

**Application for the Flood Protection Corridor Program (FPCP) of
the Costa Machado Water Act of 2000**

For the

**Bedford Wash and Temescal Wash Flood Protection Corridor
Restoration Project, Temescal Canyon
Redevelopment Project Area
and the Dos Lagos Redevelopment Project**

Prepared for

**The Flood Protection Corridor Program
Department of Water Resource, Division of Flood Management
1416 Ninth Street, Room 1641
Sacramento, CA 95814**

Prepared by

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in cooperation with

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and

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February 14, 2003

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Temescal Canyon Open Space Vegetation Management and Enhancement Plan, RCRCDD, January 2003.

Qualifications: SE Corporation and Temescal Canyon Properties-8, LLC

Qualifications: ENV America, Resume: Massoud Vatankhahi, P.E.

Qualifications: Zeiser Kling Consultants, Inc., Resume: Larry Fanning

General Information Sheet

Project Name: Bedford Wash and Temescal Wash Flood Protection Corridor
Restoration Project, Temescal Canyon Redevelopment Area
and the Dos Lagos Redevelopment Project

Project Location: Temescal Canyon Redevelopment Area, City of Corona

County: Riverside

Name and address of sponsoring agency or non-profit organization:

Riverside-Corona Resource Conservation District (RCRCD)
4500 Glenwood Drive
Riverside, CA 92501

Name of Project Manager (contact):

Shelli Lamb, Regional Manager

Phone Number: (909) 683-7691 **E-mail Address:** rcrcd@earthlink.net

Grant Request Amount: \$5,000,000

Project Manager	Title	Date
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Project Objective(s): Briefly describe your project and explain how it will advance FPCP goals.

The Bedford Wash and Temescal Wash Flood Protection Corridor Project represents an important restoration effort located within the Temescal Canyon Redevelopment Project Area (see Exhibit 2). Temescal Canyon Road and Cajalco Road are principal arterials that traverse the redevelopment area. Flooding across Temescal Canyon Road at Bedford Wash and Cajalco Road at Temescal Wash during storm conditions create serious problems. The Riverside County Flood Control and Water Conservation District has stated, “We believe the problems are serious, and pose a threat to both public health and safety, and to the local economy”. Temescal Canyon Road has been designated as an alternative evacuation route to I-15, which runs along the western boundary of the redevelopment area. Mitigation of these serious problems will clearly advance FPCP goals.

Furthermore, the restoration of Bedford Wash and Temescal Wash will contribute to a new approach in land use planning. The redevelopment area project has been identified by institutions, including the University of California at Riverside's Center for Sustainable Suburban Development, as a model for future land planning efforts. However, significant approved development in the area cannot start construction until flooding conditions are mitigated.

Bedford Wash and especially Temescal Wash are major local drainages. Temescal Wash is a relatively major drainage basin of 60,000 acres at the point that it crosses the Dos Lagos project area. The project seeks to establish a permanent location for Bedford Wash, which currently flows over Temescal Canyon Road from a crude unlined channel at a location 500 feet south of its original location, onto a confluence with Temescal Wash (see Exhibit 11).

Another goal of the FPCP is wildlife habitat enhancement. The remediation, restoration, and preservation of Bedford and Temescal Washes, (see Exhibits 5a and 5b) will integrate with surrounding development and ongoing land use planning efforts such as the preservation of 135 acres of open space, linking a 13,000 acre preserve with Temescal Wash and current restoration activities, to Temescal Wash (see Exhibit 6).

The Executive Summary that follows will further describe the project.

Executive Summary

The Bedford Wash and Temescal Wash Flood Protection Corridor Project (the project) represents an important restoration effort located within the Temescal Canyon Redevelopment Project Area. (*see Exhibit 2*). Located in the City of Corona, the project area has also been identified in the County of Riverside's Temescal Valley Area, Multiple Species Habitat Conservation Plan (MSHCP) (*see Exhibit 4*). The proposed project, in conjunction with surrounding projects, which includes the Dos Lagos Redevelopment Area, represents a model mixed land use approach designed to reclaim a 600-acre area damaged by more than seventy-years of silica mining extraction and processing, and general manufacturing activity. The restoration of Bedford Wash and Temescal Wash in combination with the balanced and sustainable approach to the redevelopment of the larger and surrounding area, make this a unique and important project. Located in the Inland Empire, one of the fastest growing and most rapidly urbanizing areas in the Nation, the project has been identified by institutions, including the University of California at Riverside's (UCR's) Center for Sustainable Suburban Development, as a model for future land planning efforts.

The remediation, restoration, and preservation of Bedford and Temescal Washes, (*see Exhibits 5a and 5b*) will integrate with surrounding development and ongoing land use planning efforts such as the preservation of 135 acres of open space, linking the 13,000 acre Lake Matthews-Estelle Reserve with restoration activities to Temescal Wash (*see Exhibit 6*). The two drainages have been relocated from their original location, streambed material composition modified, and vegetation degraded and inundated with invasive undesirable vegetation by long-term mining and farming activities. These conditions have resulted in excessive streambed erosion, siltation, and flooding creating roadway hazards, risk to adjacent property and life, and the loss of wildlife habitat. The original form of the drainages included broad floodplain zones, a well-developed and relatively open riverine system that included a moderate and stabilizing riparian corridor. A broad spreading confluence zone also originally existed where Bedford Wash joins Temescal Wash. *Exhibits 7 through 10* illustrate how the fluvial system has been altered, restricted and continually relocated during the last seventy years.

Bedford Wash and especially Temescal Wash are major local drainages. Temescal Wash is a relatively major drainage basin of 60,000 acres at the point that it crosses the Dos Lagos project area. The project seeks to establish a permanent location for Bedford Wash which currently flows over Temescal Canyon Road from a crude unlined channel at a location 500 feet south of its original location, onto a confluence with Temescal Wash (*see Exhibit 11*). The project will mitigate the current highly erosive conditions of Bedford Wash exasperated by its manmade location. A basin will be established at its confluence with Temescal Wash providing for deposition of sediment transported from upstream. The basin will mirror the shape of an alluvial fan and will be planted with riparian habitat conducive to the surrounding natural environment. Flood proofing structures will be required to provide the wash stability, reliability, and separation from the surrounding activities. Temescal Wash meanders through the 543

acre Dos Lagos project and its natural banks have been encroached upon by past mining operations. The manmade banks composition is of rejected material (fine sand, silts, and clay) from the silica mining that has occurred for over 60 years. In their current condition the banks of Temescal Wash are highly erosive and subject to failure as the wash reclaims its natural banks. The project proposes to stabilize this condition through a variety of methods including laying the slopes back and armoring the critical bank locations with a combination of rip rap, geo-grid fabric, geo-netting, and *vegetation* (*see Exhibit 11*). The project will restore, to the extent possible, the natural functions and riparian habitat values inherent to coastal dessert floodplains. The Washes, when restored as proposed, will provide linkages from the 13,000 acre Lake Matthews-Estelle Reserve, through the 135 acre hillside preserve permanently set aside as a result of the Dos Lagos project (*see Exhibit 6*). These linkages will help reestablish an east-west wildlife corridor connecting the Cleveland National Forest, the 13,000 acre Lake Matthews-Estelle Reserve, and restore and preserve north-south corridors to Prado Dam, the Santa Ana River, and Lake Elsinore.

The restoration of Bedford Wash and Temescal Wash will contribute to a new approach in land use planning; The goal of which is to obtain sustainable development. This new attitude to development strives to achieve sustainability through the creation of a live-work-play environment. This approach addresses growth concerns including water quality, public health and safety, the job/housing imbalance, traffic congestion, the recreational needs of the population, the creation and preservation of open space and the long-term restoration and stewardship of environmental and biological resources. The mixed land use development plan for the Dos Lagos redevelopment, encompasses the integration of the flood corridors and open space preserve, with major roadway infrastructure improvements, a public golf course, business/office facilities, small-lot and garden cluster residential dwellings, hotel and conference facilities, and the reclamation of an abandoned mining operation into a retail/recreational asset for the greater community.

The proposed project represents a public-private partnership that supports work previously completed and efforts planned throughout the project area by the Riverside-Corona Resource Conservation District (RCRCD), Temescal Canyon Properties-8, LLC, SE Corporation, the City of Corona, County of Riverside, and surrounding land owners currently investing in major infrastructure and redevelopment activities surrounding and adjacent to the project area (*see Exhibit 3*).

Minimum Qualifications

Project proposals that do not meet the minimum qualifications will not be accepted.

- A. 4 The project proposes to use any granted funds for protection, creation, and enhancement of flood protection corridors [*Water Code Section 79037(b)*].
- B. 4 A local public agency, a non-profit organization, or a joint venture of local public agencies, non-profit organizations, or both proposes the project [*Water Code Section 79037(a)*].
- C. 4 The project will use the California Conservation Corps or a community conservation corps whenever feasible [*Water Code Section 79038(b)*].
- D. 4 If it is proposed to acquire property in fee to protect or enhance flood protection corridors and floodplains while preserving or enhancing agricultural use, the proponent has considered and documented all practical alternatives to acquisition of fee interest [*Water Code Section 79039(a)*].
- E. 4 Holders of property interests proposed to be acquired are willing to sell them [*Water Code Section 79040*].
- F. 4 If it is proposed to acquire property interests, the proposal describes how a plan will be developed that evaluates and minimizes the impact on adjacent landowners prior to such acquisition and evaluates the impact on the following [*Water Code Section 79041*]:
 - ▶ Floodwaters including water surface elevations and flow velocities
 - ▶ The structural integrity of affected levees
 - ▶ Diversion facilities
 - ▶ Customary agricultural husbandry practices
 - ▶ Timber extraction operations

The proposal must also describe maintenance required for a) the acquired property, b) any facilities that are to be constructed or altered.

- G. 4 The project site is located at least partially in one of the following:
 - 1. A Federal Emergency Management Agency (FEMA) Special Flood Hazard Area (SFHA), or
 - 2. An area that would be inundated if the project were completed and an adjacent FEMA SFHA were inundated, or

3. A FEMA SFHA, which is determined by using the detailed methods identified in FEMA Publication 37, published in January 1995, titled "Flood Insurance Study Guidelines and Specifications for Study Contractors", or
4. A floodplain designated by The Reclamation Board under Water Code Section 8402(f) [*Title 23, California Code of Regulations, Division 2, Section 497.5(a)*], or a
5. Locally designated Flood Hazard Area, with credible hydrologic data to support designation of at least one in 100 annual probability of flood risk. This is applicable to locations without levees, or where existing levees can be set back, breached, or removed. In the latter case, levee setbacks, removal, or breaching to allow inundation of the floodplain should be part of the project.

Section 497.7. Application for Grant Funding

Applicants for grant funding under the program shall file a complete application with the Department on a form prescribed by the Department. The Department shall not revise the application form during any period in which project proposals are being solicited. A complete application shall contain at least the following information:

(a) A description of the proposed project including:

(1) A statement of the problem being addressed

The problem being addressed is that of remediation of a drainage system located in a redevelopment area (*see Exhibit 2*) that is undergoing reclamation and urbanization. The fluvial system is located within a 100-year floodplain (*see Exhibits 5a and 5b*) has been heavily modified and degraded by long-term mining disposal operations and farming activities of the past and invasive aggressively adverse vegetation resulting in excessive erosion, sedimentation, flooding and the loss of wildlife habitat. The original wash fluvial systems included a broad floodplain zone, a well-developed and relatively open channel system that included a moderate and stabilizing riparian corridor. The alluvium developed in the channel was in dynamic equilibrium with the flow regimes. A broad spreading confluence zone also originally existed where Bedford Wash joins Temescal. Aerial photographs taken between 1931 and 2000 (*see Exhibits 7 through 10*), demonstrate how the fluvial system has been altered, restricted and continually relocated during the last seventy years as a result of farming and mining activities.

