

MASTER STORM WATER SYSTEM
MAINTENANCE PROGRAM

DRAFT PROGRAM ENVIRONMENTAL IMPACT REPORT
SCH. NO. 2005101032; PROJECT NO. 42891

APPENDIX C.1
Biological Technical Report

JULY 2009

Prepared for:

CITY OF SAN DIEGO
STORM WATER DEPARTMENT
2781 Caminito Chollas
San Diego, California 92105

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BIOLOGICAL TECHNICAL REPORT
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Prepared for :

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STORM WATER DEPARTMENT
2781 Caminito Chollas
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**City of San Diego Master Storm Water System Maintenance Program
Biological Technical Report**

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LIST OF ACRONYMS AND ABBREVIATIONS

ADD	Assistant Deputy Director
Baja	Baja California, Mexico
BCC	Birds of Conservation Concern
BMP	Best Management Practice
CCC	California Coastal Commission
CDFG	California Department of Fish and Game
CDP	Coastal Development Permit
CEQA	California Environmental Quality Act
City	City of San Diego
Corps	U.S. Army Corps of Engineers
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
dB(A)	Decibel
DSD	Development Services Division
ESA	Endangered Species Act
ESL	Environmentally Sensitive Lands
FE	Federally Listed Endangered
FT	Federally Listed Threatened
GIS	Geographic Information Systems
HU	Hydrologic Unit
IBA	Individual Biological Assessment
IMP	Individual Maintenance Plan
IP	Individual Permit
JD	Jurisdictional Delineation
LOP	Letter of Permission
MBTA	Migratory Bird Treaty Act
MBTRA	Migratory Bird Treaty Reform Act
MHPA	Multi-Habitat Planning Area
MMRP	Mitigation Monitoring and Reporting Program
MSCP	Multiple Species Conservation Program
MSWSMP	Master Storm Water System Maintenance Program
NCCP	Natural Communities Conservation Planning
NPDES	National Pollutant Discharge Elimination System
NPPA	Native Plant Protection Act
NWP	Nationwide Permit
O&M	Operation and Maintenance
OHWM	Ordinary High Water Mark
Program	City's MSWSMP
PEIR	Program Environmental Impact Report
RGP	Regional General Permit
RWQCB	Regional Water Quality Control Board
SAA	Streambed Alteration Agreement
SCR	Substantial Conformance Review
SE	State Listed Endangered

LIST OF ACRONYMS AND ABBREVIATIONS (cont.)

SR	State Listed Rare
SS	Sensitive Species
SSC	State Species of Special Concern
ST	State Listed Threatened
SWD	Storm Water Department
USFWS	U.S. Fish and Wildlife Service
WUS	Waters of the U.S.

EXECUTIVE SUMMARY

This report describes existing biological resources within the City of San Diego (City) Master Storm Water System Maintenance Program (MSWSMP) study area and evaluates the potential impacts to those resources that may occur from long-term maintenance of these storm water facilities. The report also identifies potential mitigation measures to compensate for those impacts. This report is intended to provide information to the U.S. Fish and Wildlife Service (USFWS), U.S. Army Corps of Engineers (Corps), California Department of Fish and Game (CDFG), Regional Water Quality Control Board (RWQCB), California Coastal Commission and City in support of the City's goal of obtaining general permits from those agencies to conduct long-term maintenance activities without the need for separate approvals for each maintenance action.

The purpose of this report is to provide a programmatic analysis of potential biological impacts resulting from implementation of the City's MSWSMP (Program). This analysis provides information that will be used by the City and wildlife agencies as part of the permit process for master or regional channel maintenance permits. This report includes a biological reconnaissance and impact analysis for maintenance in the City's largest storm water facilities. It does not include an analysis of every potential channel or facility that may be subject to impacts from future maintenance, which means that the impacts could be understated. On the other hand, it is not likely that the City would be able to maintain all the channels during the life of each regional agency permit, so based on that, the impacts may be overstated. This report includes an impact analysis based on assumptions available at the current time. The reader is reminded that this report is intended to analyze potential impacts from implementation of the overall program so that the framework for regional permits can be established and evaluated. Under the Program, more specific resource identification, impact analysis and mitigation determinations would occur each year in advance of specific maintenance activities proposed by the City.

The City's Storm Water Department (SWD) provides flood control maintenance for numerous storm water facility channels and basins occurring in seven watersheds in the San Diego. Recognizing the need for, and importance of, continuing the periodic inspection, cleaning, and maintenance of storm water facilities in the future, the City has proposed the MSWSMP. The focus of the subject Program is to identify the long-term maintenance and access needs for each storm water facility. The program includes specific storm water protocols designed to minimize impacts to sensitive resources.

Twelve wetland/riparian and thirteen upland vegetation communities occur within the study area. Wetland/riparian vegetation communities include southern riparian forest, southern sycamore riparian woodland, southern willow scrub, riparian woodland, mule fat scrub, riparian scrub, freshwater marsh, cismontane alkali marsh, southern coastal saltmarsh, coastal brackish marsh, disturbed wetland, and natural flood channel/open water/streambed. Upland vegetation communities include coast live oak woodland, scrub oak chaparral, southern foredunes, beach, Diegan coastal sage scrub, coastal sage-chaparral scrub, broom baccharis scrub, southern mixed chaparral, non-native grassland, eucalyptus woodland, non-native vegetation/ornamental, disturbed habitat/ruderal, and developed land.

No federally or state listed plant species or Multiple Species Conservation Program (MSCP) narrow endemic species were observed within the study area. The following five sensitive plant species were observed: single-whorl burrobush (*Ambrosia monogyra*), San Diego marsh-elder (*Iva hayesiana*), southwestern spiny rush (*Juncus acutus* ssp. *leopardii*), Nuttall's scrub oak (*Quercus dumosa*), and San Diego sunflower (*Viguiera laciniata*).

The federally listed threatened coastal California gnatcatcher and federally and state listed endangered California brown pelican (*Pelecanus occidentalis californicus*) were observed/detected in the study area. The following six sensitive animal species were also observed/detected: Cooper's hawk (*Accipiter cooperii*), northern harrier (*Circus cyaneus*), yellow warbler (*Dendroica petechia brewsteri*), double-crested cormorant (*Phalacrocorax auritus*), western bluebird (*Sialia mexicana*), and little blue heron (*Egretta caerulea*). Although not detected during the biological surveys, the federally and state listed least Bell's vireo (*Vireo bellii pusillus*) is among the high interest animal species with high potential to occur in the MSWSMP study area.

Approximately 562.55 acres of Corps jurisdictional areas, 636.02 acres of CDFG jurisdictional areas, and 635.62 acres of City wetlands were mapped within the study area.

Up to an estimated 70.40 acres of vegetated wetland habitat, 24.63 acres of unvegetated streambed/natural flood channel, and 19.4 acres of sensitive upland habitat could be impacted upon implementation of the assumed maintenance activities anticipated under the proposed project. The maintenance activities assumed for this report are only an approximation of impacts anticipated by long-term maintenance activities, and precise impacts and mitigation would be established each year by the reporting requirements under the MSWSMP. These estimates are based on the amount of area within each facility that could be affected by maintenance and excludes access roads, which are too difficult to predict at this stage.

Wetland habitat impacts could include: 6.08 acres of southern riparian forest (including disturbed), 0.17 acre of southern sycamore riparian woodland, 0.18 acre of riparian woodland, 27.36 acres of southern willow scrub (including disturbed), 4.08 acres of mule fat scrub (including disturbed), 0.34 acre of riparian scrub, 20.00 acres of freshwater marsh (including disturbed), 0.01 acre of cismontane alkali marsh, 1.39 acres of coastal saltmarsh, 0.38 acre of coastal brackish marsh, and 10.41 acres of disturbed wetland. An additional 24.63 acres of streambed/natural flood channel could also be affected, although it is noted that impacts to these unvegetated channels would be temporary impacts that would not require mitigation.

Sensitive upland impacts could include: 0.3 acre of coast live oak woodland, 9.2 acres of Diegan coastal sage scrub (including disturbed), 1.4 acres of broom baccharis scrub, 1.1 acres of southern mixed chaparral, and 7.4 acres of non-native grassland.

Approximately 22.13 acres of vegetated wetland impacts, 11.46 of unvegetated streambed/natural flood channel impacts, and 4.0 acres of upland impacts may occur within the City's Multi-Habitat Planning Area (MHPA). Approximately 10.64 acres of wetland impacts and 10.59 acres of non-vegetated streambed/natural flood channel impacts may occur within the coastal overlay zone.

Implementation of the proposed project would impact single-whorl burrobush, San Diego marsh-elder, southwestern spiny rush, and San Diego sunflower as well as habitat for coastal California gnatcatcher, least Bell's vireo, yellow warbler, western bluebird, double-crested cormorant, and little blue heron. Implementation of the proposed project also has potential to impact nesting raptors.

Based on the assumed implementation of the channel and basin maintenance activities, project-related impacts could occur to approximately 34.66 acres of Corps jurisdictional wetlands, 70.66 acres of

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CDFG jurisdictional wetlands, and 70.40 acres of City-defined wetlands. Maintenance activities could also take place in approximately 32.52 acres of earthen-bottom Corps non-wetland Waters of the U.S. (WUS), 35.75 acres of concrete-bottom Corps WUS, and 24.63 acres of unvegetated CDFG streambed/City natural flood channel.

Impacts to wetland habitat and/or jurisdictional areas are anticipated to be mitigated through wetland enhancement, restoration, and/or purchase of mitigation credits from an Agency-approved wetland mitigation site or bank. Impacts to Diegan coastal sage scrub, broom baccharis scrub, southern mixed chaparral, and non-native grassland would be mitigated through one or more of the following: preservation of appropriate habitat or payment into the City's Habitat Acquisition Fund, as appropriate.

Impacts to eucalyptus woodland, non-native vegetation/ornamental, disturbed habitat/ruderal, and developed land would not be considered significant under the City's Biological Significance Guidelines; therefore, no mitigation is required.

Mitigation for direct impacts to single-whorl burrobush, San Diego marsh-elder, southwestern spiny rush, and San Diego sunflower would not be required. Impacts to coastal California gnatcatcher habitat would be avoided and minimized to the greatest extent practicable, and unavoidable impacts would be mitigated through preservation of habitat. Potential impacts to vireo, gnatcatcher, and nesting raptors would be mitigated by the implementation of avoidance measures during their respective breeding seasons. Impacts to western bluebird, yellow warbler, double-crested cormorant, and little blue heron, and impacts to habitat for these and other sensitive species, would be offset by habitat-based mitigation.

The MSWSMP includes maintenance protocols that would be followed in order to reduce potential indirect impacts. Indirect project impacts related to habitat insularization, lighting, fugitive dust, and roadkill would be less than significant. Indirect project impacts related to human intrusion would be less than significant with implementation of maintenance protocols that include use of temporary construction fencing. Indirect project-related impacts from noise, water quality, exotic plant species, and animal behavioral changes could be significant. However, implementation of maintenance protocols combined with resource-specific mitigation measures would ensure that the proposed project is in conformance with MSCP Compatible Land Uses and Land Use Adjacency Guidelines and that significant indirect impacts are reduced to below a level of significance.

Although not anticipated, the project has the potential to result in cumulative impacts to listed species not covered by the MSCP. Cumulative impacts to non-covered species under the MSCP would be evaluated at a project-specific level. For most non-covered species, it is assumed that habitat-based preservation within the MHPA would provide adequate mitigation; however, given the wide range of potential species and degrees of impact that may be encountered, case-by-case analysis would be conducted to determine if any non-covered species would be impacted to a level that would be cumulatively significant. In the event that they are determined, these impacts would be disclosed in subsequent environmental review and mitigated in accordance with the City's Biology Guidelines.

1.0 INTRODUCTION

The purpose of this report is to provide a programmatic analysis of potential biological impacts resulting from implementation of the City of San Diego's (City's) Master Storm Water System Maintenance Program (MSWSMP). This analysis provides information that will be used by the City and wildlife agencies as part of the permit process for programmatic or regional channel maintenance permits. This report includes a biological reconnaissance and impact analysis for maintenance in the City's largest storm water facilities. It does not include an analysis of every potential channel or facility that may be subject to impacts from future maintenance, which means that the impacts could be understated. On the other hand, it is not likely that the City would be able to maintain all the channels during the life of each regional agency permit, so based on that, the impacts may be overstated. This report includes an impact analysis based on assumptions available at the current time. The reader is reminded that this report is intended to analyze potential impacts from implementation of the overall MSWSMP (Program) so that the framework for regional permits can be established and evaluated. Under the Program, more specific resource identification, impact analysis and mitigation determinations would occur each year in advance of specific maintenance activities proposed by the City.

1.1 PROJECT BACKGROUND AND DESCRIPTION

The City's SWD provides flood control maintenance for numerous storm water channels and basins occurring in seven watersheds in San Diego. Recognizing the need for, and importance of, continuing the periodic inspection, cleaning, and maintenance of storm water facilities in the future, the City has proposed the MSWSMP. The focus of the subject Program is to identify the long-term maintenance and access needs for each channel and/or detention basin.

Maintenance activities assumed for this report are only an approximation of impacts anticipated by long-term maintenance activities, and precise impacts and mitigation would be established as part of a Substantial Conformance Review (SCR) process which would be conducted annually in accordance with the MSWSMP. The estimation of impacts to storm water facilities presented in this report should be considered a representation of potential impacts resulting from flood control maintenance activities for the overall MSWSMP. It is anticipated that minor maintenance activities may occur in storm water facilities not analyzed in this report as part of the City's annual maintenance activities, but these minor additions would be more than offset by the overestimation of storm water facility maintenance inherent in the analysis, since not all assumed maintenance of channels would actually occur.

A description of the various storm water facilities included in the MSWSMP and the proposed maintenance activities and estimated width of disturbance for each facility is presented in Appendix A. In general, the channels are divided into natural and man-made. The surface of the channels varies between earth (soft-bottom), cobble, riprap and concrete. In some cases, the channels are completely earthen. In other cases, the surface is covered by a combination of earth, cobble, riprap, and concrete.

1.1.1 Maintenance Activities

Maintenance activities are expected to range from vegetation and debris removal to sediment dredging. The selection of the maintenance method, frequency, and equipment will depend largely on site-specific

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characteristics of each storm water facility, including size, flow characteristics, surrounding land uses and vegetation, availability of access, and whether the storm water facility is concrete-lined or natural bottom. Where possible, maintenance activities would generally occur during dry months to take advantage of low urban runoff flows within the storm water facility.

Frequency of Maintenance

The frequency of storm water facility maintenance would be based upon routine inspections and past maintenance history. Maintenance frequencies typically occur at three-year intervals. Facilities that have a known history of flooding and/or accumulation of soil, debris, and vegetation and have the potential to increase the risk to life and property would be placed on a priority maintenance list which would require maintenance annually or bi-annually.

Equipment Selection

Mechanized equipment clearing would be utilized whenever possible to reduce cost. Depending on the conditions associated with each facility, different types of mechanized equipment would be utilized. The decision as to which mechanized equipment would be used would be based upon the density and volume of accumulated material, vegetation growth, the size of the facility, the flow characteristics of the facility, and the need to complete maintenance activities in a timely and efficient manner. The types of mechanized equipment would include, but not be limited to, skid-steers, backhoes, Gradalls, excavators, loaders, dump trucks, and bulldozers. Equipment would range in size from 4 feet wide for the smallest skid-steer to 12.5 feet wide for the largest bulldozer. Smaller equipment such as skid-steers would typically be used for smaller channels. For all equipment clearing activities, the depth of material to be removed would be based upon the design capacity of the facility.

Maintenance equipment would utilize existing access roads, whenever possible. In some cases, the maintenance activity would require creating access pathways. Depending on the terrain and vegetation density, bulldozers may be used to create access paths.

Maintenance Methods

Depending on the characteristics of the storm water facility to be maintained, maintenance would affect the entire channel including bottom and banks (referred to as "full maintenance") or affect only that portion of the channel required to achieve the necessary flood control capacity (referred to as "selective maintenance"). A description of each of these techniques including a discussion of the conditions under which they would be appropriate follows.

Full-width Maintenance

Many of the storm water facilities in the urbanized areas were not designed to support vegetation. As a result, retention of any amount of vegetation would impede the flow of flood water and cause flooding on adjacent property. In these circumstances, full removal of vegetation on the banks as well as channel bottom would be the only way to avoid or, at least, minimize the risk of flooding along these facilities. In these cases, mechanized equipment would be used to remove above-ground vegetation and sediment would be excavated from the channel. In most cases, the root systems of vegetation would be likely removed in the course of full channel maintenance. This would be

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particularly true on the channel bottoms because the root systems are commonly associated with the sediment that must also be removed to restore flood conveyance capacity. Scraping would be limited to the amount of excavation required to remove plant material and sediment needed to restore the original channel condition.

Selective Maintenance

Selective maintenance would be based on a combination of empirical evidence and hydraulic analysis. These two methods would be used to determine the minimum amount of sediment and vegetation which must be removed to enable a storm water facility to safely convey flood water. A number of approaches may be used to achieve the necessary flood capacity. These are described below.

Parallel-strip Maintenance. This approach would rely on clearing a strip of vegetation along the centerline of the channel parallel to the direction of flow; this area is commonly referred to as a "pilot channel". Mechanized equipment would remove the quantity of vegetation and sediment which is necessary to transport flood water. This form of maintenance would optimize the flow of flood water by creating sufficient area free of vegetation and sediment. While portions of the channel cleared of vegetation would promote the capacity of the storm water facility to convey flood water, under certain circumstances, the removal of plant material and the root system could encourage scouring which could cause downstream sedimentation.

Perpendicular-strip Maintenance. This approach would involve removing strips of vegetation perpendicular to the direction of flow. Mechanized equipment would excavate vegetation and sediment in alternating strips ranging in width from 10-25 feet. As with the parallel maintenance approach, the width of the strips would be designed to provide adequate flood control capacity. Each strip would be excavated to a depth required to remove vegetation and accumulated sediment. This technique would create a series of depressions that would function as individual sediment basins. The intervening vegetation would intercept debris and trash carried in runoff. Implementation of this approach would be limited to channels where access allows equipment to create these strips while not impacting intervening vegetation. Normally, this would require continuous access from at least one bank of the channel.

While this approach would provide water quality benefits during periods of low flow, this approach could create water quality impacts during periods of high flows. As discussed in a letter from Rick Engineering (see Appendix B), the excavated strips and would increase the velocity of water as it drops into the excavated strip would cause scouring that could create downstream sediment deposition. In addition to the increased potential for sediment production during high flows, the tendency of the intervening vegetation to intercept trash and debris during low flow could actually be disadvantageous during high flows. The vegetation and debris collected in the vegetation could slow the water which could cause flooding because the floodwater would not be allowed to move out of the channel as quickly as with an unvegetated channel.

Half and Half Maintenance. Under this approach, storm water facilities would be cleared parallel to the direction of flow. However, in this case, half of the channel would be cleared in alternating sequence using mechanized equipment. Although the amount of vegetation and sediment to be removed would be essentially the same as parallel-strip technique, the half and half approach would affect different sides of the channels during maintenance rather than constantly affecting the centerline of the channel.

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Above-Ground Vegetation Removal Maintenance. This approach would be used in storm water facilities where the primary reason for decreased flood control capacity is related to vegetation rather than sediment accumulation. In these circumstances, the above-ground vegetation would be periodically mowed with mechanized equipment or removed by hand where mowing equipment access is unavailable. If the cut vegetation would not interfere with flood capacity, it would be left within the channel. Where this would not be possible, the cut vegetation would be collected and disposed in a suitable off-site location. With mowing or hand clearing, the root system would remain in place to hold the channel substrate.

Although maintenance activities typically occur during dry months, a few storm water facilities convey sufficient amounts of urban runoff to preclude or hinder maintenance. In these limited cases, temporary by-pass operations may be necessary. Maintenance activities not contained by simple Best Management Practices (BMPs) such as gravel bags or silt fencing may require check-dams that prevent the flow of water, sediment, vegetation, and debris into and out of the maintenance segment. Dams would be installed at the up- and downstream boundaries of the segment. Depending storm water facility flow, pumps may be necessary to transport water from the up- to the downstream check-dam with appropriate BMPs to prevent downstream water quality impacts. Temporary site dewatering may be necessary to permit equipment operations within the maintenance segment.

Maintenance operations that require dredging of soils would use existing soil spoils storage sites whenever possible. These storage sites would allow dewatering and processing of dredge spoils prior to transport to an appropriate dumping facility. Processing will include removal of tires, large rocks, trash, and other debris. The sites would be surrounded by BMPs to prevent erosion impacts to adjacent properties. Spoils sites may also incorporate vector access to ensure the containment of all runoff.

Several types of BMPs are commonly used during maintenance operations. The type(s) of BMPs used are based upon the site-specific characteristics of the storm water facility and include but are not limited to k-rails, gravel bags, silt fencing, fiber rolls, and gabions.

Riprap is a collection of rock, coarse stone, or boulders used to provide channel bank stability, erosion control, and energy dissipation. Maintenance activities may include replacement of channel bank riprap due to storm water displacement and erosion and installation of new riprap due to erosion of earthen channel banks.

1.1.2 Access

The majority of storm water facility segments have existing access such as utility roads and/or concrete or earthen ramps. For those storm water facilities either without access or with historical access grown over with vegetation, the MSWSMP includes provisions for sensitive access path design or relocation of access to impact the least sensitive habitat possible. Hand clearing of storm water facilities requires only footpath access, resulting in minimal soil and vegetation disturbance (if any) during activities. Equipment access could be achieved via grading access roads where none currently exist, importing soil into the storm water facility to create temporary ramps where access roads exist followed by subsequent soil removal and storm water facility restoration to pre-impact contours, or using smaller equipment such as skid-steers from storm water facility banks using Gradalls. Where possible, access to a storm water facility segment, which may include a combination of natural and concrete-lined areas, would be achieved within the concrete-lined area to avoid and/or minimize impacts to sensitive habitat.

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The type of access needed would be based on facility site-specific characteristics (i.e. surrounding land uses and vegetation, concrete-lined vs. earthen, adjacency of public right-of-way) and the type of equipment necessary to complete maintenance activities. The storm water facilities would be designed to minimize and/or completely avoid impacts to sensitive environmental resources, along with engineering and property ownership considerations. All created access paths would incorporate BMPs during and after maintenance activities.

1.1.3 Wetland Impact Authorization Process

It is anticipated that future maintenance activities would be approved by the agencies on an annual basis with appropriate jurisdiction through an SCR process, which would be defined in each of the long-term maintenance permits issued by local, state and federal agencies with jurisdiction over the specific channel where a maintenance action is proposed. The overall goal of the SCR process is to allow maintenance activities to proceed under the terms of the general permits as long as impacts and mitigation were appropriately identified in the Program EIR and program-level permits prepared for the MSWSMP and the appropriate mitigation measures either have been or would be accomplished as part of the proposed maintenance activity. While the SCR process may vary with each general permit, the overall process is expected to include the following steps.

Step 1: Annual Maintenance Needs Assessment. On an annual basis, the City's SWD would determine which storm water facilities require maintenance in the coming fiscal year.

Step 2: Individual Maintenance Plans. An IMP will be prepared for each maintenance activity. The IMP will identify the following: width of channel clearing, maintenance method(s) to be used; equipment type; access roads/paths; staging areas; spoils storage sites; and schedule. As part of preparing the IMPs, a preliminary hydrology/hydraulic analysis would be conducted to determine if any vegetation could be retained in the channel after maintenance without affecting the facilities ability to convey floodwater. Based on the results of this analysis, a maintenance program would be defined to determine the amount of vegetation and sediment to be removed and the process by which it would be removed.

As appropriate, the IMP shall incorporate construction BMPs required by the RWQB to prevent pollutants from further conveyance by the storm system, the maintenance protocols identified earlier and compensatory mitigation identified in Section 4.3 of the PEIR. The maintenance requirements shall be based on empirical and/or quantitative evaluation of what is required to achieve the desired flood control capacity of the subject storm water facility.

Pursuant to Council Policies 700-13 and 14, the IMP will utilize existing access paths within environmentally sensitive lands that serve other utilities including sewer, water, natural gas, and power to minimize the need for creating new access paths. As an alternative, the IMP may propose alternative access to replace existing utility access paths when that new access can reduce effects on environmentally sensitive resources.

Step 3: Individual Biological Assessments. An IBA would be prepared for any facility that supports native vegetation or occurs adjacent to habitat that has the potential to support sensitive species. Once the limits of maintenance have been defined for a specific facility, a qualified biologist would visit the affected facility to determine the extent and condition of biological resources and

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determine the extent of impact which would occur to those resources. The results of this survey would be summarized in an IBA. An IBA would include the following components:

- Description of maintenance to be performed including length, width and depth;
- Protocol surveys, as needed;
- Scaled map of each affected storm water facility illustrating pre-maintenance vegetation including wetland boundaries based on evaluation of above-ground indicators of the resources; excavation of soil pits, and completion of Corps wetland determination data forms, or completion of Corps preliminary or approved jurisdictional determination forms are not proposed;
- Location of sensitive species;
- Quantification of impacts to all sensitive biological resources;
- Two, digital, date-stamped photos of the affected area;
- Specific maintenance protocols from the MSWSMP that should be implemented as part of the IMP;
- Identification of any biological monitoring required during maintenance; and
- Specific compensation that would be required to mitigate impacts to biological resources (e.g., wetland creation/enhancement/restoration or offsite upland habitat acquisition).

Step 4: Agency Notification. The SWD would provide written notice to designated City department, as well as state and federal agency with jurisdiction over storm water facilities that are proposed to be maintained in the upcoming fiscal year. The written notice would include the IMP, IBA, INA, and IHA for each facility.

Step 5: Agency SCR Determination. Based on information provided with the notification package, each agency would determine whether the proposed maintenance activities are in substantial conformance with the analysis contained in the Program Environmental Impact Report (PEIR) and specific terms of the general permit issued to the City pursuant to the MSWSMP. Where an agency determines that one or more of the maintenance activities are not in substantial conformance, it shall identify additional measures which would be needed to bring those activities into compliance with the PEIR and general permit conditions.

Step 6: Annual Report. The SWD would prepare an annual report for designated City departments and state and federal agencies with jurisdiction over storm water facilities that were maintained during the past year. This report would include the following:

- Tabular summary of the acreage of sensitive vegetation lost by the facility that was maintained;
- Scaled map of each affected storm water facility illustrating pre- and post-maintenance vegetation;
- Updated master storm water facility list to reflect the facilities which have been mitigated and, for which, no additional mitigation shall be required;
- Summary of the status of mitigation which has been carried out during the current and previous years to compensate for impacts to upland and wetland vegetation, as well as sensitive species;

- Two digital, date-stamped photographs of each of the areas that were maintained in the current year; and
- Description of any remedial actions and the outcome of their implementation for each affected storm water facility.

After securing the necessary SCR determination or additional permits, maintenance activities would occur in storm water facilities in the following manner:

Storm Water Facility and Access Route Field Delineation: Approved access routes would be field marked per the IMP. A qualified biologist would clearly mark both sensitive biological resource areas to be avoided and the limits of resource areas approved for clearing or crossing. The biologist would check for any substantial change in site conditions from those shown on the IMP and have the ability to refine the access routes and maintenance methods whenever possible to avoid or reduce impacts to sensitive biological resources as maintenance progresses in the field.

Sensitive Biological Resource Clearance: Within a minimum of 72 hours of initiating any clearing or grubbing activities, a qualified biologist would conduct any necessary pre-maintenance surveys, including bird nest surveys to provide for compliance with the Migratory Bird Treaty Act (MBTA).

Archaeology: In conjunction with more detailed planning and California Environmental Quality Act (CEQA) review for each project, a site-specific cultural resources assessment would be completed by a qualified archaeologist and include a pre-grading walkover survey and resource evaluation, as appropriate. If cultural resources occur within the disturbance area of maintenance, the City's SWD would notify the City's Development Services Division (DSD) to determine the appropriate measures to be taken to protect or salvage historic or prehistoric resources. No maintenance would occur without specific approval from DSD and implementation of required mitigation measures.

Access Route Clearing (if necessary): Approved access routes would be cleared of brush, low-hanging branches, and obstacles, and limited grading would be conducted as necessary to allow equipment to be transported to the work areas. BMPs would be installed in accordance with the IMP.

Maintenance Activities: Storm water facility maintenance would be completed using IMP methodology.

Waste Management: All debris accumulated during the maintenance process would be removed from the site either by vacuum/pressure truck or dump truck and disposed of off site.

Site Close-Out: Following completion of the maintenance activities and removal of all maintenance wastes and equipment, site close-out activities would include installation of erosion control devices such as straw wattles, geotextile blankets/nets, and hydroseed; implementation of on-site wetland/streambed restoration measures required by the PEIR; and any additional measures imposed as part of the SCR determination and/or securing the site from public access, as appropriate.

1.1.4 Maintenance Protocols

In order to carry out maintenance in the most biologically sensitive manner, the MSWSMP includes the following protocols which would be incorporated into each IMP, as appropriate:

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Erosion Control Protocols

- Protocol #1 Minimize new ground disturbance to the maximum extent feasible, through efforts such as limiting grading to the minimum areas required, and restricting vehicle access and maneuvering to designated areas (with an emphasis on using existing roads).
- #2 Minimize maintenance operations during the rainy season (October 1 to April 30).
- #3 When maintenance cannot be avoided during the rainy season, prepare and implement a “weather triggered” action plan for activities to provide enhanced erosion and sediment control measures prior to predicted storm events (i.e., 40 percent or greater chance of rain).
- #4 Schedule grading, earth disturbing and restoration activities as far in advance of the start of the rainy season as feasible, to maximize the opportunity for revegetated areas to establish prior to the advent of storm runoff.
- #5 Stabilize access roads (or other graded areas) proposed to be permanently retained through the use of measures such as permeable protective surfacing (e.g., grasscrete), storm water diversion structures (e.g., brow ditches or berms), or crossing structures (e.g., culverts).
- #6 During maintenance, use sediment controls on all slopes, access paths and staging areas to prevent off-site sediment transport, including measures such as silt fence, fiber rolls, gravel bags, temporary sediment basins, stabilized construction access points (e.g., shaker plates), containment barriers (e.g., silt fence, fiber rolls and/or berms) for material stockpiles, and properly fitted covers for material transport vehicles. Remove temporary erosion control measures upon completion of maintenance.
- #7 Store BMP materials on-site to provide “standby” capacity adequate to provide complete protection of exposed areas and prevent off-site sediment transport.
- #8 Provide appropriate training for personnel responsible for BMP installation and maintenance.
- #9 As appropriate, implement revegetation efforts on all slopes, access paths and staging areas using native or naturalized vegetation, non-invasive plant material as soon as feasible during or after maintenance operations. Revegetated areas shall be monitored and maintained for a period of not less than 25 months.
- #10 Monitor erosion control measures during the rainy season to assure effectiveness.
- #11 Implement sampling/analysis, monitoring/reporting and post-construction management programs per NPDES and/or City requirements.
- #12 Comply with local dust control requirements, including measures such as material stockpile and transport vehicle control (as noted above), regular watering or use of soil binders, and restriction of grading during high winds.

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Water Quality Protocols

- #13 Minimize the amount of hazardous materials stored on-site, and restrict storage/use locations to areas at least 50 feet from storm drains and surface waters.
- #14 Store construction-related trash in areas at least 50 feet from storm drains and surface waters, and implement regular (at least weekly) removal of trash by a licensed operator for disposal at an approved site.
- #15 Cover and/or enclose storage facilities for hazardous materials and trash, and maintain accurate and up-to-date written hazardous material inventories.
- #16 Store hazardous materials off the ground surface (e.g., on pallets) and in their original containers, with the legibility of labels protected. Replace damaged labels.
- #17 Use berms, ditches and/or impervious liners (or other applicable methods) in material storage and vehicle/equipment maintenance and fueling areas to provide a containment volume of 1.5 times the volume of stored/used materials and prevent discharge in the event of a spill.
- #18 Place warning/information signs in areas of hazardous material use or storage to identify the types of materials present, as well as applicable use restrictions and containment/clean-up procedures.
- #19 Mark storm drains (or other appropriate locations) to discourage inappropriate hazardous material or trash disposal.
- #20 Provide training for applicable employees in the proper use, handling and disposal of hazardous materials, as well as appropriate action to take in the event of a spill.
- #21 Store readily accessible absorbent and clean-up materials in applicable locations such as hazardous material storage and vehicle/equipment maintenance areas.
- #22 Post regulatory agency telephone numbers and a summary guide of clean-up procedures in a conspicuous location at or near the job site trailer.
- #23 Monitor and maintain hazardous material use/storage facilities and operations to ensure proper working order on at least a monthly basis.

Biological Resource Protection Protocols

- #24 Retain wetland vegetation during maintenance when retention would not interfere with the goal of facilitating the conveyance of floodwaters, and protecting adjacent life and property.
- #25 Vehicles operating outside storm water facilities shall use existing/approved access roads.

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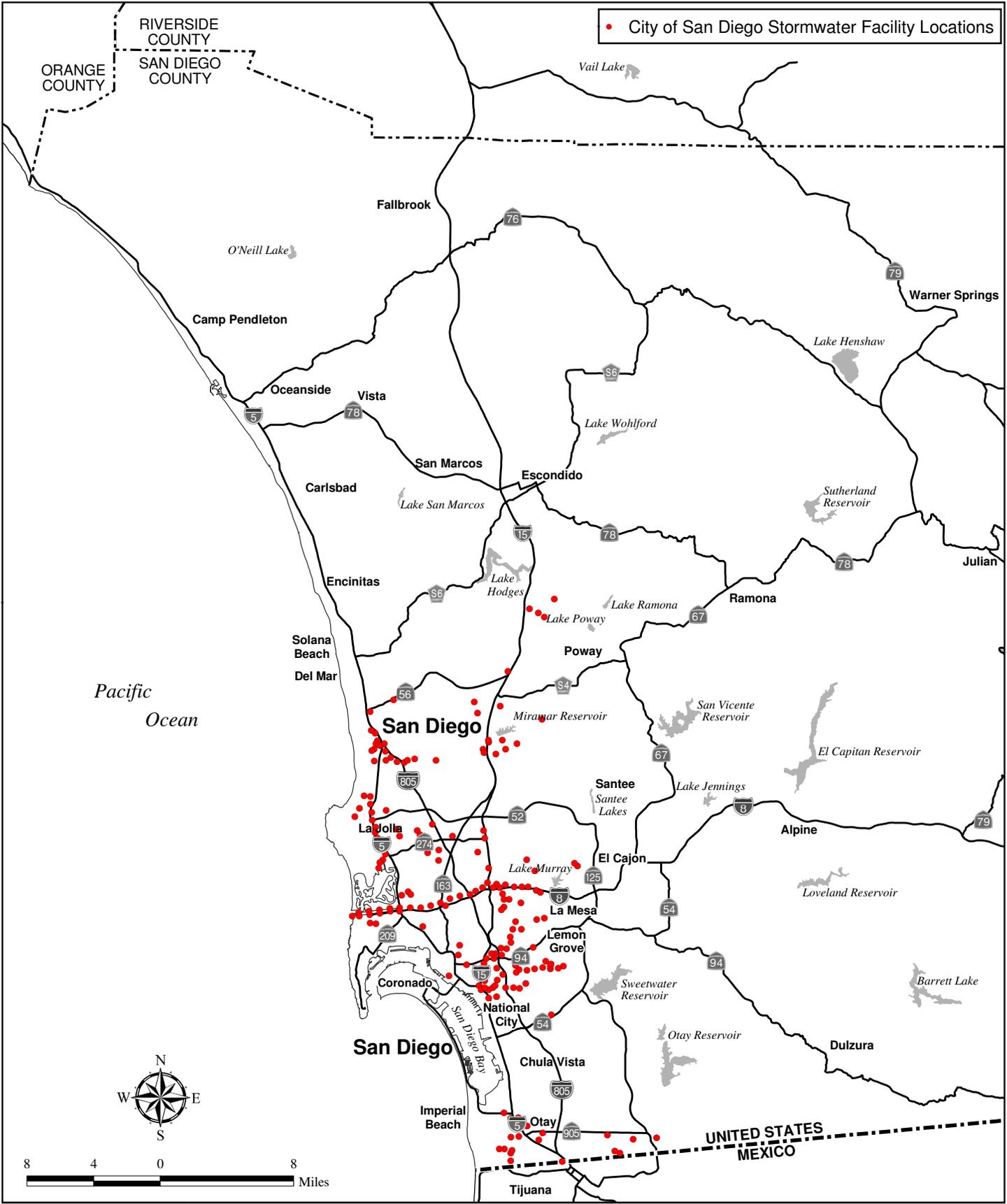
- #26 The size and number of equipment used for maintenance shall be selected to minimize disturbance associated with maintenance.
- #27 All sensitive biological resource areas shall be flagged in the field prior to initiation of maintenance activities. Where necessary, a qualified biologist shall be present to monitor the work to assure impacts to the resource are avoided.
- #28 Physical erosion control measures (e.g. fiber mulch, rice straw, etc.) shall not carry seed from invasive species.
- #29 Maintenance activities within areas potentially supporting sensitive wildlife shall be avoided, whenever possible. Pre-construction surveys would be conducted to determine the presence of any sensitive animal species and to determine appropriate protection measures to be implemented during maintenance.
- #30 If maintenance activities must occur near active raptor nests, necessary setbacks must be maintained during the period of nest use.

1.2 PROJECT LOCATION

The project study area is situated in San Diego, California (Figure 1) and includes segments scattered along named and unnamed channels in addition to 16 sedimentation basins and a limited number of outfall/drain structures (Figures 2a-e). Table 1 provides information on cross-referencing the study area locations shown on Figures 2a-e with numerous smaller-scale vegetation and wetland delineation maps located in Appendix B of this report. Approximately 561.5 acres of the study area lie within the City's MHPA and 398.5 acres are within the Coastal Overlay Zone (Figure 3). The study area was determined using storm water facility area boundaries provided by the City.

