South Oxnard Stormwater Flood Management Project
Attachment 3 of Proposition 1E Grant Proposal Attachment 3 (Work Plan)
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January 18, 2010 Ormond Beach Lagoon Emergency Breach Incident Report

I) Applicant and applicant's agent name, address, and telephone number

Applicant:
Ventura County Watershed Protection District (District)
Norma J. Camacho, Director
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Ventura, CA 93009-1600
805-654-2040

Agent (same agency and address as applicant):
Pam Lindsey, Watershed Ecologist
805-654-2036
Angela Bonfiglio Allen, Environmental Planner
805-477-7175

II) Full description of the activity

1. Description of the emergency and the potential for loss of life or property

Overview: At about 7 am on January 18, 2010 the District was informed that both the International Paper and Oxnard Waste Water Treatment Plants (hereafter referred to as IPP and OWWTP, respectively) were experiencing 3 to 4 feet of flooding (see attached photos and map). The J Street Drain (JSD) lies along the OWWTP west boundary and the Oxnard Industrial Drain (OID) flows within 120 feet of the IPP's southeast corner. OID bisects the Halaco Superfund site, where an estimated 4 to 5 feet of flooding had occurred and drums were observed floating within the fence line. Flooding was also observed at the Surfside III condominium complex west of JSD (parking areas and approaching patios), on Perkins Road (located between the two plants), and at both the Hueneme and Cypress Road intersections with OID.

Both JSD and OID flow into the Ormond Beach Lagoon, which is intermittently connected during the rainy season to the Pacific Ocean. This occurs when freshwater inputs raise the lagoon elevation sufficiently to carve a channel across Ormond Beach. Most recently, the Lagoon breached naturally on December 7, 2009 when the southern Oxnard/Port Hueneme area received 0.79 inch of rainfall over a 13-hour period. This is based on preliminary data collected at the District's nearby Silverstrand Beach (H403) Automated Local Evaluation in Real Time (ALERT) system gage. The breach channel established that day was subsequently plugged with beach sand pushed into it by waves and wind. Lack of rainfall and associated surface runoff in the intervening weeks also contributed to plugging of the breach channel, but this is not unusual.

The 12-hour rainfall total recorded by the ALERT system between 1:50 pm on Sunday, January 17 and 1:50 am on Monday, January 18, 2010 was 1.14 inches at the Silverstrand Beach gage. When compared to rainfall frequency information for the Oxnard Airport, which has over 50 years of record, the event experienced during this period is less than the 12-hour, 2-year rainfall depth of 2.03 inches. The record for the OWWTP gage (not part of the ALERT system) is

less than 20 years and identifies a 12-hour, 2-year rainfall depth of 1.74 inches, which is also greater than the amount of rainfall received at Silverstrand Beach on January 17-18, 2010. The flooding observed on January 18 was surprising given the relatively low amount of rainfall received.

It is interesting to note that the 12-hour rainfall depth experienced at Silverstrand Beach on January 17-18 has been exceeded nearly every year since 1991, with the exception of 1999, when the maximum 12-hour rainfall recorded was 0.93 inches. The largest 12-hour rainfall totals recorded at Silverstrand Beach between 1991 and the present occurred in 1998 (3.75 inches) and 2003 (3.03 inches). There is no record of flooding between 1991 and 2009 to the extent observed January 17-18, 2010.

The District was fully aware of the multiple storms forecast for the period between January 17 and 22, 2010. However, given that the lagoon had breached naturally only 5 weeks before during a smaller event than those forecast January 17-22, the District expected it would easily breach again without human interference. Moreover, the lagoon has breached naturally since 1992, when the District ceased its annual mechanical breaching activities by order of the U.S. Fish and Wildlife Service (USFWS).

The District thus saw no need to coordinate an emergency action with regulatory agencies the week before the storms. However, as a result of high surf (approximately 15-foot swells) and high tide conditions in early January the Ormond Beach sand berm was taller than it has been during past years (Table 1). The water surface elevation as measured at the OWWTP entrance sign was 7.75 feet NGVD. In the future, the District plans to monitor the beach elevation in addition to water surface elevations at the lagoon.

Regulatory agencies, including the USFWS, California Department of Fish and Game (CDFG), U.S. Army Corps of Engineers (USACE), and Los Angeles Regional Water Quality Control Board (RWQCB) were notified of the emergency by email at approximately noon on January 18. The USACE immediately coordinated with the above agencies as well as the San Francisco Office of the California Coastal Commission (CCC). Coordination with the local CCC office began January 20.

Table 1

Year	Approximate Berm Elevation*	Source
1997	8 feet	Aerial Topography
2001	7.5 feet	LIDAR
2005	8 feet	LIDAR
2007	9 feet	Aerial Topography
2010	10 feet	Ground Survey

*National Geodetic Vertical Datum 1929. LIDAR contours were adjusted to NGVD 29.

***International Paper Plant*[1]:** According to District Operations and Maintenance staff, this was the first time IPP had ever requested flood assistance. IPP staff observed on Monday morning at 3:00 am that a surge of water had rapidly flooded 50 - 60% of their property up to 4 feet deep in areas. OID had overtopped its banks and flooded adjacent open space as well as the IPP. IPP's storm water drainage system was overwhelmed and water could not be pumped off the property, as it would just return. Five diesel pumps were activated to remove the water, but were quickly overwhelmed. Based on observation of the sand elevation at Ormond Beach, IPP staff estimated that 3 to 4 feet of additional water surface elevation increase was needed for the lagoon to overtop the beach.

Between 8 am and 10 am floodwaters started to recede a bit, then rain began to fall again and flooded 80% of the IPP, causing 900- to 1200-pound bales of paper to float around the property, a safety hazard. Perkins Road essentially functioned as a river from McWane Boulevard to its south terminus as a result of overflow from OID. The IPP motor control center, which had never been inundated before, was short-circuited by floodwaters around 2 pm (this was after the breach channel was completed). With the motor control center off line, equipment was shutting down automatically. To prevent further damage to the plant's electrical system, workers shut down all remaining equipment.

IPP provides secondary treatment of its industrial process water before discharging it to the OWWTP. Prior to discharge, effluent is monitored daily for pH, total suspended solids (TSS), total dissolved solids (TDS), biological oxygen demand (BOD), and chemical oxygen demand (COD). Fiber and starch arising from the breakdown of cardboard and other paper are the sources of solids and of nutrients that raise BOD/COD. Treatment occurs at the IPP to avoid overwhelming the OWWTP system. Other constituents such as metals, chlorides, sulfates are monitored monthly, and hydrocarbons and pesticides are monitored annually. As these constituents have never been detected above regulatory thresholds listed in the plant's Regional Water Quality Control Board discharge permit, the the IPP is not required to treat them.

Because electricity was disrupted, water levels in the secondary treatment tank could not be controlled and the tank was in danger of overflowing directly into the lagoon. Also, the biological treatment process was compromised because blowers could not introduce oxygen to the tank.

The District created a breach channel through Ormond Beach at around 1 pm and the floodwaters began to recede by 4 pm. Fortunately, this occurred before the secondary containment areas around the plant's tanks were inundated. Secondary containment collects paper fibers and starch originating from the glue in cardboard boxes. An electrician was able to bring equipment back on line by 9 pm and uncontrolled releases from the tank were avoided. According to the plant manager, if the floodwater depth had continued to increase until a natural breach could occur, all equipment at the property would have been damaged, resulting in a complete loss of the plant from which the company likely would not have been able to recover economically.

