

Phelan Residence  
Stream Channel Restoration  
Landscape and Re Vegetation Plan  
Analytical Environmental Services  
March 2013

**Phelan Ranch Stream Channel Restoration, Napa County  
Draft Landscape and Re-vegetation Plan**

**March 2013**

**Introduction**

This Landscape and Re-vegetation Plan (Plan) has been prepared for the Phelan Ranch pond area in Napa County, California. This Plan provides specific information regarding existing and proposed vegetation in addition to the revised Phelan Ranch Stream Channel Restoration Project Mitigation, Monitoring, and Reporting Plan (MMRP) prepared by AES, dated February 2013 for CDFW as part of the SAA process for the channel above the pond. .

This landscaping/re-vegetation plan is intended to compliment the construction plan and MMRP for the channel restoration effort being done under the CDFW SAA and serves to improve the landscape of the property around the pond near the delineated restoration area and the pond spillway area in a compatible manner. The goal of the Phelan landscape re-vegetation effort is blend more naturally into the surrounding landscape while providing stabilization and native vegetation within the previously disturbed areas.

The Phelan ranch landscape area has several habitats that need to be re-vegetated in different ways to create a more natural habitat overall. The chaparral habitat on this property is typified by dry serpentine soils and a limited seasonal water regime. The chaparral habitat type, such as that found on the Phelan property is suitable for plant species adapted to a dry Mediterranean coastal climate. The area directly surrounding the ephemeral drainage is located within such a climate zone. The areas surrounding the pond and house have similar habitat requirements, but soil diversification and proximity to potential irrigation allow for an additional variety of plantings. Along the base of the ephemeral channel water will be more plentiful due to the nature of the planned filtration system and nearby pond. As a result, water loving species can be planted here similar to the willows that have already become established. The goal of the plan is to blend the new landscaping as much as possible with the natural surroundings and to develop a system that will not require long term watering or maintenance. A detailed description of the Phelan landscaping plan follows and includes additional plant types in each habitat as water availability allows for species diversification.

The chaparral habitat is classified by a drier climate and is occupied by heat and drought tolerant species. Typical of much of the property, this habitat requires plants and shrubs that minimize erosion. The ephemeral stream in particular as well as the north (above pond) and east (behind house) quadrants of the property demonstrate a chaparral-style topography and vegetation.

To restore any ground disturbed by past activities a seed mixture shall be applied that includes a native plant and grass mix. See **Table 1** for suggested species of grasses that grow well in a coastal California chaparral habitat. Hardier grasses should be included that will develop a strong root system and limit erosion.

Suitable wildflowers are also to be included in the seed mix, some examples include the native California poppy or several types of coast adapted native lupine species.

**Table 1: Suitable Native Grasses and Herbs for Chaparral Habitat**

Species	Common Name	Description	Similar Coastal Natives	Comments
<i>Elymus glaucus</i>	Blue Wild Rye	Perennial Bunch grass	<i>Danthonia californica</i> , <i>Deschampsia caespitosa</i> , <i>Festuca idahoensis</i> and <i>Nassella pulchra</i>	<i>Nassella pulchra</i> (purple needle grass) grows especially well on clay and serpentine soils.
<i>Festuca Californica</i>	California Fescue	Clumping Bunch grass	<i>Festuca idahoensis</i>	Excellent to reclaim disturbed habitat in chaparral habitat.
<i>Bromus carinatus</i>	California Brome	Perennial Bunch grass		Excellent for erosion control. <b>Caution:</b> May act as a weed in agricultural settings.
<i>Hordeum brachyantherum</i>	Meadow Barley	Tufting Bunch grass		Diploid cytotype typically occurs only in California.
<i>Nassella pulchra</i>	Needle Grass	Drought tolerant bunch grass	<i>Nassella lepida</i>	State grass of California, once a dominant species in coastal grasslands.
<i>Eschscholzia californica</i>	California Poppy	Flowering plant		California state flower, vibrant orange blooms
<i>Lupinus arboreus</i>	Yellow bush lupine	Flowering perennial herb	<i>Lupinus littoralis</i> (purple-lower to ground)	<b>Caution:</b> pods and foliage toxic to livestock.
<i>Solidago californica</i>	California Golden Rod	Rhizomatous perennial herb		Grows in many habitat types including disturbed areas. Attract bees and butterflies. Will need to <b>plant rhizomes separately from seed mix.</b>
<i>Penstemon heterophyllus</i>	Bunchleaf penstemon	Perennial herb		Drought tolerant chaparral plant, vibrant purple or blue blooms.

There are many strategies to optimally plant grass seed. Each strategy has benefits and challenges associated with it. In the broadcast style of seeding, technicians spread the seed mix on the terrain to be re-vegetated, then rake the seed into the ground to bury it. Planting the seed this way is typically less intensive than other methods. Labor requirements vary depending on the type of soil specific habitat. Raking seed into steep terrain will be more labor intensive than a flat surface. Broadcast seed typically requires more water than hydroseed to establish successfully. Application has to be timed very carefully because germination of broadcast seedlings is slower than other methods. Additional environmental concerns including erosion, runoff, or seed being eaten by birds and other animals should be considered<sup>1</sup>. The best time for any seeding is early fall usually just before the rainy season. Some initial watering for several days to encourage

germination may be required. While the seeds are becoming established some limited waddles may also be required to ensure that no significant erosion will occur on the downslope portion of the reseeded area.