The mining operations of the past 70 plus years had placed very thick accumulations into the primary floodplain and active channel area of the wash. These accumulations consist of relatively fine grained micaceous sandy silt and arkose which were reject materials washed from the sand processing operations of the mine. They were placed hydraulically in bermed areas that extend well into the pre-existing active channel zone. These fills, including the berms are generally poorly consolidated. The wash system during heavy flows, tends to scour into and undercut these berms. During high water stands, the berm embankments develop relatively deep saturation, which induced temporary high pore pressure and seepage when the waters recede, resulting in piping and greatly reduced slope stability. The combination results in high erosion and mass-wasting events that can place very large accumulations of these reject soils into the wash channel.

The introduction of adverse and invasive vegetation, especially that of “Giant Reed” (*see Exhibit 16*) has compounded this problem. The now altered and choked channel presents a fine environment for the growth of giant reed, a bamboo like plant that develops very tall and dense stands that propagate by cuttings, root rhizomes, and seed. The plant can tolerate boggy conditions, and can grow up to a foot or more per day. It develops thick mattings of roots and grows at a rate that allows it to overwhelm native plant communities. The thickets choke out wildlife and desirable vegetation, and develop anaerobic bog conditions and trap significant organics and fines within the root mats.

The stands of reeds cause the water of the previously clear channel to develop stagnation, and provide an excellent environment for vectors (mosquitoes, etc.). The giant reed also has documented evapotranspirative capacities of up to ***40-times that of equivalent open water***, and contribute to both significant degradation of water quality, and result in significant loss of water to evaporation that would have been available for surface use and/or groundwater recharge.

Together, the mass wasting effects of the berm embankments introducing choking volumes of sediment into the channel, and the presence of the invasive giant reed community causes the channel to become choked and boggy during lower flow periods. The matting and sedimentation significantly reduces vertical permeability and infiltration capacity, as well as through anaerobic development, degrades the quality of water available. During higher flows, the silts, and the shallow mattings and reed stands uprooted can be transported to damage and choke downstream areas, as well as spread the invasive reed. When mass wasting occurs in the course of a flooding event, a large pulse of heavy sedimentation can be developed.

(2) A discussion of the ways that the project addresses the problem and satisfies the purposes described in Section 497.5(a)(2).

The project addresses the above-described problems by directly acting on the causative factors. The rechannalization of Bedford Wash, the construction of a bridge over Temescal Canyon Road and the creation of a sedimentation basin at the confluence of Bedford Wash and Temescal Wash (*see Exhibit 11*), will create a permanent location for Bedford Wash addressing roadway flooding. The sedimentation basin in conjunction with bank stabilization will address erosion sedimentation issues and will enable a restoration program for both Washes enabling habitat restoration and enhancing identified wildlife corridors impacting the region

The removal of the invasive giant reed community throughout both washes will clear up the channel to more open flow, and allow for native/desirable plant communities to develop. The stabilization of the berm embankments greatly enhances their resistance to erosion and other instability forces, allows for vegetation to develop, and will greatly control adverse sedimentation development in the channel. Once both are implemented, it is expected that the Wash will begin to develop new and much more favorable equilibrium with respect to alluviation and channel stability. Bank vegetation and stabilization will develop a new and favorable/desirable equilibrium. It is also anticipated that a notable increase in groundwater recharge capacity will be realized.

(3) A description of the project approach

The project approach for Bedford Wash would be the removal of unwanted vegetation, existing debris and accumulated sediment. The reestablishment of a permanent channel to acceptable functional condition and location for Bedford Wash and restoration of the natural channel presently disrupted by Temescal Canyon Road through the construction of a bridge. Additionally, the creation of a sediment retention basin would restore the natural function and relationship of the confluence of Bedford Wash with Temescal Wash identified by FEMA as located with a 100-year floodplain, and located within the Temescal Valley Land Use Area of the Multiple Species Habitat Conservation Plan (MSHCP) component of the Riverside County Integrated Plan (RCIP). Reestablishment of the confluence will provide for the restoration of an important east-west wildlife corridor restoring previously severed linkages between the Cleveland National Forest, the Temescal Wash wildlife corridor that extends north to Prado Dam and South to Lake Elsinore, and the 13,000-acre Lake Matthews-Estelle Wildlife Reserve located directly east of Temescal Wash (*see Exhibit 4*). The removal of adverse vegetation and the replanting of native vegetation and Riparian restoration throughout Bedford and Temescal Wash, will facilitate the restoration of important habitat previously occupied by sensitive and endangered species including the least Bell's vireo, willow flycatcher and California gnatcatcher.

In the case of Temescal Wash, existing embankments will be stabilized and regraded using a geogrid/ geofabric/reinforced soil approach followed by implementation of a re-vegetation program per the attached *Erosion Stabilization Plan Concept, Exhibit 11*, and *Remediation Methods 1 through 4 (RM-1 through RM4)* illustrated in *Exhibits 12 through 15*. The stabilization program is intended to minimize channel disturbance, and maximize use of existing soils and will utilize subsurface internal embankment strength enhancement as a primary mechanism. The surface in most cases will be stabilized by a combination of geo webbing (*see Exhibit 12*) and will reinforce and enhance the planned re-vegetation. Only a minimum of “conventional” rip-rap type stabilization (*see Exhibit 11*) is anticipated. The result will be stabilization that is effective, yet is aesthetically and environmentally friendly, without the “hard” “engineered-look.” As discussed previously, the desiltation, bank stabilization and replanting of native vegetation (*see Table 2*) throughout Temescal Wash will result in the restoration and preservation of an important riparian habitat and wildlife corridor. Additionally, the planned golf open space land use adjacent to the easternmost and southeastern reaches of Temescal Wash provide for a transitional open space zone between the Wash and a new 135-acre open space conservation area that links directly to the 13,000-acre Lake Matthews-Estelle Reserve. This land use component provides the final critical connection for the strategic wildlife corridors that are being reestablished and preserved in this area. The Riverside-Corona Conservation Resource District (RCRCD) will be responsible for the long-term preservation, restoration and management of the newly created 135-acre open space preserve and is working directly with Resource Agencies including the U.S. Fish and Wildlife Service and the U.S. Army Corps of Engineers, to implement additional restoration work including 75-acres of Coastal Sage Scrub restoration for the endangered

California gnatcatcher. The *Temescal Canyon Open Space Vegetation Management and Enhancement Plan*, provided in the *Appendices* of this document, describes the restoration work undertaken by RCRCDC for the 135-acre open space preserved, in detail.

(4) A discussion of the expected outcome and benefits of the project

Expected outcomes and benefits of the project include:

- The mitigation of impacts from serious and moderate flood events which create a serious threat to emergency vehicles and have been known to keep citizens from reaching or leaving their homes and also prevent supplies and customers from reaching local businesses and industry.
- The protection of structures, property, infrastructure adjacent to the project.
- The protection of roadways adjacent to the 100-year flood plain, the protection of residents and motorists impacted by roadway hazards caused by sedimentation, debris, floodwaters and drainage deficiencies that currently affecting Cajalco Road and Temescal Canyon Road rendering major arterial roadways impassable.
- Removal and managed flow of debris, siltation and floodwaters will significantly reduce impacts to the Santa Ana Watershed downstream of the project site.
- The establishment of a permanent course for Bedford Wash.
- The creation and restoration of significant wildlife corridors.
- Restoration of riparian habitat for the endangered California gnatcatcher, Least Bells Vireo and Willow Fly Catcher.
- This area is a key component for upland habitat linkage from Temescal Wash to the Santa Ana Mountains. This project will greatly enhance both the upland and riparian habitat linkage/corridor to Temescal Creek.
- Preservation of habitat and open space.
- Creation of recreational/open space viewing opportunities and amenities for existing and planned surrounding recreational, residential and public land uses.
- The project contributes to environmental and habitat restoration and preservation efforts previously implemented and planned within the project area and directly adjacent to the project area, by organizations including the Riverside-Corona Resource Conservation District (RCRCDC), the County of Riverside, the City of Corona and participating land owners.

(5) A description of the geographic boundaries of the project

To the east the project is bounded by golf, 135-acre habitat preserve, the Lake Matthews-Estelle Reserve, and Hubbs Quarry (a rock mining operation). Northerly project boundaries include Material Transport (industrial facility), Cajalco Road which

runs east-west, the Cajalco Bridge (point of confluence of Temescal Wash and Bedford Wash), and Liston Aluminum, currently out of operation. To the west the Interstate Freeway 15 (I-15) intersects Bedford Wash; however the segment of Bedford Wash included in the project area does not encompass the entire reach to the I-15 intersection. The southerly boundaries of the project areas include vacant land planned for business park and recreational use, Quick Crete (a concrete molding manufacturer), planned golf, City of Corona Waste Water Treatment Plant No. 3 and a proposed recreational facility. Temescal Canyon Road bisects the project area from North to South. Planned land uses and uses currently being constructed adjacent to the project boundaries include: a golfcourse and open space preservation areas to the East; a 100 acre commercial-retail center, 60 acre business/office complex, and major roadway and infrastructure improvements along Cajalco Road to the North; master planned residential, commercial and business park uses to the West; and recreational, entertainment, retail, hotel and residential uses to the South. Major infrastructure improvements are planned along Temescal Canyon Road which bisect the project area. Improvements here include water, sewer, roadway, pedestrian-bicycle path, median, intersection and landscape improvements planned as part of a Community Facilities District for a one-mile stretch along Temescal Canyon Road between Cajalco to the North and Weirick Road to the South (*see Exhibit 3*).

(6) Verification that the project is located at least partially in one of the qualifying areas listed in Section 497.5(a).

The project is located within a 100- year Flood Plain identified by the Federal Emergency Management Agency (FEMA) (*See Exhibits 5a and 5b*).

(7) A description and justification of any proposed use of program funds for flood control system or water system repairs performed as part of an easement program or a project developed or financed under the program.

Flood Control Elements of the project include 1) Bank stabilization which eliminates or minimizes sediment transport and erosion, 2) channel relocation, 3) channel bottom stabilization, 4) Bridge crossing. Project elements and benefits are described in items 3, 4 and 5 of this section.

(8) A demonstration that the project is technically feasible

The technical feasibility of the proposed project is discussed in detail in the Flood Protection, Wildlife and Miscellaneous Benefits sections of this document and is demonstrated graphically through Exhibits and Figures provided in the *Appendices* and reference throughout this document. Additionally, a list of sources of information

including professionals and technicians contributing to the findings presented in this document, are provided in **Table 4**.

(9) A hydrologic and hydraulic analysis prepared by a civil engineer registered pursuant to California law.

The finding presented in this document are based on preliminary analysis conducted for aspects of this project and extensive hydrologic and hydraulic analysis prepared for aspects of this project and components of projects immediately adjacent to the proposed project. A list of reference documents and sources of information are provided in **Table 4** of this document.

(10) A complete initial study environmental checklist as required by Section 15063(f), Title 1, California Code of Regulations, and if available a completed Environmental Impact Report or other environmental documentation as required by CEQA.

The project area is included as part of the Temescal Valley Redevelopment Plan and the Dos Lagos Specific Plan (SP 99-03) in **Final Environmental Impact Report, State Clearinghouse Number: 19991110011, Corona Annexation No 94 and Dos Lagos Specific Plan**, prepared for the City of Corona, prepared by David Evans and Associates (DEA); June 21, 2000. A complete initial study environmental checklist was completed by the City of Corona, and DEA as part of the EIR process and will be forwarded to you upon receipt from the City.

(11) A list of required permits for the project and an implementation plan for their procurement.

Resource agency permits including 401, 404, and 1603 Permits, are currently in place for restoration activities already occurring as part of the Dos Lagos mixed land use project. Additionally, RCRCDD has regional-wide permits in place for Temescal and Bedford Wash for arundo removal, monitoring of the Least Bells' Vireo, cowbird trapping and other restoration activities and projects that the Agency currently manages. RCRCDD regularly communicates and has ongoing working relationships with resource agencies including the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, and Fish and Game and will communicate with the Agencies as required. No additional resource agency permitting is anticipated. A LOMAR will most likely be required however, with the implementation of the sedimentation basin in Bedford Wash.