[1] Rudy Rehbein, Plant Manager, International Paper, personal communication, 01-19-10

The plant's emergency response, such as installing sandbags, represented a significant safety hazard for its workers both through contact with poor quality floodwaters and risk of electrical injury.

IPP lost approximately $250,000 in production and $50,000 in equipment.

Oxnard Waste Water Treatment Plant[2]**:** According to the plant manager, high surf and tides in early January 2010 pushed beach sand up and created a very large sandbar between the lagoon and the shoreline. JSD and OID were backing up due to significant rain and runoff ponded in the lagoon as a result of the higher than normal berm. Backwater overflowed the banks of the OID, encroached onto Perkins Road, and began flooding OWWTP at 8 am the morning of Monday, January 18. More than 4 feet of flooding was observed in some areas of OWWTP.

The maintenance shop and equipment storage building received 2 feet of water, which ruined some equipment (transformers, pumps, and motors) essential to plant function. The primary concern was inundation of the main electrical switch gear building, which is the plant's power distribution center, including emergency power.

Average dry weather waste water flow into the plant is 23 million gallons per day. During rain events, infiltration through manhole covers increases inflow, in this case estimated at approximately 40 million gallons in one day. Waste water is usually treated to the tertiary level before it is pumped to an ocean outfall approximately 1.5 miles off the Port Hueneme coastline. Without power, waste water would bypass the treatment tanks and spill in an uncontrolled manner directly onto the OWWTP, lagoon, beach, ocean, and adjacent residential and industrial lands. Fortunately, the breach channel was created in time to relieve the flooding and avoid an untreated sewage spill.

In 15 years of plant oversight, Mr. Miller has not observed this level of flooding, including 2005. Mr. Miller believes the flooding was caused by the unprecedented height of the beach berm.

Surfside III Community: This community is located immediately west of lower JSD, opposite the OWWTP. Residents observed flooding of parking areas. Floodwaters were also approaching the patios of first floor units nearest JSD and threatened to enter the units themselves if the water level continued to rise. Residents phoned 911 and City of Oxnard and Port Hueneme police responded. Residents interviewed could not recall experiencing flooding to this degree.

2. Purpose of the activity

Create a temporary breach channel from the north end of Ormond Beach Lagoon (edge closest to the ocean) southward across the beach toward the ocean. It was critical to extend the temporary channel beyond the point of highest elevation on the beach to permit unimpeded movement of water out of the lagoon.

[2] Jeffrey S. Miller, Wastewater Maintenance Manager, City of Oxnard, personal communication, 01-19-10.

3. **Final goal of the entire activity**

Reconnect the lagoon to the ocean and lower the lagoon's water surface elevation in a manner that mimics a natural breach event. Relieve flooding of public, residential, and industrial properties.

4. **Location**

Latitude, Longitude: 34º8'19.139" North, 119º11'15.309" West

5. **Size and description of project area (include maps/drawings of areal and lineal extent and pre- and post-work photos)**

The equipment access route began at the easternmost Port Hueneme Beach Park parking lot (see attached aerial photo map). Although the District has identified an Emergency Access Plan route in its J Street Drain Draft Environmental Impact Report (public review period November 2, 2009 through January 15, 2010), this route was not used on January 18 for several reasons identified below.

First, the DEIR is not yet final, and the District has not reached agreement with the City of Port Hueneme to use this route, and the District is currently revising the route defined in the DEIR. Second, this route contains beach infrastructure (sidewalks, landscaping, Alaska Airlines memorial, light posts) that would likely have been damaged. Third, private vehicles were parked adjacent to the access point, blocking equipment passage. Fourth, the severity of the flood emergency required that the excavator be delivered as close as possible to the lagoon, and the route identified in the DEIR was an additional 600 feet to the east. The assumption in the DEIR was that the route would be taken during dry weather conditions preceding a specifically defined threshold event (forecast 10-year storm in combination with high lagoon surface water elevation and lack of prior lagoon breaching during the current rainy season). The District did not have the luxury of advanced planning on January 18, 2010.

The route taken by the excavator was 15 feet wide and approximately 1,750 feet long. Approximately the first 890 linear feet crossed existing access road and disturbed habitat almost entirely composed of non-native species (0.30 acre). The remaining 860 linear feet traversed both southern foredune habitat and unvegetated sandy beach (0.30 acre). Native plant species observed in the southern foredune habitat include sand verbena (*Abronia maritima*), beach bur (*Ambrosia chamissonis*), and beach evening primrose (*Camissonia cheiranthifolia*). Giant reed (*Arundo donax*), European searocket (*Cakile maritima*), Bermuda grass (*Cynodon dactylon*), iceplant (*Carpobrotus* spp.), and tamarisk (*Tamarix* spp.), all non-native species, also occur within the foredune habitat at Ormond Beach.

The access route ended at the selected emergency breach channel location. Beginning near the edge of the ocean and working toward the lagoon, an excavator bucket was used to dig a 6-foot-wide channel between the two water bodies. As initially dug, the channel was not deep enough to allow water to flow through it, and the excavator retraced its path to carve out the channel a bit more

near the tallest part of the berm. The breach channel was approximately 295 feet long and varied from 1 to 5 feet deep, the greatest depth coinciding with the sand berm peak.

The total temporary impact to unvegetated beach and southern foredune resulting from the breach channel is estimated at 0.14 acre. This includes the 15-foot-wide equipment access area immediately west of the channel that also received sidecast sand. Impacts were quantified and assessed by District environmental staff on January 25, 2010

Indirect impacts to federal and state waters occurred by way of surface water release from the lagoon to the ocean. Direct impacts to Waters of the U.S. and State amounted to approximately 18 square feet where the excavator removed sand from the lagoon edge to complete the breach channel. The ocean side of the breach channel was excavated during low tide, and as work proceeded toward the lagoon it became apparent the channel terminus was below the high tide line. The impact area below the high tide line is estimated to be 525 square feet.

Work began at noon, the breach occurred at approximately 1:00 pm, and all work was completed by 3 pm. See attached photos.

6. Quantities of materials used

No imported fill materials were placed during the breaching.

7. Information on the impacted receiving waterbody

a) Name of waterbody: Ormond Beach Lagoon, which receives runoff from J Street Drain, Oxnard Industrial Drain, and Hueneme Drain

b) Type of receiving waterbody: brackish coastal lagoon

c) Temporary/permanent adverse impacts in acres/cubic yards/linear feet

Direct impacts to the lagoon amount to 18 square feet, 2 cubic yards of excavation, 6 linear feet measured parallel to the lagoon shoreline, and 3 linear feet measured perpendicular to the lagoon shoreline.

The estimated impact below the high tide line is 525 square feet (0.01 acre), 17 cubic yards, 25 linear feet measured perpendicular to the shoreline, and 6 linear feet measured parallel to the shoreline.

d) Compensatory mitigation in acres/cubic yards/linear feet

See 8b below.

e) Other mitigation steps to avoid, minimize, and/or compensate

See 8b below.