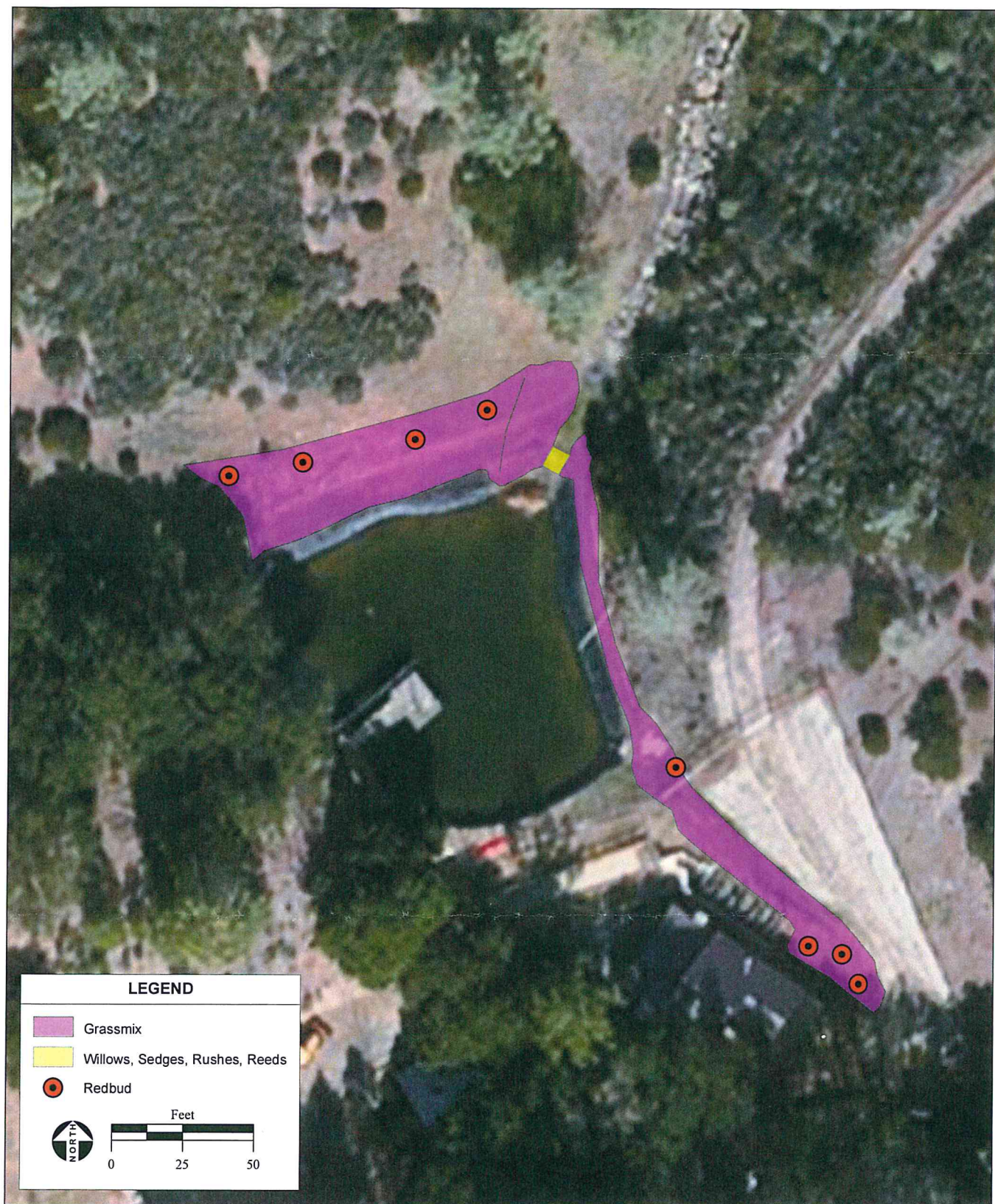
Hydroseed is the application of a slurry of grass seed and other compounds that encourage growth. It can be applied quickly and also has a faster rate of germination. The hydroseed process requires less water and assists with erosion control<sup>2</sup>. Hydroseeding also has to be timed carefully and often does not allow the customer as many choices as to the type or combination of seed applied. Again the timing should be early fall. The initial cost of applying hydroseed is typically more expensive than broadcast planting. Ultimately the choice of seeding style depends on habitat topography and future plans for care of the site.

In addition to the grasses, forbs, and herbs, listed above, installation of native shrubs and mid-sized vegetation in the disturbed area surrounding the pond and spillway area is encouraged. Manzanita (*Manzanita* sp.), black sage (*Salvia mellifera*), toyon (*Heteromeles arbutifolia*), and chamise (*Adenostoma fasciculatum*) are suitable to augment this native vegetation. These species should be purchased as potted plants and should be irrigated until fully established. This may take up to two years and initially such planting will likely require a chicken wire cover to prevent deer from eating plants until they are firmly established. See **Table 2**.

**Table 2: Suitable Native Shrubs for Chaparral Habitat**

Species	Common Name	Description	Similar Coastal Natives	Comments
<i>Arctostaphylos glauca</i>	Bigberry manzanita	Large long-lived shrub	<i>Manzanita</i> sp.	May inhibit growth of plants situated in its understory.
<i>Salvia mellifera</i>	Black Sage	Perennial flowering shrub	<i>Artemisia californica</i>	Pale blue or lavender bloom, suited to dry and serpentine soils
<i>Heteromeles arbutifolia</i>	Toyon	Perennial shrub		Showy winter berries attract birds, drought tolerant
<i>Adenostoma fasciculatum</i>	Chamise	Flowering shrub		Drought tolerant and suited to serpentine soils, good for erosion control
<i>Erigonum fasciculatum</i>	California Buckwheat	Flowering shrub		Suited to dry washes and chaparral, pink blooms attract honey bees.

Young trees also are also proposed to be planted to reduce future erosion and provide better cover where feasible for wildlife and birds. The grey pine (*Pinus sabiniana*) is suited to dry serpentine soils. Redbud (*Cercis occidentalis*) may also work. See aerial map of landscape plan **Figure 1**.



Along the bank and dry hillside of the pond, the land is more accessible than within the ephemeral canyon. It also has a low flow spring nearby that may provide limited additional water. Include the native grass and herb mix from Table 1 around the perimeter, and small trees such as western redbud (*Cercis occidentalis*). Small native wildflowers such as monkey flower (*Mimulus dentatus*), a rhizome suited to higher water environments, can also be included to increase biodiversity and encourage insect participation. Irrigate the area for at least two years using either drip lines or adequate hand watering. Irrigate as needed following that period to ensure successful establishment of plantings. Chicken wire caging may be required for trees and shrubs until they become established.

The land surrounding the house is similar to the chaparral described earlier. Special concern should be devoted to the area where the flume was removed and the spillway pipe runs underneath the surface. Because landscaping/re-vegetation should consider possible repairs in the future to this pipeline and this cover habitat, large well-rooted trees or shrubs are not included in the landscaping plan here. However, small native trees such as the western redbud (*Cercis occidentalis*) may be planted at least ten feet from the underground pipe. A seed mixture should be placed over any disturbed areas to the east of the house where the flume/spillway has historically been located. Native plants such as those listed from Table 1 are suitable here as is sundew (*D. elongata*). Irrigation will be required for two or more years to ensure successful establishment. Adding additional native forbs and wildflowers will increase species richness of the basic native seeding mix.

