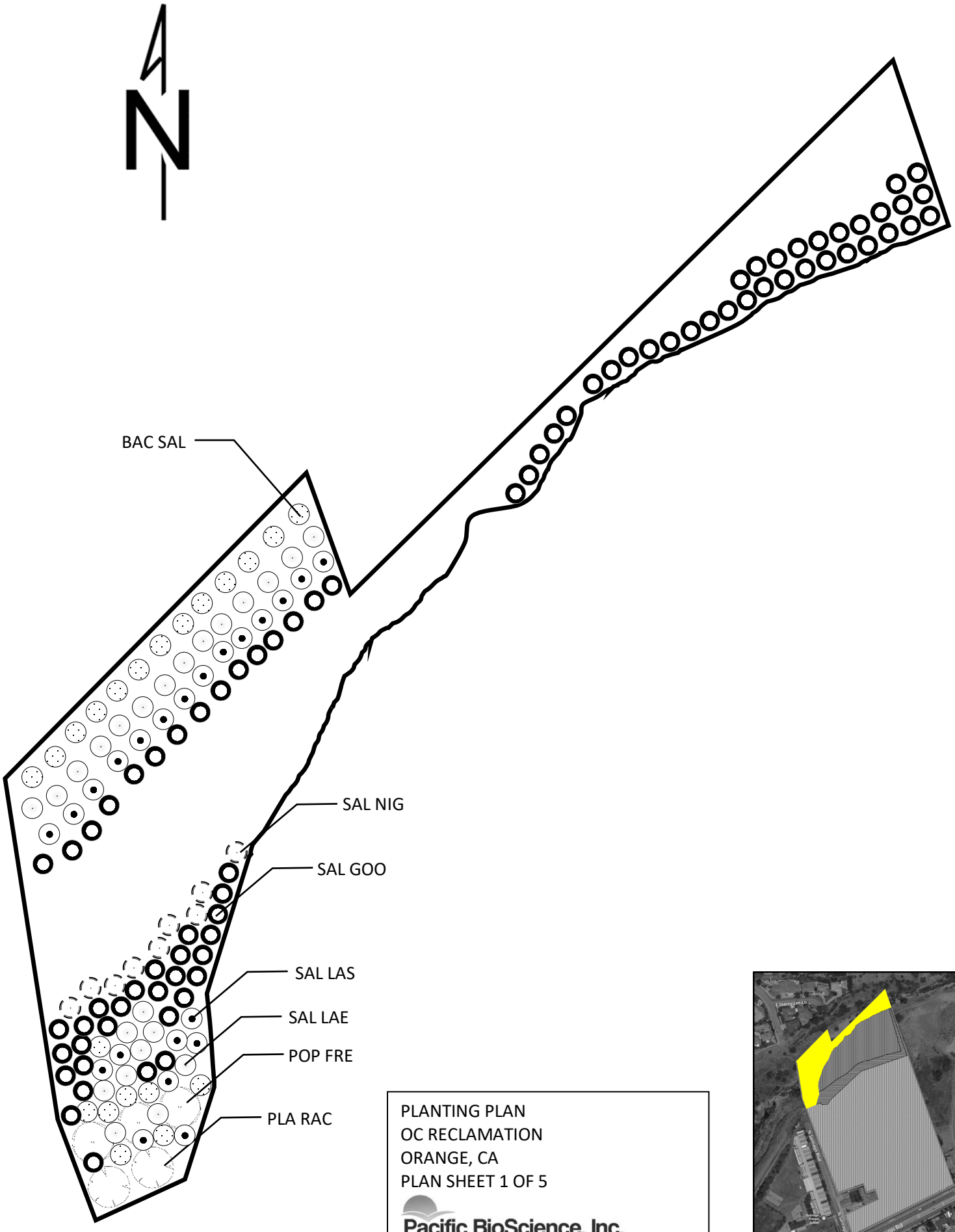
- Enhanced (willow thickets/mulefat scrub)
- Enhanced (LBV transitional foraging habitat)
- Created Riparian