Map No(s)	Channel or Basin Name (map numerical order)	Channel or Basin Name (alphabetical order)	Map No(s)
1	Rancho Bernardo Rd & Bernardo Center Dr	10205 Pomerado Rd	20
2-3	Rancho Bernardo	10249 Pinetree Dr	21
4	11044 Via San Marco	11000 Roselle St/11100 Flinkote Ave	9
5	Scripps Poway Pkwy & Scripps Summit Dr	11044 Via San Marco	4
5a	12350 Black Mountain Rd n/o Mercy Rd		
6	Tripp Ct/11689 Sorrento Valley Rd	12350 Black Mountain Rd n/o	5a
6a	Industrial Court	Mercy Rd	
7-8	Los Peñasquitos Channel	12660 Legacy Rd	23a
9	11000 Roselle St/11100 Flinkote Ave	13153 Paseo del Verano	169
10	Dunhill St & Roselle St	30 th and Del Sol Blvd	131
11-12	Soledad Creek Channel	3053 Renault Way	31
13-17	Soledad Creek Channel	35th St & Martin Ave	92
18	Maya Linda & Via Pasar	3860 Calle Fortunada	48

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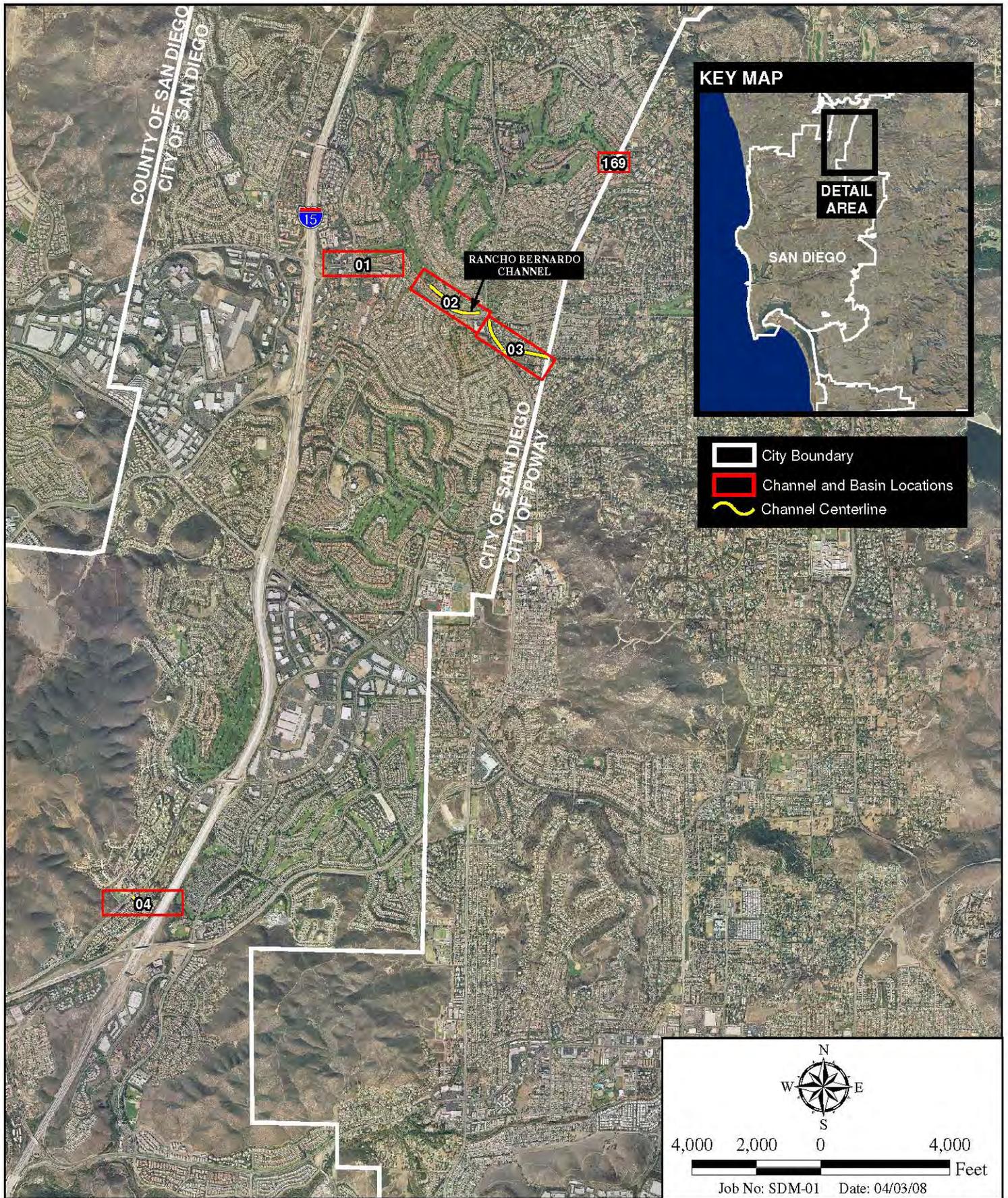


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Regional Location Map

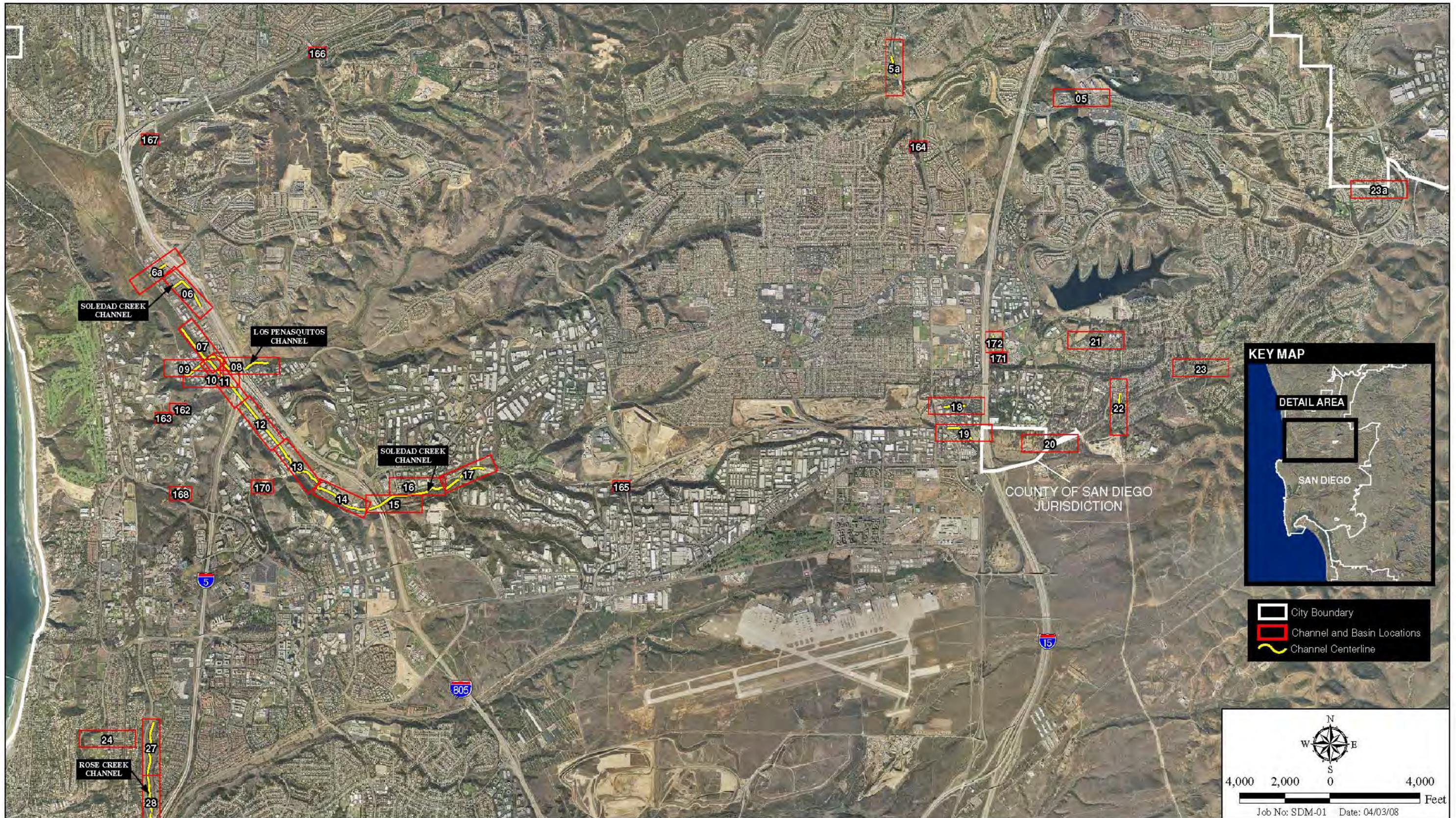
CITY OF SAN DIEGO MASTER STORMWATER SYSTEM MAINTENANCE PROGRAM

Figure 1



Project Location Map - Rancho Bernardo Area

CITY OF SAN DIEGO MASTER STORMWATER SYSTEM MAINTENANCE PROGRAM

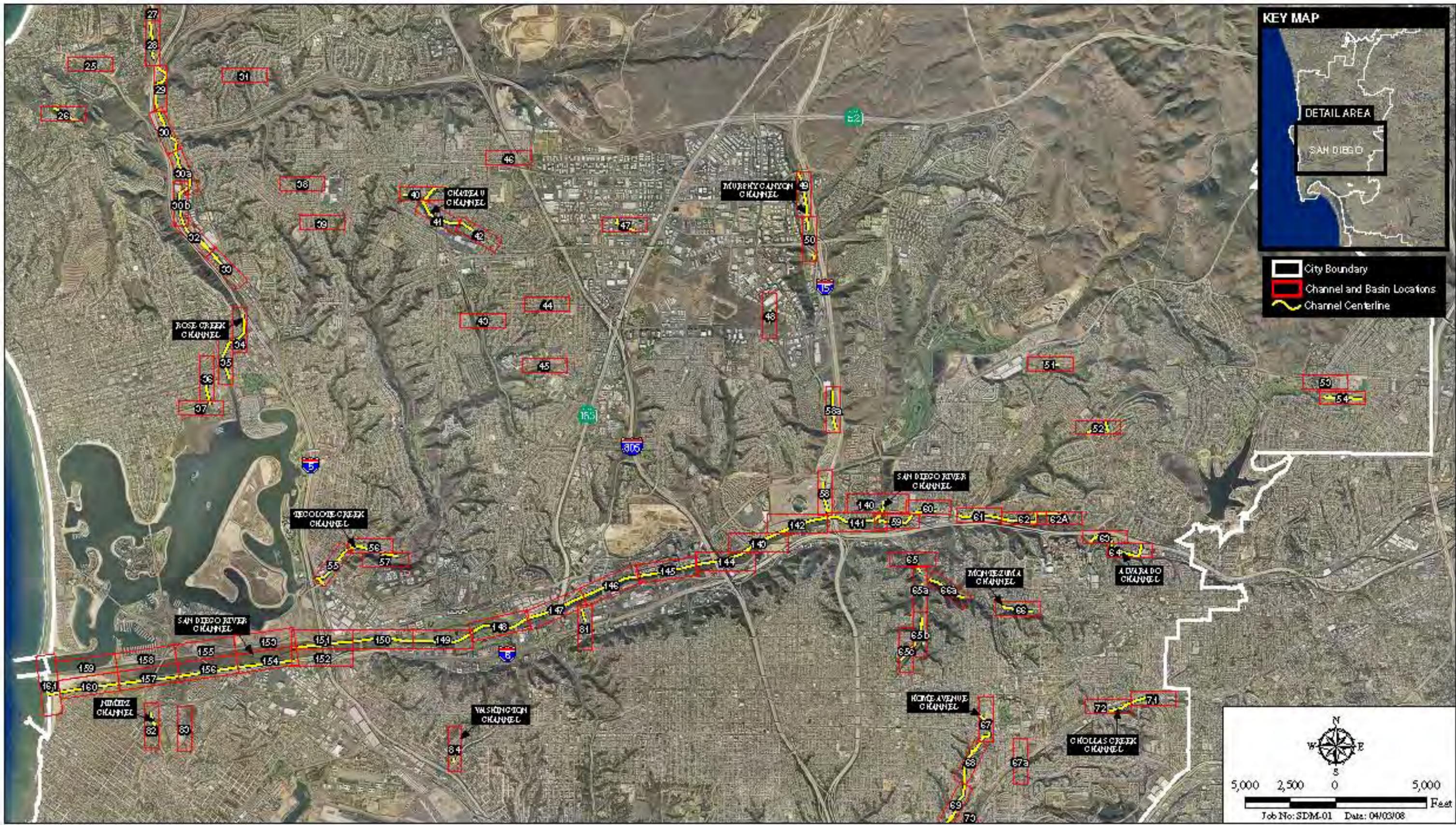


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Project Location Map - Soledad Area

CITY OF SAN DIEGO MASTER STORMWATER SYSTEM MAINTENANCE PROGRAM

Figure 2b



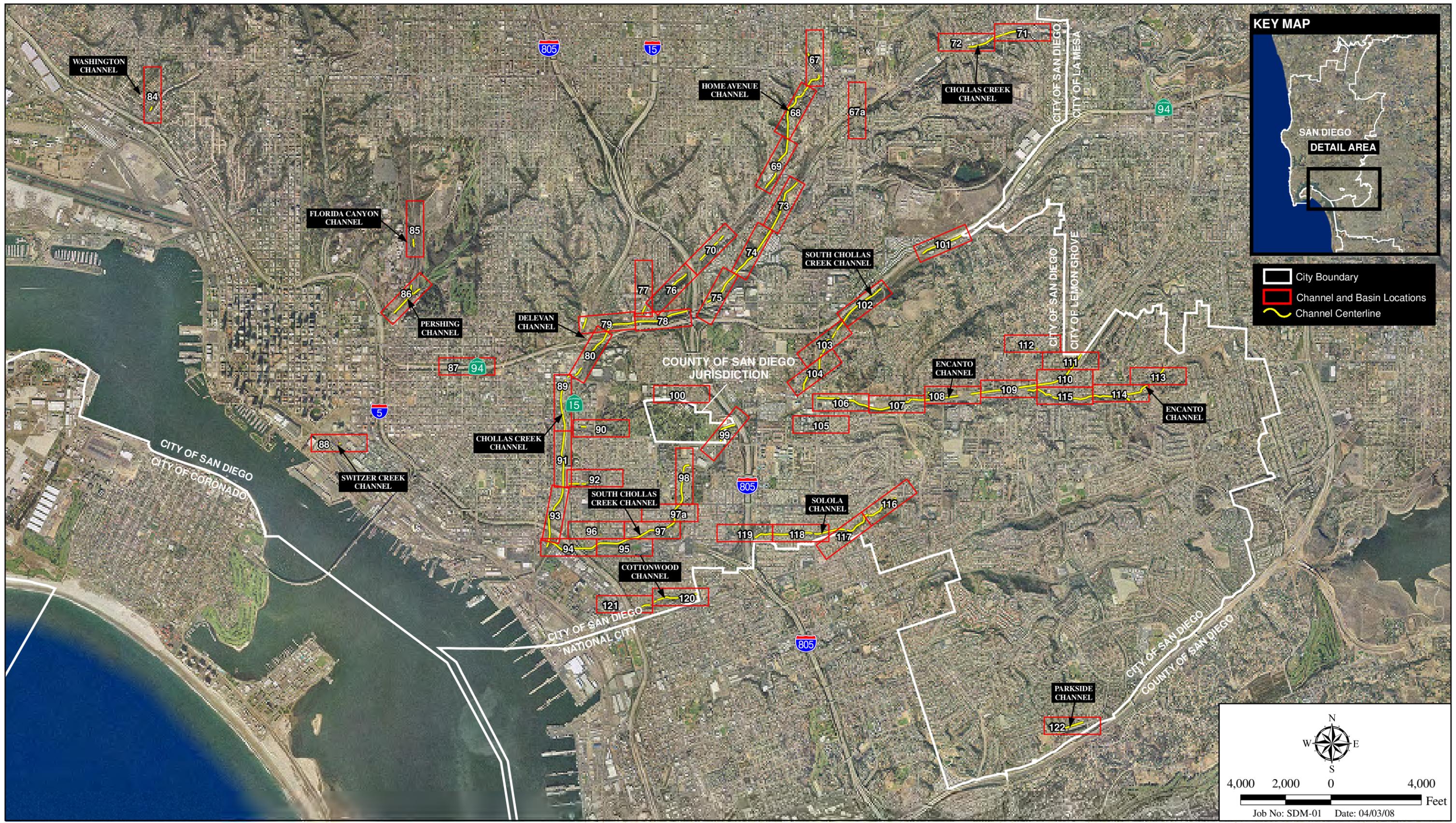
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Project Location Map - I-8 Corridor

CITY OF SAN DIEGO MASTER STORMWATER SYSTEM MAINTENANCE PROGRAM



Figure 2c



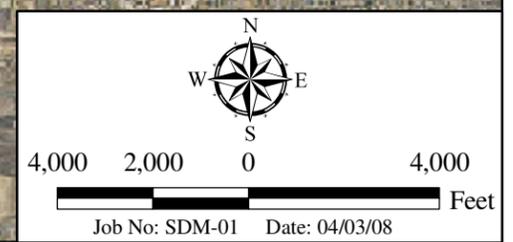
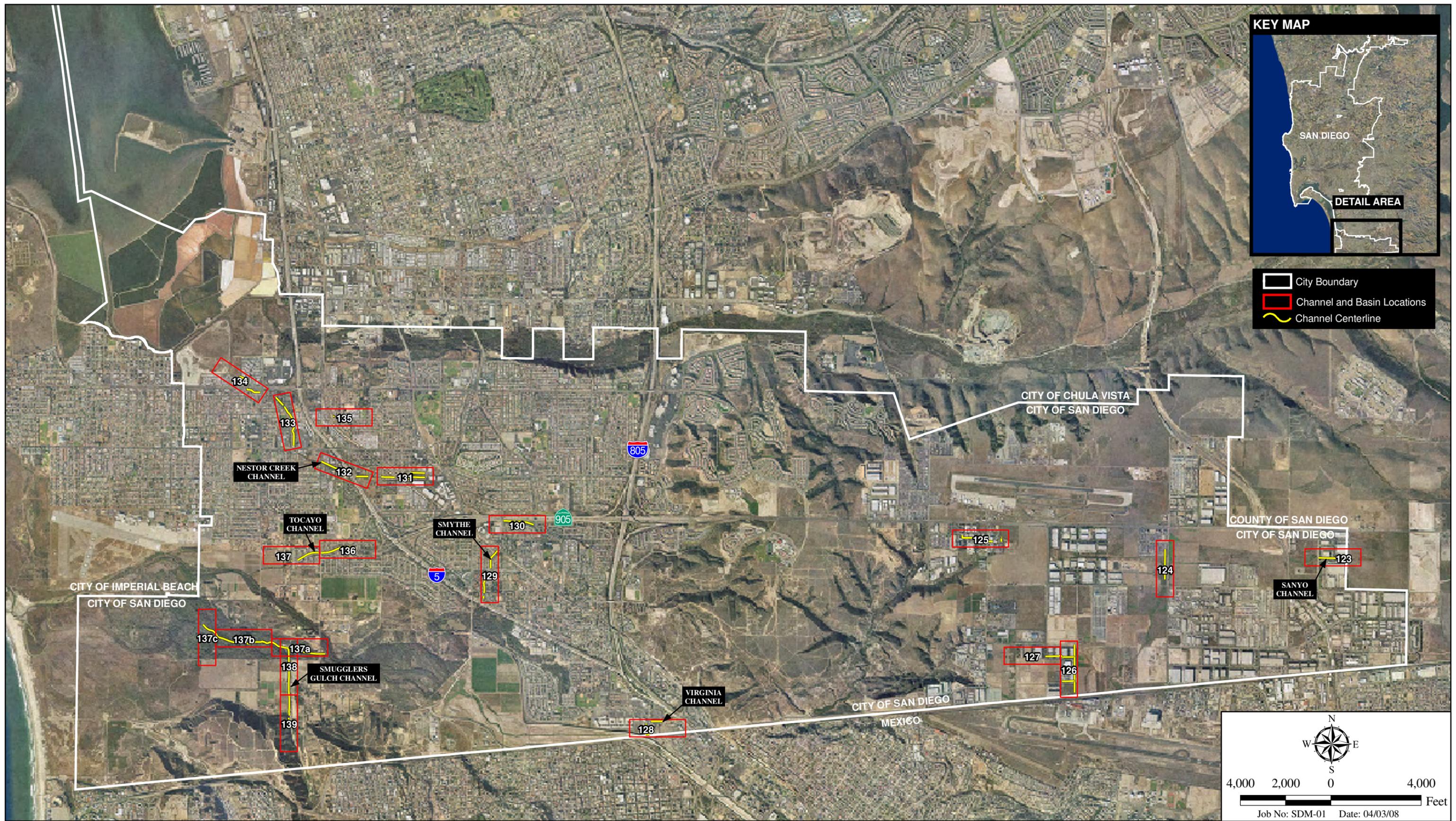
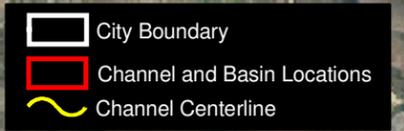
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Project Location Map - Central San Diego Area

CITY OF SAN DIEGO MASTER STORMWATER SYSTEM MAINTENANCE PROGRAM



Figure 2d



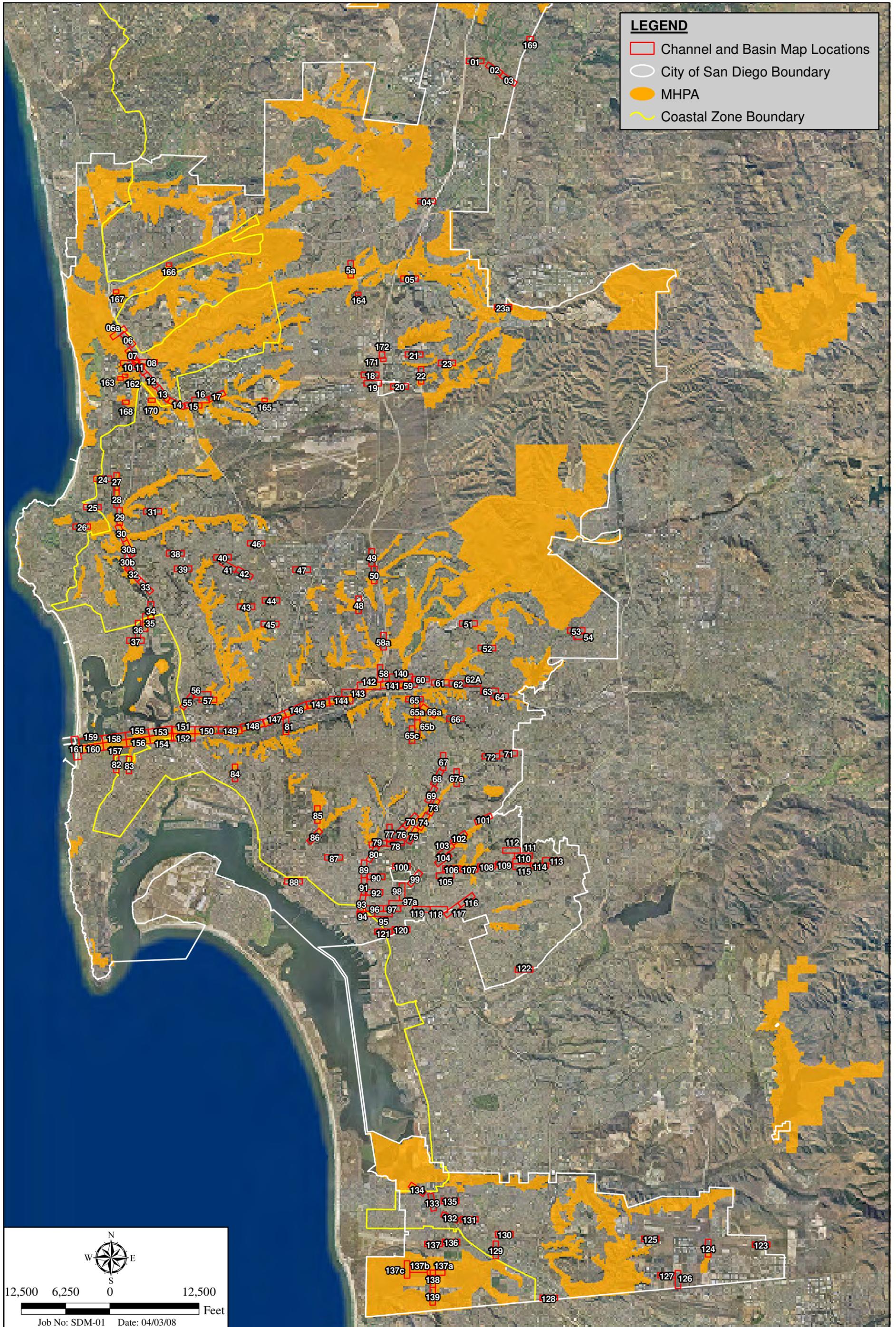
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Project Location Map - Otay Mesa Area

CITY OF SAN DIEGO MASTER STORMWATER SYSTEM MAINTENANCE PROGRAM

Figure 2e





Study Area Locations in Relation to the MHPA / Coastal Overlay Zone

CITY OF SAN DIEGO MASTER STORMWATER SYSTEM MAINTENANCE PROGRAM

Table 1 (cont.)
CROSS-REFERENCE BETWEEN MAP NUMBER AND CHANNEL OR BASIN NAME

Map No(s)	Channel or Basin Name (map numerical order)	Channel or Basin Name (alphabetical order)	Map No(s)
19	Candida & Via Pasar	42nd & J St	100
20	10205 Pomerado Rd	7969 & 7971 Engineer Rd	47
21	10249 Pinetree Dr	9262 Camino Santa Fe	165
22	NE Corner of Pomerado Rd & Scripps Ranch Blvd	Alvarado Channel	59-60
23	Pomerado Rd & Avenida Magnifica	Alvarado Channel	61-62, 62a
23a	12660 Legacy Rd	Alvarado Channel	63
24	Scenic Pl & Cliff Ridge	Alvarado Channel	64
25	Ardath Rd from Esterel to Ardath Ln	Ardath Rd from Esterel to Ardath Ln	25
26	Hillside Dr from Rue Adriane to Via Capri	Black Mountain Road S of Westview	164
27	Rose Creek Channel	Britannia & Bristow	127
28	Rose Creek Channel	Camino de la Reina & Camino del Arroyo	81
29-30 30a-b	Rose Creek Channel	Camino del Arroyo	52
31	3053 Renault Way	Camino Maquiladora & Cactus	125
32	Rose Creek Channel	Candida & Via Pasar	19
33	Rose Creek Channel	Carmel Country Rd Bridge S of SR 56	166
34	Rose Creek Channel	Chateau Channel	40-42
35	Rose Creek Channel	Chollas Creek Channel	67a
36	Mission Bay High School	Chollas Creek Channel	71-72
37	Pacific Beach Dr & Olney St	Chollas Creek Channel	73-75
38	Drain Structures – Lakehurst Ave	Chollas Creek Channel	78-80
39	Drain Structures – Clairemont Dr	Chollas Creek Channel	89
40-42	Chateau Channel	Chollas Creek Channel	91
43	Thornwood St & Mario Pl	Chollas Creek Channel	93
44	Drain Structures – Beal St	Clairemont Mesa & 805 behind hotel	46
45	Drain Structures – Mesa College Way	Cottonwood/Nordica Channel	120-121
46	Clairemont Mesa & 805 behind hotel	Cowles Mtn Channel	53
47	7969 & 7971 Engineer Rd	Delevan Dr	79
48	3860 Calle Fortunada	Drain Structures – Beal St	44
49-50	Murphy Canyon Channel	Drain Structures -- between 26 th & 27 th sts	87
51	Red River Dr & Conestoga Dr	Drain Structures – Boston Ave & Z St	96
52	Camino del Arroyo	Drain Structures – Clairemont Dr	39
53	Cowles Mtn Channel	Drain Structures – Lakehurst Ave	38
54	San Carlos Channel	Drain Structures – Mesa College Way	45
55	West Morena Blvd	Dunhill St & Roselle St	10
55-57	Tecolote Creek Channel	Elm & Harris	135
58-58a	Murphy Canyon Channel	Encanto Channel	106-107
59-60	Alvarado Channel	Encanto Channel	108-111
61-62, 62a	Alvarado Channel	Euclid & Castana	105
63	Alvarado Channel	Fairmont Channel	65, 65a-c

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Table 1 (cont.)
CROSS-REFERENCE BETWEEN MAP NUMBER AND CHANNEL OR BASIN NAME

Map No(s)	Channel or Basin Name (map numerical order)	Channel or Basin Name (alphabetical order)	Map No(s)
64	Alvarado Channel	Famosa Blvd & Valeta St	83
65, 65a-c	Fairmont Channel	Florida Canyon Channel	85
66-66a	Montezuma Channel	Hillside Dr from Rue Adriane to Via Capri	26
67a	Chollas Creek Channel	Home Ave Channel	67
67	Home Ave Channel	Home Ave Channel	68
68	Home Ave Channel	Home Ave Channel	69
69	Home Ave Channel	Home Ave Channel	70
70	Home Ave Channel	Home Ave Channel	76-77
71-72	Chollas Creek Channel	Imperial Ave & Gillette St	90
73-75	Chollas Creek Channel	Industrial Court	6a
		Jamacha Channel	109
76-77	Home Avenue Channel	Jamacha Channel	113-115
78-80	Chollas Creek	La Media & Airway	124
79	Delevan Dr	Los Peñasquitos Channel	7-8
81	Camino de la Reina & Camino del Arroyo	Madera & Broadway	112
82	Nimitz Channel	Maya Linda & Via Pasar	18
83	Famosa Blvd & Valeta St	Mission Bay High School	36
84	Washington Channel	Montezuma Channel	66-66a
85	Florida Canyon Channel	Murphy Canyon Channel	49-50
86	Pershing Channel	Murphy Canyon Channel	58-58a
87	Drain Structures – between 26 th & 27 th sts	NE Corner of Pomerado Rd & Scripps Ranch Blvd	22
88	Switzer Creek Channel	Nestor Creek Channel	131
89	Chollas Creek Channel	Nestor Creek Channel	132-133
90	Imperial Ave & Gillette St	Nestor Creek Channel	134
91	Chollas Creek Channel	Nimitz Channel	82
92	35th St & Martin Ave	Northside Genesee E of Science Center Dr	168
93	Chollas Creek Channel	Pacific Beach Dr & Olney St	37
94-95	South Chollas Creek Channel	Parkside Channel	122
96	Drain Structures – Boston Ave & Z St	Pershing Channel	86
97-99	South Chollas Creek Channel	Pomerado Rd & Avenida Magnifica	23
100	42nd & J St	Rancho Bernardo	2-3
101-104	South Chollas Creek Channel	Rancho Bernardo Rd & Bernardo Center Dr	1
105	Euclid & Castana	Red River Dr & Conestoga Dr	51
106-107	Encanto Channel	Rose Creek Channel	27
108-111	Encanto Channel	Rose Creek Channel	28
109	Jamacha Channel	Rose Creek Channel	29-30, 30a-b
112	Madera & Broadway	Rose Creek Channel	32
113-115	Jamacha Channel	Rose Creek Channel	33
116	Solola Channel	Rose Creek Channel	34
117	Solola Channel	Rose Creek Channel	35

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**Table 1 (cont.)
CROSS-REFERENCE BETWEEN MAP NUMBER AND CHANNEL OR BASIN NAME**

Map No(s)	Channel or Basin Name (map numerical order)	Channel or Basin Name (alphabetical order)	Map No(s)
118-119	Solola Channel	Roselle St (dead end)	170
120-121	Cottonwood/Nordica Channel	San Carlos Channel	54
122	Parkside Channel	San Diego River	140-161
123	Sanyo Channel	Sanyo Channel	123
124	La Media & Airway	Scenic Pl & Cliff Ridge	24
125	Camino Maquiladora & Cactus	Scripps Lake Dr W of Treena St	171-172
126	Siempre Viva & Bristow	Scripps Poway Pkwy & Scripps Summit Dr	5
127	Britannia & Bristow	Siempre Viva & Bristow	126
128	Virginia Channel	Smugglers Gulch Channel	138-139
129	Smythe Channel	Smythe Channel	129
130	Smythe Channel	Smythe Channel	130
131	Nestor Creek Channel	Soledad Creek Channel	11-12
131	30 th and Del Sol Blvd	Soledad Creek Channel	13-17
132-133	Nestor Creek Channel	Solola Channel	116
134	Nestor Creek Channel	Solola Channel	117
135	Elm & Harris	Solola Channel	118-119
136-137	Tocayo Channel	South Chollas Creek Channel	94-95
137a-c	Tijuana River	South Chollas Creek Channel	97-99
138-139	Smugglers Gulch Channel	South Chollas Creek Channel	101-104
140-161	San Diego River	Switzer Creek Channel	88
162-163	Tower Road	Tecolote Creek Channel	55-57
164	Black Mountain Rd S of Westview	Thornwood St & Mario Pl	43
165	9262 Camino Santa Fe	Tijuana River	137a-c
166	Carmel Country Rd Bridge S of SR 56	Tocayo Channel	136-137
167	Westside El Camino Real S of SR 56	Tower Rd	162-163
		Tripp Ct/11689 Sorrento Valley Rd	6
168	Northside Genesee E of Science Center Dr	Virginia Channel	128
169	13153 Paseo del Verano	Washington Channel	84
170	Roselle St (dead end)	West Morena Blvd	55
171-172	Scripps Lake Dr W of Treena St	Westside El Camino Real S of SR 56	167

1.3 PHYSICAL DESCRIPTION AND LAND USE

The project study area consists of a network of storm water facility channels and basins and scattered outfall structures throughout San Diego. The major channels consist of named creeks, some of which have been channelized and/or lined with concrete and/or riprap along portions of their lengths. Minor channels include unnamed tributaries, which also may include channelized and/or concrete or riprap-lined segments. The storm water facilities are diverse in terms of size, vegetative cover, substrate, hydrology, and environmental setting. The smallest storm water facilities are only a few feet wide, while segments of the largest are over 100 feet wide. Vegetative cover ranges from mature riparian forest to marsh habitat to unvegetated surfaces, with substrates including loams, sands, cobbles, rock and concrete. Hydrology varies from permanently flowing creeks to ephemeral streambeds that flow

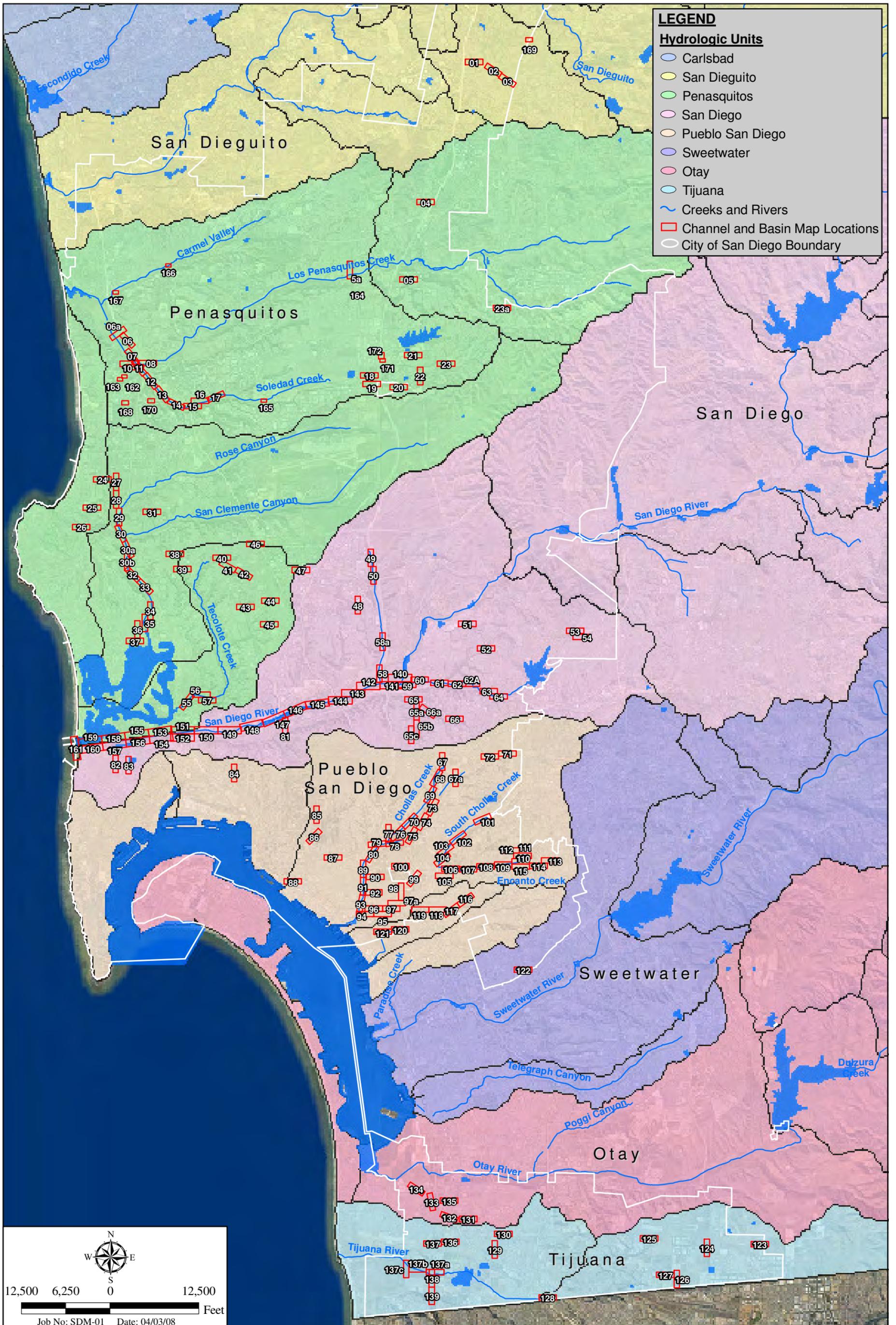
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only following rainfall or in response to urban runoff. Some storm water facilities are in highly urbanized settings and present little opportunity for wildlife utilization due to their location and individual characteristics, while others traverse open space areas and/or function as important wildlife corridors.

As channels are naturally associated with larger basins, this analysis is based on Hydrologic Units (HUs) as defined in the San Diego Regional Water Quality Control Board (RWQCB) Water Quality Control Plan for the San Diego Basin. The channels and detention basins that are included in the City's MSWSMP occur within the following seven HUs: San Dieguito, Peñasquitos, San Diego, Pueblo San Diego, Sweetwater, Otay, and Tijuana (Figure 4). Summary descriptions of the seven HUs applicable to the proposed project are provided below.

- San Dieguito HU – The San Dieguito HU is a rectangular-shaped area of approximately 350 square miles associated with the San Dieguito River watershed. Major tributaries and water bodies include Santa Ysabel and Santa María creeks and Lakes Sutherland and Hodges. The Rancho Bernardo Channel is the only named channel mapped in this HU addressed by the MSWSMP.
- Peñasquitos HU – The Peñasquitos HU is a rectangular-shaped area of approximately 170 square miles associated with several smaller storm water facilities including Peñasquitos, Rose Canyon and San Clemente Canyon Creeks. Water bodies within this HU include Los Peñasquitos (Sorrento) Lagoon, Mission Bay and Miramar Reservoir. Segments of named channels addressed by the MSWSMP include Rose, Los Peñasquitos, Soledad, and Tecolote creeks.
- San Diego HU – The San Diego HU is a long, generally triangular-shaped area of approximately 440 square miles that encompasses the San Diego River watershed. Major water bodies within this area include El Capitan, San Vicente and Murray reservoirs as well as Lakes Jennings and Cuyamaca. Segments of named channels addressed by the MSWSMP include Alvarado, Fairmont, and Nimitz channels as well as the San Diego River and Murphy Canyon.
- Pueblo San Diego HU – The Pueblo San Diego HU is a small rectangular area encompassing approximately 60 square miles. No major water bodies occur within this HU, with much of the western HU boundary adjacent to San Diego Bay. Segments addressed by the MSWSMP include the Chollas and South Chollas creeks as well as Encanto, Home Avenue, Jamacha, Cottonwood/Nordica, Pershing, Solola, and Washington channels.
- Sweetwater HU – The Sweetwater HU is a linear area encompassing approximately 160 square miles associated with the Sweetwater River watershed. Major water bodies within this unit include the Sweetwater and Loveland reservoirs as well as the southern portion of San Diego Bay. Only the Parkside Channel is addressed by the MSWSMP.
- Otay HU – The Otay HU is a club-shaped area of approximately 160 square miles associated with the Otay River and related tributaries including Jamul and Dulzura creeks. Major water bodies within this HU include Upper and Lower Otay reservoirs. The Nestor Creek is only storm water facility addressed in the MSWSMP.
- Tijuana HU – The Tijuana HU is a triangular-shaped area of approximately 470 square miles that encompasses the portions of the Tijuana River watershed north of the international border. Principal

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Study Area Locations in Relation to Hydrologic Units

CITY OF SAN DIEGO MASTER STORMWATER SYSTEM MAINTENANCE PROGRAM



Figure 4

drainages include portions of the Tijuana River in the westernmost portion of the HU, as well as Campo and Cottonwood creeks. Major water bodies within this unit include Morena Reservoir, Barrett Lake and the Tijuana Estuary. Segments of named channels addressed by the MSWSMP include the Sanyo, Tocayo, and Virginia channels, Smuggler's Gulch, and the Tijuana River.

All of the described HUs and associated drainage courses are ultimately tributary to the Pacific Ocean, with several encompassing coastal lagoons and embayments as noted above.

2.0 METHODS

2.1 LITERATURE REVIEW

Prior to conducting field investigations, HELIX Environmental Planning, Inc. (HELIX) performed a review of existing literature, including previous vegetation mapping completed by Mooney and Associates (Mooney 2004) and Dudek (2006) as well as information compiled as part of the Multiple Species Conservation Program (MSCP; City 1997).

2.2 BIOLOGICAL SURVEYS

2.2.1 Biological Resources Mapping

HELIX biologists mapped vegetation communities within the project study area during site visits (Table 2). The majority of vegetation communities within the study area were mapped on 1"=150' scale aerials, except for the areas along the San Diego River, which were mapped on 1"=200' scale aerials. Mapping along the Tijuana River is based on mapping conducted by Dudek and Associates in 2006. Storm water facilities were mapped to the boundaries provided to HELIX by the City. The overall mapping effort covered approximately 885 acres within the City. For logistical reasons, numerous other storm water facility structures scattered throughout the City were not individually mapped. These include relatively small features such as brow ditches, pipes, outfalls, curb inlets and outlets, culverts, and manholes. Many of these areas would not be expected to support sensitive resources. Furthermore, additional review required during the SCR process would evaluate all storm water facilities which are proposed to be maintained. Any facilities not included in this analysis would be reviewed at that time.

Vegetation communities were mapped in accordance with the City's Guidelines for Conducting Biological Surveys (2002). The study area was surveyed on foot, with the aid of binoculars when necessary. Access was limited in certain portions of the study area, and in these areas vegetation was mapped using aerial interpretation combined with upstream and/or downstream observations.

Lists of plant and animal species observed/detected within the study area during site visits were recorded and are presented in Appendices C and D, respectively.

**Table 2
SURVEY INFORMATION**

Date	Personnel	Survey Type
June 15, 2006	Stacy Nigro, Matt Cooper	Jurisdictional delineation (JD), vegetation mapping
June 16, 2006	Stacy Nigro, Matt Cooper	JD, vegetation mapping
February 5, 2007	Stacy Nigro	JD, vegetation mapping
February 6, 2007	Stacy Nigro, Sarah Haas	JD, vegetation mapping
February 7, 2007	Stacy Nigro, Jason Kurnow	JD, vegetation mapping
February 8, 2007	Stacy Nigro, Sarah Haas	JD, vegetation mapping
February 13, 2007	Stacy Nigro	JD, vegetation mapping
February 14, 2007	Stacy Nigro, Heather Haney	JD, vegetation mapping
February 15, 2007	Stacy Nigro, Sarah Haas	JD, vegetation mapping
February 16, 2007	Stacy Nigro, Jason Kurnow	JD, vegetation mapping
February 20, 2007	Stacy Nigro, Sarah Haas	JD, vegetation mapping
February 21, 2007	Stacy Nigro, Brian Parker	JD, vegetation mapping
February 22, 2007	Stacy Nigro, Sarah Haas	JD, vegetation mapping
February 26, 2007	Stacy Nigro, Heather Haney	JD, vegetation mapping
February 28, 2007	Stacy Nigro, Heather Haney	JD, vegetation mapping
March 1, 2007	Stacy Nigro, Heather Haney	JD, vegetation mapping
March 23, 2007	Stacy Nigro, Shelby Howard	JD, vegetation mapping
April 5, 2007	Stacy Nigro, Phillip Tran	JD, vegetation mapping
April 6, 2007	Stacy Nigro, Brian Parker	JD, vegetation mapping
April 9, 2007	Stacy Nigro	JD, vegetation mapping
January 30, 2008	Stacy Nigro, Kimberly Davis	JD, vegetation mapping
February 1, 2008	Stacy Nigro, Kathy Pettigrew	JD, vegetation mapping
February 7, 2008	Stacy Nigro, Kathy Pettigrew	JD, vegetation mapping
November 20, 2008	Stacy Nigro	JD, vegetation mapping

2.2.2 Jurisdictional Delineation

HELIX biologists conducted program-level jurisdictional delineation fieldwork within the study area on the same dates that vegetation mapping was conducted. Approximately 52 linear miles of storm water facilities were mapped as part of this effort. Delineations were conducted on foot with the aid of 1"=150' scale aerials and topographic maps, except for the areas along the San Diego River, in which 1"=200' scale aerials and topographic maps were used. Access was limited in certain portions of the study area, and in these areas the delineation was completed via aerial and topographic interpretation combined with upstream and/or downstream observations. All areas with depressions or storm water facility channels were evaluated for the presence of Waters of the U.S. (WUS), including jurisdictional wetlands. Wetland determinations were completed at a program level and soil pits were not excavated. Determinations were based on species of vegetation present and their wetland affiliations, above-ground hydrology indicators, topography, soil surface substrate, and best professional judgment. Areas were determined to be a federal (Corps) wetland if they presumably satisfied the three criteria (vegetation, hydrology, and soils) established for wetland delineations as described in Environmental Laboratory (1987) and the Wetland Delineation Manual: Arid West Region (Arid West Supplement; Corps 2006), as applicable. Areas were determined to be non-

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wetland WUS if there was evidence of regular surface flow (e.g., bed and bank) but the vegetation or soil criterion was not met. Jurisdictional limits for these areas were delineated by the ordinary high water mark (OHWM), which is defined in 33 CFR Section 329.11 as “that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank; shelving; changes in the character of the soil; destruction of terrestrial vegetation; the presence of litter or debris; or other appropriate means that consider the characteristics of the surrounding areas.”

CDFG jurisdictional boundaries were determined based on the presence of riparian vegetation or regular surface flow. Streambeds within CDFG jurisdiction were delineated based on the definition of streambed as “a body of water that flows at least periodically or intermittently through a bed or channel having banks and supporting fish or other aquatic life. This includes watercourses having a surface or subsurface flow that supports riparian vegetation” (Title 14, Section 1.72). Riparian habitat is not defined in Title 14, but the section refers to vegetation and habitat associated with a stream. CDFG jurisdictional habitat includes all riparian shrub or tree canopy that may extend beyond stream banks.

City jurisdictional areas were based on the definition of wetlands pursuant to the Environmentally Sensitive Lands Regulations (ESL) of the Land Development Code and include areas characterized by any of the following conditions: (1) All areas persistently or periodically containing naturally occurring wetland vegetation communities characteristically dominated by hydrophytic vegetation, including but not limited to salt marsh, brackish marsh, freshwater marsh, riparian forest, oak riparian forest, riparian woodlands, riparian scrub, and vernal pools; (2) Areas that have hydric soils or wetland hydrology and lack naturally occurring wetland vegetation communities because human activities have removed the historic wetland vegetation or catastrophic or recurring natural events or processes have acted to preclude the establishment of wetland vegetation as in the case of salt pannes and mudflats; (3) Areas lacking wetland vegetation communities, hydric soils, and wetland hydrology due to non-permitted filling of previously existing wetlands; or (4) Areas mapped as wetlands on Map C-713 as shown in Chapter 13, Article 2, Division 6 (Sensitive Coastal Overlay Zone). City-defined wetlands are the same as CDFG wetlands in almost all cases, with the exception being that CDFG exerts jurisdiction over coast live oak woodland (an upland vegetation community) when associated with a storm water facility.