The base of the ephemeral stream, including the now-established willows, is a special microhabitat about six by six feet in area. This region of the property is covered as part of the channel restoration program under the SAA agreement with CDFW. Installation of vegetation on both sides of the flat area around the pond once the channel restoration is complete will limit erosion and improve stability. Plants placed upstream of the flat area adjacent to the pond will receive some water from the pond due to proximity, but will not have frequent water access except during the wet season, storm events or moisture from other nearby hillside seeps. There should be an emphasis on hardier willows such as *Salix lasiopelis*. Willows should be planted as cuttings collected from the site at a spacing of five feet from the nearest plant. Other plants such as sedges (*Cyperus eragrostis*) and rushes (*Juncus* sp.) may be added to the settling basin area after the SAA restoration effort has been completed if sufficient water is available. Sedges can be placed towards the edge of the landscape plot while rushes and willows should be placed closer to the banks of the drainage to ensure adequate water access. These plants will help to trap silt, limiting the quantity that reaches the pond.

## References

<sup>1</sup>Seed: Broadcast Seeding vs. Hydroseeding. Buildipedia Staff. 26, January 2012.

<http://buildipedia.com/knowledgebase/division-32-exterior-improvements/32-90-00-planting/32-92-19-seeding/seed-broadcast-seeding-vs-hydroseeding>. 28, February 2013.

<sup>2</sup>Ibid

Phelan Residence  
Stream Channel Restoration Project  
Mitigation, Monitoring and Reporting Plan  
Analytical Environmental Services  
March 2013

# **PHELAN RANCH**

## **STREAM CHANNEL RESTORATION PROJECT**

### MITIGATION, MONITORING AND REPORTING PLAN

OCTOBER 2012

Revised March 2013

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# TABLE OF CONTENTS

## PHELAN RANCH STREAM CHANNEL RESTORATION PROJECT MITIGATION, MONITORING AND REPORTING PLAN

<b>1.0 INTRODUCTION .....</b>	<b>1</b>
1.1 PROJECT LOCATION.....	1
1.2 REGULATORY SETTING .....	1
1.3 PROJECT COMPONENTS .....	4
<b>2.0 EXISTING CONDITIONS AND RESOURCES .....</b>	<b>4</b>
2.1 METHODOLOGY.....	4
2.2 ENVIRONMENTAL SETTING .....	4
2.3 HABITAT TYPES .....	4
2.4 WILDLIFE .....	5
<b>3.0 RESTORATION DESIGN .....</b>	<b>6</b>
3.1 GOALS AND OBJECTIVES .....	6
3.2 GENERAL PROTECTION MEASURES .....	6
3.2.1 Measures to Protect Water Quality During Boulder-Moving Activities.....	6
3.2.2 Channel Stability .....	6
3.3 RESTORATION ACTIVITIES.....	7
3.3.1 Bank Stabilization.....	7
3.3.2 Willow Establishment .....	7
3.4 TIMELINE .....	8
<b>4.0 MAINTENANCE AND MONITORING PROGRAM .....</b>	<b>8</b>
4.1 SPECIES SPECIFIC TABLE AND MAP SHOWING THE AREA PROPOSED FOR REVEGETATION.....	8
4.2 INITIAL MONITORING AND REPORTING .....	8
4.3 MAINTENANCE ACTIVITIES .....	8
4.3.1 Nonnative Plant Control .....	8
4.3.2 Trash Removal .....	9
4.4 LONG TERM MONITORING METHODS.....	9
<b>5.0 REFERENCES .....</b>	<b>10</b>

### LIST OF TABLES

Table 1	Recommended Native Seed List .....	7
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### LIST OF FIGURES

Figure 1	Regional Location Map .....	2
Figure 2	Site and Vicinity.....	3
Figure 3	Revegetation Plan .....	9

### ATTACHMENTS

Attachment A: Representative Photos

## **1.0 INTRODUCTION**

Analytical Environmental Services (AES) has prepared this Mitigation, Monitoring, and Reporting Plan (Plan) for Phelan Ranch as guidance for the proposed stream restoration project (Project) in Napa County, California. This Plan is drafted in a manner consistent for use with permitting requirements included in the following: Clean Water Act (CWA) Section 404 U.S. Army Corps of Engineers (USACE) permit; CWA Section 401 Water Quality Certification (WQC) from the Regional Water Quality Control Board (RWQCB); and California Department of Fish and Game (DFG) Section 1600 Streambed Alteration Agreement (SAA). The existing ephemeral stream channel has been significantly altered by a previous landowner by lining the channel with thick, impermeable plastic and placing boulders on top of the plastic. The proposed restoration would consist of removing the plastic and hydroseeding any exposed areas along the channel. The returned rocks will only be slightly altered to convey a more natural alignment, thereby eliminating the straight lines the rocks have been placed to form pools or to keep water in the lined area. The purpose of the Plan is to ensure that the restoration of the ephemeral stream channel is, at a minimum, consistent with the ecological integrity, resource functions, and value of the area for wildlife.