(b) Maps and drawings as necessary to describe the project, including:

- (1) *A vicinity map (see Exhibits 1 and 2).*
- (2) *A map indicating location of project features and boundaries of affected property (see Exhibits 3, 7-10, and 11.)*
- (3) *Drawings or sketches of project features as necessary to describe them (see Exhibits 11-15).*

(c) A financial summary including:

- (1) The estimated cost of the project broken down by task.*
- (2) The estimated flood control benefits of the project.*
- (3) The amount of the grant requested.*
- (4) The estimated amount to be funded by the applicant.*
- (5) Identification of any other parties contributing to the cost, and the amounts and activities to be funded by them.*

Table 1, located at the end of this document, provides a detail project cost estimate requested in item 1 below. These estimates are preliminary in nature and are subject to change upon completion of final engineering design. It is obvious that the expenditures on this project exceed the \$5 million maximum grant amount, therefore the applicant requests that upon approval of the project to have the flexibility to modify and prioritize the line items based on final detail cost budgets in order to assure the full allocation of the \$5 million grant award.

Table 1 also provides reconciliation for items 3, 4 and 5.

An estimate of flood control benefits are covered under the section “Flood Control Benefits”, application section IV. B. 3.

(d) A summary of proposed property acquisition rights including:

Table 3 located at the end of this document, provides a complete listing of property and property owners participating in this flood protection project. Land owners are currently participating in the negotiation process for easements and fee title for property rights.

- (1) Identification of each property*
- (2) Names, addresses and telephone numbers of the property owners and lessees or tenants.*
- (3) The type of property rights to be acquired (such as easement or fee title).*
- (4) Evidence that affected landowners are willing participants in any proposed real property transactions.*
- (5) A justification of any proposed acquisition of fee interest in property to protect or enhance a flood protection corridor or floodplain while preserving or enhancing agricultural use (Water Code Section 79037(b)(1)) which includes:*
 - (a) Reason for the fee title acquisition*
 - (b) Alternatives considered to fee title acquisition for each property*
 - (c) Proposed final disposition of the property*
 - (d) Effect on county property tax revenue*

(e) A tentative work plan for the project including:

(1) *A timetable for execution of the project.*

03/15/03 - Finish Hydrological and Environmental Studies

05/30/03 - Finish Engineering and Design

06/01/03 - Start Construction and Restoration

05/30/04 - Finish Construction and Restoration

(2) *A task breakdown for the project is provided in Table 1.*

(3) *A description of how services of the California Conservation Corps, or local community conservation corps will be used in the project.*

The CCC will be used to place erosion control material on the construction footprint and for placement of native vegetation on slopes and riparian areas of the wash.

(f) A list of names and addresses of owners of all property interests in parcels adjacent to those for which acquisition of property rights is proposed.

See *Table 3* provide at the end of this document.

(g) A plan to minimize the impact of the project on adjacent property owners, including but not limited to the following (Water Code Section 79041):

(1) *An evaluation of the impact on floodwaters is provided in detail in the Flood Protection Benefits section of this document.*

(2) *The structural integrity of affected levees. No levees are affected.*

(3) *Diversion facilities are not created or impacted by the project.*

(4) *Customary agricultural husbandry practices are not conducted within the project area and thus, are not impacted by the project.*

(5) *Timber extraction operations is not conducted within the project area and thus, are not impacted by the project.*

(6) *An evaluation with regard to maintenance is discussed in the in the Flood Protection Benefits section and Wildlife Benefits section of this document.*

(h) A description of the input and participation that local groups and affected parties provided in the preparation of the work plan and application.

The mitigation of the roadway flooding and drainage problems at this location have been a major concern to the local community, local government agencies and property owners for a number of years. Support for the project and mitigation from the local community is documented in letters provided at the end of this document. RCRCDC is working in cooperation with local landowner including Temescal Canyon Properties-8, LLC, and SE Corporation. Additionally, land owners of the following adjacent facilities including Liston Aluminum, Quick Crete, Material Transport, and the City of Corona Waste Water Treatment Plant No. 3 are in negotiations to provide necessary easements and in some cases, in-kind and fee title, in support of the project efforts to mitigate problems as dicussed throughout this document.

IV. (340 points) Flood Protection Benefits

A. Existing and potential urban development in the floodplain (50)

1. *Describe the existing and potential urban development at the site and the nature of the flood risk.*

The project is located within the I-15 corridor, one of the most rapidly growing areas in the nation in terms of population and urbanization. The project is located within the Temescal Canyon Redevelopment Area. Development occurring directly adjacent to the project includes major infrastructure and roadway improvements along Temescal Canyon and Cajalco Roads, and the new City of Corona Waste Water Treatment Plant No. 3, designed to handle 1.5 million gallons per day to meet the needs of rapidly developing residential growth throughout the surrounding area. Two large development projects representing approximately 742 acres of residential, commercial/retail, office/business park, and open space set aside for recreational use and habitat preservation, surround the site and are currently under development. Three smaller parcels including a recently closed aluminum processing plant, a concrete manufacturing plant, and a warehouse and manufacturing facility are also directly adjacent to the project area.

The project area is located adjacent to Temescal Canyon Road (TCR). Currently an unimproved and undivided 2-lane road, TCR is designated as a major arterial roadway. Average Daily Traffic (ADT) along this stretch of TCR is projected to reach 27,500 vehicle by 2008. 2008 projections for roadways adjacent to the project area include 25,000 vehicles along Cajalco Road (a designated Urban Arterial and Expressway) between TCR and the I-15 Cajalco; and 25,000 vehicles along Weirick Road (a designated major arterial) between the I-15 and TCR. As of March 2002, the Annual Average Daily Traffic (AADT) volumes at the I-15 and Cajalco interchange was 105,000 vehicles (peak, 114,000 vehicles); and the I-15 and Weirick Road (leading into the project area at the south) was 93,000 vehicles (peak, 101,000 vehicles). Traffic volumes in this area demonstrate the unprecedented growth and critical need to mitigate flooding in the interest of life safety and overall public.

The problem being addressed is that of remediation of a drainage system located within a 100-year floodplain (*see Exhibit 5a and 5b*) that has been heavily modified and degraded by long-term mining disposal operations and farming activities of the past and invasive aggressively adverse vegetation resulting in excessive erosion, sedimentation, flooding and the loss of wildlife habitat. Flooding occurs within Temescal Wash and Bedford Wash affecting Cajalco Road and Temescal Canyon Road rendering major arterial roadways impassable. Additionally the flooding through abandoned silica sand mine site produces siltation of the waterways that impact the Santa Ana Water Shed down stream of the project site.

2. *How often has flooding occurred historically?*

Bedford Wash and especially Temescal Wash are major local drainages. Temescal Wash is a regionally major basin and serves to drain some 60,000 acres at the point it crosses Dos Lagos. They are by nature both ephemeral, flowing zero to a few cubic feet per second at low stands to thousands of cubic feet (tens of thousands in the case of Temescal) under exceptional flow events.

Bedford Wash is relatively short feched and steep, and primarily drains the proximity of Bedford Canyon. It drains easterly into Temescal Wash just north of the Dos Lagos site. The tailwater area is situated near the industrial area and the intersection of Cajalco and Temescal Canyon Roads. This area has significantly altered the geomorphology of the wash, and its ability to translate flows into Temescal Wash. Bedford Wash is currently forced to cross directly over a swaled area of Temescal Canyon Road through a crude unlined channelization (*see Exhibit 16*).

Temescal Wash is relatively elongate and flows at a flatter gradient, and is the principle drainage for the Temescal/Elsinore Valley. It flows northerly to the Santa Ana River. Its reach upstream of the site is relatively rural, and includes areas of intrusion.

Bedford Wash is considered to be the more sensitive of the two, in that it reacts to a much lower threshold of influx (ie. storm activity). This reactivity is aggravated by the constrictions in the area of Temescal Wash. Based on review of available data and direct observation, Bedford Wash can be expected to flood and flow across Temescal Canyon Road as a nuisance flow in most rain events exceeding ¼-inch per day. Bedford Wash can flow across in a relatively heavy and damaging manner during the more significant storms exceeding 1 to 2-year events. In 10-year and heavier events, it can be expected to flood out a significant adjacent area of the road, and cause heavy alterations to its channel. The road can be impacted in such events by depositions of coarse clastics and scouring.

Temescal Wash can develop very high stands in response to high regional flows and storm events, however, it has a much higher latency with respect to storm response. In response to 100-year storm events, the wash can develop flows on the order of 19,000 cubic feet per second. At stands in response to 2-year and up storms, it develops flows that induce siltation and barring. At stands in response to 10-year and up storms, it can be expected to jump and or flood out of its existing banks and begin scouring and eroding the existing poorly consolidated mine tailings and alluvial soils within the limits of the Dos Lagos project. These flows transport the eroded soils downstream and into the channel in a derogatory manner. The combination of undercutting, saturation/induced seepage, and erosion results in heavy mass wasting effects. Bank cutbacks over the 40-or so years that the mine tailings have existed in the wash are estimated locally at over 100-feet.

3. Discuss the importance of improving the flood protection at this location. Include the number of people and structures that are affected by the flood hazard, and the flood impacts to highways and roads, railroads, airports and other infrastructure, and agriculture.

Flood control improvements within the Bedford and Temescal Washes 100-year floodplain are critical in light of the unprecedented growth and urbanization that is occurring throughout the project area. Located at the southernmost end of the City of Corona (estimated population 135,000), there are 78,776 person and 23, 476 households estimated to be located within a 5-mile area of the project site by 2006. Additionally, an estimated 20,000 new residential units (*see Exhibit 3a*) are in various of planning, development and completion in the unincorporated areas of Riverside County directly south of the project area.

The increase in residential population, development activity and automobile and truck traffic throughout the area will increase with planned roadway and infrastructure improvements that will result in increased traffic throughout the project area. As discussed in *Section A-1*, the project area is located adjacent to Temescal Canyon Road (TCR). Currently an unimproved and undivided 2-lane road, TCR is designated as a major arterial roadway. Average Daily Traffic (ADT) along this stretch of TCR is projected to reach 27,500 vehicle by 2008. 2008 projections for roadways adjacent to the project area include 25,000 vehicles along Cajalco Road (a designated Urban Arterial and Expressway) between TCR and the I-15 Cajalco; and 25,000 vehicles along Weirick Road (a designated major arterial) between the I-15 and TCR. As of March 2002, the Annual Average Daily Traffic (AADT) volumes at the I-15 and Cajalco interchange was 105,000 vehicles (peak, 114,000 vehicles); and the I-15 and Weirick Road (leading into the project area at the south) was 93,000 vehicles (peak, 101,000 vehicles). Traffic volumes in this area demonstrate the unprecedented growth and critical need to mitigate flooding in the interest of life safety and overall public.

Cajalco Road is designated as a County Scenic Highway and the portion of the I-15 running parallel to TCR is also identified as an official State and County Scenic Highway. Prior to construction of the I-15 Freeway, TCR served as the major "highway" extending south to San Diego and North through Riverside. The section of TCR impacted by flooding activities remains a major transportation route providing alternative circulation and relief to congestion along the I-15 and is also an important emergency access route for police, fire and medical services.

Currently TCR is a 2-lane undivided road with a 26-foot wide pavement width and no curbs, gutters or sidewalks. Planned improvements for this 1-mile stretch of TCR include widening of the road right-of-way to 110-120 feet to provide for four travel lanes, a 28-foot raised landscape median at the northern end of the roadway (designed to accommodate the preservation of six California Coastal Live Oak Trees that are located in proximity to the point that Bedford Wash currently flows over TCR), and 28-foot parkways to include meandering bicycle/pedestrian pathways. Major improvements along Cajalco Road between the I-15 and TCR are currently underway and include

improvements from a 4-lane undivided roadway with no sidewalks or curbs and gutters to a 6-lane divided roadway with curbs, gutters and sidewalks, four-way intersections and signalization at TCR and Cajalco, a new three-way signalized intersection between Cajalco and the I-15, and on and off-ramp improvements at Cajalco Road and the I-15. Comparable improvements are also planned one exit south of Cajalco at Weirick Road and the I-15.