8. Federally listed/proposed threatened and endangered species and critical habitat designations

a) Temporary/permanent adverse impacts

No permanent impacts resulted from the emergency action, however approximately 0.44 acre of critical habitat for threatened western snowy plover was temporarily impacted by the excavator's passage over the sand dunes and by creation of the breach channel. No direct impacts to plovers occurred because they were not present during the emergency work.

Endangered tidewater gobies were likely released from the lagoon to the ocean, however this effect mimics what would have occurred if the lagoon had breached naturally, as expected in a storm of this magnitude. Release of lagoon water also indirectly impacted tidewater goby critical habitat and foraging habitat of the endangered California least tern, but as described above this effect mimics natural processes during storm events of sufficient size. No direct impacts to terns occurred because they were not present during the emergency work.

b) Compensatory mitigation

The District proposes a one-time removal of all iceplant, including pieces uprooted during passage of the tracked excavator, as soon as possible either prior to or immediately following the plover and tern nesting season. The removal would occur in a 1.9-acre area of southern foredune habitat bounded by the lagoon on the north and the temporary access route created on January 18, 2010 on all other sides (see attached aerial map). The method of removal will be worked out with the USFWS, as this area is within western snowy plover critical habitat. The primary issue is herbicide use versus digging out iceplant roots in critical habitat (in some cases, iceplant is growing within patches of native plants).

In addition, the District proposes to distribute native plant seed throughout the 1.9-acre iceplant removal area as soon as possible, either during the current or the next rainy season. Species will include sand verbena, beach bur, and beach evening primrose.

c) Other mitigation steps to avoid, minimize, and/or compensate

A tracked excavator was utilized to minimize ground pressure in sensitive habitat areas. The excavator took the same route in and out of the work area to avoid excessive disturbance.

A biological monitor was on site prior to and during the action to ensure that impacts to threatened/endangered species, sensitive dune and wetland habitat, and federal/state waters were minimized to the extent feasible. The biologist originally sought to direct the equipment to the natural breaching area approximately 3,200 feet southeast of the JSD (see attached aerial map), as this area does not contain dune habitat. However, this would have resulted in the excavator traversing surface water that had escaped the

lagoon but became trapped behind the tall sand berm. This water was flowing northwest toward the JSD. Crossing this water may have resulted in unsafe conditions for the excavator operator had the equipment sunk in the waterlogged sand.

Instead, the biologist selected a point of low elevation along the southwestern margin of the lagoon to minimize the need for excavation and avoid disturbance of wetland vegetation such as California bulrush (*Scirpus californicus*) (see Photo 5).

January 18, 2010 Ormond Beach Lagoon Emergency Breach Incident Photos

Photo 1: Flooding at the IPP threatened its electrical systems and employees attempting to protect the facility.

Photo 2: View southwest from the IPP toward flooded lands. The OWWTP lies along the right edge of the photo. Perkins Road separates the two properties and functioned as a secondary channel for OID. (Photo taken at 4 pm, 01-18-10)

Photo 3: View east toward Perkins Road and the IPP. The structure on the left whose entrance is protected by sandbags is the Main Electrical Building for OWWTP. Inundation of equipment in this building would have caused release of untreated sewage to residential, commercial, lagoon, beach, and ocean areas.

Photo 4: View northeast toward JSD, which was close to overtopping its banks and contributing additional floodwaters to the OWWTP, already flooded by OID.

Photo 5: Selected breach channel location prior to the beginning of work, view northeast toward Ormond Beach Lagoon. This site was chosen because the beach elevation was lower than surrounding areas and most of the wetland vegetation along the lagoon margin could be avoided. The biological monitor is on site.

Photo 6: Excavation of the emergency breach channel, view southwest toward the Pacific Ocean. Work began at the ocean shoreline and progressed toward the lagoon shoreline.

Photo 7: View southeast toward the excavator as it approached the lagoon.

Photo 8: View southwest toward the excavator as it carved the end of the channel a bit deeper. Water that had escaped the lagoon near the natural breach location but still remained trapped behind the tall berm appears in the photo. This flow swept north along the coast, but could not reach the ocean, and was not observed to alleviate flooding at either plant property.

Photo 9: View northeast toward the junction of the excavated breach channel and the lagoon. This surface water release alleviated flooding at the IPP, OWWTP, Surfside III community, and streets within the City of Oxnard.

Photo 10: View south along the excavated breach channel toward its junction with the ocean.

Photo 11: This photo was taken the day after the emergency action and shows that flow exiting the lagoon had considerably widened the excavated breach channel. View northeast toward the lagoon.

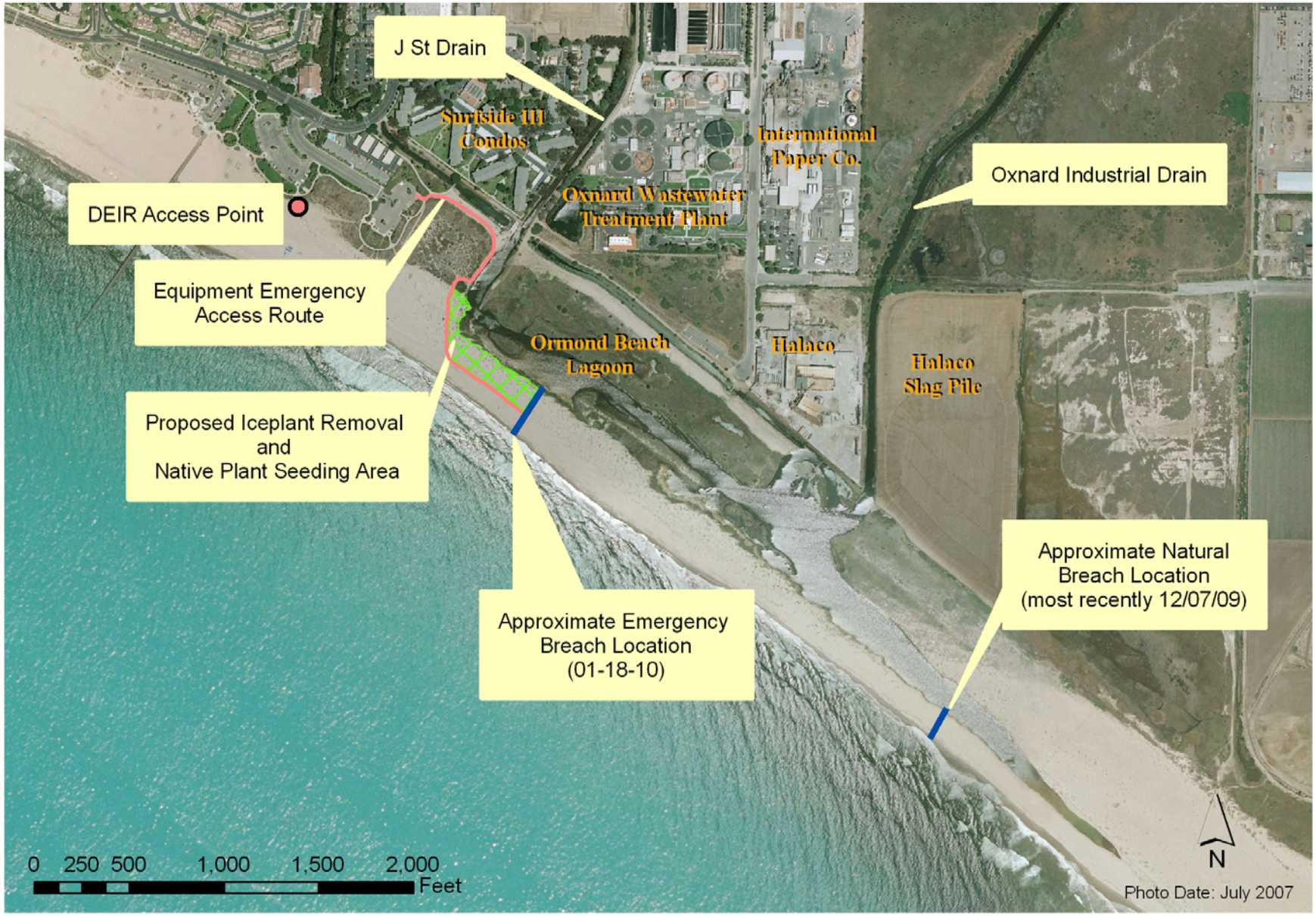
Photo 12: View north toward the lagoon and JSD the day after the emergency action. The lagoon surface water elevation had been lowered, but the lagoon still retained aquatic habitat.