### **1.1 PROJECT LOCATION**

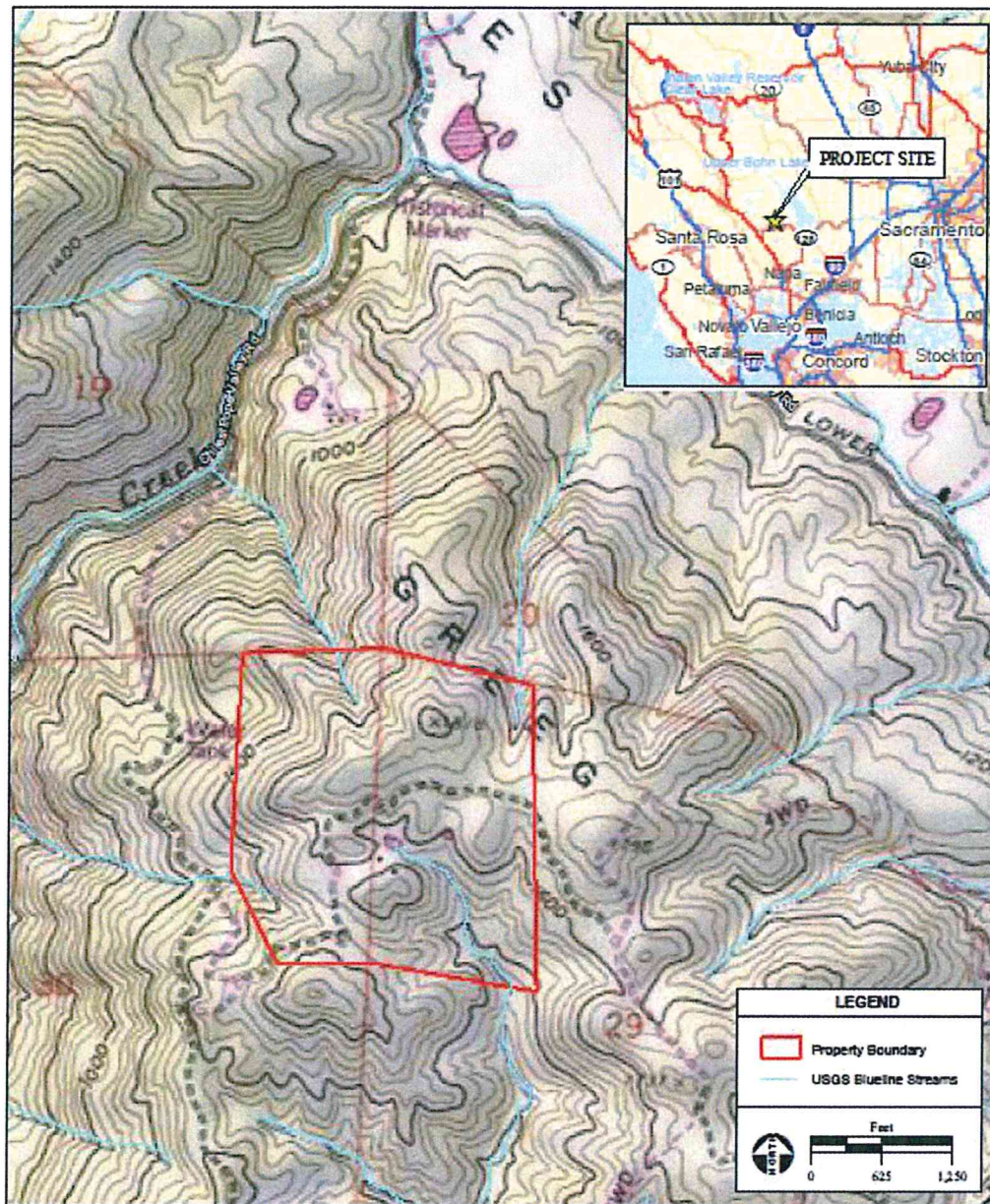
The project site is located approximately seven miles east of St. Helena in Napa County, California (**Figure 1**). The project site is within Sections 29 and 30 of Township 8 North, Range 4 West, Mount Diablo Baseline and Meridian (MDBM) of the “Chiles Valley, CA” U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle (**Figure 2**). This location is within the San Pablo Bay watershed (Hydrologic Unit Code #18050002) (USGS, 1978).

### **1.2 REGULATORY SETTING**

The following federal, state, and local regulations and permitting requirements are potentially applicable for the project:

The USACE has primary federal responsibility for administering regulations that concern waters of the U.S., including wetlands, under Section 404 of the CWA. Section 404 regulates the discharge of dredged and fill material into waters of the U.S. The USACE requires that a permit be obtained if a project proposes to place structures within, over, or under navigable waters and/or discharging dredged or fill material into waters below the ordinary high-water mark.