Currently, storm flows from Bedford Wash traverse Temescal Canyon Road from the west before emptying into Temescal Wash to the east. With no bridge crossing or culvert currently in place, heavy rainstorms often cause localized flooding along Temescal Canyon Road and the intersection at Cajalco. Because of these deficiencies, frequent flooding and subsequent standing water has caused the deterioration of existing parking areas, streets, and other covered surfaces, as well as erosion to unimproved surfaces. Flooding as a result often requires road desilting cleanup work and road closure. The culvert from the west to the east side of Temescal Canyon Road has completely filled with sediment and no longer has runoff conveyance capacity. Fencing along the west side of the road has prohibited inspection and maintenance of the Bedford Wash culvert for several years.

Historically, Temescal Canyon Road, which runs parallel to the Interstate 15 Freeway, served as a major State Highway. The flooding of the roads creates a public safety concern for emergency vehicle access to points east and south of the wash locations. Siltation downstream of the project site affects the flood storage capacity of Prado Basin and water quality of the Santa Ana River and southern California Coast line. Millions of people rely on these resources for recreation, water transport and storage, and flood protection. Existing facilities and structures directly adjacent to the site and threaten by existing conditions include, a new Waste Water Treatment Plant completed in 2002, an aluminum processing plant, a concrete manufacturing plant, and a warehouse and manufacturing facility. Planned structures and facilities presently at various stages of construction include approximately 700,000 square feet of commercial/retail, office/light industrial use, a golf course, 599 new residential units, and a 500,000 square foot commercial/recreational area.

B. Flood damage reduction benefits of the project (100)

1. Does the proposed project provide for transitory storage of floodwaters? What is the total community need for transitory storage related to this water course and what percentage of the total need does this project satisfy? What is the volume of water and how long is it detained?

The proposed project DOES provide for some enhancement of the groundwater recharge capacity which is maximized at flood periods. This increase in recharge capacity allows the groundwater to accumulate infiltrations of surface waters at a higher rate due to the improved channel conditions. The increased rate of infiltration means a potential increase in groundwater storage that can develop from flood events, translating into an

increase in transitory storage in the highly desirable form of groundwater within the wash aquifers. Removal of invasive vegetation that has exceptionally high evapotranspirative potentials (ie. Giant Reed) that chokes down the channel and consumes up to 40 times the water of equivalent areas of standing open water will provide additional improvement in the groundwater recharge, eliminating this vegetation which entraps fine particulates and develops boggy, anaerobic conditions that both limit the infiltration rates and greatly degrade the quality of the infiltrate water.

The wash aquifers are utilized extensively in the area as a primary local water source. Similarly, the basins planned for Bedford Wash will allow for transitory storage and increased infiltration of these waters into the groundwater table of both the wash and the general alluvial aquifers. Additionally, it will mitigate undesirable silts and clays from being transported from the project site down stream to the Prado Basin and to the lower Santa Ana in Orange County where water percolation is relied upon to recharge the ground water basin.

- 2. Describe any structural and non-structural flood damage reduction elements of the project. (Examples of structural elements are levees, weirs, detention/retention basins, rock slope-protection, etc. Examples of non-structural elements are acquisition of property for open space, acquisition of land for flood flow easements, transitory storage, relocation of structures and other flood prone development, elevating flood prone structures, flood proofing structures, etc.)*

Structural flood damage reduction elements include a crossing over Bedford Wash to provided for Temescal Canyon Road, the creation of a 4 to 5 acres retention and desiltation basin to handle flows through Bedford Wash before entering downstream waters in Temescal Wash at the confluence of Temescal and Bedford Wash. Bank stabilization of Temescal Wash and Bedford Wash utilizing interlocking pavers and a soft bottom channel (except at the Bedford Wash bridge crossing) will be utilized to reduce scour and provide slope protection.

Non-structural element include the acquisition of right-of-ways and easements, and a 4 to 5 acre parcel for the creation of the retention and desiltation basin; and the creation of open space and riparian habitat.

- 3. By what methods and by how much dollar value will the project decrease expected average annual flood damages?*

Temescal Canyon Road and Cajalco Road are principal arterials that traverse the redevelopment area. Flooding across Temescal Canyon Road at Bedford Wash and Cajalco Road at Temescal Wash during storm conditions create serious problems. The Riverside County Flood Control and Water Conservation District has stated, “We believe the problems are serious, and pose a threat to both public health and safety, and to the local economy”. Temescal Canyon Road has been designated as an alternative

evacuation route to I-15, which runs along the western boundary of the redevelopment area. The economic impact from situations in which flooding occurs on these important arterials could be immense.

The project will provide protection of Cajalco Road and Temescal Canyon Road, the two principal roadways adjacent to the 100-year flood plain, as well as protection of residents and motorists who would be impacted by roadway hazards caused by sedimentation, debris, floodwaters and drainage deficiencies that would make the roadways impassable. The closure of the section of Temescal Canyon Road and the cost of traffic diversion affecting traffic flows for a distance of one mile south and one mile north, annual rain events and cleanup activities, is difficult to quantify in monetary terms. Historical costs for just cleanup are estimated at around \$50,000 to \$60,000 in annual costs. These are costs historically borne by the County of Riverside Department of Transportation for loaders, trucks and personnel needed to remove sediment and debris deposited from Bedford Wash onto Temescal Canyon Road and Cajalco Road during annual rain events. Our consultant has estimated that after the Bedford Wash and Temescal Canyon flood protection improvements are completed that the impacts of a 100-year event would be reduced by a factor of 100%. Average annual flood damages after factoring in major flooding occurrences would be decreased substantially.

Aside from damages to Cajalco Road and Temescal Canyon Road and interruption of traffic flow, recent and planned development activities in the redevelopment are resulting in more property that becomes in risk. The City of Corona's new wastewater treatment plant (WWTP #3), which is located in the project area, is valued at \$15 million. Damage to this facility which is directly in the existing floodplain would be catastrophic, not only from the harm done to the facility itself, but even more so from interruption of service to its users, incurring significant health and safety hazards. The Dos Lagos project alone is estimate to generate approximately \$400 million in new assessed value. We have estimated that 20% of that development, or \$80 million, would be in close proximity to the current area of flooding. In addition to the Dos Lagos development, there are other significant developments including the 1,000,000 square foot Renaissance shopping center already underway at Cajalco Road and I-15. See Exhibit 3a for surrounding land-use activities.

4. How does the project affect the hydrologic and hydraulic conditions at the project site and adjacent properties?

Bedford Wash is not in its historical location and Temescal Wash has been severely impacted. Aerials provided in ***Exhibits 7 through 10*** illustrate how the Washes have evolved over a period of 70 years (1931-2000) from broad unconstrained alluvial flats to constrained channels. Historically the confluence of Temescal and Bedford Washes allowed for a broad, smooth and direct transition. As illustrated in in the above referenced aerial photographs, Bedford Wash has been relocated several times, from its original location due to agricultural activities, mining and manufacturing operations of the past, construction of the Interstate 15 Freeway and Cajalco Road. The current

gradient of the channel has been reduced to a narrow and sinuous swale and the channel flattens out at intersection with Temescal Canyon Road and results in deposition of massive amounts of sediment on the roadway. Improvements will shift the sediment transport further to the east into an area that can accommodate the sediment.

The proposed channelization and embankment improvements for the washes will result in a significant improvement to both washes. This will be accomplished by:

Bedford Wash:

- Improved alignment and flowpath of the wash through the roadway crossing and adjacent upstream area.
- Separation of the wash and the road by construction of a bridge crossing at this point.
- Cleaning out of existing accumulations of uncontrolled fill and flood deposits.
- Provision for a clear and direct tie-in to Temescal Wash, facilitating flow-through, and limiting siltation/deposition due to constraintment at the outlet.

Temescal Wash:

- Improvement of the existing channel by removal of adverse vegetation development and debris accumulation. This improves overall flow character at both high, and also importantly, low stands. The low stand improvement through this project is also realized in significant reduction of water loss through adverse evapotranspiration induced by the giant reed and similar invasives, which can induce losses on the order of 40 times that of open water. The removal of the thickets of invasive plants and debris will also limit areas of stagnation and siltation, and bog development.
- Embankment stabilization and restoration will greatly limit the wash's ability to induce heavy mass wasting and associated derogatory siltation/sedimentation during high flow events. The stabilization will also improve greatly the safety aspects of these embankments which are currently heavily undercut and eroded. As already touched on, these existing embankments have experienced areas of over 100-feet of retreat and include numerous landslides with vertical instabilities to over 40-feet high, and undercut zones of several feet.

a) Will the project reduce the magnitude of a flood flow, which could cause property damage and/or loss of life?

Yes, by controlling the location and manner in which flood waters are conveyed through areas of concern as mentioned above, property immediately adjacent to the channels will not be flooded as in the past. Additionally, emergency vehicles will be able to pass through previously obstructed roadways to address life safety concerns such as those posed by community members and the Riverside County Flood Control and Water Conservation District (*see letters at the back of this document*).

b) What are the effects of the project on water surface elevations during a flood event which could cause property damage and/or loss of life?

The project reduces the deposition of sediment within both washes which directly affect the carrying capacity of the channels to convey flows. Removal of non-native vegetation and existing siltation from the Washes will increase its capacity to convey organized flows, therefore allowing for higher and more uniformed flow potentials, and enable the reduction of the water surface elevation.

Construction of the bridge crossing at Temescal Canyon Road (TCR) and Bedford Wash will remove TCR from the floodplain. The sediment will be carried to the proposed debris/detention basin at the confluence of the Temescal Wash (TW) and Bedford Wash (BW). Therefore the impact of 100-year flows and corresponding sediments on the Temescal Canyon Road would be reduced by a factor of 100%. Armoring the eroded sections of TCW will reduce the total of sediments. Lot 6 at southeast corner of the project in existing condition is in the floodplain; it will be removed from the floodplain. This also will reduce the flooding and sediment problems.

c) How are flow velocities impacted by the project during a flood flow which could cause property damage and/or loss of life?

The roughness factors n for eroded areas of TCW is approximately .025. By armoring and applying methods of slope stabilization the roughness factor n would be higher. The higher roughness factor n will reduce the flow velocities and amount of sediment. The existing velocities in TCW are ranging from 5 to 15 feet per second (fps). Flow velocities will be consistent with current velocities after the project completion, and any potential impacts of the velocities on surrounding properties and roadways are mitigated by the project design.

C. Restoration of natural processes (60)

1. Describe how any natural channel processes will be restored (for example: for channel meander, sediment transport, inundation of historic floodplain, etc.) and describe how these natural processes will affect flood management and adjacent properties.

The natural bed of Temescal Wash will be restored by removal of arundo and the stabilization of the mine tailings along its banks, allowing the gravel bed of the channel to be exposed and reestablished in a native condition. A permanent location will be created for Bedford Wash, which as discussed previously and historically illustrated below, has been severely impacted, relocated in a haphazard manner several times due to agricultural, mining, manufacturing and road and freeway improvements during the last 70 years. A permanent location will enable the restoration of natural water flow and habitat function

and the establishment of an east-west wildlife corridor between the Cleveland National Forest, the Lake Matthews Estelle Reserve, Prado Dam and Lake Elsinore.

Specifically:

- Channel function will return to more organized wash from current choked and bogged braided condition induced by invasives and mass wasting.
- Sediment transport systems implemented will limit development of heavy sediment overloads due to stabilization of embankments and removals of invasives.
- Redevelopment of Riparian Corridor – once invasives are removed and controlled, and sediment loads and conditions achieve a new equilibrium, the channel will develop conditions suitable for the development of a more appropriate and desirable riparian corridor. This corridor will also assist in channelization stabilization and foster the redevelopment of desirable flora and fauna.
- Increase in character and quality of groundwater recharge – the heavy siltation results in deposits that lower permeability and recharge capacity of surface waters into the groundwater associated with the washes. The removal of the invasive plants will also significantly improve recharge by strong reductions in evapotranspiration potentials, and groundwater withdrawals during low stands.
- In the case of Bedford Wash, the project will restore continuity for flow and channel functionality by reducing the bottleneck effect of the existing conditions at Temescal Canyon Road.

A review of the following historical aerial photographs illustrate the natural channel processes and how they have been altered during the past seventy-years.