2.3 SURVEY LIMITATIONS

Site visits were conducted during daylight hours. No focused plant or animal surveys were conducted. Complete inventories of biological resources present on a site often require numerous focused surveys at different times of day during different seasons. Some species such as annual plants are present in only spring or summer, and nocturnal animals are difficult to detect during the day. Other species may be present in such low numbers that they could be missed. Due to such timing and seasonal variations, survey results are not an absolute list of all species that the study area may support. Sensitive species with potential to occur are described in Sections 4.2.2 and 4.3.2 of this report.

Vegetation and wetland delineation boundaries were converted to a GIS database to assist in estimating the general magnitude of impacts that could be associated with future channel maintenance activities. Due to the precision possible through GIS, the individual impact estimates in many of the tables that appear in this report infer an accuracy level that is somewhat misleading due to the programmatic estimates of maintenance work to be conducted. Thus, these numbers should be

considered approximations and not definitive.

2.4 NOMENCLATURE

Nomenclature used in this report follows the conventions used in the City Biology Guidelines (City 2001) and the MSCP (City 1997). Vegetation community classifications follow Holland (1986); Latin plant names follow Hickman, ed. (1993) while common names follow Hickman or California Native Plant Society ([CNPS] 2007). Sensitive plant status follows CNPS (2007) and CDFG (2007a and b). Animal nomenclature is taken from Heath (2004) for butterflies, Crother (2001) for amphibians and reptiles, American Ornithologists' Union (2007) for birds, and Baker et al. (2003) for mammals. Sensitive animal status follows CDFG (2007c; 2006).

3.0 RESULTS

3.1 VEGETATION COMMUNITIES

Twelve wetland/riparian and thirteen upland vegetation communities occur within the study area, which covers approximately 884.95 acres. Wetland/riparian vegetation communities within the study area include southern riparian forest, southern sycamore riparian woodland, southern willow scrub, riparian woodland, mule fat scrub, riparian scrub, freshwater marsh, cismontane alkali marsh, southern coastal saltmarsh, coastal brackish marsh, disturbed wetland, and streambed/open water/natural flood channel. Approximately 635.62 acres of wetland/riparian habitat were mapped within the study area (Table 3). Upland vegetation communities include coast live oak woodland, scrub oak chaparral, southern foredunes, beach, Diegan coastal sage scrub, coastal sage-chaparral scrub, broom baccharis scrub, southern mixed chaparral, non-native grassland, eucalyptus woodland, non-native vegetation/ornamental, disturbed habitat/ruderal, and developed land. Approximately 249.4 acres of upland habitat, including developed land, were mapped within the study area (Table 3). Appendix B includes vegetation mapping and jurisdictional delineations at either a 1"=150' or 1"=200' scale for all areas within the MSWSMP study area. Figure 4 can be used as a key map for Appendix B. This figure depicts each map page location in relation to other map pages and hydrologic unit.

**Table 3
EXISTING VEGETATION COMMUNITIES***

HU	Wetlands†												Total
	SRF	SRW	RW	SWS	MFS	RS	FWM	CAM	CSM	CBM	DW	STM/OW	
San Dieguito	0.00	0.00	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.00	0.02	0.02	0.38
Peñasquitos	11.26	0.05	0.18	25.84	0.84	0.00	10.79	0.00	1.71	0.53	2.90	10.08	64.18
San Diego	149.02	0.88	0.00	30.89	10.97	0.02	21.66	5.47	87.09	0.00	2.95	210.64	519.59
Pueblo San Diego	0.00	0.00	0.00	3.79	2.65	0.52	5.52	0.00	0.53	0.00	6.93	13.62	33.56
Sweetwater	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.03
Otay	0.00	0.00	0.00	0.59	0.00	0.00	2.42	0.00	0.00	0.00	0.07	0.04	3.12
Tijuana	0.00	0.00	0.00	4.72	1.93	0.00	1.88	0.00	0.00	0.00	2.93	3.30	14.76
TOTAL	160.28	0.93	0.18	65.83	16.39	0.54	42.61	5.47	89.33	0.53	15.83	237.7	635.62

HU	Uplands†													Total
	Tier I				Tier II			Tier IIIA	Tier IIIB	Tier IV				
	CLOW	SOC	SFD	BCH	DCSS	CSCS	BS	SMC	NNG	EW	NNV/ORN	DH/RUD	DEV	
San Dieguito	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	4.4	4.7
Peñasquitos	0.2	0.0‡	0.0	0.0	2.5	0.0‡	0.6	0.8	2.2	3.7	6.3	2.1	25.4	43.8
San Diego	0.2	0.0	13.0	23.1	3.7	0.0	0.8	0.1	2.3	2.5	5.6	8.4	55.1	114.8
Pueblo San Diego	0.0	0.0	0.0	0.0	11.9	0.0	0.3	0.3	6.0	0.2	4.1	3.9	39.58	66.28
Sweetwater	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0
Otay	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	1.4	0.0	0.6	4.2	1.8	8.3
Tijuana	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	1.3	1.4	5.8	10.5
TOTAL	0.4	0.0‡	13.0	23.1	18.4	0.0‡	1.7	1.2	13.9	6.4	18.2	20.0	133.1	249.4

*Upland habitats are rounded to the nearest 0.1 acre, while wetland habitats are rounded to the nearest 0.01; thus, totals reflect rounding

†Habitat acronyms: BCH=beach, BS=broom baccharis scrub, CAM=cismontane alkali marsh, CBM=coastal brackish marsh, CLOW=coast live oak woodland, CSCS=coastal sage-chaparral scrub, CSM=coastal saltmarsh, DCSS=Diegan coastal sage scrub, DEV=developed land, DH/RUD=disturbed habitat/ruderal, DW=disturbed wetland, EW=eucalyptus woodland, FWM=freshwater marsh, MFS=mule fat scrub, NNG=non-native grassland, NNV/ORN=non-native vegetation/ornamental, RS=riparian scrub, RW=riparian woodland, SFD=southern foredunes, SMC=southern mixed chaparral, SOC=scrub oak chaparral, SRF=southern riparian forest, SRW=southern sycamore riparian woodland, STM/OW=streambed/open water, SWS=southern willow scrub

‡On-site totals comprise 0.01 acre for each of these habitats, which extend off site

3.1.1 Wetland/Riparian Vegetation Communities

Southern Riparian Forest (including disturbed)

Southern riparian forests are composed of winter deciduous trees that require an abundant supply of water at or near the soil surface for most of the year. Species such as willows (*Salix* spp.) and western cottonwood (*Populus fremontii*) form a dense, medium-height canopy. This habitat occurs in wet areas along frequently flooded rivers and creeks, generally with fine alluvial soils. Typical species present in this habitat in the study area include red willow (*Salix laevigata*), western sycamore (*Platanus racemosa*), black willow (*S. gooddingii*), arroyo willow (*S. lasiolepis*), stinging nettle (*Urtica dioica*), pampas grass (*Cortaderia selloana*), and giant reed (*Arundo donax*). Approximately 160.28 acres of this habitat were mapped along Rose and Soledad creeks, Smuggler's Gulch, Murphy Canyon, the San Diego River, and one of three basins shown on Map 172, with the majority occurring along the San Diego River.

Southern Sycamore Riparian Woodland (including disturbed)

Southern sycamore riparian woodland is a tall, open, broad-leaved, winter-deciduous streamside woodland dominated by western sycamore (*Platanus racemosa*). These stands of woodlands seldom form closed canopy forests and may appear as trees scattered in a shrubby thicket of sclerophyllous and deciduous species. Species present on site include western sycamore, poison oak (*Toxicodendron diversilobum*), western cottonwood, castor bean (*Ricinus communis*), and ripgut grass (*Bromus diandrus*). Approximately 0.93 acre of southern sycamore riparian woodland was mapped along the Roselle Street Basin, Alvarado Channel, Murphy Canyon, Soledad Creek, and the San Diego River.

Riparian Woodland

Riparian woodland is a tall, open, streamside woodland dominated by any of several tree species (e.g., coast live oak, willow, sycamore, or cottonwood). This habitat was mapped within the Roselle Street and Tower Road basins (Map Nos. 170 and 162) and is atypical in its composition in that the dominant plant is blue elderberry (*Sambucus mexicana*) with an understory of poison oak but is strongly affiliated with a drainage. The elderberry forms a moderately dense woodland within and adjacent to streambed habitat. In the Roselle Street Basin, this habitat occurs along a drainage between disturbed wetland and southern sycamore riparian woodland, while in the Tower Road Basin, it parallels the drainage adjacent to disturbed wetland. Approximately 0.18 acre of riparian woodland occurs in these two areas.

Southern Willow Scrub (including disturbed)

Southern willow scrub consists of dense, broad-leaved, winter-deciduous stands of trees dominated by shrubby willows in association with mule fat (*Baccharis salicifolia*) and with scattered emergent cottonwood and western sycamores. This vegetation community occurs on loose, sandy, or fine gravelly alluvium deposited near stream channels during flood flows. Frequent flooding maintains this early seral community, preventing succession to a riparian woodland or forest (Holland 1986). Typical species occurring in this habitat within the study area include arroyo willow, red willow, black willow, sandbar willow (*Salix exigua*), mule fat, western sycamore, tamarisk (*Tamarix* sp.), Brazilian pepper (*Schinus terebinthifolius*), Mexican fan palm (*Washingtonia robusta*), pampas grass, giant reed, and cattails (*Typha* spp.). Approximately 65.83 acres of this habitat were mapped along the Tower Road, Black Mountain, and Camino Santa Fe basins; Alvarado, Encanto, Fairmont, Home Avenue, and Solola

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channels; Chollas, Nestor, Rose, Soledad, Los Peñasquitos, South Chollas, and Tecolote creeks; Murphy Canyon; San Diego and Tijuana rivers; Smuggler's Gulch; and several smaller unnamed drainages.

Mule Fat Scrub (including disturbed)

Mule fat scrub is a depauperate, shrubby, riparian scrub community dominated by mule fat and interspersed with shrubby willows. This vegetation community occurs along intermittent stream channels with a fairly coarse substrate and moderate depth to the water table. Approximately 16.39 acres of mule fat scrub were mapped along the Tower Road and Black Mountain basins; Chollas, Los Peñasquitos, Rose, and South Chollas creeks; Encanto, Home Avenue, and Virginia channels; Florida Canyon; San Diego and Tijuana rivers; Smuggler's Gulch; and smaller unnamed drainages.

Riparian Scrub (including disturbed)

Riparian scrub is a generic term for several shrub-dominated communities that occur along drainage and/or riparian corridors. Typical species in this habitat within the study area include mule fat, Hooker's evening primrose (*Oenothera elata* ssp. *hookeri*), and San Diego golden-bush (*Isocoma menziesii* var. *menziesii*). Approximately 0.54 acre of riparian scrub was mapped along Chollas Creek, Encanto and Home Avenue channels, San Diego River, and a smaller unnamed channel.

Freshwater Marsh (including disturbed)

Freshwater marsh is dominated by perennial emergent monocots that reach between 12 and 15 feet. This vegetation type occurs along the coast and in coastal valleys, near river mouths, and around lake and springs margins. Species present in this habitat in the study area include cattails, California bulrush (*Scirpus californicus*), umbrella sedge (*Cyperus involucreatus*), tall flatsedge (*C. eragrostis*), watercress (*Rorippa nasturtium-aquaticum*), spike-rush (*Eleocharis* spp.), and rabbitsfoot grass (*Polypogon monspeliensis*). Approximately 42.61 acres were mapped within the Alvarado, Encanto, Home Avenue, Jamacha, Mission Bay High School, Montezuma, Nimitz, Cottonwood/Nordica, Rancho Bernardo, Sanyo, Smythe, Solola, and Tocayo channels; Chollas, Los Peñasquitos, Nestor, Rose, Murphy Canyon, Soledad, and South Chollas creeks; the San Diego and Tijuana rivers; and various smaller unnamed drainages and several basins.

Cismontane Alkali Marsh (including disturbed)

Cismontane alkali marsh is dominated by perennial, emergent, herbaceous monocots. Standing water or saturated soils are present during most or all of the year, and high evaporation and low input of fresh water render these marshes somewhat salty. Characteristic species include yerba mansa (*Anemopsis californica*), sedges (*Carex* spp.), saltgrass (*Distichlis spicata*), beardless wild rye grass (*Leymus triticoides*), and rushes (*Juncus* spp.), among others. Yerba mansa, saltgrass, Mexican rush (*Juncus mexicanus*), bristly ox-tongue (*Picris echioides*), Hooker's evening primrose, and southwestern spiny rush (*Juncus acutus* ssp. *leopoldii*) were the dominant species in this habitat on site. Approximately 5.47 acres of cismontane alkali marsh were mapped in the Alvarado Channel and San Diego River.

Southern Coastal Saltmarsh

Coastal saltmarsh is dominated by plants adapted to the higher soil salinity levels and frequent inundation in areas periodically flooded by salt water. Typical plant species include California seablite (*Suaeda californica*), common glasswort/pickleweed (*Salicornia* spp.), and saltgrass. Species present on site included glasswort, alkali-heath (*Frankenia salina*), fleshy jaumea (*Jaumea carnosa*), western marsh-rosemary (*Limonium californicum*), California loosestrife (*Lythrum californicum*), and saltgrass. Approximately 89.33 acres of southern coastal saltmarsh were mapped within Chollas and Rose creeks and the San Diego River, with the majority of this habitat occurring near the mouth of the San Diego River.

Coastal Brackish Marsh

Coastal brackish marsh is dominated by perennial, emergent, herbaceous monocots that are adapted to varying soil salinities due to input from saltwater and freshwater. It is very similar to cismontane alkali marsh, with many of the same species. This habitat typically intergrades with coastal salt marshes toward the ocean and occasionally with freshwater marshes at the mouths of rivers. Species observed in this habitat on site include cattails, southwestern spiny rush, saltgrass, and glasswort. Approximately 0.53 acre of coastal brackish marsh was mapped in Rose Creek near its confluence with Mission Bay.

Disturbed Wetland

Disturbed wetland is typically dominated by exotic wetland species that have likely become established following previous disturbance(s), although it may also contain native species. The habitat composition is highly variable based on the hydrology, soils, and type and frequency of disturbance. Species present within the study area include rabbitsfoot grass, curly dock (*Rumex crispus*), giant reed, bristly ox-tongue, cockle-bur (*Xanthium strumarium*), umbrella sedge, common celery (*Apium graveolens*), Bermuda grass (*Cynodon dactylon*), and poison hemlock (*Conium maculatum*). Approximately 15.83 acres of disturbed wetland were mapped within the Alvarado, Encanto, Home Avenue, Jamacha, Cottonwood/Nordica, Parkside, Pershing, Rancho Bernardo, Sanyo, Smythe, Solola, Tocayo, Virginia, and Washington channels; Chollas, Los Peñasquitos, Nestor, Soledad, and South Chollas creeks; Florida Canyon; San Diego River; and several basins and smaller unnamed drainages. Giant reed-dominated disturbed wetland areas include Alvarado, Home Avenue, Washington, Florida Jamacha, Solola, and Smythe channels and South Chollas Creek. Giant reed is mixed with native habitats along the Los Peñasquitos, Soledad, Chollas, and Nestor creeks; Smuggler's Gulch; and the Tijuana and San Diego rivers.

Streambed/Open Water

Streambed/open water habitat includes unvegetated drainages with a natural bottom (i.e., not concrete-lined) regulated by the Corps as non-wetland WUS and by CDFG as streambed/open water. Areas mapped as open water either support perennial surface flows or were inundated at the time of mapping. Approximately 237.70 acres of streambed and/or open water were mapped within the basins and storm water facilities in the study area. The City regulates these areas as natural flood channels.

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3.1.2 Upland Vegetation Communities

Coast Live Oak Woodland (Tier I)

Coast live oak woodland is an evergreen woodland or forest community dominated by coast live oak (*Quercus agrifolia*) with a height between 35 to 80 feet. The shrub layer generally consists of toyon (*Heteromeles arbutifolia*), Mexican elderberry, fuchsia-flowered gooseberry (*Ribes speciosum*), and poison oak. A dense herbaceous understory is dominated by miner's lettuce (*Claytonia perfoliata* var. *perfoliata*), chickweed (*Stellaria media*), and various grasses. This community occurs along the coastal foothills of the Peninsular Ranges, typically on north-facing slopes and shaded ravines (Holland 1986). Coast live oak woodland can be further described as either open or dense. Approximately 0.4 acre of this habitat was mapped within Murphy Canyon, Rose Creek, and around two drain structures within the MSWSMP.

Scrub Oak Chaparral (Tier I)

Scrub oak chaparral is a dense evergreen chaparral dominated by Nuttall's scrub oak (*Quercus dumosa*) with considerable mountain mahogany (*Cercocarpus betuloides*). This habitat occurs in somewhat more mesic areas than many other chaparrals such as north-facing slopes and recovers more rapidly from fires due to resprouting capabilities of scrub oak (Holland 1986; Keeley and Keeley 1988). Only 0.01 acre of scrub oak chaparral was mapped within the MSWSMP in the Black Mountain Basin boundary.

Southern Foredunes (Tier I)

Southern foredunes are dominated by low, often succulent perennial herbs and subshrubs. A small amount of perennial grasses may also occur. Foredunes are similar to active coastal dunes, but have less wind and/or a smaller supply of sand and/or more available groundwater. These relatively favorable conditions allow the establishment of plants, which reduce the amount of blowing sand, and partially stabilize the dunes. Species observed within this habitat include beach evening primrose (*Camissonia cheiranthifolia* ssp. *suffruticosa*), sea rocket (*Cakile maritima*), and beach-bur (*Ambrosia chamissonis*). Approximately 13.0 acres of southern foredunes were mapped near the mouth of the San Diego River.

Beach (Tier I)

The beach community refers to the expanse of sandy substrate between mean tide and the foredune or in the absence of a foredune to the furthest inland reach of storm waves. The beach is characterized by a maritime climate, high exposure to salt spray and sand blast, and a shifting sandy substrate with low water-holding capacity and low organic matter content. Beach steepness, height, and width are affected by wave height, tidal range, sand grain size and supply. Approximately 23.1 acres of beach were mapped adjacent to the mouth of the San Diego River.

Diegan Coastal Sage Scrub (including disturbed; Tier II)

Diegan coastal sage scrub is dominated by low, soft-woody subshrubs on xeric sites characterized by shallow soils. Many of the shrubs are drought-deciduous, an adaptation that allows the habitat to withstand the prolonged drought period in the summer and fall (Holland 1986). Sage scrub species have relatively shallow root systems and open canopies that allow for a substantial seasonal

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herbaceous (annual plant) component. Typical species on site include California sagebrush (*Artemisia californica*), California buckwheat (*Eriogonum fasciculatum* ssp. *fasciculatum*), laurel sumac (*Malosma laurina*), black sage (*Salvia mellifera*), California encelia (*Encelia californica*), lemonadeberry (*Rhus integrifolia*), and coast prickly-pear (*Opuntia littoralis*). Disturbed Diegan coastal sage scrub contains many of the same shrub species as the undisturbed type but is more sparse and has a higher proportion of non-native annual species. Approximately 18.4 acres of Diegan coastal sage scrub were mapped within or adjacent to several basins and Alvarado, Encanto, Fairmont, and Home Avenue channels; Chollas, Nestor, Rose, Soledad, South Chollas, and Tecolote creeks; Florida and Murphy canyons; and the San Diego River.

Coastal Sage-Chaparral Scrub (Tier II)

Coastal sage-chaparral scrub is a mixed community of sclerophyllous, woody chaparral species and drought-deciduous sage scrub species, which often occurs as an ecotone transitioning between the two vegetation communities. Typical species observed include California sagebrush, black sage, and chamise (*Adenostoma fasciculatum*). Only 0.01 acre of coastal sage-chaparral scrub was mapped within the study area within the Black Mountain Basin boundary.

Broom Baccharis Scrub (Tier II)

Although not listed as a native plant community by Holland (1986), baccharis scrub is an upland community recognized by resources agencies as a subtype of coastal sage scrub that develops under a variety of circumstances following Diegan coastal sage scrub disturbance. This vegetation community is dominated by broom baccharis (*Baccharis sarothroides*), and may also support coyote brush (*Baccharis pilularis*). Approximately 1.7 acres of broom baccharis scrub were mapped within or adjacent to the Roselle Street Basin, Alvarado and Home Avenue channels, Chollas and Rose creeks, Murphy Canyon, and a smaller unnamed drainage.

Southern Mixed Chaparral (including disturbed; Tier IIIA)

Southern mixed chaparral is composed of broad-leaved sclerophyllous shrubs that can reach 6 to 10 feet in height and form dense often nearly impenetrable stands with poorly developed understories. In this mixed chaparral the shrubs are generally tall and deep rooted, with a well developed soil litter layer, high canopy coverage, low light levels within the canopy, and lower soil temperatures (Keeley and Keeley 1988). This vegetation community occurs on dry, rocky, often steep north-facing slopes with little soil. As conditions become more mesic, broad-leaved sclerophyllous shrubs that resprout from underground root crowns become dominant. Species present on site include chamise, toyon (*Heteromeles arbutifolia*), mountain mahogany, and laurel sumac. Approximately 1.2 acres of southern mixed chaparral were mapped along the Alvarado, Chateau, and Solola channels as well as two smaller unnamed drainages. This habitat is also found outside the Camino Santa Fe Basin boundary.

Non-native Grassland (Tier IIIB)

Non-native grassland is a dense to sparse cover of annual grasses, often associated with numerous species of showy-flowered native annual forbs. This association occurs on gradual slopes with deep, fine-textured, usually clay soils. Characteristic species include oats (*Avena* spp.), foxtail chess (*Bromus madritensis* ssp. *rubens*), ripgut grass, ryegrass (*Lolium* sp.), and mustard (*Brassica* spp.). Most of the

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annual introduced species that comprise the majority of species and biomass within the non-native grassland originated from the Mediterranean region, an area with a long history of agriculture and a climate similar to California. Approximately 13.9 acres of non-native grassland were mapped within or adjacent to the Alvarado, Cowles Mountain, Encanto, Fairmont, Home Avenue, Jamacha, Mission Bay High School, Montezuma, Nimitz, San Carlos, Smythe, Solola, Tocayo, Virginia, and Washington channels; Chollas, Nestor, Rose, Soledad, South Chollas, and Tecolote creeks; the San Diego River; and several basins and smaller unnamed drainages.

Eucalyptus Woodland (Tier IV)

Eucalyptus woodland is dominated by any of several species of eucalyptus (*Eucalyptus* spp.), all of which are large, non-native trees that produce abundant amounts of leaf and bark litter, the chemical and physical characteristics of which limit the ability of other species to grow in the understory, causing floristic diversity to decrease. Eucalyptus has been planted extensively in San Diego County as wind blocks, as ornamentals, and for hardwood production. If sufficient moisture is available, eucalyptus trees become naturalized and are able to reproduce and expand their range, which has happened in many riparian areas. Approximately 6.4 acres of eucalyptus woodland were mapped in or adjacent to the Alvarado, Jamacha, Nimitz, Rancho Bernardo, and San Carlos channels; Chollas, Rose, Soledad, and South Chollas creeks; Murphy Canyon; the San Diego River; and several basins and smaller unnamed drainages. Although this habitat is not considered sensitive, it may support nesting raptor species, which are protected by the federal MBTA, under which direct or indirect impacts to an active raptor nest are not allowed.

Non-native Vegetation/Ornamental (Tier IV)

Non-native vegetation/ornamental consists of cultivated plants that have naturalized into otherwise native habitat areas or were put in place by humans, usually for the purpose of beautification, windbreaks, or other related purposes. Species observed in this habitat include Peruvian pepper (*Schinus terebinthifolius*), Brazilian pepper, golden wattle (*Acacia longifolia*), myoporum (*Myoporum laetum*), sea-fig (*Carpobrotus chilensis*), hottentot-fig (*Carpobrotus edulis*), oleander (*Nerium oleander*), Canary Island date palm (*Phoenix canariensis*), fountain grass (*Pennisetum setaceum*), and carrotwood (*Cupaniopsis anacardioides*). Approximately 18.2 acres of non-native vegetation/ornamental were mapped along the Alvarado, Encanto, Fairmont, Home Avenue, Jamacha, Mission Bay High School, Nimitz, Cottonwood/Nordica, Rancho Bernardo, San Carlos, Sanyo, Smythe, and Solola channels; Chollas, Nestor, Rose, Soledad, South Chollas, and Tecolote creeks; Florida and Murphy canyons; the San Diego River; Smuggler's Gulch; and several basins and smaller unnamed channels.

Disturbed Habitat/Ruderal (Tier IV)

Disturbed habitat/ruderal areas are devoid of vegetation due to soil disturbance (dirt roads and/or grading) or are dominated by exotic annual forbs without a major grass component. Pursuant to City guidelines for mapping, these areas can be bare ground or dominated by at least 50 percent cover of invasive broad-leaved non-native plant species when vegetated. Plants observed in this community on site include garland daisy (*Chrysanthemum coronarium*), Russian thistle (*Salsola tragus*), castor-bean (*Ricinus communis*), star-thistle (*Centaurea melitensis*), shortpod mustard (*Hirschfeldia incana*), fennel (*Foeniculum vulgare*), horehound (*Marrubium vulgare*), cheeseweed (*Malva parviflora*), and filaree (*Erodium*

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spp.). Approximately 20.0 acres of disturbed/ruderal habitat were mapped in or adjacent to Alvarado, Cowles Mountain, Encanto, Home Avenue, Jamacha, San Carlos, Solola, Tocayo, and Virginia channels; Chollas, Los Peñasquitos, Nestor, Rose, Soledad, South Chollas, and Tecolote creeks; Murphy Canyon; the San Diego River; Smuggler's Gulch; and in or adjacent to several basins and smaller unnamed drainages.

Developed

Developed land is where permanent structures and/or pavement have been placed. Unvegetated, concrete-lined channels and ditches constitute the majority of developed land mapped in the study area, for a total of approximately 133.1 acres. The following basins and channels are entirely concrete-lined: 13153 Paseo del Verano, Chateau, Cowles Mountain, Cottonwood/Nordica, Parkside, Pershing, Rancho Bernardo, San Carlos, Sanyo, and Switzer. Both Tecolote Creek and Tocayo Channel are almost entirely concrete-lined within the mapping area, with a small amount of natural bottom at one or both ends of the mapped extent. The following channels contain sections that are natural bottom and sections that are concrete-lined: Alvarado, Encanto, Home Avenue, Jamacha, Montezuma, Nimitz, Smythe, Solola, Tocayo, Virginia, and Washington channels; Chollas, Nestor, Rose, Soledad, South Chollas, and Tecolote creeks; and Florida and Murphy canyons. Several smaller unnamed drainages are also entirely or partially concrete-lined.

3.2 PLANT SPECIES OBSERVED

A total of 127 plant species were observed within the study area. A list of plant species observed during the site visits is provided in Appendix C.

3.3 ANIMAL SPECIES OBSERVED OR DETECTED

A total of 99 animal species were observed/detected within the study area: 12 butterflies (among other invertebrates), 1 amphibian, 3 reptiles, 72 birds, and 8 mammals (Appendix D). All animal species were identified by direct observation or vocalizations, presence of scat and/or tracks, or other sign.

3.4 JURISDICTIONAL AREAS

A program-level jurisdictional delineation was conducted within subject storm water facility channels and sedimentation basins with results categorized by HUs. An estimate of the amount of jurisdictional wetlands within each HU is shown in Tables 3 and 4. Mapping was conducted along segments of several major and minor water areas, including Rose, Los Peñasquitos, Soledad, Chollas, South Chollas, Alvarado, Tecolote, and Nestor creeks; the San Diego and Tijuana rivers; the Jamacha and Encanto channels; Murphy Canyon; and others. Jurisdictional areas within the study area consist of southern riparian forest, southern sycamore riparian woodland, coast live oak woodland, southern willow scrub, mule fat scrub, riparian scrub, freshwater marsh, cismontane alkali marsh, southern coastal saltmarsh, coastal brackish marsh, disturbed wetland, and streambed/open water/natural flood channel.

3.4.1 Federal (Corps) Jurisdictional Areas

Areas under Corps jurisdiction total approximately 562.55 acres and consist of approximately 272.49 acres of wetlands and 290.06 acres of non-wetland WUS. Non-wetland WUS were divided

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into earthen-bottom and concrete-bottom channels, and comprise approximately 250.49 acres and 39.57 acres, respectively. As illustrated in Table 4, the majority of wetland habitat occurs along named channels within the San Diego, Pueblo, and Peñasquitos HUs.

3.4.2 State (CDFG) Jurisdictional Areas

CDFG jurisdictional areas constitute approximately 636.02 acres within the study area. The approximate acreage of each type of wetlands included in the CDFG's jurisdiction area are as follows: 160.28 acres of southern riparian forest, 0.93 acre of southern sycamore riparian woodland, 0.18 acre of riparian woodland, 65.83 acres of southern willow scrub, 16.39 acres of mule fat scrub, 0.54 acre of riparian scrub, 42.61 acres of freshwater marsh, 5.47 acres of cismontane alkali marsh, 89.33 acres of coastal saltmarsh, 0.53 acre of coastal brackish marsh, 15.83 acres of disturbed wetland, 0.40 acre of coast live oak woodland, and 237.70 acres of unvegetated streambed (Table 5).

3.4.3 City Wetlands

City wetlands include the same areas as noted above for CDFG jurisdiction, except for 0.40 acre of coast live oak woodland, which is not considered a wetland habitat under the City's Biology Guidelines (City 2001). City jurisdictional areas therefore constitute approximately 635.62 acres within the study area, of which 397.92 are vegetated with wetland or riparian vegetation and 237.7 are unvegetated natural flood channels (Table 5).

Table 4
EXISTING CORPS JURISDICTIONAL AREAS (acre[s])*

HU†	Wetlands‡												Non-wetland WUS		Total
	SRF	SRW	RW	SWS	MFS	RS	FWM	CAM	CSM	CBM	DW	Subtotal	Earthen	Concrete	
San Dieguito	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.02	1.68	1.71
Peñasquitos	1.07	0.00	0.00	6.25	0.09	0.00	8.58	0.00	1.71	0.31	0.30	18.31	16.56	14.52	49.39
San Diego	103.67	0.00	0.00	16.44	1.22	0.00	20.26	3.47	86.74	0.00	0.44	232.24	213.57	5.62	451.43
Pueblo San Diego	0.00	0.00	0.00	1.55	0.32	0.36	5.46	0.00	0.53	0.00	3.91	12.13	14.45	15.34	41.92
Sweetwater	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.28
Otay	0.00	0.00	0.00	0.53	0.00	0.00	2.05	0.00	0.00	0.00	0.04	2.62	0.04	0.74	3.40
Tijuana	0.00	0.00	0.00	2.54	0.67	0.00	1.68	0.00	0.00	0.00	2.29	7.18	5.66	1.58	14.42
TOTAL	104.74	0.00	0.00	27.31	2.30	0.36	38.04	3.47	88.98	0.31	6.98	272.49	250.30	39.76	562.55

*Totals reflect rounding

†The HUs correspond to the following Storm Water Facility Maps in Appendix B: San Dieguito HU=Maps 1-3 and 169; Peñasquitos HU=Maps 4-46, 55-57, 163-168, and 170-172; San Diego HU=Maps 47-54, 58-66, 81-83, and 140-161; Pueblo San Diego HU= Maps 67-80 and 84-121; Sweetwater HU= Map 122; Otay HU= Maps 131-135; Tijuana HU= Maps 123-130 and 136-139

‡Habitat acronyms: CAM=cismontane alkali marsh, CBM=coastal brackish marsh, CSM=coastal saltmarsh, DW=disturbed wetland, FWM=freshwater marsh, MFS=mule fat scrub, RS=riparian scrub, RW=riparian woodland, SRF=southern riparian forest, SRW=southern sycamore riparian woodland, SWS=southern willow scrub, WUS=Waters of the U.S.

Table 5
EXISTING CDFG AND CITY JURISDICTIONAL AREAS (acre[s])*

Hydrologic Unit (HU)†	Wetland/Riparian Habitat‡													Drainage	Total CDFG/ City
	SRF	SRW	RW	SWS	MFS	RS	FWM	CAM	CSM	CBM	DW	CLOW (CDFG only)	Wetland/ Riparian Total	STM/ NFC	
San Dieguito	0.00	0.00	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.00	0.02	0.00	0.36	0.02	0.38
Peñasquitos	11.26	0.05	0.18	25.84	0.84	0.00	10.79	0.00	1.71	0.53	2.90	0.24	54.35/ 54.10§	10.08	64.42/ 64.18§
San Diego	149.02	0.88	0.00	30.89	10.97	0.02	21.66	5.47	87.09	0.00	2.95	0.16	309.11/ 308.95§	210.64	519.75/ 519.59§
Pueblo San Diego	0.00	0.00	0.00	3.79	2.65	0.52	5.52	0.00	0.53	0.00	6.93	0.00	19.94	13.62	33.56
Sweetwater	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.03	0.00	0.03
Otay	0.00	0.00	0.00	0.59	0.00	0.00	2.42	0.00	0.00	0.00	0.07	0.00	3.08	0.04	3.12
Tijuana	0.00	0.00	0.00	4.72	1.93	0.00	1.88	0.00	0.00	0.00	2.93	0.00	11.46	3.30	14.76
TOTAL	160.28	0.93	0.18	65.83	16.39	0.54	42.61	5.47	89.33	0.53	15.83	0.40	398.32/ 397.92§	237.7	636.02/ 635.62§

*Totals reflect rounding

†The HUs correspond to the following Storm Water Facility Maps in Appendix B: San Dieguito HU=Maps 1-3 and 169; Peñasquitos HU=Maps 4-46, 55-57, 163-168, and 170-172; San Diego HU=Maps 47-54, 58-66, 81-83, and 140-161; Pueblo San Diego HU=Maps 67-80 and 84-121; Sweetwater HU=Map 122; Otay HU=Maps 131-135; Tijuana HU=Maps 123-130 and 136-139

‡Habitat acronyms: CAM=cismontane alkali marsh, CBM=coastal brackish marsh, CLOW=coast live oak woodland, CSM=coastal saltmarsh, DW=disturbed wetland, FWM=freshwater marsh, MFS=mule fat scrub, NFC=City natural flood channel, RS=riparian scrub, RW=riparian woodland, SRF=southern riparian forest, SRW=southern sycamore riparian woodland, STM=CDFG streambed (includes open water habitat), SWS=southern willow scrub

§First number is CDFG acreage; the second is City acreage

4.0 SENSITIVE RESOURCES

4.1 SENSITIVE VEGETATION COMMUNITIES

Sensitive vegetation communities are considered rare within the region or sensitive by CDFG (Holland 1986) or the City (City 2001). These communities in any form are considered sensitive because they have been historically depleted, are naturally uncommon, or support sensitive species. The study area supports the following twenty-one sensitive vegetation communities: southern riparian forest, southern sycamore riparian woodland, riparian woodland, southern willow scrub, mule fat scrub, riparian scrub, freshwater marsh, cismontane alkali marsh, southern coastal saltmarsh, coastal brackish marsh, disturbed wetland, natural flood channel, coast live oak woodland, scrub oak chaparral, southern foredunes, beach, Diegan coastal sage scrub, coastal sage-chaparral scrub, broom baccharis scrub, southern mixed chaparral, and non-native grassland.

4.2 SENSITIVE PLANT SPECIES

4.2.1 Sensitive Plants Observed

Sensitive plant species are considered rare, a characteristic that may be based on three distributional traits: geographic range, habitat specificity, or population size (Rabinowitz et al. 1986). A species that exhibits a small or restricted geographic range (such as those endemic to the San Diego region) is geographically rare. A species may be more or less abundant but occur only in very specific habitats. Lastly, a species may be widespread but exists naturally in small populations. High-interest plants include those listed by CDFG (2007a and b), CNPS (2007), and City (2001).

No federally or state listed species or City narrow endemic plants species were observed within the study area; however, the following five sensitive plant species were observed and are described below: single-whorl burrobush (*Ambrosia monogyra*), San Diego marsh-elder (*Iva hayesiana*), southwestern spiny rush (*Juncus acutus* ssp. *leopoldii*), Nuttall's scrub oak (*Quercus dumosa*), and San Diego sunflower (*Viguiera laciniata*).

Single-whorl burrobush (*Ambrosia monogyra*)

Listing: --/--; CNPS List 2.2

Distribution: San Diego County, San Bernardino County, and east to western Texas

Habitat: Sandy washes, chaparral, and desert scrub communities.

Status on site: Observed in ruderal habitat on banks of a minor channel paralleling Delevan Drive west of Chollas Creek. CNNDB reports species in general vicinity of Map Nos. 138-139 (Smuggler's Gulch; CDFG 2003).

San Diego marsh-elder (*Iva hayesiana*)

Listing: --/--; CNPS List 2.2

Distribution: San Diego County; Baja California, Mexico (Baja)

Habitat: Intermittent streambed creeks are preferred habitat for this low-growing, conspicuous shrub. Riparian canopy is typically open; sandy alluvial embankments with cobbles are frequently colonized.

Status on site: Observed in riparian scrub and Diegan coastal sage scrub adjacent to South Chollas Creek. Fairly widespread in San Diego County and expected to occur in other study area locations.

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Southwestern spiny rush (*Juncus acutus* ssp. *leopoldii*)

Listing: --/--; CNPS List 4.2

Distribution: Los Angeles, San Bernardino, San Luis Obispo, Ventura, and San Diego counties; Baja

Habitat: Moist, saline, or alkaline soils in coastal salt marshes and riparian marshes

Status on site: Observed at base of slope adjacent to the Black Mountain Road Basin on Map No. 164, in cismontane alkali marsh adjacent to El Camino Real Basin on Map No. 167, in seep adjacent to Alvarado Channel, and in marsh habitat in South Chollas Creek and the San Diego River.

Nuttall's scrub oak (*Quercus dumosa*)

Listing: --/--; CNPS List 1B.1

Distribution: San Diego, Orange, and Santa Barbara counties; Baja

Habitat: Chaparral or coastal sage scrub with relatively open canopy cover in flat terrain; on north-facing slopes, may grow in dense monotypic stands. Found in sandy or clay loam soils.

Status on site: Observed in scrub oak chaparral on slopes adjacent to Black Mountain Road Basin, Map No. 164

San Diego sunflower (*Viguiera laciniata*)

Listing: --/--; CNPS List 4.2

Distribution: Known from southern coastal and foothill San Diego County and Baja. Reported localities in San Diego County include San Onofre, Bonsall, Mission Hills, Mission Valley, Spring Valley, La Mesa, and Otay Lake (Beauchamp 1986).

Habitat: Open coastal sage scrub and maritime succulent scrub on a variety of soil types

Status on site: Observed within scrub habitats adjacent to the Black Mountain Road Basin on Map No. 164, the Camino Santa Fe Basin on Map No. 16, as well as in Diegan coastal sage scrub abutting the Chollas and South Chollas creeks and Encanto Channel.

4.2.2 Sensitive Plants with Potential to Occur

City narrow endemic plant species not observed during programmatic-level surveys but with potential to occur in the study area are described in Table 6; additional sensitive plant species not observed but with potential to occur are described in Table 7. CNDDDB occurrences of several sensitive plant species occur scattered throughout the City are noted in Tables 6 and 7 when reported in the general vicinity (within an approximate radius of 0.5 to 1.0 mile) of areas mapped for the project.

Table 6 NARROW ENDEMIC SPECIES WITH POTENTIAL TO OCCUR		
SPECIES	STATUS*	POTENTIAL TO OCCUR
San Diego thorn-mint (<i>Acanthomintha ilicifolia</i>)	FT/SE CNPS List 1B.1 MSCP Covered	Low to moderate. Occurs on clay lenses and friable, cracked, clay soils in open areas within grasslands. Project focused around channels that typically do not support appropriate habitat for species. Has been reported in general vicinity of Map Nos. 52, 61-64, 147-149, and 164 (CDFG 2003).
Shaw's agave (<i>Agave shawii</i>)	--/-- CNPS List 2.1 MSCP Covered	Low. Generally occurs in coastal sage scrub and maritime succulent scrub, often on volcanic soils.

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Table 6 (cont.)
NARROW ENDEMIC SPECIES WITH POTENTIAL TO OCCUR

SPECIES	STATUS*	POTENTIAL TO OCCUR
San Diego ambrosia (<i>Ambrosia pumila</i>)	FE/-- CNPS List 1B.1 MSCP Covered	Moderate. Primarily restricted to flat or sloping grasslands, often along valley bottoms or areas adjacent to vernal pools as well as creek beds, seasonally dry drainages, and floodplains. Very uncommon but has been reported in general vicinity of Map No. 164 (CDFG 2003).
Aphanisma (<i>Aphanisma blitoides</i>)	--/-- CNPS List 1B.2 MSCP Covered	Very low. Occurs on coastal bluffs and beach dunes, little of which occurs within the study area.
Coastal dunes milk vetch (<i>Astragalus tener</i> var. <i>titi</i>)	FE/SE CNPS List 1B.1 CA Endemic MSCP Covered	Low. Occurs in coastal dune communities. Suitable habitat within the study area only occurs near the mouth of the San Diego River.
Encinitas baccharis (<i>Baccharis vanessae</i>)	FT/SE CNPS List 1B.1 CA Endemic MSCP Covered	Low. Found in southern maritime chaparral and mature but relatively low-growing southern mixed chaparral. Project focused around channels that do not support appropriate habitat for species but reported in general vicinity of Map Nos. 164 and 167 (CDFG 2003).
Otay tarplant (<i>Deinandra conjugens</i>)	FT/SE CNPS List 1B.1	Low to moderate. Found on fractured clay soils in grasslands or lightly vegetated coastal sage scrub. Portions of study area within Otay Mesa may support species, which has been reported in general vicinity of Map Nos. 124-127 (CDFG 2003).
Short-leaved dudleya (<i>Dudleya brevifolia</i>)	--/SE CNPS List 1B.1 CA Endemic MSCP Covered	Low. Occurs in open areas and sandstone bluffs of chamise chaparral or Torrey pine forest, which are not common in the study area. Reported in general vicinity of Map Nos. 14-16 (CDFG 2003).
Variiegated dudleya (<i>Dudleya variegata</i>)	--/-- CNPS List 1B.2 MSCP Covered	Low to moderate. Found on cobbly clay soils in very open sage scrub and grassland, and especially among vernal pool communities. Habitat within study area is largely unsuitable to support species. Reported in general vicinity of Map Nos. 61-62, 126-127, and 150-152 (CDFG 2003).
San Diego button-celery (<i>Eryngium aristulatum</i> var. <i>parishii</i>)	FE/SE CNPS List 1B.1 MSCP Covered	Low to moderate. Found in vernal pool communities and vernal moist areas with mima mound topography. Suitable habitat does not occur within study area. Reported in general vicinity of Map Nos. 6-7, 47, 66, 101, 125-128, and 145-146 (CDFG 2003).
Prostrate navarretia (<i>Navarretia prostrata</i>)	FT/-- CNPS List 1B.1 CA Endemic MSCP Covered	Very low. Occurs in vernal pool communities, which were not observed within the study area. No CNDDDB records within the MSWSMP study area.