Figure 1: Regional Location Map

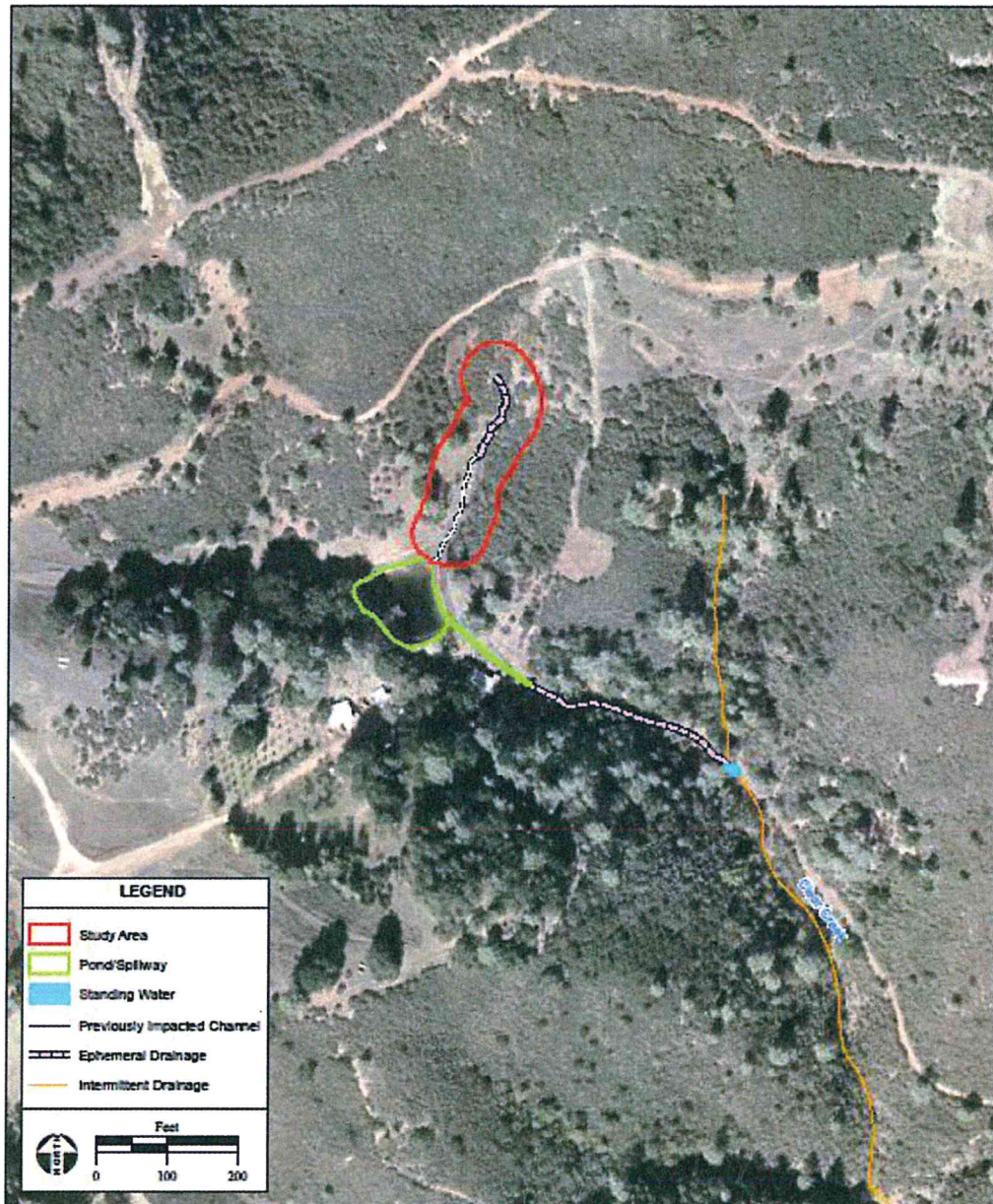


SOURCE: "Chiles Valley, CA" USGS 7.5 Minute Topographic Quadrangle, TRN R4W, Sections 29 & 30; Mt. Diablo Baseline & Meridian; AES, 2012

Phelan Ranch Stream Channel Restoration / 212526 ■

**Figure 1**  
Site and Vicinity

Figure 2: Site and Vicinity



SOURCE: USDA NAIP Aerial Photograph, 2010, AES, 2012

Phelan Ranch Stream Channel Restoration / 212526 ■

**Figure 2**  
Aerial Photograph

In addition, a Section 401 WQC in compliance with CWA Sections 301, 302, 303, 306, and 307 is regulated by the RWQCB. Anyone proposing to conduct a project that requires a federal permit or that may result in a discharge to U.S. surface waters and/or other waters of the state, including wetlands (all types), seasonal streams, and lakes must obtain a WQC to confirm that the permitted action meets state water quality objectives.

If a proposed project will result in the alteration or degradation of a stream, river, or lake in California, the DFG requires notification prior to commencement, and a SAA pursuant to Fish and Game Code Subsection 1601-1603, 5650F, may be required.

### **1.3 PROJECT COMPONENTS**

The landowner proposes to restore a previously-impacted section of ephemeral channel to a more natural state by removing the heavy plastic lining the channel and slightly re-arranging some of the rocks and boulders. The rocks would generally be returned to their current locations once the plastic lining has been removed. The returned rocks will only be slightly altered to convey a more natural alignment; thereby eliminating the straight lines where the rocks have been placed to form pools or sides along the channel. Replacing the rocks nearby their currently occurring locations prevents a straight unimpeded flow from occurring should any unpredictable post storm rush of water result in artificial erosion once the lining is removed and before vegetation has reestablished.

Temporary construction fencing would be placed around the project site to protect existing vegetation. Removal of the plastic would involve the use of a backhoe to move the boulders; no other equipment is anticipated to be needed. Disturbance would be confined to the stream channel and the area impacted by rocks. No vegetation outside the channel would be significantly disturbed. Work will be conducted during the dry season. (See detail in Construction Plan)

## **2.0 EXISTING CONDITIONS AND RESOURCES**

### **2.1 METHODOLOGY**

An AES biologist conducted a reconnaissance-level biological survey of the project site on July 18, 2012. During the survey, the habitat types on-site were classified and further evaluated for the occurrence of and the overall potential to support special-status plant and animal species.

### **2.2 ENVIRONMENTAL SETTING**

The project site is located in central Napa County, among rolling hills covered with chaparral and rural residential development. Elevation of the project is approximately 490 meters (m) (1,600 feet) above mean sea level (msl). Land use in the project vicinity consists of rural residences.

### **2.3 HABITAT TYPES**

The habitat type of the project site is ephemeral drainage. The surrounding habitat type is chaparral; a developed area abuts the southern end of the project site. Representative photographs of the project site taken during the July 18, 2012 biological survey are shown in **Attachment A**.

### 2.3.1.1 *Ephemeral Drainage*

A single unnamed ephemeral drainage channel was mapped for the Project. The drainage initiates approximately 250 feet north of the storage pond at the very top of the watershed, and extends north-to-south before transitioning into a man-made storage pond (**Figure 2**). The lower 150- to 200-foot reach of this drainage is the area proposed for restoration through removal of plastic and replacement of existing rocks. The reach of the drainage channel upstream from the project site forms an approximately two-foot wide and less than six-inch deep scour channel within a relatively steep hillside surrounded by chaparral habitat. This minor scour channel flows naturally for approximately 50 to 100 feet. At this point the channel is significantly altered from its natural state; this point marks the beginning of the project site. Large boulders were used to construct step pools and delineate the outer edge of the channel, and the channel was lined with a layer of thick plastic to prevent infiltration and loss from seepage. The thick layer of plastic has prevented vegetation from establishing in the channel. This ephemeral drainage only has water during and immediately following significant rain events.

Adjacent to the restoration project site at the south end is a manmade storage pond, into which the ephemeral drainage flows across the relatively narrow (about 6 ft wide) road like area along the ponds edge during significant rain events. This pond was created circa 1903, and is primarily sustained by seeps that have been tapped from within the hillside. The pond is lined with an impermeable layer of plastic and contains a plastic culvert that acts as a passive spillway. Overflow from the pond is directed through this passive spillway, empties into a rock-lined dissipater, and passes through another culvert under the roadway. From there, flow exits into a naturally functioning ephemeral stream channel, thence to the confluence with an intermittent channel, where it becomes a full Class II stream course.