RWQCB Mitigation Area

- Wetland

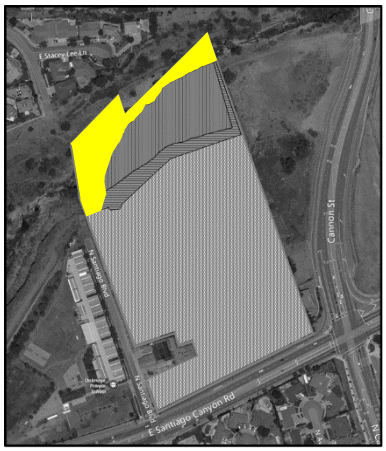
FIGURE 3

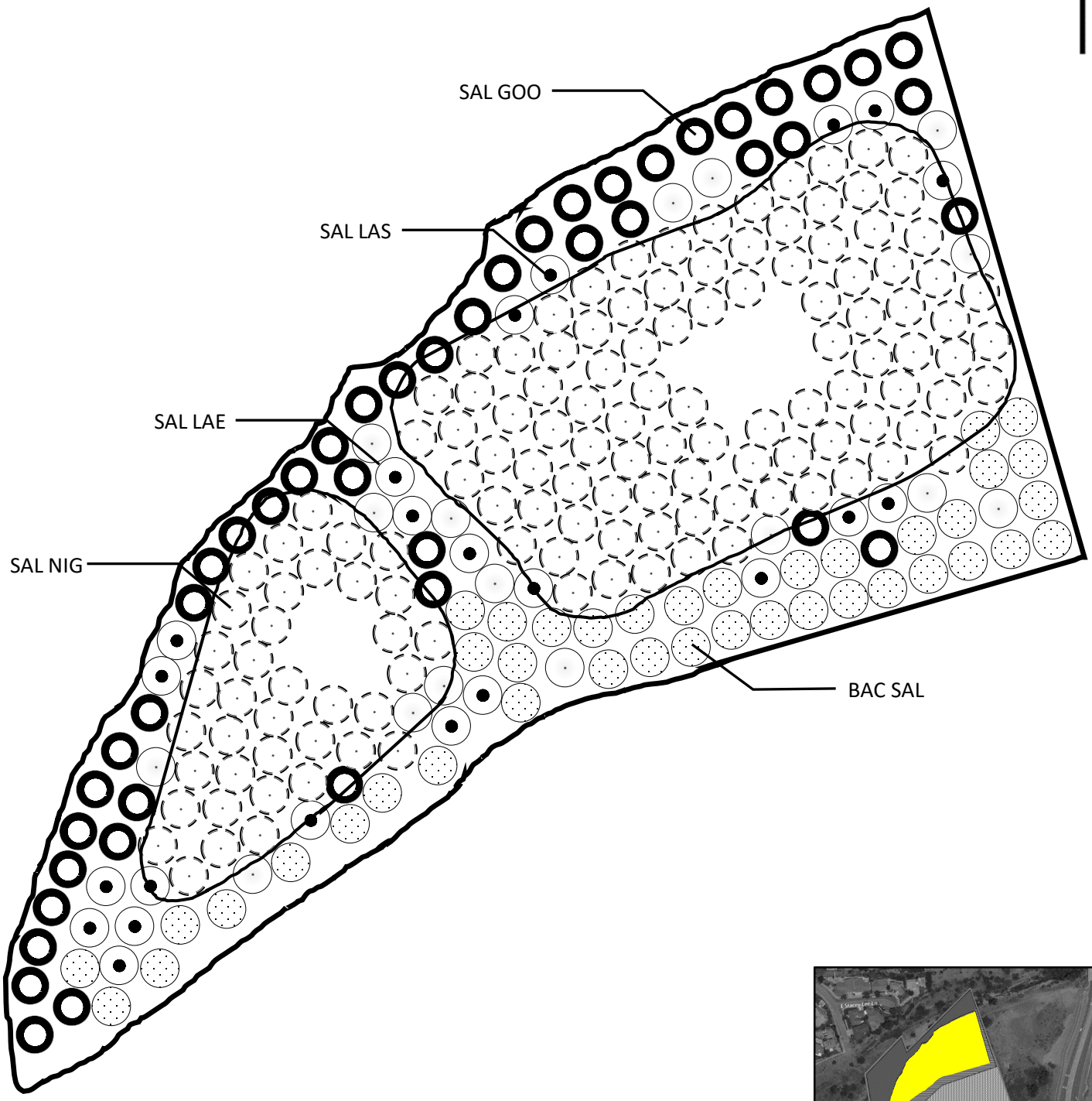
OC Reclamation
Enhancement/Creation Areas