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**Table 6 (cont.)
NARROW ENDEMIC SPECIES WITH POTENTIAL TO OCCUR**

SPECIES	STATUS*	POTENTIAL TO OCCUR
Snake cholla (<i>Opuntia californica</i> var. <i>californica</i>)	--/-- CNPS List 1B.1 MSCP Covered	Moderate. Occurs in Diegan coastal sage scrub on xeric hillsides from Point Loma south to Chula Vista. Species reported in general vicinity of Map Nos. 11-13, 70, 73-78, 85, 162-163, and 168 (CDFG 2003).
California Orcutt's grass (<i>Orcuttia californica</i>)	FE/SE CNPS List 1B.1 MSCP Covered	Low to moderate. Occurs in vernal pool communities, which were not observed within the study area. However, species has been reported in the general vicinity of Map No. 128 (CDFG 2003).
San Diego mesa mint (<i>Pogogyne abramsii</i>)	FE/SE CNPS List 1B.1 CA Endemic MSCP Covered	Low. Occurs in vernal pool communities, which were not observed within the study area. Species reported in general vicinity of Map No. 66 (CDFG 2003).

*Refer to Appendix E for a listing and explanation of status and sensitivity codes

**Table 7
LISTED OR SENSITIVE PLANT SPECIES WITH POTENTIAL TO OCCUR**

SPECIES	STATUS*	POTENTIAL TO OCCUR
California adolphia (<i>Adolphia californica</i>)	--/-- CNPS List 2.1	Moderate to high. Most often found in sage scrub but occasionally occurs in peripheral chaparral habitats, particularly on hillsides above creeks. Reported in general vicinity of Map Nos. 4-5, 51, 59-65, 76-80, and 164 (CDFG 2003).
San Diego bur-sage (<i>Ambrosia chenopodifolia</i>)	--/-- CNPS List 2.1	Low to moderate. Arid, low-growing, fairly open Diegan coastal sage scrub is preferred. Olivenhain cobbly loam is the soil type mapped for San Ysidro population. Reported in general vicinity of Map Nos. 129-130 (CDFG 2003).
Del Mar manzanita (<i>Arctostaphylos glandulosa</i> ssp. <i>crassifolia</i>)	FE/-- CNPS List 1B.1 MSCP Covered	Low. Generally found in southern maritime chaparral and Torrey pine forest. Although reported in vicinity of Map Nos. 5, 7-11, and 162-163 (CDFG 2003), not expected to occur within mapped storm water facilities.
Otay manzanita (<i>Arctostaphylos otayensis</i>)	--/-- CNPS List 1B.2 MSCP Covered	Very low. Known only from Otay, San Miguel, Jamul, and Guatay mountains in San Diego County.
Dean's vetch (<i>Astragalus deanei</i>)	--/-- CNPS List 1B.1	Low. Dry hillsides in open coastal sage scrub, chaparral, or southern oak woodland. Rocky sandy loam is soil type mapped for the Tecate population.
Coulter's saltbush (<i>Atriplex coulteri</i>)	--/-- CNPS List 1B.2	Low. Found in coastal bluff scrub, coastal dunes, valley and foothill grasslands, and desert slopes.

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**Table 7 (cont.)
LISTED OR SENSITIVE PLANT SPECIES WITH POTENTIAL TO OCCUR**

SPECIES	STATUS*	POTENTIAL TO OCCUR
South coast saltscale (<i>Atriplex pacifica</i>)	--/-- CNPS List 1B.2	Moderate. Occurs in coastal bluff scrub or sandy, open coastal sage scrub. Reported in general vicinity of Map No. 167 (CDFG 2003).
Davidson's saltscale (<i>Atriplex serenana</i> var. <i>dauidsonii</i>)	--/-- CNPS List 1B.2	Low. Primarily occurs in coastal bluff scrub, although Reiser (2001) suggests it was historically associated with alkaline flats.
Golden-spined cereus (<i>Bergerocactus emoryi</i>)	--/-- CNPS List 2.2	Low. Sandy soils and dry bluffs along coast associated with maritime succulent scrub. Reported in general vicinity of Map Nos. 128-135 (CDFG 2003).
Thread-leaved brodiaea (<i>Brodiaea filifolia</i>)	FT/SE CNPS List 1B.1 MSCP Covered	Low. Clay soils in vernal moist grasslands and vernal pool periphery are typical locales.
Orcutt's brodiaea (<i>Brodiaea orcuttii</i>)	--/-- CNPS List 1B.1 MSCP Covered	Low to moderate. Occurs in vernal moist grasslands and on the periphery of vernal pools but will occasionally grow on streamside embankments (Reiser 2001). Reported in general vicinity of Map Nos. 49-52 (CDFG 2003).
Dunn's mariposa lily (<i>Calochortus dunnii</i>)	--/SR CNPS List 1B.2 MSCP Covered	Low. Dry, stony ridges and firebreaks in chaparral or grassland/chaparral ecotone. Appears to be restricted to gabbroic and metavolcanic soils.
Lakeside ceanothus (<i>Ceanothus cyaneus</i>)	--/-- CNPS List 1B.2 MSCP Covered	Very low. Generally found in inland chaparral from Crest up to the Lakeside foothills (Reiser 2001). Suitable habitat does not occur within the study area.
Wart-stemmed ceanothus (<i>Ceanothus verrucosus</i>)	--/-- CNPS List 2.2 MSCP Covered	Low. Xeric chamise and mixed chaparrals. Reported in general vicinity of Map Nos. 6-11, 24-30, 42-44, 59-66, 70, 85-86, 162-163, 165, and 170 (CDFG 2003). However, very little chaparral mapped in actual study area.
Southern tarplant (<i>Centromadia parryi</i> ssp. <i>australis</i>)	--/-- CNPS List 1B.1	Low. Found in valley and foothill grasslands, particularly near alkaline locales.
Orcutt's pincushion (<i>Chaenactis glabriuscula</i> var. <i>orcuttiana</i>)	--/-- CNPS List 1B.1	Low to moderate. Occurs in open Diegan coastal sage scrub, typically in proximity to moist ocean breezes (Reiser 2001).
Orcutt's spineflower (<i>Chorizanthe orcuttiana</i>)	FE/SE CNPS List 1B.1	Low. Found in coastal chamise chaparral openings with loose sandy substrate (Reiser 2001). Very little chaparral mapped within study area.
Long-spined spineflower (<i>Chorizanthe polygonoides</i> var. <i>longispina</i>)	--/-- CNPS List 1B.2	Low. Typically found on clay lenses and on periphery of vernal pools. Reported in general vicinity of Map Nos. 46-47 (CDFG 2003).
Delicate clarkia (<i>Clarkia delicata</i>)	--/-- CNPS List 1B.2	Low. Shaded areas or the periphery of oak woodlands and cismontane chaparral. Very little appropriate habitat occurs within the study area.

HELIX

Table 7 (cont.)
LISTED OR SENSITIVE PLANT SPECIES WITH POTENTIAL TO OCCUR

SPECIES	STATUS*	POTENTIAL TO OCCUR
Summer holly (<i>Comarostaphylis diversifolia</i> ssp. <i>diversifolia</i>)	--/-- CNPS List 1B.2	Moderate. Mesic north-facing slopes in southern mixed chaparral preferred habitat of this large, showy shrub. Reported in general vicinity of Map Nos. 26 and 66 (CDFG 2003).
Salt marsh bird's beak (<i>Cordylanthus maritimus</i> ssp. <i>maritimus</i>)	FE/SE CNPS List 1B.2 MSCP Covered	Low. Salt marshes, particularly slightly raised hummocks. Only two native sites definitely extant in San Diego County (Reiser 2001), neither of which is within the study area.
Orcutt's birdsbeak (<i>Cordylanthus orcuttianus</i>)	--/-- CNPS List 2.1 MSCP Covered	Moderate to high. Seasonally dry drainages and upland adjacent to riparian habitat preferred habitat. In Tijuana River Valley, grows in a cobbly ecotone with sage scrub upslope and disturbed broom baccharis and southern willow scrub near watercourse. Reported in general vicinity of Map Nos. 126-127 (CDFG 2003).
Sea dahlia (<i>Coreopsis maritima</i>)	--/-- CNPS List 2.2	Low. Habitat is coastal bluff scrub. Reported in general vicinity of Maps Nos. 24-25 and 27-29 (CDFG 2003).
San Diego sand-aster (<i>Corethrogyne filaginifolia</i> var. <i>incana</i>)	--/-- CNPS List 1B.1	Low. Typically occurs in coastal bluff scrub and coastal chaparral, neither of which occurs within the study area but reported in general vicinity of Map Nos. 138-139, 162-163, and 168 (CDFG 2003).
Del Mar Mesa sand-aster (<i>Corethrogyne filaginifolia</i> var. <i>linifolia</i>)	--/-- CNPS List 1B.1 MSCP Covered	Low. Found in sandy and disturbed areas within southern maritime chaparral. Reported within general vicinity of Map Nos. 6-11, 162-163, 165, and 167-168 (CDFG 2003).
Tecate cypress (<i>Cupressus forbesii</i>)	--/-- CNPS List 1B.1 MSCP Covered	None. Closed-cone coniferous forest and southern mixed chaparral, particularly on Otay Mountain.
Blochman's dudleya (<i>Dudleya blochmaniae</i> ssp. <i>blochmaniae</i>)	--/-- CNPS List 1B.1 MSCP Covered	Low to moderate. Dry, stony places associated with coastal sage scrub or chaparral near the coast. Reported in general vicinity of Map Nos. 133-134 (CDFG 2003).
Sticky dudleya (<i>Dudleya viscida</i>)	--/-- CNPS List 1B.2 MSCP Covered	Low. Conspicuous succulent perennial primarily on very steep north-facing slopes. Reported in general vicinity of Map Nos. 82-83 and 160 (CDFG 2003).
Palmer's goldenbush (<i>Ericameria palmeri</i> ssp. <i>palmeri</i>)	--/-- CNPS List 2.2 MSCP Covered	Moderate to high. This sizeable shrub grows along coastal drainages in mesic chaparral sites, or rarely in Diegan coastal sage scrub. Occasionally occurs as a hillside element (usually at higher elevations inland on north-facing slopes). Reported in general vicinity of Map Nos. 65-66 and 76-80 (CDFG 2003).
Round-leaved filaree (<i>Erodium macrophyllum</i>)	--/-- CNPS List 1B.1	Moderate. Clay soils in open areas of grassland or sage scrub in coastal valleys.

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**Table 7 (cont.)
LISTED OR SENSITIVE PLANT SPECIES WITH POTENTIAL TO OCCUR**

SPECIES	STATUS*	POTENTIAL TO OCCUR
Coast wallflower (<i>Erysimum ammophilum</i>)	--/-- CNPS List 1B.2 MSCP Covered	Moderate. Coastal dunes and coastal strand. Reported in general vicinity of Map Nos. 6, 82-83, and 166 (CDFG 2003).
Cliff spurge (<i>Euphorbia misera</i>)	--/-- CNPS List 2.2	Very low. Occurs in maritime succulent scrub, which does not occur within the study area.
San Diego barrel cactus (<i>Ferocactus viridescens</i>)	--/-- CNPS List 2.1 MSCP Covered	High. Occurs in open coastal sage scrub, often at crown of hillsides or in association with vernal pools. Reported in general vicinity of Map Nos. 5, 12-17, 26-30, 70, 73-80, 84, 101, 149-150, 165, and 170 (CDFG 2003).
Palmer's frankenia (<i>Frankenia palmeri</i>)	--/-- CNPS List 2.1	Low. This low-growing shrub grows on coastal salt marsh periphery, but the only known extant native population in the U.S. is in Chula Vista (Reiser 2001).
Mexican flannelbush (<i>Fremontodendron mexicanum</i>)	FE/SR CNPS List 1B.1	Very low. This large bush occurs in closed-cone coniferous forest and southern mixed chaparral in Otay Mountain habitats. Reported in general vicinity of Map No. 85 (CDFG 2003).
Orcutt's hazardia (<i>Hazardia orcuttii</i>)	--/ST CNPS List 1B.1	None. Open chaparral with chamise. The only known U.S. site where species occurs is in Encinitas (Reiser 2001) but is primarily found in Baja.
Ramona horkelia (<i>Horkelia truncata</i>)	--/-- CNPS List 1B.3	Low. Limited to gabbro soils occurring in chaparral communities (usually chamise chaparral).
Decumbent goldenbush (<i>Isocoma menziesii</i> var. <i>decumbens</i>)	--/-- CNPS List 1B.2	Low to moderate. Presumed to utilize coastal sage scrub habitat intermixed with grassland and is more partial to clay soils than other closely related varieties.
Coulter's goldfields (<i>Lasthenia glabrata</i> ssp. <i>coulteri</i>)	--/-- CNPS List 1B.1	High. Found in coastal salt marshes and vernal pools (Reiser 2001). Reported in general vicinity of Map Nos. 6-12, 149-154, and 162-163 (CDFG 2003).
Robinson's pepper grass (<i>Lepidium virginicum</i> var. <i>robinsonii</i>)	--/-- CNPS List 1B.2	Moderate. This annual herb grows in openings in chaparral and sage scrub at the coastal and foothill elevations. Typically observed in relatively dry, exposed locales rather than beneath a shrub canopy or along creeks. Reported in general vicinity of Map Nos. 85 and 101 (CDFG 2003).
Gander's pitcher-sage (<i>Lepechinia ganderi</i>)	--/-- CNPS List 1B.3 MSCP Covered	Low. Found in metavolcanic-derived soils in chaparral.
Nuttall's lotus (<i>Lotus nuttallianus</i>)	--/-- CNPS List 1B.1 MSCP Covered	High. Occurs in coastal dune communities. Reported near mouth of San Diego River in general vicinity of Map Nos. 55-57, 82-83, and 151-161 (CDFG 2003).
Felt-leaved monardella (<i>Monardella hypoleuca</i> ssp. <i>lanata</i>)	--/-- CNPS List 1B.2 MSCP Covered	Low. Found in chaparral understory, typically beneath mature stands of chamise in xeric situations.

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Table 7 (cont.)
LISTED OR SENSITIVE PLANT SPECIES WITH POTENTIAL TO OCCUR

SPECIES	STATUS*	POTENTIAL TO OCCUR
Jennifer's monardella (<i>Monardella stoneana</i>)	--/-- CNPS List 1B.2	Low. Found in canyons around Otay and Tecate mountains.
Willow monardella (<i>Monardella linooides</i> ssp. <i>viminea</i>)	FE/SE CNPS List 1B.1 MSCP Covered	Moderate. Occurs in coastal and riparian scrub, especially in sandy washes (Reiser 2001). Reported in general vicinity of Map Nos. 18-20, 31, and 165 (CDFG 2003).
San Diego goldenstar (<i>Muilla clelandii</i>)	--/-- CNPS List 1B.1 MSCP Covered	Moderate. Occurs in grasslands, particularly in association with mima mounds and vernal pools. Reported in general vicinity of Map Nos. 45, 48, 53-54, 63-66, 84, 126-127, and 148-150 (CDFG 2003).
Little mousetail (<i>Myosurus minimus</i> ssp. <i>apus</i>)	--/-- CNPS List 3.1	Very low. Occurs in vernal pool communities, which do not occur within the study area. Species reported in general vicinity of Map Nos. 124-127 (CDFG 2003).
Spreading navarretia (<i>Navarretia fossalis</i>)	FT/-- CNPS List 1B.1 MSCP Covered	Low to moderate. Occurs in vernal pool communities, which were not observed within study area. However, reported in general vicinity of Map Nos. 47-50 and 123-127 (CDFG 2003), and species critical habitat overlaps with portions of Map Nos. 124 and 126.
Coast woolly-heads (<i>Nemacaulis denudata</i> var. <i>denudata</i>)	--/-- CNPS List 1B.2	Moderate. Typically found in coastal dune communities. Reported in general vicinity of Map Nos. 160-161 near mouth of San Diego River (CDFG 2003).
Slender woolly-heads (<i>Nemacaulis denudata</i> var. <i>gracilis</i>)	--/-- CNPS List 2.2	Low. Well-developed dunes whether on desert or rarely along coastal beaches. Reported in general vicinity of Map No. 128 (CDFG 2003).
Brand's phacelia (<i>Phacelia stellaris</i>)	--/-- CNPS List 1B.1	Moderate. Occurs in coastal bluff scrub and in sandy coastal sage scrub openings near beach (Reiser 2001). Reported in general vicinity of Map Nos. 150-154 near San Diego River (CDFG 2003).
Torrey pine (<i>Pinus torreyana</i> ssp. <i>torreyana</i>)	--/-- CNPS List 1B.2 MSCP Covered	None. Occurs in closed-cone coniferous forest along coast near Del Mar. Would likely have been detected within study area if present.
Otay Mesa mint (<i>Pogogyne nudiscula</i>)	FE/SE CNPS List 1B.1 MSCP Covered	Low to moderate. Restricted to vernal pools on Otay Mesa and in northern Baja. Reported in general vicinity of Map Nos. 85-86, 124-127, and 147-149 (CDFG 2003).
Small-leaved rose (<i>Rosa minutifolia</i>)	--/SE CNPS List 2.1 MSCP Covered	None. No known native U.S. populations remain. Only known U.S. site occurred on periphery of coastal sage scrub in Otay Mesa and was transplanted into biological open space to make way for development.
San Miguel savory (<i>Satureja chandleri</i>)	--/-- CNPS List 1B.2 MSCP Covered	Low. Gabbro and metavolcanic soils in interior foothills, chaparral, and oak woodland

**Table 7 (cont.)
LISTED OR SENSITIVE PLANT SPECIES WITH POTENTIAL TO OCCUR**

SPECIES	STATUS*	POTENTIAL TO OCCUR
Rayless ragwort (<i>Senecio aphanactis</i>)	--/-- CNPS List 2.2	Low. Occurs in open coastal sage scrub, cismontane woodlands, and alkaline flats (Reiser 2001).
Bottle liverwort (<i>Sphaerocarpos dreweii</i>)	--/-- CNPS List 1B.1	Low. Occurs under shrubs within coastal sage scrub and chaparral. Reported in general vicinity of Map Nos. 85-86 (CDFG 2003).
Purple stemodia (<i>Stemodia durantifolia</i>)	--/-- CNPS List 2.1	High. Small perennial herb typically found in wet sand along minor creeks and seasonal drainages. Reported in general vicinity of Map Nos. 63-64 (CDFG 2003).
Oil neststraw (<i>Stylocline citroleum</i>)	--/-- CNPS List 1B.1	Low to moderate. Coastal scrub areas and chenopod scrub in clay soils in vicinity of oilfields.
Estuary scablite (<i>Sueda esteroa</i>)	--/-- CNPS List 1B.2	High. Found on periphery of coastal salt marsh, as soils usually mapped as tidal flats. Reported in general vicinity of Map Nos. 82-83, 134, and 153-158 (CDFG 2003).
Parry's tetraococcus (<i>Tetraococcus dioicus</i>)	--/-- CNPS List 1B.2 MSCP Covered	Low. Gabbro soils in low growing chamise chaparral and sage scrub. Conditions typically quite xeric with only limited annual growth.

*Refer to Appendix E for a listing and explanation of status and sensitivity codes

4.3 SENSITIVE ANIMAL SPECIES

4.3.1 Sensitive Animals Observed or Detected

Eight sensitive animal species were observed/detected within the study area during HELIX surveys and are described below.

Coastal California gnatcatcher (*Poliophtila californica californica*)

Listing: FT/SSC; MSCP Covered

Distribution: Southern Los Angeles, Orange, western Riverside, and San Diego counties south into Baja

Habitat: Coastal sage scrub

Status on site: One individual observed in Diegan coastal sage scrub on Encanto Channel slopes near the post office. Likely occurs in other areas of appropriate habitat near mapped channels and basins. CNDDDB records species scattered throughout the City (CDFG 2003).

California brown pelican (*Pelecanus occidentalis californicus*)

Status: FE/SE, Fully Protected; MSCP Covered

Distribution: Observed year-round along San Diego County's coast but most abundant in winter

Habitat: Coastal salt water, beaches, bays, marshes, and on the open ocean

Status on site: One individual observed on San Diego River near Pacific Ocean confluence; known to occur in larger bodies of water on or adjacent to coast. Apart from San Diego River, unlikely to use any other storm water facilities mapped for the project.

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Cooper's hawk (*Accipiter cooperii*)

Status: --/SSC; MSCP Covered

Distribution: Year-round throughout San Diego County's coastal slope where tree stands present

Habitat: Oak groves, mature riparian woodlands, and eucalyptus stands or other mature forests

Status on site: One individual observed perched in a tree adjacent to Soledad Creek. Widespread species expected to occur in several locations within project where trees are present.

Northern harrier (*Circus cyaneus*)

Status: --/SSC; MSCP Covered

Distribution: Throughout San Diego County lowlands but also in foothills, mountains, and desert

Habitat: Open grassland and marsh

Status on site: One individual observed foraging over grassland near Otay region storm water facility. Few individuals expected to occur on actual site, as most areas are vegetated with trees and shrubs or are developed. Little appropriate habitat occurs along mapped storm water facilities.

Yellow warbler (*Dendroica petechia brewsteri*)

Status: --/SSC

Distribution: Observed throughout much of San Diego County during breeding season with rare sightings in winter

Habitat: Riparian woodland

Status on site: Two individuals heard calling in southern riparian forest along San Diego River

Double-crested cormorant (*Phalacrocorax auritus*)

Status: --/SSC

Distribution: Observed throughout San Diego County year-round but more abundant in winter

Habitat: Fresh and salt water habitats

Status on site: One individual observed flying over coastal salt marsh habitat in San Diego River near Pacific Ocean confluence. Except for coastal San Diego River, unlikely to use any other storm water facilities mapped for project.

Western bluebird (*Sialia mexicana*)

Status: --/--; MSCP Covered

Distribution: Occurs throughout much of San Diego County, mainly in foothills and mountains

Habitat: Montane coniferous and oak woodlands

Status on site: One individual observed perched on a post in ruderal habitat near riparian forest along San Diego River. Scattered distribution in central and western portions of San Diego County and likely to occur in other locations within the project.

Little blue heron (*Egretta caerulea*)

Status: BCC/--

Distribution: San Diego represents northwestern corner of species' range, where it is observed in coastal areas most frequently around Mission Bay. A relatively recent arrival in San Diego County, population is estimated between 10 and 12 individuals (Unitt 2004).

Habitat: Shallow marshes and ponds near coast

Status on site: One individual observed foraging in freshwater marsh habitat in Rose Creek near Mission Bay Drive. Uncommon in the City and not likely to be found in other mapped project locations.

HELIX

4.3.2 Sensitive Animals with Potential to Occur

Additional sensitive animal species that were not observed or detected but have potential to occur within the study area are listed in Table 8.

Table 8 LISTED OR SENSITIVE ANIMAL SPECIES WITH POTENTIAL TO OCCUR		
SPECIES	LISTING OR SENSITIVITY*	POTENTIAL TO OCCUR
INVERTEBRATES		
San Diego fairy shrimp (<i>Branchinecta sandiegonensis</i>)	FE/--	Low. Occurs in vernal pools and road basins on the mesas in San Diego County.
Quino checkerspot butterfly (<i>Euphydryas editha quino</i>)	FE/--	Very low. Occurs in open sage scrub and chaparral. Requires abundant nectar and primary host plant dwarf plantain (<i>Plantago erecta</i>). Not reported in project study area (CDFG 2003).
Hermes copper butterfly (<i>Lycaena hermes</i>)	--/--	Low to moderate. Found in southern mixed chaparral and coastal sage scrub with mature larval host plant spiny redberry (<i>Rhamnus crocea</i>).
Wandering/saltmarsh skipper (<i>Panoquina errans</i>)	--/--	High. Coastal saltmarshes along river mouths and other brackish waters. Larval host plant is saltgrass (<i>Distichlis spicata</i>).
Riverside fairy shrimp (<i>Streptocephalus woottoni</i>)	FE/--	Low. Occurs in vernal pools and road basins on San Diego County mesas.
VERTEBRATES		
Reptiles and Amphibians		
Silvery legless lizard (<i>Anniella pulchra pulchra</i>)	--/SSC	Moderate. Occurs in loose soil, particularly in sand dunes or otherwise sandy soil. Generally found in leaf litter, under rocks, logs, or driftwood in oak woodland, chaparral, and desert scrub.
Arroyo toad (<i>Bufo californicus</i>)	FE/SSC MSCP Covered	Low. Found on banks with open-canopy riparian forest of willows, cottonwoods, or sycamores. Breeds in shallow slow-moving streams but burrows in adjacent uplands during dry months. No recorded CNDDDB locations in study area, and MSCP list of known locations does not include creeks in study area.
Orange-throated whiptail (<i>Cnemidophorus hyperythrus</i>)	--/SSC MSCP Covered	High. Found in coastal sage scrub, chaparral, riparian woodland, and adjacent disturbed areas. Prefers matrix of open shady areas with abundant termites (<i>Reticulitermes</i> sp.).
Red-diamond rattlesnake (<i>Crotalus exsul</i>)	--/SSC	Moderate. Found in chaparral, coastal sage scrub, and along creek banks, particularly among rock outcrops or debris piles with burrowing rodents for prey. Suitable habitat occurs within study area.

HELIX

**Table 8 (cont.)
LISTED OR SENSITIVE ANIMAL SPECIES WITH POTENTIAL TO OCCUR**

SPECIES	LISTING OR SENSITIVITY*	POTENTIAL TO OCCUR
VERTEBRATES (cont.)		
Reptiles and Amphibians (cont.)		
Coronado skink (<i>Eumeces skiltonianus interparietalis</i>)	--/SSC	Moderate. Found in grasslands, sage scrub, open chaparral, oak woodland, and coniferous forests, usually under rocks, leaf litter, logs, debris, or in shallow burrows it digs.
San Diego horned lizard (<i>Phrynosoma coronatum</i> ssp. <i>blainvillei</i>)	--/SSC MSCP Covered	High. Found in coastal sage scrub, open chaparral, oak woodlands, and coniferous forests with sufficient basking sites, adequate scrub cover, and loose soil. Requires harvester ants (<i>Pogonomyrmex</i> sp.) but generally excluded from areas invaded by Argentine ants (<i>Linepithema humile</i>).
Coast patch-nosed snake (<i>Salvadora hexalepis virgultae</i>)	--/SSC	Moderate. Primarily in chaparral but also inhabits coastal sage scrub and grassland mixed with scrub.
Western spadefoot (<i>Spea hammondi</i>)	--/SSC	Moderate. Occurs in open coastal sage scrub, chaparral, grassland, and along sandy or gravelly washes, floodplains, alluvial fans, or playas. Requires temporary pools for breeding and friable soils for burrowing.
Two-striped garter snake (<i>Thamnophis hammondi</i>)	--/SSC	High. Occurs along permanent and intermittent streams bordered by dense riparian vegetation but also associated with vernal pools or stock ponds.
Birds		
Tricolored blackbird (<i>Agelaius tricolor</i>)	--/SSC MSCP Covered	Low to moderate. Marsh habitat near grasslands, pastures, and agricultural fields
Southern California rufous-crowned sparrow (<i>Aimophila ruficeps canescens</i>)	--/SSC MSCP Covered	Moderate. Occurs in coastal sage scrub, chaparral, and shrubby grasslands.
Bell's sage sparrow (<i>Ampispiza belli belli</i>)	--/SSC	Low. Chaparral and sage scrub with modest leaf-litter on ground. Largely eliminated from most coastal areas of San Diego County (Unitt 2004).
Golden eagle (<i>Aquila chrysaetos</i>)	--/SSC MSCP Covered	Low. Nesting occurs on cliff ledges or in trees on steep slopes, with foraging occurring primarily in grassland and sage scrub. Not usually observed near development.
Burrowing owl (<i>Athene cunicularia</i>)	--/SSC MSCP Covered	Low. Grasslands and open scrub habitats restricted to Otay Mesa and North Island. Majority of study area too urbanized to support species.
Coastal cactus wren (<i>Campylorhynchus brunneicapillus sandiegensis</i>)	--/SSC MSCP Covered	Moderate. Occurs in coastal sage scrub and chaparral where there are large thickets of cactus in which they nest.

HELIX

Table 8 (cont.)
LISTED OR SENSITIVE ANIMAL SPECIES WITH POTENTIAL TO OCCUR

SPECIES	LISTING OR SENSITIVITY*	POTENTIAL TO OCCUR
VERTEBRATES (cont.)		
Birds (cont.)		
Western snowy plover (<i>Charadrius alexandrinus nivosus</i>)	FT/SSC MSCP Covered	Low. Found on beaches, dunes, and salt flats. Very little appropriate habitat within study area.
Western yellow-billed cuckoo (<i>Coccyzus americanus occidentalis</i>)	--/SE	Low to moderate. A rare and sporadic summer visitor to San Diego County found only in extensive stands of mature riparian woodland.
Southwestern willow flycatcher (<i>Empidonax traillii extimus</i>)	FE/-- MSCP Covered	Low to moderate. Uses mature riparian woodland for nesting. Breeding restricted to modest small colonies in San Diego County along Santa Margarita and San Luis Rey rivers, Whelan and Guajome lakes, Couser Canyon, and Pala (Unitt 2004).
California horned lark (<i>Eremophila alpestris actia</i>)	--/SSC	Low. Occurs in open fields, grasslands, disturbed areas, and open sage scrub. Open habitat uncommon in study area.
Prairie falcon (<i>Falco mexicanus</i>)	--/SSC	Low. Nests on cliff or bluff ledges or occasionally in old hawk or raven nests; forages in grassland or desert habitats. All known nesting locations are at least 23 miles from the coast (Unitt 2004); therefore, study area likely outside species' range.
Yellow-breasted chat (<i>Icteria virens</i>)	--/SSC	High. Habitat is shrubby willows and riparian woodland. Likely to occur along willow-dominated storm water facilities within the City, particularly within the MHPA.
Least bittern (<i>Ixobrychis exilis</i>)	--/SSC	Moderate. Found in marshes and other wetland habitat.
California black rail (<i>Laterallus jamaicensis coturniculus</i>)	--/ST	Very low. Found in wetland habitats; presumed extirpated from San Diego County.
Osprey (<i>Pandion heliaetus</i>)	--/SSC	Low. Coasts and inland lakes with open water and a supply of fish.
Belding's savannah sparrow (<i>Passerculus sandwichensis beldingi</i>)	--/SE MSCP Covered	Moderate. Restricted to coastal salt marshes dominated by pickleweed.
Light-footed clapper rail (<i>Rallus longirostris levipes</i>)	FE/SE	High along San Diego River near coast and in southern reaches of Rose Creek; low elsewhere. Coastal salt marshes, especially those dominated by cordgrass (<i>Spartina</i> sp.), but known to use brackish and freshwater sites.

Table 8 (cont.)
LISTED OR SENSITIVE ANIMAL SPECIES WITH POTENTIAL TO OCCUR

SPECIES	LISTING OR SENSITIVITY*	POTENTIAL TO OCCUR
VERTEBRATES (cont.)		
Birds (cont.)		
California least tern (<i>Sternula antillarum browni</i>)	FE/SE MSCP Covered	Low. Coastal areas adjacent to the ocean. Very little appropriate habitat within study area.
Least Bell's vireo (<i>Vireo bellii pusillus</i>)	FE/SE MSCP Covered	High. Occurs in mature riparian forest and woodland, as well as riparian scrub. CNDDDB records include areas along or near San Diego River, Smuggler's Gulch, Los Peñasquitos Creek, and Map No. 164. Species critical habitat occurs in Smuggler's Gulch/Tijuana River vicinity.
Mammals		
Pallid bat (<i>Antrozous pallidus</i>)	--/SSC	Moderate. Deserts and canyons. Daytime roosts in buildings, crevices; less often in caves, mines, hollow trees, and other shelters.
Dulzura pocket mouse (<i>Chaetodipus californicus femoralis</i>)	--/SSC	Low. Typically found in chaparral, especially where it intergrades with grasslands.
Northwestern San Diego pocket mouse (<i>Chaetodipus fallax fallax</i>)	--/SSC	Moderate. Occurs in open coastal sage scrub, particularly in open, weedy areas with sandy substrates.
Mexican long-tongued bat (<i>Choeronycteris mexicana</i>)	--/SSC	High. Occurs in scrublands and forests, especially canyons with riparian vegetation. Roosts in mines, caves, and buildings. Sporadically reported through much of San Diego County (CDFG 2003).
Spotted bat (<i>Euderma maculatum</i>)	--/SSC	Low. Mountainous regions with ponderosa pines. Roosts primarily in rocky cliff crevices and canyons.
Western mastiff bat (<i>Eumops perotis californicus</i>)	--/SSC	Moderate. Chaparral and coast live oaks. Also occurs in arid, rocky areas, cliffs, and canyons.
Silver-haired bat (<i>Lasionycteris noctivagans</i>)	--/SSC	Moderate. Prefers forested areas adjacent to ponds and streams. Roosts under loose bark and in tree hollows and buildings.
Hoary bat (<i>Lasiurus cinereus</i>)	--/SSC	Moderate. Evergreen forests and wooded areas.
San Diego black-tailed jackrabbit (<i>Lepus californicus bennettii</i>)	--/SSC	Moderate. Occurs primarily in open sage scrub, chaparral, grasslands, croplands, and disturbed habitat with at least some shrub cover present.
San Diego desert woodrat (<i>Neotoma lepida intermedia</i>)	--/SSC	Moderate. Occurs in open chaparral and coastal sage scrub, often building large, stick nests in rock outcrops or around clumps of cactus or yucca.

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Table 8 (cont.) LISTED OR SENSITIVE ANIMAL SPECIES WITH POTENTIAL TO OCCUR		
SPECIES	LISTING OR SENSITIVITY*	POTENTIAL TO OCCUR
VERTEBRATES (cont.)		
Mammals (cont.)		
Pocketed free-tailed bat (<i>Nyctinomops femorosaccus</i>)	--/SSC	Low. Occurs in arid scrublands, including chaparral; roosts in crevices in cliff faces.
Big free-tailed bat (<i>Nyctinomops macrotus</i>)	--/SSC	Low. Occurs in rocky scrublands and woodlands, and roosts in rocky cliff faces. Reported sporadically in variety of San Diego County locations (CDFG 2003).
Pacific pocket mouse (<i>Perognathus longimembris pacificus</i>)	FE/SSC	Low. Fine-grained, sandy or gravelly substrates in coastal strand, coastal dunes, river alluvium, and coastal sage scrub growing on marine terraces.
American badger (<i>Taxidea taxus</i>)	--/SSC MSCP Covered	Low. Occurs in open plains and prairies, farmland, and sometimes edges of woods.

*Refer to Appendix E for a listing and explanation of status and sensitivity codes

5.0 REGIONAL AND REGULATORY CONTEXT

5.1 MULTIPLE SPECIES CONSERVATION PROGRAM (MSCP)

The City's MSCP Subarea Plan has been prepared to meet the requirements of the California Natural Communities Conservation Planning (NCCP) Act of 1992. The Subarea Plan is consistent with the NCCP and describes how the evaluation of proposed development projects relative to the City's portion of the MSCP Preserve (the Multi-Habitat Planning Area [MHPA]) will be implemented. The Plan was adopted in 1997, allowing the City to issue take permits at the local level. Approximately 56,831 acres of habitat are designated as the City's portion of the MHPA, of which approximately 90 percent is to be preserved and the remaining 10 percent may be developed (City 1997).

The MSCP (City 1997) identifies an MHPA that is intended to link all core biological areas into a regional wildlife preserve. Because the project area encompasses several natural creeks and associated wetland/riparian corridors, many of these storm water facilities lie within the MHPA. As illustrated in Figure 3, approximately 561.5 acres of the project study area are within the MHPA, including portions of the following named channels: San Diego River, Los Peñasquitos Creek, Soledad Creek, Rose Creek, Florida Canyon, Alvarado Creek, Chollas Creek, South Chollas Creek, Smuggler's Gulch, and the Tijuana River. The San Diego River corridor accounts for the vast majority of the MHPA within the study area (approximately 497 acres, or 88 percent of the total). Hydrologic units supporting habitat within the MHPA for the project area include Peñasquitos, Pueblo San Diego, San Diego, and Tijuana.

The proposed project is evaluated for consistency with applicable MSCP policies and guidelines in Section 6.1.7.

HELIX

5.1.1 General Planning Policies and Guidelines

The MSCP establishes specific guidelines that limit activities that occur within the MHPA. In general, activities occurring within the MHPA must conform to these guidelines and, wherever feasible, should be located in the least sensitive areas. Because flood control channel maintenance is an allowed use within the MHPA, an MHPA boundary adjustment would not be required for the proposed project.

Because of their importance and difficulty finding alternate locations, public infrastructure are given special consideration by the MSCP. This is especially true for storm water structures because they must be located within drainage areas that typically are associated with core biological resource areas. MSCP Section 1.4.2 outlines planning policies and design guidelines for various potential usages. The following policies listed under Flood Control in Section 1.4.2 would apply to the proposed project:

- Flood control should generally be limited to existing agreements with Resource Agencies unless demonstrated to be needed based on a cost-benefit analysis and pursuant to the restoration plan. Floodplains within the MHPA, and upstream from the MHPA, if feasible, should remain in a natural condition and configuration in order to allow for the ecological, geological, hydrological, and other natural processes to remain or be restored.
- No berming, channelization, or man-made constraints or barriers to creek, tributary, or river flows should be allowed in any floodplain within the MHPA unless reviewed by all appropriate agencies and adequately mitigated. Review must include impacts to upstream and downstream habitats, flood flow volumes, velocities and configurations, water availability, and changes to water table level.
- No riprap, concrete, or other unnatural material shall be used to stabilize river, creek, tributary, and channel banks within the MHPA. River, stream, and channel banks shall be natural and stabilized where necessary with willows and other appropriate native plantings. Rock gabions may be used to dissipate flows and should incorporate design features to ensure wildlife movement.

Some of the facilities would require construction of access roads and staging areas that would be subject to the Roads and Utilities – Construction and Maintenance Policies found in Section 1.4.2 of the City's MSCP subarea plan. Applicable policies from this section include:

- Temporary construction areas and roads, staging areas, or permanent access roads must not disturb existing habitats unless determined to be unavoidable. All such activities must occur on existing agricultural lands or other disturbed areas rather than in habitat. If temporary habitat disturbance is unavoidable, then restoration of and/or mitigation for the disturbed areas after project completion will be required.
- Construction and maintenance activities in wildlife corridors must avoid significant disruption of corridor usage. Environmental documents and Mitigation Monitoring and Reporting Programs (MMRPs) covering such development must clearly specify how this will be achieved, and construction plans must contain all the pertinent information and be readily available to crews in the field. Training of construction crews and field workers must be conducted to ensure that all conditions are met. A responsible party must be specified.

- Roads in the MHPA will be limited to those identified in Community Plan Circulation Elements, collector streets essential for area circulation, and necessary maintenance/emergency access roads.
- Development of roads in canyon bottoms should be avoided whenever feasible. If an alternative location outside the MHPA is not feasible, then the road must be designed to cross the shortest length possible of the MHPA in order to minimize impacts and fragmentation of sensitive species and habitat. If roads cross the MHPA, they should provide for fully-functional wildlife movement capability. Bridges are the preferred method of providing for movement, although culverts in selected locations may be acceptable. Fencing, grading and plant cover should be provided where needed to protect and shield animals, and guide them away from roads to appropriate crossings.
- Where possible, roads within the MHPA should be narrowed from existing design standards to minimize habitat fragmentation and disruption of wildlife movement and breeding areas. Roads must be located in lower quality habitat or disturbed areas to the extent possible.
- For the most part, existing roads and utility lines are considered a compatible use within the MHPA and therefore will be maintained. Exceptions may occur where underutilized or duplicative road systems are determined not to be necessary.

5.1.2 MHPA Adjacency Guidelines

The City's MSCP Subarea Plan also contains policies found in Section 1.4.3, Land Use Adjacency Guidelines, which are designed to help limit the impact of activities located adjacent to MHPAs. Applicable guidelines include:

- Uses in or adjacent to the MHPA should be designed to minimize noise impacts. Excessively noisy uses or activities adjacent to breeding areas must incorporate noise reduction measures and be curtailed during the breeding season of sensitive species.
- Invasive non-native plant species shall not be introduced into areas adjacent to the MHPA.
- All developed and paved areas must prevent the release of toxins, chemicals, petroleum products, exotic plant materials, and other elements that might degrade or harm natural environment or ecosystem processes within the MHPA.

5.1.3 General Management Directives

The following management directives are in addition to the General Planning Policies and Guidelines outlined in Section 5.1.1 above.

- Mitigation, when required as part of project approvals, shall be performed in accordance with the City's ESL Ordinance and Biology Guidelines.
- Restoration or revegetation undertaken within the MHPA shall be performed in a manner acceptable to the City. Wetland restoration/revegetation proposals are subject to permit authorization by federal and state agencies.

HELIX

- Remove giant reed, tamarisk, pampas grass, castor bean, artichoke thistle, and other exotic invasive species from creek and river systems, canyons and slopes, and elsewhere within the MHPA as funding becomes available. Avoid removal activities during reproductive seasons of sensitive species and avoid/minimize impacts to sensitive species or native habitats.
- Perform standard maintenance, such as clearing and dredging of existing flood channels, during the non-breeding or nesting season of sensitive bird or wildlife species utilizing the riparian habitat. For the least Bell's vireo, the non-breeding season generally includes mid-September through mid-March.
- Review existing flood control channels within the MHPA periodically (every 5 to 10 years) to determine the need for their retention and maintenance, and to assess alternatives such as restoration of natural rivers and floodplains.

5.1.4 Specific Management Policies and Directives

Tijuana River Valley

The southwestern portion of the study area (Smuggler's Gulch and Tijuana River) is located in the Tijuana River Valley portion of the MSCP. As outlined in MSCP Section 1.5.5, the following specific management policy would apply to this project:

Flood control in the Tijuana River Valley is limited to existing agreements with the Resource Agencies that allow clearing or sand removal within existing low-flow or pilot channel(s), and any flood control projects resulting from the 1994 BSI Consultants "Tijuana River Valley Flood Control and Infrastructure Study." Any flood control facility must be consistent with City, State, and FEMA regulations and be designed and constructed to maintain riparian and wetland ecosystems within the channel and the valley.

Other specific management policies and directives listed in MSCP Sections 1.5.3 through 1.5.10 are not applicable to this project.

5.1.5 Special Conditions for Covered Species

Special conditions apply to the three covered species observed during field surveys within the study area (coastal California gnatcatcher, Cooper's hawk, and northern harrier), as well as to three covered species with high potential to occur in the study area (least Bell's vireo, San Diego barrel cactus, and Nuttall's lotus). Special conditions for the southwestern willow flycatcher were also included in this discussion and have been combined with those for the vireo, as the conditions are nearly identical. The conditions relevant to the potential maintenance activities are noted below.

- Area-specific management directives for the coastal California gnatcatcher must include measures to reduce edge effects and minimize disturbance during the nesting period, fire protection measures to reduce the potential for habitat degradation due to unplanned fire, and management measures to improve habitat quality including vegetation structure. No clearing of occupied habitat within the City's MHPA may occur between March 1 and August 15.