The naturally functioning ephemeral stream channel south of the spillway flows through a deeply confined ravine to its confluence with a small intermittent drainage. The ephemeral drainage in this area shows signs of small pool formation and sporadically supports rush (*Juncus* sp.) and sedge (*Cyperus* sp.). The ephemeral drainage south of the spillway was dry during the July 18, 2012 site visit.

### 2.3.1.2 *Chaparral*

This habitat type surrounds the project site, except where the ephemeral drainages transitions to the storage pond. Chaparral occurs on the relatively steep hillsides adjacent to the drainage. Dominant vegetation is composed of manzanita (*Manzanita* sp.), chamise (*Adenostoma fasciculatum*), gray pine (*Pinus sabiniana*), toyon (*Heteromeles arbutifolia*), wild oat (*Avena fatua*), and soap plant (*Chlorogalum* sp.). This habitat type will not be impacted by the project, but is described here to give a sense of the Project's setting.

## 2.4 WILDLIFE

The land in the project vicinity is predominantly chaparral with scattered rural residences, and likely provides habitat for a number of wildlife species common to the area, such as coyote (*Canis latrans*), turkey vulture (*Cathartes aura*), western scrub jay (*Aphelocoma coerulescens*), western rattlesnake

(*Crotalus oreganus*), and western fence lizard (*Sceloporus occidentalis*). The project site is not located in or near any areas of particular importance to wildlife.

### **3.0 RESTORATION DESIGN**

This Plan was designed in accordance with the “*Guidelines for Monitoring Riparian Mitigation Projects*” published by the San Francisco District of the USACE (USACE, 1994), as well as the “*California Salmonid Stream Habitat Restoration Manual Part XI: Riparian Habitat Restoration*” (DFG, 2003).

#### **3.1 GOALS AND OBJECTIVES**

The general goal of this Plan is to: 1) ensure that the restoration of the ephemeral stream channel is consistent with the ecological integrity, resource functions, and value of the area for wildlife; 2) restore the ephemeral drainage channel to a more natural hydrologic and vegetative state; and 3) increase the wildlife habitat functions and values. The objectives of the restoration effort identified below are provided to ensure that the goals are achieved:

- Increase the overall wildlife habitat functions and value by restoring the drainage channel to a more natural hydrology and planting native vegetation; and
- Implement Best Management Practices (BMPs) for erosion control to ensure water quality and stream bank stability of the ephemeral drainage channel after removal of the plastic.

#### **3.2 GENERAL PROTECTION MEASURES**

##### **3.2.1 Measures to Protect Water Quality During Boulder-Moving Activities**

The following measures will prevent potential impacts to water quality from moving boulders within the drainage channel:

- All earth work within the area of inundation shall be conducted only in the dry season; generally between April 15 and October 15;
- BMPs for erosion control shall be implemented to ensure water quality of the ephemeral drainage prior to and during boulder re-arrangement is not decreased;
- Temporary erosion control measures, such as silt fences, staked straw bales, fiber rolls, and mats, shall be installed in disturbed areas prior to any forecast rain events and prior to establishment of reseeded; and
- All disturbed areas shall be re-vegetated with an acceptable herbaceous seed mix (specified below) by October 15. If infeasible, exposed soil surfaces shall be hydromulched or stabilized by other erosion control measures prior to October 15.

##### **3.2.2 Channel Stability**

The following proposed measures will prevent potential impacts to the stability of the existing unnamed stream channel from construction of the proposed project:

- Temporary erosion control measures, such as silt fences, staked fiber rolls, mats, and temporary revegetation, shall be installed in disturbed areas of the streambanks prior to any forecast rain events and prior to establishment reseeding after the project construction is completed;
- No disturbed surfaces shall be left without erosion control measures in place during the winter and spring months;

### 3.3 RESTORATION ACTIVITIES

#### 3.3.1 Bank Stabilization

As part of the bank stabilization, all disturbed areas along the restored ephemeral drainage channel shall be reseeded with a native plant seed mix, and may include those species identified in **Table 1**, or a similar seed mix approved by a qualified botanist. The goal is a ground cover mirroring the undisturbed area above the restored area by the end of 5 years. To verify this, a plot will be established in the un-impacted area and at least two plots within the restored area will be established to verify this basic ground cover compared to the control area above.

**TABLE 1: RECOMMENDED NATIVE SEED LIST**

Common Name	Scientific Name	Re-vegetation Approach
California brome	<i>Bromus carinatus</i>	Seed
Small-flowered fescue	<i>Vulpia microstachys</i>	Seed
Meadow barley	<i>Hordeum brachyantherum</i>	Seed
California melic grass	<i>Melica californica</i>	Seed

Source: DFG 2003; AES 2012

#### 3.3.2 Willow, Tree, and Shrub Establishment

At the base of the currently impacted ephemeral drainage where some seepage from the hillside flows along the existing pond side path, several willow (*Salix* sp.) have established. Since this is also where the restored drainage will enter the flat area immediately prior to flowing into the existing man made storage pond, some expansion of this semi-riparian/wetland area may occur. The expansion of this area will also prevent or filter any sediment from the restored streambed before it enters the pond. To facilitate this, a rock filled area about 6ft by 6ft will be dug out to about 6 inches in depth and filed largely with rocks. The underlying ground will be “roughed up” to create a shallow sediment catchment area. This area will function as the bridge from the natural chaparral-surrounded drainage to the pond. This basin may hold some water from the hill side seeps which will drain toward this low spot and may support some expansion of the existing willows and sedges. The additional willows that are proposed shall be started with sprigs cut from the existing willow. A total of 5 to 10 willow sprigs will be established in currently bare areas within the flat area between the stream and the manmade pond. They will be irregularly spaced approximately two feet apart. If by year two following completion of the construction, if this area has sufficient moisture to naturally support the willows, it is likely that some other sedges or reeds similar to those at the ponds edge today may become established although no planting is proposed. At the end of



the 5 year monitoring period it is planned to have up to 3 additional willows established in the rock filtration area even if they are closer to the pond than the drainage.

In the wider area where the plastic has been removed from along the channel, up to 5 trees or shrubs such as grey pine, Manzanita, toyon will be planted. These plantings shall be surrounded by chicken wire and hand watered for up to two years to encourage establishment. The goal is to have at least three trees/shrubs in the area of the drainage where the plastic has been removed growing naturally at the end of 5 years.

