RECLAMATION

Managing Water in the West

San Diego Creek Watershed Natural Treatment System

Orange County, California

Environmental Assessment

U.S. Department of the Interior
Bureau of Reclamation
Southern California Area Office
Temecula, California

August 2009

Mission Statements

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The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

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Environmental Assessment

San Diego Creek Watershed
Natural Treatment System Project

(SCH No. 2002021120)

Irvine Ranch Water District, Orange County, California

Prepared pursuant to the National Environmental Policy Act (NEPA)
42 U.S.C. 4332 (2) (C), 16 U.S.C. 470, 49 U.S.C. 303 and 23 U.S.C. 138
for the

Environmental Protection Agency
(NEPA Cooperating Agency)

and the

Bureau of Reclamation
(NEPA Lead Agency)

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ABBREVIATIONS AND ACRONYMS

ACOE	Army Corps of Engineers
AQMP	Quality Management Plan
BMPs	Best Management Practices
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
cfs	cubic feet per second
CWA	Federal Clean Water Act
DDT	Dichloro-Diphenyl-Trichloroethane
EA	Environmental Assessment
EDR	Electrodialysis Reversal
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ET	Evapotranspiration
FONSI	Finding of No Significant Impact
FWS	Fish and Wildlife Service
HP	Horsepower
IRWD	Irvine Ranch Water District
Kw	Kilowatts
MCAS	Marine Corps Air Station
MS4	Municipal Separate Storm Sewer System
MT	Metric Ton
MWRP	Michelson Water Reclamation Plant
MPN	Most Probable Number
NCCP/HCP	Natural Community Conservation Plan/Habitat Conservation Plan
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NTS	Natural Treatment System
OCSD	Orange County Sanitation District
PA	Planning Area
PCB	Polychlorinated Biphenyl
PM-10	Particulate Matter, 10 micrometers or less
PM-2.5	Particulate Matter, 2.5 micrometers of less
RWQCB	Regional Water Quality Control Board
SAMS	Small Area Mitigation Site
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCH	State Clearinghouse
Se	Selenium
SIP	State Implementation Plan
SJM	San Joaquin Marsh
SR	State Route
TDS	Total Dissolved Solids
TMDL	Total Maximum Daily Load
TN	Total Nitrogen
TP	Total Phosphorus
UNB	Upper Newport Bay

Table of Contents

ATTACHMENTS:

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I. INTRODUCTION

The Environmental Protection Agency (EPA) and the Bureau of Reclamation (Reclamation) are authorized to provide Federal funds to the Irvine Ranch Water District (IRWD) for the Natural Treatment System (NTS) Master Plan, a series of constructed treatment wetlands intended to improve water quality in San Diego Creek and Newport Bay in Orange County, California.

The IRWD has applied to the EPA and Reclamation for financial assistance. The proposed Federal actions would be the execution of Assistance Agreements by EPA and Reclamation providing Federal funds to IRWD to implement the NTS Plan. EPA funds would be applied towards the design and development of NTS Site 62 at the San Joaquin Marsh. Reclamation funding authority would be used for the balance of the system.

On April 27, 2004, IRWD certified an Environmental Impact Report (EIR) under the California Environmental Quality Act (CEQA), finding the proposed project would not result in significant adverse environmental effects. This Environmental Assessment (EA) was prepared to determine if an Environmental Impact Statement (EIS) is required under the National Environmental Policy Act (NEPA) or if a Finding of No Significant Impact is an appropriate determination. The EIR is incorporated by reference as part of the Federal environmental review administrative record.

Reclamation is the NEPA Lead Agency. EPA has agreed to be a Cooperating Agency.

Background

The IRWD, in cooperation with Orange County and several cities developed the NTS Master Plan to improve water quality in San Diego Creek and its tributaries and to complement ongoing activities to comply with established total maximum daily load (TMDL) targets in the watershed established by EPA pursuant to the Federal Clean Water Act (CWA). The project is expected to be the largest watershed-wide urban retrofit project for runoff treatment in the nation.

The NTS Plan will develop and maintain 31 constructed wetlands that use natural processes to remove sediment, nutrients, and other contaminants from urban runoff. Engineered basins are also planned to capture sediment and trash from "first flush" rain events. Plants such as bulrush and cattails and the beneficial bacteria within the wetlands soils provide natural cleanup of pollutants that would otherwise flow to the Bay and the ocean. Secondary benefits include habitat creation and enhancement, aesthetics, recreation, and education.

The natural "technology" used for this project has been used successfully at the San Joaquin Marsh in Irvine and at the Playa Vista wetlands in Los Angeles County. IRWD has taken the lead on the NTS effort due to the success of its San Joaquin Marsh project in treating runoff from San Diego Creek. In that project, water from San Diego Creek is allowed to spend 7-10 days flowing through a series of constructed wetlands. About 200 lbs of nitrogen are removed per day (70,000 pounds per year), reducing the total load to Newport Bay by about 30%. Basins installed within the San Diego Creek channel also remove an estimated 50,000 tons of sediment per year and approximately 10,000 pounds of phosphorus.

Purpose and Need

EPA and the California Regional Water Quality Control Board (RWQCB) identified San Diego Creek and Newport Bay as water quality limited by a number of pollutants under Clean Water Act section 303(d) and subsequently established pollutant discharge limits. A TMDL specifies the maximum daily amount of pollutant that can be discharged to meet water quality standards defined in the *Water Quality Control Plan for the Santa Ana River Basin* (Basin Plan). The TMDLs for sediment, nutrients, pathogens, and unknown toxicity must be reduced in accordance with requirements being phased in over a 15-year period.

The NTS Master Plan is intended to improve the chemical, biological and physical integrity of drainages in the San Diego Creek Watershed by planning, developing, and implementing a large-scale water quality treatment program which will rely on natural ecosystems to reduce pollutant loads to Newport Bay. Surface drainage and urban runoff containing fertilizers, pesticides, sediment, and pathogens, flow through the San Diego Creek watershed and into Newport Bay, adversely impacting water quality.

The goal of the NTS Master Plan is to comply with the Basin Plan, further Basin Plan beneficial uses, and address, along with other Best Management Practices (BMPs), TMDLs, municipal stormwater permit (MS4) requirements, and regional water quality problems associated with these pollutants. The NTS is intended to support compliance with EPA and RWQCB regulations and other requirements. The NTS Plan, together with other BMPs to be implemented by MS4 permittees within the watershed, will reduce pollutant loadings and help meet adopted TMDLs and MS4 Permit requirements.

The overall objectives of the Project are to:

- Ensure that the NTS Master Plan's system of constructed wetlands conforms to the objective of the Federal Clean Water Act to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters."
- Assist County and Cities and others in meeting TMDLs and National Pollutant Discharge Elimination System (NPDES) permit requirements.
- Provide a comprehensive, regional, watershed-wide approach to clean up storm runoff and dry weather flows from: a) existing land uses, and b) future land uses.
- Improve water quality in San Diego Creek, Upper Newport Bay Ecological Reserve, and Newport Bay.
- Enhance habitat value of aquatic and riparian habitats located within the Natural Community Conservation Plan (NCCP) Reserve. Provide for an adaptively managed comprehensive water quality program that will enhance habitat values within the Upper Newport Bay area of the NCCP reserve system as well as in other areas of the San Diego Creek Watershed adjacent to the NCCP reserve system that flow to Upper Newport Bay.

Authority

EPA grant funding for the NTS was authorized by Congress as a special project in the EPA's annual Appropriations Acts for fiscal years 2003 and 2004.

The Irvine Basin Surface and Groundwater Improvement Act of 2004 (Public Law 108-233) amended the Reclamation Wastewater and Groundwater Study and Facilities Act of 1992 (Title XVI of Public Law 102-575) by adding section 1636 authorizing the Secretary of Interior, in cooperation with IRWD, to participate in the design, planning and construction of the NTS. This authority is delegated to Reclamation.

In 2001, the California Legislature passed Assembly Bill 810 (John Campbell), which adds the diversion and treatment of urban runoff to the list of services that may be provided by IRWD in southern Orange County. This authority was granted as part of the California Water District Act, Division 13 of the California Water Code, Part 5, Chapter 2.7, section 35539.12.

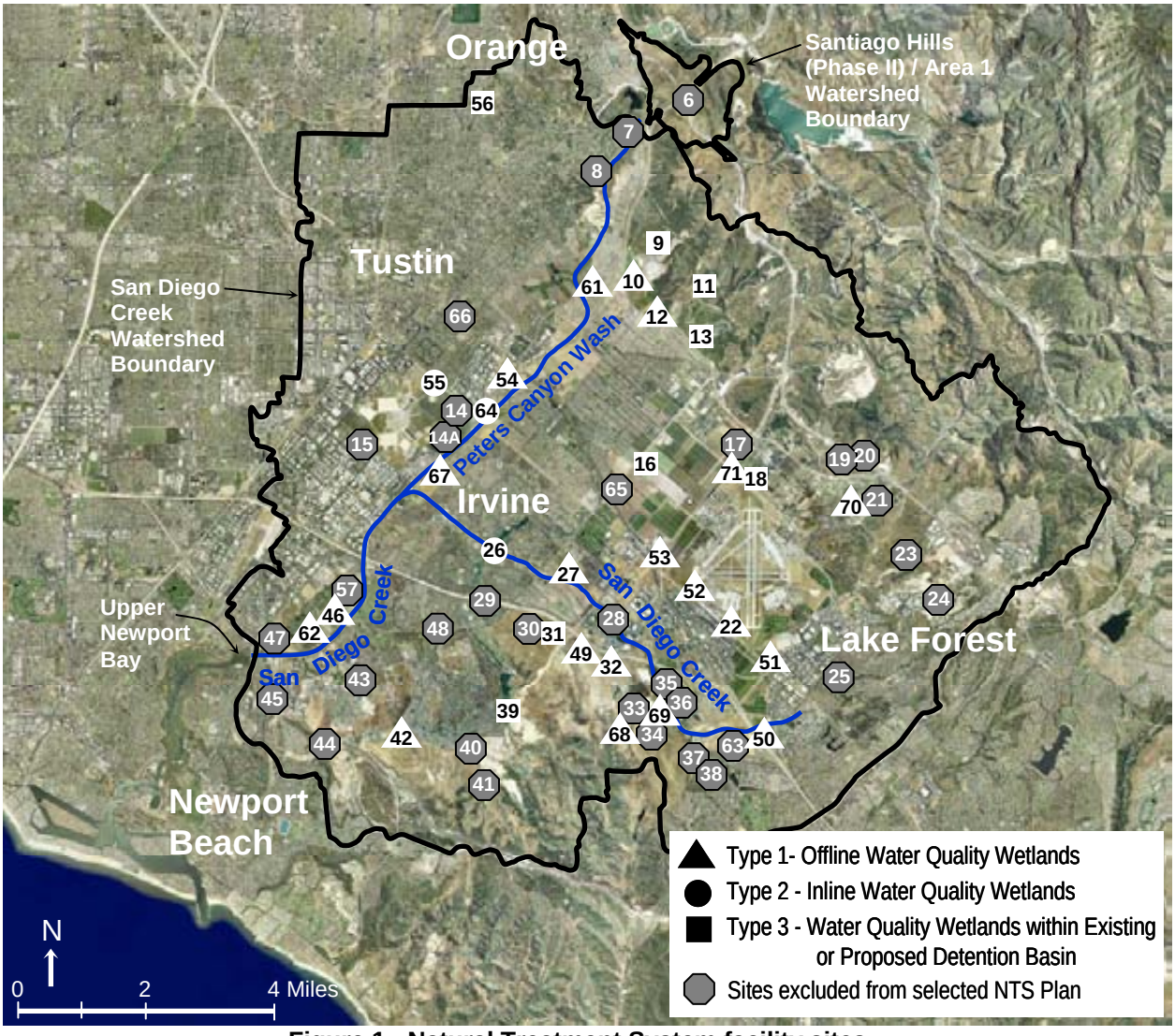


Figure 1: Natural Treatment System facility sites

II. PROJECT ALTERNATIVES INCLUDING PROPOSED ACTION

NEPA requires Federal agencies to study, develop, and describe appropriate alternatives to any proposed action which involves unresolved conflicts concerning alternative uses of available resources. No such conflicts have been identified; however, several alternatives were discussed in the EIR. A summary of the NTS Plan (Proposed Action); Alternatives Considered but Rejected; the No Project Alternative; and Alternative to Replace In-Line Facilities with Off-Line Facilities (Site 26 Alternative) is provided below.

Table 1 lists the 31 proposed NTS wetland sites. Figure 1 includes the NTS Plan and alternative sites considered for treatment wetlands.

Table 1. NTS facility sites

Site number	Facility name	Facility type	Regional retrofit or local facility	Location/ drainage area
26	Woodbridge In-Line Basins	II	Regional	San Diego Creek
27	Barranca Off-Line Wetlands	I	Regional	San Diego Creek
46	San Joaquin Marsh — Augmentation	I	Regional	San Diego Creek
53	Caltrans SR-133/I-5 Interchange	I	Regional	Marshburn Channel
54	Caltrans SR-261 Site/Walnut	I	Regional	Peters Canyon Wash
55	Santa Ana/Santa Fe Channel In-Line Basins	II	Regional	Santa Ana/Santa Fe Channel
56	El Modena Park	III	Regional	El Modena-Irvine Channel
62	San Joaquin Marsh — SAMS 1	I	Regional	San Diego Creek
64	Westpark In-Line Basins	II	Regional	Peters Canyon Wash
67	Cienega (Cienega de Las Ranas)	N/A*	Regional	Peters Canyon Wash
13	Rattlesnake Reservoir — Existing	N/A*	Regional	Rattlesnake Canyon Wash
39	Sand Canyon Reservoir — Existing	N/A*	Regional	Upper Sand Canyon Wash
9	PA 1 — Eastfoot Retarding Basin	III	Local	Upper Peters Canyon Wash
10	PA 1 — Eastfoot Upper	I	Local	Rattlesnake Canyon Wash
11	PA 1 — Orchard Estates Retarding Basin	III	Local	Upper Rattlesnake Canyon
12	PA 1 — Lower Orchard Estates (multiple basins)	I	Local	Rattlesnake and Hicks Canyon
61	PA 1 — Eastfoot Lower	I	Local	Rattlesnake Canyon Wash
16	Trabuco Retarding Basin	III	Local	Central Irvine Channel
18	Marshburn Retarding Basin	III	Local	Bee and Round Canyon
31	PA 17 — West Basin	III	Local	San Joaquin Channel
32	PA 17 — East Basin	I	Local	Upper San Diego Creek
49	PA 17 — Center Basin	I	Local	San Joaquin Channel
42	Turtle Ridge North	I	Local	Bonita Creek
68	PA 18	I	Local	Upper San Diego Creek
69	PA 39 (multiple basins)	I	Local	Upper San Diego Creek
70	PA 6 — Agua Chinon (multiple basins)	I	Local	Agua Chinon Wash
71	PA 6 — Marshburn	I	Local	Marshburn Channel
22	MCAS El Toro — Aqua Chinon Lower	I	Local	Agua Chinon Wash
50	MCAS El Toro — Irvine Auto Center	I	Local	Upper San Diego Creek
51	MCAS El Toro — Serrano	I	Local	Serrano Creek
52	MCAS El Toro — Bee Canyon	I	Local	Bee Canyon Channel

* Not applicable

A. NTS Plan (Proposed Action)

The NTS Plan alternative is a watershed-wide system of 31 manmade wetlands in strategic locations throughout the San Diego Creek Watershed. Dry weather urban runoff, as well as flows from smaller rainstorms, will be diverted into these wetlands where contaminant levels will be reduced before the water reaches the Upper Newport Bay. The treatment process takes place naturally using natural ecosystems such as beneficial bacteria in the pond soils along with plants such as bulrush and cattails to remove nitrogen from the runoff. Sediment, phosphorous and other pollutants are also reduced in the settling basins within the creek channel.

The NTS Plan Alternative expands the treatment approach used successfully at the San Joaquin Marsh into a network of wetlands throughout the San Diego Creek Watershed. The proposed wetlands are similar to the existing IRWD wetlands with shallow pools between zero to two feet deep that can support growth of emergent marsh wetland plants, primarily cattails (*Typha* sp.) and bulrushes (*Scirpus* sp.) and a typical residence time of about 1 to 2 weeks. Some proposed wetlands have deeper open water areas four to six feet deep, designed to trap coarse sediments, help to maintain uniform flow through the marsh, and aid in pathogen removal.

The proposed wetlands are primarily intended to treat dry-weather low flows. Many NTS facilities would have the secondary function of treating stormwater runoff by integrating the wetlands into detention basins or flood control retarding basins. These facilities would treat runoff from small storms, as well as the "first-flush," or initial fraction of runoff from larger storm events. Treatment of first-flush is beneficial because higher pollutant quantities are often present in the initial fraction of storm runoff.

A secondary aspect of the NTS Plan is habitat enhancement. Emergent marsh habitat created by planting riparian vegetation will enhance and/or increase habitat values of NTS Facilities.

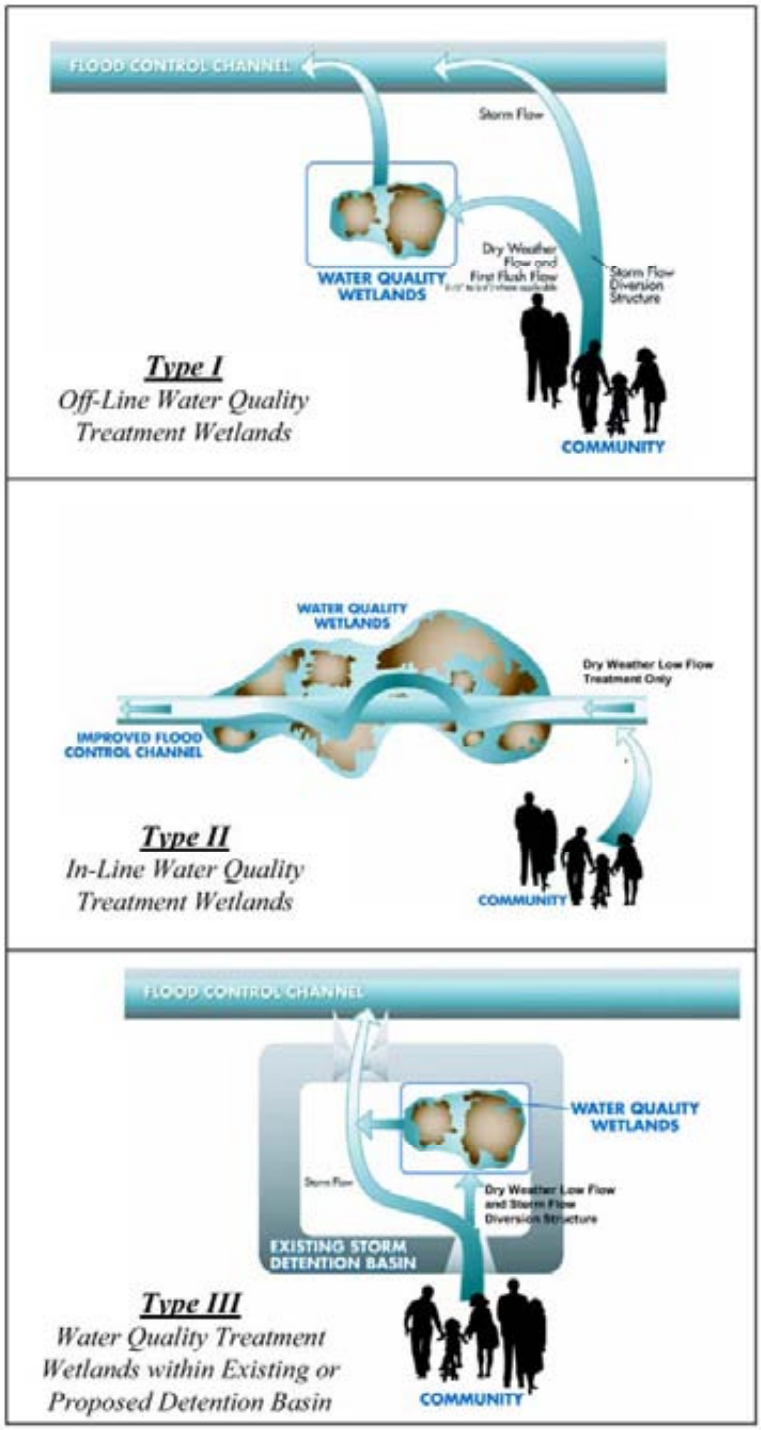
The NTS Plan wetlands are categorized into three general configurations (figure 2):

Type I – Off-line facilities - Wetlands adjacent to existing stream channels
Type II – In-line facilities - Wetlands within existing stream channels
Type III – Combination Facilities - Wetlands within existing or planned flood control basins

The NTS Plan also includes one facility (Site 67) designed primarily to remove selenium from low flows in Peters Canyon Wash. The proposed selenium treatment facility would be a subsurface flow wetland designed to pass water through organically rich and perpetually wet soils to trap selenium under anoxic (oxygen-deficient) conditions. The subsurface wetlands would have no water above ground, but the surface may be planted with cattails or turf.

Pump stations will be installed at sites 53, 54, 56, 62 and 67. NTS site 62 will be supplied from the existing pump station at the San Joaquin treatment wetlands (NTS Site 46) but will require a 25 horsepower (HP) pump to return flows to San Diego Creek. NTS Sites 53 and 54 will require 10 HP and 25 HP pump stations, respectively. Site 56 includes a 5 HP pump that operates 8 to 10 hours every 5 days. The 0.3 cfs demonstration wetland at NTS Site 67 uses two 15 HP pump stations, one for diversion and one for return flows. The 3 cfs full scale NTS Site 67 will require a single 150 HP diversion pump, with return flows by gravity.

Figure 2. Three types of water quality treatment wetlands



The IRWD will install or retrofit Regional facilities under their Capital Improvement Program. Local facilities are or will be installed by private developers in accordance with regulatory requirements and consistent with IRWD design criteria, then are transferred to IRWD or to another public agency. IRWD will operate and maintain all NTS facilities in accordance with operating agreements and right of way documents executed with the agencies that own the land.