- Area-specific management directives for the least Bell's vireo and southwestern willow flycatcher must include measures to provide appropriate successional habitat, upland buffers for all known populations, cowbird control, and specific measures to protect against detrimental edge effects to this species. Any clearing of occupied habitat must occur between September 15 and March 15 for vireo and between September 1 and May 1 for willow flycatcher (i.e., outside the nesting season).
- Area-specific management directives for Cooper's hawk must include 300-foot impact avoidance areas around active nests and minimization of disturbance in oak woodlands and oak riparian forests.
- Area-specific management directives for the northern harrier must manage agricultural and disturbed lands within 4 miles of nesting habitat to provide foraging habitat, include an impact avoidance area (900 feet) around active nests, and include measures for maintaining winter foraging habitat in preserve areas in Proctor Valley, around the Sweetwater Reservoir, San Miguel Ranch, Otay Ranch east of Wueste Road, Lake Hodges, and San Pasqual Valley.
- Area-specific management directives for San Diego barrel cactus must include measures to protect this species from edge effects, unauthorized collection, and include appropriate fire management/control practices to protect against a too-frequent fire cycle.
- Area-specific management directives for Nuttall's lotus must include specific measures to protect against detrimental edge effects.

5.2 WILDLIFE CORRIDORS

Wildlife corridors can be local or regional in scale; their functions may vary temporally and spatially based on conditions and species presence. Wildlife corridors represent areas where wildlife movement is concentrated due to natural or anthropogenic constraints. Local corridors provide access to resources such as food, water, and shelter. Animals use these corridors, which are often hillsides or riparian areas, to move between different habitats. Regional corridors provide these functions and link two or more large habitat areas. They provide avenues for wildlife dispersal, migration, and contact between otherwise distinct populations.

Approximately 561.5 acres of the study area are within the City's MHPA, which provide connectivity through several creeks and tributaries as well as the San Diego River corridor. Several channels within the MSWSMP are likely to function as wildlife corridors, including but not limited to the San Diego and Tijuana rivers and Rose, Chollas, Soledad, and Los Peñasquitos creeks.

5.3 REGULATORY ISSUES

Biological resources within the study area are subject to regulatory administration by the federal government, State of California, and City.

The federal government administers non-marine plant- and wildlife-related issues through the U.S. Fish and Wildlife Service (USFWS), while the Corps administers WUS, including wetland and non-wetland issues. California law relating to wetland, water-related, and wildlife issues is administered by the CDFG.

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Laws and regulations that may apply include the federal Endangered Species Act (ESA), Clean Water Act, Coastal Zone Management Act, Porter-Cologne Water Quality Control Act, CEQA, California Fish and Game Code, and City's ESL ordinance and MSCP Subarea Plan. Several meetings have taken place between the project proponent and various regulatory agencies to discuss various aspects of the project (Table 9).

Date	Form of Communication	Major Topic(s)	Person/Affiliation
November 2007	Phone	Clean Water Act Section 404 Permit	Tom Huffman (HELIX) Mark Durham (Corps) Robert Smith (Corps)
February 4, 2008	Meeting	Clean Water Act Section 404 Permit	Bruce McIntyre (HELIX) Tom Huffman (HELIX) Stacy Nigro (HELIX) Daniel Lottermoser (City of San Diego) Kerry Santoro (City of San Diego) Robert Smith (Corps) Terry Dean (Corps)
April 3, 2008	Meeting	Rose Creek Conservancy	Bruce McIntyre (HELIX) Kelly Fisher (CDFG) Daniel Lottermoser (City of San Diego) Kerry Santoro (City of San Diego) Ann Van Leer (Land Conservation Broker)
April 9, 2008	Meeting	Rose Creek Conservancy	Bruce McIntyre (HELIX) Tom Huffman (HELIX) Ann Van Leer (Land Conservation Broker) Mike Nelson (San Diego River Conservancy)
April 16, 2008	Meeting	Wetland Mitigation Approach	Bruce McIntyre (HELIX) Daniel Lottermoser (City of San Diego) Jeanne Krosch (City of San Diego) Kerry Santoro (City of San Diego) Kristy Foreburger (City of San Diego)
May 14, 2008	Meeting	Streambed Alteration Agreement	Bruce McIntyre (HELIX) Tom Huffman (HELIX) Daniel Lottermoser (City of San Diego) Kerry Santoro (City of San Diego) Kelly Fisher (CDFG)
June 9, 2008	Meeting	Clean Water Act Section 404 Permit	Tom Huffman (HELIX) Kerry Santoro (City of San Diego) Kris McFadden (City of San Diego) Daniel Lottermoser (City of San Diego) Robert Smith (Corps)

**Table 9 (cont.)
AGENCY COORDINATION**

Date	Form of Communication	Major Topic(s)	Person/Affiliation
June 12, 2008	Meeting	Clean Water Act Section 401 Certification	Bruce McIntyre (HELIX) Tom Huffman (HELIX) Kerry Santoro (City of San Diego) Kris McFadden (City of San Diego) Daniel Lottermoser (City of San Diego) Robert Smith (Corps) Mike Porter (RWQCB) Chiara Clemente (RWQCB) Lori Walsh (RWQCB) Christina Arias (RWQCB)
November 26, 2008	Submittal of Draft Public Notice	Clean Water Act Section 404 Permit	Steve Neudecker (HELIX) Robert Smith (Corps)

5.3.1 Federal Government

Administered by the USFWS, the federal ESA provides the legal framework for the listing and protection of species (and their habitats) that are identified as endangered or threatened with extinction. Actions that jeopardize endangered or threatened species and the habitats upon which they rely are considered a “take” under the ESA. Section 9(a) of the ESA defines take as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct.” “Harm” and “harass” are further defined in federal regulations and case law to include actions that adversely impair or disrupt a listed species’ behavioral patterns.

Federal wetland regulation (non-marine issues) is guided by the Rivers and Harbors Act of 1899 and Clean Water Act (CWA). The Rivers and Harbors Act deals primarily with discharges into navigable waters, while the purpose of the CWA is to restore and maintain the chemical, physical, and biological integrity of all WUS. Permitting for projects filling WUS (including wetlands) is overseen by the Corps under Section 404 of the Clean Water Act. Projects are typically permitted on an individual basis or are covered under one of several approved general, or Nationwide Permits (NWP).

For actions such as maintenance activities contemplated by the proposed MSWSMP in which repeated and similar activities throughout a jurisdiction would occur, a Regional General Permit (RGP) may be issued. The Corps issues RGPs to augment the NWP program and authorize regionally occurring activities not addressed in the NWP. Thus, an RGP is a comprehensive permit that the City could pursue for impacts to WUS resulting from ongoing flood control maintenance activities. However, pursuant to the Coastal Zone Management Act (CZMA), for projects within the coastal zone, the Corps cannot issue an RGP until the federal consistency requirements of Section 307(c)(3)(A) of the CZMA have been met. Receiving Coastal Development Permits (CDPs) or exemptions from the California Coastal Commission (CCC) or through the Federal Consistency Unit CCC project review can meet these requirements.

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Another type of potential Corps permit for the MSWSMP is the Letter of Permission (LOP) that may be used for work that the Corps' District Engineer determines to be minor, would not have significant individual or cumulative impacts on the environment, and should encounter no appreciable public opposition. The proposal is coordinated with federal and state resource agencies and in most cases adjacent property owners who might be affected by the proposal. LOPs are typically used to authorize activities regulated under Section 10 of the CWA (e.g., work pertaining to piers, wharves, docks, jetties, artificial reefs, beach fill, dredged material disposal, etc.) but can be used to authorize activities regulated under Section 404 of the CWA if the process for this type of review has been established via an Individual Permit (IP). The resultant IP that would be issued would be considered an IPLOP.

The USFWS identifies critical habitat for endangered and threatened species. Critical habitat is defined as areas of land considered necessary for recovery of threatened or endangered species. The ultimate goal is to restore healthy populations of listed species within their native habitat so they can be removed from the list. Once an area is designated as critical habitat pursuant to the federal ESA, all federal agencies must consult with the USFWS to ensure that any action they authorize, fund, or carry out is not likely to result in destruction or adverse modification of the critical habitat. Critical habitat for least Bell's vireo occurs within the Smuggler's Gulch/Tijuana River portion of the study area (Maps 137a-c and 138; Figure 5). Critical habitat for San Diego fairy shrimp (*Branchinecta sandiegonensis*) occurs in the central portion of the study area adjacent to Maps 48 and 58a. Critical habitat for spreading navarretia occurs on Otay Mesa within and adjacent to Map Nos. 124 and 126 (Figure 5). Although present nearby, the storm water facilities do not actually overlap critical habitat for San Diego fairy shrimp and spreading navarretia. Although critical habitat for several other species occurs within City boundaries, the MSWSMP study area does not overlap these areas.

All migratory bird species that are native to the U.S. or its territories are protected under the federal MBTA as amended under the Migratory Bird Treaty Reform Act (MBTRA) of 2004 (FR Doc. 05-5127; USFWS 2004). The MBTA is generally protective of migratory birds but does not actually stipulate the type of protection required. In common practice, USFWS places restrictions on disturbances allowed near active raptor nests.

5.3.2 State of California

Primary environmental legislation in California is found in CEQA and its implementing guidelines (State CEQA Guidelines), requiring that projects with potential adverse effects or impacts on the environment undergo environmental review. Adverse impacts to the environment are typically mitigated as a result of the environmental review process in accordance with existing laws and regulations.

Under Section 401 of the federal CWA, an applicant for a federal permit that may result in a discharge to a water body must obtain certification from the state that the proposed activity will comply with state water quality standards and water quality objectives. Section 401 provides the RWQCB with regulatory authority to certify or deny the proposed activity. A Section 401 Certification must be obtained prior to issuance of a 404 Permit.

The California ESA is similar to the federal ESA in that it contains a process for listing of species and regulating potential impacts to listed species. Section 2081 of the California ESA authorizes CDFG to enter into a memorandum of agreement for take of listed species for scientific, educational, or management purposes.

The Native Plant Protection Act (NPPA) enacted a process by which plants are listed as rare or endangered. The NPPA regulates collection, transport, and commerce in listed plants. The California ESA followed the NPPA and covers both plants and animals determined to be endangered or threatened with extinction. Plants listed as rare under NPPA were designated rare under the California ESA.

Raptors and owls and their active nests are protected by California Fish and Game Code 3503.5, which states that it is unlawful to take, possess, or destroy any birds of prey or to take, possess, or destroy the nest or eggs of any such bird unless authorized by CDFG.

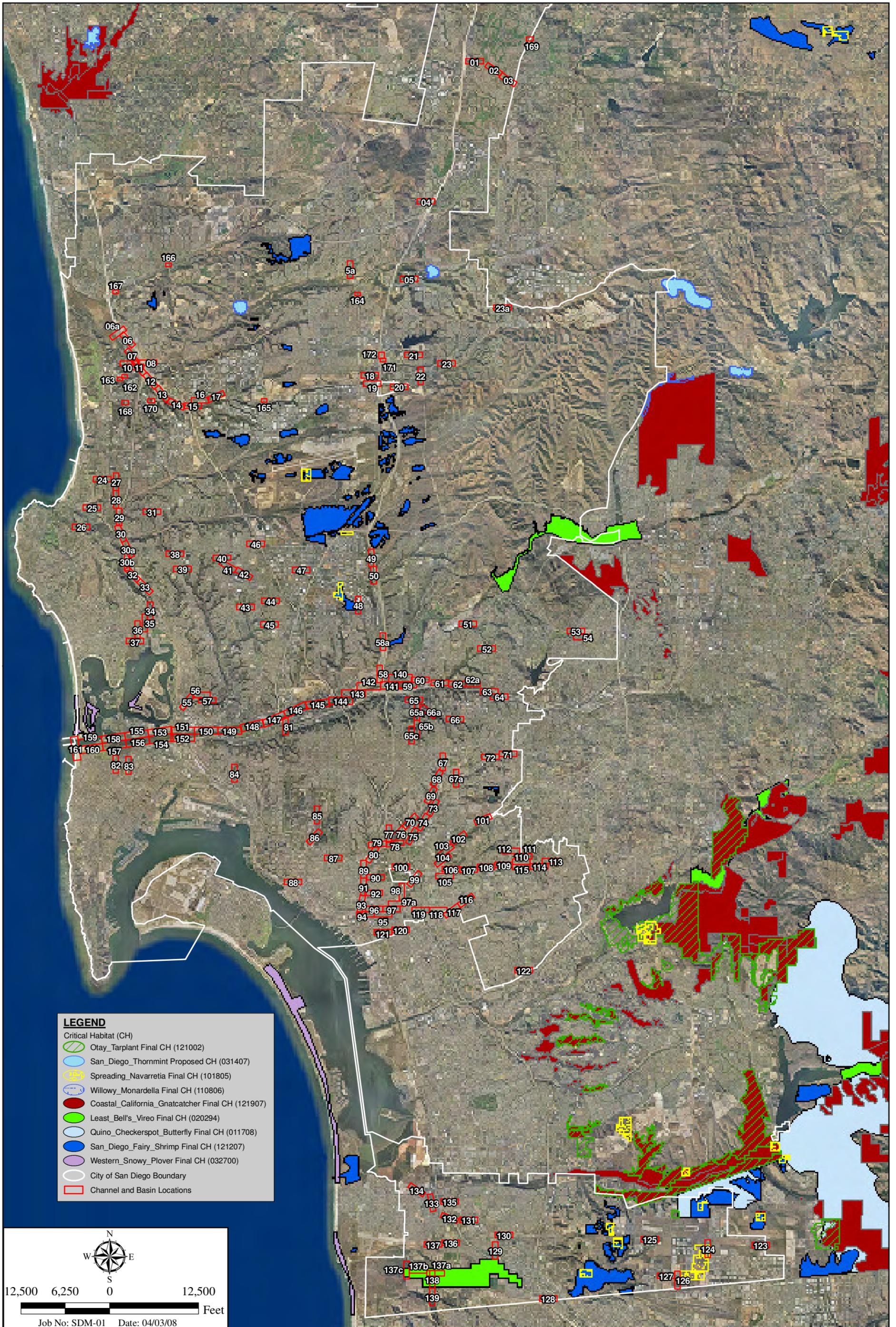
The California Fish and Game Code (Sections 1600 et seq.) requires a CDFG agreement for projects affecting riparian and wetland habitats through issuance of a Streambed Alteration Agreement (SAA).

5.3.3 City of San Diego

Impacts to biological resources in the City must comply with the City's ESL Regulations. The purpose of the regulations is to "protect, preserve and, where damaged restore, the environmentally sensitive lands of San Diego and the viability of the species supported by those lands." Environmentally sensitive lands are defined to include sensitive biological resources, steep hillsides, coastal beaches, sensitive coastal bluffs, and 100-year floodplains.

The ESL requires impacts to wetlands be avoided unless the activities meet specific exemption criteria established in the ordinance. Impacts to City-defined wetlands require approval of deviation findings as required by ESL regulations. For projects occurring within the Coastal Overlay Zone, impacts are only allowed for those uses identified in Section 143.0130(d). These uses are limited to aquaculture, nature study projects or similar resource dependent uses, wetland restoration projects, and incidental public service projects. Impacts to wetlands should only occur if they are unavoidable, have been minimized to the greatest degree possible, and have adequate mitigation. Wetlands must be mitigated in accordance with Section III(B)(1)(a) of the Land Development Manual Biology Guidelines (City 2001). The ESL also requires that buffers be maintained around all wetlands (as appropriate) to protect their functions and values. Examples of functions and values include wildlife habitat, food chain productivity, water quality/sediment filtration, ground water recharge, and storm water abatement. Typical buffer zone widths in southern California are 100 feet around wetlands and 50 feet around riparian areas, although final buffer zone widths for a project must be determined in consultation with the Corps, CDFG, and CCC, as applicable. Buffer widths may either be increased or decreased as determined on a case-by-case basis, taking into consideration the size and type of project proposed, sensitivity of the wetland resource to detrimental edge effects, topography, specific functions and values of the wetland, as well as the need for transitional upland habitat (City 2001).

In July 1997, the USFWS, CDFG, and City adopted the Implementing Agreement for the MSCP. This program allows the incidental take of threatened and endangered species as well as regionally-sensitive species that are conserved by it (covered species). The MSCP designates regional preserves that are intended to be mostly void of development activities, while allowing development of other areas subject to the requirements of the program. Impacts to biological resources are regulated by the City's ESL regulations. Mitigation requirements for sensitive resources discussed in this document follow the City's ESL Biology Guidelines (Section II, Development Regulations; City 2001). The coastal California gnatcatcher (threatened), California brown pelican (endangered), and least Bell's vireo are the only federally listed animal species known to occur or with high probability of occurring within the study area. All three are covered species under the City's MSCP Subarea Plan.



Study Area Locations in Relation to Critical Habitat

CITY OF SAN DIEGO MASTER STORMWATER SYSTEM MAINTENANCE PROGRAM

6.0 PROJECT IMPACTS

The following analysis of impacts is intended to provide a programmatic estimate of the magnitude of impacts to biological resources that could occur from the various maintenance activities anticipated to occur as a result of implementation of the proposed MSWSMP. As a result, the acreages of impacts that follow are estimates. Furthermore, due to the uncertainty of the location of future access roads or staging areas, these impacts are not included in the following estimates. In addition, it was not feasible to calculate the amount of direct impacts that would result from clearing around the numerous unmapped other storm water facilities that occur scattered throughout the City, which include brow ditches, pipes, outfalls, curb inlets and outlets, culverts and manholes. Evaluation of these lesser facilities would occur during the SCR process included in the MSWSMP, as IMPs would be prepared annually.

The estimated area, nature and frequency of maintenance are based on information provided by the City's SWD (Appendix A), which identifies a number of key information items, including channel type, anticipated maintenance method, and estimated width of disturbance. It is important to note that these parameters are based on past experience and could change depending on the condition of growth in the channel and evolution of maintenance techniques.

The following analysis characterizes impacts as direct or indirect. An impact is considered direct when the primary effect is removal of existing habitat and/or species. Direct impacts would result from clearing of vegetation and removal of accumulated sediment and debris as well as construction of access paths or roads where none currently exist. Indirect impacts occur when secondary effects of adjacent activities such as noise, reduced water quality, dust, or non-native plant invasion adversely affect adjacent biological resources. The magnitude of an indirect impact may be the same as a direct impact; however, the effect usually takes a longer time to become apparent.

The impacts of the proposed maintenance activities are evaluated in terms of their relationship to the guidelines established by the MSCP.

The significance of impacts to identified biological resources or those with potential to occur was determined based upon the sensitivity of the resource and the extent of the anticipated impacts. For certain highly sensitive resources (e.g., a federally listed species) any impact would be significant. Conversely, other resources that have a low sensitivity (e.g., species with a large, locally stable population in the City but declining elsewhere) could sustain an impact with insignificant effect.

6.1 DIRECT IMPACTS

6.1.1 Vegetation Communities

Based on the width of disturbance identified in Appendix A, maintenance activities analyzed in this report could affect up to approximately 70.40 acres of vegetated wetland habitat and 24.63 acres of unvegetated earthen-bottom streambed/natural flood channel. An estimated 105.9 acres of upland habitat could be impacted, of which approximately 63.5 acres are developed. Unvegetated concrete-lined channels/basins were considered developed lands in calculating impacts to vegetation communities. A breakdown of estimated wetland impacts by facility name/location is provided in Appendix G. A total of 22.13 acres of wetland impacts, 11.46 acres of unvegetated streambed impacts, and 4.0 acres of sensitive upland impacts could occur within the MHPA. A total of 10.64 acres of wetland impacts and

10.59 acres of unvegetated natural flood channel impacts could occur within the coastal overlay zone. In reality, the contemplated maintenance activities would occur over an extended period; thus, estimated impact areas would not occur at any one time. Predicting impacted vegetation in any given year is beyond the level of analysis and would be determined on an annual basis through the SCR process.

Wetland/Riparian Vegetation Communities

As previously stated, maintenance activities could impact up to 70.40 acres of vegetated wetland/riparian habitats, including 6.08 acres of southern riparian forest (including disturbed), 0.17 acre of southern sycamore riparian woodland, 0.18 acre of riparian woodland, 27.36 acres of southern willow scrub (including disturbed), 4.08 acres of mule fat scrub (including disturbed), 0.34 acre of riparian scrub, 20.00 acres of freshwater marsh (including disturbed), 0.01 acre of cismontane alkali marsh, 1.39 acres of coastal saltmarsh, 0.38 acre of coastal brackish marsh, and 10.41 acres of disturbed wetland. In addition, up to 24.63 acres of earthen-bottom streambed/natural flood channel could be impacted (Table 10). To minimize the number of tables within the body of this report, estimated wetland impacts associated with each specific channel or sedimentation basin is presented in Appendices E and F. Impacts to wetland buffers resulting from construction of access roads and staging areas could also occur as a result of the project, but would be minimized to the greatest extent practicable. Unavoidable impacts to wetland buffers would be mitigated based on ratios provided in Section 7.0. Impacts to wetland vegetation communities are considered significant and would require mitigation.

Upland Vegetation Communities

Maintenance activities could impact up to 19.4 acres of sensitive upland habitat, including 0.3 acre of coast live oak woodland, 9.2 acres of Diegan coastal sage scrub (including disturbed), 1.4 acres of broom baccharis scrub, 1.1 acres of southern mixed chaparral, and 7.4 acres of non-native grassland (Table 10). Impacts to these communities would be significant and would require mitigation.

Impacts up to 86.5 acres of non-sensitive uplands (2.5 acres of eucalyptus woodland, 8.4 acres of non-native vegetation/ornamental, 9.1 acres of disturbed habitat/ruderal, and 66.5 acres of developed land) would not be considered significant under the City's Biology Guidelines; therefore, no mitigation is required.

6.1.2 Sensitive Plant Species

Implementation of the proposed project could directly impact four sensitive plant species observed within the study area: single-whorl burrobush, San Diego marsh-elder, southwestern spiny rush, and San Diego sunflower. Although direct counts of the number of each species observed during field surveys that would be impacted were not conducted, the relatively low abundance of these species within the impact areas together with avoidance and minimization measures are expected to result in low numbers of individuals being affected; thus, proposed maintenance activities would not be considered significant. Species not observed but with potential to occur are addressed in Section 6.1.4.

Table 10
ESTIMATED AREA OF VEGETATION COMMUNITIES AFFECTED*

HU	Wetlands Outside MHPA†												Total
	SRF	SRW	RW	SWS	MFS	RS	FWM	CAM	CSM	CBM	DW	STM/ NFC	
San Dieguito	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.01	0.01	0.27
Peñasquitos	1.82	0.00	0.07	6.11	0.50	0.00	4.60	0.00	0.27	0.06	0.90	3.60	17.93
San Diego	1.11	0.17	0.00	5.80	0.00	0.00	3.30	0.01	0.00	0.00	1.48	0.87	12.74
Pueblo San Diego	0.00	0.00	0.00	2.80	1.25	0.34	5.20	0.00	0.45	0.00	5.91	8.65	24.60
Sweetwater	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.03
Otay	0.00	0.00	0.00	0.57	0.00	0.00	2.34	0.00	0.00	0.00	0.06	0.04	3.01
Tijuana	0.00	0.00	0.00	0.65	0.00	0.00	1.57	0.00	0.00	0.00	0.64	0.00	2.86
Non-MHPA Subtotal	2.93	0.17	0.07	15.93	1.75	0.34	17.26	0.01	0.72	0.06	9.03	13.17	61.44
HU	Wetlands Within MHPA†												Total
	SRF	SRW	RW	SWS	MFS	RS	FWM	CAM	CSM	CBM	DW	STM/ NFC	
San Dieguito	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Peñasquitos	3.15	0.00	0.11	9.45	0.00	0.00	2.40	0.00	0.67	0.32	0.08	4.62	20.80
San Diego	0.00	0.00	0.00	0.24	0.00	0.00	0.16	0.00	0.00	0.00	0.24	0.12	0.76
Pueblo San Diego	0.00	0.00	0.00	0.09	1.35	0.00	0.03	0.00	0.00	0.00	0.07	4.07	5.61
Sweetwater	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Otay	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tijuana	0.00	0.00	0.00	1.65	0.98	0.00	0.15	0.00	0.00	0.00	0.99	2.65	6.42
MHPA Subtotal	3.15	0.00	0.11	11.43	2.33	0.00	2.74	0.00	0.67	0.32	1.38	11.46	33.59
WETLANDS TOTAL	6.08	0.17	0.18	27.36	4.08	0.34	20.00	0.01	1.39	0.38	10.41	24.63	95.03

**Table 10 (cont.)
ESTIMATED AREA OF VEGETATION COMMUNITIES AFFECTED***

HU	Uplands Outside MHPA†													Total
	Tier I				Tier II			Tier IIIA	Tier IIIB	Tier IV				
	CLOW	SOC	SFD	BCH	DCSS	CSCS	BS	SMC	NNG	EW	NNV/ ORN	DH/ RUD	DEV	
San Dieguito	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.9
Peñasquitos	0.0	0.0	0.0	0.0	0.7	0.0	0.4	0.5	0.2	0.8	1.9	0.5	17.0	22.0
San Diego	0.1	0.0	0.0	0.0	1.2	0.0	0.7	0.0	0.5	1.3	2.6	1.5	8.4	16.3
Pueblo San Diego	0.0	0.0	0.0	0.0	3.9	0.0	0.2	0.3	3.8	0.1	1.7	1.9	31.1	43.0
Sweetwater	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.9
Otay	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	1.4	0.0	0.6	3.9	1.6	7.6
Tijuana	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.8	0.7	5.2	8.1
Non-MHPA Subtotal	0.1	0.0	0.0	0.0	5.9	0.0	1.3	0.8	7.3	2.2	7.6	8.5	65.1	98.8
HU	Uplands Within MHPA†													Total
	Tier I				Tier II			Tier IIIA	Tier IIIB	Tier IV				
	CLOW	SOC	SFD	BCH	DCSS	CSCS	BS	SMC	NNG	EW	NNV/ ORN	DH/ RUD	DEV	
San Dieguito	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Peñasquitos	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.1	0.3	0.5	0.1	0.7	2.3
San Diego	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.5	0.7
Pueblo San Diego	0.0	0.0	0.0	0.0	3.3	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	3.7
Sweetwater	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Otay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tijuana	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.4
MHPA Subtotal	0.2	0.0	0.0	0.0	3.3	0.0	0.1	0.3	0.1	0.3	0.8	0.6	1.4	7.1
UPLANDS TOTAL	0.3	0.0	0.0	0.0	9.2	0.0	1.4	1.1	7.4	2.5	8.4	9.1	66.5	105.9

*Totals reflect rounding

†Habitat acronyms: BCH=beach, BS=broom baccharis scrub, CAM=cismontane alkali marsh, CBM=coastal brackish marsh, CLOW=coast live oak woodland, CSCS=coastal sage-chaparral scrub, CSM=coastal saltmarsh, DCSS=Diegan coastal sage scrub, DH/RUD=disturbed habitat/ruderal, DEV=developed, DW=disturbed wetland, EW=eucalyptus woodland, FWM=freshwater marsh, MFS=mule fat scrub, NFC=City natural flood channel, NNG=non-native grassland, NNV/ORN=non-native vegetation/ornamental, RS=riparian scrub, RW=riparian woodland, SFD=southern foredunes, SMC=southern mixed chaparral, SOC=scrub oak chaparral, SRF=southern riparian forest, SRW=southern sycamore riparian woodland, STM=CDFG streambed (includes open water habitat), SWS=southern willow scrub

6.1.3 Sensitive Animal Species

With regard to sensitive animal species detected within the study area, proposed maintenance activities could directly impact the federally listed threatened coastal California gnatcatcher by clearing small areas of habitat for construction of access roads and staging areas. These activities could also result in impacts to nesting raptors such as the Cooper's hawk and northern harrier as well as other sensitive species such as the western bluebird. In the absence of information concerning the nature of the ultimate maintenance activities on specific storm water facilities, potential impacts to sensitive animal species from future maintenance activities is considered potentially significant.

Maintenance activities within the channels and basins have potential to impact other sensitive species such as the yellow warbler, double-crested cormorant, and little blue heron. These impacts would not be considered significant due to the low sensitivity status of these species and measures to avoid disruption during the breeding season. No impacts are proposed to areas likely to be used by the federally and state listed endangered California brown pelican.

6.1.4 Sensitive Plant and Animal Species with Potential to Occur

Several listed and/or narrow endemic plant species with moderate to low potential to occur in or adjacent to the MSWSMP study area include the following: San Diego ambrosia (*Ambrosia pumila*), willow monardella (*Monardella viminea*), Otay tarplant (*Deinandra conjugens*), snake cholla (*Opuntia californica* var. *californica*), variegated dudleya (*Dudleya variegata*), San Diego thorn-mint (*Acanthomintha ilicifolia*), San Diego button-celery (*Eryngium aristulatum* var. *parishii*), California Orcutt's grass (*Orcuttia californica*), Otay Mesa mint (*Pogogyne nudiuscula*), and spreading navarretia (*Navarretia fossalis*). San Diego ambrosia is known to occur within floodplain areas, and willow monardella can be found in dry creek beds; both have been reported in the vicinity of MSWSMP mapped areas (Tables 6 and 7). Snake cholla is primarily a sage scrub species; it has been reported in the vicinity of several storm water facilities in the MSWSMP study area. The remaining plants are primarily grassland or vernal pool species and were considered to have low to moderate potential to occur because of their known distributions in the Otay Mesa area where some MSWSMP channels are located, and where critical habitat for spreading navarretia occurs. Critical habitat for spreading navarretia would be expected to support other listed vernal pool plants such as San Diego thorn-mint, San Diego button-celery, California Orcutt's grass, and Otay Mesa mint.

Although the MSWSMP would not impact vernal pools, they may occur near certain areas in which maintenance is proposed. Any impacts to listed or narrow endemic plant species would be significant.

The potential for impacts to other listed and/or narrow endemic plant species including Shaw's agave (*Agave shawii*), aphanisma (*Aphanisma blitoides*), coastal dunes milk vetch (*Astragalus tener* var. *titi*), Encinitas baccharis (*Baccharis vanessae*), short-leaved dudleya (*Dudleya brevifolia*), prostrate navarretia (*Navarretia prostrata*), San Diego mesa mint (*Pogogyne abramsii*), thread-leaved brodiaea (*Brodiaea filifolia*), Del Mar manzanita (*Arctostaphylos glandulosa* ssp. *crassifolia*), Orcutt's spineflower (*Chorizanthe orcuttiana*), saltmarsh bird's beak (*Cordylanthus maritimus*), Mexican flannelbush (*Fremontodendron mexicanum*), Orcutt's hazardia (*Hazardia orcuttii*), and small-leaved rose (*Rosa minutifolia*) are low based on habitat affiliations combined with recent and previous surveys of the study area documented in the CNDDDB, cross-referenced with the areas of proposed impact. As a result, maintenance of mapped storm water facilities occurring as part of the MSWSMP would not be expected to have a significant impact on the sensitive plants listed above.

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The potential for impacts to listed animal species such as San Diego fairy shrimp, Quino checkerspot butterfly (*Euphydryas editha quino*), Riverside fairy shrimp (*Streptocephalus woottoni*), arroyo toad (*Bufo californicus*), western snowy plover (*Charadrius alexandrinus nivosus*), California black rail (*Laterallus jamaicensis coturniculus*), Belding's savannah sparrow (*Passerculus sandwichensis beldingi*), light-footed clapper rail (*Rallus longirostris levipes*), California least tern (*Sternula antillarum browni*), and Pacific pocket mouse (*Perognathus longimembris pacificus*) are low based on habitat affiliations combined with recent and previous surveys of the study area documented in the CNDDDB cross-referenced with the areas of proposed impact. As a result, maintenance of mapped storm water facilities occurring as part of the MSWSMP is not expected to have a significant impact on the sensitive animals listed above.

Although appropriate habitat for the arroyo toad occurs within the MSWSMP study area, this species was considered to have low potential to occur because there are no recorded CNDDDB locations for this species in the study area and the list of known arroyo toad locations provided in the MSCP does not include creeks within the MSWSMP study area.

The western yellow-billed cuckoo (*Coccyzus americanus occidentalis*) and southwestern willow flycatcher have low to moderate potential to occur in areas of the MSWSMP that support mature riparian woodland. Within the MSWSMP, the most probable locations for these two species to occur are along the San Diego River and Soledad Creek. Any impacts to these species would be considered significant.

Implementation of the proposed project is expected to impact the habitat of the federally and state listed endangered least Bell's vireo, which has been documented in CNDDDB as occurring in various locations within or near the study area. Any impacts to this species would be significant.

The remaining sensitive animal species with the potential to occur are not federally or state listed. Of these, the following have high potential to occur within the study area: saltmarsh skipper (*Panoquina errans*), orange-throated whiptail (*Cnemidophorus hyperthyrus*), San Diego horned lizard (*Phrynosoma coronatum* ssp. *blainvillei*), two-striped garter snake (*Thamnophis hammondi*), yellow-breasted chat (*Icteria virens*), and Mexican long-tongued bat (*Choeronycteris mexicana*). Other sensitive species not specifically addressed in this section have low or moderate likelihood of occurring on site.

Implementation of the proposed project is expected to significantly impact the habitat of yellow-breasted chat, which shares the same habitat requirements as the least Bell's vireo.

Any impacts to the remaining non-listed sensitive animal species would be adverse but less than significant because these species are not highly sensitive, and their habitat would not be permanently lost due to the frequency and nature of the maintenance clearing.

Because the locations and habitat characteristics of impact areas for new access roads and staging, as well as the numerous minor storm water facilities, are unknown, there exists the potential for impacts to listed plant and animal species in these areas. Any such impacts would be considered significant and determined during the SCR process.

6.1.5 Jurisdictional Areas (Corps, CDFG, and City)

Up to 34.66 acres of wetlands and 68.27 acres of non-wetland WUS subject to Corps jurisdiction, including 32.52 acres of earthen-bottom channels/basins and 35.75 acres of concrete-lined channels/basins, could be impacted within study area (Table 11). Appendix F contains a detailed estimate of Corps jurisdictional impacts by facility name/location.

Up to approximately 70.66 acres of wetlands/riparian habitat and 24.63 acres of unvegetated earthen-bottom streambed subject to CDFG jurisdiction could be affected by maintenance activities (Table 12). Vegetated habitat includes concrete-lined channels and basins that support a dominance of wetland vegetation. Appendix G contains an estimation of CDFG jurisdictional impacts by facility name/location.

Up to approximately 70.40 acres of vegetated wetland and 24.63 acres of unvegetated natural flood channel subject to City jurisdiction could be affected by maintenance activities (Table 12). This includes concrete-lined channels and basins that support a dominance of wetland vegetation. Approximately 10.64 acres of these impacts could occur to wetlands within the coastal overlay zone and 10.59 acres to unvegetated natural flood channels within the coastal overlay zone. Appendix G contains a detailed list of estimated City jurisdictional impacts by facility name/location.

6.1.6 Wildlife Corridors

Significant impacts to wildlife corridors are not anticipated to occur from proposed maintenance activities. Maintenance would occur periodically and be generally limited to daylight hours when wildlife use is not high. Furthermore, the maintenance activities would not alter the basic topographic characteristics of channels that accommodate wildlife movement. Although the loss of cover associated with maintenance activities would impact habitat for bird species, the impact on wildlife corridor movement from loss of cover is not significant since (1) the narrow aspect of many storm water facilities and urban context within which they occur limits their utility as wildlife corridors for larger animals; and (2) portions of storm water facilities that do occur within broader areas of habitat would continue to support adjacent habitat suitable for wildlife movement. Thus, habitat linkages and functions of preserve areas would not be significantly impacted in the long term by periodic maintenance activities.

6.1.7 MSCP

As illustrated in Table 13, maintenance activities would be consistent with relevant policies and guidelines of the City's MSCP.

Table 11
ESTIMATED CORPS JURISDICTIONAL AREAS (WUS) AFFECTED (acre[s])*

HU†	Wetlands‡												Non-wetland WUS		TOTAL
	SRF	SRW	RW	SWS	MFS	RS	FWM	CAM	CSM	CBM	DW	Total Wetland Impacts	Earthen bottom	Concrete bottom	
San Dieguito	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	1.17	1.18
Peñasquitos	0.88	0.00	0.00	3.99	0.00	0.00	5.29	0.00	0.94	0.26	0.09	11.45	12.64	11.53	35.62
San Diego	0.27	0.00	0.00	2.97	0.00	0.00	2.54	0.00	0.00	0.00	0.11	5.89	2.29	5.28	13.46
Pueblo San Diego	0.00	0.00	0.00	1.10	0.32	0.22	5.17	0.00	0.45	0.00	3.76	11.02	13.61	15.18	39.81
Sweetwater	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.28
Otay	0.00	0.00	0.00	0.52	0.00	0.00	1.97	0.00	0.00	0.00	0.04	2.53	0.04	0.74	3.31
Tijuana	0.00	0.00	0.00	0.99	0.15	0.00	1.52	0.00	0.00	0.00	1.11	3.77	3.93	1.57	9.27
TOTAL	1.15	0.00	0.00	9.57	0.47	0.22	16.49	0.00	1.39	0.26	5.11	34.66	32.52	35.75	102.93

*Totals reflect rounding

†The HUs correspond to the following Storm Water Facility map pages in Appendix B: San Dieguito HU=Maps 1-3, 169; Peñasquitos HU=Maps 4-46, 55-57, 163-168, 170-172; San Diego HU=Maps 47-54, 58-66, 81-83, 140-161; Pueblo San Diego HU=Maps 67-80, 84-121; Sweetwater HU=Map 122; Otay HU=Maps 131-135; Tijuana HU=Maps 123-130, 136-139

‡Habitat acronyms: CAM=cismontane alkali marsh, CBM=coastal brackish marsh, CSM=coastal saltmarsh, DW=disturbed wetland, FWM=freshwater marsh, MFS=mule fat scrub, RS=riparian scrub, RW=riparian woodland, SRF=southern riparian forest, SRW=southern sycamore riparian woodland, SWS=southern willow scrub

Table 12
ESTIMATED CDFG AND CITY JURISDICTIONAL AREAS AFFECTED (acre[s])*

HU†	Wetland/Riparian Habitat‡												Drainage	Total CDFG/ City	
	SRF	SRW	RW	SWS	MFS	RS	FWM	CAM	CSM	CBM	DW	CLOW (CDFG only)	Total Wetland/ Riparian Impacts		STM/ NFC
San Dieguito	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.01	0.00	0.26	0.01	0.27
Peñasquitos	4.96	0.00	0.18	15.56	0.50	0.00	7.00	0.00	0.94	0.38	0.98	0.21	30.71/ 30.50§	8.22	38.93/ 38.72§
San Diego	1.10	0.17	0.00	6.04	0.00	0.00	3.46	0.01	0.00	0.00	1.72	0.05	12.55/ 12.50§	0.99	13.54/ 13.49§
Pueblo San Diego	0.00	0.00	0.00	2.89	2.60	0.34	5.23	0.00	0.45	0.00	5.98	0.00	17.49	12.72	30.21
Sweetwater	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.03	0.00	0.03
Otay	0.00	0.00	0.00	0.57	0.00	0.00	2.34	0.00	0.00	0.00	0.06	0.00	2.98	0.04	3.02
Tijuana	0.00	0.00	0.00	2.30	0.98	0.00	1.72	0.00	0.00	0.00	1.63	0.00	6.63	2.65	9.28
TOTAL	6.08	0.17	0.18	27.36	4.08	0.34	20.00	0.01	1.39	0.38	10.41	0.26	70.66/ 70.40§	24.63	95.29/ 95.03§

*Totals reflect rounding

†The HUs correspond to the following Storm Water Facility map pages in Appendix B: San Dieguito HU=Maps 1-3, 169; Peñasquitos HU=Maps 4-46, 55-57, 163-168, 170-172; San Diego HU=Maps 47-54, 58-66, 81-83, 140-161; Pueblo San Diego HU=Maps 67-80, 84-121; Sweetwater HU=Map 122; Otay HU=Maps 131-135; Tijuana HU=Maps 123-130, 136-139

‡Habitat acronyms: CAM=cismontane alkali marsh, CBM=coastal brackish marsh, CLOW=coast live oak woodland, CSM=coastal saltmarsh, DW=disturbed wetland, FWM=freshwater marsh, MFS=mule fat scrub, NFC= City natural flood channel, RS=riparian scrub, RW=riparian woodland, SRF=southern riparian forest, SRW=southern sycamore riparian woodland, SWS=southern willow scrub, STM=CDFG streambed (includes open water habitat)

§First number is CDFG acreage; the second is City acreage

**Table 13
MSCP CONSISTENCY EVALUATION**

MSCP POLICY/GUIDELINE	EVALUATION	CONSISTENT?
General Planning Policies and Guidelines		
<p>Flood control should generally be limited to existing agreements with Resource Agencies unless demonstrated to be needed based on a cost-benefit analysis and pursuant to the restoration plan. Floodplains within and upstream from the MHPA, if feasible, should remain in a natural condition and configuration in order to allow for the ecological, geological, hydrological, and other natural processes to remain or be restored.</p>	<p>While implementation of the MSWSMP would periodically remove natural vegetation associated with earthen storm water facilities to assure proper flood control function, the natural configuration of the facilities would not be modified other than to remove accumulated sediment. Impacts to wetland vegetation associated with the channel would depart from the overall goal of maintaining natural drainage courses. This impact is unavoidable, given the project's primary goal of retaining the channel's ability to safely transport floodwaters. These impacts would occur with authorization from appropriate federal, state, or local agencies, and compensation would be required.</p>	<p align="center">Yes</p>
<p>No berming, channelization, or man-made constraints or barriers to creek, tributary, or river flows should be allowed in any floodplain within the MHPA unless reviewed by all appropriate agencies, and adequately mitigated. Review must include impacts to upstream and downstream habitats, flood flow volumes, velocities and configurations, water availability, and changes to the water table level.</p>	<p>The MSWSMP would not include new berming, channelization, or man-made constraints or barriers to channel flows in any floodplain within the MHPA and therefore would not have significant impacts associated with these activities.</p>	<p align="center">Yes</p>
<p>No riprap, concrete, or other unnatural material shall be used to stabilize river, creek, tributary, and channel banks within the MHPA. River, stream, and channel banks shall be natural and stabilized where necessary with willows and other appropriate native plantings. Rock gabions may be used where necessary to dissipate flows and should incorporate design features to ensure wildlife movement.</p>	<p>Implementation of the MSWSMP that involves replacement of riprap, concrete, or other unnatural material to stabilize channel banks within the MHPA would be consistent with this policy. However, any such placement of new riprap, concrete, or other unnatural material would be considered a significant impact and require mitigation.</p>	<p align="center">Yes</p>
<p>Temporary construction areas of roads or staging areas must not disturb existing habitats unless determined to be unavoidable. All such activities must occur on existing agricultural lands or other disturbed areas rather than in habitat. If temporary habitat disturbance is unavoidable, restoration and/or mitigation for disturbed areas after project completion will be required.</p>	<p>Construction of temporary access and staging may occur along certain channels where no such facilities currently exist. Such impacts would be considered significant if sensitive habitat or sensitive species were impacted. However, any such impacts would be mitigated.</p>	<p align="center">Yes</p>