Exhibit 7 - Aerial Photo, Year 1931

This photo stereopair shows the general pre-development configuration of the washes and adjoining areas. The photos illustrate that the Temescal Canyon Wash system has a relatively broad, somewhat braided but clear active channel. The channel is controlled by the geomorphology of the east hills and the rock knob area, and is also slightly entrenched and constrained within the alluvial flats portions. The floodplain is free of heavy vegetative growth.

Bedford Wash shows a clear transition in its downstream reach, and maintains a relatively direct and broad active channel. The confluence of Temescal Canyon and Bedford Washes allows for a broad and smooth transition.

Riparian development is moderate and maintains relatively open channels and promotes channel stability.

Exhibit 8 - Aerial Photo, Year 1962

By this time, the mining operations have greatly altered the active channel and alluvial floodplain of the Temescal Canyon Wash within the limits of the general site area. The previously relatively broad active channel zone has been tightly constrained and intruded upon by the berms and reject fills of the mine. Quarrying operations have begun at the Hubbs facility just north of the knob area.

The alluvial flats north of the knob area have been developed into orchard and other use areas which has constrained the active channel and flood plain zones. The I-15 freeway has not been constructed.

Bedford Wash shows significant development forming that has constrained the Wash confluence zone. In addition to the constraint, the land alteration for the orchards combined with the development has greatly necked down and divided the active flow paths.

Exhibit 9 - Aerial Photo, Year 1974

Photo 369 illustrates the significant development of the mining berms and reject fill intrusions onto the active channel and floodplain of Temescal Canyon Wash. The berms have very tightly constrained the wash to only a modified active corridor and has removed much of the meander and braid fluvial structures, and have forced the channel into a singular channel with only the broadest meanders remaining. These broad meanders are controlled by the geomorphology of the area (ie. the hard rock outcroppings of the East Hills and the Knob). Vegetation can be seen developing and invading into the channel area.

Bedford Wash has been largely converted into orchards in the upper portion and sharply constrained and altered by the freeway, road and industrial/commercial development in the lower reach in the area of confluence with Temescal Canyon Wash. It can be seen that the active channel portion of the wash goes from relatively broad to tightly funneled down as it approaches and crosses the freeway and Temescal Canyon Road.

These conditions in both washes have strongly disturbed the equilibrium of alluvial and fluvial processes, and have introduced sharp transitions and channel constraint which promote adverse flow behavior during flood events, and promote adverse alluviation during low flow events.

Exhibit 10 - Aerial Photo, Year 2000

These photos show the general conditions of the washes within the current timeframe. Note that the channel for Temescal Canyon Wash has become heavily overgrown with vegetation. Note also the very sharp escarpments and marked retreats of the berms due to mass wasting and scour when compared to the earlier photos. The products of the erosion and mass wasting have combined with the invasive vegetation to choke the channel with sediments and induce the heavy braiding structure.

Note that Bedford Wash has been almost entirely channelized and the area developed by orchards and infrastructure/development, and that its once relatively broad juncture with Temescal Canyon Wash has been reduced to a narrow and sinuous swale.

2. *Describe any upstream or downstream hydraulic or other effects (such as bank erosion or scour, sediment transport, growth inducement, etc.).*

Temescal Wash:

Because mass wasting and scour/erosion will be controlled, downstream sedimentation and choking effects are anticipated to be significantly reduced. Similarly, the removal of the invasives and debris will eliminate them from inclusion in heavy flood flows where they are uprooted and carried along with the flow, to contribute to adversities and water quality downstream.

Bedford Wash:

Upstream hydraulics will be improved by the more organized and controlled flow offered by the proposed project channelization.

3. *If the project includes channel modification or bank protection work, will riprap or dredging be part of the design? If so, provide an analysis of potential benefits and impacts.*

The project is using river engineering and watershed planning procedures to develop environmentally sensitive engineering solutions and design sustainable restoration measures that maximizes potential biodiversity in both Bedford and Temescal Washes.

Modification along Bedford Wash which has been almost entirely channelized and reduced to a narrow and sinuous swale along its western reach, and functionally disconnected from its confluence with Temescal Wash along its eastern reach, will be restored to a permanent location. The benefits of this modification include 100% improvement in natural function, controlled flows in the event of a storm event, the benefits of desiltation currently impacting the Santa Ana River to the North.

Riprap or other form of bank stabilization will be utilized such as interlocking pavers. The use of a bank stabilization process is meant to stabilize the sediment load in storm flows as well as stabilize banks and stream beds to enable reestablishment of native riparian habitat. A portion of the proposed work will focus on the remediation and protection of the existing channel embankments in both washes, but particularly in Temescal Wash. The embankment and restoration will be risk-rated, and different approaches will be recommended for areas of relative high, medium, and low risk/need for stabilization. Details for the different phases of approach are presented in the attached *Exhibits 11 - 15*.

Additionally, modifications to and the restoration of riparian habitat within Bedford wash will restore a wildlife corridor linking the Cleveland National Forest with the Temescal Wash. Restoration of riparian habitat within the Temescal Corridor combined with restoration and linkage of the Bedford Corridor, will ensure an east-west corridor to wildlife preserves located to the east, Prado Dam and the Santa Ana River to the North, and Lake Elsinore to the South. From an environmental biological standpoint, the project creates, protects and preserves open space and habitat resources for the community and as well as endangered species, and provides recreational benefits in the form of scenic view opportunities available from public roadways and adjacent public and private land uses. Modifications represent a major public safety and emergency access benefits due to roadway hazards eliminated in the case of local flooding and 2-year events, and greatly reduced hazards associated with 100-year events which are reduced by 100%. In addition to improved roadway and traffic safety benefits, the protection of existing and planned adjacent properties and structures are also significantly improved and in some cases eliminated. No adverse impacts have been identified.

D. Project effects on the local community (60)

The project effects on the local community are beneficial and include:

- The project will address life and safety hazards.
- The project will keep roads open for emergency access vehicles such as police, medical and fire, during a flood event.
- Elimination of existing roadway hazards resulting in increased public safety.
- The protection of public and private property and structures adjacent to a 100-year floodplain.
- Increased benefits in local and regional water quality and groundwater supply.
- The restoration, creation and protection of open space resources including wildlife corridors and habitat.
- Creation of recreational amenities in the form of public and private view corridors.
- The removal of blight and the reclamation of an abandoned mining facility.

- Support economic development and redevelopment goals of the Redevelopment Agency, local residents and business owners.
- Support continued private investment and increased property values within the project area and areas surrounding the site.

1. How will the project impact future flooding on and off this site?

The project will help contain the flooding to designated areas without interrupting transportation on roads adjacent to the project area as well as reducing impacts to the downstream watershed.

2. How will the project affect emergency evacuation routes or emergency services and demands for emergency services?

As mentioned above the project will improve the reliability of these transportation corridors.

3. Explain how the project will comply with the local community floodplain management ordinance and the floodplain management criteria specified in the Federal Emergency Management Agency's National Flood Insurance Program (FEMA's NFIP).

The project will keep travel lanes open during 100-year flood events as required by local ordinance. The project will address life and safety hazards. The project will contain floodwaters without encroaching into the floodplain and provides necessary freeboard within floodplain provide factor of safety.

E. Value of improvements protected (70)

1. What is the assessed value of structural improvements that will be protected by the project?

The assessed value for Liston Brick and Material Transport, two existing properties adjacent to the area where the Bedford Wash crossing on Temescal Canyon Road will be constructed, are listed on the assessor's database for a total of \$3.1 million. The City of Corona's wastewater treatment plant (WWTP #3) is approximately \$15.0 million. The total of the Dos Lagos development when fully built out is approximately \$400 million. As a rough estimate, approximately 20% of the build out (\$80.0 million) would be directly protected by the Bedford Wash and Temescal Wash project. The entire Dos Lagos development, as well as surrounding developments, is indirectly protected by the project in that road closures will be prevented.

2. What is the estimated replacement value of any flood control facilities or structures protected by the project?

As shown in Table 1, the total cost of the Bedford Wash and Temescal Wash project is \$6.4 million. Replacement values for Liston Brick and Material Transport are not known. Most likely in the long term, because of surrounding development activity, these two properties would have a highest-and-best use other than the current use. Because the Dos Lagos project is future development, projected assessed value and replacement value can be considered the same.

V. (340 points) Wildlife Benefits

Habitat values refer to the ecological value and significance of the habitat features at this location that presently occur, have occurred historically, or will occur after restoration.

Viability refers to the site's ability, after restoration if necessary, to remain ecologically viable with minimal on-site management over the long-term, and to be able to recover from any natural catastrophic disturbances (fire, floods, etc.).

A1. Importance of the site to regional ecology (70)

1. Describe any habitat linkages, ecotones, corridors, or other buffer zones within or adjacent to the site. How are these affected by the project?

The project creates new habitat linkages, restores the function of existing corridors and provides buffer zones and open space resources in a rapidly urbanizing area. Currently, the Temescal Creek drainage is a major tributary and corridor linkage along the eastern slope of the Santa Ana Mountains. This area is a key component for upland habitat linkage from Temescal Wash to the Santa Ana Mountains. The project will greatly enhance both the upland and riparian habitat linkage/corridor to Temescal Creek. The restoration of this corridor, which has been damaged by previous mining activities and industrial land uses, when combined with the reclamation and restoration of Bedford Wash, will create an important east-west linkage between the Cleveland National Forest, the 13,000 acres lake Matthews-Estelle Wildlife Reserve, the Santa Ana Mountains and Prado Dam to the north, and Lake Elsinore to the south, allowing for movement of wildlife (see Exhibits 6). The project re-establishes these linkages in an ecologically sound manner.

2. Is the site adjacent to any existing conservation areas?

Yes. The project site is within the Western Riverside County Multi Species Habitat Conservation Plan (MSHCP) (see **Exhibit 4**) and adjacent to the 13,000 acre Lake Matthews-Estelle Mountain Reserve (see *Exhibits 3 and 6*). The project site is adjacent to a new 135-acre hillside area that is currently being set aside for restoration and preservation and will be managed in perpetuity by the RCRC (see *Temescal Canyon Open Space Vegetation Management and Enhancement Plan provided in the appendices of this document for details on the 135-acre preserve*). Restoration of the Washes (the project site) will restore an important east-west wildlife corridor linkage (destroyed by previous impacts and land uses) between the preservation areas mentioned, and the Cleveland National Forest via Bedford Wash. Regional linkages of the project site include Prado Dam and the Santa Ana River upstream to the North, and Lake Elsinore to the South.

3. Describe any plans for aquatic restoration resulting in in-stream benefits.

The project site will incorporate hydrologic benefits from a soft bottom design with small drop structures to reduce sedimentation and velocity flows during rainfall and flooding events and provide side channel stabilization with interlocking pavers which allow for installation of native plant material, alluvial sage scrub upstream and riparian willow woodland downstream. The project will have an estimated major effect on both water quality and quantity that is available for recharge into the associated groundwater basins. Restoration of the channel will assist in infiltration and groundwater recharge both onsite and downstream as a result of the following restoration activities:

- Removal of invasive vegetation that has exceptionally high evapotranspirative potentials (ie. Giant Reed) - that chokes down the channel and consumes up to 40 times the water of equivalent areas of standing open water. The vegetation entraps fine particulates and develops boggy, anaerobic conditions that both limit the infiltration rates and greatly degrade the quality of the infiltrate water.
- Restoration of a more effective channel configuration within Bedford Wash - the current channel area is both choked by invasives and accumulated fine sediments from both upstream and mass wasting sources. The current channel is more of a choked braided stream, and the planned work will result in more organized flow in the long term that will allow for the redevelopment of a riparian corridor and increase availability of usable surface water both onsite and downstream.

4. Discuss any natural landscapes within the site that support representative examples of important, landscape-scale ecological functions (flooding, fire, sand transport, sediment trapping, etc.)?

Presently, mining berms and reject fill intrusions onto the active channel and floodplain of Temescal Canyon Wash, best describe the natural landscape. The berms have very tightly constrained the wash to only a modified active corridor and have removed much of the meander and braid fluvial structures, and have forced the channel into a singular channel with only the broadest meanders remaining. These broad meanders are controlled by the geomorphology of the area (ie. the hard rock outcroppings of the East Hills and the Knob). The channel for Temescal Wash has become heavily overgrown with vegetation. Very sharp escarpments and marked retreats of the berms due to mass wasting and scour, the products of the erosion and mass wasting have combined with the invasive vegetation to choke the channel with sediments and induce the heavy braiding structure.