Photo 13: View southwest along the portion of the excavator access route on existing dirt road adjacent to the JSD. This and all subsequent photos were taken one week after the emergency breach action.

Photo 14: View southwest along the excavator access route at the point where it diverted from the existing dirt road onto a field of iceplant.

Photo 15: View northeast along the excavator access route at the point where it departs from the iceplant field and crosses beach dunes. The Surfside III community is at the top of the photo, and the OWWTP is at the top right corner.

Photo 16: View south toward excavator tracks across the beach dunes.



Ormond Beach Lagoon Emergency Breaching - January 18, 2010

HDR | ONE COMPANY *Many Solutions*℠

Technical Memo

To:	Kirk Norman		
From:	Bill Young	Project:	J-Street Drain Channel
CC:			
Date:	10/11/11	Job No:	75217

Control Water Surface Elevations for J Street Drain Design

The J Street Drain project involves providing engineering design to reconstruct approximately 2.2 miles of J Street Drain Channel from it's outlet at Ormond Beach to Redwood Street in the City of Oxnard. The existing J Street Drain is under capacity and needs to be improved. A sand berm created by wave action prevents J Street Drain from outletting to the ocean. The resulting backwater reduces the channel capacity.
In addition, the channel's existing capacity was estimated at 500-600 cfs which is equivalent to a 5-year storm (per URS Channel Improvement Study).

The proposed improvements will include designing an open reinforced concrete channel that will accommodate a 100-year storm event with the condition of a berm breaching effect at it's outlet at Ormond Beach. The invert of the proposed channel will be dropped by approximately 3 feet and have a bottom width of 22 to 49.5 feet.

The existing J Street Drain Channel lining terminates near the Hueneme Drain Confluence. The earthen channel connects to the Ormond Beach Lagoon, where it then meets a confluence point with the Oxnard Industrial Drain (OID). The naturally created sand berm between Ormond Beach Lagoon and the Pacific Ocean prevents flows from directly draining to the ocean except when the berm breaches. During the rainy season minor storm events will produce enough runoff volume to fill the Ormond Beach Lagoon, which can cause the berm to breach. An ocean outlet will then be naturally created to allow the storm flows to outlet to the ocean.

The hydraulics for the improved channel were initially analyzed using the Los Angeles County Flood Control District "Water Surface Pressure Gradient" (WSPG) Program. A Hydraulic Control of 9.6 NGVD at the end of the channel lining was provided by the HDR's Coastal Engineering Group was used for the hydraulic analysis. This control water surface was developed using the MHHW of 5.3 NAVD at the existing natural breach location approximately one-half mile southeast along the beach from J Street Drain.

IPCC (2007) predicts eustatic sea level rise over the next 100 years between 0.6 ft and 1.9 ft with a central value of 1.1 ft. The National Oceanic and Atmospheric Administration's (NOAA) Center for Operational Oceanographic Products and Services (2008) reports that historic measured relative sea level rise at the Santa Barbara tide gauge is approximately 0.91 feet per century and approximately 0.52 feet per century at Santa Monica. Relative sea level rise is the combined relative change in water level including effects of subsidence or uplift. Ground water withdrawal and oil and gas production have been named as the primary source of subsidence within the Oxnard Plain (Hanson 1992). Hanson (1992) also indicates that tectonic activity is a minor contributor to subsidence and uplift within the Oxnard Plain. Available data indicates that MHHW is rising 19% faster than MSL for a mean anticipated rise of 1.3 ft over then next century (Coastal Conservancy Undated-B).
Sea level rise likely will not significantly affect the elevation of the beach adjacent the lagoon over the next 100 years. Rise of MHHW by 1.3 ft should be considered as the lower limit for lagoon water level during a storm.

Measured long-term mean sea level rise at nearby tidal stations is less than 1 ft per century. IPCC (2007) predicts eustatic sea level rise of 1.1 ft over the next 100 years. Sea level rise likely will not significantly affect the elevation of the beach adjacent the lagoon over the next 100 years. Rise of MHHW by 1.3 ft should be considered to determine the lower limit for lagoon water level during a storm.

A1. Tides

Tidal elevation and datum information were obtained from the NOAA tide gauge in Santa Barbara, CA and at the NOAA tide gauge in Santa Monica, CA. The water level analysis, shown in Figure A.6, is based on four years of verified historical data at Santa Barbara, and ten years of verified historical data from Santa Monica. Water level statistics were calculated using the average hourly water level reported at each station. Based on these data, percent exceedance of water level was calculated. Tides in the region are predominately semi-diurnal, with two high tides and two low tides occurring per day. Tidal datums and the greater diurnal tidal range, defined as the difference between MHHW (mean higher high water) and MLLW (mean lower low water), at both gauges are summarized in Table A.1.

Water level data was collected inside the lagoon in an effort to compare with water level at the tide gauges and to calibrate the numerical model. The water level data inside the lagoon would have provided a time history of flow into the lagoon depending on the weather during deployment. Water level in the ocean is generally much lower than the elevation of the beach crest.