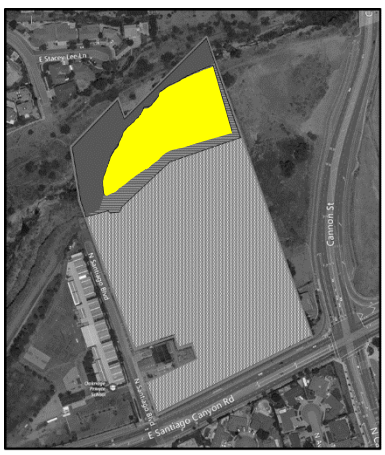


PLANTING PLAN
OC RECLAMATION
ORANGE, CA
PLAN SHEET 1 OF 5

Pacific BioScience, Inc.

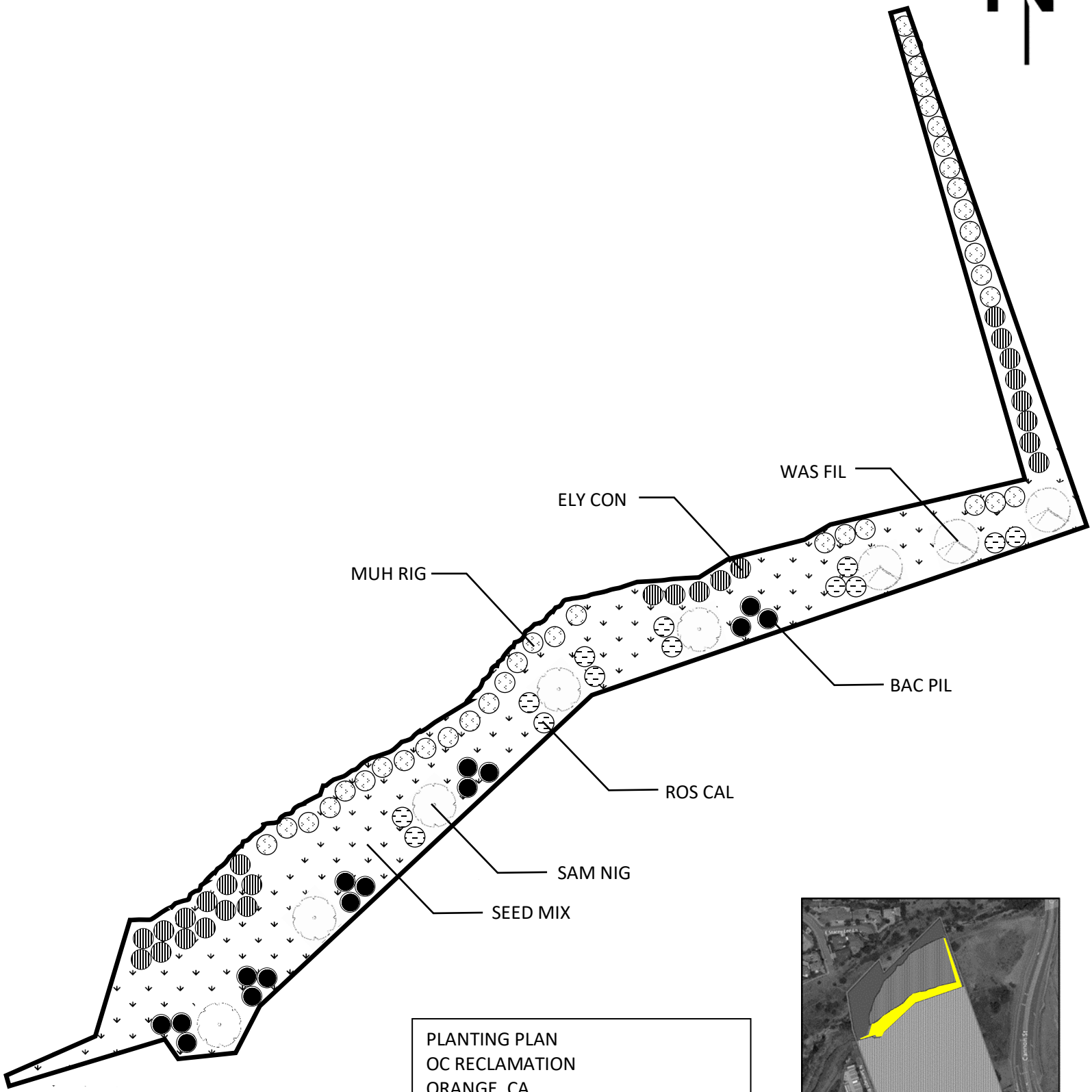






PLANTING PLAN
OC RECLAMATION
ORANGE, CA
PLAN SHEET 2 OF 5

Pacific BioScience, Inc.



PLANTING PLAN
OC RECLAMATION
ORANGE, CA
PLAN SHEET 3 OF 5

Pacific BioScience, Inc.

PLANT LEGEND

SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE (GALLON)	PLANT SPACING (FEET)
TREES				
PLA RAC	PLATANUS RACEMOSA	CALIFORNIA SYCAMORE	15	20
POP FRE	POPULUS FREMONTII	COTTONWOOD	15	20
SAL GOO	SALIX GOODDINGII	GOODINGS WILLOW	1 OR CUTTINGS	5-20
SAL LAE	SALIX LAEVIGATA	RED WILLOW	1 OR CUTTINGS	5-20
SAL LAS	SALIX LASIOLEPIS	ARROYO WILLOW	1 OR CUTTINGS	5-20
SAL NIG	SALIX NIGRA	BLACK WILLOW	1 OR CUTTINGS	5-20
SAM NIG	SAMBUCUS NIGRA	BLACK ELDERBERRY	15	15
WAS FIL	WASHINGTONIA FILIFERA	CALIFORNIA FAN PALM	10	15
SHRUBS				
BAC PIL	BACCHARIS PILULARIS	COYOTE BRUSH	1	8-10
BAC SAL	BACCHARIS SALICIFOLIA	MULEFAT	1	8-10
ELY CON	ELYMUS CONDENSATUS	GIANT WILD RYE	1	8-10
MUH RIG	MUHLENBERGIA RIGENS	DEERGRASS	1	8-10
ROS CAL	ROSA CALIFORNICA	CALIFORNIA ROSE	1	8-10