B. Alternatives Considered But Rejected

Initially, 71 possible sites within the 118-square mile watershed were studied during the master planning process. Those sites were reduced to the 31 best locations in terms of treatment effectiveness, constructability, land availability and cost. Factors used to eliminate alternatives from detailed consideration in this EIR included: (1) failure to meet most basic project objectives, (2) infeasibility, and (3) inability to avoid significant environmental impacts.

Alternative NTS Sites

Three NTS alternative facilities were considered to have serious potential for implementation but were ultimately rejected as being infeasible in the final analysis. Descriptions of these alternatives and the reasons for their elimination from the NTS Plan are summarized below.

• ***Site 14–MCAS Tustin.***
This alternative site was proposed at the former Tustin Marine Corps Air Station (MCAS), currently planned for conversion to other land uses. Decisions on land conversion are expected to evolve over an extended planning horizon and therefore no specific sites or conceptual designs were determined or developed. The City of Tustin expressed concerns over designating any portion of this site for an NTS constructed wetlands. The City's primary concern was the effect such a designation might have on current and future development projects on the former MCAS Tustin. As this was a program level site and any future development of the MCAS property will need to comply with TMDL and MS4 NPDES related permit requirements issued by Santa Ana RWQCB, Site 14 was removed from the NTS Plan as requested by the City of Tustin.

• ***Site 57–San Joaquin Marsh (SJM) Extension.***
This alternative site consists of approximately 13 acres of land in the San Joaquin Marsh adjacent to the existing San Joaquin Marsh NTS facility (Site 46). The preliminary design was for an In-line Facility that would have received inflow from the existing pump location in San Diego Creek that feeds the existing San Joaquin Marsh and returned treated water to the Creek. Site 57 consists of mostly willow woodland habitat and is known to be occupied by least Bell's vireo, a state and federal endangered species. Construction of an NTS facility at this site would convert this habitat to an emergent marsh type of habitat that would effectively displace the least Bell's vireo. This impact was determined to be unacceptable and this alternative was therefore eliminated from the NTS Plan.

• ***Site 47–Jamboree/SR-73/MacArthur Triangle***
This alternative site consists of approximately 12 acres of land between Jamboree Road, MacArthur Boulevard, and State Route (SR) 73. The preliminary design was for an In-line Facility that would have received inflow from a newly constructed pipeline to San Diego Creek. Site 47 consists of patches of black willow woodland, herbaceous riparian, and native grassland vegetation, as well as disturbed detention basin area. Least Bell's vireo, a state and federal endangered species, is known to occupy the site. Construction of an NTS Facility at this site would convert this vegetation to an emergent marsh type of habitat that would effectively displace the least Bell's vireo. This impact was determined to be unacceptable and this alternative was therefore eliminated from the NTS Plan.

Technical Treatment Alternatives

• ***Technological Treatment Alternative A: Divert Low Flow Urban Runoff from San Diego Creek to Orange County Sanitation District (OCSD) Facilities for Treatment.***
The proposed NTS Plan facilities in the San Diego Creek Watershed would not be implemented. This alternative would divert low flow urban runoff from San Diego Creek to the Orange County Sanitation District for treatment and disposal by ocean outfall. This alternative would partially achieve some NTS Plan objectives, but would not enhance habitat values in Upper Newport Bay. Diversion of low flow runoff from San Diego Creek would eliminate a perpetual source of fresh water input to the Bay. The loss of water may result in significant impacts to habitats and ecological systems in the Upper Bay. This alternative would reduce loads at the diversion point but would not contribute to in-stream water quality improvement throughout the watershed. Water quality benefits would be reduced compared to the NTS Plan and this alternative would cost significantly more.

• ***Technological Treatment Alternative B: Construct New Treatment Plant at Site of Michelson Water Reclamation Plant (MWRP) Site to Treat Low Flow Runoff from San Diego Creek.***
The proposed NTS Plan facilities in the San Diego Creek Watershed would not be implemented. Instead, a single Electrodialysis Reversal (EDR) treatment plant would be constructed near the downstream end of San Diego Creek on 2.5-acres of IRWD-owned land adjacent to the existing MWRP. This alternative would achieve some NTS Plan objectives and would achieve a higher degree of Total Nitrogen (TN) and Selenium removals than would be achieved by the NTS facilities. These removal rates are only for low flows and do not include small storm flows which would not be treated at the EDR plant due to the large land area required to process these flows. By treating low flow runoff only at the downstream end of the watershed, this alternative would not assist local agencies meet the TMDLs for other areas within the San Diego Creek Watershed. This alternative would not achieve the TMDL reduction targets to the same degree as the NTS Plan. This alternative would not achieve the objective related to enhancing habitat values within Upper Newport Bay or in the channels in the watershed. This alternative would require substantial amounts of electricity use to operate the EDR treatment plant in comparison with the relatively small amounts of electricity needed to operate the facilities in the NTS Plan.

• ***Technological Treatment Alternative C: Construct Distributed Treatment Plants at Four Locations within the San Diego Creek Watershed for Low Flow Runoff Treatment.***
The proposed NTS Plan's approach of using constructed wetlands would not be implemented. Instead of the San Diego Creek Watershed treatment wetlands, four Electro-dialysis Reverse (EDR) treatment plants would be constructed at key locations in the San Diego Creek Watershed to remove target pollutants in low flow runoff from the Creek. This alternative would partially achieve some of the objectives of the NTS Plan. The facilities would not treat small storm runoff and would not achieve the overall pollutant reductions of the NTS Plan. The objective of enhancing habitat values within the watershed would also not be achieved by this alternative. This alternative would require substantial amounts of annual electricity use to operate the distributed EDR treatment plants in comparison with the relatively small amounts of electricity needed to operate the facilities in the NTS Plan.

Stream Restoration

Literature on use of wetlands for pollution reduction and comments received on an earlier draft EIR suggested that restoration of portions of San Diego Creek could achieve similar water quality benefits as the NTS Plan Facilities at lesser costs. Implementation of this concept would require removal of existing flood control improvements constructed to protect public health, safety, and welfare of residents in existing and future planned development areas. Returning the San Diego Creek watershed to a more natural state would require construction of additional structures and creation of wider flood flow areas to safely convey stormwater flows through the watershed. Construction and operations costs, as well as the environmental impacts of such a far reaching alternative, would likely be greater than those projected for the NTS Plan. This alternative was considered to be infeasible and was eliminated from further consideration.

C. No Action Alternative

Under The No Action Alternative, the NTS Plan for the San Diego Creek Watershed would not be implemented. MS4 co-permittees within the San Diego Creek Watershed would continue to implement source reduction Best Management Practices (BMPs) such as education, training, and routine maintenance of catch basins, and would require structural BMPs to treat smaller storm flows from new development and significant redevelopment projects. Compliance with the Orange County Flood Control Master Plan and Sediment Management Program provisions that are applicable to the San Diego Creek Watershed would continue.

D. Replace In-Line Facilities with Off-Line Facilities (Site 26 Alternative)

Under this alternative, the proposed NTS Plan would be implemented using a modified approach for the three Inline facilities at Sites 26, 55 and 64. The CEQA alternatives analysis concluded that alternatives for sites 55 and 64 were not feasible, but an alternative for site 26 was evaluated.

The only available land in proximity to Site 55 is within the former MCAS Tustin. Recognizing the City of Tustin request that the former MCAS not be considered for implementation of NTS facilities, Site 55 was found to not be a candidate for replacement with an Off-line NTS design.

The NTS Plan facility at Site 64 involves approximately three miles of earth bottom channel. Conceptual modeling estimated that an Off-line replacement site for Site 64 would require about 11.2 acres to achieve an equivalent degree of TN removal. Appropriately sized sites that would be hydraulically capable of serving as an Off-line facility to replace Site 64 are not available.

An Off-line location with available land was located as a replacement for Site 26. Concept level modeling determined that an Off-line replacement for Site 26 would require about 2.2 acres. The Site 26 Off-line alternative would achieve the objectives of the NTS Plan and would not require regulatory agency permits.

Alternative Site 26 is located east of Culver Drive, at the intersection of Culver Drive and the San Diego Creek Channel (figure 3). The 0.5 acre site is situated between Alton Park and the Channel in an area that contains ornamental landscaping. An adjacent area currently used for ball fields could potentially accommodate both an NTS facility and a reconfigured ball field.

Figure 3. Location and photos of possible off-line site to replace in-line facilities (site 26).

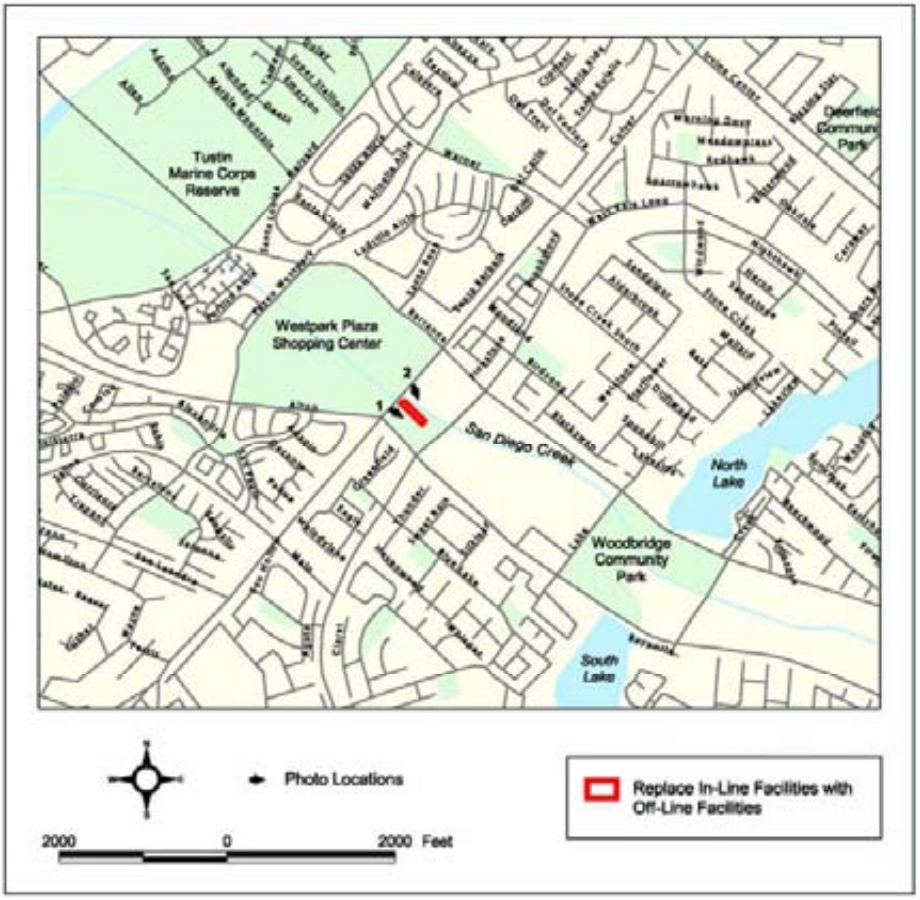


Photo 1

Photo 2

III. PRESENT ENVIRONMENT

A. Community Location

The San Diego Creek Watershed covers approximately 122 square miles in Orange County, California, including the city of Irvine and portions of the cities of Lake Forest, Newport Beach, Orange, and Tustin, as well as unincorporated areas of the County. The watershed boundary is approximately the same as the Irvine Ranch Water District service area.

B. Service Area

The Irvine Ranch Water District provides domestic water service, wastewater collection and treatment, water reclamation, and urban runoff treatment for the city of Irvine and portions of four surrounding cities as well as unincorporated areas of Orange County.

C. Population

The District serves a resident population of over 266,000 with a daytime population of approximately 500,000.

D. Land Use

The San Diego Creek Watershed experienced rapid growth and land-use development after World War II. Currently, more than 50 percent of the watershed area is urbanized, with much of the development concentrated in the western portions. About 15 percent is used for agriculture, and the remaining 35 percent is open space. Much of the open space is in mountainous regions and has been set aside for recreation and habitat conservation. Build-out within the watershed is expected to be completed within the next 20 years. Projected land use when fully developed will be 70 percent urban, 29 percent open space areas, and less than 1 percent agricultural.

E. Topography

The western and central portions of the San Diego Creek Watershed are a relatively flat alluvial plain, bordered by the Santiago Hills to the northeast and the San Joaquin Hills to the south. Peak elevations in the San Joaquin and Santiago Hills are 1160 feet and 1775 feet above mean sea level. The central portions of the watershed lie in the Tustin alluvial plain, which slopes gently to the west and connects with the coastal plain. Elevations in the coastal and alluvial plains range from sea level at Upper Newport Bay rising gently to about elevation 400 feet at the El Toro Marine Corps Air Station (MCAS).

E. Geology

***Faults*:** The Newport-Inglewood-Rose Canyon fault zone is located along the Newport coast and extends northwest into Los Angeles County and southeast along the San Diego county coast. To the northeast, the Santiago foothills and the Santa Ana Mountains are consequences of the Elsinore fault zone, one of the largest in southern California, extending from near the Sea of Cortez in Mexico roughly parallel to the San Andreas fault zone. At its northern end, the Elsinore fault zone splays into two segments, the Chino fault and the Whittier fault.

The State of California adopted the Alquist-Priolo Earthquake Fault Zoning Act in 1972 to mitigate the hazard of surface fault rupture along active faults. The State defined an active fault as having had surface displacement during Holocene time (the last 11,000 years), and delineated

Earthquake Fault Zones along active faults throughout the State. Alquist-Priolo zones have been designated along most of the Elsinore fault and over a portion of the Newport-Inglewood fault.

***Soils*:** Soil maps compiled by the Natural Resources Conservation Service (NRCS) indicate that major portions of the San Joaquin and Santiago Hills contain soils characterized by low infiltration capacity (silty-loam soils interbedded with fine textured soils, and clayey soils with a high swelling potential). These soils are also prevalent in the El Modena-Irvine Channel, Lower Peters Canyon Wash, and lower San Diego Creek. Soils with higher infiltration capacity (fine to coarse textured sandy loams) are prevalent in the central portion of upper San Diego Creek and in Peters Canyon Wash upstream of the El Modena-Irvine Channel. Isolated areas with highly permeable well-drained sands and gravels are present in Peters Canyon Wash upstream of the El Modena-Irvine Channel.

F. Climate and Air Quality

California's south coast region has a Mediterranean type climate characterized by warm, dry summers and cool, intermittently wet winters. The wet season is from October to April, when widespread general winter storms may last for several days. Annual rainfall averages 18 inches in the mountains and 13 inches near the coast. Maximum annual rainfall on the coastal plain recorded since 1898 was 34.78 inches in the 1997-98 water years.

Orange County is in the South Coast Air Basin, a 6,600 square mile area comprised of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino counties. The Basin's climate and topography are highly conducive to the formation and transport of air pollution. Peak ozone concentrations in the Basin over the last two decades have occurred at the base of the mountains around Azusa and Glendora in Los Angeles County and at Crestline in the mountain area above the City of San Bernardino. Ozone concentrations have been relatively low in Orange County in recent years. Both peak ozone concentrations and the number of days the standards were exceeded decreased everywhere in the air basin throughout the 1990's. Carbon monoxide concentrations also dropped significantly throughout the air basin as a result of strict new emission controls and reformulated gasoline sold in winter months.

G. Environmental Inventory

***Wetlands*:** San Diego Creek and its major tributaries are man-made flood control channels draining the generally urbanized alluvial and coastal plain. Most historic wetlands within the project area were long ago drained for agricultural development. Important wetland habitats still exist in Upper Newport Bay and the adjacent San Joaquin Marsh.

The 500-acre San Joaquin Marsh is a remnant of an extensive marsh and riparian system that existed along the Santa Ana River and San Diego Creek. Campus Drive bisects the marsh. The area west of Campus Drive is the San Joaquin Marsh Reserve, managed by the University of California Natural Reserve System. The remaining 300 acres are owned by IRWD, designated the San Joaquin Marsh and Wildlife Sanctuary. The IRWD land includes a parcel west of Campus Drive containing a 16.9-acre Small Area Mitigation Site (SAMS-1) and 9.2 additional acres proposed for NTS site 62. NTS site 27 is also an existing 14-acre wetland mitigation site.

***Groundwater Resources*:** Groundwater in the San Diego Creek Watershed is largely within the Irvine sub-basin, forming the eastern portion of the larger Orange County groundwater basin. Groundwater resources in the Irvine sub-basin are primarily used for agricultural irrigation. The main aquifer in the Irvine sub-basin is beneath the Tustin alluvial plain. The thickness of the aquifer generally increases from east to west and regional groundwater flows in a westerly direction. The interaction between groundwater and stream flow affects the amount of water flowing in the San Diego Creek. Groundwater that naturally surfaces into San Diego Creek contains pollutants that are regulated under the TMDL program.

Groundwater quality is affected by high concentrations of nitrate, total dissolved solids (TDS), selenium, and contamination from organic compounds in specific locations. High nitrate and TDS concentrations are thought to be associated with infiltration from agricultural irrigation, affecting mostly shallow portions of the regional aquifer. High groundwater levels are believed to be a significant source of elevated selenium levels in San Diego Creek, apparently naturally-occurring from the historic *Cienega las Ranas* (Swamp of the Frogs) with wet weather erosion of the Monterey Formation in the Santiago foothills suspected as a natural selenium source.

No sole source aquifers have been designated in Orange County.

***Floodplain*:** San Diego Creek drains 80 percent of the 154 square miles tributary to Upper Newport Bay. Peters Canyon Wash is the largest tributary to San Diego Creek, draining about one-third of the total watershed area. The wet season in the watershed is from October to April. An absence of rain for several months during the summer dry season is common.

The record rainfall in the 1997-98 season produced peak flows of 15,300 cubic feet per second (cfs) in San Diego Creek at Culver Drive, and an estimated peak discharge in San Diego Creek at Newport Bay of 39,000 cfs. Floods with a 100-year return period would generate 16,700 cfs in San Diego Creek at Culver Drive, and 42,500 cfs in San Diego Creek at Newport Bay. Average base flow for San Diego Creek at Culver Drive is less than 16 cfs during summer conditions and less than 45 cfs during winter dry weather (excluding storm flow) conditions.

The majority of drainage courses in the San Diego Creek Watershed have been extensively altered and realigned, initially from agricultural activities and then from urban development, including the construction of flood control facilities. Historically, San Diego Creek and the small tributaries originated in the Santiago Hills and drained into an ephemeral lake and marsh area in the western portion of the Tustin Plains known as the *Cienega de las Ranas*. There were no defined channels along the lower reaches of San Diego Creek and Peters Canyon Wash. Occasionally, this ephemeral lake and marsh area would overflow and drain into the Santa Ana River. In response to periodic catastrophic flooding by the Santa Ana River, the river was rerouted to the west of Newport Beach in 1920.

Beginning in the 1880's, the San Diego Creek watershed was significantly altered by agricultural activities including ranching, grazing, and farming. The *Cienega de las Ranas* was drained and marsh vegetation cleared to accommodate these agricultural activities. Drainage channels were constructed to maximize the utility of this area for agricultural purposes. The drainage channels were ultimately rerouted to drain into Upper Newport Bay.

Following World War II, land uses changed from agriculture to more urban development including residential, commercial and industrial land uses. This urbanization caused further expansion of flood control facilities aimed at providing storm flow conveyance protection for the residents of this area and their property. This urbanization and subsequent expansion of flood control facilities caused the following to occur:

- Channelization of San Diego Creek and the isolation of San Joaquin Marsh from San Diego Creek. San Joaquin Marsh was the last remaining historic marsh land upstream of Upper Newport Bay.
- Creation of Rattlesnake, Siphon, Bonita Canyon, San Joaquin, Laguna, and Sand Canyon reservoirs for municipal and agricultural irrigation use.
- Increasing flood conveyance capacity to 100-year and straightening San Diego Creek and Peters Canyon Wash.
- Ongoing operation and management of these flood control facilities for flood protection purposes.

These agricultural and urban development activities eliminated the *Cienega de las Ranas* and channelized San Diego Creek, Peters Canyon Wash and their tributary drainages. The amount of freshwater wetlands, including emergent marsh wetlands habitat and other riparian habitat types that previously existed in the San Diego Creek Watershed was significantly reduced.

***Important/Significant Agricultural Lands*:** Currently, more than 50 percent of the watershed is urbanized. Approximately 15 percent (approximately 11,461 acres) of the watershed is used for agricultural purposes and the remaining 35 percent is open space. Farmland data from the California Department of Conservation, Division of Land Resource Protection, indicates that the majority of land in north Irvine is designated as prime farmland. There are 16,953 acres of prime or unique farmland in Orange County and 6,995 acres within the San Diego Creek watershed.

***Coastal Zones*:** The California coastal zone extends inland to include upper Newport Bay. None of the proposed NTS sites are in the coastal zone. Site 62 is just outside the coastal zone.

***Wild and Scenic Rivers*:** San Diego Creek is not a designated wild and scenic river. The nearest designated wild and scenic river is Sespe Creek in Ventura County.

Coastal Barrier: The Coastal Barrier Resources Act designated various undeveloped barrier islands along the Atlantic, Gulf, and Great Lakes coasts. The act does not currently apply to the California coast. Balboa Peninsula, at the mouth of lower Newport Bay, is similar to a barrier island and may have been created by a single 19th century flood event. It is fully developed.

Major Botanical Features: Thirty-six vegetation types were identified during field observations on the NTS project sites. The majority of the sites are dominated by disturbed or developed land such as modified channels, parks, and existing basins. However, several sites also contain native vegetation including needlegrass grassland, mule fat scrub, freshwater marsh, saltwater marsh, and herbaceous riparian.

***Important Fish and Wildlife*:** A variety of bird species reside in the watershed while some species are present only during certain seasons. The Upper Newport Bay Ecological Reserve is southern California's largest estuary and is a major stopping place for birds migrating along the Pacific flyway. Mammals within the San Diego Creek Watershed include common small mammals, such as Audubon cottontail and ground squirrels; bat species, such as the big brown bat and the western red bat; and larger mammal species including coyote, bobcat, and mule deer.

Due to the condition of the San Diego Creek and impaired water quality, tributaries within this watershed contain very few types and low numbers of invertebrate species. Most native fish species in the watershed have been extirpated.