Figure A.6. Water level frequency of exceedance

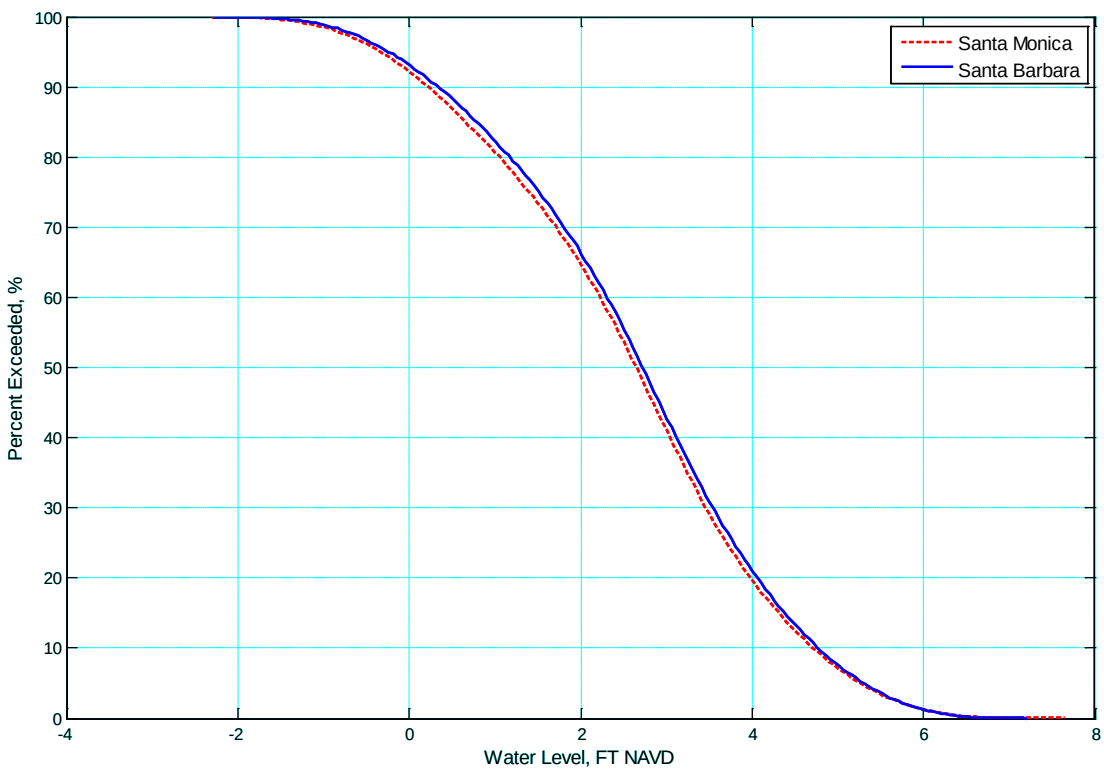


Table A.1. Tidal datums and range.						
Station Name	**MHHW, ft NAVD**	**MHW, ft NAVD**	**MSL, ft NAVD**	**MLW, ft NAVD**	**MLLW, ft NAVD**	**Tide Range, ft**
Santa Barbara	5.30	4.54	2.69	0.89	-0.09	5.39
Santa Monica	5.24	4.50	2.60	0.74	-0.19	5.43

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

Los Angeles Regional Water Quality Control Board

November 9, 2012

Mr. Kirk Norman
Ventura County Watershed Protection District
800 South Victoria Avenue
Ventura, CA 93009-1610

GENERAL WASTE DISCHARGE REQUIREMENTS FOR SPECIFIED DISCHARGES TO GROUNDWATER IN SANTA CLARA AND LOS ANGELES RIVER BASINS – J STREET DRAIN PROJECT, VENTURA, CALIFORNIA (FILE NO. 12-099, ORDER NO. 93-010, SERIES NO. 044, CI-9869, GLOBAL ID WDR100007795)

Dear Mr. Norman:

We have completed our review of your application dated August 2, 2012, which includes the Report of Waste Discharge, for the use of extracted groundwater from dewatering during the reconstruction of the J Street Drain for dust suppression and moisture conditioning of the soil material.

The Ventura County Watershed Protection District (hereinafter Discharger) proposed J Street Drain Project (project), which involves an increase of the capacity of the existing J Street Drain channel to reduce potential flooding in residential and commercial areas of the Cities of Oxnard and Port Hueneme. The J Street Drain is located in the City of Oxnard and adjacent to the City of Port Hueneme. The J Street Drain lies between the north and south bound lanes of J Street with the northern boundary near Hueneme Road. The J Street Drain flows southerly and discharges to the Ormond Beach Lagoon.

The proposed project involves converting the existing trapezoidal concrete channel into an open rectangular channel. The existing box culverts under Hueneme Road and Ventura County Railroad (VCRR) will also be replaced by larger structures to improve flow conveyance.

It is anticipated that the demolition of the existing drain and construction of the new, higher capacity drain will start at the southern end of the drain and move northward. The initial construction activities include installation of groundwater dewatering wells, a coffer dam, and channel flow bypass. A coffer dam will be placed across the channel at the south end of the construction area. The coffer dam will assist in blocking tidal flow into the work area.

A total of 128 groundwater dewatering wells, each approximately 15 to 20 feet deep, will be placed along the work area of the J Street Drain. These wells will be installed and removed as construction moves upstream. Once installed, these wells will be attached to temporary pumps to extract groundwater for discharge into the Pacific Ocean through Perkins Drain and Ormond Beach Lagoon.

Estimated maximum volume of groundwater from the excavation is 3,000,000 gallons per day (gpd). The water will be discharged to the Perkins Drain (discharge to surface water), about 300 feet southeast of the Hueneme Drain Pump Station, at N34°08'26.4" and W119°11'16". This discharge is enrolled under *General National Pollutant Discharge Elimination System and Waste Discharge Requirements for Discharges of Groundwater from Construction and Project Dewatering to Surface Waters in Coastal Watersheds of Los Angeles and Ventura Counties* Order No. R4-2008-0032 and Monitoring and Reporting Program No. CI-9867 on September 21, 2012.

Up to 10,000 gpd of the groundwater from the excavation will be used for dust control within the work area limits (approximately 8 acres) for a period of 10 months. The water will be stored in a series of Baker Tanks onsite and then transfer to a water truck for spraying on the ground to control dust.

Based on the information provided and information gathered during the site inspection on September 17, 2012, Regional Board staff has determined that the proposed discharge of the groundwater from the excavation to be used for dust control meets the conditions specified in Order No. 93-010, *"General Waste Discharge Requirements for Specified Discharges to Groundwater in Santa Clara River and Los Angeles River Basins"* adopted by this Board on January 25, 1993.

Enclosed are your General Waste Discharge Requirements consisting of Regional Board Order No. 93-010, Monitoring and Reporting Program No. CI-9869 and Standard Provisions Applicable to Waste Discharge Requirements. Please note that the discharge limits in Attachments A (Oxnard Plain – unconfined and perched aquifers) and B of Order No. 93-010 are applicable to your discharge. The Water Quality Control Plan, Los Angeles Region, has established water quality objectives for the Oxnard Plain – unconfined and perched aquifers. The water quality objectives are 3,000 mg/L for total dissolved solids (TDS), 1,000 mg/L for sulfate, 500 mg/L for chloride.

The Monitoring and Reporting Program requires you to implement the monitoring program on the effective date of coverage under this permit. When submitting monitoring or technical reports to the Regional Board per these requirements, please include a reference to "Compliance File No. CI-9869" which will assure that the reports are directed to the appropriate file and staff. Also, please do not combine other reports with your monitoring reports. Submit each type of report as a separate document.

The Discharger shall comply with the Electronic Submittal of Information (ESI) requirements by submitting all reports and correspondence required under the MRP, including groundwater monitoring data, discharge location data, and pdf monitoring reports to the State Water Resources Control Board GeoTracker database under Global ID WDR100007795. ESI training video is available at:
https://waterboards.webex.com/waterboards/ldr.php?AT=pb&SP=MC&rID=44145287&rKey=7dad4352c990334b

Please see Paperless Office Notice for GeoTracker Users, dated December 12, 2011 at:

http://www.waterboards.ca.gov/losangeles/resources/Paperless/Paperless%20Office%20for%20GT%20Users.pdf

To avoid paying future annual fees, please submit a written request for termination of your enrollment under the general permit in a separate letter, when your project has been completed and the permit is no longer needed. Be aware that the annual fee covers the fiscal year billing period beginning July 1 and ending June 30, the following year. You will pay the full annual fee if your request for termination is made after the beginning of the new fiscal year beginning July 1.