### **3.4 TIMELINE**

Upon approval of this Plan, restoration activities will commence during the dry season, approximately April 15 through October 15 of the same year. Restoration activities would occur in 2013. Willow establishment would occur in January or February 2014.

## **4.0 MAINTENANCE AND MONITORING PROGRAM**

A five-year Maintenance and Monitoring Program (MMP) consistent with the USACE, DFG, and RWQCB terms will be implemented upon completion of construction activities at the project site. Details of the maintenance and monitoring activities are provided below.

### **4.1 SPECIES SPECIFIC TABLE AND MAP SHOWING THE AREA PROPOSED FOR REVEGETATION**

By October 15, all bare areas where plastic was removed will be seeded with a herbaceous plant mix, as described in this Plan. **Figure 3** identifies the nine locations in which the herbaceous mix will be added following removal of the plastic lining.

### **4.2 INITIAL MONITORING AND REPORTING**

No later than 90 days following completion of plastic removal and re-vegetation with seed mix at the project site, an initial monitoring site visit shall occur. The initial site visit shall record initial conditions of the restored ephemeral drainage. Photo monitoring stations shall also be established during the initial site visit. The photo monitoring stations should adequately depict the overall project area. An Initial Restoration Report shall be drafted and would include the existing conditions along with a summary of the restoration activities implemented, and recommendations should the restoration activities not comply with the Plan. The Initial Restoration Report shall be submitted to the DFG, USACE, and the RWQCB upon completion.

### **4.3 MAINTENANCE ACTIVITIES**

#### **4.3.1 Nonnative Plant Control**

Invasive non-native weeds, plant species defined as having moderate to high rating of invasiveness by the California Invasive Plant Council (Cal-IPC), can compete with the newly planted species and should be removed. Weed control will occur at least once per year for the duration of the five-year maintenance period. Methods for removal and control include hand-clearing techniques and/or spot application of

Environmental Protection Agency (EPA)-labeled herbicides suitable for aquatic settings that will not impact adjacent native vegetation. If herbicides are used, all safety measures recommended by the manufacturer will be followed by the licensed applicator.

#### **4.3.2 Trash Removal**

Trash and other undesirable debris will be removed from the project site as-needed, and at least once per year throughout the five year maintenance period.

#### **4.4 LONG TERM MONITORING METHODS**

The following success criteria are required in addition to those identified within the revised MMRP (AES, 2013):

- All herbaceous seed mix shall be monitored and maintained as necessary for five years.
- All herbaceous seed mix and hydroseeded areas shall have a minimum of 80 percent survival at the end of five years and shall attain 70 percent cover after three years and 75 percent coverage after five years. The herbaceous plant species used to hydroseed the area following plastic removal shall be included as part of the percent coverage.
- If the survival and/or cover requirements are not meeting these goals, the Permittee is responsible for additional application of herbaceous seed mix, additional watering, weeding, invasive exotic eradication, or any other practice, to achieve these requirements. Replacement of additional herbaceous seed mix shall be monitored with the same survival and growth requirements for five years after planting.

## 5.0 REFERENCES

Analytical Environmental Services, 2012. *Phelan Ranch Stream Channel Assessment*. Sacramento, CA.

California Department of Fish and Game (DFG), 2003. *California Stream Habitat Restoration Manual part XI: Riparian Habitat Restoration*. Sacramento, CA.

U.S. Army Corps of Engineers (USACE), 1994. *Final Guidelines for Monitoring Riparian Mitigation Projects*. U.S. Army Corps of Engineers, San Francisco District. San Francisco, CA. June 1994. Available online at: <http://www.spn.usace.army.mil/regulatory/ripguide.htm>. Accessed on August 19, 2011.

U.S. Geological Survey (USGS), 1978. Hydrologic Unit Map, State of California. U.S. Department of the Interior, Geologic Survey. Reston, Virginia.

**Phelan Ranch Stream Channel Restoration, Napa County  
Construction Plan**

**March 2013**

**Introduction**

Analytical Environmental Services (AES) has prepared this Draft Construction Plan (Plan) for the Phelan Ranch Stream Channel Restoration project, in Napa County, California. On behalf of the Permittee, AES representative Pete Bontadelli submitted a Streambed Alteration Agreement (SAA) Application (application) to the California Department of Fish and Wildlife (Department) on October 16, 2012. The Department submitted a SAA Agreement (Agreement) (Notification No. 1600-2012-0370-R3) to Mr. Bontadelli on January 15, 2013. As part of the Agreement, the Department is requiring approval of a draft Construction Plan for the proposed project prior to finalization of the Agreement. Upon approval, this Plan would satisfy Subsection 2.7 of Section 2, Avoidance and Minimization Measures, as identified within the Agreement. This Plan addresses the additional items required in the Agreement and describes the portion of ephemeral drainage where the channel is significantly altered from its natural state. The plan contains information on the process of construction which will relocate large and small boulders that are arranged as step pools within a plastic lined creek bed. The plastic lining currently limits the natural processes of filtration and seepage. The altered section of stream channel is approximately 150-200 feet long and approximately 3 feet wide, although the current lining and boulder placement impact about 6-8 feet wide in some areas.

**Duration**

The project would be completed within ten working days, in accordance with the Agreement.

**Construction Equipment**

Construction equipment would be limited to one rubber-tired backhoe and hand tools.

**Staging Areas**

The staging area would be limited to a graded road like area on the north and east edges of the pond and generally to the southwest of the ephemeral drainage being restored. The staging area would only be utilized for parking the backhoe. The plastic would be removed from the creek bed on a daily basis and would be contained onsite in the staging area until it is removed offsite to a regional landfill.

**Site Access Route**

The site access route initiates at the driveway, extends long the graded dirt road adjacent to and along the western and northern portion of the pond, and extends in upland habitat along the west side of the ephemeral stream. No chaparral vegetation or other existing vegetation would need to be removed to obtain access. Temporary construction fencing would be placed along the edge of the project site and as needed along the access route to ensure that no incidental damage occurs to native vegetation.