***Endangered or Threatened Species*:** The EIR identified potential for several Federal listed species in the project area:

Birds: Southwestern willow flycatcher (*Empidonax traillii extimus*), endangered
Least Bell's vireo (*vireo bellii pusillus*), endangered
Light-footed clapper rail (*Rallus longirostris levipes*), endangered
California least tern (*Sterna antillarum browni*), endangered
Coastal California gnatcatcher (*Polioptila californica californica*), threatened

Insects: Quino checkerspot butterfly (*Euphidryos editha quino*), endangered

Plants: Thread-leaved brodiaea (*Brodiaea filifolia*), threatened

No listed fish or amphibian species are anticipated within the NTS project area. Tidewater goby (*Eucyclogobius newberryi*), Santa Ana sucker (*Catostomus santaanae*), unarmored three-spine stickleback (*Gasterosteus aculeatus williamsoni*), southern steelhead (*Oncorhynchus mykiss*), southwestern arroyo toad (*Bufo californicus*), red-legged frog (*Rana aurora draytoni*), and mountain yellow-legged frog (*Rana muscosa*) are not known or likely in this watershed.

Two listed vernal-pool species, San Diego fairy shrimp (*Branchinecta sandiegonensis*) and Riverside fairy shrimp (*Streptocephalus woottoni*), are known to occur within Orange County but are not known or expected within the project area.

***Critical Habitats*:** Critical habitat for coastal California gnatcatcher is designated in two upland areas of the San Diego Creek watershed: San Joaquin hills south and west of Sand Canyon, and Borrego Canyon in Santiago Hills within the northeast portion of the former El Toro Marine Corps Air Station.

***Environmental Sensitive Areas*:** San Diego Creek drains into Upper Newport Bay, one of the largest coastal estuaries in southern California. The 752-acre Upper Newport Bay Ecological Reserve is one of three state ecological reserves in Southern California owned and managed by the California Department of Fish and Game (CDFG). The Ecological Reserve is within the Pacific Flyway and supports a wide range of resident and migratory species. During winter migration, up to 35,000 birds may inhabit Newport Bay.

The combination of fresh and salt water and the seasonal variability in salinity within the Bay promotes a variety of diverse habitats specifically adapted to life in an estuarine environment. The Ecological Reserve is home to six federally- and state-listed Threatened and Endangered species (five bird species and one plant species).

***National Natural Landmarks*:** The Secretary of the Interior designated 36,398 acres within Irvine Ranch as a National Natural Landmark (NNL) on October 6, 2006, including upland areas of the San Diego Creek watershed in the San Joaquin Hills and the Santiago Foothills.

***Historic, Prehistoric, Architectural, Archaeological, and Cultural Sites*:** The San Diego Creek Watershed study area is known to have artifacts that represent American history, architecture, archaeology, engineering and culture, as found in subsurface excavations, buildings, structures and objects. A cultural resources evaluation report was prepared for the Draft EIR.

The former Tustin MCAS property contains two hangers considered the largest unsupported wooden structures in the world. The facilities were initially established as a Navy lighter-than-air base and commissioned in September 1942. In August 1978, the hangers were designated as a national historical landmark. The MCAS property was considered for NTS site 14 and as an off-line alternative to in-line NTS site 55.

***Aesthetic Resources*:** The proposed facilities are situated throughout the watershed, primarily in existing flood control basins and channels, drainages, agricultural areas, or near residential or commercial development areas. A number of NTS sites are proposed in proximity to roads or highways designated as viewscape corridors, scenic highways with rural or natural character, or having major views and/or scenic resources.

***Hazardous Materials*:** Some proposed NTS sites have historically been, or currently are, within areas used for agricultural purposes. Agricultural sites generally have the potential for hazardous materials concerns based upon historical presence of underground storage tanks or pesticide use.

The Regional Retrofit facilities and Existing Regional facility sites are located in proximity to identified non-agricultural sites documented to have instances of hazardous materials transport, storage, use, or disposal. Five proposed Local Facility sites are located in areas where there is documented history of hazardous materials transport, use, or disposal, or where the land use type could generally be expected to require the transport, use or disposal of hazardous materials.

H. Present Facilities

San Diego Creek currently serves primarily as a flood control channel, designed to contain run-off from a 100-year storm event, estimated at 42,500 cfs. Three sediment trapping basins, each measuring 2,000-3,000 feet long, were built in the San Diego Creek channel adjacent to the IRWD Michelson Water Reclamation Plant, to reduce sediment transport to Upper Newport Bay, capable of capturing a total of 300,000 cubic yards of sediment. Additional sediment basins are installed in foothill areas of the upper watershed.

Four NTS sites are existing Regional facilities: San Joaquin Wetlands (Site 46), Rattlesnake Reservoir (Site 13), San Canyon Reservoir (Site 39) and Barranca Off-line wetlands (Site 27). Site 62 would be adjacent to an existing mitigation wetland, SAMS-1.

***San Joaquin Wetlands (Site 46)*:** The IRWD began diverting 5 cfs of dry weather baseflow into the San Joaquin wetlands in 1997 to reduce nutrient loads. Capacity was upgraded to 10 cfs in 2001. Low flows from San Diego Creek are conveyed via a diversion structure in the creek, the San Diego Creek pump station and an 18-inch diameter pipeline.

The San Diego Creek pump station is equipped with two 75 horsepower (HP) pumps. Normally only one pump operates at a time. Water is returned to San Diego Creek via a 200 HP pump station. The extra return capacity is primarily to pump storm flows to the flood control channel.

The constructed wetlands consist of five treatment cells with 45 acres of open water and 11 acres of marshland vegetation. Water is pumped from San Diego Creek into the wetlands at an average rate of about 7 cfs and slowly moves through the ponds for seven to 10 days. During that time, the water comes into contact with cattails, bulrush and other vegetation that removes 50% to 70% of the nitrogen before it returns to San Diego Creek and flows into upper Newport Bay.

The San Joaquin Marsh treatment wetlands remove about 200 lbs of nitrate-N per day during dry weather, reducing the total load to Upper Newport Bay by 30%. A corresponding decrease in algal growth in Newport Bay has been reported, associated with the drop in nitrogen levels. The sediment basins capture 50,000 tons of sediment per year, with 10,000 pounds of phosphorus.

***Rattlesnake Reservoir (Site 13)*:** Rattlesnake Reservoir is an existing reservoir formerly used for agricultural irrigation. The reservoir is currently used for storage of reclaimed water and is owned and operated by IRWD. The reservoir retains most dry and wet weather flows. No physical changes to the reservoir or its operations and maintenance activities are envisioned as part of the NTS Plan.

***Sand Canyon Reservoir (Site 39)*:** Sand Canyon Reservoir is an existing reservoir that was formerly used for agricultural irrigation and would provide water quality benefits for future development in the drainage area. It is owned and operated by IRWD. No physical changes to the reservoir or its operations and maintenance activities are envisioned as part of the NTS Plan.

***Barranca Off-line Wetlands (Site 27)*:** Site 27 is an existing mitigation site located on the northeast corner of Barranca Parkway and Jeffrey Road within the City of Irvine. This area is a depression also known as the Barranca Natural Habitat Revegetation Area. The site is linear and narrow with dimensions of 2,500 feet by 250 feet. It consists of two separate cells divided by a berm. The east cell is the larger of the two and is approximately 11 acres. The west cell is approximately three acres.

San Joaquin Marsh Small Area Mitigation Site-1 (SAMS-1): A 16.9-acre cottonwood-willow riparian forest referred to as SAMS-1 was created in the San Joaquin Marsh in June 1990 as a consolidated mitigation to address impacts for several development projects by The Irvine Company. The original landscape plan included black willow, arroyo willow, and Freemont cottonwood plantings. Understory plantings were not included in the initial landscape design. The parcel also contains 9.2 acres of degraded habitat proposed for NTS Site 62.

K. Quality of Present Receiving Waters

The Santa Ana RWQCB identified San Diego Creek and Upper Newport Bay as impaired water bodies with respect to sediments, nutrients, pathogens, and unknown toxicity. TMDLs for San Diego Creek and Upper Newport Bay have been adopted for sediments, nutrients, pathogens, organophosphates, Selenium, metals, and organochlorine compounds.

L. Water Quality Problems

Sediment loads are primarily generated from non-urban land uses, such as agricultural and other open space lands and from construction sites and other disturbed urban sites. Nutrients promote algal blooms and the growth of rooted aquatic vegetation, which adversely affects dissolved oxygen and aquatic organisms in the Upper Newport Bay. Sources of nitrogen nutrient loading include irrigation return flows from commercial nurseries, urban runoff, atmospheric deposition, and rising groundwater. The phosphorous load is mostly generated during the wet season and is associated with winter storm events and sediment loading. The phosphorus may be primarily particulate rather than dissolved, or at least seems readily adsorbed onto sediment particles.

Pathogens are organisms that can cause disease, such as bacteria and viruses. The presence of fecal coliform bacteria implies that the water body has been contaminated with human and/or animal waste, suggesting the potential presence of associated pathogenic organisms. Other toxic pollutants of concern for the San Diego Creek include organophosphates (pesticides), Selenium, heavy metals, and organochlorine compounds (e.g., PCBs, DDT).

M. Characteristics of Air Basin

The South Coast Air Basin is a non-attainment basin for ozone, PM-10, and PM-2.5 and is classified as a “severe-17” non-attainment area for ozone (8-hour). Some of the nation’s highest concentrations of PM-2.5 and ozone occur in the South Coast Air Basin despite stringent State and local controls and substantial air quality progress. The South Coast Air Basin is one of two PM-2.5 nonattainment areas in the State, and the most serious in the nation. It is also the nation’s worst area for ozone, with 8-hour ozone levels that are currently 50 percent above the federal standard. The ozone standard is exceeded somewhere in the basin on an average of 85 days per year. The air basin was re-designated from non-attainment to attainment for carbon monoxide (CO) on May 11, 2007. Most air pollution is believed to be due to mobile source emissions.

Regionally, the South Coast Air Quality Management District (SCAQMD) and the Southern California Association of Governments (SCAG) have responsibility under state law to prepare the Air Quality Management Plan (AQMP) containing measures to meet state and federal requirements. When approved by the California Air Resources Board (CARB) and the federal EPA, the AQMP becomes part of the State Implementation Plan (SIP).

IV. ENVIRONMENTAL IMPACTS

Based on the EIR, the IRWD made the following findings under CEQA:

The NTS Plan (proposed Action) could impact biological resources, water quality, air quality, land use, landform modification and aesthetics, human health and public safety, and cultural resources. Mitigation measures (Attachment A) were imposed to reduce potential impacts to below significance. No environmental effects would remain significant and unavoidable after implementation of project design features, standard conditions, and mitigation measures. Effects to flood control, noise, traffic, population and housing, geology and soils, paleontology, mineral resources, and public services and utilities were found to be less than significant.

The "No Action" alternative would not achieve the objectives of the NTS Plan, would not enhance habitat, and would not enhance local agency efforts to achieve compliance with the TMDLs set for the San Diego Creek Watershed.

The Site 26 Alternative would achieve the objectives of the NTS Master Plan and would avoid regulatory agency permits required for the proposed Site 26 In-line facility. The NTS Master Plan objective related to enhancing habitat values within the watershed would be achieved under this alternative, since the Off-line facility would include areas that could be used by wildlife. Although this alternative is feasible, would attain the objectives of the project, and would not result in any different or increased significant impact of the project, it would not avoid or reduce any significant impact and was not found environmentally superior to the project.

A. Impacts

i. Wetlands

NTS Plan: NTS Plan implementation will create a net increase of 56.7 acres of freshwater wetland habitat that otherwise would not exist. Impacts to some existing wetlands may have to be mitigated by the creation of non-treatment wetlands. The increase in freshwater wetlands areas and 60.2 additional acres of surrounding habitat enhancement at 15 NTS Facilities totaling 116.9 acres is the primary mitigation for creation, operation, and maintenance of NTS Facilities.

Most NTS facilities involve negligible impacts on existing wetlands. Of the 31 proposed NTS sites, 22 are characterized as dry, disturbed upland areas. NTS wetlands are expected to increase the net conservation benefit of these areas. Three of the 31 sites, Rattlesnake Reservoir (Site 13), Sand Canyon Reservoir (Site 39), and San Joaquin Marsh (Site 46) are existing IRWD facilities. No construction is planned for these sites. No changes in are proposed.

Three sites are in-line basins where dry weather low flows will be temporarily detained longer within existing flood control channels. These channels are currently maintained with minimal vegetation. There are existing benthic areas within the channels, but due to the high maintenance and disturbance in these channels for flood control, the habitat value is typically low. The introduction of NTS facilities to these sites is expected to increase the value of the habitat.

The Barranca Off-Line Wetland (Site 27) is an existing habitat mitigation site, owned and operated by the City of Irvine. Due to the sensitive nature of this site, no changes in O&M for this site are proposed other than increasing water detention times. This site is managed under existing agreements and permits. No changes are proposed at this time. IRWD committed to no reduction in biological values or function at Site 27.

Site 62 contains 6.34 acres of freshwater marsh and 0.81 acre of saltwater marsh and is in proximity to a variety of sensitive habitats, including alkali marsh, salt marsh, freshwater wetlands, and cottonwood-willow woodland contained in the SAMS-1 mitigations site and the San Joaquin Marsh Reserve. Site 62 may require an individual permit from the Army Corps of Engineers (ACOE) under section 404 of the Clean Water Act (CWA). Design of site 62 is not complete and no 404 permit application has been submitted to date. IRWD is committed to wetland habitat enhancement and no decrease in biological functions and values at NTS Site 62. Enhancement of adjacent habitat within SAMS-1 is also proposed, unrelated to NTS function.

Operations and Maintenance (O&M): Wetland habitats on some sites may be disturbed during O&M activities that may result in temporary removal of the 56.7 acres of constructed wetlands. Based on Habitat Sensitivity Designation Definitions contained in the Master Plan, IRWD staff biologists will perform preliminary site assessments prior to O&M activities to identify potential effects and recommend appropriate action to avoid or minimize the effects to the greatest extent practicable. Maintenance will be rotated so that only some of the sites are undergoing maintenance at any one time. The overall net increase in freshwater wetlands is expected to offset any impacts associated with long-term O&M.

CWA section 404 permits have been issued for NTS sites 26, 55, 64, 53, 56, 67, 31, 32, 49, 42, 16, 71, 52, 22, 50, 51, 9, 10, 11, 12A-12G, 61, and 68 (see table 2). For Sites 31, 32, 49 and 42, no impacts to jurisdictional resources resulted with construction. Mitigation was required at NTS site 16 for impacts to 0.25 acres of jurisdictional wetland. Final regulatory action is pending on a 404 permit application for Irvine Planning Area 39, including NTS sites 69 A-E. Planning Area 39 includes 4.7 acres of wetland mitigation to offset impacts from a recreational trail; no compensatory mitigation is being required for the proposed NTS site 69 facilities.

No Action Alternative: Impacts to jurisdictional wetlands and habitats would be avoided. No additional wetland habitats would be created. Without the NTS facilities, there would be little or no valuable habitat available for sensitive species in most of the proposed NTS sites.

Site 26 Alternative: Off-line Replacement of the In-Line Facility at Site 26 would eliminate impacts to existing biological resources and jurisdictional areas within San Diego Creek from construction and operation of the In-line site 26 facility. Impacts to approximately 2.81 acres of ACOE jurisdiction (1.04 acres of waters of the U.S. and 1.77 acres of jurisdictional wetlands) would be avoided by implementation of an Off-Line replacement for NTS Site 26.

Table 2: Army Corps of Engineers Permits for Irvine Ranch Water District NTS Program

Site #	Site Name	ACOE Permit #	Date completed
Regional Sites			
26	Woodbridge In-Line	200501836-YJC	2/27/06
55	Santa Ana/Santa Fe Channel	200501836-YJC	2/27/06
64	Westpark In-Line	200501836-YJC	2/27/06
53	Caltrans SR-133/I-5 Interchange	200600565-YJC	6/14/06
56	El Modena Park	200600565-YJC	6/14/06
67	*Cienega de Las Ranas*	200601326-YJC	9/26/06
62	SAMS 1/SJM	Permit application not yet submitted	
Local Sites			
31	PA 17 West Basin	PA 17 Permit No. 2000-01036-RLK	6/21/01
49	PA 17 Center Basin	PA 17 Permit No. 2000-01036-RLK	6/21/01
32	PA 17 East Basin	PA 17 Permit No. 2000-01036-RLK	6/21/01
42	Turtle Ridge North	PA 27 Permit No. 1999-16339-RLK	Issued 3/26/01 Amended 3/2/04
16	Trabuco Retarding Basin	PA 9 Permit No. 2002-01466-YJC	3/4/03
71	PA 6 Marshburn	200400594-CLM	6/8/04
52	MCAS El Toro, Bee Canyon	200400594-CLM	6/8/04
22	MCAS El Toro, Aqua Chinon Lower	200400594-CLM	6/8/04
50	MCAS El Toro, Irvine Auto Center	200400594-CLM	6/8/04
51	MCAS El Toro, Serrano	200400594-CLM	6/8/04
9	PA 1 Eastfoot Retarding Basin	200501057-YJC	9/7/2005
10	PA 1-Eastfoot Upper	200501057-YJC	9/7/2005
11	PA 1-Orchard Estates Retarding Basin	200501057-YJC	9/7/2005
12A-12G	Lower Orchard Estates (multiple basins)	200501057-YJC	9/7/2005
61	PA 1-Eastfoot Lower	200501057-YJC	9/7/2005
68	PA 18	200600752-YJC	9/20/2006
69 A-E	PA 39 (multiple basins)	SPL-2007-964-YJC	pending

ii. Floodplain/Hydrology

NTS Plan: Potential impacts to existing flood control functions in the Watershed, including impacts to existing channels and retarding basins, were evaluated. In general, flood control concerns apply to NTS Facilities proposed within existing stormwater detention basins or existing flood control channels (Type II or III facilities).

No physical changes are proposed for NTS Sites 13, 39, 46 and 27. Sites 26, 55, 56, 64, 31, 18, 16, 9 and 11 are existing flood retarding basins or existing in-line facilities that could be affected by the addition of water quality treatment wetlands. Type III NTS Facilities constructed within existing retarding basins (NTS Sites 9, 11, 16, 18, and 31) are designed to avoid impacts to existing flood control function and capacities of the basins by excavating existing basins to accommodate the capacity needed for the constructed wetlands.

For in-channel facilities, project designs are intended to ensure no decrease in channel capacity by modeling or use of seasonal weir structures (Sites 26, 55, and 64). Hydraulic analysis of the NTS Master Plan concluded that no significant impacts would occur to the existing channel hydrology or flood conveyance capabilities. Potential flooding impacts would be reduced to below a level of significance with implementation of Project Design Features, including the removal of weirs at some In-line facilities prior to the start of the winter storm season. No significant flood control impacts were identified in the EIR.

Project designs are intended to ensure that the rate of outflow to the downstream channel is not changed during flood conditions. Additional detailed assessment of flood control impacts will be performed during final design studies to ensure that NTS facilities will not impact existing flood control capacities and functions. All proposed modifications to existing retarding basins require approval from the California Department of Safety of Dams.

The NTS Plan is not intended to alter the quantity of water flowing in San Diego Creek, but rather to address water quality in San Diego Creek by removing impairing pollutants. No permanent diversions out of the waterway are proposed. All NTS Plan facilities will discharge to San Diego Creek. NTS facilities could affect stream flows as a result of diversions into off-line facilities, increased evaporation, and infiltration and percolation to groundwater. Infiltration and percolation effects will be minimized with basin liners where required by soil conditions.

Diversions: Type III Off-Line Facilities require the diversion of water from the adjacent stream channel into the proposed water quality treatment wetlands and returning the treated water from the wetlands back into the stream channel. Where Off-Line Facilities are proposed, there would be a short stream reach between the point of diversion and the point of return flow. That reach of the channel would experience less flow than would otherwise be the case.

Off-Line Facilities are designed to minimize potential impacts of flow diversions by locating the diversion and return points as close as possible and setting maximum diversion at 75 percent of estimated stream flow. Flows diverted to Off-Line Facilities would average 50 percent during the dry season. Diverted waters would be returned to the stream from which they were diverted minus evapotranspiration loses which are expected to be minimal (see below).

Evaporation: Construction of NTS Facilities may increase the amount of evaporation from diversion of channel flows into the water quality treatment wetlands. The total loss of water from evaporation and transpiration from wetland vegetation was estimated in the NTS Plan using data from the California Irrigation Management Information System (CIMIS).

Evapotranspiration losses in the San Diego Creek Watershed average 17 and 34 inches of water per unit area in the wet and dry seasons, respectively. Implementation of the proposed NTS Plan will reduce base flows by about seven and three percent in the dry and wet seasons, respectively. Evaporation conditions may be higher at some NTS sites, particularly those with relatively low inflows or located further inland with dryer and warmer weather conditions.

Infiltration: A third potential impact on surface water volumes is possible at certain NTS sites through infiltration into underlying groundwater systems. Infiltration at any particular NTS site depends primarily on the underlying soils, local groundwater elevations, and facility design. Many NTS sites are located in areas with poorly draining soils; however, some sites are proposed in areas with moderate to high infiltration capacity, where infiltration is a potential issue.

For sites with moderate to high infiltration capabilities, the NTS Plan will use liners along the bottom of the constructed wetlands. While most water quality treatment wetlands tend to seal naturally, liners are proposed that would consist of one to two feet of compacted clay or a synthetic geo-textile material, effectively eliminating infiltration losses.

An opposite scenario was also considered in which rising groundwater could potentially infiltrate into the NTS Facilities. This could occur in areas where groundwater elevations are high. If near-surface groundwater is detected during detailed design studies, the use of liners would also be incorporated into the design to limit hydraulic continuity between the wetlands and underlying groundwater system.

No Action Alternative: No floodplain or hydrology impacts would occur.

Site 26 Alternative: This alternative would relocate the In-line NTS Site 26 to an Off-line location out of the flood control channel, avoiding floodplain issues for NTS Site 26. Hydrology effects due to evapotranspiration should be approximately identical to the NTS Plan.

iii. Significant and/or Important Farmlands

NTS Plan: Twelve NTS sites are located within areas designated as prime or unique farmland. The amount of land is not substantial in the context of the 6,995 acres of prime and unique farmland in the watershed. Installation of treatment wetlands may not be an irreversible conversion of agricultural land. Reclamation initiated consultation with the Natural Resources Conservation Service in compliance with the provisions of the Farmland Protection Policy Act (Attachment D).