If you have any additional questions, please contact the Project Manager, Mr. David Koo at (213) 620-6155 (dkoo@waterboards.ca.gov) or the Unit Chief, Dr. Eric Wu at (213) 576-6683 (ewu@waterboards.ca.gov).

Sincerely,

Samuel Unger

Samuel Unger, P.E.
Executive Officer

Enclosures:

1) General WDR Order No. 93-010
2) Standard Provisions
3) Monitoring and Reporting Program CI-9869

cc: Mr. William Stratton, Ventura County, Environmental Health Division
Mr. Krassimir Roussev, Ventura County Watershed Protection District

State of California
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

ORDER NO. 93-010

GENERAL WASTE DISCHARGE REQUIREMENTS
FOR SPECIFIED DISCHARGES TO GROUNDWATER
IN
SANTA CLARA RIVER AND LOS ANGELES RIVER BASINS
File No. 92-60

The California Regional Water Quality Control Board, Los Angeles Region (hereinafter Regional Board), finds:

1. The California Water Code, Section 13260 of Chapter 4, Article 4, requires that any person discharging wastes, or proposing to discharge wastes, which could affect the quality of the waters of the State, shall file a Report of Waste Discharge with the Regional Board. The Regional Board will then prescribe requirements as to the nature of the proposed or existing discharge.

2. A number of activities carried on within the Region result in the discharge of water that, because of its characteristics, results in little or no pollution when discharged to groundwater. Examples of these activities include:

   a) hydrostatic testing of tanks, pipes, and storage vessels;
   b) construction dewatering;
   c) dust control application;
   d) water irrigation storage systems;
   e) subterranean seepage dewatering;
   f) well development and test pumping;
   g) aquifer testing; and
   h) monitoring well construction.

   The following discharges are specifically excluded from this list: water produced from seawater extraction or wastewater treatment, reclaimed water, and water to be injected directly into an aquifer.

3. The water discharged from these activities results in discharges of relatively "clean" wastewater, containing few pollutants. For the purposes of this Order, "wastewater" is defined as high quality wastewater, produced as a result of the above-listed specified activities, and other similar activities. It is of a quality acceptable for use under State Department of Health Services standards and the Regional Board's Water Quality Control Plan.

4. These discharges occur in a manner where they will likely, through recharge or percolation, enter the groundwater and may therefore, be considered a waste discharge which could affect the quality of the waters of the State, and for which a Report of Waste Discharge must be filed under Water Code Section 13260.

5. Each month, this Regional Board receives a large number of requests to discharge water from the activities listed in Finding 2 above, and for other similar activities. For each such request, staff must determine the absence or presence of significant pollutants in the discharge, the regulatory limits for the pollutants, and the potential impact of the discharge on the waters of the State, and then prepare individual Waste Discharge Requirements.

6. It is anticipated that the large number of such requests will continue to be filed, and far exceed the capacity of staff to review applications and prepare individual Waste Discharge Requirements to bring to the Board for consideration, in a timely manner. These circumstances create the need for an expedited system for processing the numerous requests for discharge to groundwater.

7. The adoption of General Waste Discharge Requirements will:
   a) simplify the application process for the Discharger,
   b) expedite the issuance of Waste Discharge Requirements and decrease the regulatory burden on the regulated community,
   c) free up Board staff for higher priority work, and
   d) reduce the Board's time involved by enabling the Executive Officer to notify the Discharger, in appropriate cases, of the applicability of these general requirements adopted by the Regional Board.

   These General Waste Discharge Requirements would benefit the public, the Board, and Board staff by accelerating the review process without loss of regulatory jurisdiction or oversight.

8. The beneficial uses of groundwater in the Los Angeles River and Santa Clara River Basins may include municipal and domestic supply, agricultural supply, industrial service and process supply, and freshwater replenishment.

9. The Board adopted revised Water Quality Control Plans for the Santa Clara River Basin and Los Angeles River Basin on October 22, 1990, and June 3, 1991, respectively. These Water Quality Control Plans contain water quality objectives for groundwater within the Basins. The requirements contained in this Order, as they are met, will be in conformance with the goals of these Water Quality Control Plans.

10. The State Water Resources Control Board adopted Resolution 68-16, "Statement of Policy With Respect to Maintaining High Quality of Waters in California", on October 28, 1968. This Policy states that wherever the existing quality of water is better than the quality established as objectives or adopted policies, such existing quality shall be maintained.

11. The issuance of General Waste Discharge Requirements for the discharges subject to these general requirements is exempt from the provisions of Chapter 3 (commencing with Section 21100) of Division 13 of the Public Resources Code pursuant to one or more of the following:

    a) The lead agency has prepared an Environmental Impact Report or a negative declaration based on findings pursuant to California Code of Regulations (CCR), Title 14, Chapter 3, Section 15070, which show that there will be no significant impact on water quality.
    b) The replacement or reconstruction of existing structures will have substantially the same purpose and capacity as the structure replaced as defined in CCR, Title 14, Section 15302.
    c) The construction of new structures or the conversion of existing small structures will have only minor modifications in the exterior of the structure as defined in CCR, Title 14, Section 15303.
    d) The activity will cause only minor alterations to land as defined in CCR, Title 14, Section 15304.
    e) Minor alterations in land use will not result in any changes in land use or density as defined in CCR, Title 14, Section 15305.

12. These General Waste Discharge Requirements are not intended to alter or supersede existing restrictions or conditions imposed by other government agencies.

The Board has notified interested agencies and concerned persons of its intent to adopt General Waste Discharge Requirements for specified discharges to groundwater, and has provided them with an opportunity to submit their written views and recommendations.

The Board, in a public meeting, heard and considered all comments pertaining to the tentative requirements.

IT IS HEREBY ORDERED that the Dischargers authorized under this order shall comply with the following:

A. ELIGIBILITY

1. The General Waste Discharge Requirements, contained in this Order, will regulate discharges to groundwater from: hydrostatic testing of tanks, pipes and storage vessels; construction dewatering; dust control application; water irrigation storage systems; subterranean seepage dewatering; well development and test pumping; aquifer testing; monitoring well construction; and other similar discharges, in accordance with the California Code of Regulations.

To qualify for coverage under this Order, the Discharger may be required to:

a) submit specific hydrogeological site studies summarizing the following: regional and local hydrogeology, a site plan designating structures and operations, descriptions and details of representative water supply and monitoring wells, and water conveyance systems, soil engineering analyses of representative earth materials including site lithology, permeability, infiltration data, and any potential adverse impacts on groundwater.

b) demonstrate that the discharge meets the criteria set forth herein, and that specified discharges to groundwater will not adversely impact the overall quality of the regional and local groundwater basin(s), and is in accordance with the appropriate Basin Plan Water Quality Objectives, State Department of Health Services (DHS) Primary and Secondary Drinking Water Standards, and all water quality standards associated with Priority Pollutants.

c) demonstrate that disinfectants, if used, will not adversely impact water quality in the groundwater basin(s).