Table 13 (cont.)
MSCP CONSISTENCY EVALUATION

MSCP POLICY/GUIDELINE	EVALUATION	CONSISTENT?
General Planning Policies and Guidelines (cont.)		
Construction and maintenance activities in wildlife corridors must avoid significant disruption of corridor usage. MMRPs and environmental documents covering such development must specify how this will be achieved, and construction plans must contain all pertinent information and be readily available to field crews. Training of crews and field workers must be conducted to ensure that all conditions are met. A responsible party must be specified.	Maintenance activities would be of limited durations (less than one week) and would occur during daylight hours when wildlife movement is limited. Maintenance activities would follow the SSMPs developed for this project, which includes training of field personnel in the protocols established to avoid and minimize impacts to sensitive resources.	Yes
Roads in the MHPA will be limited to those identified in Community Plan Circulation Elements, collector streets essential for area circulation, and necessary maintenance/emergency access.	Maintenance roads would be constructed only as necessary in order to gain access to storm water facilities to be maintained. Many facilities in the MSWSMP study area have existing access routes.	Yes
Development of roads in canyon bottoms should be avoided whenever feasible. If a location outside the MHPA is not feasible, the road must be designed to cross the shortest length of the MHPA in order to minimize impacts and fragmentation of sensitive species and habitat. If roads cross the MHPA, they should provide for fully functional wildlife movement capability. Bridges are preferred for providing movement, although culverts in selected locations may be acceptable. Fencing, grading, and plant cover should be provided where needed to protect, shield, and guide animals from roads to appropriate crossings.	Limited road construction may be necessary to access storm water facilities in canyon bottoms as part of the maintenance program. Any such roads would be of the shortest length possible, would be used on a very limited basis, and would not hinder wildlife movement capability.	Yes
Where possible, roads within the MHPA should be narrowed from existing design standards to minimize habitat fragmentation and disruption of wildlife movement and breeding areas. Roads must be located in lower quality habitat or disturbed areas to the extent possible.	Access roads would be constructed to the minimum width required to accommodate moving equipment in and out of the channels and would be located in the least sensitive habitat to the greatest extent practicable.	Yes
For the most part, existing roads and utility lines are considered a compatible use within the MHPA and therefore will be maintained. Exceptions may occur where underutilized or duplicative road systems are determined not to be necessary.	Wherever possible, access for maintenance would occur along existing roads and paths.	Yes

Table 13 (cont.)
MSCP CONSISTENCY EVALUATION

MSCP POLICY/GUIDELINE	EVALUATION	CONSISTENT?
MHPA Adjacency Guidelines		
Lighting of all developed adjacent areas should be directed away from the MHPA. Where necessary, development should provide adequate shielding with non-invasive plant materials (preferably native), berms, and/or other methods to protect MHPA and sensitive species from night lighting.	Maintenance activities would be of limited durations (less than one week) and would occur during daylight hours. Lighting would only be used in emergencies when maintenance cannot be limited to daylight hours.	Yes
Uses in or adjacent to the MHPA should be designed to minimize noise impacts. Excessively noisy uses or activities adjacent to breeding areas must incorporate noise reduction measures and be curtailed during the breeding season of sensitive species.	Wherever possible, maintenance activities would avoid breeding seasons for sensitive bird species. When avoidance is not feasible, the IBAs required as part of the SCR process would identify actions required to minimize noise impacts to sensitive bird species, including noise limitations, acoustical measurements, and noise reduction measures. A biologist shall be on site during maintenance. If noise measurements or the biological monitor indicates that nearby sensitive birds may be adversely impacted by maintenance noise, additional noise attenuation measures shall be undertaken, or maintenance activities shall be curtailed or stopped until the breeding season end.	Yes
Invasive non-native plant species shall not be introduced into areas adjacent to the MHPA.	The MSWSMP includes SSMPs that prohibit use of invasive plants in revegetation and measures to limit spread of existing invasive species into downstream areas during removal.	Yes
When required as part of project approvals, mitigation shall be performed in accordance with the City's ESL Ordinance and Biology Guidelines.	Mitigation measures would be carried out in compliance with the ESL and Biology Guidelines.	Yes
Restoration or revegetation undertaken within the MHPA shall be performed in a manner acceptable to the City. Wetland restoration/revegetation proposals are subject to permit authorization by federal and state agencies.	Restoration or revegetation would be subject to approval of the City as well as state and federal agencies.	Yes
Remove giant reed, tamarisk, pampas grass, castor bean, artichoke thistle, and other exotic invasive species from creek and river systems, canyons and slopes, and elsewhere within the MHPA as funding or other assistance becomes available. Avoid removal activities during the reproductive seasons of sensitive species and avoid/minimize impacts to sensitive species or native habitats.	By their nature, maintenance activities would promote this guideline because they would remove these species due to their adverse impact on the flood control function of storm water facilities. In addition, the MSWSMP includes SSMPs to minimize the downstream spread of invasive species during removal.	Yes

**Table 13 (cont.)
MSCP CONSISTENCY EVALUATION**

MSCP POLICY/GUIDELINE	EVALUATION	CONSISTENT?
MHPA Adjacency Guidelines (cont.)		
Perform standard maintenance, such as clearing and dredging of existing flood channels, during the non-breeding or nesting season of sensitive bird or wildlife species utilizing the riparian habitat. For the least Bell's vireo, the non-breeding season generally includes mid-September through mid-March.	Wherever possible, maintenance activities would avoid breeding seasons for sensitive bird species. As indicated earlier, if avoidance is not feasible, measures included in the MSWSMP would require identification and implementation of effective noise attenuation or for maintenance activities generating unacceptable noise to cease until the breeding season end.	Yes
Review existing flood control channels within the MHPA periodically (every 5 to 10 years) to determine the need for their retention and maintenance, and to assess alternatives, such as restoration of natural rivers and floodplains.	The MSWSMP would provide for the routine inspections and maintenance identified in this guideline.	Yes
Special Conditions for Covered Species		
Area-specific management directives for the coastal California gnatcatcher must include measures to reduce edge effects and minimize disturbance during the nesting period, fire protection measures to reduce potential for habitat degradation due to unplanned fire and management measures to improve habitat quality, including vegetation structure. No clearing of occupied habitat within the City's MHPA may occur between March 1 and August 15.	Wherever possible, maintenance activities would avoid breeding seasons for sensitive bird species. As indicated earlier, if avoidance is not feasible, measures included in the MSWSMP would require identification and implementation of effective noise attenuation or require maintenance activities generating unacceptable noise to cease until the end of the breeding season.	Yes
Area-specific management directives for the least Bell's vireo and southwestern willow flycatcher must include measures to provide appropriate successional habitat, upland buffers for all known populations, cowbird control, and specific measures to protect against detrimental edge effects to these species. Any clearing of occupied habitat must occur between September 15 and March 15 for the vireo and between September 1 and May 1 for the flycatcher (i.e., outside the nesting season).	Wherever possible, maintenance activities would avoid breeding seasons for sensitive bird species. As previously stated, if avoidance is not feasible, measures included in the MSWSMP would require identification and implementation of effective noise attenuation or require maintenance activities generating unacceptable noise to cease until the end of the breeding season.	Yes
Area-specific management directives for the Cooper's hawk must include 300-foot impact avoidance areas around active nests, and minimization of disturbance in oak woodlands and oak riparian forests.	The MSWSMP includes a BMP, which would require maintenance activities to maintain a setback of 300 feet from active nests.	Yes

**Table 13 (cont.)
MSCP CONSISTENCY EVALUATION**

MSCP POLICY/GUIDELINE	EVALUATION	CONSISTENT?
Special Conditions for Covered Species (cont.)		
Area-specific management directives for the northern harrier must manage agricultural and disturbed lands within 4 miles of nesting habitat to provide foraging habitat and include both a 900-foot impact avoidance area around active nests and measures for maintaining winter foraging habitat in preserve areas in Proctor Valley, around Sweetwater Reservoir, San Miguel Ranch, Otay Ranch east of Wueste Road, Lake Hodges, and San Pasqual Valley.	The MSWSMP includes SSMPs that would require maintenance activities to maintain a setback of 900 feet from active nests.	Yes
Area-specific management directives for San Diego barrel cactus must include measures to protect this species from edge effects, unauthorized collection, and include appropriate fire management/control practices to protect against a too frequent fire cycle.	The MSWSMP includes mitigation measures that require relocation or replanting in the event a substantial number of sensitive plants would be lost in the course of maintenance.	Yes
Area-specific management directives for Nuttall's lotus must include specific measures to protect against detrimental edge effects.	The MSWSMP includes mitigation measures that require relocation or replanting in the event a substantial number of sensitive plants would be lost in the course of maintenance.	Yes

6.2 INDIRECT IMPACTS

Potential indirect impacts from maintenance activities would normally be associated with secondary effects, including habitat insularization, water quality, lighting, noise, roadkill, exotic plant species, animal behavioral changes, fugitive dust, and human intrusion. The magnitude of an indirect impact can be the same as a direct impact, but the effect usually takes more time to become apparent. Many indirect impacts are particularly critical from work proposed both within and adjacent to the MHPA and are addressed by the City's MSCP Subarea Plan as Compatible Land Uses and Land Use Adjacency Guidelines.

6.2.1 Habitat Insularization

Habitat insularization is the fragmentation of large habitat areas into smaller "islands" effectively isolated from one another. Such fragmentation presents barriers to wildlife movement and breeding, splits animal and plant populations, and increases edge effects. Often, habitat insularization is associated with local species extinctions since smaller habitat areas support relatively fewer species than larger ones.

No habitat insularization impacts are expected to occur as a result proposed maintenance activities because the activities would not result in the isolation of any habitat areas.

6.2.2 Water Quality

Increased hardscape area resulting from construction of access roads may result in a nominal increase in runoff during and after rain events. Runoff is often associated with increased erosion, sedimentation, and pollution that have the potential to significantly impact water quality in adjacent and downstream areas. The use of petroleum products (i.e., fuels, oils, lubricants) by maintenance equipment could potentially contaminate surface water and adversely affect biological resources both in and outside of the MHPA, and has potential to be significant. The removal of wetland vegetation occurring as part of the MSWSMP may result in a decrease in pollutant uptake by plants, as vegetation in the channel and basin bottoms would be removed. Plants such as cattails are capable of absorbing pollutants such as excess nitrogen and heavy metals commonly found in urban runoff. Vegetation clearing may reduce the filtering capacity of channels and basins and result in adverse water quality impacts downstream. These impacts would be considered significant. Additional impacts to water quality could occur as a result of disturbance of sediment on the channel bottom during clearing activities and subsequent increases in turbidity if water is present at the time of maintenance. These impacts could be significant if not mitigated.

6.2.3 Lighting

Night lighting exposes adjacent wildlife species to an unnatural light regime, may alter their behavior patterns, and consequently result in a loss of species diversity. Except in the case of emergency maintenance, maintenance activities would take place during daylight hours. Due to the short-term duration of emergency maintenance, night-time lighting would not represent a significant impact.

6.2.4 Noise

Project-related noise from such sources as machinery potentially used for clearing could result in a temporary impact to wildlife. Noise-related impacts would be considered significant if sensitive species were displaced from their nests or territories and failed to breed.

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Indirect noise impacts to nesting/breeding coastal California gnatcatchers, least Bell's vireos, or raptors could occur if grubbing, clearing, grading, or other maintenance activities create noise in excess of 60 decibels (dB) hourly average in occupied habitat within the MHPA during the gnatcatcher breeding season (March 1 to August 15), vireo breeding season (March 15 to September 15), or raptor breeding season (February 1 to August 1). These impacts would be considered significant and require mitigation.

6.2.5 Roadkill

Roadkill is not a significant issue for this project, as all maintenance machinery would be slow-moving and the project would not open up access roads for use by the general public.

6.2.6 Exotic Plant Species

Non-native plants could colonize areas disturbed by maintenance and could potentially spread into the adjacent preserve areas. Such invasions could displace native plant species, reducing diversity, increasing flammability and fire frequency, change ground and surface water levels, and adversely affect the native wildlife that are dependent on native vegetation.

The limited amount of clearing expected to occur in upland habitats would not open significant amounts of upland areas to non-native species invasion. Clearing of native wetland vegetation within the channels and ditches could result in subsequent colonization by non-native vegetation such as giant reed. However, many of the channels and ditches within the MHPA already support a variety of non-native wetland-affiliated species growing in conjunction with native species. Clearing the channels would remove both native and non-native species, and quick-growing species such as cattails could be expected to recolonize many of the wetter areas over the short term. Non-native plant invasion of the MHPA in areas where they previously did not exist would be considered a significant impact.

6.2.7 Animal Behavioral Changes

Maintenance activities have potential to temporarily displace sensitive mammals and birds from their territories, which may result in decreased reproductive success or increased mortality. These indirect impacts would be considered significant for any federally or state listed species or raptors located within the MHPA. Raptors, which have potential to occur in trees within riparian woodlands and eucalyptus woodlands, or in adjacent grasslands, may be susceptible to disturbance from maintenance, and any such activity within 300 feet of an active Cooper's hawk (*Accipiter cooperii*) nest, 900 feet of an active northern harrier (*Circus cyaneus*) nest, and 500 feet of any other raptor nest would be considered significant. Such activity may cause temporary or permanent abandonment of a nest, which would expose eggs or nestlings to predation or exposure to the elements.

6.2.8 Fugitive Dust

Fugitive dust produced by maintenance could disperse onto vegetation in the MHPA and cause adverse effects to sensitive vegetation. A continual cover of dust may reduce the overall vigor of individual plants by reducing their photosynthetic capabilities and increasing their susceptibility to pests or disease. In turn, this could affect animals dependent on these plants. Fugitive dust is a temporary maintenance impact not expected to be a significant issue due to the restricted areas of potential clearing and the relatively short duration of maintenance within each storm water facility.

6.2.9 Human Intrusion

Increases in human activity in natural areas could result in degradation of sensitive vegetation communities by fragmenting habitat, forming edges (through creation of roads and trails), and removing existing plants. In addition, illegal dumping of landscape debris and trash may occur. No significant impacts would occur as a result of human activity given that many of the areas are already used as homeless encampments and for illegal dumping. Maintenance activities in the storm water facilities are not expected to result in an increase in these activities.

6.3 CUMULATIVE IMPACTS

Although impacts to sensitive biological resources may not be significant when considered independently, when multiple impacts such as from several projects within an area are combined, they may be cumulatively significant. The MSCP was designed to compensate for the regional loss of biological resources throughout the region. According to the City's Significance Determination Guidelines (City 2007), projects that conform to the MSCP as specified by the City's ESL Regulations and Biology Guidelines would not result in a significant cumulative impact for those upland vegetation communities adequately covered by the MSCP (Tiers I through IV vegetation communities with the exception of native grasslands and vernal pools). Cumulative impacts to wetlands are being addressed by the regional permit process and comprehensive mitigation plan. Impacts to species covered by the MSCP would not be considered cumulatively significant, provided that all mitigation and conditions of coverage are implemented. Impacts to or federally or state listed species not covered by the MSCP would be considered cumulatively significant. Other sensitive species not analyzed for coverage under the MSCP would typically be considered adequately conserved through the habitat-based mitigation as described in the City's Biology Guidelines.

Implementation of the proposed project is not expected to result in cumulative impacts to sensitive biological communities, as the project would conform to the MSCP and no impacts to native grasslands or vernal pools are anticipated. Implementation of the proposed project is not expected to result in cumulative impacts to sensitive plant or animal species, as no impacts are expected to occur to listed species that are not covered by the MSCP, and impacts to all species that are covered under the MSCP would be mitigated and appropriate conditions of coverage implemented. Impacts to other sensitive species not covered by the MSCP would be considered adequately conserved through the habitat-based mitigation. Although impacts would occur within the MHPA, no net loss of the MHPA would occur. However, because locations and habitat characteristics of impact areas for new access roads and staging as well as numerous minor storm water facilities are unknown, there exists potential for impacts to listed plant and animal species in these areas. Any such impacts to listed species not covered by the MSCP would be considered cumulatively significant, including impacts to species such as Otay tarplant, San Diego and Riverside fairy shrimp, and western yellow-billed cuckoo.

6.4 PROJECT ALTERNATIVES

Because the proposed maintenance activities would affect wetlands, alternatives are provided pursuant to 404 (B)(1) Guidelines of the Clean Water Act to assure that proposed maintenance activities are the least environmentally damaging. Based on the requirement that alternatives meet most of the basic objectives of the proposed project and reduce significant impacts associated with the proposed project, this Program EIR analyzes the following alternatives which fall into two categories:

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Non-structural and Structural. Non-structural alternatives focus on management of vegetation within existing channels while structural alternatives focus on increasing the capacity of the storm water facilities to convey flood water without regular removal of vegetation.

Non-structural Alternatives

Non-structural alternatives considered include:

- No Project (Past Approach); and
- No Maintenance.

Structural Alternatives

Structural Alternatives considered include:

- Raising the channel banks by constructing walls or berms along the top of the channels;
- Diverting storm water in pipes around constrained segments; and
- Widening channels to accommodate vegetation.

The following discussion of alternatives is divided into two subsections for each alternative. The first subsection describes the general characteristics of the alternative. The second subsection provides a qualitative comparison of the wetland impacts of the alternative with those of the proposed MSWSMP.

6.4.1 Maintenance in Accordance with Past Approach (No Project)

Description

If the proposed MSWSMP were not adopted, storm water system maintenance would continue in the manner in which it has occurred in the past.

In the past, the City has maintained the storm water facilities in a much less systematic way than would occur with the proposed MSWSMP. The City generally conducted regular maintenance activities largely as needed. However, in recent years, there have been increased regulatory constraints on channel cleaning and maintenance. Consequently, maintenance as needed is no longer feasible given the long lead times required to obtain authorization from resource agencies to undertake mitigation. As a result, most local agencies, including the City, have largely suspended their regular maintenance activities pending approval of regional permits such as proposed as part of the MSWSMP.

Thus, without the adoption of the proposed MSWSMP and accompanying master permits, it is likely that maintenance would be primarily restricted to activities which clearly meet the Resource Agency definitions of emergency maintenance. Typically, to qualify as an emergency maintenance, the activity must be required due to an imminent threat of loss of life or property from flooding and must be carried out within seven days of the determination that maintenance is required. In addition, the maintenance would be done without the benefit of protocols included in the proposed MSWSMP.

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Impact Comparison

Under this alternative, storm water facilities would likely be maintained to a lesser extent than would occur with the proposed MSWSMP due to difficulties securing the necessary authorization from Resource Agencies. Thus, many of the channels would either not be maintained or would be maintained with less frequency. As a result, less wetland habitat would be lost and/or habitat would exist for longer periods of time within channels. Thus, wetland impacts would likely be less than under the proposed project.

6.4.2 No Maintenance

Description

Under this alternative, the City would not conduct any maintenance activities within the storm water conveyance system. Vegetation would grow unchecked within the channels and sediment would not be removed.

Impact Comparison

This alternative would substantially reduce the biological impacts in comparison with the proposed MSWSMP. Under this alternative, wetland vegetation within the channels would be allowed to grow naturally which would enhance wildlife habitat.

6.4.3 Raised Bank Alternative

Description

Under this alternative, structures (e.g., walls or levees) would be constructed along the top of channels to allow them to contain vegetation without compromising their ability to transport flood waters. The structures would offset the effect of vegetation and sediment by allowing water elevations to increase without spilling out into adjacent areas. However, accumulation of sediment and vegetation could ultimately eliminate the increased flood capacity created by the structures. Channel-specific engineering would be undertaken to determine the additional "bank" height needed.

Impact Comparison

Under the Raised Bank Alternative, impacts to vegetation communities would be limited to the construction of access routes and the proposed walls or levees. This alternative would not include the clearing of vegetation from storm water facilities. The Raised Bank Alternative also would substantially reduce required impacts to jurisdictional habitat in comparison to the proposed MSWSMP.

Because this alternative would not include the removal of any vegetation within the affected storm water facilities, impacts to wildlife habitat would be substantially reduced and limited to impacts associated with construction of the access routes, walls and/or levees. However, the structures would have an adverse impact on wildlife by making it more difficult for upland wildlife to access the

channels for water, food, and cover. Sensitive plant species within the storm water facilities would not be affected by implementation of this alternative.

Potentially significant indirect impacts from construction activities associated with access routes and structures would still occur from implementation of this alternative, including indirect impacts to water quality, noise, and exotic plant species. Indirect noise impacts to nesting or breeding coastal California gnatcatchers, least Bell's vireo, and/or raptors could still occur under this alternative, as well as the proposed MSWSMP, if maintenance activities create noise in excess of 60 dB(A) L_{eq} in occupied habitat during these species' breeding seasons.

In summary, implementation of the Raised Bank Alternative would reduce the biological impacts in comparison with the proposed MSWSMP.

6.4.4 Channel By-pass Alternative

Description

This alternative would involve construction of underground pipes that would divert some or all of the flow around a channel segment to allow the channel to be naturally vegetated. Channel-specific modeling would be undertaken to determine the location and sizing of by-pass pipes to assure that vegetated channel segments can continue to support vegetation without resulting in flooding.

Impact Comparison

Under the Channel By-pass Alternative, impacts to vegetation communities would be limited to the construction of access routes and the proposed underground pipes. This alternative would not include the clearing of vegetation from storm water facilities. This alternative also would substantially reduce impacts to jurisdictional habitat in comparison to the proposed MSWSMP.

Because this alternative would not include the removal of vegetation within the affected storm water facilities, impacts to wildlife habitat would be substantially reduced and limited to impacts associated with construction of the access routes and underground pipes. In addition, sensitive plant species within the storm water facilities would not be affected by implementation of this alternative.

Potentially significant indirect impacts from construction activities associated with access routes and pipelines would still occur from implementation of this alternative, including indirect impacts to water quality, noise, and exotic plant species. Indirect noise impacts to nesting or breeding coastal California gnatcatchers, least Bell's vireo, and/or raptors could still occur under this alternative, as well as the proposed MSWSMP, if maintenance activities create noise in excess of 60 dB(A) L_{eq} in occupied habitat during these species' breeding seasons.

In summary, implementation of the Channel By-pass Alternative would substantially reduce the biological impacts in comparison with the proposed MSWSMP.

6.4.5 Widened Bank Alternative

Description

Under this alternative, the configuration of channels would be modified to increase the volume capacity of the channel. The goal of increasing the channel volume would be to enable vegetation to exist in the channel without causing flooding. In order to promote wetland habitat, the modified channels would be completely earthen, and any pre-existing concrete or other impermeable forms of channel protection would be removed.

Channel-specific modeling would be undertaken to determine the additional width needed. In most cases, the capacity would be increased by widening the cross-section of the channel. Increasing the depth of the channel would also increase capacity but is expected to be difficult to achieve in most cases due to constraints imposed by the slope limitations on the channel banks and maintaining downstream gradients.

Implementation of this alternative would require a substantial grading operation within the existing channels as well as encroachment into adjacent areas to accommodate the widened cross-section. As the City typically has little, if any, right-of-way beyond the existing channels, it is anticipated that implementation of this alternative would require the City to purchase property and/or secure easements from landowners adjacent to the affected channel.

Comparison of Impacts

With the Widened Channel Alternative, short-term impacts to vegetation communities within the affected channels would be comparable to the proposed project because, in both cases, the majority of the channel vegetation would be removed. However, unlike the proposed project, at least some portion of the vegetation would be able to re-establish within the channel without subsequent removal.

Potentially significant indirect impacts from channel widening would be greater than the proposed project due to the amount of disturbance that would be required within the channels themselves. Uncontrolled erosion and sedimentation could impact downstream wildlife habitat. Construction activities in channels could impede the movement of animals through natural drainage corridors. Indirect noise impacts to nesting or breeding coastal California gnatcatchers, least Bell's vireo, and/or raptors could still occur under this alternative, as well as the proposed MSWSMP, if maintenance activities create noise in excess of 60 dB(A) L_{eq} in occupied habitat during these species' breeding seasons.

In summary, implementation of the Widened Channel Alternative would substantially reduce the long-term biological impacts in comparison with the proposed MSWSMP but would have similar short-term impacts. As with the proposed project, it is difficult to forecast whether the short-term impacts could be fully mitigated without more information on the nature of the impact and the ability to implement sufficient mitigation.

7.0 MITIGATION MEASURES

As discussed earlier, the proposed maintenance activities would be expected to impact sensitive vegetation communities and impact sensitive plant and animal species. The following measures are proposed to mitigate for these direct and indirect impacts.

7.1 MITIGATION FOR DIRECT IMPACTS

The City's MSWSMP will be limited to the minimum amount of clearing required to adequately maintain storm water facilities. An extensive number of best management practices and protocols have been incorporated into the project to help minimize the adverse effects of the program on sensitive biological resources. In addition to those measures outlined in Section 1.1 of this report, this section presents additional mitigation measures that would be required, as well as providing the mitigation approach for direct impacts to sensitive habitats. A conceptual wetland mitigation plan is provided in Appendix H to describe the mitigation approach in greater detail than is presented below.

7.1.1 Mitigation Approach

Wetland mitigation often consists of a combination of creation, enhancement, or restoration to satisfy local, state, and federal mitigation requirements. Typically, creation at a ratio of 1:1 is required as a component of the mitigation. However, in the case of mitigating for storm water facility maintenance activities conducted in channels, enhancement and restoration without the traditional creation component are considered appropriate for three primary reasons. First, the channel itself would remain after maintenance and would continue to function for wildlife movement and, in the case of earthen bottom facilities, would continue to filter out urban runoff pollutants. Second, wetland vegetation has historically returned to these channels between maintenance events. Third, maintenance, in most cases, occurs in urban channels where repeated maintenance activities have already occurred for many years.

Impacts to wetland vegetation have been placed into two categories: (1) high frequency clearing, or permanent clearing, which is defined as occurring more often than every three years, and (2) low frequency clearing, or temporary clearing, which is defined as occurring less often than every three years. The form of mitigation is dependent on the frequency of maintenance due to the fact that wetland vegetation can typically re-establish with a longer period between maintenance events. No mitigation is required for impacts to unvegetated channels (i.e., streambed/natural flood channels) because the drainage course would remain in place, unlike other types of projects that physically eliminate these areas.

7.1.1.1 Mitigation for High Frequency Clearing (Permanent Impacts)

Where maintenance would occur more frequently than every three years, wetland vegetation would have less opportunity to re-establish. Mitigation for high frequency maintenance impacts to wetlands may take one or a combination of the following three actions: (1) restoration, (2) purchase of mitigation credits, or (3) creation. These actions would occur on a one-time basis pursuant to the ratios shown in Table 14. However, if the mitigation were carried out and successfully established before the impact were to occur, the mitigation ratio would be 1:1 for that particular impact since no temporal loss would occur.

Restoration

Restoration would involve the rehabilitation of highly degraded wetlands (i.e., areas infested with exotics such as giant reed) with the goal of repairing natural or historic function of a degraded wetland. Activities would include removal of invasive plants, minor grading to remove accumulated sediment and restore surface conditions, and installing native wetland plants as seed and/or container stock. Installation of cuttings, container stock, and seed would begin following removal of any exotic species. Irrigation may be provided, depending on the type and location of the habitat to be restored.

For the restoration to achieve the highest wildlife and water quality value, these activities should occur in large, continuous areas (e.g., San Diego River and Rose Creek). In addition, wherever possible, the restoration would occur at the uppermost region of a drainage course or watershed to minimize the likelihood of invasive plants being transported downstream. Also, whenever possible, mitigation should occur within the same watershed as the impact.

Mitigation ratios are proportional to the habitat type and quality, and are typically higher for wetland habitat types that have a higher function and diversity and typically take longer to establish. Restoration activities would be considered “permanent” mitigation and, assuming the initial mitigation continues to thrive, would allow storm channel maintenance to occur at the impacted area without additional mitigation for future clearing events.

Table 14
WETLAND MITIGATION RATIOS

WETLAND TYPE	MITIGATION RATIO ¹
Southern riparian forest	3:1
Southern sycamore riparian woodland	3:1
Riparian woodland	3:1
Coastal saltmarsh	3:1
Coastal brackish marsh	3:1
Southern willow scrub	2:1
Mule fat scrub	2:1
Riparian scrub	2:1
Freshwater marsh	1:1
Cismontane alkali marsh	1:1
Disturbed wetland	1:1
Streambed/natural flood channel	--

¹Mitigation done in advance or through purchase of mitigation credits would be at a 1:1 ratio.

To assure the long-term success of the restoration, a five-year monitoring and maintenance program would be undertaken. Maintenance would target the removal of all invasive species as well as installing replacement plants, as necessary. Annual monitoring would include qualitative (visual assessment) and/or quantitative (transect data collection) sampling. The sampling would include assessments of cover (native and non-native), observations of plant recruitment, and lists of wildlife

and plant species observed on site each year. Success criteria would include requirements for native wetland/riparian species coverage and/or richness, as well as establishing limits on the presence of non-native species and invasive exotics. Once the mitigation area has met success criteria and is considered self-sufficient, a long-term maintenance program would be carried out to maintain the restored area for as long as the mitigation is required to offset storm water maintenance impacts.

Purchase of Mitigation Credits

In place of restoration, the City could choose to purchase mitigation credits. Mitigation ratios would be 1:1 for all wetland habitat impacts when the native habitat associated with mitigation credits is fully established in advance of the impact. In some cases, mitigation credits would have a higher value than the impacted habitat.

Creation

Although opportunities for creation have not been specifically identified, the City may opt to create wetland habitat as part of the mitigation process should suitable locations arise and be economically feasible. Creation could include widening existing channels to allow vegetation to remain in the channel without compromising the channel's ability to convey floodwater. Mitigation could be achieved if the widening resulted in a net increase in the amount of wetland vegetation that would occur in the long-term.

7.1.1.2 Mitigation for Low Frequency Clearing (Temporary Impacts)

Mitigation for low frequency maintenance (occurring less frequently than every three years) would be accomplished solely through wetland enhancement in the form of invasive species removal because wetland vegetation in these areas would be likely to re-establish between maintenance events. Normally, wetland vegetation re-establishes if the maintenance occurs at intervals greater than three years. Typically, cattails and other emergent vegetation re-establish and attain a height of approximately 1 foot within six months of maintenance. Willows and other woody plants such as mule fat would likely establish along the edge of the cattails within the first year, provided the root base of on-site wetland plants is partially retained after maintenance and/or there is adequate seed stock on site or upstream. Provided these factors are met, willows would be expected to attain a height of between 5-10 feet within three years of a maintenance event.

Removal of invasive species (e.g., giant reed, pampas grass, castor-bean, Mexican fan palm, Canary Island date palm, Brazilian pepper tree, and tamarisk) would be followed by a proactive maintenance program that would assure that invasive species would not re-establish for a period of two years after the removal has occurred. During this two-year period, maintenance would include cutting all large woody exotics as well as large grasses such as giant reed and pampas grass to ground level with all above-ground portions either (1) removed from the site and disposed of in a licensed landfill or (2) mowed or chipped into small pieces and left on site. Maintenance events targeting resprouts of invasive species would occur every 2 months. Herbicides approved for use in wetland areas would be used as necessary to prevent re-growth. The mitigation ratios for low frequency clearing activities would be the same as shown in Table 14.

Maintenance and monitoring of enhancement areas will continue for a two-year period after the removal of exotics has occurred. Regular monitoring visits will be conducted during the two-year period, with an annual memo distributed by the end of each year.

To illustrate the amount of wetland mitigation that may be required as result of full implementation of the proposed MSWSMP, Tables 15 through 17 present the estimated wetland mitigation requirements for Corps, CDFG, and City jurisdictional areas, respectively. It should be noted that these tables are intended to estimate the maximum amount of mitigation by assuming that all of the maintenance is in the high frequency category. Based on these tables, the maximum amount of restoration/enhancement would be as follows: 50.52 acres (Corps), 119.21 acres (CDFG), and 118.43 acres (City).

Table 15
SUMMARY OF IMPACTS AND MITIGATION BASED ON HIGH FREQUENCY MAINTENANCE
ASSUMED IN ALL CORPS WETLANDS (acre[s])*

HU	Estimated Wetland Impacts†											Total Wetland Impacts‡	
	SRF	SRW	RW	SWS	MFS	RS	FWM	CAM	CSM	CBM	DW		
San Dieguito	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Peñasquitos	0.88	0.00	0.00	3.99	0.00	0.00	5.29	0.00	0.94	0.26	0.09	0.11	5.89
San Diego	0.27	0.00	0.00	2.97	0.00	0.00	2.54	0.00	0.00	0.00	0.11	0.11	5.89
Pueblo San Diego	0.00	0.00	0.00	1.10	0.32	0.22	5.17	0.00	0.45	0.00	3.76	0.11	11.02
Sweetwater	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Otay	0.00	0.00	0.00	0.52	0.00	0.00	1.97	0.00	0.00	0.00	0.04	0.04	2.53
Tijuana	0.00	0.00	0.00	0.99	0.15	0.00	1.52	0.00	0.00	0.00	1.11	1.11	3.77
Total Impacts	1.15	0.00	0.00	9.57	0.47	0.22	16.49	0.00	1.39	0.26	5.11	5.11	34.66
Mitigation	Estimated Mitigation											Total Estimated Wetland Mitigation	
Restoration/Enhancement Ratio	3:1	3:1	3:1	2:1	2:1	2:1	1:1	3:1	3:1	3:1	1:1	1:1	--
Acre(s)	3.45	0.00	0.00	19.14	0.94	0.44	16.49	0.00	4.17	0.78	5.11	5.11	50.52
Mitigation Credit Ratio	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	0.5:1	0.5:1	--
Acre(s)	1.15	0.00	0.00	9.57	0.47	0.22	16.49	0.00	1.39	0.26	2.56	2.56	32.11

*Totals reflect rounding

†Habitat acronyms: CAM=cismontane alkali marsh, CBM=coastal brackish marsh, CSM=coastal saltmarsh, DW=disturbed wetland, FWM=freshwater marsh, MFS=mule fat scrub, RS=riparian scrub, RW=riparian woodland, SRF=southern riparian forest, SRW=southern sycamore riparian woodland, SWS=southern willow scrub

‡Does not include impacts from maintenance conducted in non-wetland WUS, as no mitigation is anticipated

Table 16
SUMMARY OF IMPACTS AND MITIGATION BASED ON HIGH FREQUENCY MAINTENANCE
ASSUMED IN ALL CDFG WETLANDS (acre[s])*

HU	Estimated Wetland Impacts†												Total Estimated Riparian Impacts‡
	SRF	SRW	RW	SWS	MFS	RS	FWM	CAM	CSM	CBM	DW	CLOW	
San Dieguito	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.01	0.00	0.26
Peñasquitos	4.96	0.00	0.18	15.56	0.50	0.00	7.00	0.00	0.94	0.38	0.98	0.21	30.71
San Diego	1.10	0.17	0.00	6.04	0.00	0.00	3.46	0.01	0.00	0.00	1.72	0.05	12.55
Pueblo San Diego	0.00	0.00	0.00	2.89	2.60	0.34	5.23	0.00	0.45	0.00	5.98	0.00	17.49
Sweetwater	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.03
Otay	0.00	0.00	0.00	0.57	0.00	0.00	2.34	0.00	0.00	0.00	0.06	0.00	2.98
Tijuana	0.00	0.00	0.00	2.30	0.98	0.00	1.72	0.00	0.00	0.00	1.63	0.00	6.63
Total Impacts	6.08	0.17	0.18	27.36	4.08	0.34	20.00	0.01	1.39	0.38	10.41	0.26	70.66
Mitigation	Estimated Mitigation												Total Estimated Riparian Habitat Mitigation
Enhancement/ Restoration Ratio	3:1	3:1	3:1	2:1	2:1	2:1	1:1	3:1	3:1	3:1	1:1	3:1	--
Acre(s)	18.24	0.34	0.54	54.72	8.16	0.68	20.00	0.03	4.17	1.14	10.41	0.78	119.21
Mitigation Credit Ratio	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	0.5:1	1:1	--
Acre(s)	6.08	0.17	0.18	27.36	4.08	0.34	20.00	0.01	1.39	0.38	5.21	0.26	65.46

*Totals reflect rounding

†Habitat acronyms: CAM=cismontane alkali marsh, CBM=coastal brackish marsh, CLOW=coast live oak woodland, CSM=coastal saltmarsh, DW=disturbed wetland, FWM=freshwater marsh, MFS=mule fat scrub, RS=riparian scrub, RW=riparian woodland, SRF=southern riparian forest, SRW=southern sycamore riparian woodland, SWS=southern willow scrub

‡Does not include impacts from maintenance conducted in unvegetated streambeds, as no mitigation is anticipated

Table 17
SUMMARY OF IMPACTS AND MITIGATION BASED ON HIGH FREQUENCY MAINTENANCE
ASSUMED IN ALL CITY JURISDICTIONAL AREAS (acre[s])*

HU	Estimated Wetland Impacts†											Total Overall Wetland/ Riparian Impacts‡
	SRF	SRW	RW	SWS	MFS	RS	FWM	CAM	CSM	CBM	DW	
San Dieguito	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.01	0.26
Peñasquitos	4.96	0.00	0.18	15.56	0.50	0.00	7.00	0.00	0.94	0.38	0.98	30.50
San Diego	1.10	0.17	0.00	6.04	0.00	0.00	3.46	0.01	0.00	0.00	1.72	12.50
Pueblo San Diego	0.00	0.00	0.00	2.89	2.60	0.34	5.23	0.00	0.45	0.00	5.98	17.49
Sweetwater	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03
Otay	0.00	0.00	0.00	0.57	0.00	0.00	2.34	0.00	0.00	0.00	0.06	2.98
Tijuana	0.00	0.00	0.00	2.30	0.98	0.00	1.72	0.00	0.00	0.00	1.63	6.63
Total Impacts	6.08	0.17	0.18	27.36	4.08	0.34	20.00	0.01	1.39	0.38	10.41	70.40
Mitigation	Estimated Mitigation											Total Overall Estimated Wetland Mitigation
Enhancement/Restoration Ratio	3:1	3:1	3:1	2:1	2:1	2:1	1:1	3:1	3:1	3:1	1:1	--
Acre(s)	18.24	0.34	0.54	54.72	8.16	0.68	20.00	0.03	4.17	1.14	10.41	118.43
Mitigation Credit Ratio	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	0.5:1	--
Acre(s)	6.08	0.17	0.18	27.36	4.08	0.34	20.00	0.01	1.39	0.38	5.21	65.20

*Totals reflect rounding

†Habitat acronyms: CAM=cismontane alkali marsh, CBM=coastal brackish marsh, CSM=coastal saltmarsh, DW=disturbed wetland, FWM=freshwater marsh, MFS=mule fat scrub, RS=riparian scrub, RW=riparian woodland, SRF=southern riparian forest, SRW=southern sycamore riparian woodland, SWS=southern willow scrub

‡Does not include impacts from maintenance conducted in unvegetated natural flood channels, as no mitigation is anticipated

7.1.1.3 Upland Mitigation

Upland mitigation is traditionally accomplished by off-site acquisition of existing habitat. The amount of upland habitat acquired would be based on the ratios identified in Table 18. In addition, the City has established a Habitat Acquisition Fund, which is intended to be used to mitigate for upland habitat losses of typically less than 5 acres. In such cases, a per-acre fee is paid into a City fund used to purchase mitigation land.

Vegetation Type	Tier	Location of Impact with Respect to the MHPA	
		Inside	Outside
Coast live oak woodland	I	2:1	1:1
Scrub oak chaparral	I	2:1	1:1
Southern foredunes	I	2:1	1:1
Beach	I	2:1	1:1
Diegan coastal sage scrub	II	1:1	1:1
Coastal sage-chaparral scrub	II	1:1	1:1
Broom baccharis scrub	II	1:1	1:1
Southern mixed chaparral	IIA	1:1	0.5:1
Non-native grassland	IIIB	1:1	0.5:1
Eucalyptus woodland	IV	--	--
Non-native vegetation/ornamental	IV	--	--
Disturbed habitat/ruderal	IV	--	--
Developed	IV	--	--

*Assumes mitigation occurs within an MHPA

In order to encourage mitigation to occur within areas targeted for preserves, the City has established lower mitigation ratios for upland habitats. Similarly, the mitigation ratios for impacts to preserve areas are higher in order to discourage impacts within these preserves.

To illustrate the maximum amount of upland mitigation that may be required as result of full implementation of the proposed MSWSMP, Table 19 presents the estimated maximum upland mitigation requirements. Full mitigation of upland impacts could require acquisition of up to 15.6 acres of upland vegetation, including 0.3 acre of coast live oak woodland, 9.2 acres of Diegan coastal sage scrub, 1.4 acres of broom baccharis scrub, 1.1 acres of southern mixed chaparral, and 7.4 acres of non-native grassland. Broom baccharis scrub would likely be mitigated with Diegan coastal sage scrub, thus bringing the total estimated mitigation requirement for sage scrub to 10.6 acres.

**Table 19
ESTIMATED PROGRAM IMPACTS AND MITIGATION TO UPLAND VEGETATION COMMUNITIES***

HU	Upland Impact Outside MHPA†													Total
	Tier I				Tier II			Tier IIIA	Tier IIIB	Tier IV				
	CLOW	SOC	SFD	BCH	DCSS	CSCS	BS	SMC	NNG	EW	NNV/ORN	DH/RUD	DEV	
San Dieguito	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.9
Peñasquitos	0.0	0.0	0.0	0.0	0.7	0.0	0.4	0.5	0.2	0.8	1.9	0.5	17.0	22.0
San Diego	0.1	0.0	0.0	0.0	1.2	0.0	0.7	0.0	0.5	1.3	2.6	1.5	8.4	16.3
Pueblo San Diego	0.0	0.0	0.0	0.0	3.9	0.0	0.2	0.3	3.8	0.1	1.7	1.9	31.1	43.0
Sweetwater	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.9
Otay	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	1.4	0.0	0.6	3.9	1.6	7.6
Tijuana	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.8	0.7	5.2	8.1
Non-MHPA Subtotal	0.1	0.0	0.0	0.0	5.9	0.0	1.3	0.8	7.3	2.2	7.6	8.5	65.1	98.8
Mitigation	Estimated Mitigation for Upland Impacts Outside of the MHPA‡													Total Max Est Mit
Ratio	1:1	1:1	1:1	1:1	1:1	1:1	1:1	0.5:1	0.5:1	--	--	--	--	--
Required (acre[s])	0.1	0.0	0.0	0.0	5.9	0.0	1.3	0.4	3.7	--	--	--	--	11.4
HU	Upland Impact Within MHPA†													Total
	Tier I				Tier II			Tier IIIA	Tier IIIB	Tier IV				
	CLOW	SOC	SFD	BCH	DCSS	CSCS	BS	SMC	NNG	EW	NNV/ORN	DH/RUD	DEV	
San Dieguito	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Peñasquitos	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.1	0.3	0.5	0.1	0.7	2.3
San Diego	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.5	0.7
Pueblo San Diego	0.0	0.0	0.0	0.0	3.3	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	3.7
Sweetwater	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Otay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tijuana	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.4
MHPA Subtotal	0.2	0.0	0.0	0.0	3.3	0.0	0.1	0.3	0.1	0.3	0.8	0.6	1.4	7.1
Uplands Total	0.3	0.0	0.0	0.0	9.2	0.0	1.4	1.1	7.4	2.5	8.4	9.1	66.5	105.9
Mitigation	Estimated Mitigation for Upland Impacts Within the MHPA‡													Total Max Est Mit
Ratio	2:1	2:1	2:1	2:1	1:1	1:1	1:1	1:1	1:1	--	--	--	--	--
Required (acre[s])	0.4	0.0	0.0	0.0	3.3	0.0	0.1	0.3	0.1	--	--	--	--	4.2
Overall mit required	0.5	0.0	0.0	0.0	9.2	0.0	1.4	0.7	3.8	--	--	--	--	15.6

*Totals reflect rounding

†Habitat acronyms: BCH=beach, BS=broom baccharis scrub, CLOW=coast live oak woodland, CSCS=coastal sage-chaparral scrub, DCSS=Diegan coastal sage scrub, DEV=developed, DH/RUD=disturbed habitat/ruderal, EW=eucalyptus woodland, NNG=non-native grassland, NNV/ORN=non-native vegetation/ornamental, SFD=southern foredunes, SMC=southern mixed chaparral, SOC=scrub oak chaparral

‡Mitigation is assumed to occur within the MHPA

7.1.2 Sensitive Upland Vegetation Communities

Mitigation Measure (MM) 7.1.2a

Upland impacts shall be compensated through payment into the City's Habitat Acquisition Fund, acquisition and preservation of specific land, or habitat restoration in accordance with the ratios identified in Table 19, as appropriate.