No Action Alternative: No conversion of farmland would occur as a result of the NTS plan. The ongoing urbanization of the San Diego Creek watershed would likely continue.

Site 26 Alternative: Neither In-Line Site 26 nor the Site 26 Off-line Alternative are in designated farmland. Implementing this alternative would not change the farmland conversion impact.

iv. Coastal Zones

None of the proposed NTS sites are within the California Coastal Zone Boundary. Site 62 is located just outside the coastal zone.

v. Wild and Scenic Rivers

San Diego Creek is not a designated Wild and Scenic River.

vi. Coastal Barrier Resources

No coastal barrier islands are involved. Balboa Peninsula will not be affected.

vii. Air Quality

NTS Plan: The primary source of potential air quality impacts is the construction of each of the NTS Facilities. Short-term construction impacts would result from fugitive dust generated during grading and excavation, construction vehicle and equipment emissions, and vehicle emissions associated with employee vehicle trips. No substantial long term air quality impacts are expected from the operation of these water quality treatment wetlands and basins.

No Action Alternative: No construction impacts to air quality would occur.

Site 26 Alternative: The Off-line site considered under this alternative would require the same mitigation measures as all of the remaining NTS Facilities. Short-term construction impacts from implementation of this alternative would not be significant after applying all available mitigation measures (e.g., MM-AQ-1 through MM-AQ-9). Since this Off-line facility is assumed to use gravity flow, electricity use would not occur. The operations impacts of this alternative on air quality, similar to the NTS Plan, would not be significant.

viii. Important Vegetation Types

NTS Plan: Installation of NTS Facilities may affect existing wetlands and upland habitats, including some sensitive vegetation. About 74.2 acres would be disturbed within the 122-square mile San Diego Creek watershed. About 65.05 acres of the 74.2 acres (89 percent) involve low value, non-sensitive resources (agricultural, annual grassland, ruderal, ornamental, developed, or disturbed areas). The other 9.17 acres involve moderate to high quality vegetation (freshwater swale, freshwater marsh, herbaceous riparian, and mule fat scrub), including 7.15 acres of marsh habitat considered degraded at NTS site 62.

Not all of the 9.17 acres of impact to moderate to high quality vegetation would be permanent, as existing vegetation would be replaced with habitat and vegetation related to the NTS Facility. Some impacts would be temporary because they would be replaced with features of the operating water quality treatment wetlands (open water, bulrushes, grassland buffers). There will be some "type conversion" of habitats (e.g., from non-native grassland to freshwater/emergent marsh), but to the extent that such type conversion occurs, it would represent a beneficial impact that facilitates one of the goals of the CWA by enhancing and rehabilitating the historic loss of wetland areas to development in the San Diego Creek Watershed.

The biological function and value of the vegetation impacted by construction will be replaced with created habitat of higher biological function and value within the operating NTS water quality treatment wetlands. Implementation of NTS Plan Facilities will result in permanent

creation of 56.7 acres of emergent marsh/wetlands and open water habitats. Compared to the 9.17 acres of moderate to high quality habitat impacted by construction, the 56.7 acres of created emergent marsh/wetland habitat represents a greater than 5:1 replacement ratio. Additionally, a total of 60.2 additional acres of habitat enhancement will occur in areas adjacent to NTS Facilities through planting/seeding of annual grassland, scrub, saltwater marsh, and mixed riparian scrub vegetation. These are high quality habitats used for foraging.

In total, the NTS Facilities will create or enhance 116.9 acres of habitat comprising 56.7 acres of emergent marsh/wetlands and open water habitat and 60.2 acres of adjacent foraging habitats consisting of annual grassland, scrub, saltwater marsh, and mixed riparian scrub. The restored habitat areas would more than offset the 9.17 acres of sensitive habitats impacted by NTS Facility construction and represents a 13:1 replacement ratio.

No Action Alternative: Impacts to 74.2 acres of land including 9.17 acres of moderate to high quality vegetation would be avoided. Creation of 56.7 acres of emergent wetland and 60.2 acres of upland habitat enhancement would not occur.

Site 26 Alternative: Neither the In-line Site 26 nor the Off-line Site 26 Alternative would affect important vegetation types. This alternative would create the same amount of wetland habitat as the NTS Plan.

ix. Endangered or Threatened Species and Critical Habitats

NTS Plan: With implementation of EIR mitigation commitments including future surveys and avoidance measures (MM-BIO-1 and MM-BIO-7, Attachment A pages 9 and 12, respectively), the project is not expected to adversely affect any Federal listed species or critical habitat areas. The 9.17 acres of moderate to high quality habitat impacted by project construction are not designated as critical habitat and are not known to contain any listed species.

IRWD engaged in substantial consultation with the U.S. Fish and Wildlife Service (FWS) and had planned to apply for a Major Amendment to the Central and Coastal Subregion of the Orange County NCCP/HCP to include the NTS Plan and add tri-colored blackbirds (*Agelaius tricolor*) as a conditionally covered species. This unlisted, former candidate 2 species is likely to use the constructed wetland habitats, raising concerns that a future listing of the species might create regulatory impediments to operations and maintenance of NTS wetlands.

The FWS was originally asked to be the lead Federal agency for NEPA compliance. IRWD consultants prepared a draft Environmental Assessment for the proposed FWS action to approve a Major Amendment to the NCCP/HCP or an alternative "Safe Harbor" agreement for tri-colored blackbird. Consultations resulted in project modifications to avoid impacts to listed species and IRWD ultimately elected to drop the NCCP/HCP amendment/Safe Harbor request.

Several potential NTS sites were eliminated from the Master Plan due to existing riparian woodlands suitable as nesting habitat for least Bell's vireo or southwestern willow flycatcher. Sites 69C and 69E were identified as having some potential for thread-leaved brodiaea; however, subsequent surveys conducted for Planning Area 39 were negative. No direct impacts to coastal sage scrub or to critical habitat for coastal California gnatcatcher were identified. Survey results were negative for Quino checkerspot butterfly.

Coastal sage scrub habitat preserved or created in upland areas around some NTS wetlands may provide habitat for coastal California gnatcatchers. Construction or maintenance activities may generate noise that could result in very minor indirect effects to this threatened bird species. Informal consultation with FWS biologists resulted in a finding that the action is not likely to adversely affect gnatcatchers. FWS concurred on July 27, 2009 (Attachment B), based on a commitment to avoid the breeding season (March 15 to August 30).

No Action Alternative: No impacts to Federal listed species would occur.

Site 26 Alternative: No impacts to Federal listed species would occur.

x. Topography

NTS Plan: Most of the NTS water quality treatment wetlands are located in low-lying drainage channels, reservoirs or level open-space areas, and none of the NTS Sites are located in areas with unique geologic or physical land form features. The excavation and grading required to construct the shallow- and open water areas of the wetlands would create basins between one and six feet deep, with the shallow-water areas generally found around the periphery of the wetland. The change in topography for these sites is considered relatively minor in terms of landform modification, with the vegetated, shallow-water emergent plants and surface waters generally level with the surrounding topography. No significant landform modification impacts within the San Diego Creek Watershed are anticipated with implementation of the NTS Plan.

No Action Alternative: No landform modifications would occur.

Site 26 Alternative: This alternative would require grading and earthwork activities that would cover less area than proposed with implementation of the NTS Plan. Overall, this alternative would not result in significant impacts to landform modification.

xi. Groundwater

NTS Plan: Impacts to groundwater resources are not expected. The proposed action does not involve any groundwater extraction or recharge. Proposed In-Line Facilities would create shallow water areas, where ponding of water would occur within channels that are regularly saturated under existing conditions since they are flood control facilities and presently carry year-round low flows. The addition of the NTS Plan ponding water would not significantly alter the likelihood of infiltration of surface water into the groundwater. For Off-Line Facilities where detention times may extend up to approximately two weeks, basin liners are proposed at those sites where infiltration is likely due to soils composition.

Liners are proposed at Regional Retrofit Facility Sites 25, 54, and 56, and are assumed to be needed for program-level Site 67 (also a Regional Retrofit Facility). The need for liners for the remaining Local Facilities will be determined during final design for those sites and will be addressed in subsequent environmental reviews. In summary, impacts to groundwater quality are not anticipated because infiltration from NTS facilities will be minimal, either by the presence of dense/clayey soils, or by the use of liners.

No Action Alternative: No impacts to groundwater would occur.

Site 26 Alternative: No impacts to groundwater would occur. The Site 26 alternative would include a basin liner if soil types are susceptible to infiltration.

xii. Hazardous Materials

NTS Plan: The EIR concluded that proposed NTS facilities within agricultural use areas have a low potential for hazardous materials concerns. A review of government databases did not identify any agricultural sites of areas of concern.

Each recorded hazardous materials site located near the Regional Retrofit and Existing Regional facility NTS sites has been or is in the process of being remediated, if necessary. None of the Regional Retrofit facilities and Existing Regional facility sites are considered to have potential for hazardous material contamination from surrounding uses.

A hazardous materials records search will be conducted for all of the Local Facility sites during subsequent environmental review and development entitlement processing. Any known hazardous materials sites in the vicinity of the Local Facilities will be identified at that time.

No Action Alternative: No impact relating to hazardous materials would occur.

Site 26 Alternative: Neither the In-line Site 26 or the Off-line Alternative Site 26 is expected to involve hazardous material concerns.

xiii. Environmental Sensitive Areas

NTS Plan: The proposed NTS Program is intended to have a beneficial effect on the water quality within the San Diego Creek watershed and in Upper Newport Bay, with a long-term reduction in daily loads of target pollutants, including nutrients, sediment, pathogen indicators, toxic substances and selenium. The project is expected to result in a beneficial impact on aquatic plants and wildlife, and on avian species that use habitat areas within the watershed and in Upper Newport Bay for foraging and nesting activities.

No Action Alternative: Beneficial impacts to environmentally sensitive areas attributable to water quality improvements would not occur.

Site 26 Alternative: The water quality impacts of the Site 26 alternatives are expected to be similar to the Proposed Action.

xiv. Geology/Seismic Consideration/Soils

NTS Plan: None of the NTS sites are within designated Alquist-Priolo zones. Two project sites are within close proximity to fault locations:

Site 13 – Rattlesnake Reservoir: Located at the base of the Santiago Hills, west of the Santa Ana Mountains. The Elsinore fault zone is mapped east of the Santa Ana Mountains.

Site 39 – Sand Canyon Reservoir: Located in the San Joaquin Hills near the Newport-Inglewood-Rose Canyon faults zone.

As with development in most of Orange County, geotechnical issues pose a potential constraint to development. Standard design and engineering practices are adequate to ensure that potential impacts can be mitigated. Specific designs for each proposed construction project is required to fully address these concerns.

No Action Alternative: No geology, seismic considerations, or soils issues apply to the No Action alternative.

Site 26 Alternative: The Site 26 alternative is not within a designated Alquist-Priolo zone. Standard geotechnical designs would also apply to this alternative.

xv. National Natural Landmarks

NTS Plan: No NTS sites are located on Irvine Ranch NNL lands. All 36,398 acres of the Irvine Ranch NNL lands are in permanent conservation and will not be affected.

No Action Alternative: No effects to NNL lands.

Site 26 Alternative: No effects to NNL lands.

xvi. Historical, Architectural, Archaeological, and Cultural sites

NTS Plan: The potential exists for construction to encounter cultural resources at one or more of the Local Facility sites and Site 67. One Regional Retrofit Facility was determined to have the potential to impact cultural resources (Site 62) during project grading and construction. Because of archaeological sensitivity and the possibility that buried archaeological deposits could be present, all ground disturbing activities at Project Area 62 (San Joaquin Marsh-SAMS 1) will be monitored by a qualified archaeologist.

By letter dated July 26, 2005 (Attachment C), the California State Historic Preservation Officer concurred with the finding that no properties eligible for listing in the National Register of Historic Place will be affected by the proposed undertaking. This concurrence was conditioned on the commitment to have project construction at site 62 monitored by a professional archaeologist who meets the Secretary of Interior's Standards for archaeology.

No Action Alternative: Potential effects to archaeological resources at site 62 would be avoided.

Site 26 Alternative: The Site 26 alternative site is located in a developed urban area. No cultural resources are known or expected at this location.

xvii. Aesthetic Resources

NTS Plan: The EIR concluded that implementation of the proposed NTS Plan would not result in long-term operational and maintenance impacts resulting from landform modification and aesthetics changes. None of the proposed NTS sites include nighttime lighting; no light and glare impacts are expected. While NTS sites could be visible from these scenic roadways, the potential visual impacts to motorists are not considered adverse.

No Action Alternative: No aesthetic impacts or befits would result.

Site 26 Alternative: The Off-line facility would include an open water feature that may be considered an aesthetic benefit, enhancing the visual setting of the area. Fencing required around the facility may be considered a visual distraction. Existing ornamental landscaping would be removed for construction, but would be replaced to screen the proposed fencing. With the screening, aesthetic impacts of this alternative would be reduced to a less than significant level.

xvii. Land Use and Zoning

NTS Plan: All 31 NTS Facilities are located within the San Diego Creek Watershed. All NTS Plan facilities will be consistent with applicable land use plans, policies, and regulations. Most proposed Local Facilities are located within planned communities and were anticipated or identified in adopted development plans for those communities.

No land use compatibility issues are anticipated for Type II (in-line facilities) because they would be located within existing flood control channels. Type III (combination facilities) would be located within existing detention basins, retarding basins, or reservoirs and no land use compatibility impacts are anticipated. Type I (off-line) facilities are proposed in areas with a similar existing land use setting and would be compatible with existing and surrounding land uses since they would be similar in nature to the present setting and site operations.

Some of the proposed project sites will require converting agricultural land to wetland facilities and some sites are either entirely or partially designated as prime farmland or farmland of statewide importance. Removal of land currently used for agriculture or designated as prime farmlands could impact agricultural operations in Orange County.

No Action Alternative: No land use effects would result.

Site 26 Alternative: Implementation of an Off-line facility would be compatible with existing and planned surrounding land uses. The site has a General Plan designation of Recreation and a zoning designation of 1.5 Recreation. Implementation of this Off-line facility would be consistent with these designations. Adjacent land uses include the San Diego Creek Channel to the north, Culver Drive to the west, Alton Park to the south and ornamental landscaping to the east. A batting cage and electrical facilities are located immediately to the south of this alternative site, within Alton Park. This alternative would be located adjacent to these areas and would be compatible with surrounding land uses as the area is already developed for urban uses.

xix Socioeconomic Impacts

NTS Plan: The proposed action would provide water quality treatment facilities to treat urban runoff from existing and planned development. Changes in the local or regional population are not expected to be influenced by the proposed NTS Plan. The project does not propose any development that would increase the population in the individual study areas or within Orange County as a whole. No housing would be built or removed as a result of the proposed project. The project would not induce development or result in secondary population or housing impacts.

No Action Alternative: No socioeconomic effects would occur.

Site 26 Alternative: The Site 26 Alternative would create no socioeconomic impacts compared to the proposed NTS Plan.

xx. Utilities

NTS Plan: The EIR concluded that the proposed NTS Plan would not result in increased population and/or significant demands upon existing utilities or service systems. The NTS Plan does not include any facilities that would generate wastewater nor would it affect local wastewater treatment facilities. The NTS Plan may have short-term, minimal potable water demands for wetland plant establishment. A small amount of solid waste may be generated by the construction of wetland berms, but the amount of project construction debris is considered to be very low and would not warrant on-site recycling.

Pump stations associated with 5 of the NTS Plan facilities will increase the amount of electricity used compared to the existing San Joaquin treatment wetlands. The baseline electrical demand is 114 kilowatts (Kw) with peak demand of 266 Kw. Implementation of the NTS Plan will create an additional 163 Kw peak demand. The existing peak demand of the Southern California Edison system is about 23,000 megawatts.

No Action Alternative: The small increased electricity demand created by the proposed NTS Plan would be avoided under the No Project alternative. Existing pumping from San Diego Creek to the San Joaquin treatment marsh would continue.

Site 26 Alternative: The Off-line Site 26 Alternative would require a 25 HP pump station, resulting in a 19 Kw incremental increase in electricity demand compared to the NTS Plan.

xxi. Transportation and Access

NTS Plan: A total of 31 NTS Facilities are proposed at various locations throughout the San Diego Creek Watershed. The proposed NTS project would not result in a measurable increase in vehicular traffic on city streets and would, therefore, not result in reduced levels of service.

Routine and major O&M activities for each facility would necessitate only a minimal number of employees and vehicles and no significant traffic operations are expected.

xxii. Climate

NTS Plan: Several proposed NTS facilities would use energy (electricity) to operate small pump stations, increasing peak electrical demand by about 163 Kw. This may increase greenhouse gas emissions by about 500 metric tons (MT) of carbon dioxide per year. SCAQMD has suggested a significance screening level of 10,000 MT/year for industrial projects or 3,000 MT/year for commercial or residential projects. Greenhouse gas emissions attributable to the project may be partly offset due to carbon uptake and sequestering by vegetation in the created wetlands.

No Action Alternative: No increased energy use and indirect greenhouse gas issues would result. No increased carbon sequestering would occur. Existing pump operations for the San Joaquin treatment wetlands would continue.

Site 26 Alternative: This alternative requires a pump station that would not be needed for the proposed in-line NTS 26 facility. As a result, this alternative would marginally increase power demand and indirectly increase greenhouse gas emissions compared to the proposed action.

xxii. Noise

NTS Plan: A noise study was prepared to determine the potential for short- or long-term noise impacts from implementation of the NTS Plan. The proposed sites are currently exposed to ambient noise generated by traffic, aircraft flights, train movements, and commercial/industrial activities in the area.

Initial phase implementation of the NTS Plan would require construction at nine NTS sites with the length of the construction ranging from about three to 25 weeks. The construction on sites near special status species will be scheduled during weekday work hours and with consideration to avoid peak breeding season months. The EIR concluded that the construction activities would not create a significant impact.

Ongoing operations and periodic maintenance would be performed during weekday work hours and would be scheduled with consideration to avoid peak bird breeding season months. Pumps to move water into or out of the facilities would be housed with reinforced concrete, which would reduce noise levels below the thresholds of significance established for the study.

No Action Alternative: Construction-related noise issues would be avoided.

Site 26 Alternative: The EIR concluded that the Off-line Site 25 facility would not generate any noise, assuming that stream flows from the adjacent channel would be diverted by gravity. No mechanical equipment or other noise generating equipment was assumed. If a pump station is required, it would be housed with reinforced concrete to reduce noise as described above.

xxiv. Environmental Justice

The project area is a relatively affluent area, but NTS Project facilities are intended to provide broad benefits. The proposed action will not exclude persons or populations from participating, deny benefits to persons or populations, or subject persons or populations to discrimination because of their race, Color, or national origin.

xxv. Tribal issues

No tribal sacred sites or Indian Trust Assets were identified in the project impact area. Outreach efforts to tribes were conducted as part of the NHPA 106 consultation process. No tribal issues were raised.

xxvi. Other

a. Vector Control

The proposed NTS sites could present public health and safety concerns associated with open water bodies and the risk the sites present to human contact and vector attraction. The NTS Program includes recommendations to control mosquitoes and describes long-term vector and pest monitoring measures.

No Action Alternative: No wetlands would be created, and associated mosquito abatement issues would be avoided.

Site 26 Alternative: The Off-line Site 26 alternative would be approximately the same size as the In-line facility proposed in the NTS Plan. Vector control issues would be identical.

b. Bioaccumulation

NTS Plan: Pollutants can accumulate in water quality treatment wetlands, increasing the risk of exposure to wildlife and the food chain. Pollutant-laden sediments and plants in the In-Line facilities may be flushed to Newport Bay by runoff from winter storm events.

Selenium is present in the San Diego Creek Watershed and can be both beneficial and toxic to wildlife, particularly birds. Bioaccumulation of some selenium in the food web cannot be prevented in the NTS Plan or in the current unmanaged San Diego Creek Watershed. The NTS Plan will provide some reductions in selenium toxicity to wildlife over the existing conditions.

The NTS will not remove all selenium from San Diego Creek and Newport Bay. However, it is likely that the NTS will reduce the overall amount of bioavailable selenium by between 30 and 70%. A reduction of this magnitude may move the watershed out of the threat of serious selenium toxicity to birds and other wildlife.

If the NTS does not perform as expected it will increase the amount of selenium-polluted wetlands and threats to birds. Some parts of the food chain in the NTS may be contaminated with selenium at levels above those considered safe by several agencies. However, this is the situation now found in every part of the San Diego Creek watershed.

NTS facility designs and O&M activities have been planned to minimize the possibility that exposure to selenium in (or other trapped pollutants) would be increased (i.e., trapped within the NTS facility) in comparison to existing conditions. The NTS Plan has been designed to reduce the potential for selenium impacts on a watershed basis; it includes a Selenium Action Plan to define the steps that IRWD will take during operations of the NTS facilities to assess the potential risk to biota from selenium to address unacceptable selenium levels that either would cause a significant increase in risk or result in a detrimental condition.

To address the concern that pollutants can accumulate in the NTS Facilities wetlands and increase the risk of exposure to wildlife and the food chain, sediment, plant tissue, and macro-invertebrates samples from all facilities will be tested based on approved monitoring protocols for constituents that are subject to bio-magnification and/or bioaccumulation, including trace metals, Selenium, mercury, organochlorine pesticides, and PCBs.

No Action Alternative: If the NTS or a similar system is not constructed in the SDC watershed, other less environmentally friendly and unsustainable methods of pollution control may have to be used to address the existing selenium issue. Such methods include drilling and “pump and treat” technologies, as well as grout curtains and in situ immobilization using injections of soluble carbon. These alternatives have not been formally studied, but are typical methods used for selenium and other contaminant problems in groundwater. All of these methods are costly, intrusive and unsustainable, unlike the NTS.

Site 26 Alternative: No change in bioaccumulation impacts compared to proposed action.

B. Summary of any Significant Impacts and Mitigation Measures

NTS Plan treatment wetlands include Project Design Features and Standard Conditions to minimize and avoid adverse effects. Mitigation measures were adopted pursuant to the requirements of CEQA when adverse effects were identified. The CEQA EIR concluded that the proposed NTS Plan would result in potentially significant environmental impacts for the issues of biological resources, hazardous materials, air quality, aesthetics and cultural resources. For each potentially significant effect identified in the EIR, mitigation measures were proposed to reduce the potential impacts to below significance. A list of Project Design Features, Standard Conditions and Requirements, and mitigation measures is provided in Attachment A.