2. The discharge must not adversely impact the overall quality of the regional and local groundwater basins, must not adversely affect beneficial uses, and must have water quality characteristics in accordance with Basin Plan Water Quality Objectives, State Department of Health Services (DHS) Primary and Secondary Drinking Water Standards, and all water quality standards associated with Priority Pollutants.

B. APPLICABILITY

1. This Order will serve as General Waste Discharge Requirements for specified discharges to groundwater.

2. Upon receipt of the Report of Waste Discharge describing such discharge, the Executive Officer shall determine, as applicable, if such discharge,

a) involves wastewater at limits lower than, or equal to, the acceptable levels of the Basin Plan Water Quality Objectives, the State DHS Primary and Secondary Drinking Water Standards, and all water quality standards associated with Priority Pollutants,
b) will be completed within a time frame stated by the Discharger and approved by the Executive Officer,
c) has been adequately characterized by hydrogeologic assessment,
d) is not a threat to water quality,
e) does not cause the degradation of groundwater, and
f) does not threaten or impair any designated beneficial uses of such waters.

3. In the event the Executive Officer so finds, he shall notify the Discharger, in writing, that the proposed wastewater discharge to groundwater is subject to this Order. Appropriate cases may also be brought to the Board for adoption of individual requirements when the Executive Officer deems it desirable or necessary.

4. Should individual Waste Discharge Requirements with more specific requirements be issued to a Discharger, the applicability of these general requirements to the individual will be automatically terminated on the effective date of the individual Waste Discharge Requirements.

C. REPORT OF WASTE DISCHARGE

1. Deadline for Submission

All Dischargers shall file a Report of Waste Discharge at least 120 days before start of the discharge. The Executive Officer will determine the applicability of General Waste Discharge Requirements.

2. Failure to Submit a Report of Waste Discharge

Dischargers who fail to file a Report of Waste Discharge under Section 13260 of the California Water Code are guilty of a misdemeanor and may be liable civilly in accordance with Section 13261(b) of the California Water Code.

D. PROHIBITION

1. Discharge of wastewater is prohibited, except as specified in the Report of Waste Discharge.

E. WASTE DISCHARGE REQUIREMENTS

IT IS HEREBY ORDERED that the Discharger shall comply with the following:

1. Only those types of discharges specifically listed in the Report of Waste Discharge are authorized to be discharged by the General Waste Discharge Requirements.

2. Wastewater shall be analyzed, prior to discharge, to determine if it contains constituents in excess of the appropriate Basin Plan Water Quality Objectives, as listed in Tables 1 and 2 of Attachment "A".

   Hydrologic and groundwater basin boundaries are included in Figures 1 and 2 of Attachment "A".

3. Wastewater shall be analyzed, prior to discharge, to determine that it does not contain constituents in excess of the Maximum Contaminant Levels (MCL) as listed in the State DHS Primary and Secondary Drinking Water Standards in Attachment "B".

4. Wastewater shall be analyzed, prior to discharge, to determine the concentrations of the chemical constituents listed in the Priority Pollutants exhibited in Attachment "B".

5. Wastewater which contains any constituent in excess of the MCL's, the Drinking Water Standards, or the Priority Pollutant standards, listed herein, shall not be discharged to groundwater.

6. Wastewater discharged to groundwater shall maintain the existing water quality, even if that existing water quality exceeds established objectives. A determination shall be made by the Executive Officer as to the applicability of water quality standards with regard to the "Statement of Policy With Respect to Maintaining High Quality of Waters in California", with each discharge, on a site-specific basis.

7. Neither the treatment nor discharge of wastewater shall cause a condition of pollution or nuisance.

8. The pH of wastewater discharged to groundwater, under this Order, shall at all times be within the range of 6.0 and 9.0 pH units.

9. Wastewater to be discharged to groundwater, under this Order, shall be retained on the areas of use, and shall not be allowed to escape as surface flow, except as provided in a National Pollutant Discharge Elimination System (NPDES) permit uniquely applicable to the specified discharge. For the purpose of this requirement, however, minor amounts of irrigation return water from peripheral areas shall not be considered a violation of this Order.

10. Wastewater discharged to groundwater shall be discharged at the site in accordance with these requirements, and only on property owned or controlled by the Discharger.

11. Wastewater which does not meet each of the foregoing requirements shall be held in impervious containers, and if transferred elsewhere, the final discharge shall be at a legal point of disposal, and in accordance with the provisions of Division 7.5 of the California Water Code. For the purpose of these requirements, a legal point of disposal is defined as one for which Waste Discharge Requirements have been established by a California Regional Water Quality Control Board, and which is in full compliance therewith.

12. Wastewater discharged to groundwater shall not contain any substance in concentrations toxic to human, animal, plant, or aquatic life.

13. Wastewater discharged to groundwater shall not impart tastes, odors, color, foaming, or other objectionable characteristics to the receiving groundwater.

14. Neither disposal nor handling of wastes shall cause a condition of pollution or nuisance or problems due to breeding of mosquitos, gnats, midges, flies or other pests.

15. The temperature of discharged wastewater shall not exceed 100°F.

F. PROVISIONS

1. A copy of this Order shall be maintained at the discharge facility and shall be available at all times to operating personnel.

2. In the event the Discharger is unable to comply with any of the conditions of this Order due to:
   (a) Breakdown of equipment,
   (b) Accidents caused by human error or negligence,
   (c) Other causes such as acts of nature,
   (d) Facility operations,

   the Discharger must notify this Board, by telephone, within 24 hours of the incident, and confirm it in writing within one week of the telephone notification.

3. In accordance with Section 13260(c) of the California Water Code, the Discharger shall file a report with this Regional Board of any material change or proposed change in the character, location and/or volume of the discharge.

4. In accordance with Section 13267(b) of the California Water Code, the Discharger shall furnish, under penalty of perjury, technical monitoring program reports; such reports shall be submitted in accordance with specifications prepared by the Executive Officer.

5. The Regional Board and other authorized representatives shall be allowed:

   (a) Entry upon premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this Order;
   (b) Access to copy any records that are kept under the conditions of this Order;
   (c) To inspect any facility, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order; and
   (d) To photograph, sample, and monitor for the purpose of assuring compliance with this Order, or as otherwise authorized by the California Water Code.

6. In accordance with Section 13263(e) of the California Water Code, these Waste Discharge Requirements are subject to periodic review and revision by this Regional Board.

7. These requirements, prescribed herein, do not authorize the commission of any act, by the Discharger, which causes injury to the property of another, do not protect the Discharger from his/her liabilities under Federal, State, or local laws, and do not guarantee the Discharger a capacity right in the receiving groundwater.

8. If hazardous or toxic materials or hydrocarbons are stored at the facility and the facility is not monitored at all times, a 24-hour emergency response telephone number shall be prominently posted where it can be easily discerned.

G. MONITORING REQUIREMENTS

1. The Executive Officer may prescribe a Monitoring and Reporting Program for each authorized Discharger; applicable parameters limited in the discharge shall be monitored as specified by the Executive Officer in the Monitoring and Reporting Program.