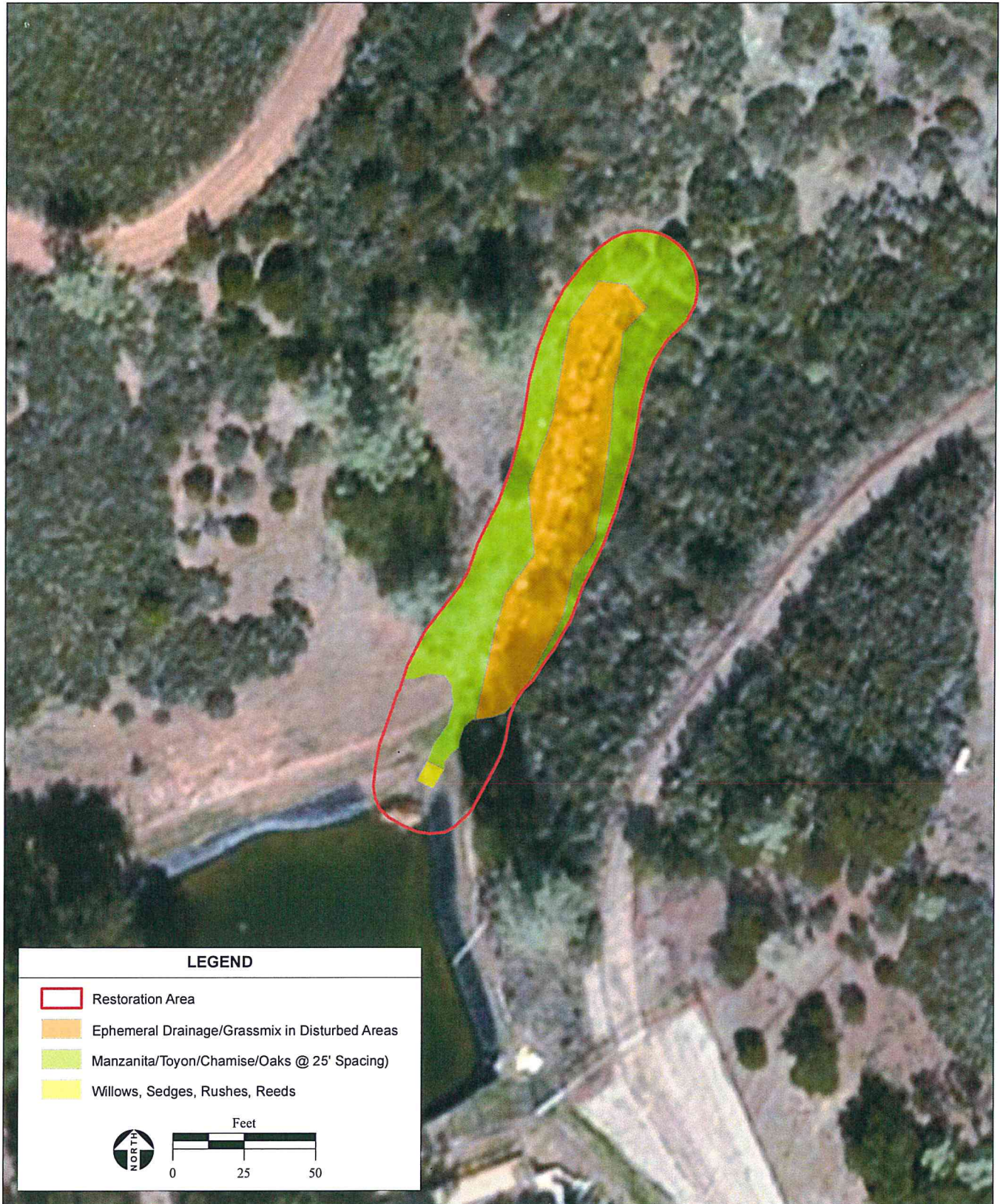
### **Construction Work**

Earthwork or excavation will be limited to moving rocks with a rubber-tired backhoe to expose and remove the plastic lining the streambed and to temporarily move the larger boulders onto the relatively flat road-like area at the base of the drainage. Currently a staging area without plastic lining is available for this purpose near where the ephemeral drainage flows into the pond. Boulders immediately adjacent to the pond will not be relocated to this staging area. The plastic lining should be removed using hand tools once the rocks have been temporarily relocated. The rocks will then be returned to near their current locations in most circumstances. Some rocks will be slightly altered to convey a more natural alignment, thereby eliminating the straight lines where the rocks have been placed to try to form pools and outer barriers on top of the existing plastic lining. Unimpeded flow may initially cause artificial erosion as a result of larger storm events. Replacing rocks non-linearly will retard flow of runoff and along with seeding should help to prevent streambed scour and erosion. Photograph 1 in Attachment 1 shows this unnatural pool alignment that would be altered as a result of the proposed project. The purpose of replacing the rocks is also to avoid possible damage to surrounding vegetation which may occur by attempting to remove them. Photograph 2 in Attachment 1 shows the ephemeral stream upstream of the project site. The restored stream is intended to be similar to this portion of the ephemeral stream when the construction is completed. The removal of the lining and the use of natural flows should help to mimic the original conditions above the point of previous disturbance and create a more natural drainage. The revised MMRP is based on this minimal approach to construction. Again, no new channel creation will occur, aside from the removal of the artificial lining and the replacement of the rocks and boulders. Thus, the original channel would remain as intact as feasible following the removal of the plastic lining. Reseeding of native vegetation will occur within the now reestablished channel once the plastic lining has been removed to reduce erosion and to facilitate restoration.

A shallow catchment basin will be created at the base of the drainage at the “road crossing” to filter any erosion sediment out of runoff water. The catchment basin will limit the amount of particulate that accumulates in the pond. It will be composed of small and medium sized rock and cobble. Some of the roadbed may need to be excavated so that the added rock filtration system remains flat and even with the roadway and maintains the current natural low from the drainage. Because seeps in the hillside flow towards this low area from along the hill on the eastern edge of the pond, it is likely to maintain water beyond storm events.

### **Landscape re-vegetation**

Areas disturbed by construction will need to be re-vegetated. (See revised MMRP for details of this native re-vegetation.)



**Attachment 1: Photographs**



Photograph 1: Rocks situated in straight lines to form pools. Upon removal of the plastic lining, these rocks would be slightly modified to reflect a more natural streambed condition.



Photograph 2: Portion of the ephemeral drainage upstream of the project site. This portion of the ephemeral drainage has not been modified by the previous landowner.