C. Water Quality Benefits from Operation of the Proposed Project

The proposed NTS Program would provide a beneficial impact on water quality in San Diego Creek, in tributaries to the Creek, and ultimately to Upper Newport Bay which receives drainage from the watershed. The NTS sites would remove sediment, harmful nutrients (nitrogen and phosphorous), pathogens and toxic pollutants, resulting in improved water quality within the watershed, Upper Newport Bay and ultimately in flows reaching the Pacific Ocean.

NTS In-Line and Off-Line facilities should restore natural ecosystem functions that remove sediments, nutrients, pathogens and other contaminants from dry weather and small storm flows. As an integral element in a watershed approach to improving water quality, the NTS Plan is intended to assist in both protecting and restoring the biological, chemical and physical integrity of the San Diego Creek Watershed.

Implementation of the NTS wetland facilities will reduce in-stream total nitrogen concentrations below current standards at almost all locations. Total phosphorous TMDL targets for 2002 and 2012 during stormwater runoff for build-out watershed sources are also predicted to be met in all but the wettest years, assuming that in-stream sources are effectively controlled at build-out. The fecal coliform TMDL is projected to be met during the dry season, but not during all wet season low flow conditions, and not under storm conditions.

While the NTS Plan is not designed to meet the sediment TMDL, NTS Facilities would capture on average about 800 tons per year of sediment, contributing to a reduction in sediment generated by urban and open space land sources in the San Diego Creek Watershed. Most sediment within the Watershed is expected to be transported during large storm events and would not be captured by the proposed NTS Facilities.

The NTS Plan is projected to remove about 14 percent of the total copper loads, 11 percent of lead loads, and about 12 percent of the total zinc loads attributable to urban and open land sources. The proposed selenium treatment facility (Site 67) is estimated to remove about 200 pounds of selenium per year from dry weather base flows in Peters Canyon Wash. This removal estimate equates to a removal of approximately 20 to 50 percent of the base flow selenium load to Newport Bay. This Facility by itself, however, would not achieve the proposed TMDL targets because are other tributaries also contribute selenium loads and because it would only treat low flows; Site 67 would not address selenium loads in large storm flows.

Table 3: Expected Water Quality benefits

TMDL Constituent	TMDL target and water quality objective[1]	What the NTS Plan is estimated to achieve	Estimated contribution of the NTS Plan to TMDL compliance
Nitrogen	TMDL for TN Load to Upper Newport Bay (UNB): Dry season = 153,861 lbs; Wet season = 144,364 lbs.	Dry Season: Ave TN removed = 127,300 lbs Load to UNB = 70,500 lbs Wet Season: Ave TN removed = 103,500 lbs Load to UNB = 129,200 lbs	Both dry and wet season TMDL objectives are met.
Sediment	TMDL for sediment: 62,500 tons/year to UNB; 62,500 tons/year to watershed (trapped in sediment basins).	Annual sediment loads are variable, strongly associated on rainfall. Estimated removal in NTS facilities is about 800 tons/year from urban and open land sources for average rainfall year conditions.	Estimated sediment loads from urban and open land areas are below the TMDL allocation for these sources. The NTS Plan is not intended to address in-stream sediment sources (channel scour), which is the source of the vast majority of sediments in storm runoff.
Phosphorus	TMDL for TP (Load to UNB): 62,080 lbs/year	TP loads are strongly associated with sediment loads. Estimated removal is 4,300 lbs/year from urban and open land sources for average rainfall year conditions.	Estimated TP loads from urban and open land areas are below the TMDL limit in all years except extreme rainfall years. The NTS plan does not address in-stream sources of TP.
Pathogens	TMDL for fecal coliform in flows to UNB: Maximum = 400 MPN per 100 mL (with 10% exceedance in 30-days) 30-day average = 200 MPN per 100 mL	Fecal coliform concentration is variable, associated with rainfall. Average maximum fecal coliform concentrations are reduced by roughly 30 percent in dry weather low flows, and about 10 percent in storm flows.	TMDL would be met for most, but not all dry and wet season low flows. TMDL is not met for storm flows.
Diazinon and Chlorpyrifos	Concentration limits in San Diego Creek (ng/L): Diazinon = 80 (acute) 50 (chronic) Chlorpyrifos = 20 (acute) 14 (chronic)	Removals were not quantified. Characteristics of chlorpyrifos and diazinon suggest that removal will occur in NTS facilities, primarily by adsorption to wetland sediments and biodegradation.	Undetermined. Some reduction is expected from NTS facilities.
Organochlorine compounds	Annual load limits to Newport Bay (g/yr) Chlordane = 314.7 Dieldrin = 262 DDT = 432.6 PCBs = 282 Toxaphene = 8.9	Removals were not quantified due to lack of monitoring data and undetermined sources. These legacy compounds are strongly associated with sediments. Sediment removal in NTS facilities could provide minimal treatment of these compounds.	Undetermined. Reduction by NTS facilities is expected to be small.
Selenium	Annual total load target =	Estimated annual removal at site	NTS facilities will remove

TMDL Constituent	TMDL target and water quality objective[1]	What the NTS Plan is estimated to achieve	Estimated contribution of the NTS Plan to TMDL compliance
	891.4 lbs. Loads are partitioned into four flow tiers	67 is about 200 lbs, or about 20 to 50 percent of the low flow selenium load. All surface flow NTS facilities may have incidental removals of selenium from base flows.	significant quantities of selenium from low flows, however, TMDL compliance at the low flow tier is undetermined. NTS facilities are not intended for treatment of selenium in storm runoff.
Heavy metals	Concentration based TMDLs expressed at four flow tiers. Concentrations are based on the CTR objectives using average hardness values of the associated flow tier.	Annual loads are variable, depending on rainfall. Total metal loads in storm runoff from urban and open land sources are reduced by about 13 percent for copper, 10 percent for lead, and 12 percent for zinc. Cadmium was not modeled. Removal from low flows was not quantified.	TMDL objectives are met on average for the highest flow tier (large flows), assuming in-stream sources are controlled. Exceedances of the CTR criteria would still be expected. Data from the San Joaquin Marsh indicates that NTS facilities will contribute to metal reductions during dry weather low flows.

Table 3: Expected Water Quality Benefits (continued from previous page)

D. Short-Term Use of the Environment versus Long-Term Productivity

The NTS Master Plan is intended to enhance long-term productivity of the environment by improving water quality and increasing the amount of wetland habitat in the San Diego Creek drainage. Short term construction phase impacts are not anticipated to be substantially adverse.

E. Irreversible and Irretrievable Commitment of Resources

Some non-renewable resources, such as natural resources and energy supplies, would be committed to uses by implementation of the NTS Plan that future generations would probably be unable to reverse. The proposed NTS Plan would result in environmental changes to natural resources at individual NTS sites, though the net result would be a benefit and improvement to the quantity and types of natural biological resources within the San Diego Creek Watershed.

Additional natural resources (sand and gravel, asphalt, petrochemicals, and other construction materials) would be utilized in the construction of the NTS facilities. Fossil fuels would be used in the construction phase of the project, and would also be required periodically during long-term maintenance and operation activities. Some proposed NTS facilities would also use energy (electricity) to operate small pump stations.

The proposed NTS Plan's use of non-renewable resources is not excessive or significant given the relatively small scale of these individual NTS facilities and the fact that these facilities, once constructed, would operate as natural wetlands facilities which would have minimal long-term demands for non-renewable resources.

F. Re-Evaluation

NEPA requires review of a proposed Federal action to determine its impact on the human environment. Council on Environmental Quality (CEQ) regulations direct Federal agencies to cooperate with State and local agencies to the fullest extent possible to reduce duplication between NEPA and State and local requirements (40 CFR 1506.2).

Previously adopted environmental documents may require supplemental review if there have been substantial changes to the project or if there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action and its impacts. California re-evaluation criteria at 14 CCR 15162(a) are functionally identical to Federal regulations for implementing NEPA at 40 CFR 1502.9(c).

Since 2004, when the CEQA EIR was certified, there have been no substantial changes to the proposed project and no significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts. The proposed project does not involve new significant environmental effects and will not increase the severity of previously identified effects. No changes with respect to the circumstances under which the project is undertaken are known and no new information of substantial importance was identified.

V. CUMULATIVE IMPACTS

The EIR reviewed combined cumulative impacts associated with the Project's incremental effect in conjunction with past projects and surrounding current and probable future development projects. The cumulative impacts analysis identified potentially significant impacts for three resource areas: Biological Resources, Air Quality, and Hydrology/Water Quality.

The cumulative impact analyses concluded that cumulative impacts were less than significant except for one topic, construction impacts to water quality. That impact was found to be mitigated to less than significant levels through the application of Best Management Practices (BMPs) for sediment control as required by the State Water Resources Control Board, General Construction Activities Permit program.

To evaluate short-term air quality impacts, General Plan projections were selectively combined with NTS Master Plan proposed construction impacts to create a "worst-case" cumulative air quality analysis that likely overestimates potential cumulative air quality impacts. The EIR found that the NTS project is consistent with the AQMP. To ensure that emissions from construction do not contribute considerably to cumulative regional emissions, a mitigation measured was added requiring that no more than five acres of NTS wetlands construction be under construction by heavy equipment at any one time. Fugitive dust suppression and other construction-related emissions minimization measures will be applied as required by mitigation measures in the EIR.

The incremental increase in electrical demand created by operation of the proposed NTS Plan may result in an indirect increase in greenhouse gas emissions, estimated at 500 MT of carbon dioxide per year. California's total greenhouse gas emissions inventory in 2004 was estimated at 494 million MT. California's goal is to achieve 1990 levels of 427 million MT by 2020.

Overall, the NTS project will have beneficial environmental effects particularly with regard to water quality throughout the San Diego Creek watershed and improvements in habitat values within Upper Newport Bay resulting from improved water quality in tributaries to Upper Newport Bay and centralized adaptive management of future new development-related water quality wetlands and improvements in habitat values through the creation of freshwater wetlands to partially offset the historical loss of this wetlands type.

IV. REFERENCES

San Diego Creek Watershed Natural Treatment System Master Plan, GeoSyntec Consultants Portland, Oregon, June 2005

San Diego Creek Watershed Natural Treatment System, Revised Draft Environmental Impact Report (State Clearinghouse No. 2002021120), Bonterra Consulting, Costa Mesa, California, January 2004.

San Diego Creek Watershed Natural Treatment System, Revised Draft Environmental Assessment, Bonterra Consulting, Costa Mesa, California, February 2004.

San Diego Creek Watershed Natural Treatment System Feasibility Report, U.S. Bureau of Reclamation, October 2006

ATTACHMENTS:

A. CEQA Mitigation Monitoring Table
B. Endangered Species Act, FWS Section 7 Consultation
C. National Historic Preservation Act, SHPO Section 106 Consultation
D. Farmland Protection Policy, Conversion Impact Rating

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Attachment A
CEQA Mitigation Monitoring Table

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TABLE 1
NATURAL TREATMENT SYSTEM EIR MITIGATION MONITORING PROGRAM

EIR Section/Mitigation Program	Applicable NTS Sites	Timing of Mitigation	Responsible Party(ies)	Monitoring Action
3.1 Land Use/Planning and Land Use Compatibility				
Project Design Features				
PDF-LU-1 Construction and long-term operations and maintenance activities associated with the NTS Facility sites is expected to involve the use of construction equipment. Prior to construction activities and long-term operations and maintenance activities at any of the NTS Facility sites, the IRWD General Manager (or designee) shall confirm that activities will be conducted in compliance with local jurisdiction grading and construction ordinances, specifically with respect to construction hours and any restricted activities.	Applicable to all NTS Facility Sites	Prior to construction and/or commencement of operation and maintenance activities	IRWD General Manager	Review of plans, site inspections
Standard Conditions and Requirements				
None				
Mitigation Measures				
MM-LU-1 NTS Sites 31, 32, 49, 42, 16, 18, 22, 50, 51, 52, 70A-70C and 71 have either previously approved CEQA documents and/or regulatory permits issued. Construction of these NTS sites shall comply with applicable mitigation measures identified in previously approved CEQA documents and/or measures identified in the issued regulatory permits.	Applicable to Facility Sites 31, 32, 49, 42, 16, 18, 22, 50, 51, 52, 70A-70C, and 71.	Refer to previous CEQA documents and/or regulatory permits	IRWD General Manager	Review of plans, site inspections
3.2 Hydrology and Water Quality				
Project Design Features				
PDF-WQ-1 Off-Line Facilities shall include basin liners to prevent infiltration into existing groundwater, in conditions where underlying soils are characterized as having moderate to high permeability.	Applicable to all off-line facilities	During construction phase	IRWD General Manager	Review of plans, site inspections
PDF-WQ-2 All NTS Facilities shall be operated and maintained as specified in Section 7, and monitored as specified in Section 8 of the NTS Plan (reproduced in Appendix J of this Revised Draft EIR) to ensure compliance with long-term water quality objectives. Operations and maintenance activities include routine, major, emergency and episodic activities and minimization measures intended to optimize performance of the NTS Facilities and the improvement of water quality leaving the treatment wetlands and to minimize the adverse environmental effects. Monitoring activities for each NTS Facility include: visual site inspections; field testing of water quality parameters; basic pollutant suite testing (dry weather); expanded pollutant suite testing (dry weather); aquatic biology, sediment, and plant tissue monitoring; flow monitoring and hydraulic	Applicable to all NTS Facility Sites	Ongoing- During operation and maintenance and monitoring activities	IRWD General Manager and Regional Water Quality Control Board	Review monitoring reports and site inspections

TABLE 1 (Continued)
NATURAL TREATMENT SYSTEM EIR MITIGATION MONITORING PROGRAM

EIR Section/Mitigation Program	Applicable NTS Sites	Timing of Mitigation	Responsible Party(ies)	Monitoring Action
retention time; selenium monitoring; vegetation monitoring; vector and pest monitoring; performance monitoring of selected NTS Facilities; wildlife monitoring; watershed monitoring for TMDL compliance; and preparation of annual monitoring reports. Detailed subtasks for inspection and monitoring are provided in Section 8 of the NTS Master Plan and individual site PDRs. As noted in Section 8 of the NTS Master Plan, NTS Facilities will be monitored with a phased approach that includes the following components: Baseline – Pre-construction; Baseline – Startup; Startup (years 1-3); Ongoing (years 4 and beyond); Sediment removal; Vegetation harvesting; and Emergency monitoring.				
PDF-WQ-3 Soil samples shall be collected from NTS Facilities where selenium is suspected to be currently present in the soils prior to initiation of construction for NTS Sites 6, 9, 10, 11, 12, 18, and 52, as specified in Section 8 of the NTS Plan. Samples will be collected from areas within these basins where NTS Facilities are planned for construction. Results of the sampling will be provided to the RWQCB.	Applicable to Sites 6, 9, 10, 11, 12, 18, and 52	Prior to commencement of construction activities	IRWD General Manager and Regional Water Quality Control Board	Review monitoring reports and site inspections
PDF-WQ-4 NTS Facilities 16, 26, 27, 46, 54, 55, and 64 shall be monitored for a two year period after construction as specified in the provisions of the Selenium Action Plan. This period may be extended by IRWD, in consultation with CRWQCB, if vegetation growth or wetland maturation is slower than expected or if monitoring identifies potential problems. These facilities have been determined to be those with the highest potential for selenium accumulation due to their locations in the watershed relative to known selenium sources. The following monitoring activities will be conducted: 1. Water column monitoring upstream and downstream of NTS facilities for selenium, including selenate, selenite and organic forms, including both dissolved and totals. 2. Quarterly sediment testing, over a two year period, for total selenium through quarterly composite sediment sampling in the forebay areas of the off-line NTS facilities for a two year period; and quarterly composite sediment sampling in selected reaches of channels without NTS facilities for a two year period.	Applicable to Facility Sites 16, 26, 27, 46, 54, 55, and 64	During monitoring activities for two years following initiation of facility operations	IRWD General Manager and Regional Water Quality Control Board	Review monitoring reports and site inspections

TABLE 1 (Continued)
NATURAL TREATMENT SYSTEM EIR MITIGATION MONITORING PROGRAM

EIR Section/Mitigation Program	Applicable NTS Sites	Timing of Mitigation	Responsible Party(ies)	Monitoring Action
3. Quarterly vegetation monitoring of selected wetlands vegetation at each site (in-line, off-line and selected reaches of channels without NTS facilities); two to three species, including at least one food species, will be monitored for total selenium. 4. Quarterly invertebrate testing for a two year period in both NTS sites and in channels with no NTS facilities; selenium concentrations and invertebrate types and biomass testing will be conducted. The focus of this effort will be on chironomids, but other invertebrates such as crayfish or dragonfly will be sampled if there are significant numbers of these species present. 5. Quarterly mosquito fish testing for selenium in tissues for a two year period in both NTS sites and in channels with no NTS facilities; if other fish species are observed during sampling, they will also be tested. 6. Annual bird egg testing (if nests are found) for a two year period in both NTS facilities and in channels with no NTS facilities. Appropriate regulatory agency coordination will be conducted and regulatory agency permits will be obtained before any bird egg testing is initiated. 7. Quarterly monitoring reports will be issued and provided to the SARWQCB for review. Formal annual reports will be prepared and incorporated as an appendix to the County of Orange's annual water quality report. 8. Prior to initiation of the monitoring activities described above, a detailed plan will be developed to include applicable protocols, as well as training programs for staff to insure that monitoring data are uniformly and correctly collected. Additionally, as also specified in the Selenium Action Plan, the monitoring data from the above facilities shall be evaluated annually, in coordination with the Santa Ana Regional Water Quality Control Board's programs, to determine the potential ecological risk to biota that inhabit or feed in the NTS facilities. The purpose of this analysis is to assist IRWD management in determining:				

TABLE 1 (Continued)
NATURAL TREATMENT SYSTEM EIR MITIGATION MONITORING PROGRAM

EIR Section/Mitigation Program	Applicable NTS Sites	Timing of Mitigation	Responsible Party(ies)	Monitoring Action
1. Do concentrations in the water, sediment, or food chain indicate unacceptable risks and are these available to biota? 2. Do direct measures such as bird eggs indicate an exposure that might impair reproduction of migratory birds? 3. Does the risk to biota appear to be greater or reduced overall, to the extent there is enough available data due to implementation of the NTS program as compared to the potential risk to biota that is present today? If a problem is noted at any NTS facility involving selenium at levels or risks that are above those within San Diego Creek at the present time, the following management actions will be initiated by IRWD after consultation with SARWQCB staff: 1. Additional monitoring shall be conducted to further characterize and substantiate risk potential. 2. Develop additional design alternatives to minimize wildlife access to selenium, including reduction of open water areas, reduction of aquatic plants that attract wildlife and food species (submerged vegetation), reduction in wildlife access to NTS facilities etc. 3. Development and implementation of a revised maintenance schedule to remove potential "hot spot" materials, including sediments and plant materials. 4. Develop potential designs for sub-surface selenium removal areas within or upstream of the NTS facilities. 5. Implement a program to locate and target individual seeps for selenium treatment systems to reduce selenium concentrations in the main flows in San Diego Creek. 6. Develop extended detention dry basin alternatives for off-line NTS facilities that do not remove selenium from dry weather flows. 7. Develop and implement efforts to decommission NTS sites that cannot successfully reduce selenium caused problems to acceptable levels.				