PLANTING PLAN
OC RECLAMATION
ORANGE, CA
PLAN SHEET 4 OF 5

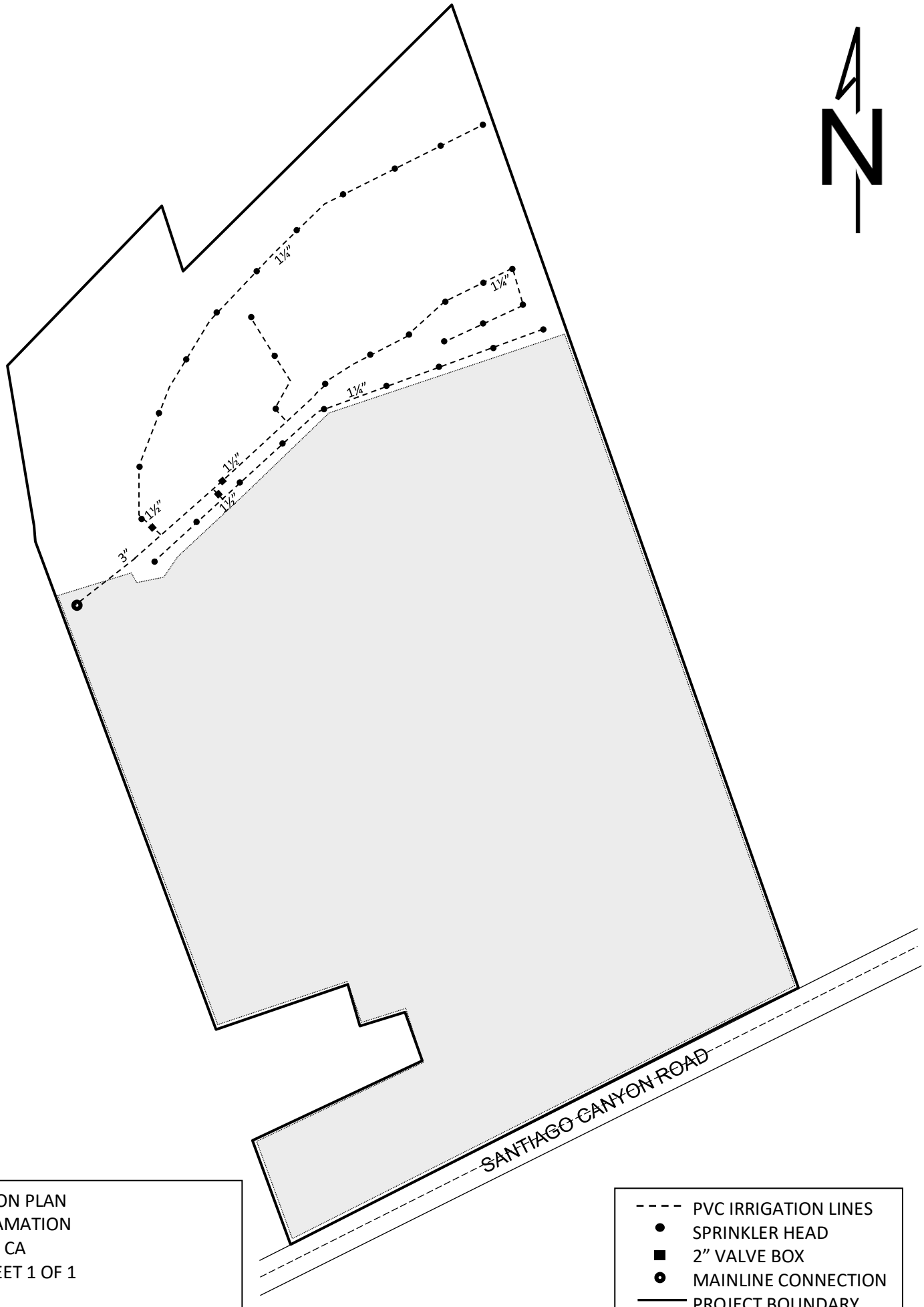
Pacific BioScience, Inc.

SEED MIX

BOTANICAL NAME	COMMON NAME	LBS/ACRE
BLUE EYED GRASS	SISYRINCHIUM BELLUM	2
CALIFORNIA BEE PLANT	SCROPHULARIA CALIFORNICA	2
CATERPILLAR PHACELIA	PHAECILIA CICUTARIA	2
COAST RANGE MELIC	MELICA IMPERFECTA	2
DOUGLAS' NIGHTSHADE	SOLANUM DOUGLASII	2
FIDDLENECK	AMSINCKIA MENZIESII	2
LADIES' TOBACCO	PSEUDOGNAPHALIUM CALIFORNICUM	2
LUPINE	LUPINUS BICOLOR	2
RAGWEED	AMBROSIA PSILOSTACHYA	2
SMALL FESCUE	VULPIA MICROSTACHYS	2
WILD CANTERBURY BELLS	PHACELIA MINOR	2

PLANTING PLAN
OC RECLAMATION
ORANGE, CA
PLAN SHEET 5 OF 5

Pacific BioScience, Inc.



IRRIGATION PLAN
OC RECLAMATION
ORANGE, CA
PLAN SHEET 1 OF 1

Pacific BioScience, Inc.

- PVC IRRIGATION LINES
- SPRINKLER HEAD
- 2" VALVE BOX
- MAINLINE CONNECTION
- PROJECT BOUNDARY
- *NOT A PART (NAP)*