Bedford Wash has been largely converted into orchards in the upper portion (off site area) and sharply constrained and altered by the freeway, road and industrial/commercial development in the lower reach (project area) in the area of confluence with Temescal Canyon Wash. The active channel portion of the wash goes

from relatively broad to tightly funneled down as it approaches and crosses the freeway and Temescal Canyon Road. These conditions in both washes have strongly disturbed the equilibrium of alluvial and fluvial processes, and have introduced sharp transitions. Bedford Wash has been almost entirely channelized and the area developed by orchards and infrastructure/development, and that its once relatively broad juncture with Temescal Canyon Wash has been reduced to a narrow and sinuous swale. Alluvial sage/scrub plant communities exist in small numbers along Bedford Wash.

A2. Diversity of species and habitat types (70)

1. Does the site possess any:

I. areas of unique ecological and/or biological diversity?

Historically, Bedford Wash was a prime area of alluvial sage/scrub habitat and was used by wildlife, such as the California Gnatcatcher, arroyo toad and mountain lion as a primary linkage corridor from Temescal Wash to the Cleveland National Forest. Due to increased urbanization and improper flood control practices, the remaining habitat has become significantly degraded and fragmented. Restoration of the Washes will allow riparian habitat to be restored, provide wildlife linkages between Temescal Wash and Cleveland National Forest via Bedford Wash. Habitat for California gnatcatcher, Least Bells Vireo and Willow Fly Catcher, destroyed by previous impacts to the wash and previous land uses adjacent to the wash, and will be restored.

II. Describe vegetative complexity either horizontally or vertically?

The lower portion of the project site contains older eucalyptus stands and sparse mule fat, black and red willow clumps. Vertical complexity is limited to the eucalyptus grove on the East end of the project, with horizontal complexity being limited to small, undisturbed alluvial sage/scrub vegetation on the slopes of Bedford Wash. These plant communities have been impacted by surrounding property owners and annual sediment removal from Temescal Road.

Temescal Wash is deeply incised toward the south, with bank height gradually decreasing and flood plain width increasing as the stream channel meanders approaching the north. The northernmost onsite segment of Temescal Wash retains the most natural channel profile and mature vegetation, although evidence of past channelization on both sides can be seen. The central segment of the wash was completely channelized (dirt bottom and sides) in the past and exhibits a dramatically narrower, straighter profile. Throughout the southernmost onsite portion, the existing stream course of Temescal Wash lies several hundred yards west of its historical channel alignment along the base of the hills. Past deposition of silica sand mining spoils in the channel and along the east bank, has resulted in gradual westward migration of the wash. The spoil pits have been

filled with waste silts and clays that form unconsolidated mounds adjacent to Temescal Wash. During flood flows, portions of these mounds erode contributing to downstream water quality impacts. Channelized, over-steepened banks and placement of fill in the channel and flood plains, have contributed to ongoing erosion and increased sediment bed-load downstream, negatively impacting habitat for both plants and wildlife, especially amphibians.

Past disturbances to the channel have resulted in the formation of three distinct reaches within this channel which are characterized by different morphology. Reach One is the downstream reach and occurs from the Cajalco Road bridge to the beginning of the sand and gravel mining operation to the east. This reach is characterized by a wide floodplain (70-250 feet wide) with the eroding edge of two slag pits forming the western boundary of the wash. In several areas, the sides of the pits are 50 feet high and are actively eroding resulting in the discharge of silts and clays into Temescal Wash. Reach Two is located within the sand and gravel mining operation area. This area has been channelized by past activities. The entire channel is 40 feet wide and is approximately 15 feet deep. While the vegetation is relatively thick here, there are no large trees. Reach Three extends from the sand and gravel mining operation to the northern end of the site. This reach is also relatively wide (approx. 70-170 feet) but has been artificially channelized by the presence of slag pits along both sides of the wash throughout this Reach.

Southern Willow Scrub habitat is found within Temescal Wash throughout its reach on-site. Dense stands of the highly invasive, non-native giant arundo (*Arundo donax*) are present throughout the wash, along adjacent streambank and along the margins of the borrow pit ponds. Several small areas of freshwater marsh are found on the property. These areas include short stretches of still and slow-moving water in Temescal Wash and along the margins of the borrow pit ponds in the property's northwestern corner, particularly on the southern shore of each pond. Cattails (*Typha* spp.) and bulrushes (*Scirpus* spp.) are co-dominant within this community and arundo is abundant within the wash.

2. Describe habitat components including year-round availability of water, adequate nesting/denning areas, food sources, etc.

The project area contains degraded riparian, coastal sage scrub, alluvial fan scrub and floodplain habitats. Improvements brought about by the project will enhance nesting areas for at least two endangered birds, the least Bell's vireo and the southwestern willow flycatcher. The floodplain provides nesting/burrowing habitat for small mammals. The endangered California Gnatcatcher is an obligate resident of coastal sage scrub. Gnatcatchers nest and forage in the artemisia and buckwheat. Many other bird species use these habitats for nesting and foraging. Raising Temescal Road will prevent periodic

scrapping off of the vegetation and allow populations to persist in the area. Revegetation will enhance nesting, foraging, and roosting opportunities. Water is available year-around in Temescal Creek.

3. Describe any superior representative examples of specific species or habitats.

Superior representatives for the habitat types in the project area include the mountain lion (keystone), least Bell's vireo, southwestern willow flycatcher, yellow warbler, yellow-breasted chat (riparian habitat), and the California gnatcatcher and loggerhead shrike (coastal sage scrub).

4. Does the site contain a high number of species and habitat types? List and describe.

The project area contains diverse habitat types and a high number of species and a high number of sensitive species. The Western Riverside Multi Species Habitat Conservation Plan (MSHCP) considered covering 142 species of concern in its plan: 45 species of birds, 14 species of mammals, five species of amphibians, 12 species of reptiles, five species of invertebrates, 2 species of fish, and 59 species of plants. Of these 142 sensitive species, the project area contains or may contain 23 sensitive species. The enhancements provided by this project would support the persistence or return of these species. They are according to habitat type:

Coastal sage scrub: Bell's sage sparrow, California gnatcatcher, white-tailed kite, loggerhead shrike, southern California rufous-crowned sparrow.

Riparian: downy woodpecker, least Bell's vireo, southwestern willow flycatcher, yellow-breasted chat, yellow warbler, Cooper's hawk. Clay soils: long-spined spine flower, Munz's onion, Palmer's grapplinghook, small-flowered microseris, small-flowered morning-glory, and many stemmed dudleya; Floodplain: smooth tarplant, Coulter's matilija poppy, and peninsular spine flower. Bobcat and mountain lion can be found throughout the area. Stephen's kangaroo rat inhabits grasslands for which the project area provides linkage. Habitat types include: Riversidean alluvial fan scrub, flood plain, clay soils, riparian woodland, coastal sage scrub. The project area is adjacent to non-native grasslands and coniferous forest.

5. Does the site contain populations of native species that exhibit important subspecies or genetic varieties historically present prior to European immigration?

The Western Riverside Multiple Species Habitat Conservation Plan (MSHCP) has identified 23 species of concern alone that may be present in Temescal and require protection. They are listed in Question #4.

A3. Ecological importance of species and habitat types (100)

1. Discuss the significance of habitat types at this location and include any local, regional, or statewide benefits received by preserving or improving the area.

Bedford Wash contains Riversidean alluvial sage/scrub habitat that provides nesting structure for listed avian species and riparian habitat at the lower end of the project area that provides habitat for riparian species that are listed, in decline or rare. By improving, enhancing and restoring the ecological function of the wash, the size and quality of the habitat types are greatly increased.

2. Does the site contain any significant wintering, breeding, or nesting areas? Does it fall within any established migratory corridors? What is the level of significance? How are these affected by the project?

The project will enhance the riparian breeding grounds for the federally listed endangered Least Bell's Vireo and Southwestern Willow Flycatcher, and the federally listed threatened California Gnatcatcher. Project area provides linkage to uplands that support the federally listed endangered Stephen's kangaroo rat. The improvements considered in this project will greatly enhance the corridor between the upland Lake Mathews-Estelle Mountain Reserve to the east and the Cleveland National Forest to the west. Sensitive species that will benefit from the improvement include the mountain lion, the bobcat, and the Stephen's Kangaroo Rat.

3. Describe any existing habitats that support any sensitive, rare, "keystone" or declining species with known highly restricted distributions in the region or state. Does the site contain any designated critical habitat? How are these affected by the project?

The project area is included in the Critical Habitat designation for the California Gnatcatcher. Existing habitats include the highly endemic Riversidean alluvial fan scrub, which is considered a distinct, and rare plant community found primarily on alluvial fans and flood plains along the southern bases of the Transverse Ranges and portions of the Peninsular Ranges in southern California. The federally listed endangered Santa Ana River Woolly star is an indicator of this habitat type. The clay soils of the lower portion

of the project support, or may support with the habitat improvements of the project, sensitive plant species such as Munz's onion (federally-listed endangered), Palmer's grapplinghook (rare in California per California Native Plant Society (CNPS)), small-flowered morning glory (limited distribution per CNPS), long-spined spine flower (rare per CNPS), small-flowered microseris, (limited distribution per CNPS) and many-stemmed dudleya (rare per CNPS). The flood plain may support sensitive plant species including peninsular spineflower (uncommon per CNPS), smooth tarplant (rare per CNPS), and Coulter's matilija poppy (limited distribution per CNPS). (Plants from Western Riverside Multiple Species Habitat Conservation Plan).

Other Sensitive or declining species include Bell's sage sparrow, Cooper's hawk, loggerhead shrike, Southern California rufous-crowned sparrow, white-tailed kite, downy woodpecker, yellow-breasted chat, yellow warbler, bobcat, mountain lion, and Stephen's kangaroo rat, coast range newt, and western pond turtle. Projected improvements to the habitat would support the recovery of the endangered least Bell's vireo and southwestern willow flycatcher, as well as those sensitive species listed above.

4. What is the amount of shaded riverine aquatic (SRA) and riparian habitat to be developed, restored, or preserved?

The total amount of riparian habitat to be created, restored and preserved within Bedford and Temescal Washes is approximately 42 acres. on the project site.

A4. Public benefits accrued from expected habitat improvements (60)

1. Describe present public use/access, if any. For instance, does or will the public have access for the purpose of wildlife viewing, hunting, fishing, photography, picnics, etc.

Currently, there is limited public access or uses at the site, except for illegal dumping that has occurred over a period of 25 to 30 years, and off road motorcycle activities, both of which will be eliminated after the project is completed. The floodplain and wildlife corridor will not be open to the public for public safety reasons and to protect and ensure the restoration activities planned. After completion of the project, the public will have access to viewing and photography opportunities along Temescal Canyon Road which will have a landscaped parkway with pedestrian and bicycle pathways and a bridge crossing over Bedford Wash. Viewing opportunities will also be available along Cajalco from an existing bridge above Temescal Wash where Bedford comes to a confluence with Temescal. Additionally, the public will have viewing opportunities of the wildlife corridors from portions of the golfcourse, from the proposed recreational field adjacent to the City's Waste Water Treatment Plant No. 3, and from a proposed hotel site located within the redevelopment area. Residents as well as the population working in office and other commercial facilities as well as City-owned facilities adjacent to, and located within the vicinity, will benefit from the vistas and views offered by the project. Additionally, it is possible that the general public could benefit from proposed

educational kiosks and markers that have been proposed and may be implemented within the redevelopment area. The kiosks and markers or educational programs could if implemented, illustrate the history of the redevelopment area and might include references to past land use activities including, the citrus groves, historical route of the Butterfield Stage Coach, mining activities, geologically significant natural resources such as silica, rock, aluminum and tin; as well as the restoration of native vegetation and wildlife, and preserves throughout the area.

2. Discuss areas on the site that are critical for successfully implementing landscape or regional conservation plans. How will the project help to successfully implement the plans?