TABLE 1 (Continued)
NATURAL TREATMENT SYSTEM EIR MITIGATION MONITORING PROGRAM

EIR Section/Mitigation Program	Applicable NTS Sites	Timing of Mitigation	Responsible Party(ies)	Monitoring Action
PDF-WQ-5 Detailed performance monitoring shall be conducted for three years following initiation of NTS Facilities operations at Sites 16, 26, 46, 56, and 67. The primary objective of this performance monitoring is to test the performance of the NTS Facilities in treating dry weather flows; Sites 16 and 56 will also be tested during storm flows. If the pumps at Site 46 are operated during dry weather flows, it will also be tested during storm flow conditions. All other NTS Facilities that do not receive detailed performance monitoring shall be monitored using the general site management monitoring provisions specified in Section 8 of the NTS Plan.	Applicable to Facility Sites 16, 26, 46, 56, and 67	During monitoring activities for three years following initiation of facility operations	IRWD General Manager and Regional Water Quality Control Board	Review monitoring reports and site inspections
Standard Conditions and Requirements				
SC-WQ-1 Obtain General Construction Activity Stormwater Permit from SWRCB/RWQCB. These permits would be obtained following approval of project designs and certification of Final CEQA documents.	Applicable to all NTS Facility Sites	Prior to commencement of construction activities	IRWD General Manager and Regional Water Quality Control Board	Approval of General Construction Activity Stormwater Permit
SC-WQ-2 Obtain SWRCB 401 Water Quality Certification. The 401 Certification would be required for those NTS Facilities that require a Section 404 Permit from the USACOE.	Applicable to Facility Sites 26, 27, 53, 54, 55, 56, 62, 64, 9, 10, 11, 12A-12G, 61, 22, 50, 51, 52, 68, 69A-69E, and 71	Prior to commencement of construction activities	IRWD General Manager and Regional Water Quality Control Board	Approval of 401 Water Quality Certification
SC-WQ-3 Obtain SWRCB Permit to Appropriate Water, if required.	Applicable to all NTS Facility Sites	Prior to commencement of construction activities	IRWD General Manager and Regional Water Quality Control Board	Approval of Water Appropriation Permit
Mitigation Measures				
MM-WQ-1 NTS Sites 31, 32, 49, 42, 16, 18, 22, 50, 51, 52, 70A-70C and 71 have either previously approved CEQA documents and/or regulatory permits issued. Construction of these NTS sites shall comply with applicable mitigation measures identified in previously approved CEQA documents and/or measures identified in the issued regulatory permits.	Applicable to Facility Sites 31, 32, 49, 42, 16, 18, 22, 50, 51, 52, 70A-70C and 71	Refer to previous CEQA documents and/or regulatory permits	IRWD General Manager	Review of plans, site inspections

TABLE 1 (Continued)
NATURAL TREATMENT SYSTEM EIR MITIGATION MONITORING PROGRAM

EIR Section/Mitigation Program	Applicable NTS Sites	Timing of Mitigation	Responsible Party(ies)	Monitoring Action
3.3 Biological Resources				
Project Design Features				
PDF-BIO-1 Off-Line Facilities shall include basin liners to prevent infiltration into existing groundwater, in conditions where underlying soils are characterized as having moderate to high permeability.	Applicable to all off-line facilities	During construction phase	IRWD General Manager	Review plans and site inspections
PDF-BIO-2 All NTS Facilities shall be operated and maintained as specified in Section 7, and monitored as specified in Section 8 of the NTS Plan to ensure compliance with long-term water quality objectives. Operations and maintenance activities include routine, major, emergency and episodic activities and minimization measures intended to optimize performance of the NTS Facilities and the improvement of water quality leaving the treatment wetlands and to minimize the adverse environmental effects. Monitoring activities include routine inspection and monitoring of each NTS Facility, performance monitoring of select NTS Facilities, and preparation of annual monitoring reports. Detailed subtasks for inspection and monitoring are provided in the NTS Plan and individual site PDRs.	Applicable to all NTS Facility Sites	Ongoing- During operation and maintenance and monitoring activities	IRWD General Manager and Regional Water Quality Control Board	Review monitoring reports and site inspections
PDF-BIO-3 NTS Facilities 16, 26, 27, 46, 54, 55, and 64 shall be monitored for a two year period after construction as specified in the provisions of the Selenium Action Plan. These facilities have been determined to be those with the highest potential for selenium accumulation due to their locations in the watershed relative to known selenium sources. The following monitoring activities will be conducted: 1. Water column monitoring upstream and downstream of NTS facilities for selenium, including selenate, selenite and organic forms, including dissolved and totals. 2. Quarterly sediment testing, over a two year period, for total selenium through composite sampling in the in-line NTS facilities; quarterly composite sediment sampling in the forebay areas of the off-line NTS facilities for a one year period; and composite sediment sampling in selected reaches of channels without NTS facilities. 3. Quarterly vegetation monitoring of selected wetlands vegetation at each site (in-line, off-line and selected reaches of channels without NTS facilities); two to three species, including at least one food species, will be monitored for total selenium.	Applicable to Facility Sites 16, 26, 27, 46, 54, 55, and 64	During monitoring activities for two years following initiation of facility operations	IRWD General Manager and Regional Water Quality Control Board	Review monitoring reports and site inspections

TABLE 1 (Continued)
NATURAL TREATMENT SYSTEM EIR MITIGATION MONITORING PROGRAM

EIR Section/Mitigation Program	Applicable NTS Sites	Timing of Mitigation	Responsible Party(ies)	Monitoring Action
4. Quarterly invertebrate testing in both NTS sites and in channels with no NTS facilities; selenium concentrations and invertebrate types and biomass testing will be conducted. The focus of this effort will be on chironomids, but other invertebrates such as crayfish or dragonfly will be sampled if there are significant numbers of these species present. 5. Quarterly mosquito fish testing for selenium in tissues in both NTS sites and in channels with no NTS facilities; if other fish species are observed during sampling, they will also be tested. 6. Annual bird egg testing (if nests are found) for a two year period in both NTS facilities and in channels with no NTS facilities. Appropriate regulatory agency permits will be obtained before any bird egg testing is initiated. 7. Quarterly monitoring reports will be issued and provided to the Santa Ana Regional Water Quality Control Board (SARWQCB) for review. Formal annual reports will be prepared and incorporated with the County of Orange's annual water quality report. 8. Prior to initiation of the monitoring activities described above, a detailed plan will be developed to include applicable protocols, as well as training programs for staff to insure that monitoring data are uniformly and correctly collected. Additionally, as also specified in the Selenium Action Plan, the monitoring data from the above facilities shall be evaluated annually, in coordination with the SARWQCB's programs, to determine the potential ecological risk to biota that inhabit or feed in the NTS facilities. The purpose of this analysis is to assist IRWD management in determining: 1. Do concentrations in the water, sediment, or food chain indicate unacceptable risks and are these available to biota? 2. Do direct measures such as bird eggs indicate an exposure that might impair reproduction?				

TABLE 1 (Continued)
NATURAL TREATMENT SYSTEM EIR MITIGATION MONITORING PROGRAM

EIR Section/Mitigation Program	Applicable NTS Sites	Timing of Mitigation	Responsible Party(ies)	Monitoring Action
3. Does the risk to biota appear to be greater or reduced overall, to the extent there is enough available data due to implementation of the NTS program as compared to the potential risk to biota that is present today? If a problem is noted at any NTS facility involving selenium at levels or risks that are above those within San Diego Creek at the present time, the following management actions will be initiated by IRWD after consultation with SARWQCB staff: 1. Additional monitoring shall be conducted to further characterize and substantiate risk potential. 2. Develop additional design alternatives to minimize wildlife access to selenium, including reduction of open water areas, reduction of aquatic plants that attract wildlife and food species (submerged vegetation), reduction in wildlife access to NTS facilities, etc. 3. Development and implementation of a revised maintenance schedule to remove potential "hot spot" materials, including sediments and plant materials. 4. Develop potential designs for sub-surface selenium removal areas within or upstream of the NTS facilities. 5. Implement a program to locate and target individual seeps for selenium treatment systems to reduce selenium concentrations in the main flows in San Diego Creek. 6. Develop extended detention dry basin alternatives for off-line NTS facilities that do not remove selenium from dry weather flows. 7. Develop and implement efforts to decommission NTS sites that cannot successfully reduce selenium caused problems to acceptable levels.				

TABLE 1 (Continued)
NATURAL TREATMENT SYSTEM EIR MITIGATION MONITORING PROGRAM

EIR Section/Mitigation Program	Applicable NTS Sites	Timing of Mitigation	Responsible Party(ies)	Monitoring Action
Standard Conditions and Requirements				
SC-BIO-1 Prior to initiating any grading or construction permits, an NPDES statewide General Construction Activity Stormwater Permit will be obtained from the State Water Resources Control Board.	Applicable to all NTS Facility Sites	Prior to commencement of construction activities	IRWD General Manager and Regional Water Quality Control Board	Approval of General Construction Activity Stormwater Permit
SC-BIO-2 Any entity constructing an NTS site or conducting operation and maintenance activities at NTS Site must comply with all applicable requirements of the NCCP/HCP, including all construction impact Minimization Measures contained in NCCP/HCP EIR/EIS 553.	Applicable to all NTS Facility Sites	Ongoing- During operation and maintenance and monitoring activities	IRWD General Manager	Plan review and site inspections
SC-BIO-3 Any entity constructing any NTS site or conducting operating and maintenance activities, other than those performed by hand, at any NTS Site must comply with all applicable mitigation measures, conditions, and project design features from previously certified EIRs and applicable state and federal permits.	Applicable to all NTS Facility Sites	Ongoing- During operation and maintenance and monitoring activities	IRWD General Manager	Review of plans, site inspections
Mitigation Measures				
MM-BIO-1 Prior to any construction and/or major operation and maintenance activity within an NTS site that involves the disturbance and/or removal of vegetation resources that provide suitable habitat for sensitive plant and wildlife species IRWD's staff biologist will inspect the NTS site to determine if sensitive species are present. If the staff biologist is not certain as to the presence/absence of a sensitive species, an independent, qualified biological specialist will be consulted and/or will be directed to perform the survey of the site and determine if a sensitive species is present. If a sensitive species is present, the biologist will recommend appropriate minimization measures aimed at minimizing and/or reducing the effects of this activity on the species. If special status or protected nesting birds are present, construction activities shall avoid nesting habitat to the maximum extent practicable. At least sixty percent (60%) of all vegetation clearing will occur outside of the avian breeding and nesting season (March 15 through August 30) to avoid and minimize impacts to breeding and nesting birds. With respect to the 40% of vegetation permitted for impact during the nesting season, surveys shall be conducted to identify nest locations, and a buffer shall be established to protect the nest until a biologist has determined that the young have fledged or the nest has been abandoned.	Applicable to all NTS Facility Sites	Prior to construction and/or commencement of operation and maintenance activities	IRWD General Manager and California Department of Fish and Game	Review biological survey report from biologist and site inspections

TABLE 1 (Continued)
NATURAL TREATMENT SYSTEM EIR MITIGATION MONITORING PROGRAM

EIR Section/Mitigation Program	Applicable NTS Sites	Timing of Mitigation	Responsible Party(ies)	Monitoring Action
MM-BIO-2 If construction or routine or major maintenance activities occur between February 1 and June 30 on NTS sites identified as having potential for nesting raptors, the IRWD staff biologist will review site conditions for the presence of any active raptor nests. If any active or inactive nest is found during site review, it will be mapped on the construction plans. If no active nests are found, the construction and/or operation and routine or major maintenance activities will be allowed to proceed. If nesting activity is determined to be present at any raptor nest site identified during the site review, a qualified biologist shall recommend appropriate actions to avoid and/or minimize impacts to these nesting raptors. Information concerning the raptor nest locations and nesting status will be provided to the CDFG.	Applicable to any NTS Facility Site with potential for nesting raptors	Prior to construction and/or commencement of operation and maintenance activities	IRWD General Manager and California Department of Fish and Game	Review biological survey report from biologist and site inspections
MM-BIO-3 Prior to and within 30 days of the initiation of construction and/or operations and maintenance involving activities, other than those implemented by hand, on NTS Sites 16, 18, 27 and 62, a pre-construction survey for the burrowing owl shall be conducted by a qualified biologist. If the species is determined present, the biologist shall prescribe the appropriate course of action(s) to avoid and/or minimize impacts this species to the greatest extent practicable. Avoidance actions may include establishing a 50 m buffer (approximately 160 feet) between construction activities and known burrows. If avoidance is not possible, passive relocation measures will be implemented. Passive relocation is defined as encouraging owls to move from occupied burrows to alternate natural or artificial burrows that are beyond 50 m from the impact zone and that are within or contiguous to a minimum of 6.5 acres of foraging habitat for each pair of relocated owls. Relocation of owls should only be implemented during the non-breeding season (i.e., September 1st to January 30th). On-site habitat should be preserved in a conservation easement and managed to promote burrowing owl use of the site. Owls should be excluded from burrows in the immediate impact zone and within a 50 m (approximately 160 ft.) buffer zone by installing one-way doors in burrow entrances. One-way doors should be left in place 48 hours to insure owls have left the burrow before excavation. One alternate natural or artificial burrow will be provided for each burrow that will be excavated in the project impact zone. The project area will be monitored daily for one week to confirm owl use of alternate burrows before excavating burrows in the immediate impact zone. Whenever possible, burrows will be excavated using hand tools and	Applicable to Facility Sites 16, 18, 27, and 62	Prior to and within 30 days of the initiation of construction and/or operations and maintenance activities	IRWD General Manager and California Department of Fish and Game	Review pre-construction survey and site inspections

TABLE 1 (Continued)
NATURAL TREATMENT SYSTEM EIR MITIGATION MONITORING PROGRAM

EIR Section/Mitigation Program	Applicable NTS Sites	Timing of Mitigation	Responsible Party(ies)	Monitoring Action
refilled to prevent reoccupation. Sections of flexible plastic pipe or burlap bags should be inserted into the tunnels during excavation to maintain an escape route for any animals inside the burrow. Information concerning the nest locations and nesting status of this species will be provided to the CDFG.				
MM-BIO-4 Prior to the issuance of a grading permit over areas that have been identified as jurisdictional as determined by the CDFG and USACOE, the landowner shall obtain all permits and/or authorizations from CDFG pursuant to Section 1601-1603 of the Fish and Game Code, the USACOE pursuant to Section 404 of the Clean Water Act and RWQCB Water Quality Certification pursuant to Section 401 of the Clean Water Act. Mitigation for jurisdictional impacts will contain construction impact minimization measures including, at a minimum, a provision that prevents noise levels greater than 60 dBA Leq (hourly) for construction between March 15th to September 15 (breeding/nesting season). Mitigation plans for Site 68 will require, at a minimum, that prior to the final design of Site 68 NTS facility, the facility will be adjusted to avoid impacts to mule fat scrub. If avoidance is not possible, then mitigation will be provided at a 1:1 ratio in accordance with a plan approved by the USACOE and CDFG.	Applicable to Facility Sites 26, 27, 53, 54, 55, 56, 62, 64, 9, 10, 11, 12A-12G, 61, 22, 50, 51, 52, 68, 69A-69E, and 71	Prior to the issuance of a grading permit	IRWD General Manager, California Department of Fish and Game, U.S. Army Corps of Engineers, and Regional Water Quality Control Board	Approval of permits and/or authorizations
MM-BIO-5 Surveys for southern tarplant (*Centromadia parryi* sp. *australis*) will be conducted by a qualified botanist prior to the initiation of major maintenance activities involving vegetation removals within Sites 31, 32, 46, 62 and 64. Also, prior to the construction of Site 62, a survey for this species will be conducted to determine presence. If found in areas that are scheduled to be disturbed as part of the operation and maintenance and/or creation of a NTS facility, seeds from this species will be collected for use in the appropriate restoration area associated with the facility's development or an appropriate off-site location as directed by a restoration ecologist.	Applicable to Facility Sites 31, 32, 46, 62 and 64	Prior to the initiation of major maintenance activities	IRWD General Manager and California Department of Fish and Game	Review biological survey report from biologist and site inspections
MM-BIO-6 Prior to the initiation of construction of Site 62, a restoration and enhancement plan shall be prepared in consultation with University of California Natural Reserve System (UCNRS) based on the Conceptual Planning elements listed below and graphically portrayed in Figure 2.6-52 in the RDEIR: • Preservation of areas containing salt marsh habitat to the extent practicable; • Restoration and enhancement of salt marsh, freshwater marsh, and coastal sage scrub habitats. The enhancement plan for this facility will also include active exotic invasive	Applicable to Facility Site 62	Prior to the initiation of construction activities	IRWD General Manager, California Department of Fish and Game, and University of California Natural Reserve System	Review restoration and enhancement plan and site inspections

TABLE 1 (Continued)
NATURAL TREATMENT SYSTEM EIR MITIGATION MONITORING PROGRAM

EIR Section/Mitigation Program	Applicable NTS Sites	Timing of Mitigation	Responsible Party(ies)	Monitoring Action
weed species management that will increase the long-term conservation values of the site for sensitive and non-sensitive native plant and wildlife species. The plan may also include enhancement of the cottonwood-willow riparian forest within the SAMS 1 site. • Enhancement of the freshwater marsh through the incorporation of the water quality treatment facility; • Cooperative design and management provisions with respect to the UCNRS including the following: (1) the provision of maintenance measures that IRWD will coordinate cleaning or other major work at the SAMS 1 site with UCNRS; (2) the provision of water to UCNRS site upon their request; and (3) a spine in the wetland to provide rotational drying of the wetlands to allow amphibious species and others to move out of the area being dried into another wetland. • Limited frequency of maintenance activities to avoid and minimize potential impacts on sensitive plant and animal species that may use the site.				
MM-BIO-7 Prior to the initiation of any construction-related activity involving the disturbance and/or removal of vegetation resources within NTS Sites 68, 69C and 69E, surveys will be conducted by a qualified botanist at the appropriate time of the year to determine the presence/absence of the thread-leaved brodiaea (*Brodiaea filifolia*), many-stemmed dudleya (*Dudleya multicaulis*). If any of these species are found, the project design will be modified to the extent practicable to avoid impacts to the sensitive plant species. If the sensitive plant species cannot be avoided, a Mitigation Plan will be prepared and submitted to the USFWS and CDFG for review and approval. This Mitigation Plan will provide that mitigation can be accomplished in one of three ways: (1) performance of additional surveys in unsurveyed or undersurveyed portions of the NCCP Reserve or Irvine Ranch Reserve Lands in order to demonstrate that substantial unreported occurrences of these plants occupy the open space areas; or (2) through translocation of plants to selected portions of the NCCP Reserve or the Irvine Ranch Land Reserve lands, or 3) through a combination of these measures. If translocation is undertaken, it will be accomplished by one or more of the following methods: (1) relocation of corms/seeds (as applicable) to receptor sites determined to have appropriate soil and habitat characteristics; (2) seed collection from impact areas followed by hand broadcasting at appropriate receptor sties; (3) seed collection with propagation,	Applicable to Facility Site 68, 69C, and 69E	Prior to the initiation of construction activities	IRWD General Manager and California Department of Fish and Game	Review biological survey report from biologist and site inspections

TABLE 1 (Continued)
NATURAL TREATMENT SYSTEM EIR MITIGATION MONITORING PROGRAM

EIR Section/Mitigation Program	Applicable NTS Sites	Timing of Mitigation	Responsible Party(ies)	Monitoring Action
nursery rearing and translocation to appropriate sites. Receptor sites will be identified within conserved areas, such as the NCCP Reserve and Irvine Ranch Land Reserve. Performance standards for the Mitigation Plan will be derived as follows: a number of colonies and an average number of individuals per colony shall be identified as a minimum requirement for plant preservation and/or successful re-establishment pursuant to translocation. This number of colonies and individuals shall be based upon (a) the number of colonies and individuals estimated to be impacted by the pre-construction surveys, and (b) the number of colonies and individual plants known to occur in preserved areas at the time of impact. Prior to any relocation of the thread-leaved brodiaea, a 2081 permit will be obtained from CDFG.				
MM-BIO-8 NTS Sites 31, 32, 49, 42, 16, 18, 22, 50, 51, 52, 70A-70C and 71 have either previously approved CEQA documents and/or regulatory permits issued. Construction of these NTS sites shall comply with applicable mitigation measures identified in previously approved CEQA documents and/or measures identified in the issued regulatory permits.	Applicable to Sites 31, 32, 49, 42, 16, 18, 22, 50, 51, 52, 70A-70C and 71	Refer to previous CEQA documents and/or regulatory permits	IRWD General Manager	Review of plans, site inspections
MM-BIO-9 Prior to constructing any NTS site or conducting operating and maintenance activities, other than those performed by hand, at any NTS Site, a reconnaissance-level survey for southwestern pond turtle (*Clemmys marmorata pallida*)) shall be conducted in basins near known populations. The survey to determine if suitable habitat for the pond turtle occurs on the project site would be conducted throughout the project site and 500 feet upstream and downstream of the site. Following the assessment, if pond turtles are likely to occur, then a focused survey of the areas supporting suitable habitat should be conducted for pond turtles. Focused surveys will be consistent with survey recommendations in Holland (1991) and Reese (undated and unpublished paper on surveying for pond turtles). If pond turtles are found in the within the impact area, a Pond Turtle Mitigation Plan would be prepared and implemented immediately in consultation with the California Department of Fish and Game. At a minimum, the Mitigation Plan will include the following measures: • Trapping and relocating the turtles to either a) appropriate areas within the drainage associated with the NTS site, either upstream or downstream of the impact area, or b) appropriate temporary pond turtle facilities. If pond turtles are relocated to temporary facilities, appropriate provisions shall be made in consultation with CDFG to assure that the	Applicable to all Facility Sites	Prior to construction and/or commencement of operation and maintenance activities	IRWD General Manager and California Department of Fish and Game	Review biological survey report from biologist and site inspections

TABLE 1 (Continued)
NATURAL TREATMENT SYSTEM EIR MITIGATION MONITORING PROGRAM

EIR Section/Mitigation Program	Applicable NTS Sites	Timing of Mitigation	Responsible Party(ies)	Monitoring Action
turtles are cared for and that their basic needs for food, shelter, and typical behaviors are met. After completion of impacts, turtles relocated to temporary facilities shall be returned to the NTS wetland area. • Construction, operation and maintenance activities shall be timed to avoid the pond turtle season (January 30 through June 30) for those Sites that the species is determined to occupy. • Construction, operating and maintenance activities shall be timed to avoid the pond turtle hibernation period (November through January) for those NTS Sites that the species is determined to occupy.				
MM-BIO-10 Prior to constructing NTS Sites 62 and 64 or conducting operation and maintenance activities, other than those performed by hand, at NTS Sites 31, 32, 39, 46, 62, or 64, an assessment shall be conducted to determine if any southern tarplant is present. If tarplant is found to be present, prior to impact the soil, seed and tarplants within the area of impact shall be collected, and stored. After completion of impact, the collected and stored material shall be spread over the area of impact to facilitate re-establishment of the plant.	Applicable to Facility Sites 31, 32, 39, 46, 62, and 64	Prior to construction and/or commencement of operation and maintenance activities	IRWD General Manager and California Department of Fish and Game	Review biological survey report from biologist and site inspections
MM-BIO-11 Prior to the initiation of any construction-related activity involving the disturbance and/or removal of vegetation resources within NTS Site 62, surveys will be conducted by a qualified botanist at the appropriate time of the year to determine the presence/absence of the Coulter's Goldfields. If any of these species are found, the project design will be modified to the extent practicable to avoid impacts to the sensitive plant species. If the sensitive plant species cannot be avoided, a Mitigation Plan will be prepared and submitted to the USFWS and CDFG for review and approval. This Mitigation Plan will provide that mitigation can be accomplished in one of three ways: (1) performance of additional surveys in unsurveyed or undersurveyed portions of the NCCP Reserve in order to demonstrate that substantial unreported occurrences of these plants occupy the open space areas; or (2) through translocation of plants to selected portions of the NCCP Reserve, or 3) through a combination of these measures. If translocation is undertaken, it will be accomplished by one or more of the following methods: (1) relocation of seeds to receptor sites determined to have appropriate soil and habitat characteristics; (2) seed collection from impact areas followed by hand broadcasting at appropriate receptor sites; (3) seed collection with	Applicable to Facility Site 62	Prior to initiation of construction activities	IRWD General Manager and California Department of Fish and Game	Review biological survey report from biologist and site inspections