7.1.3 Wetland Vegetation Communities

MM 7.1.3a High frequency wetland impacts shall be compensated with "permanent" wetland mitigation (restoration/enhancement or mitigation credits) in accordance with ratios in Table 14. Mitigation through purchase of mitigation credits would be at a 1:1 ratio. Restoration/enhancement activities shall include invasives removal as well as installing native wetland plants through seed and/or container stock. Irrigation shall be provided, as needed. To assure the long-term success of the restoration/enhancement, a five-year monitoring and maintenance program shall be undertaken. Maintenance shall target the removal of all invasive species as well as installing replacement plants, as necessary. Annual monitoring shall include qualitative (visual assessment) and quantitative sampling. The sampling shall include assessments of cover (native and non-native), observations of plant recruitment, and compiling lists of wildlife and plant species observed on site each year. Success criteria would include requirements for native wetland/riparian species coverage and/or richness, as well as establishing limits on the presence of non-native species and invasive exotics. Once the mitigation area has met success criteria and is considered self-sufficient, a long-term maintenance program would be carried out to maintain the restored/enhanced area for as long as the mitigation is required to offset storm water maintenance impacts. Wherever possible, restoration/enhancement shall occur within the same drainage as the maintenance impact.

MM 7.1.3b Low frequency wetland impacts shall be compensated through a program of exotic species removal (e.g., giant reed) at the ratios noted in Table 14 each time the impact occurs. Removal of invasives (e.g., giant reed, pampas grass) shall be followed by a maintenance program that would assure that invasives would not re-establish for a period of two years after the removal has occurred. Maintenance shall include cutting all large woody exotics, as well as large grasses such as giant reed and pampas grass, to ground level with all above-ground portions removed from the site and disposed of in a licensed landfill.

7.1.4 Sensitive Plant Species

MM 7.1.4a Impacts to narrow endemic and other highly sensitive plant species shall be avoided to the maximum extent practicable. This would be accomplished through design measures as well as specific maintenance control measures. If maintenance activities will occur within areas supporting listed or narrow endemic plants, the boundaries of the plant populations designated sensitive by the resource agencies will be clearly delineated with flagging or temporary fencing that must remain in place for the duration of the activity. Flagged or fenced areas must be avoided to the greatest

extent practicable. Where these areas cannot be avoided, a combination of one or more of the following measures would be implemented:

- Impacted plants would be salvaged and relocated;
- Seeds from impacted plants would be collected for use at an off-site location;
- Off-site habitat that supports the species impacted would be enhanced and/or supplemented with seed collected on-site; and/or
- Comparable habitat at an off-site location shall be preserved.

Mitigation, which involves relocation, enhancement, or transplanting sensitive plants, shall include the following:

- Conceptual planting plan including grading and temporary irrigation, if appropriate;
- Planting specifications;
- Monitoring Program including success criteria; and
- Long-term maintenance and preservation plan.

7.1.5 Sensitive Animal Species

MM 7.1.5a Direct impacts to coastal California gnatcatcher shall be avoided and minimized to the greatest extent practicable during implementation of the proposed project. Impacts to gnatcatcher habitat shall be mitigated through preservation of habitat suitable for coastal California gnatcatchers at a 1:1 ratio in accordance with Table 18. Mitigation shall take place within the MHPA.

MM 7.1.5b Wherever possible, maintenance activities shall not occur within the following areas:

- 300 feet from any nesting site of Cooper's hawk (*Accipiter cooperii*);
- 1,500 feet from known locations of the southwestern pond turtle (*Clemmys marmorata pallida*);
- 900 feet from any nesting sites of northern harriers (*Circus cyaneus*);
- 4000 feet from any nesting sites of golden eagles (*Aquila chrysaetos*); or
- 300 feet from any occupied burrow or burrowing owls (*Athene cunicularia*).

MM 7.1.5c If removal of any eucalyptus or other trees used by raptors for nesting within a maintenance area is proposed during raptor breeding season (February 1 through August 1), a qualified biologist shall ensure that no raptors are nesting in such trees. If maintenance occurs during the raptor breeding season, a pre-maintenance survey shall be conducted, and no maintenance shall occur within 300 feet of any nesting site of Cooper's hawk or other nesting raptor until the young fledge. Should the biologist determine that raptors are nesting, trees shall not be removed until after the breeding season. In addition, if removal of grassland or other habitat appropriate for nesting by northern harriers occurs, a qualified biologist shall ensure that no harriers are nesting in such areas. If maintenance occurs during the raptor breeding season, a pre-maintenance survey shall be conducted and no maintenance shall occur within 900 feet of any nesting site of northern harrier until the young fledge.

MM 7.1.5d If evidence indicates the potential is high for a listed species or highly sensitive species to be present based on historical records or site conditions, then clearing, grubbing, or grading (inside and outside the MHPA) shall be restricted during the breeding season where development may impact the following species:

- Coastal California gnatcatcher (between March 1 and August 15 inside the MHPA only; no restrictions outside MHPA);
- Least Bell's vireo (between March 15 and September 15);
- Southwestern willow flycatcher (between May 1 and September 1);
- Western snowy plover (between March 1 and September 15);
- Least tern (between April 1 and September 15);
- Cactus wren (between February 15 and August 15); or
- Tricolored black bird (between March 1 and August 1).

When other sensitive species, including, but not limited to, arroyo toad, burrowing owl, or Quino checkerspot butterfly are known or suspected to be present all appropriate protocol surveys and mitigation measures required shall be implemented.

MM 7.1.5e If maintenance activities will occur at known localities for listed fish species, a biologist shall determine the presence/absence of flowing/standing water and/or species presence/absence. If flowing/standing water is present, a biological monitor shall accompany the maintenance crew and supervise activities. If maintenance activities must occur within suitable habitat for other highly sensitive aquatic species (i.e., southwestern pond turtle) avoidance or minimization measures (i.e., exclusionary fencing, dewatering of the activity area, live trapping, and translocation to suitable habitat) must be implemented.

7.1.6 MHPA

MM 7.1.6a Impacts to floodplains within the MHPA would be minimized to the greatest extent practicable through project design and coordination with the regulating agencies. Impacts would typically be restricted to the floodway (stream channel) and immediately adjacent areas, and would change the natural condition of these areas by removing vegetation and accumulated sediment. These impacts would be mitigated as outlined in MM 7.1.3a.

MM 7.1.6b Placement of new riprap, concrete, or other unnatural material into channels in the MHPA would be minimized to the maximum extent practicable. These materials would be used only in the event of severe erosion of earthen banks that cannot feasibly be repaired with the use of natural materials. Any impacts to sensitive habitat resulting from such measures would be mitigated in accordance with MMs 7.1.2a and 7.1.3a.

MM 7.1.6c Construction of temporary access and staging along channels will be restricted to those areas where no such facilities currently exist. Impacts to sensitive habitat and/or sensitive species would be minimized to the greatest extent practicable through project design measures, such as locating the facilities in the least sensitive habitat possible, and implementation of mitigation measures for sensitive species described in MMs 7.1.4a and 7.1.5a-e. Any impacts to sensitive habitat would be mitigated according to ratios provided in Tables 13 and 17.

HELIX

7.2 MITIGATION FOR INDIRECT IMPACTS

The applicant has proposed storm water protocols (Section 1.1.4) that would minimize impacts to sensitive biological resources. The following mitigation measures are required in addition to project protocols.

7.2.1 Sensitive Vegetation Communities

In order to mitigate for potential indirect impacts to sensitive vegetation communities resulting from exotic/invasive plant species, the following measures shall be required:

MM 7.2.1a Access roads and staging areas shall be monitored for presence of exotic species, and exotic species would be removed as appropriate. Maintenance clearing of storm water facilities would also remove non-native species. Mitigation for direct impacts from the proposed project may also involve the removal of invasive non-native species in and adjacent to storm water facilities within the MHPA.

MM 7.2.1b Physical erosion control measures such as fiber mulch, hay bales, etc. shall not harbor seeds from invasive species.

7.2.2 Sensitive Plant Species

MM 7.2.2a If maintenance activities will occur within areas supporting listed and/or narrow endemic plants, the boundaries of the plant populations designated sensitive by the resource agencies will be clearly delineated with flagging or temporary fencing that must remain in place for the duration of the activity. Flagged or fenced areas must be avoided. Where these areas cannot be avoided, proper rehabilitation of the impact area will occur in accordance with Section 7.1.3 above.

7.2.3 Sensitive Animal Species

MM 7.2.3a A qualified biologist (possessing a valid Endangered Species Act Section 10(a)(1)(a) recovery permit) shall survey those habitat areas inside and outside the MHPA that would be subject to maintenance noise levels exceeding 60 dB (A) hourly average for the breeding season presence of the coastal California gnatcatcher (no restriction outside the MHPA), least Bell's vireo, and/or other listed species with a high potential to occur. Surveys for the appropriate species shall be conducted pursuant to the protocol survey guidelines established by the USFWS.

MM 7.2.3b If any listed species is present, then the following conditions must be met:

- a. At least two weeks prior to the commencement of maintenance activities, under the direction of a qualified acoustician, noise attenuation measures (e.g., berms, walls) shall be implemented to ensure that noise levels resulting from maintenance activities would not exceed 60 dB(A) hourly average at the edge of occupied habitat. Concurrent with the commencement of maintenance activities and the maintenance of necessary noise attenuation facilities, noise monitoring shall be conducted at the edge of the occupied habitat area to ensure that noise levels do not exceed 60 dB(A) hourly average. If the noise attenuation techniques implemented are determined to be inadequate by the qualified acoustician or

biologist, then the associated maintenance activities shall cease until such time that adequate noise attenuation is achieved or until the end of the breeding season of the subject species as noted above.

- b. Maintenance noise shall continue to be monitored at least twice weekly on varying days, or more frequently depending on the maintenance activity, to verify that noise levels at the edge of occupied habitat are maintained below 60 dB(A) hourly average. If not, other measures shall be implemented in consultation with the biologist and the Assistant Deputy Director (ADD) as necessary to reduce noise levels to below 60 dB(A) hourly average or to the ambient noise level if it already exceeds 60 dB(A) hourly average. Such measures may include but are not limited to limitations on the placement of maintenance equipment and the simultaneous use of equipment.
- c. An analysis showing that noise generated by maintenance activities would not exceed 60 dB(A) hourly average at the edge of occupied habitat must be completed by a qualified acoustician (possessing current noise engineer license or registration with monitoring noise level experience with listed animal species) and approved by the ADD at least two weeks prior to the commencement of maintenance activities. The analysis shall include a map locating the sound monitoring equipment and the 60 dB(A) sound contour.
- d. Prior to the commencement of maintenance activities that would disturb sensitive resources during the breeding season, the biologist shall ensure that all fencing, staking and flagging identified as necessary on the ground have been installed properly in the areas restricted from such activities.
- e. If noise attenuation walls or other devices are required to assure protection to identified wildlife, then the biologist shall make sure such devices have been properly constructed, located and installed.

MM 7.2.3c If a subject species is not detected during the protocol survey, the qualified biologist shall submit substantial evidence to the City Manager and an applicable resource agency which demonstrates whether or not mitigation measures such as noise walls are necessary between the dates stated above for each species. If this evidence concludes that no impacts to this species are anticipated, no mitigation measures would be necessary.

MM 7.2.3d If the applicant chooses to not do the required surveys, then the City's Development Services Department shall assume that the appropriate avian species are present and all necessary protection and mitigation measures shall be required as described in MM 7.2.3b.

MM 7.2.3e If no surveys are completed and no sound attenuation devices are installed, it shall be assumed that the habitat in question is occupied by the appropriate species and that maintenance activities would generate more than 60dB(A) within the habitat requiring protection. All such activities adjacent to the protected habitat shall cease for the duration of the breeding season of the appropriate species and a qualified biologist shall establish a limit of work.

HELIX

MM 7.2.3f No clearing, grubbing, or grading shall occur in or within 500 feet of the MHPA between March 1 and August 15 for occupied gnatcatcher habitat or between March 15 and September 15 for occupied vireo habitat.

MM 7.2.3g If maintenance occurs during the raptor breeding season (February 1 to August 1), a pre-maintenance survey for active raptor nests shall be conducted in areas supporting suitable habitat. If active raptor nests are found, maintenance shall not occur within 300 feet of a Cooper's hawk nest, 900 feet of a northern harrier's nest, or 500 feet of any other raptor's nest until any fledglings have left the nest or until after August 1.

7.2.4 Water Quality

MM 7.2.4a Potential water quality effects would be minimized through implementation of SSMPs 13-23 that are identified in the MSWSMP. In addition, the City will comply with the Standard Urban Storm Water Management Plan and Municipal Storm Water Permit criteria of the RWQCB and City. BMPs mandated by these documents include but would not necessarily be limited to k-rails, gravel bags, silt fencing, fiber rolls, and gabions.

MM 7.2.4b In order to minimize the potential decrease in pollutant uptake capacity resulting from clearing of wetland vegetation, such clearing shall be the minimum required for adequate conveyance of storm water, as required by the MSWSMP.

8.0 CERTIFICATION/QUALIFICATION

The following individuals contributed to the fieldwork and/or preparation of this report.

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APPENDIX A

STORM WATER SYSTEM CHANNELS
AND DETENSION BASINS

Appendix A
STORM WATER SYSTEM CHANNELS AND DETENTION BASINS

Map No.	City Equipment No.	MHPA*	Hydrologic Unit	Facility Description	Year Built or Initiation of Maintenance	Type†	Maintenance Method‡	Estimated Disturbance Width (ft)
CHANNEL								
1	88000504		San Dieguito	Rancho Bernardo Rd & Bernardo Center Dr	1963	C	4	12
2-3	88000192 88000194 88000196 88000198		San Dieguito	Rancho Bernardo	1965	C	2	10
4	88000505		Peñasquitos	11044 Via San Marco	N/A	C	2	4
5	N/A	X	Peñasquitos	Scripps Poway Pkwy & Scripps Summit Dr	1992	C	1	10
6	88000321		Peñasquitos	11689 Sorrento Valley Rd	N/A	C	2	20
6a	N/A		Peñasquitos	Industrial Court	N/A	C	1	12
7-8	88000138 88000317	X X	Peñasquitos	Los Peñasquitos Channel	N/A	E	3	50
9	88000251		Peñasquitos	11000 Roselle St/11100 Flinkote Ave	1975	C	1/2	8
10	88000250		Peñasquitos	Dunhill St & Roselle St	1962	E	4	4
11-12	88000247 88000249 88000250 88000251	X X X	Peñasquitos	Soledad Creek Channel	Pre 61	Part E, Part C	1	20
13-17	88000247 88000249 88000250 88000251	X	Peñasquitos	Soledad Creek Channel	Pre 61	E	1	20
18	88000321		Peñasquitos	Maya Linda & Via Pasar	1983	E	4/1	8
19	88000502		Peñasquitos	Candida & Via Pasar	1981	C	2	8
20	88000502		Peñasquitos	10205 Pomerado Rd	1970	C	4	10
21	88000502		Peñasquitos	10249 Pinetree Dr	N/A	C	3	20
22	88000321		Peñasquitos	NE Corner Pomerado Rd & Scripps Ranch Blvd	N/A	C	1	4
23	N/A		Peñasquitos	Pomerado Rd & Avenida Magnifica	N/A	C	1	6
24	88000748		Peñasquitos	Scenic Pl & Cliff Ridge	1973	E	1	10
25	88000321		Peñasquitos	Ardath Rd from Esterel to Ardath Ln	N/A	C	4	4
26	88000321	X	Peñasquitos	Hillside Dr from Rue Adriane to Via Capri	N/A	C	4	4
27	88000199	X	Peñasquitos	Rose Creek Channel	1963	E	1/4	60
28	88000199 88000201	X	Peñasquitos	Rose Creek Channel	1963	E, except south of Gilman is C	1 or 4	68

Appendix A (cont.)
STORM WATER SYSTEM CHANNELS AND DETENTION BASINS

Map No.	City Equipment No.	MHPA*	Hydrologic Unit	Facility Description	Year Built or Initiation of Maintenance	Type†	Maintenance Method‡	Estimated Disturbance Width (ft)
CHANNEL (cont.)								
29-30; 30a-b	88000203 88000205 88000206 88000207	X X X X	Peñasquitos	Rose Creek Channel	1956	½ E, ½ C	1	20-100
31	88000321		Peñasquitos	3053 Renault Way	N/A	C	4	7.5
32	88000207 88000208		Peñasquitos	Rose Creek Channel	N/A	E west of railroad, remainder is C	1	90
33	88000209		Peñasquitos	Rose Creek Channel	N/A	C	1	100-130
34	88000210 88000211		Peñasquitos	Rose Creek Channel	1959	Approx 375 linear ft C, remainder E	1	50-150
35	88000211	X	Peñasquitos	Rose Creek Channel	N/A	E	1	80
36	88000502		Peñasquitos	Mission Bay High School	1963	C	2	4
37	88000321		Peñasquitos	Pacific Beach Dr & Olney St	1968	E	4	10
38	80025515		Peñasquitos	Drain Structures – Lakehurst Ave	N/A	E	1	9
39	80025600		Peñasquitos	Drain Structures – Clairemont Dr	N/A	E	5	15
40-42	88000024 88000026 88000029 88000031 88000033		Peñasquitos	Chateau Channel	1966	C	2	30
43	88000502		Peñasquitos	Thornwood St & Mario Pl	N/A	C	2	5
44	80025801		Peñasquitos	Drain Structures – Beal St	N/A	E	1	9
45	80025988		Peñasquitos	Drain Structures – Mesa College Way	N/A	E	3	2
46	N/A		Peñasquitos	Clairemont Mesa & 805 behind Hotel	N/A	E	5	2
47	88000321		San Diego	7969 & 7971 Engineer Rd	1962	E in middle; C either end	2	3
48	N/A		San Diego	3860 Calle Fortunada	N/A	E	1	4
49-50	88000146 880001481		San Diego	Murphy Canyon Channel	1983	E	3	80
51	N/A		San Diego	Red River Dr & Conestoga Dr	1965	C	1	50
52	88000321		San Diego	Camino del Arroyo	1966	C	1/2	4
53	88000065		San Diego	Cowles Mtn Channel	1969	C	2	15

Appendix A (cont.)
STORM WATER SYSTEM CHANNELS AND DETENTION BASINS

Map No.	City Equipment No.	MHPA*	Hydrologic Unit	Facility Description	Year Built or Initiation of Maintenance	Type†	Maintenance Method‡	Estimated Disturbance Width (ft)
CHANNEL (cont.)								
54	88000212 88000214		San Diego	San Carlos Channel	1963	C	1 & 2	30
55	80031810		Peñasquitos	West Morena Blvd	N/A	E	1 & 2	40-50
55-57	88000295 88000296 88000298		Peñasquitos	Tecolote Creek Channel	1957	C	2	40-50
58	88000155 88000156		San Diego	Murphy Canyon Channel	1983	E	1	70
58a	88000150		San Diego	Murphy Canyon	N/A	E	2	40
58a	88000151		San Diego	Murphy Canyon	N/A	E	1	40
58a	88000152		San Diego	Murphy Canyon	N/A	C	3	30
59-60	88000019 88000020 88000022	X	San Diego	Alvarado Channel	N/A	½ E, ½ C	1	45
61-62	88000009 88000011 88000013 88000015 88000016		San Diego	Alvarado Channel	1968	C	1	60
62a	88000008		San Diego	Alvarado Channel	N/A	E	1	70
63	88000004		San Diego	Alvarado Channel	1968	E	4	12-40
64	88000002 88000003 88000004	X	San Diego	Alvarado Channel	1976	½ E, ½ C	1 & 2	12-35
65	88000085		San Diego	Fairmont Channel	1960	E	2	8
65a	88000087		San Diego	Fairmont Channel	1960	C	1	10
65a	88000089	X	San Diego	Fairmont Channel	1960	C	2	5
65b	88000091	X	San Diego	Fairmont Channel	1960	E	2	20
65b	88000093		San Diego	Fairmont Channel	1960	C	3	5
65b-c	88000095	X	San Diego	Fairmont Channel	1960	E	3	4
66	88000142 88000143 88000145		San Diego	Montezuma Channel	1958	C	1 & 2	20

Appendix A (cont.)
STORM WATER SYSTEM CHANNELS AND DETENTION BASINS

Map No.	City Equipment No.	MHPA*	Hydrologic Unit	Facility Description	Year Built or Initiation of Maintenance	Type†	Maintenance Method‡	Estimated Disturbance Width (ft)
CHANNEL (cont.)								
66a	88000140	X	San Diego	Montezuma Channel	1960	E	1	16
67	88000104 88000106		Pueblo San Diego	Home Avenue Channel	1960	E	1	8
67a	88000044 88000046	X	Pueblo San Diego	Chollas Creek	1957	E	1	10
68	88000108 88000110 88000112		Pueblo San Diego	Home Avenue Channel	1960	½ E, ½ C	2	12
69	88000112 88000114		Pueblo San Diego	Home Avenue Channel	1957	C	1	20
70	88000117 88000119		Pueblo San Diego	Home Avenue Channel	N/A	Approx 994 linear ft E, 430 linear ft C	1	40
71-72	88000037 88000039 88000041 88000042		Pueblo San Diego	Chollas Creek Channel	1985	Approx 806 linear ft E, remainder C	2	40
73-75	88000048	X	Pueblo San Diego	Chollas Creek Channel	1960	E	3	20-70
76-77	88000121 88000123 88000125		Pueblo San Diego	Home Avenue Channel	N/A	E	2 & 3	40
78-80	88000050 88000051		Pueblo San Diego	Chollas Creek Channel	N/A	C, except approx. 1,200 linear ft on Map 80 is E	2	70
79	88000066		Pueblo San Diego	Delevan Dr	1951	E	1	30
81	88000502		San Diego	Camino de la Reina & Camino del Arroyo	1966	C	4	4
82	88000181 88000182		San Diego	Nimitz Channel	1963	Approx 188 linear ft earthen bottom, 320 linear ft C	4	10
82	88000183		San Diego	Nimitz Channel	1969	E	1	5
83	88000183		San Diego	Famosa Blvd & Valeta St	1970	C	2	10

Appendix A (cont.)
STORM WATER SYSTEM CHANNELS AND DETENTION BASINS

Map No.	City Equipment No.	MHPA*	Hydrologic Unit	Facility Description	Year Built or Initiation of Maintenance	Type†	Maintenance Method‡	Estimated Disturbance Width (ft)
CHANNEL (cont.)								
84	88000312 88000313 88000314		Pueblo San Diego	Washington Channel	N/A	Approx. 150 linear ft E, 56 linear ft C	1	15
85	88000102 88000103	X X	Pueblo San Diego	Florida Canyon Channel	1959	E	1	50
86	88000189 88000190 88000191		Pueblo San Diego	Pershing Channel	N/A	C	2	35
87	80028073		Pueblo San Diego	Drain Structures – between 26 th and 27 th sts	1987	E	4	12
88	88000293		Pueblo San Diego	Switzer Creek Channel	1980	C	1	50
89	88000051 88000053		Pueblo San Diego	Chollas Creek Channel	1965	C	2	70
90	N/A		Pueblo San Diego	Imperial Ave & Gillette St	N/A	E	4	12
91	88000053		Pueblo San Diego	Chollas Creek Channel	1957	C	1	70
92	80039275		Pueblo San Diego	35th St & Martin Ave	N/A	E	4	12
93	88000053 88000054 88000055		Pueblo San Diego	Chollas Creek Channel	1957	Part E, part C	1	60
94-95	88000055 88000292		Pueblo San Diego	South Chollas Creek Channel	N/A	Concrete sides, E bottom	1	70
96	80028356		Pueblo San Diego	Drain Structures – Boston Ave & Z St	N/A	E	1	15
97a, 97-99	88000282 88000285 88000287 88000288 88000289 88000290 88000291 88000292		Pueblo San Diego	South Chollas Creek Channel	N/A	Concrete sides, E bottom	1	50

Appendix A (cont.)
STORM WATER SYSTEM CHANNELS AND DETENTION BASINS

Map No.	City Equipment No.	MHPA*	Hydrologic Unit	Facility Description	Year Built or Initiation of Maintenance	Type†	Maintenance Method‡	Estimated Disturbance Width (ft)
CHANNEL (cont.)								
100	88000321		Pueblo San Diego	42 nd & J St	N/A	E	4	3
101-104	88000261 88000262 88000266 88000268 88000270 88000272 88000274 88000276	X	Pueblo San Diego	South Chollas Creek Channel	N/A	Part E, part C	2 & 3	20-50
105	N/A		Pueblo San Diego	Euclid & Castana	1960	E	4	12
106-107	88000079 88000080 88000081		Pueblo San Diego	Encanto Channel	1970	Part E, part C	1 & 2	30-65
108-111	88000069 88000071 88000073 88000075 88000077 88000079		Pueblo San Diego	Encanto Channel	1970	C	2	20
109	88000136		Pueblo San Diego	Jamacha Channel	N/A	E	4	15
112	880038398		Pueblo San Diego	Madera & Broadway	N/A	C	2	20
113-115	88000126 88000128 88000130 88000132 88000134 88000136		Pueblo San Diego	Jamacha Channel	1985	E	1 & 2	30
116	88000253 88000255		Pueblo San Diego	Solola Channel	N/A	E	1	30

Appendix A (cont.)
STORM WATER SYSTEM CHANNELS AND DETENTION BASINS

Map No.	City Equipment No.	MHPA*	Hydrologic Unit	Facility Description	Year Built or Initiation of Maintenance	Type†	Maintenance Method‡	Estimated Disturbance Width (ft)
CHANNEL (cont.)								
117	88000255 88000256 88000258		Pueblo San Diego	Solola Channel	N/A	Part E, part C	2	30
118-119	88000258 88000260		Pueblo San Diego	Solola Channel	N/A	C	2	30
120-121	88000056 88000058 88000060 88000062 88000064		Pueblo San Diego	Cottonwood Channel	N/A	C	2	30
122	88000188		Sweetwater	Parkside Channel	N/A	C	2	35
123	88000229		Tijuana	Sanyo Channel	1987	C	2	50
124	N/A		Tijuana	La Media & Airway	N/A	E	4	25
125	N/A		Tijuana	Camino Maquiladora & Cactus	N/A	C	2 & 4	20
126	88000321 88000502		Tijuana	Siempre Viva & Bristow	1988	E	4	12-25
127	N/A		Tijuana	Britannia & Bristow	1988	E	4	20
128	88000308 88000309 88000311		Tijuana	Virginia Channel	N/A	E	2 & 4	15
129	88000238 88000239 88000240 88000242 88000244		Tijuana	Smythe Channel	1986	C, except southernmost 110 linear ft is E	2	30-50
130	88000233		Tijuana	Smythe Channel	1979	E	2	60
131	88000157 88000159 88000160 88000163		Otay	Nestor Creek Channel	1987	Part E, part C	1 & 2	30
132-133	88000167 88000169 88000174 88000176		Otay	Nestor Creek Channel	1979	E	1 & 2	30-50
134	88000178 88000180		Otay	Nestor Creek Channel	1990	C	1 & 2	30-50
135	88000322		Otay	Elm & Harris	N/A	C	4	4

Appendix A (cont.)
STORM WATER SYSTEM CHANNELS AND DETENTION BASINS

Map No.	City Equipment No.	MHPA*	Hydrologic Unit	Facility Description	Year Built or Initiation of Maintenance	Type†	Maintenance Method‡	Estimated Disturbance Width (ft)
CHANNEL (cont.)								
136-137	88000301 88000303 88000305		Tijuana	Tocayo Channel	1986	C, except for westernmost 55 linear ft	2	35
137a-c	88000300	X	Tijuana	Tijuana River	1994	E	1	24
138-139	88000232	X	Tijuana	Smugglers Gulch Channel	1994	E	1	50
140-161	88000217 88000219 88000221 88000223 88000225 88000227 88000228	X X X X X X X	San Diego	San Diego River	N/A	E	NA	NA
BASIN								
162-163	N/A		Peñasquitos	Tower Road	N/A	E	1	100
164	N/A		Peñasquitos	Black Mountain Road south of Westview	N/A	E	1	80
5a	N/A		Peñasquitos	12350 Black Mountain Road n/o Mercy Road	N/A	E	1	50
165	N/A		Peñasquitos	9262 Camino Santa Fe	N/A	E	1	10
166	N/A		Peñasquitos	Carmel Country Rd Bridge south of SR 56	N/A	E	1	200
167	N/A		Peñasquitos	Westside El Camino Real south of SR 56	N/A	E	1	50
168	N/A		Peñasquitos	Northside Genesee east of Science Center Dr	N/A	E	1	100
169	N/A		San Dieguito	13153 Paseo del Verano	N/A	C	1	140
170	N/A	X	Peñasquitos	Roselle Street (dead end)	N/A	E	1	100
171-172	N/A		Peñasquitos	Scripps Lake Drive west of Treena St	N/A	E	1	15-20
23a	N/A	X	Peñasquitos	12660 Legacy Road	N/A	E	1	100
131	N/A		Otay	30 th & Del Sol Blvd	N/A	E	1	300

N/A=unknown or not applicable

*X=Equipment No. segment is wholly or partially within the MHPA

†C=concrete lined; E=earthen

‡Method 1=Equipment such as a skid-steer or bulldozer enters the drainage using existing access and pushes the accumulated material with a bucket to a site within the drainage. The material is scooped with a loader in the drainage or a Gradall along the top of the drainage bank and loaded into a dump truck. Alternatively, a loader enters the drainage, scoops material, and loads it into a dump truck; Method 2=This method is the same as Method 1, except no access ramp is available. Equipment is lowered into the channel with a larger piece of equipment (crane or Gradall); Method 3=This method is the same as Method 1, except that a temporary ramp is constructed and removed after maintenance; Method 4=No equipment enters the channel. A Gradall or excavator operates from the bank to scoop the accumulated material from outside the drainage and load it onto dump trucks for off-site disposal.

CITY OF SAN DIEGO MASTER STORMWATER SYSTEM
MAINTENANCE PROGRAM

Appendix B
VEGETATION/WETLAND DELINEATION MAPS

NOTE:

A legend for all maps in this appendix is included in the pocket following this cover

APPENDIX C

PLANT SPECIES OBSERVED

Appendix C
 PLANT SPECIES OBSERVED –
 CITY OF SAN DIEGO MASTER STORM WATER SYSTEM MAINTANENCE PROGRAM

<u>FAMILY</u>	<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>	<u>HABITAT</u> ‡
DICOTYLEDONS			
Aizoaceae	<i>Carpobrotus chilensis</i> *	sea-fig	NNV/ORN
	<i>Carpobrotus edulis</i> *	hottentot-fig	NNV/ORN
	<i>Mesembryanthemum crystallinum</i> *	crystalline iceplant	NNV/ORN
Anacardiaceae	<i>Malosma laurina</i>	laurel sumac	DCSS, SMC, SRW
	<i>Rhus integrifolia</i>	lemonadeberry	DCSS, SMC, SOC
	<i>Schinus molle</i> *	Peruvian pepper tree	NNV/ORN
	<i>Schinus terebinthifolius</i> *	Brazilian pepper tree	CSM, NNV/ORN, SWS
	<i>Toxicodendron diversilobum</i>	poison oak	MFS, RW, SRW
Apiaceae	<i>Apium graveolens</i> *	common celery	DW, FWM
	<i>Conium maculatum</i> *	poison hemlock	DW
	<i>Foeniculum vulgare</i> *	fennel	DH/RUD, DW, NNG, NNV/ORN
Apocynaceae	<i>Nerium oleander</i> *	oleander	NNV/ORN
Asteraceae	<i>Ambrosia chamissonis</i>	beach-bur	SFD
	<i>Ambrosia monogyra</i> †	single-whorl burrobush	DH/RUD
	<i>Ambrosia psilostachya</i>	western ragweed	NNG
	<i>Artemisia californica</i>	California sagebrush	CSCS, DCSS
	<i>Artemisia douglasiana</i>	mugwort	MFS, SRF
	<i>Baccharis pilularis</i>	coyote brush	BS, DCSS, RW
	<i>Baccharis salicifolia</i>	mule fat	DW, FWM, MFS, RS, SRF, SWS
	<i>Baccharis sarothroides</i>	broom baccharis	BS, DCSS
	<i>Centaurea melitensis</i> *	star-thistle	DCSS, DH/RUD, NNG
	<i>Chrysanthemum coronarium</i> *	garland daisy	DH/RUD
	<i>Cirsium vulgare</i> *	bull thistle	DW
	<i>Conyza canadensis</i>	horseweed	NNG
	<i>Corethrogyne filaginifolia</i>	common sand-aster	DCSS, NNG
	<i>Cotula coronopifolia</i> *	African brass-buttons	CAM
	<i>Deinandra fasciculata</i>	fascicled tarplant	NNG
	<i>Encelia californica</i>	California encelia	DCSS
	<i>Hedypnois cretica</i> *	crete hedypnois	NNG
	<i>Isocoma menziesii</i> var. <i>menziesii</i>	San Diego goldenbush	RS
	<i>Iva hayesiana</i> †	San Diego marsh-elder	DCSS, RS
	<i>Jaumea carnosia</i>	fleshy jaumea	CSM
	<i>Picris echioides</i> *	bristly ox-tongue	CAM, DW
	<i>Pluchea odorata</i>	salt marsh fleabane	FWM
	<i>Pluchea sericea</i>	arrow weed	MFS
<i>Sonchus</i> sp.*	sow-thistle	DW, NNG	
<i>Viguiera laciniata</i> †	San Diego County viguiera	DCSS	
<i>Xanthium strumarium</i>	cocklebur	DW, FWM, SWS	

Appendix C (cont.)
 PLANT SPECIES OBSERVED –
 CITY OF SAN DIEGO MASTER STORM WATER SYSTEM MAINTANENCE PROGRAM

<u>FAMILY</u>	<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>	<u>HABITAT</u> ‡
DICOTYLEDONS (cont.)			
Brassicaceae	<i>Brassica nigra</i> *	black mustard	DCSS, DH/RUD, NNG
	<i>Cakile maritima</i> *	sea rocket	SFD
	<i>Hirschfeldia incana</i> *	perennial mustard	DCSS, DH/RUD, NNG
	<i>Raphanus sativus</i> *	wild radish	DH/RUD, DW, NNG
	<i>Rorippa nasturtium-aquaticum</i>	water cress	FWM
Cactaceae	<i>Cylindropuntia prolifera</i>	coastal cholla	DCSS
	<i>Opuntia littoralis</i>	coastal prickly pear	DCSS
Caprifoliaceae	<i>Lonicera japonica</i> *	Japanese honeysuckle	NNV/ORN
	<i>Lonicera subspicata</i> var. <i>subspicata</i>	San Diego honeysuckle	DCSS
	<i>Sambucus mexicana</i>	blue elderberry	RW
Chenopodiaceae	<i>Salicornia</i> sp.	glasswort	CBM, CSM
	<i>Salsola tragus</i> *	Russian thistle	DH/RUD
Euphorbiaceae	<i>Ricinus communis</i> *	castor-bean	DH/RUD, DW, SRF, SRW
Fabaceae	<i>Acacia longifolia</i> *	golden wattle	NNV/ORN
	<i>Medicago polymorpha</i> *	bur-clover	NNG
	<i>Melilotus indicus</i>	Indian sweet-clover	DH
Fagaceae	<i>Quercus agrifolia</i> var. <i>agrifolia</i>	coast live oak	CLOW, SRF
	<i>Quercus dumosa</i>	Nuttall's scrub oak	SOC
Frankeniaceae	<i>Frankenia salina</i>	alkali-heath	CSM
Geraniaceae	<i>Erodium</i> sp.*	filaree	DCSS, DH/RUD, NNG
Lamiaceae	<i>Marrubium vulgare</i> *	horehound	DH/RUD
	<i>Salvia apiana</i>	white sage	DCSS
	<i>Salvia mellifera</i>	black sage	CSCS, DCSS
Lythraceae	<i>Lythrum californicum</i>	California loosestrife	CSM
	<i>Lythrum byssopifolia</i> *	grass poly	DW
Malvaceae	<i>Malva parviflora</i> *	cheeseweed	DH/RUD, NNG, SFD
Myoporaceae	<i>Myoporum laetum</i> *	myoporum	NNV/ORN
Myrtaceae	<i>Eucalyptus</i> sp.*	eucalyptus	EW, NNV/ORN, SWS
Onagraceae	<i>Camissonia cheiranthifolia</i> ssp. <i>suffruticosa</i>	beach evening primrose	SFD
	<i>Epilobium ciliatum</i> ssp. <i>ciliatum</i>	willow herb	FWM
	<i>Ludwigia peploides</i>	water-primrose	FWM, SRF
	<i>Oenothera elata</i> ssp. <i>hookeri</i>	Hooker's evening-primrose	CAM, RS, SRF
Oxalidaceae	<i>Oxalis pes-caprae</i> *	Bermuda-buttercup	NNG
Phrymaceae	<i>Mimulus aurantiacus</i>	bush monkey-flower	DCSS
Plantaginaceae	<i>Plantago lanceolata</i> *	English plantain	DW, NNG
Platanaceae	<i>Platanus racemosa</i>	western sycamore	MFS, SRF, SRW, SWS
Plumbaginaceae	<i>Limonium californicum</i>	western marsh- rosemary	CSM

Appendix C (cont.)
 PLANT SPECIES OBSERVED –
 CITY OF SAN DIEGO MASTER STORM WATER SYSTEM MAINTANENCE PROGRAM

<u>FAMILY</u>	<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>	<u>HABITAT</u> ‡
DICOTYLEDONS (cont.)			
Polygonaceae	<i>Eriogonum fasciculatum</i> ssp. <i>fasciculatum</i>	California buckwheat	DCSS
	<i>Rumex crispus</i> *	curly dock	DW, FWM, NNG, SWS
Rosaceae	<i>Adenostema fasciculatum</i>	chamise	CSCS, SMC
	<i>Cercocarpus minutiflorus</i>	mountain mahogany	SMC, SOC
	<i>Heteromeles arbutifolia</i>	toyon	DCSS, SMC
	<i>Rosa californica</i>	California rose	SRF
Rutaceae	<i>Citrus</i> sp.*	citrus	NNV/ORN
Salicaceae	<i>Populus fremontii</i>	Fremont cottonwood	SRF, SRW, SWS
	<i>Salix exigua</i>	narrow-leaved willow	SWS
	<i>Salix gooddingii</i>	Goodding's black willow	SRF, SWS
	<i>Salix laevigata</i>	red willow	SRF, SWS
	<i>Salix lasiolepis</i>	arroyo willow	FWM, MFS, RS, SRF, SWS
Sapindaceae	<i>Cupaniopsis anacardioides</i> *	carrotwood	NNV/ORN
Saururaceae	<i>Anemopsis californica</i>	yerba mansa	CAM, MFS, SRF
Solanaceae	<i>Nicotiana glauca</i> *	tree tobacco	SRF
Tamaricaceae	<i>Tamarix</i> sp.*	tamarisk	CAM, MFS, SWS
Tropaeolaceae	<i>Tropaeolum majus</i> *	garden nasturtium	SRF
Urticaceae	<i>Urtica dioica</i>	stinging nettle	SRF
	<i>Urtica urens</i> *	dwarf nettle	DH/RUD
Vitaceae	<i>Vitis girdiana</i>	wild grape	SRF
MONOCOTYLEDONS			
Agavaceae	<i>Agave americana</i> *	century plant	NNV/ORN
Araceae	<i>Lemna</i> sp.	duckweed	OW
Arecaceae	<i>Phoenix canariensis</i> *	Canary Island date palm	NNV/ORN
	<i>Washingtonia robusta</i> *	Mexican fan palm	FWM, NNV/ORN, SRF, SWS
Cyperaceae	<i>Carex</i> sp.	sedge	CAM
	<i>Cyperus eragrostis</i>	tall flatsedge	FWM
	<i>Cyperus involucratus</i> *	umbrella sedge	DW, FWM, SRF
	<i>Eleocharis macrostachya</i>	pale spike-rush	FWM
	<i>Eleocharis montevidensis</i>	slender creeping spike-rush	FWM
	<i>Scirpus californicus</i>	California bulrush	FWM, SWS
	<i>Scirpus maritimus</i>	bulrush	FWM

Appendix C (cont.)
 PLANT SPECIES OBSERVED –
 CITY OF SAN DIEGO MASTER STORM WATER SYSTEM MAINTANENCE PROGRAM

<u>FAMILY</u>	<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>	<u>HABITAT</u> ‡
MONOCOTYLEDONS (cont.)			
Juncaceae	<i>Juncus acutus</i> ssp. <i>leopoldii</i> †	southwestern spiny rush	CAM, CBM, FWM, MFS, SRF
	<i>Juncus mexicanus</i>	Mexican rush	CAM, SRF
	<i>Triglochin maritima</i>	arrow-grass	CSM
Poaceae	<i>Arundo donax</i> *	giant reed	DW, SRF, SWS
	<i>Avena</i> sp.*	oats	EW, NNG
	<i>Bromus diandrus</i> *	common ripgut grass	CLOW, EW, NNG, SRW
	<i>Bromus hordeaceus</i> *	soft chess	NNG
	<i>Bromus madritensis</i> ssp. <i>rubens</i> *	foxtail chess	EW, NNG
	<i>Cortaderia selloana</i> *	pampas grass	CAM, NNV/ORN, SRF, SWS
	<i>Deschampsia danthonioides</i>	annual hairgrass	DW, NNG
	<i>Distichlis spicata</i>	saltgrass	CAM, CBM, CSM
	<i>Echinochloa crus-galli</i> *	common barnyard-grass	SRF
	<i>Lolium multiflorum</i> *	Italian ryegrass	DW, NNG
	<i>Paspalum dilatatum</i> *	dallis grass	DW
	<i>Pennisetum setaceum</i> *	fountain grass	NNG, NNV/ORN
	<i>Phalaris</i> sp.*	canary grass	DW
	<i>Piptatherum miliaceum</i> *	smilo grass	CLOW, DH/RUD
	<i>Polypogon monspeliensis</i> *	rabbitsfoot grass	DW, FWM
Typhaceae	<i>Typha</i> sp.	cattail	CBM
	<i>Typha domingensis</i>	southern cattail	FWM, SWS
	<i>Typha latifolia</i>	broad-leaved cattail	DW, FWM, SRF, SWS

GYMNOSPERM

Pinaceae	<i>Pinus</i> sp.*	pine	NNV/ORN
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*Non-native species

†Sensitive species

‡Habitat acronyms: BS=broom baccharis scrub, CAM=cismontane alkali marsh, CBM=coastal brackish marsh, CLOW=coast live oak woodland, CSCS=coastal sage-chaparral scrub, CSM=southern coastal saltmarsh, DCSS=Diegan coastal sage scrub, DH/RUD=disturbed habitat/ruderal, DW=disturbed wetland, EW=eucalyptus woodland, FWM=freshwater marsh, MFS=mule fat scrub, NNG=non-native grassland, NNV/ORN=non-native vegetation/ornamental, RS=riparian scrub, RW=riparian woodland, SFD=southern foredunes, SMC=southern mixed chaparral, SOC=scrub oak chaparral, SRF=southern riparian forest, SRW=southern sycamore riparian woodland, SWS=southern willow scrub

APPENDIX D

ANIMAL SPECIES OBSERVED OR DETECTED

Appendix D
 ANIMAL SPECIES OBSERVED OR DETECTED –
 CITY OF SAN DIEGO MASTER STORM WATER SYSTEM MAINTANENCE PROGRAM

SCIENTIFIC NAME

COMMON NAME

INVERTEBRATES

Hemiptera – Bugs

species unknown

water strider

Decapoda – Crayfish, Crabs, Lobsters, Prawns and Shrimp

*Procambarus clarkii**

crayfish

Lepidoptera – Butterflies and Moths

Anthocharis sara

Sara orangetip

Danaus plexippus

monarch

Erynnis funeralis

funereal duskywing

Junonia coenia

common buckeye

Limenitis lorquini

Lorquin's admiral

Nymphalis antiopa

mourning cloak

Papilio rutulus

western tiger swallowtail

Papilio zelicaon

anise swallowtail

Pieris rapae

cabbage white

Pontia protodice

checkered white

Vanessa atalanta rubria

red admiral

Vanessa cardui

painted lady

Odonata – Dragonflies and Damselflies

Libellula saturata

flame skimmer

VERTEBRATES

Amphibian

Ranidae – True Frogs

*Rana catesbeiana**

bullfrog

Reptiles

Colubridae – Colubrid Snakes

Masticophis lateralis

striped racer

Phrynosomatidae – Earless, Spiny, Tree, Side-blotched, and Horned Lizards

Sceloporus occidentalis

western fence lizard

Uta stansburiana

side-blotched lizard

Appendix D (cont.)
 ANIMAL SPECIES OBSERVED OR DETECTED
 CITY OF SAN DIEGO MASTER STORM WATER SYSTEM MAINTANENCE PROGRAM

SCIENTIFIC NAME

COMMON NAME

VERTEBRATES (cont.)