The site is a critical habitat/wildlife corridor/linkage in the Western Riverside Multiple Species Habitat Conservation Plan (MSHCP) and is listed as a major link between the Cleveland National Forest, Santa Ana Mountains, Temescal Wash and the Estelle Mountain Preserve. Without improving this linkage, Temescal Wash is isolated for miles in each direction from any large-scale wildlife movement between the core preserves.

3. Describe the surrounding vicinity. Include the presence or absence of large urban areas, rapidly developing areas, and adjacent disturbed areas with non-native vegetation and other anthropogenic features. Do any surrounding areas detract from habitat values on the site?

The project site is located at the southernmost edge of the City of Corona with a current population of over 135,000. Although this area is highly urbanized, areas adjacent or close to the site are protected, preserved or otherwise limited in their use or development. Restoration of the Washes will allow riparian habitat to be restored, provide wildlife linkages between Temescal Wash and Cleveland National Forest via Bedford Wash. Habitat for California gnatcatcher, least Bell's vireo and willowfly catcher, destroyed by previous impacts to the wash and previous land uses adjacent to the wash, and will be restored.

3. Describe compatibility with adjacent land uses.

Restoration of the Washes will allow riparian habitat to be restored, provide wildlife linkages between Temescal Wash and Cleveland National Forest via Bedford Wash. Habitat for California gnatcatcher, least Bell's vireo and willow flycatcher, destroyed by previous impacts to the wash and previous land uses adjacent to the wash, and will be restored. Compatibility with surrounding land uses will be equal or better than current uses and is expected to greatly increase the aesthetic value of the wash. Past uses which include mining and industrial manufacturing uses have been the primary contributors to the impacts degrading the project area. Planned new uses surrounding and

adjacent to the project site include golf course and open space uses that have been designed to implement sustainable development practices that create open space and natural resource buffer zones and wildlife corridors that are compatible with, and support efforts to restore natural and biological resources throughout the project area. Additionally, impacts from the few remaining small parcels in industrial use, will be mitigated by the project.

A5. Viability/sustainability of habitat improvements (40)

1. Describe any future operation, maintenance and monitoring activities planned for the site. How would these activities affect habitat values?

Once the project is completed, there would be minimal maintenance activities at the site due to the low-maintenance design of the crossing, desedimentation structures, and grade stabilization within the channel. The Washes are to be restored with native habitat and will function in a self sustaining manner once the project is complete and a monitoring period required to insure habitat is established has transpired. Recovery of the area after a flood event will be done by natural means. No equipment or other tools will be used to restore the area. A properly functioning and healthy waterway recovers quickly from catastrophic flood events when the hydrologic functions of the stream are active and uninhibited from man made structures such as dams, concrete channels and trash. The area will contain plants that are genetically adapted to frequent flooding or inundation. Any sediment or other material that may wash down during floods will create additional substrate to grow new plant material and establish a seed bank of native plants naturally. A functioning system will not require constant upkeep and will recover from floods in a matter of months during normal rainfall seasons.

2. Does the site contain large areas of native vegetation or is it adjacent to large protected natural areas or other natural landscapes (for example, a large stand of blue-oak woodland adjacent to public land)?

The site does not currently contain large amounts of natural vegetation, but is adjacent to large natural areas such as the Cleveland National Forest and the Lake Mathews-Estelle Mountain Preserve.

3. Is the watershed upstream of the site relatively undisturbed or undeveloped and likely to remain so into the foreseeable future? Describe its condition.

Yes. The Bedford Wash Watershed has a large, undeveloped upper drainage from the Cleveland National Forest, but the acreages directly above the site are being developed into residential homes, which will have detention basins installed to reduce impacts to the wash. Currently, only one side of the upper wash has been developed, with half of the runoff being diverted into Temescal Creek below the project site. The

upper watershed condition is pristine and has not been disturbed, except for wildfires. The middle reach of the watershed is open space with mixed agriculture/residential uses. The lower portion is degraded with active channel movement and can be improved through the application of vegetation stabilization and habitat enhancement.

4. Describe any populations of native species or stands of native habitats that show representative environmental settings, such as soil, elevations, geographic extremes, or climatic conditions (for example, the wettest or most northerly location of a species within the state.)

The site does contain a small amount of alluvial sage scrub, which is a declining habitat type and will be restored during and after the project has been completed. Populations of native species that exist in the area are listed in section A2 above, with the alluvial sage scrub showing small remaining populations of this vegetative habitat above the site. Prime and unique soils that exist at the site are alluvial outwash which supports rare and endangered plants and Alo clays that support wetland and riparian plant species when adequate water is available.

VI. (320 points) Miscellaneous Benefits and Quality of Proposal

A. Size of request, other contributions, number of persons benefiting, cost of grant per benefited person (40)

\$ 6,435,000	<i>Estimated Total Project Cost</i>
\$ 5,000,000	<i>Amount of FPCP Grant Funds Requested</i>
\$ 601,000	<i>Amount of Local Funds Contributed</i>
\$ 747,000	<i>Amount of In-kind Contributions</i>
\$ 87,000	<i>Additional Funding Sources</i>
907,500	<i>Number of Persons Expected to Benefit</i>
\$ 7	<i>Cost of Grant per Benefited Person</i>

(* Count as beneficiaries those receiving flood benefits, recreational users of habitat areas protected by the Project, and consumers of food products from agricultural areas conserved by the Project.)

B. Quality of effects on water supply or water quality (90)

1. Will water stored by the project provide for any conjunctive use, groundwater recharge, or water supply benefit?

YES! The project will have an estimated major effect on both water quality and quantity that is available for recharge into the associated groundwater basins. This will be accomplished primarily by:

- Removal of invasive vegetation that has exceptionally high evapotranspirative potentials (ie. Giant Reed) - that chokes down the channel and consumes up to 40 times the water of equivalent areas of standing open water. The vegetation entraps fine particulates and develops boggy, anaerobic conditions that both limit the infiltration rates and greatly degrade the quality of the infiltrate water.
- Restoration of a more effective channel configuration - the current channel area is both choked by invasives and accumulated fine sediments from both upstream and mass wasting sources. The current channel is more of a choked braided stream, and the planned work will result in more organized flow in the long term that will allow for the redevelopment of a riparian corridor and increase availability of usable surface water both onsite and downstream.
- Restoration the channel will assist in infiltration and groundwater recharge both onsite and downstream.
- The construction of a detention basin for Bedford Wash will increase recharge of groundwater.

2. Does the project fence cattle out?

No. However there are no cattle present in the project area.

3. Does the project pass water over newly developed fresh water marsh?

Yes. Riparian planting and restoration activities will benefit from water that is present year-round within the 100-year floodplain

4. Does the project trap sediments?

Yes. IN a controlled manner by use of sediment traps and drop structures installed during project implementation and through natural processes achieved after project completion. The project will also limit sediment development by stabilizing the channels and embankments.

C. Quality of impact on underrepresented populations or historic or cultural resources (60)

1. Does the project benefit underrepresented populations? Explain.

Yes. . The project contribute directly to the goals and objectives established for this area by the City of Corona Redevelopment Agency. The project is located within the Temescal Valley Redevelopment Project Area (Redevelopment Area) established on July 5, 2000. The Redevelopment Area was established to address blighted conditions and to support economic development activity and private investment in an area marked by former mining and industrial manufacturing and left abandoned and depreciated for more that 25-years. New development activities occurring in the Redevelopment Area contribute to the creation of jobs, an increase in local investment, additional investment in local infrastructure including water, sewer and roadways, and the construction of a new Waste Water Treatment Plant. A joint Police and Fire facility was proposed with the establishment of the Redevelopment Area. Finally, the Agency will allocate 20% of the tax increment revenue generated by new development within this area, to projects and programs that increase and improve the supply of affordable housing in the community. Low and moderate income housing funds may be distributed on a community-wide basis.

2. Are historical or cultural resources impacted by the project? Explain.

Yes. Historical and cultural resources will be impacted in a beneficial way by the project. A portion of the project area is located along Temescal Canyon Road (TCR)

which is the old "Old Butterfield Stage Coach Route" or "The Butterfield (or Southern) Overland Mail", which operated from September 15, 1858, until March 1, 1861. The route was a semiweekly mail and passenger stage service from St. Louis, Missouri, and Memphis, Tennessee, across northern Texas to San Francisco, California. The routes from the two eastern termini united at Fort Smith, Arkansas. From St. Louis to San Francisco the distance was 2,795 miles, probably the longest route of any system using horse-drawn conveyances in the history of the United States. The Butterfield Route was instrumental in westward migration of populations to the east and trade and farming which flourished in the area. The Women's Improvement Club of Coroa had a special marker made that was placed along TCR. The marker was stolen a few years back, however, there are photos and plans to replace the marker as part of the Dos Lagos redevelopment.

Additionally, part of the Dos Lagos project site was home to the Owens-Illinois silica mining facility which produced the highest quality silica that was shipped throughout the Western United States for use in fine glass products including windshield glass, glass bottles and fine glass figurines. The Silica mine was active for almost 70 years and represents just one of the many geologically significant mines in the Temescal Canyon Valley which provided raw natural resources used in the making of goods to improve quality of daily life. Additionally, the area was once known as the citrus capital of the world. Home to the Sunkist Company, orchards were once plentiful in this region.

The Dos Lagos project has plans to integrate the history of this area, the history of the Butterfield stage coach route, the mining of silica and other natural resources and the orchards, into the cultural and historical fabric and monumental of its development to educate the general public coming through the area, about the history here. Additionally, The Dos Lagos project is preserving natural features including six Oak Trees that mark the route of the "old Highway" within the median of roadway improvements on Temescal Canyon Road approximately 1000 feet from the Bedford Crossing portion of the project. Project-wide preservation efforts along with educational features provided within the project area, will serve to provide cultural, historical, educational and recreation elements that provide amenities to motorists, visitors and local residents utilizing the landscaped parkways and bicycle and pedestrian pathways along Temescal Canyon Road.

D. Technical and fiscal capability of the project team (60)

1. Does the project require scientific or technical expertise, and if so, is it provided for in the grant proposal?

Yes. The project is technically and scientifically challenging, and will require significant expertise in engineering, hydrology, hydrogeology, and engineering geology. RCRC in conjunction with Temescal Canyon Properties-8, LLC, will retain SE Corporation and expert consultants in Civil Engineering, Hydrology, Environmental, Geotechnical, Hydrogeological, and Engineering Geology. Significant study has already been

performed in regards to study of the engineering, hydrology, and hydrogeology of both washes by the design consultant team.

2. *Grant funds will be available in phases. What monitoring and reporting mechanisms are built into your administrative plan to track progress, initiation, and completion of successive phases?*

The Riverside Corona Resource Conservation District (RCRCD), supported by Temescal Canyon Properties LLC-8 (TCP-8) and SE Corporation, will develop final cost budgets for each of the components of the project. Once underway, a system of monthly reporting elements will be in place in order to track construction and restoration process. It is expected that once the grant is awarded, the FPCP and RCRCD will enter into contract, and that the FPCP will stipulate all reporting requirements that are necessary to carry out the project.

3. *Please outline your team's management, fiscal and technical capability to effectively carry out your proposal. Mention any previous or ongoing grant management experience you have.*

Riverside-Corona Resource Conservation District (RCRCD)

4500 Glenwood Drive,
Riverside, CA 92501
(909) 683-7691

Primary Contact: Shelli Lamb, District Manager

The Riverside-Corona RCD has 15 years of experience in applying for and receiving the following grants:

1. DWR Grant to Fund the Establishment of an IWM Mobile Lab Program in 1987.
2. Bureau of Reclamation Grant to establish the "Residential Water Conservation Program in 1999.
3. Bureau of Reclamation Grant to establish "Irrigation Management Practices and Conservation Techniques (IMPACT) in 2001.
4. Bureau of Reclamation Grant to develop "Residential Controller Retrofit and Evaluation" Program in 2001.
5. Sacramento Regional Foundation Grant to develop public outreach program for urban-wildland interface in 2002.