TABLE 1 (Continued)
NATURAL TREATMENT SYSTEM EIR MITIGATION MONITORING PROGRAM

EIR Section/Mitigation Program	Applicable NTS Sites	Timing of Mitigation	Responsible Party(ies)	Monitoring Action
propagation, nursery rearing and translocation to appropriate sites. Receptor sites will be identified within conserved areas, such as the NCCP Reserve. Performance standards for the Mitigation Plan will be derived as follows: a number of colonies and an average number of individuals per patch shall be identified as a minimum requirement for plant preservation and/or successful re-establishment pursuant to translocation. This number of patches and individuals shall be based upon (a) the number of patches and individuals estimated to be impacted by the pre-construction surveys, and (b) the number of patches and individual plants known to occur in preserved areas at the time of impact.				
MM-BIO-12 Prior to constructing NTS Sites 68, 69C and 69E, an assessment shall be conducted to determine if any Palmer's grapplinghook (*Harpagonella palmeri*) or wild peppergrass (*Lepidium virginicum*) is present. If any of these species is found to be present, prior to impact, the soil, seed and plants within the area of impact shall be collected, and stored. After completion of impact, the collected and stored materials shall be spread over the area outside of the newly created facility within selected portions of the NCCP Reserve or the Irvine Ranch Land Reserve lands to facilitate re-establishment of the plant.	Applicable to Facility Site 68, 69C, and 69E	Prior to initiation of construction activities	IRWD General Manager and California Department of Fish and Game	Review biological survey report from biologist and site inspections
MM-BIO-13 All NTS sites will be inspected once annually during the fall or winter months by the IWMD biologist for presence/absence of bullfrog tadpoles. If bullfrog tadpoles are present, where practicable, the NTS facility will be dried out completely to interrupt their breeding cycle and eliminate breeding populations.	Applicable to all Facility Sites	Prior to construction and/or commencement of operation and maintenance activities	IRWD General Manager and California Department of Fish and Game	Review biological survey report from biologist and site inspections
3.4 Human Health and Public Safety				
Project Design Features				
PDF-PHS-1 The proposed NTS Plan includes a Vector and Pest Control Plan (Appendix G of the NTS Plan) developed cooperatively with OCVCD. The Vector and Pest Control Plan includes abatement methods, monitoring requirements, and assessment procedures to evaluate the effectiveness of proposed control methods. Appendix J, Operations and Maintenance, of this Revised Draft EIR includes several provision identified in the Vector and Pest Control Plan. The Vector and Pest Control Plan will be implemented through an agreement between IRWD and OCVCD.	Applicable to all Facility Sites	Ongoing- During operation and maintenance and monitoring activities	IRWD General Manager and Orange County Vector Control District	Review plans and site inspection

TABLE 1 (Continued)
NATURAL TREATMENT SYSTEM EIR MITIGATION MONITORING PROGRAM

EIR Section/Mitigation Program	Applicable NTS Sites	Timing of Mitigation	Responsible Party(ies)	Monitoring Action
PDF-PHS-2 The NTS Facility sites may utilize deep and shallow and ponded water areas for water quality treatment purposes. During final design, the following features shall be incorporated into NTS Facility sites that are determined to pose a potential water safety threat: fencing, signage, or special design features, based on the specific physical circumstances at each site. In addition, signage in English and Spanish shall be used where it can effectively describe the functions of the NTS Facility to the public. The IRWD General Manager shall confirm that appropriate water safety features have been incorporated into the final designs of NTS Facilities that could pose a water safety threat.	Applicable to all Facility Sites that are determined to pose a potential water safety threat	During construction phase and prior to operation of sites	IRWD General Manager	Review plans and site inspection
PDF-PHS-56-1 Site 56 includes the following project design features that would minimize the potential for water safety impacts: 1) the upper slopes will be graded at a 5:1 ratio (horizontal:vertical); 2) gravel will be placed around the edges of the NTS Site to improve pedestrian traction; 3) a fence will surround the shallow and open water and riparian areas to restrict access, and will include signs that warn the public about open water areas and public safety risks; and 4) vegetation shall be planted to minimize access into the shallow and open water and riparian areas.	Applicable to Site 56	During construction phase and prior to operation of sites	IRWD General Manager	Review plans and site inspection
PDF-PHS-16-1 Site 16 includes the following project design features that would minimize the potential for water safety impacts: 1) gravel will be placed around the edges of the NTS Site to improve pedestrian traction; 2) a fence will surround the shallow and open water and riparian areas to restrict access, and will include signs that warn the public about open water areas and public safety risks; and 3) vegetation shall be planted to minimize access into the shallow and open water and riparian areas.	Applicable to Site 16	During construction phase and prior to operation of sites	IRWD General Manager	Review plans and site inspection
Standard Conditions and Requirements				
None				
Mitigation Measures				
MM-PHS-1 In the event that underground storage tanks, obvious or suspected contamination, or other features or materials that could present a threat to human health or the environment are discovered during construction of NTS facilities, work in the immediate area shall cease immediately. A qualified technical professional shall evaluate any such condition. Prior to re-initiation of construction activities, the contractor shall submit evidence to the IRWD General Manager that underground storage tanks or other identified hazardous materials have been removed and/or remediated in accordance with	Applicable to all Facility Sites	Ongoing- During operation and maintenance	IRWD General Manager and Orange County Health Care Agency	Review of satisfactory evidence of removal of tanks and site inspection

TABLE 1 (Continued)
NATURAL TREATMENT SYSTEM EIR MITIGATION MONITORING PROGRAM

EIR Section/Mitigation Program	Applicable NTS Sites	Timing of Mitigation	Responsible Party(ies)	Monitoring Action
existing standards and regulations implemented by the OCHCA. The process for removal of underground storage tanks required by the OCHCA is detailed in the Remediation Procedures Report included in Appendix N, Volume III of this Revised Draft EIR.				
MM-PHS-2 NTS Sites 31, 32, 49, 42, 16, 18, 22, 50, 51, 52, 70A-70C and 71 have either previously approved CEQA documents and/or regulatory permits issued. Construction of these NTS sites shall comply with applicable mitigation measures identified in previously approved CEQA documents and/or measures identified in the issued regulatory permits.	Applicable to Facility Sites 31, 32, 49, 42, 16, 18, 22, 50, 51, 52, 70A-70C and 71	Refer to previous CEQA documents and/or regulatory permits	IRWD General Manager	Review of plans, site inspections
3.5 Air Quality				
Project Design Features				
PDF-AQ-1 Planting and maintaining vegetation in shallow water areas would prevent fugitive dust erosion during the dry season and would also remove toxic compounds which could otherwise become windborne.	Applicable to all Facilities Sites with planting plans	Ongoing- During operation and maintenance	IRWD General Manager	Review plans and site inspection
Standard Conditions and Requirements				
None				
Mitigation Measures				
MM-AQ-1 Moisten soil not more than 15 minutes prior to moving soil and three times a day or four times a day under windy conditions in order to maintain soil moisture of 12 percent.	Applicable to all Facilities Sites requiring grading and construction activities	During construction phase	IRWD General Manager	Review plans and site inspection
MM-AQ-2 On the last day of active operations prior to a weekend or holiday, apply water or chemical stabilizer to maintain a stabilized surface.	Applicable to all Facilities Sites requiring grading and construction activities	During construction phase	IRWD General Manager	Review plans and site inspection
MM-AQ-3 Water excavated soil piles hourly or cover with temporary coverings.	Applicable to all Facilities Sites requiring grading and construction activities	During construction phase	IRWD General Manager	Review plans and site inspection
MM-AQ-4 Cease grading during periods when winds exceed 25 miles per hour.	Applicable to all Facilities Sites requiring grading and construction activities	During construction phase	IRWD General Manager	Review plans and site inspection
MM-AQ-5 Moisten excavated soil prior to loading on trucks.	Applicable to all Facilities Sites requiring grading and construction activities	During construction phase	IRWD General Manager	Review plans and site inspection

TABLE 1 (Continued)
NATURAL TREATMENT SYSTEM EIR MITIGATION MONITORING PROGRAM

EIR Section/Mitigation Program	Applicable NTS Sites	Timing of Mitigation	Responsible Party(ies)	Monitoring Action
MM-AQ-6 Cover all loads of dirt leaving the site or leave sufficient freeboard capacity in truck to prevent fugitive dust emissions en route to disposal site.	Applicable to all Facilities Sites requiring grading and construction activities	During construction phase	IRWD General Manager	Review plans and site inspection
MM-AQ-7 Turn off equipment when not in use for more than five minutes.	Applicable to all Facilities Sites requiring grading and construction activities	During construction phase	IRWD General Manager	Review plans and site inspection
MM-AQ-8 In order to reduce significant NO_X emissions on the peak day, the grading and hauling schedule shall be extended and equipment use on peak days shall be reduced.	Applicable to NTS Sites 54 and 56	During construction phase	IRWD General Manager	Review plans and site inspection
MM-AQ-9 In order to reduce NO_X and PM_{10} emissions expected from simultaneous construction of more than one NTS site, no more than 5 acres of NTS wetlands construction shall be under construction at any one time and that fugitive dust suppression and other construction emissions minimization measures will be fully applied as required by MM-AQ-1 through MM-AQ-7. Grading activities at one site shall be substantially completed before grading activities are started at other NTS sites.	Applicable to NTS Sites 54 and 56	During construction phase	IRWD General Manager	Review plans and site inspection
MM-AQ-10 NTS Sites 31, 32, 49, 42, 16, 18, 22, 50, 51, 52, 70A-70C and 71 have previously approved CEQA documents and/or regulatory permits issued. Construction of these NTS sites shall comply with applicable mitigation measures identified in previously approved CEQA documents and/or measures identified in the issued regulatory permits.	Applicable to Sites 31, 32, 49, 42, 16, 18, 22, 50, 51, 52, 70A-70C and 71	Refer to previous CEQA documents and/or regulatory permits	IRWD General Manager	Review of plans, site inspections
3.6 Landform Modification and Aesthetics				
Project Design Features				
PDF-AES-1 IRWD will screen all visible mechanical equipment in areas that can be seen from a residential zoning area or designated trails. Mechanical equipment shall be screened from view from adjacent streets and adjacent properties. Screening shall consist of a colored mesh covering to blend with setting or sufficient landscaping.	Applicable to all Facility Sites	Ongoing- During construction and operation and maintenance activities	IRWD General Manager	Review plans and site inspection
Standard Conditions and Requirements				
None				

TABLE 1 (Continued)
NATURAL TREATMENT SYSTEM EIR MITIGATION MONITORING PROGRAM

EIR Section/Mitigation Program	Applicable NTS Sites	Timing of Mitigation	Responsible Party(ies)	Monitoring Action
Mitigation Measures				
MM-AES-64-1 Prior to issuance of building permits, IRWD will demonstrate to the City of Irvine that the temporary weir designs proposed for Site 64 (A-frame weir and rubber weir) will be constructed with materials resembling a natural appearance, allowing them to blend in with the channel and existing riprap. A neutral/natural color (e.g., brown, beige, sand) is recommended for the temporary designs.	Applicable to Site 64	Prior to issuance of grading permits	IRWD General Manager and City of Irvine	Review plans and site inspection
MM-AES-1 NTS Sites 31, 32, 49, 42, 16, 18, 22, 50, 51, 52, 70A-70C and 71 have previously approved CEQA documents and/or regulatory permits issued. Construction of these NTS sites shall comply with applicable mitigation measures, standard conditions and project design features adopted and/or any issued regulatory agency permits identified in previously approved CEQA documents.	Applicable to Facility Sites 31, 32, 49, 42, 16, 18, 22, 50, 51, 52, 70A-70C and 71	Refer to previous CEQA documents and/or regulatory permits	IRWD General Manager	Review of plans, site inspections
3.7 Cultural Resources				
Project Design Features				
None				
Standard Conditions and Requirements				
None				
Mitigation Measures				
MM-CUL-67-1 All ground disturbing activities associated with the undeveloped disturbed parcel bound by Peters Canyon Channel to the west, Barranca Parkway to the south, Harvard Avenue to the west and abandoned MCAS Tustin housing to the north, shall be in compliance with the applicable cultural resources mitigation measures identified in the MCAS Tustin Final EIS/EIR (1999) and repeated below: *Applicable MCAS Tustin Final EIS/EIR (1999) Cultural Resources Mitigation:* *Arch-2 Prior to issuance of grading permits, the cities of Tustin and Irvine shall each require applicants of individual development projects to retain, as appropriate, a county-certified archaeologist. If buried resources are found during grading within the reuse plan area, a qualified archaeologist would need to assess the site significance and perform the appropriate mitigation. The Native American view point shall be considered during this process. This could include testing or data recovery. Native American consultation shall also be initiated during this process.*	Applicable to Site 67	Prior to issuance of grading permit (Arch-2); During construction phase (Paleo-1); and prior to issuance of grading permit (Paleo-2)	IRWD General Manager and City of Tustin	Receipt of proof of retention of archaeologist, review plans and site inspection

TABLE 1 (Continued)
NATURAL TREATMENT SYSTEM EIR MITIGATION MONITORING PROGRAM

EIR Section/Mitigation Program	Applicable NTS Sites	Timing of Mitigation	Responsible Party(ies)	Monitoring Action
Paleo-1 The cities of Tustin and Irvine shall require applicants of individual projects to comply with the requirements established in a Paleontological Resources Management Plan (PRMP) prepared for the site, which details the methods to be used for surveillance of construction grading, assessing finds, and actions to be taken in the event that unique paleontological resources are discovered during grading. *Paleo-2 Prior to issuance of a grading permit, project applicants shall provide written evidence to each city, that a county-certified paleontologist has been retained to conduct salvage excavation of unique paleontological resources if they are found.*				
MM-CUL-1 All ground disturbing activities will be monitored by a qualified archaeologist. If cultural evidence that appears to be archaeological in nature becomes apparent during ground disturbing activities, activities in that location shall be diverted away from the find, and an Orange County-certified archaeologist shall be contacted immediately to examine the find. The certified archaeologist shall notify IRWD or property owner (if other than IRWD) if the find is potentially significant, and the archaeologist may recommend additional study (e.g., salvage excavations).	Applicable to all Facility Sites	During construction phase	IRWD General Manager	Receipt of proof of retention of archaeologist, review plans and site inspection
MM-CUL-2 If ground disturbing activities will be undertaken in any area that has not been physically surveyed for cultural resources, such activities will not be initiated until the area has been physically surveyed by a qualified archaeologist. If previously unknown cultural resources are identified as a result of the survey, further archaeological investigation may be required before project-related ground disturbing activities may be initiated.	Applicable to all Facility Sites	During construction phase	IRWD General Manager	Receipt of proof of retention of archaeologist and review plans
MM-CUL-3 If human remains are discovered at any time, State Health and Safety Code §7050.5 requires that all activities in the area of the find must stop, and the Orange County coroner must be notified immediately to make a determination of origin and disposition according to Public Resources Code §5097.98. If the remains are determined to be prehistoric, the coroner is required to notify the Native American Heritage Commission (NAHC), which will identify the Most Likely Descendent (MLD). The MLD shall complete an inspection of the area of the discovery within 24 hours of notification by the NAHC. The MLD, in consultation with IRWD and/or property owner and the certified archaeologist, shall have the authority to make procedural determinations regarding disposition of the remains (e.g.,	Applicable to all Facility Sites	Ongoing- During construction and operation and maintenance activities	IRWD General Manager	Site inspection

TABLE 1 (Continued)
NATURAL TREATMENT SYSTEM EIR MITIGATION MONITORING PROGRAM

EIR Section/Mitigation Program	Applicable NTS Sites	Timing of Mitigation	Responsible Party(ies)	Monitoring Action
removal, scientific examination and nondestructive analysis, and/or reburial).				
MM-CUL-4 NTS Sites 31, 32, 49, 42, 16, 18, 22, 50, 51, 52, 70A-70C and 71 have either previously approved CEQA documents and/or regulatory permits issued. Construction of these NTS sites shall comply with applicable mitigation measures identified in previously approved CEQA documents and/or measures identified in the issued regulatory permits.	Applicable to Sites 31, 32, 49, 42, 16, 18, 22, 50, 51, 52, 70A-70C and 71	Refer to previous CEQA documents and/or regulatory permits	IRWD General Manager	Review of plans, site inspections

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Attachment B
Endangered Species Act
Section 7 Consultation

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Fish and Wildlife Office
6010 Hidden Valley Road, Suite 101
Carlsbad, California 92011

In Reply Refer To:
FWS-OR-09B0359-09I0996

Douglas S. McPherson
Environmental Protection Specialist
Bureau of Reclamation
27708 Jefferson Avenue, Suite 202
Temecula, California 92590-2628

Subject: Informal Section 7 Consultation for Irvine Ranch Water District Natural Treatment System, Orange County, California

Dear Mr. McPherson:

On July 10, 2009, we received your letter (SCAO-1500/ENV-7.00) requesting concurrence that the proposed Irvine Ranch Water District Natural Treatment System project in Orange County, California, is not likely to adversely affect the federally threatened coastal California gnatcatcher (*Polioptila californica californica*, "gnatcatcher"). Additionally, you determined that the project will not affect the federally endangered southwestern willow flycatcher (*Empidonax traillii extimus*, "flycatcher"), least Bell's vireo (*Vireo bellii pusillus*, "vireo"), light-footed clapper rail (*Rallus longirostris levipes*, "clapper rail"), California least tern (*Sterna antillarum browni*, "tern"), Quino checkerspot butterfly (*Euphydryas editha quino*, "Quino"), and the federally threatened thread-leaved brodiaea (*Brodiaea filifolia*, "brodiaea"). The proposed project is the installation and/or operation of 31 constructed wetlands within the San Diego Creek watershed to improve water quality in the San Diego Creek, its tributaries, and in Upper Newport Bay.

The proposed project will impact 65 acres of non-sensitive habitats (agricultural, annual grassland, ruderal, ornamental, developed, or disturbed areas), 6.43 acres of degraded freshwater marsh, and 2.97 acres of sensitive habitats (needlegrass grassland, freshwater swale, salt water marsh, herbaceous riparian, mule fat scrub, and ephemeral stream and washes) by converting them into 56.7 acres of emergent marsh/wetlands and open water habitat. The project will also preserve or enhance 60.2 acres of adjacent annual grassland, scrub, saltwater marsh, and mixed riparian scrub habitats. The proposed project includes the operation and maintenance (O&M) activities of the constructed wetlands.

The project was determined to have no effect on flycatcher, vireo, clapper rail, tern, Quino, and brodiaea for the following reasons:

- There will be no direct impacts to potential vireo or flycatcher nesting habitat;

- Survey results were negative for Quino and brodiaea;
- Vegetation removal activities will be conducted outside the period from March 15 to August 30, which will avoid the majority of the breeding season for vireo, flycatcher, and terns;
- Construction and O&M activities will avoid the breeding season (March 15 to August 30). Additionally, a qualified biologist will conduct site assessments prior to construction and/or major O&M activities;
- Potential clapper rail occurrence is considered to be low. If clapper rails are observed within any of the NTS sites, the U.S. Fish and Wildlife Service will be contacted to determine if additional consultation is required;
- Vegetation within the NTS sites will be managed to prevent the growth of mulefat, willows, and other riparian vegetation that could support vireo and flycatcher nesting habitat.

We concur with your determination of not likely to adversely affect gnatcatcher for the following reasons:

- There will be no direct impacts to coastal sage scrub or critical habitat for the gnatcatcher;
- Vegetation removal activities will be conducted outside the period from March 15 to August 30, which will avoid the majority of the breeding season for the gnatcatcher;
- Construction and O&M activities will avoid the breeding season (March 15 – August 30). Additionally, a qualified biologist will conduct site assessments prior to construction and/or major O&M activities;

With the implementation of the above measures, project construction and O&M may result in minor disturbance to gnatcatchers in adjacent habitat, but this disturbance will occur outside the breeding season and is not anticipated to substantially disrupt essential behaviors such as foraging and dispersal.

Based on our concurrence that the proposed project is not likely to adversely affect the gnatcatcher, the interagency consultation requirements of section 7 of the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 *et seq.*), have been satisfied. Although this ends informal consultation, obligations under section 7 of the Act shall be reconsidered if (1) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not previously considered, (2) this action is subsequently modified in a

manner that was not considered in this assessment, or (3) a new species is listed or critical habitat designated that may be affected by the action.

If you have any questions regarding this consultation, please contact Fish and Wildlife Biologist Jennifer Wise at (760) 431-9440, extension 276.

Sincerely,

for Karen A. Goebel
Assistant Field Supervisor

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United States Department of the Interior

BUREAU OF RECLAMATION
Southern California Area Office
27708 Jefferson Ave., Suite 202
Temecula, CA 92590-2628

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:
SCAO-1500
ENV-7.00

JUL 08 2009

MEMORANDUM

To: Division Chief for Orange County and Camp Pendleton,
Fish and Wildlife Service, Carlsbad Field Office
Attn: Jennifer Wise

From: Douglas S. McPherson
Environmental Protection Specialist

Doug McPherson

Subject: Irvine Ranch Water District Natural Treatment System Orange County, California

The Bureau of Reclamation and the Environmental Protection Agency have been authorized to provide Federal funding to the Irvine Ranch Water District (IRWD) for the proposed Natural Treatment System (NTS) project, which would install and/or operate 31 constructed wetlands within the San Diego Creek watershed in Orange County, California. The goal of the NTS Plan is to improve water quality in San Diego Creek and its tributaries and in Upper Newport Bay.

Based on information provided by IRWD and informal consultation with your office, we have concluded that installation of proposed NTS facilities is not likely to adversely affect any federally listed species or designated critical habitat. It is our understanding that IRWD planned the project in coordination with your office and California Department of Fish and Game.

The IRWD certified an Environmental Impact Report (EIR) under the California Environmental Quality Act in 2004. The EIR identified potential impacts to southwestern willow flycatcher (*Empidonax traillii extimus*), least Bell's vireo (*vireo bellii pusillus*), light-footed clapper rail (*Rallus longirostris levipes*), California least tern (*Sterna antillarum browni*), coastal California gnatcatcher (*Polioptila californica californica*), Quino checkerspot butterfly (*Euphidryas editha quino*), and thread-leaved brodiaea (*Brodiaea filifolia*).

Installation of NTS facilities will impact 74 acres, including 65 acres of low value, non-sensitive resources (agricultural, annual grassland, ruderal, ornamental, developed, or disturbed areas), 6.43 acres of degraded freshwater marsh, and 2.97 acres of sensitive habitats (needlegrass grassland, freshwater swale, salt water marsh, herbaceous riparian, mule fat scrub, and ephemeral stream and washes). These habitats will be converted into 56.7 acres of emergent marsh/wetlands and open water habitat. The project also proposes to preserve or enhance 60.2 acres of adjacent annual grassland, scrub, saltwater marsh, and mixed riparian scrub habitats.