Birds

Accipitridae – Hawks, Old World Vultures, Kites, Harriers, and Eagles

<i>Accipiter cooperii</i> †	Cooper's hawk
<i>Buteo jamaicensis</i>	red-tailed hawk
<i>Buteo lineatus</i>	red-shouldered hawk
<i>Circus cyaneus</i> †	northern harrier

Aegithalidae – Bushtit

<i>Psaltriparus minimus</i>	bushtit
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Alcedinidae – Kingfishers

<i>Ceryle alcyon</i>	belted kingfisher
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Ardeidae – Herons, Egrets and Bitterns

<i>Ardea alba</i>	great egret
<i>Ardea herodias</i>	great blue heron
<i>Butorides virescens</i>	green heron
<i>Egretta caerulea</i> †	little blue heron
<i>Egretta thula</i>	snowy egret
<i>Nycticorax nycticorax</i>	black-crowned night-heron

Anatidae – Dabbling Ducks and Diving Ducks

<i>Anas acuta</i>	northern pintail
<i>Anas americana</i>	American wigeon
<i>Anas clypeata</i>	northern shoveler
<i>Anas crecca</i>	green-winged teal
<i>Anas cyanoptera</i>	cinnamon teal
<i>Anas platyrhynchos</i>	mallard
<i>Anas strepera</i>	gadwall
<i>Aythya americana</i>	redhead
<i>Aythya marila</i>	greater scaup
<i>Lophodytes cucullatus</i>	hooded merganser
<i>Oxyura jamaicensis</i>	ruddy duck

Columbidae – Doves

<i>Zenaida macroura</i>	mourning dove
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Corvidae – Jays, Magpies, and Crows

<i>Abelocoma californica</i>	western scrub-jay
<i>Calocitta colliei</i>	black-throated magpie jay
<i>Corvus brachyrhynchos</i>	American crow
<i>Corvus corax</i>	common raven

Appendix D (cont.)
 ANIMAL SPECIES OBSERVED OR DETECTED
 CITY OF SAN DIEGO MASTER STORM WATER SYSTEM MAINTANENCE PROGRAM

SCIENTIFIC NAME

COMMON NAME

VERTEBRATES (cont.)

Birds (cont.)

Emberizidae – Sparrows, Longspurs, and Emberiza Buntings

<i>Melospiza melodia</i>	song sparrow
<i>Pipilo crissalis</i>	California towhee
<i>Pipilo maculatus</i>	spotted towhee
<i>Zonotrichia leucophrys</i>	white-crowned sparrow

Falconidae – Falcons

<i>Falco sparverius</i>	American kestrel
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Fringillidae – Finches

<i>Carpodacus mexicanus</i>	house finch
<i>Carduelis psaltria</i>	lesser goldfinch

Hirundinidae – Swallows

<i>Petrochelidon pyrrhonota</i>	cliff swallow
<i>Stelgidopteryx serripennis</i>	northern rough-winged swallow

Icteridae – Orioles, Meadowlarks, Blackbirds, and Relatives

<i>Agelaius phoeniceus</i>	red-winged blackbird
<i>Icterus cucullatus</i>	hooded oriole
<i>Sturnella neglecta</i>	western meadowlark

Laridae – Skuas, Jaegers, Gulls, Terns, and Skimmers

<i>Larus</i> sp.	gull
<i>Sterna</i> sp.	Caspian or royal tern

Mimidae – Mimic Thrushes

<i>Mimus polyglottos</i>	northern mockingbird
<i>Toxostoma redivivum</i>	California thrasher

Parulidae – Wood-warblers

<i>Dendroica coronata</i>	yellow-rumped warbler
<i>Dendroica petechia</i>	yellow warbler†
<i>Geothlypis trichas</i>	common yellowthroat
<i>Vermivora celata</i>	orange-crowned warbler

Pelecanidae – Pelicans

<i>Pelecanus occidentalis californicus</i>	California brown pelican†
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Phalacrocoracidae – Cormorants

<i>Phalacrocorax auritus</i>	double-crested cormorant†
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Picidae – Woodpeckers

<i>Colaptes auratus</i>	northern flicker
<i>Picoides nuttallii</i>	Nuttall's woodpecker
<i>Pocpodes pubescens</i>	downy woodpecker

Appendix D (cont.)
 ANIMAL SPECIES OBSERVED OR DETECTED
 CITY OF SAN DIEGO MASTER STORM WATER SYSTEM MAINTANENCE PROGRAM

<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>
VERTEBRATES (cont.)	
<u>Birds</u> (cont.)	
Podicipedidae – Grebes	
<i>Aechmophorus</i> sp.	western or Clark's grebe
<i>Podilymbus podiceps</i>	pied-billed grebe
Rallidae – Rails	
<i>Fulica americana</i>	American coot
Scolopacidae – Sandpipers and Phalaropes	
<i>Actitis macularia</i>	spotted sandpiper
<i>Calidris minutilla</i>	least sandpiper
<i>Catoptrophorus semipalmatus</i>	willet
<i>Gallinago delicata</i>	Wilson's snipe
<i>Tringa</i> sp.	yellowlegs
Sturnidae – Starlings	
<i>Sturnus vulgaris</i>	European starling
Sylviidae – Gnatcatchers and Old World Warblers	
<i>Poliophtila californica californica</i> †	coastal California gnatcatcher
Timaliidae – Wrentit	
<i>Chamaea fasciata</i>	wrentit
Trochilidae – Hummingbirds	
<i>Calypte anna</i>	Anna's hummingbird
Troglodytidae – Wrens	
<i>Thryomanes bewickii</i>	Bewick's wren
<i>Troglodytes aedon</i>	house wren
Turdidae – Thrushes	
<i>Sialia mexicana</i> †	western bluebird
<i>Turdus migratorius</i>	American robin
Tyrannidae – Flycatchers	
<i>Empidonax difficilis</i>	Pacific-slope flycatcher
<i>Sayornis nigricans</i>	black phoebe
<i>Tyrannus vociferans</i>	Cassin's kingbird
<u>Mammals</u>	
Canidae – Coyotes, Wolves, Foxes, and Dogs	
<i>Canis familiaris</i>	feral dog, domestic dog
<i>Canis latrans</i>	coyote (scat, tracks)
Felidae – Cats and Relatives	
<i>Felis domestica</i>	feral cat, domestic cat

Appendix D (cont.)
 ANIMAL SPECIES OBSERVED OR DETECTED
 CITY OF SAN DIEGO MASTER STORM WATER SYSTEM MAINTANENCE PROGRAM

SCIENTIFIC NAME

COMMON NAME

VERTEBRATES (cont.)

Mammals (cont.)

Geomyidae – Gophers

Thomomys bottae

Botta's pocket gopher

Leporidae – Rabbits and Hares

Sylvilagus auduboni

desert cottontail

Muridae – Mice, Rats, and Voles

Neotoma sp.

woodrat

Procyonidae – Raccoons, Ringtails, and Coatis

Procyon lotor

raccoon

Sciuridae – Squirrels, Chipmunks, and Marmots

Spermophilus beecheyi

California ground squirrel

†Sensitive species

*Introduced species

APPENDIX E

EXPLANATION OF STATUS CODES
FOR PLANT AND ANIMAL SPECIES

Appendix E
EXPLANATION OF STATUS CODES FOR PLANT AND ANIMAL SPECIES

<u>U.S. Fish and Wildlife Service (USFWS)</u>		<u>California Department of Fish and Game (CDFG)</u>	
FE	Federally listed endangered	SE	State listed endangered
FT	Federally listed threatened	ST	State listed threatened
BCC	Birds of Conservation Concern (discussed in more detail, below)	SR	State listed rare
		SSC	State species of special concern

USFWS Birds of Conservation Concern (BCC)

The primary legal authority for Birds of Conservation Concern (2002) is the Fish and Wildlife Conservation Act of 1980 (FWCA), as amended. Other authorities include the Endangered Species Act, Fish and Wildlife Act (1956) and 16 USC §701. A FWCA 1988 amendment (Public Law 100-653, Title VIII) requires the Secretary of the Interior through the USFWS to “identify species, subspecies, and populations of all migratory non-game birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act of 1973.” The BCC report is the most recent effort by the USFWS to carry out this proactive conservation mandate.

The BCC report aims to identify accurately the migratory and non-migratory bird species (beyond those already designated as federally threatened or endangered) that represent the USFWS’ highest conservation priorities and draw attention to species in need of conservation action. The USFWS hopes that by focusing attention on these highest priority species, the report will promote greater study and protection of the habitats and ecological communities upon which these species depend, thereby ensuring the future of healthy avian populations and communities. The report is available online at <http://www.fws.gov/migratorybirds/reports/BCC2002.pdf>.

Multiple Species Conservation Program (MSCP) Covered

MSCP covered species for which the City has take authorization within MSCP area.

Narrow Endemic Species

Some native species, primarily plants with restricted geographic distributions, soil affinities, and/or habitats, are referred to as narrow endemic species. For vernal pools and identified narrow endemic species, the jurisdictions will specify measures in their respective subarea plans to ensure that impacts to these resources are avoided to the maximum extent practicable.

Appendix E (cont.)
EXPLANATION OF STATUS CODES FOR PLANT AND ANIMAL SPECIES

California Native Plant Society (CNPS) Codes

List	Threat Code Extension
1A = Presumed extinct.	.1 = Seriously endangered in California (over 80 percent of occurrences threatened/high degree and immediacy of threat)
1B = Rare, threatened, or endangered in California and elsewhere. Eligible for state listing.	.2 = Fairly endangered in California (20 to 80 percent occurrences threatened)
2 = Rare, threatened, or endangered in California but more common elsewhere. Eligible for state listing.	.3 = Not very endangered in California (less than 20 percent of occurrences threatened, or no current threats known)
3 = Distribution, endangerment, ecology, and/or taxonomic information needed. Some eligible for state listing.	A CA Endemic entry corresponds to those taxa that only occur in California.
4 = A watch list for species of limited distribution. Needs monitoring for changes in population status. Few (if any) eligible for state listing.	All List 1A (presumed extinct in California) and some List 3 (need more information; a review list) plants lacking threat information receive no threat code extension. Threat Code guidelines represent only a starting point in threat level assessment. Other factors, such as habitat vulnerability and specificity, distribution, and condition of occurrences, are considered in setting the Threat Code.

APPENDIX F

ESTIMATED IMPACTS
TO CORPS JURISDICTIONAL AREAS

Appendix F ESTIMATED IMPACTS TO CORPS JURISDICTIONAL AREAS (acre[s])																		
Facility ID/ HELIX Map Number(s)	City of San Diego Segment ID	Facility Characteristics*	Habitat													Non-wetland WUS		Total
			Southern Riparian Forest	Southern Sycamore Riparian Woodland	Riparian Woodland	Southern Willow Scrub	Mule Fat Scrub	Riparian Scrub	Freshwater Marsh	Cismontane Alkali Marsh	Southern Coastal Saltmarsh	Coastal Brackish Marsh	Disturbed Wetland	Earthen- bottom	Concrete- lined			
SAN DIEGUITO HYDROLOGIC UNIT (HU)																		
13153 Paseo del Verano, Map 169	N/A	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.19		
Rancho Bernardo Rd & Bernardo Center Dr, Map 1	88000504	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01		
Rancho Bernardo Channel, Maps 2-3	88000192 88000194 88000196 88000198	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.98	0.98		
Subtotal			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	1.17	1.18		
PEÑASQUITOS HU																		
9262 Camino Santa Fe, Map 165	N/A	Earthen-bottom	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02		
Black Mountain Road south of Westview, Map 164	N/A	Earthen-bottom	0.00	0.00	0.00	0.06	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.11		
Carmel Country Rd Bridge south of SR 56, Map 166	N/A	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.01	0.00	0.03		
Westside El Camino Real south of SR 56, Map 167	N/A	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.21		
Northside Genesee east of Science Center Dr, Map 168	N/A	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.41		
Roselle Street (dead end), Map 170	N/A	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.05		
Scripps Lake Dr west of Treena St, Maps 171-172	N/A	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.05		
Tower Rd, Map 162	N/A	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.04		
Tower Rd, Map 163	N/A	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.11		
11044 Via San Marcos, Map 4	88000505	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.06		
Scripps Poway Pkwy & Scripps Summit Dr, Map 5	N/A	Concrete-lined	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.03		
12350 Black Mtn Rd n/o Mercy Rd, Map 5a	N/A	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.64	0.00	0.00	0.00	0.00	0.00	0.00	0.64		
11689 Sorrento Valley Rd (Tripp Ct), Map 6	88000321	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.51	0.51		
Industrial Court, Map 6a	N/A	Concrete-lined	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.12		
Los Peñasquitos Creek, Maps 7-8	88000138 88000317	Earthen-bottom	0.00	0.00	0.00	0.43	0.00	0.00	1.56	0.00	0.00	0.00	0.00	2.82	0.00	4.81		
11000 Roselle St-11100 Flinkote Ave, Map 9	88000251	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.14		
Dunhill St & Roselle, Map 10	88000250	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.04		
Soledad Creek, Maps 11-17	88000247 88000249 88000250 88000251	Maps 11-12=mix; Maps 13-17= earthen-bottom	0.09	0.00	0.00	0.20	0.00	0.00	0.33	0.00	0.00	0.00	0.09	3.88	1.06	5.65		
Maya Linda & Via Pasar, Map 18	88000321	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.10		
Candida & Via Pasar, Map 19	88000502	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.19		
10205 Pomerado Rd, Map 20	88000502	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
10249 Pinetree Dr, Map 21	88000502	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
NE Corner Pomerado Rd & Scripps Ranch Blvd, Map 22	88000321	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Pomerado Rd & Avenida Magnifica, Map 23	N/A	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02		
12660 Legacy Rd, Map 23a	N/A	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Scenic Pl & Cliff Ridge, Map 24	88000748	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01		
Ardath Rd from Esterel to Ardath Ln, Map 25	88000321	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Hillside Dr from Rue Adriane to Via Capri, Map 26	88000321	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

Appendix F (cont.)																	
ESTIMATED IMPACTS TO CORPS JURISDICTIONAL AREAS (acre[s])																	
Drainage ID/ HELIX Map Number(s)	City of San Diego Segment ID	Facility Characteristics*	Habitat												Non-wetland WUS		Total
			Southern Riparian Forest	Southern Sycamore Riparian Woodland	Riparian Woodland	Southern Willow Scrub	Mule Fat Scrub	Riparian Scrub	Freshwater Marsh	Cismontane Alkali Marsh	Southern Coastal Saltmarsh	Coastal Brackish Marsh	Disturbed Wetland	Earthen- bottom	Concrete- lined		
PEÑASQUITOS HU (cont.)																	
Rose Creek, Maps 27-30, 30a-b, and 32-35	88000199 88000201 88000203 88000205 88000206 88000207 88000208 88000209 88000210 88000211	Mix	0.80	0.00	0.00	3.25	0.00	0.00	1.80	0.00	0.94	0.26	0.00	5.67	5.81	18.53	
3053 Renault Way, Map 31	88000321	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Mission Bay High School, Map 36	88000502	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.10	
Pacific Beach Dr & Olney St, Map 37	88000321	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.12	
Drain structures – Lakehurst Ave, Map 38	80025515	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Drain structure – Clairemont Dr, Map 39	80025600	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	
Chateau Channel, Maps 40-42	88000024 88000026 88000029 88000031 88000033	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.77	0.77	
Thornwood St & Mario Pl, Map 43	88000502	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Drain structures – Beal St, Map 44	80025801	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Drain structures – Mesa College Way, Map 45	80025988	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Clairemont Mesa & 805, Map 46	N/A	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
West Morena Blvd, Map 55	80031810	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	
Tecolote Creek, Maps 55-57	88000295 88000296 88000298	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.76	2.76	
Subtotal			0.88	0.00	0.00	3.99	0.00	0.00	5.29	0.00	0.94	0.26	0.09	12.64	11.53	35.62	
SAN DIEGO HU																	
7969 & 7971 Engineer Rd, Map 47	88000321	Mix	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.03	0.06	
3860 Calle Fortunada, Map 48	N/A	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.06	
Murphy Canyon Channel, Maps 49-50 and 58-58a	88000146 88000148 88000150 88000151 88000152 88000155 88000156	Mix	0.27	0.00	0.00	1.63	0.00	0.00	1.21	0.00	0.00	0.00	0.00	0.35	0.18	3.64	
Red River & Conestoga drs, Map 51	N/A	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.16	
Camino del Arroyo, Map 52	88000321	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.06	
Cowles Mountain Channel, Map 53	88000065	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.08	
San Carlos Channel, Map 54	88000212 88000214	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.23	

Appendix F (cont.)																		
ESTIMATED IMPACTS TO CORPS JURISDICTIONAL AREAS (acre[s])																		
Drainage ID/ HELIX Map Number(s)	City of San Diego Segment ID	Facility Characteristics*	Habitat													Non-wetland WUS		Total
			Southern Riparian Forest	Southern Sycamore Riparian Woodland	Riparian Woodland	Southern Willow Scrub	Mule Fat Scrub	Riparian Scrub	Freshwater Marsh	Cismontane Alkali Marsh	Southern Coastal Saltmarsh	Coastal Brackish Marsh	Disturbed Wetland	Earthen- bottom	Concrete- lined			
SAN DIEGO HU (cont.)																		
Alvarado Channel, Maps 59-64	88000002 88000003 88000004 88000008 88000009 88000011 88000013 88000015 88000016 88000019 88000020 88000022	Mix	0.00	0.00	0.00	0.16	0.00	0.00	0.69	0.00	0.00	0.00	0.09	1.64	3.89	6.47		
Fairmont Channel, Maps 65, 65a-c	88000085 88000087 88000089 88000091 88000093 88000095	Mix	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.25	0.51		
Montezuma Channel, Map 66-66a	88000140 88000142 88000143 88000145	Mix	0.00	0.00	0.00	0.23	0.00	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.36	1.15		
Camino de la Reina & Camino del Arroyo, Map 81	88000502	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Nimitz Channel, Map 82	88000181 88000182 88000183	Mix	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.01	0.02	0.05		
Famosa Blvd & Valeta St, Map 83	N/A	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03		
Subtotal			0.27	0.00	0.00	2.97	0.00	0.00	2.54	0.00	0.00	0.00	0.11	2.29	5.28	13.46		
PUEBLO SAN DIEGO																		
Home Ave Channel, Maps 67-70 and 76-77	88000104 88000106 88000108 88000110 88000112 88000114 88000117 88000119 88000121 88000123	Maps 67, 76-77 = earthen-bottom; Map 69 = concrete- lined; remaining = mix	0.00	0.00	0.00	0.09	0.00	0.00	0.02	0.00	0.00	0.00	0.44	0.70	1.26	2.51		

Appendix F (cont.) ESTIMATED IMPACTS TO CORPS JURISDICTIONAL AREAS (acre[s])																		
Drainage ID/ HELIX Map Number(s)	City of San Diego Segment ID	Facility Characteristics*	Habitat													Non-wetland WUS		Total
			Southern Riparian Forest	Southern Sycamore Riparian Woodland	Riparian Woodland	Southern Willow Scrub	Mule Fat Scrub	Riparian Scrub	Freshwater Marsh	Cismontane Alkali Marsh	Southern Coastal Saltmarsh	Coastal Brackish Marsh	Disturbed Wetland	Earthen- bottom	Concrete- lined			
PUEBLO SAN DIEGO (cont.)																		
Chollas Creek, Maps 71-75; 78-80; 89; 91; 93	88000037 88000039 88000041 88000042 88000048 88000050 88000051 88000053 88000054 88000055	Maps 73-75 = earthen-bottom; Maps 89, 91 = concrete-lined; remaining = mix	0.00	0.00	0.00	0.57	0.00	0.22	2.67	0.00	0.45	0.00	1.03	9.31	8.91	23.16		
Delevan Dr, Map 79	88000066	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.23		
Washington Channel, Map 84	88000312 88000313 88000314	Mix	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.01	0.06		
Florida Canyon Channel, Map 85	88000102 88000103	Earthen-bottom	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.00	0.23		
Pershing Channel, Map 86	88000189 88000190 88000191	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.69	0.69		
Drain Structures – 26 th and 27 th sts, Map 87	80028073	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Switzer Creek, Map 88	88000293	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.07		
South Chollas Creek, Maps 94-95; 97-99; 101-104	88000055 88000261 88000262 88000266 88000268 88000270 88000272 88000274 88000276 88000282 88000285 88000287 88000288 88000289 88000290 88000291 88000292	Maps 94-95, 97- 99 = earthen-bottom with concrete sides; Maps 101-104 = mix	0.00	0.00	0.00	0.33	0.19	0.00	0.08	0.00	0.00	0.00	0.00	1.69	2.25	1.40	5.94	
Drain Structures – Boston Ave, Map 96	80028356	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
42 nd & J St, Map 100	88000321	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Euclid & Castana, Map 105	N/A	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.04		

Appendix F (cont.)																		
ESTIMATED IMPACTS TO CORPS JURISDICTIONAL AREAS (acre[s])																		
Drainage ID/ HELIX Map Number(s)	City of San Diego Segment ID	Facility Characteristics*	Habitat													Non-wetland WUS		Total
			Southern Riparian Forest	Southern Sycamore Riparian Woodland	Riparian Woodland	Southern Willow Scrub	Mule Fat Scrub	Riparian Scrub	Freshwater Marsh	Cismontane Alkali Marsh	Southern Coastal Saltmarsh	Coastal Brackish Marsh	Disturbed Wetland	Earthen- bottom	Concrete- lined			
PUEBLO SAN DIEGO HU (cont.)																		
Imperial Ave & Gillette, Map 90	N/A	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.04	
35 th St & Martin Ave, Map 92	80039275	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.07	
Encanto Channel, Maps 106-111	88000069 88000071 88000073 88000075 88000077 88000079 88000080 88000081	Mix	0.00	0.00	0.00	0.13	0.00	0.00	0.00	1.32	0.00	0.00	0.00	0.00	0.33	1.65	3.43	
Jamacha Channel, Maps 109; 113-115	88000126 88000128 88000130 88000132 88000134 88000136	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.07	0.00	0.00	0.00	0.46	0.15	0.00	1.68	
Madera & Broadway, Map 112	N/A	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Solola Channel, Maps 116-119	88000253 88000255 88000256 88000258 88000260	Map 116=earthen-bottom; Maps 118-119=concrete-lined; Map 117=mix	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.46	0.62	1.08	
Cottonwood/Nordica Channel, Maps 120-121	88000056 88000058 88000060 88000062 88000064	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.56	
Subtotal			0.00	0.00	0.00	1.10	0.32	0.22	5.17	0.00	0.45	0.00	3.76	13.61	15.18	39.81		
SWEETWATER HU																		
Parkside Channel, Map 122	88000188	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.28	
OTAY HU																		
Nestor Creek, Maps 131-134	88000157 88000159 88000160 88000163 88000167 88000169 88000174 88000176 88000178 88000180	Maps 132-133=earthen-bottom; Map 134=concrete-lined; Map 131=mix	0.00	0.00	0.00	0.52	0.00	0.00	0.00	1.97	0.00	0.00	0.00	0.04	0.04	0.74	3.31	
Elm & Harris, Map 135	88000322	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Subtotal			0.00	0.00	0.00	0.52	0.00	0.00	1.97	0.00	0.00	0.00	0.04	0.04	0.74	3.31		

Appendix F (cont.) ESTIMATED IMPACTS TO CORPS JURISDICTIONAL AREAS (acre[s])																		
Drainage ID/ HELIX Map Number(s)	City of San Diego Segment ID	Facility Characteristics*	Habitat													Non-wetland WUS		Total
			Southern Riparian Forest	Southern Sycamore Riparian Woodland	Riparian Woodland	Southern Willow Scrub	Mule Fat Scrub	Riparian Scrub	Freshwater Marsh	Cismontane Alkali Marsh	Southern Coastal Saltmarsh	Coastal Brackish Marsh	Disturbed Wetland	Earthen- bottom	Concrete- lined			
TIJUANA HU																		
Sanyo Channel, Map 123	88000229	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.35	
La Media & Airway, Map 124	N/A	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.51	
Camino Maquiladora & Cactus, Map 125	N/A	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.13	
Siempre Viva & Bristow, Map 126	N/A	Mix	0.00	0.00	0.00	0.12	0.00	0.00	0.35	0.00	0.00	0.00	0.14	0.00	0.05	0.66	0.66	
Britannia & Bristow, Map 127	N/A	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Virginia Channel, Map 128	88000308 88000309 88000311	Mix	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.07	0.16	0.16	
Smythe Channel, Maps 129-130	88000233 88000238 88000239 88000240 88000242 88000244	Concrete-lined, except southernmost portion is earthen	0.00	0.00	0.00	0.28	0.00	0.00	0.52	0.00	0.00	0.00	0.00	0.00	0.46	1.26	1.26	
Tocayo Channel, Maps 136-137	88000301 88000303 88000305	Concrete-lined, except for westernmost tip	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.51	0.52	0.52	
Tijuana River, Maps 137a-c	88000300	Earthen-bottom	0.00	0.00	0.00	0.60	0.15	0.00	0.15	0.00	0.00	0.00	0.97	1.38	0.00	3.25	3.25	
Smuggler's Gulch, Maps 138-139	88000232	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.44	0.00	2.44	2.44	
Subtotal			0.00	0.00	0.00	0.99	0.15	0.00	1.52	0.00	0.00	0.00	1.11	3.93	1.57	9.27	9.27	
TOTAL			1.15	0.00	0.00	9.57	0.47	0.22	16.49	0.00	1.39	0.26	5.11	32.52	35.75	102.93	102.93	

*Mix signifies a combination of earthen-bottom and concrete-lined characteristics

APPENDIX G

ESTIMATED IMPACTS
TO CDFG AND CITY JURISDICTIONAL AREAS

Appendix G
ESTIMATED IMPACTS TO CDFG AND CITY JURISDICTIONAL AREAS (acre[s])

Facility ID/ HELIX Map Number(s)	City of San Diego Segment ID	Facility Characteristics*	Habitat													Total†	
			Southern Riparian Forest	Southern Sycamore Riparian Woodland	Riparian Woodland	Southern Willow Scrub	Mule Fat Scrub	Riparian Scrub	Freshwater Marsh	Cismontane Alkali Marsh	Southern Coastal Saltmarsh	Coastal Brackish Marsh	Disturbed Wetland	Coast Live Oak Woodland (CDFG only)	Streambed		
SAN DIEGUITO HYDROLOGIC UNIT (HU)																	
13153 Paseo del Verano, Map 169	N/A	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.17	
Rancho Bernardo Rd & Bernardo Center Dr, Map 1	88000504	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	
Rancho Bernardo Channel, Maps 2-3	88000192	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.01	0.00	0.00	
	88000194																
	88000196																
	88000198																
Subtotal			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.01	0.00	0.01	0.26
PEÑASQUITOS HU																	
9262 Camino Santa Fe, Map 165	N/A	Earthen-bottom	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
Black Mountain Rd south of Westview, Map 164	N/A	Earthen-bottom	0.00	0.00	0.00	0.07	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11
Carmel Country Rd Bridge south of SR 56, Map 166	N/A	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.03
Westside El Camino Real south of SR 56, Map 167	N/A	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21
Northside Genesee east of Science Center Dr, Map 168	N/A	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41
Roselle Street (dead end), Map 170	N/A	Earthen-bottom	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.01	0.23	
Scripps Lake Drive west of Treena St, Maps 171-172	N/A	Earthen-bottom	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.10	
Tower Rd, Map 162	N/A	Earthen-bottom	0.00	0.00	0.02	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.11	
Tower Rd, Map 163	N/A	Earthen-bottom	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.07	0.14	
11044 Via San Marcos, Map 4	88000505	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Scripps Poway Pkwy & Scripps Summit Dr, Map 5	N/A	Concrete-lined	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	
12350 Black Mtn Rd n/o Mercy Rd, Map 5a	N/A	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.64	0.00	0.00	0.00	0.00	0.00	0.00	0.64	
11689 Sorrento Valley Rd (Tripp Ct), Map 6	88000321	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.10	
Industrial Court, Map 6a	N/A	Concrete-lined	0.00	0.00	0.00	0.03	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.09	
Los Peñasquitos Creek, Maps 7-8	88000138 88000317	Earthen-bottom	0.00	0.00	0.00	0.43	0.00	0.00	1.55	0.00	0.00	0.00	0.00	0.00	2.82	4.80	
11000 Roselle St – 11100 Flinkote Ave, Map 9	88000251	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.10	
Dunhill St & Roselle, Map 10	88000250	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.04	
Soledad Creek, Maps 11-17	88000247 88000249 88000250 88000251	Maps 11-12=mix; Maps 13-17= earthen-bottom	1.97	0.00	0.00	1.61	0.00	0.00	0.57	0.00	0.00	0.00	0.84	0.00	1.33	6.32	
Maya Linda & Via Pasar, Map 18	88000321	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.10	
Candida & Via Pasar, Map 19	88000502	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
10205 Pomerado Rd, Map 20	88000502	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
10249 Pinetree Dr, Map 21	88000502	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
NE Corner Pomerado Rd & Scripps Ranch Blvd, Map 22	88000321	Concrete-lined	0.00	0.00	0.00	0.00	0.07	0.00	0.64	0.00	0.00	0.00	0.00	0.00	0.00	0.71	
Pomerado Rd & Avenida Magnifica, Map 23	N/A	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	
12660 Legacy Rd, Map 23a	N/A	Earthen-bottom	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	
Scenic Pl & Cliff Ridge, Map 24	88000748	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	
Ardath Rd from Esterel to Ardath Ln, Map 25	88000321	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Hillside Dr from Rue Adriane to Via Capri, Map 26	88000321	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Appendix G (cont.) ESTIMATED IMPACTS TO CDFG AND CITY JURISDICTIONAL AREAS (acre[s])																
Drainage ID/ HELIX Map Number(s)	City of San Diego Segment ID	Facility Characteristics*	Habitat													Total†
			Southern Riparian Forest	Southern Sycamore Riparian Woodland	Riparian Woodland	Southern Willow Scrub	Mule Fat Scrub	Riparian Scrub	Freshwater Marsh	Cismontane Alkali Marsh	Southern Coastal Saltmarsh	Coastal Brackish Marsh	Disturbed Wetland	Coast Live Oak Woodland (CDFG only)	Streambed	
PEÑASQUITOS HU (cont.)																
Rose Creek, Maps 27-30, 30a-b, and 32-35	88000199 88000201 88000203 88000205 88000206 88000207 88000208 88000209 88000210 88000211	Mix	2.91	0.00	0.00	13.16	0.47	0.00	2.90	0.00	0.94	0.38	0.00	0.21	3.97	24.93/24.73
3053 Renault Way, Map 31	88000321	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mission Bay High School, Map 36	88000502	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.10
Pacific Beach Dr & Olney St, Map 37	88000321	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.12
Drain structures – Lakehurst Ave, Map 38	80025515	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drain structure – Clairemont Dr, Map 39	80025600	Earthen-bottom	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Chateau Channel, Maps 40-42	88000024 88000026 88000029 88000031 88000033	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Thornwood St & Mario Pl, Map 43	88000502	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drain structures – Beal St, Map 44	80025801	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01
Drain structures – Mesa College Way, Map 45	80025988	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Clairemont Mesa & 805, Map 46	N/A	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
West Morena Blvd, Map 55	80031810	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
Tecolote Creek, Maps 55-57	88000295 88000296 88000298	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Subtotal			4.96	0.00	0.18	15.56	0.50	0.00	7.00	0.00	0.94	0.38	0.98	0.21	8.22	38.93/ 38.72
SAN DIEGO HU																
7969 & 7971 Engineer Rd, Map 47	88000321	Mix	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.01	0.06
3860 Calle Fortunada, Map 48	N/A	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.06
Murphy Canyon Channel, Maps 49-50 and 58-58a	88000146 88000148 88000150 88000151 88000152 88000155 88000156	Mix	1.10	0.16	0.00	3.22	0.00	0.00	1.26	0.00	0.00	0.00	0.00	0.05	0.19	5.98/5.93
Red River Dr & Conestoga Dr, Map 51	N/A	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Camino del Arroyo, Map 52	88000321	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cowles Mountain Channel, Map 53	88000065	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
San Carlos Channel, Map 54	88000212 88000214	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix G (cont.)
ESTIMATED IMPACTS TO CDFG AND CITY JURISDICTIONAL AREAS (acre[s])

Drainage ID/ HELIX Map Number(s)	City of San Diego Segment ID	Facility Characteristics*	Habitat													Total†
			Southern Riparian Forest	Southern Sycamore Riparian Woodland	Riparian Woodland	Southern Willow Scrub	Mule Fat Scrub	Riparian Scrub	Freshwater Marsh	Cismontane Alkali Marsh	Southern Coastal Saltmarsh	Coastal Brackish Marsh	Disturbed Wetland	Coast Live Oak Woodland (CDFG only)	Streambed	
SAN DIEGO HU (cont.)																
Alvarado Channel, Maps 59-64	88000002 88000003 88000004 88000008 88000009 88000011 88000013 88000015 88000016 88000019 88000020 88000022	Mix	0.00	0.01	0.00	2.58	0.00	0.00	1.38	0.01	0.00	0.00	1.56	0.00	0.58	6.12
Fairmont Channel, Maps 65, 65a-c	88000085 88000087 88000089 88000091 88000093 88000095	Mix	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.20	0.32
Montezuma Channel, Maps 66-66a	88000140 88000142 88000143 88000145	Mix	0.00	0.00	0.00	0.23	0.00	0.00	0.71	0.00	0.00	0.00	0.00	0.00	0.00	0.94
Camino de la Reina & Camino del Arroyo, Map 81	88000502	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nimitz Channel, Map 82	88000181 88000182 88000183	Mix	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.01	0.03
Famosa Blvd & Valeta St, Map 83	N/A	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Subtotal			1.10	0.17	0.00	6.04	0.00	0.00	3.46	0.01	0.00	0.00	1.72	0.05	0.99	13.54/13.49
PUEBLO SAN DIEGO HU																
Home Ave Channel, Maps 67-70 and 76-77	88000104 88000106 88000108 88000110 88000112 88000114 88000117 88000119 88000121 88000123	Maps 67, 76-77= earthen-bottom; Map 69= concrete-lined; remaining maps=mix	0.00	0.00	0.00	0.13	0.01	0.01	0.03	0.00	0.00	0.00	0.80	0.00	0.46	1.44

Appendix G (cont.)																
ESTIMATED IMPACTS TO CDFG AND CITY JURISDICTIONAL AREAS (acre[s])																
Drainage ID/ HELIX Map Number(s)	City of San Diego Segment ID	Facility Characteristics*	Habitat													Total†
			Southern Riparian Forest	Southern Sycamore Riparian Woodland	Riparian Woodland	Southern Willow Scrub	Mule Fat Scrub	Riparian Scrub	Freshwater Marsh	Cismontane Alkali Marsh	Southern Coastal Saltmarsh	Coastal Brackish Marsh	Disturbed Wetland	Coast Live Oak Woodland (CDFG only)	Streambed	
PUEBLO SAN DIEGO HU (cont.)																
Chollas Creek, Maps 71-75; 78-80; 89, 91, 93	88000037 88000039 88000041 88000042 88000048 88000050 88000051 88000053 88000054 88000055	Maps 73-75 = earthen-bottom; Maps 89 & 91 = concrete- lined; remaining maps = mix	0.00	0.00	0.00	1.16	1.98	0.22	2.68	0.00	0.45	0.00	1.19	0.00	8.69	16.37
Delevan Dr, Map 79	88000066	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.23
Washington Channel, Map 84	88000312 88000313 88000314	Mix	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.05
Florida Canyon Channel, Map 85	88000102 88000103	Earthen-bottom	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.05	0.23
Pershing Channel, Map 86	88000189 88000190 88000191	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.09
Drain Structures – 26 th and 27 th sts, Map 87	80028073	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Switzer Creek, Map 88	88000293	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Imperial Ave & Gillette, Map 90	N/A	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.04
35 th St & Martin Ave, Map 92	80039275	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.07
South Chollas Creek, Maps 94-95; 97-99; 101-104	88000055 88000261 88000262 88000266 88000268 88000270 88000272 88000274 88000276 88000282 88000285 88000287 88000288 88000289 88000290 88000291 88000292	Maps 94-95 & 97-99 = earthen- bottom with concrete sides; Maps 101-104 = mix	0.00	0.00	0.00	1.03	0.28	0.00	0.08	0.00	0.00	0.00	2.64	0.00	2.51	6.54
Drain Structures – Boston Ave, Map 96	80028356	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
42 nd & J St, Map 100	88000321	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Euclid & Castana, Map 105	N/A	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.04

Appendix G (cont.)																
ESTIMATED IMPACTS TO CDFG AND CITY JURISDICTIONAL AREAS (acre[s])																
Drainage ID/ HELIX Map Number(s)	City of San Diego Segment ID	Facility Characteristics*	Habitat													Total†
			Southern Riparian Forest	Southern Sycamore Riparian Woodland	Riparian Woodland	Southern Willow Scrub	Mule Fat Scrub	Riparian Scrub	Freshwater Marsh	Cismontane Alkali Marsh	Southern Coastal Saltmarsh	Coastal Brackish Marsh	Disturbed Wetland	Coast Live Oak Woodland (CDFG only)	Streambed	
PUEBLO SAN DIEGO HU (cont.)																
Encanto Channel, Maps 106-111	88000069 88000071 88000073 88000075 88000077 88000079 88000080 88000081	Mix	0.00	0.00	0.00	0.13	0.21	0.10	1.32	0.00	0.00	0.00	0.16	0.00	0.37	2.29
Jamacha Channel, Maps 109, 113-115	88000126 88000128 88000130 88000132 88000134 88000136	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	1.07	0.00	0.00	0.00	0.58	0.00	0.14	1.79
Madera & Broadway, Map 112	N/A	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Solola Channel, Maps 116-119	88000253 88000255 88000256 88000258 88000260	Map 116= earthen-bottom; Maps 118-119= concrete-lined; Map 117=mix	0.00	0.00	0.00	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.20	0.77
Cottonwood /Nordica Channel, Maps 120-121	88000056 88000058 88000060 88000062 88000064	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.11	0.00	0.00	0.14
Subtotal			0.00	0.00	0.00	2.89	2.60	0.34	5.23	0.00	0.45	0.00	5.98	0.00	12.72	30.21
SWEETWATER HU																
Parkside Channel, Map 122	88000188	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.03
OTAY HU																
Nestor Creek, Maps 131-134	88000157 88000159 88000160 88000163 88000167 88000169 88000174 88000176 88000178 88000180	Maps 132-133= earthen-bottom; Map 134= concrete-lined; Map 131 mix	0.00	0.00	0.00	0.57	0.00	0.00	2.34	0.00	0.00	0.00	0.06	0.00	0.04	3.02
Elm & Harris, Map 135	88000322	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Subtotal			0.00	0.00	0.00	0.57	0.00	0.00	2.34	0.00	0.00	0.00	0.06	0.00	0.04	3.02

Appendix G (cont.)																	
ESTIMATED IMPACTS TO CDFG AND CITY JURISDICTIONAL AREAS (acre[s])																	
Drainage ID/ HELIX Map Number(s)	City of San Diego Segment ID	Facility Characteristics*	Habitat													Total†	
			Southern Riparian Forest	Southern Sycamore Riparian Woodland	Riparian Woodland	Southern Willow Scrub	Mule Fat Scrub	Riparian Scrub	Freshwater Marsh	Cismontane Alkali Marsh	Southern Coastal Saltmarsh	Coastal Brackish Marsh	Disturbed Wetland	Coast Live Oak Woodland (CDFG only)	Streambed		
TIJUANA HU																	
Sanyo Channel, Map 123	88000229	Concrete-lined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.05	0.00	0.00	0.17
La Media & Airway, Map 124	N/A	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.51
Camino Maquiladora & Cactus, Map 125	N/A	Concrete-lined	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.06	0.00	0.00	0.09
Siempre Viva & Bristow, Map 126	N/A	Mix	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.35	0.00	0.00	0.00	0.14	0.00	0.00	0.62
Britannia & Bristow, Map 127	N/A	Earthen-bottom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Virginia Channel, Map 128	88000308 88000309 88000311	Mix	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.09
Smythe Channel, Maps 129-130	88000233 88000238 88000239 88000240 88000242 88000244	Concrete-lined, except southernmost portion is earthen	0.00	0.00	0.00	0.55	0.00	0.00	0.00	0.55	0.00	0.00	0.00	0.26	0.00	0.00	1.38
Tocayo Channel, Maps 136-137	88000301 88000303 88000305	Concrete-lined, except for westernmost tip	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.03	0.00	0.00	0.06
Tijuana River, Maps 137a-c	88000300	Earthen-bottom	0.00	0.00	0.00	0.92	0.90	0.00	0.00	0.15	0.00	0.00	0.00	0.99	0.00	0.29	3.25
Smuggler's Gulch, Maps 138-139	88000232	Earthen-bottom	0.00	0.00	0.00	0.69	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.35	3.12
Subtotal			0.00	0.00	0.00	2.30	0.98	0.00	0.00	1.72	0.00	0.00	0.00	1.63	0.00	2.65	9.28
TOTAL			6.08	0.17	0.18	27.36	4.08	0.34	0.00	20.00	0.01	1.39	0.38	10.41	0.26	24.63	95.29/95.03

*Mix signifies a combination of earthen-bottom and concrete-lined characteristics

†Where two numbers are listed, the first number represents CDFG acreage and the second number represents City acreage. Differences are due to the presence of CDFG-only coast live oak woodland in select areas.