6. Metropolitan Water District Community Partnering Grant to provide residential irrigation water management evaluations in Fiscal Year 2001-02.
7. Metropolitan Water District Community Partnering Grant to develop LandUse Learning Center Urban Area for Fiscal Year 2002-03.
8. Department of Conservation Grant to develop Native Habitat Signs for the Native Habitat Area of the Land Use Learning Center for Fiscal Year 2001 to present.
9. USDA-Natural Resources Conservation Service and California Association of RCDs Grant to develop Sustainability Outreach Program for Fiscal Year 2001 to present.
10. State of California, Department of Education Grant to develop Project Earth Probe in 1988.
11. State Water Resources Control Board 319 (h) Grant to be awarded in 2003 for Sycamore Canyon Habitat Restoration.

The Riverside-Corona RCD has successfully completed grants received as well as numerous other contracts and working agreements with various public agencies such as Riverside County Flood Control and Water Conservation District; U S Department of Navy; City of Riverside, Western Municipal Water District; Orange County Water District; U S Army Corps of Engineers, Santa Ana Regional Water Quality Control Board, Santa Ana Region; California Department of Fish & Game, California Department of Food and Agriculture and U S Fish & Wildlife Service.

Temescal Canyon Properties-8, LLC

2505 Weirick Road
Corona, CA 92883

Primary Contact: Ali Sahabi

Temescal Canyon Properties-8, LLC (TCP-8) is a limited liability partnership, and is cooperating with RCRCDD on the Bedford Wash and Temescal Canyon Flood Protection Corridor and Restoration Project. TCP-8 is also the developer of the Dos Lagos project. Mr. Ali Sahabi is the Managing Member and a Principal of Temescal Canyon Properties-8, LLC (TCP-8). The developer of Dos Lagos since 1996, Mr. Sahabi is responsible for the day-to-day operations of TCP-8 development activities. Mr. Sahabi is also President of SE Corporation, a privately held, California-based real estate planning, entitlement and development firm.

A further description of TCP-8 is given in the appendices.

SE Corporation

Planning, Entitlement, Development
1555 North Verdugo Road, Suite 201
Glendale, CA 91208
(818) 551-0123

Primary Contact(s): Gerard Tretton and Bonnie Montoya

SE Corporation (SEC) is a member in Temescal Canyon Properties-8, LLC, and also provides consulting services to that organization. SEC team competencies include: Planning & Entitlement; Economics & Finance; Business & Contract Negotiation; Architectural, Engineering & Construction; and, Project Management.

SE Corporation has established key relationships with organizations including the City of Corona Redevelopment Agency, Riverside-Corona Resource Conservation District (RCRCD), the County of Riverside, The State of California and the University of California Riverside (UCR) among others.

A further description of SEC is given in the appendices.

Zeiser Kling Consultants, Inc.

Geotechnical Consulting, Materials Testing, Inspection

1221 E. Dyer Road, Suite 105
Santa Ana, CA 92705
(714) 755-1355

Primary Contact: Larry Fanning

Zeiser Kling Consultants, Inc (ZKCI). routinely provides professional services for major projects involving various Geotechnical constraints including the following: coastal erosion, compressible/collapsible soils, seismic design, rippability/excavatability, road bed materials sources, liquefaction potential, high ground water, corrosivity, slope stability, landslide stability, flood hazard, debris flow potential and a variety of other Geotechnical considerations typical of those to the geologic conditions found within California and Nevada. A representative sampling of localities within which (ZKCI)

provides services is listed below. A full Statement of Qualifications is provided in the Appendices of this document.

Zeiser Kling Consultants, Inc. is experienced with the geotechnical and geologic conditions with the following Counties:

California		
Alameda Contra Costa Imperial Inyo Kern Los Angeles	Napa Orange Riverside San Bernardino San Diego San Mateo	Santa Clara Solano Sonoma Ventura
Neveda		
Clark		

Mr. Fanning is a highly skilled geotechnical professional, and is very adept in structural geology, seismicity, geologic hazards and forensic evaluation, and earthwork and construction procedures. Over the past 17-years, he has worked with a wide variety of client types and government agencies, including private developers, individual landowners, real estate brokerages, Caltrans, a variety of local agencies including the Counties of Orange, Los Angeles, and San Bernardino, as well as with a variety of State Boards, including the CWMB, CRWQCB, and Division of Dam Safety. He also participates actively in and is a subject matter expert for the California Board of Registration for Geologists and Geophysicists. Mr. Fanning's Qualifications are provided in the appendices.

ENV America
Environmental Engineering, Consulting & Construction
Watershed/Floodplain Management Division
 16 Technology Drive, Suite 154
 Irvine, CA 92618
 (949) 453-9191

Primary Contact: Massoud Vatankhahi, P.E.

ENV America Incorporated (ENV America) is a full service environmental engineering, consulting, and construction firm. ENV America provides single-source comprehensive services in all aspects of environmental projects, from initial site investigations and feasibility studies through engineering, design, permitting, procurement, remedial construction, construction management, and closure of hazardous and toxic wastes sites. ENV America has unparalleled experience at investigating and remediating contaminated sites. We have successfully managed numerous contaminated site projects for major public and private clients.

Mr. Massoud Vatankhahi, P.E. is a Principal at ENV America and is the Primary Project Manager from ENV America engaged on the Technical Team for the project. He is a professional Civil Engineer with 28 years of experience in civil engineering and environmental fields. Mr. Vatankhahi is experienced in almost every aspect of civil design, hydrologic analyses, water distribution and sewer systems, wastewater treatment facilities, street, highways, grading plans, and storm drains for a full range of projects including landfills, Superfund sites, small and large development projects, mining, and other special projects. He has worked in both public and private projects in various parts of the world including western United States, Canada, South America, Saipan, and the Middle East.

Mr. Vatankhahi is an expert in the use of HEC-1, HEC-2, HEC-HMS, HEC-RAS, HEC-6, TR-55, TR-20, Environmental Protection Agency's HELP Model, Los Angeles County Flood Control's Water Surface Pressure Gradient (WSPG), and various hydrology programs developed by different Counties in California.

The following projects demonstrate Mr. Vatankhahi's experience with water resources, flood control and environmental restoration issues in the project area and other projects. His full resume is provided in the appendices of this document.

- **Temescal Canyon Wash, Corona, California**

Mr. Vatankhahi was the Project Manager for the hydrology study and floodplain analysis for 58,000 acres of the Temescal Canyon Wash drainage basin. The study used U.S. Army Corps of Engineers HEC-1 and HEC-2 and required coordination with the Riverside County Flood Control and Water Conservation District.

- **Dawson Canyon Drainage Basin, Corona, California**

Mr. Vatankhahi was the Project Manager for the hydrology study and floodplain analysis for the 7,200-acre Dawson Canyon drainage basin. The study used U.S. Army Corps of Engineers HEC-1 and HEC-2 and required coordination with the Riverside County Flood Control and Water Conservation District.

- **Temescal Canyon Drainage Basin, Corona, California**

Mr. Vatankhahi was the Project Manager for the hydrology study and floodplain analysis for the 5,300-acre Temescal Canyon drainage basin. The study used U.S. Army Corps of Engineers HEC-1 and HEC-2 and required coordination with the Riverside County Flood Control and Water Conservation District.

- **South Gate Riparian Habitat Restoration Project**

As the lead hydrologist, Mr. Vatankhahi provided hydrology study to calculate the peak runoff from the off-site and on-site of the project for 10, 25 and 50-year storm events and performed water budget analysis to compute the volume of storm that would be retained on-site based upon Average Monthly Precipitation by using precipitation data from the rain gages close to the site and statistical storm data, based on 50-yr 24-hour, 25-yr 24-hr and 10-yr 24-hr storm events.

- **Los Angeles County Department of Public Works Las Virgenes Creek Restoration Services**

This is an ongoing project. Mr. Vatankhahi as the lead hydrologist and hydraulic engineer reviewed the hydrology study for the Las Virgenes watershed and at the present time he is performing hydraulic analysis for the creek utilizing the Army Corps of Engineer's HEC-RAS model. Later on three alternatives will be analyzed to select the most environmental and economical alternative.

- **Dos Lagos, City of Corona**

Mr. Vatankhahi served as the Project Manager for the drainage master plan, hydrology study, hydraulic analysis, and design and construction of storm drain improvement plans for Dos Lagos, a 543-acre residential, commercial, light industrial and an 18 hole golf course planned community in Corona. A full Best Management Practices (BMPs) was implemented including design of several constructed wetlands. Mr. Vatankhahi's responsibilities also included coordination with both the city of Corona and the Regional Water Quality Control Board in Riverside.

E. Coordination and cooperation with other projects, partner agencies, and affected organizations and individuals (80)

The Riverside-Corona Conservation Resource District (RCRCD) will coordinate with local land owners including Temescal Canyon Properties-8, LLC; SE Corporation, the developer of the Dos Lagos Mixed Land Use Project; the City of Corona, local resource agencies including the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service; Fish and Game and other Agencies such as the Santa Ana Watershed Project Authority, to implement the project.

1. List cost sharing and in-kind partners and any other stakeholders involved with your project and indicate the nature of their contribution, if any. Address the team's ability to leverage outside funds.

1. List cost sharing and in-kind partners and any other stakeholders involved with your project and indicate the nature of their contribution, if any. Address the team's ability to leverage outside funds.

- City of City of Corona will participate in 25% of the Bedford Wash/Temescal Canyon Road Crossing. Based on the estimated cost in Table 1, this amounts to \$601,000.

- The Riverside Corona Resource Conservation District (RCRCD) is providing \$85,000 in-kind contribution relating to arundo removal in Temescal Canyon Wash.
- Temescal Canyon Properties-8 LLC (TCP-8) is making an In-kind contribution of \$436,000 by providing the acreage for the Bedford Wash Sediment Basin, and an additional In-kind contribution of \$227,000 for a conservation easement relating to the Temescal Wash environmental restoration.

TCP-8 is also going to be the funding source for project costs in excess of that covered by the FPCP grant, In-kind contributions, and local funds contributed.

TCP-8 has demonstrated ability to leverage outside funds by obtaining the construction and infrastructure financing for \$46 million of land development activity relating to the Dos Lagos project.

2. Does your project overlap with or complement ongoing activities being carried out by others (such as CALFED, the Sacramento and San Joaquin River Basins Comprehensive Study, the Delta levee program, local floodplain management programs, the Reclamation Board's Designated Floodway program, or a multiple objective regional or watershed plan)? If so, indicate any coordination that has taken place to date or is scheduled to take place in the future.

Yes. The project compliments other regional-wide efforts to restore waterways, corridors and open space, and to restore habitat, undertaken by the Riverside-Conservation Resource District in conjunction with agencies such as the Santa Ana Watershed Project Authority among others. Additionally, the project compliments ongoing restoration efforts of the County of Riverside discussed previously including the Multiple Species Habitat Conservation Plan (MSHCP) and the 13,000 Lake Matthews-Estelle Wildlife Preserve as well as Forest Service efforts to preserve and maintain open space, habitat and recreational value of the Cleveland National Forest.

3. Will this application, if approved, begin the next phase of a previously approved project or advance an ongoing project substantially toward completion?

Yes. As described in Items 1 and 2 above, the project will support the ongoing effort of RCRCD related to regional-wide efforts to restore waterways, corridors and open space, and to restore habitat, undertaken by the Riverside-Conservation Resource District in conjunction with agencies such as the Santa Ana Watershed Project Authority among others. Additionally, the project will directly contribute to local investment in the area including major new infrastructure improvements along Temescal Canyon and Cajalco Roads as well as new development including residential, recreational, commercial/retail and office/business park land uses.

4. Describe how the proposal demonstrates a coordinated approach among affected landowners, local governments, and nonprofit organizations. If other entities are affected, is there written support for the proposal and a willingness to cooperate?

As described in detail in Section E, Items 1, 2 and 4, this project is being undertaken as a coordinated effort on the part of the Riverside-Corona Resource Conservation District (RCRCD), local land owners including Temescal Canyon Properties-8, LLC and the City of Corona Waste Water Treatment Facility No. 3, the developers of the Dos Lagos Redevelopment Project, and other Agencies previously described.

Appendices