Operation and maintenance (O&M) of the constructed wetlands may require temporary habitat removal on a rotating schedule. IRWD staff biologists will perform preliminary site assessment prior to O&M activities to identify potential effects and recommend appropriate actions to avoid or minimize effects to the greatest extent practicable.

No direct impacts to coastal sage scrub or critical habitat for coastal California gnatcatcher were identified. Survey results for Quino checkerspot butterfly and thread-leaved brodiaea were negative. No direct impacts to potential least Bell's vireo or southwestern willow flycatcher nesting habitat will occur. At least two potential NTS sites were eliminated to avoid existing riparian woodlands suitable as nesting habitat for vireo or flycatcher.

Construction and O&M activities will avoid the breeding season, which will reduce potential disturbance to adjacent suitable or occupied habitat. Site assessments will be conducted by IRWD's staff biologist prior to the initiation of any construction and/or major O&M activity. Vegetation within NTS sites will be managed to prevent growth of mulefat, willows, and other riparian vegetation that could support vireo and flycatcher nesting habitat.

Upper Newport Bay and the Seal Beach National Wildlife Refuge support the only substantial populations of light-footed clapper rail in Orange County. Suspected breeding was observed in the 1980s near Site 62 and the species was also identified north of Campus Drive at Site 46 in the early 1990s. Potential occurrence is considered very low. Site assessment by a qualified biologist prior to construction and/or major O&M activities will avoid impacts to this species. If light-footed clapper rails are observed within any of the NTS sites, the U.S. Fish and Wildlife Service will be contacted to determine if additional consultation is required.

The potential for California least tern foraging is high at Sites 39, 46 and 62. No construction is proposed at Sites 39 and 46. These facilities will continue to be operated and maintained as they have historically under existing regulatory permit authorizations with no new construction. Mitigation measures involving site assessment by a qualified biologist prior to construction and/or major operation and maintenance activities at Site 62 will avoid impacts to this species.

We concluded that the proposed measures are adequate to avoid effects to all listed species with the possible exception of coastal California gnatcatcher. The EIR identified a low potential for the species at sites 13, 39 and 46, and adjacent to site 62. The project will also create 9.6 acres of coastal sage scrub and 2.7 acres of mixed riparian scrub, which may become occupied later. Noise from construction or O&M activities could result in very minor indirect effects to the species. These activities will be scheduled to avoid the breeding season.

We request that you concur with a finding of "not likely to adversely affect" coastal California gnatcatcher. Please advise if you disagree with our finding of "no effect" to other listed species or if we have overlooked any other important issues.

Thank you for the guidance provided during informal consultation. If you need any additional information, please call me at (951) 695-5310.

cc: U.S. Environmental Protection Agency, 75 Hawthorne Street (WTR-3),
San Francisco, CA 94105
Attn: Ms. Cheryl Mc Govern
Irvine Ranch Water District, P.O. Box 57000, Irvine CA 92619-7000
Attn: Ms. Kelli Welch

bcc: SCAO-1500

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Attachment C
National Historic Preservation Act
Section 106 Consultation

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STATE OF CALIFORNIA - THE RESOURCES AGENCY

ARNOLD SCHWARZENEGGER, Governor

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
P.O. BOX 942896
SACRAMENTO, CA 94296-0001
(916) 653-6624 Fax: (916) 653-9824
calshpo@ohp.parks.ca.gov

July 26, 2005

In Reply Refer To: BUR050613A

Deanna J. Miller
Director, Resources Management Office
United States Department of the Interior
Bureau of Reclamation, Lower Colorado Regional Office
P.O. Box 61470
Boulder City, NV 89006-1470

Dear Ms. Miller:

Re: LC-2633 Env-3.00. 31 Natural Treatment System (NTS) Facility Sites within the San Diego Creek Watershed, Irvine Ranch Water District (IRWD), Orange County, California (LC-CA-04-11 N).

You are initiating consultation with me, regarding the above noted project, pursuant to 36 CFR Part 800 (as amended 8-05-04) regulations implementing Section 106 of the National Historic Preservation Act. The Bureau of Reclamation (BUR) is lead federal agency for the above noted undertaking, in which the proposed NTS sites are manmade or enhanced wetlands designed to function as biofilters for runoff entering the San Diego Creek Watershed. The construction of these 31 facilities will establish 56.7 acres of emergent marsh and wetland habitats and 60.2 acres of grassland, scrub, saltwater marsh, and mixed riparian scrub habitats within the San Diego Creek Watershed.

In addition to your letter of June 8, 2005 requesting consultation, you have submitted, in support of this undertaking, a packet of maps and aerial photographs of the locations of the proposed undertaking and the following documents:

- *A Cultural Resources Literature Study And Field Reconnaissance For The Natural Treatment System Master Plan Facilities, Orange County, California* (SWCA Environmental Consultants: February 2003).

- *Cultural Resources Assessment of 22 Natural Treatment System Facility Sites Within the San Diego Creek Watershed: Natural Treatment System Project, Irvine Ranch Water District, Orange County, California* (T. Fulton and D. McLean, LSA Associated, Inc.).

After reviewing your letter (June 8, 2005) and the supporting documentation for this undertaking, and considering the information provided by Mark C. Slaughter regarding the finding proposed by BUR (phone contact July 26, 2005 with William Soule of my staff and email dated July 26, 2005), I have the following comments:

1) I concur that the Area of Potential Effects is appropriate as per 36 CFR §§ 800.4(a) (1) and 800.16(d) and that the efforts made to identify historic properties have been appropriate as per

36 CFR § 800.4(b).

2) I further concur that a finding of No Historic Properties Affected is appropriate as per 36 CFR § 800.4 (d) (1) and that the documentation supporting this finding has been submitted to the SHPO as per 36 CFR § 800.11(d).

3) Concurrence with this finding is predicated on the agreement by the BUR, as stated in your letter of June 8, 2005, to have project construction at site 62 monitored by a professional archeologist who meets the Secretary of the Interior's Standards for archeology.

4) Be advised that under certain circumstances, such as unanticipated discovery or a change in project description, the BUR may have additional future responsibilities for this undertaking under 36 CFR § 800.

Thank you for seeking my comments and for considering historic properties in planning your project. If you require further information, please contact William Soule at phone 916-654-4614 or email wsoule@parks.ca.gov.

Sincerely,

Milford Wayne Donaldson, FAIA
State Historic Preservation Officer

United States Department of the Interior

BUREAU OF RECLAMATION
Lower Colorado Regional Office
P.O. Box 61470
Boulder City, NV 89006-1470

IN REPLY REFER TO:
LC-2633
ENV-3.00

JUN 0 8 2005

TAKE PRIDE IN AMERICA

6/13/05

CODE 1500

Classification
Project
Control No.
Folder

CERTIFIED - RETURN RECEIPT REQUESTED

Mr. Milford Wayne Donaldson
California State Historic Preservation Officer
P.O. Box 942896
Sacramento, CA 94296-0001

Subject: Submission of a Cultural Resource Survey Report for 31 Natural Treatment System (NTS) Facility Sites within the San Diego Creek Watershed (Watershed), Irvine Ranch Water District (IRWD), Orange County, California (LC-CA-04-11 N)

Dear Mr. Donaldson:

Thirty-one NTS sites within the IRWD, Orange County, California, have been proposed (see Enclosure 1). The NTS sites are manmade or enhanced wetlands that function as biofilters for runoff entering the Watershed. The Bureau of Reclamation is providing funding assistance for this project through the Title XVI Wastewater and Groundwater Study and Facilities Act, and this project is considered as a federal undertaking under the National Historic Preservation Act of 1966 (NHPA), as amended, Section 106. Two reports summarize the cultural resource Section 106 work conducted for the NTS. These reports, by SWCA and LSA, are enclosed for your review. Please note that Native American consultation is found in the LSA document.

Project Description

The proposed project is detailed in Enclosure 2. The NTS plan proposes improvements to assist in managing the quality of surface runoff within the Watershed. Implementation of the NTS Plan would result in treatment of runoff from both existing development and new development within the Watershed. Construction of the 31 facilities would result in a net benefit to biological resources within the Watershed because it will establish 56.7 acres of emergent marsh and wetland habitats, and 60.2 acres of grassland, scrub, saltwater marsh, and mixed riparian scrub habitats within the Watershed.

Area of Potential Effect

The area of potential effect (APE) for the proposed project is the 31 NTS sites (Enclosure 3). Construction at these locales will include mechanical grading and excavation as well as vegetation planting. The 31 sites are strategically located throughout the Watershed.

Initial construction planned for regional retrofit sites (sites 26, 27, 53, 54, 55, 56, 62, 64, 67) including subsurface excavation by heavy equipment and removal of fill, the introduction of off-site fill, grading of easements, and the use of on-site staging areas for equipment (Table 1). Similar methods will be employed at all of the future NTS sites.

Table 1. Summary of Ground Disturbance.

Site No.	Sediment Removal (in cubic yds)	Introduced Fill (in cubic yds)	Acres of Disturbance
26	275	0	6.3
53	2,922	2,922	1.4
54	12,300	0	3.7
55	20	0	0.9
56	4,700	3,200	2.6
62	3,240	17,000	8
64	500	50	18.2

Identification of Historic Properties

Two documents (see Enclosures 4&5), by SWCA and LSA, report on the cultural resource documentation and fieldwork of the NTS locales (Table 2). The SWCA document, completed in 2003, reports on their site files check and pedestrian survey of NTS sites 25, 26, 27, 46 53, 54, 55, 56, 62, and 64 (site 25 was later removed from the final NTS plan and thus not part of the proposed action). Fieldwork consisted of pedestrian survey of the NTS sites. SWCA identified no cultural resource materials on these properties; they did recommend archaeological monitoring of NTS site 62 due to the amount of vegetation found covering the ground during the survey.

In 2004 LSA conducted their archival and record searches and field survey. The LSA document covered the remaining NTS sites. In addition, Native American consultation, for the entire project, including the SWCA areas, was undertaken and reported by LSA. Field survey consisted of driving developed areas, and walking the open, undeveloped areas and roadsides adjacent to agricultural fields. No cultural properties were identified by LSA.

In sum, SWCA and LSA identified no cultural resources in the APE through their record searches and field surveys. In addition, no historic buildings or districts were identified in the APE. SWCA did recommend monitoring of NTS site 62 because an adequate inspection of the ground surface could not be done at the time of the survey.

NTS settings are within areas where buried cultural resources are not expected to be found. Based on their review of the previous work in the area, and their survey, LSA concluded that "because the NTS facility sites are located in natural or enhanced drainages, or other areas prone to water accumulation" that these areas "are typically not suitable for human occupation", the facility sites "are disturbed, either by channeling or agriculture", and thus, the "potential for buried or otherwise unknown cultural material in these areas is therefore unlikely" (LSA report, page 20).

Table 2. NTS Site Documentation by Contractor.

Contractor	NTS Site Documentation
LSA	9, 10, 11, 12A-G, 13, 16, 18, 22, 31, 32, 39, 42, 49, 50, 51, 52, 61, 67, 68, 69A-E, 70A-C, 71
SWCA	26, 27, 46, 53, 54, 55, 56, 62, 64

Native American Consultations

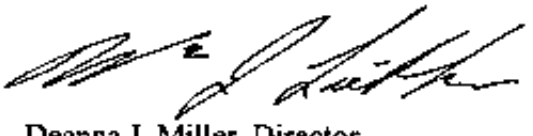
LSA contacted the Native American Heritage Commission (NAHC) for a list of Native Americans to contact regarding the proposed project. No traditional cultural properties or sacred sites were identified by the NAHC. Nineteen potentially interested Native American parties were identified. Contact results are summarized in Appendix A of the enclosed LSA report. No project specific concerns were reported.

Assessment of Effects

Reclamation finds no adverse effect / no effect for the proposed project. Due to limited surface visibility during the SWCA survey, site 62 will be monitored by a professional archaeologist during the ground disturbing activities; consultations will continue for any inadvertent discoveries. In the event that human remains are encountered, the California State Health and Safety Code and Public Resources Code shall be followed.

Reclamation requests your concurrence that the enclosed survey reports meets Section 106 requirements and with its finding of no adverse effect / no effect with monitoring condition. Should you have any questions or concerns regarding this submission, contact Mr. Mark C. Slaughter, Archaeologist, by telephone at 702-293-8143, or by e-mail at mslaughter@lc.usbr.gov.

Sincerely,



FOR Deanna J. Miller, Director
Resources Management Office

Enclosures - 5

Bc: SCAO-1500 (McPherson)

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Daily
WBR:MSlaughter:pja:06/07/05:293-8143
(Usr\COMM2000\COM2600\Mark Slaughter:&NTS SHPO letter.doc)

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Attachment D
Farmland Protection Policy
Conversion Impact Rating

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United States Department of the Interior

BUREAU OF RECLAMATION
Southern California Area Office
27708 Jefferson Ave., Suite 202
Temecula, CA 92590-2628

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:
SCAO-1500
ENV-6.00

AUG 03 2009

Mr. Paul Nguyen
U.S.D.A. Natural Resources Conservation Service
44811 North Date Avenue
Lancaster, CA 93534-3136

Subject: San Diego Creek Watershed Natural Treatment System, Orange County, California

Dear Mr. Nguyen:

The Irvine Ranch Water District (IRWD) has applied for financial assistance from the Bureau of Reclamation to implement the Natural Treatment System Master Plan, a series of 31 constructed treatment wetlands intended to improve water quality in San Diego Creek and Newport Bay in Orange County, California. The project will create a total of 56.7 acres of treatment wetlands and an additional 60.2 acres preserved or restored as upland buffer habitat.

Twelve wetland sites are at least partly within Prime or Unique farmlands mapped by the California Department of Conservation. Of these, sites 10, 12A, 12G, and 27 are in Urbanized Areas designated by the Census Bureau. Wetlands at sites 12B, 12C, 12E, 12F and 32 are already installed and on-line. The remaining eight wetland sites located within mapped farmland (9, 11, 50, 51, 61, 69D, 70A-C, and 71) comprise 6.1 acres of constructed wetlands and total 49.31 acres including the surrounding preserved or created upland habitat.

Approximately 7,000 acres within San Diego Creek watershed are designated Prime or Unique farmland. This area experienced rapid growth and land-use development after World War II. Over 50 percent of the watershed area is urbanized with much of the development concentrated in the western portions. About 15 percent is used for agriculture and the remaining 35 percent is open space. Much of the open space is in mountainous regions and has been set aside for recreation and habitat conservation. Build-out within the watershed is expected to be completed within the next 20 years. Projected land use when fully developed will be 70 percent urban, 29 percent open space areas, and less than 1 percent agricultural.

Consistent with the Farmland Protection Policy Act and regulations promulgated by your agency at 7 CFR 658, we identified and have taken into account the potential conversion of farmland to non-agricultural use. Alternatives were considered during state and Federal environmental reviews. We believe the proposed action is compatible with State and local policies and plan to provide the requested financial assistance.

Thank you for the procedural guidance you have provided. Form AD-1006 is attached, along with a map showing the locations of proposed wetlands and designated farmlands. If you have any questions, please contact me at (951) 695-5310.

Sincerely,

Doug McPherson

Douglas S. McPherson
Environmental Protection Specialist

cc: Ms. Kelly Welch
Irvine Ranch Water District
P.O. Box 57000
Irvine, CA 92619-7000

bc: SCAO-1500

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*

Name of Project: San Diego Creek Watershed Natural Treatment System		Date Of Land Evaluation Request	July 10, 2009
Proposed Land Use: Constructed Wetlands		Federal Agency Involved	Bureau of Reclamation
		County and State	Orange County, California

PART II *(To be completed by NRCS)*

Does the site contain prime, unique, statewide or local important farmland? *(If no, the FPPA does not apply - do not complete additional parts of this form)*	YES ☐	NO ☐	Acres Irrigated	Average Farm Size
Major Crop(s)	Farmable Land In Govt. Jurisdiction Acres: %		Amount of Farmland As Defined in FPPA Acres: %	
Name of Land Evaluation System Used	Name of State or Local Site Assessment System		Date Land Evaluation Returned by NRCS	

PART III *(To be completed by Federal Agency)*

	Alternative Site Rating Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly	6.16			
B. Total Acres To Be Converted Indirectly	43.15			
C. Total Acres In Site	49.31			

PART IV *(To be completed by NRCS)* Land Evaluation Information

A. Total Acres Prime And Unique Farmland	
B. Total Acres Statewide Important or Local Important Farmland	
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted	
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value	

PART V (To be completed by NRCS) Land Evaluation Criterion
Relative Value of Farmland To Be Converted (Scale of 0 to 100 Points)

PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(Criteria are explained in 7 CFR 658.5 b. For Corridor project use form NRCS-CPA-106)*

	Maximum Points	Site A	Site B	Site C	Site D
1. Area In Non-urban Use	(15)				
2. Perimeter In Non-urban Use	(10)				
3. Percent Of Site Being Farmed	(20)				
4. Protection Provided By State and Local Government	(20)				
5. Distance From Urban Built-up Area	(15)				
6. Distance To Urban Support Services	(15)				
7. Size Of Present Farm Unit Compared To Average	(10)				
8. Creation Of Non-farmable Farmland	(10)				
9. Availability Of Farm Support Services	(5)				
10. On-Farm Investments	(20)				
11. Effects Of Conversion On Farm Support Services	(10)				
12. Compatibility With Existing Agricultural Use	(10)				
TOTAL SITE ASSESSMENT POINTS	160				

PART VII *(To be completed by Federal Agency)*

Relative Value Of Farmland *(From Part V)*	100
Total Site Assessment *(From Part VI above or local site assessment)*	160
TOTAL POINTS *(Total of above 2 lines)*	260

Was A Local Site Assessment Used? YES ☐ NO ☒

Site Selected: Site A Date Of Selection: 8/3/09

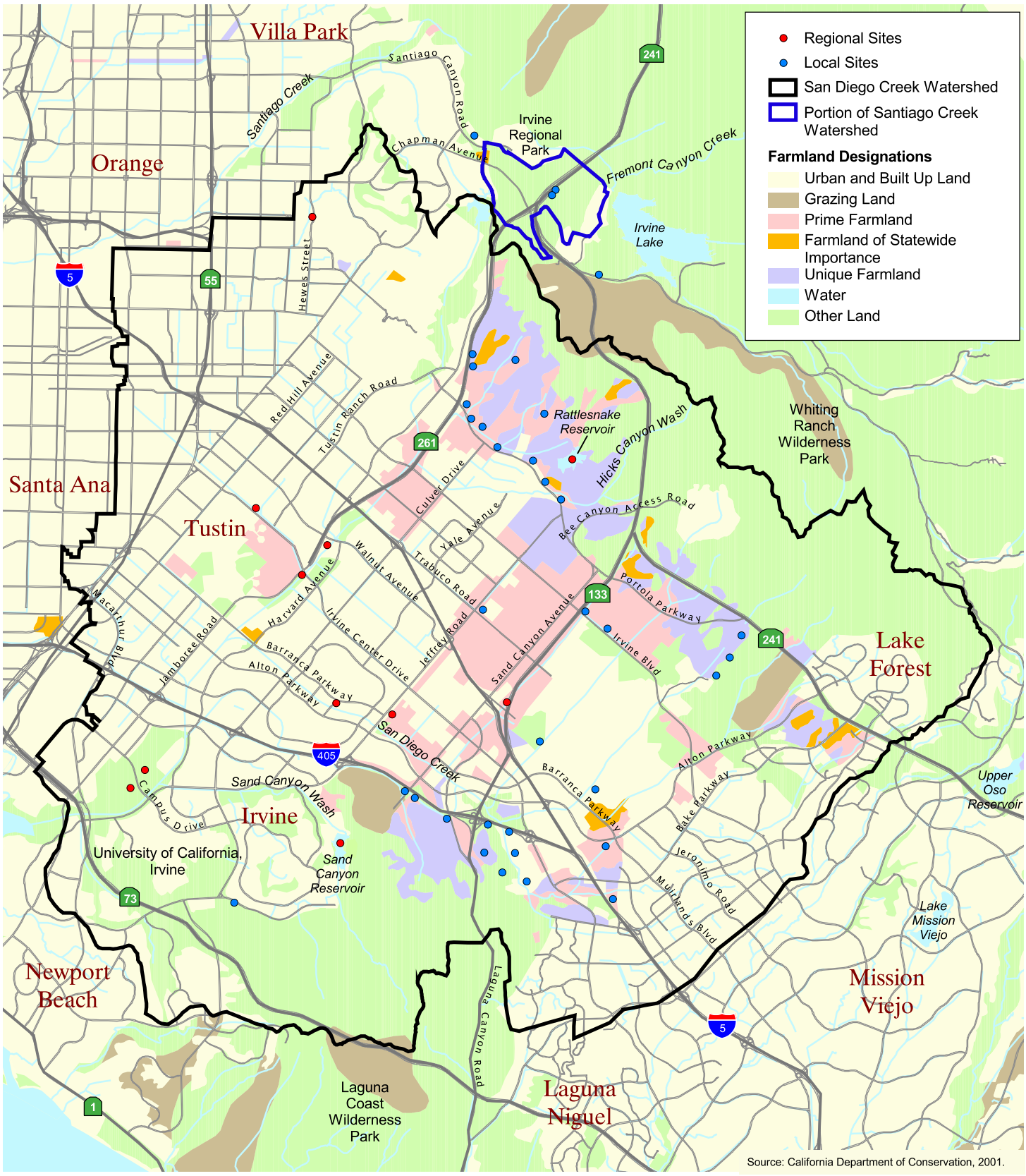
Reason For Selection:

The amount of farmland to be converted is negligible compared to the 6,995 acres of Prime and Unique farmland within the watershed. The project is compatible with State and local policies. Most or all the land is zoned for urban development. Treatment wetlands may not be an irreversible conversion of agricultural land. The substantial benefits to water quality and habitat improvement appear to outweigh the small loss of farmland.

Name of Federal agency representative completing this form: Doug McPherson Date: July 30, 2009

(See Instructions on reverse side)

Form AD-1006 (03-02)



Source: California Department of Conservation, 2001.

Farmland Designations

Figure 3.1-3

San Diego Creek Watershed Natural Treatment System Plan EIR

N W E S

2 0 2 Miles

Bonterra CONSULTING

S:/GIS_Exhibits/IRWDj001_AG_090703.pdf