2. The Discharger shall retain records of all monitoring information and data used to complete the Report of Waste Discharge for at least three years from the date of sampling, measurement, report, or application. The retention period shall be extended during the course of any unresolved litigation regarding the discharge, or when requested by the Regional Board.

3. The Discharger shall maintain all sampling, measurement and analytical results, including: the date, exact place, and time of sampling or measurement; the individual(s) who performed the sampling or measurement; the date(s) analyses were performed; analysts' names; and analytical techniques or methods used.

4. Representative samples of the discharge shall be taken prior to discharging to the groundwater.

5. All chemical and bacteriological analyses shall be conducted at a laboratory certified for such analyses by the State of California Department of Health Services. The laboratory performing the analyses must follow all applicable QA/QC protocols.

6. The Discharger shall calibrate and perform maintenance procedures on all monitoring instruments and equipment to insure accuracy of measurements, or shall insure that both activities will be conducted.

H. REPORTING REQUIREMENTS

1. The Discharger shall file with the Regional Board (Attention: Technical Support Unit) technical reports on self-monitoring work performed according to the Monitoring and Reporting Program specified by the Executive Officer, and submit other reports as requested by the Regional Board.

2. In reporting the monitoring data, the Discharger shall arrange the data in tabular forms such that the date, constituents, and concentrations are readily discernable. The data shall be summarized to demonstrate compliance with Waste Discharge Requirements.

3. All records and reports submitted to the Regional Board are public documents and will be made available for inspection by the public during normal business hours at the Regional Board office located at 101 Centre Plaza Drive in Monterey Park.

4. For every item where the requirements are not met, the Discharger shall submit a statement of the actions undertaken, or proposed, which will bring the discharge into full compliance with requirements at the earliest time, and submit a timetable for correction.

5. Each monitoring report must affirm in writing that: "All analyses were conducted at a laboratory certified for such analyses by the State of California Department of Health Services, and in accordance with current EPA guideline procedures or as specified in this Monitoring Program."

6. Each report shall contain the following completed declaration:
"I declare under penalty of law that I have personally examined, and am familiar with, the information submitted in this document and all attachments, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility if fine and imprisonment. [CWC Sections 13263, 13267, and 13268]

7. In the event that wastes, associated with the discharge under this Order, are transported to a different disposal site, the following shall be reported in the monitoring report: type and quantity of wastes; name and address of hauler (or method of transport if other than by hauling); and, location of the final point(s) of disposal.

8. In the event of any changes of subject land ownership or subject waste discharge facility currently owned or controlled by the Discharger, the Discharger shall notify the succeeding owner or operator of the existence of this Order in writing. A copy of the document shall be signed by the new owner accepting responsibility for this Order and shall be forwarded to this Regional Board.

9. The Discharger shall notify this Regional Board, within 24 hours, by telephone, of any adverse condition resulting from this discharge, and such notification shall be affirmed in writing within seven calendar days.

I. EXPIRATION DATE AND CONTINUATION OF EXPIRED GENERAL WASTE DISCHARGE REQUIREMENTS

It is the Board's intent to review this Order within five (5) years of its adoption.

I, Robert P. Ghirelli, Executive Officer, do hereby certify that the foregoing is a full, true and correct copy of an Order adopted by the California Regional Water Quality Control Board, Los Angeles Region, on January 25, 1993.

Robert P. Ghirelli

ROBERT P. GHIRELLI, D.Env.
Executive Officer

Attachment "A"

Groundwater Water Quality Objectives
- Santa Clara River (4A)
- Los Angeles River (4B)

Hydrologic Boundaries, CRWQCB-LA
- Fig 1, Principal Surface Waters
- Fig 2, Principal Ground Waters

Water Quality Objectives for Ground Waters
Santa Clara River Basin (4A)

Area	Objective in mg/L TDS	Sulfate	Chloride	Boron
Rincon Creek Hydrologic Unit[a]	None Specified (n/s)			
Ventura River Hydrologic Unit				
Ojai Hydrologic Area (HA)				
Upper Ojai Hydrologic Subarea (HSA)				
West of Sulphur Mtn Rd	1,000	300	200	1.0
East of Sulphur Mtn Rd	700	50	100	1.0
Ojai HSA[b]				
West of San Antonio-Senior Cyn Creek	1,000	300	200	0.5
East of San Antonio-Senior Cyn Creek	700	200	50	0.5
Upper Ventura River HA				
San Antonio Creek Area	1,000	300	100	1.0
Remainder of ground water basin	800	300	100	0.5
Lower Ventura River HA[c]	None Specified			
Santa Clara-Calleguas Hydrologic Unit				
Upper Santa Clara HA				
Acton HSA	600	150	100	1.0
Eastern HSA				
Above Bouquet Cyn[d]	800	150	150	1.0
Above Castaic Creek to Bouquet Cyn[e]	900	300	150	1.0
South Fork of Santa Clara River Area	1,300	800	100	0.5
Placerita Cyn Area	700	150	100	0.5
Castaic Creek to Blue Cut[f]	1,500	700	150	1.0
Bouquet HSA	400	50	30	0.5
Mint Cyn HSA	700	150	100	0.5
Sierra Pelona HSA	600	100	100	0.5
Piru HA				
Santa Felicia HSA (Piru Subarea)				
East of Piru Creek[g]	2,500	1,200	200	1.5
West of Piru Creek[h]	1,200	600	100	1.5
Upper Piru HSA	1,100	400	200	2.0
Hungry Valley HSA	500	150	50	1.0
Stauffer HSA	1,000	300	20	2.0
Sespe HA				
Fillmore HSA				
Pole Creek Fan underlying City of Fillmore	2,000	800	100	1.0
South Side of Santa Clara River	1,500	800	100	1.1
Remainder of ground water basin	1,000	400	50	0.7
Topa Topa HSA (Sespe Subarea)	900	350	30	2.0
Santa Paula HA				
Santa Paula HSA				
East of Peck Rd	1,200	600	100	1.0
West of Peck Rd	2,000	800	110	1.0
Sisar HSA	700	250	100	0.5
Oxnard Plain HA				
Oxnard HSA				
Oxnard Forebay	1,200	600	150	1.5
Deep aquifers underlying pressure area	1,200	600	150	1.5
Semiperched aquifer[i]	3,000	1,000	500	n/s

Water Quality Objectives for Ground Waters
Santa Clara River Basin (4A)

Area	Objective in mg/L			
	TDS	Sulfate	Chloride	Boron
Oxnard Plain HA (continued from previous page)				
Pleasant Valley HSA				
Fox Cyn Aquifer	1,200	600	150	1.0
Grimes Cyn Aquifer	1,200	600	150	1.0
Upper Aquifer[j]	None Specified			
Calleguas-Conejo HA				
West Las Posas HSA	900	350	150	1.0
East Las Posas HSA[k]				
NW of Grimes Cyn Rd, L.A. Avenue and Somis Rd	700	300	100	0.5
East of Grimes Cyn Rd and Hitch Blvd	2,500	1,200	400	3.0
South of L.A. Ave between Somis Rd and Hitch Blvd	1,500	700	250	1.0
Isolated basin near Grimes Cyn Rd and Broadway Rd	250	30	30	0.2
Arroyo Santa Rosa HSA	900	300	150	1.0
Conejo Valley HSA	800	250	150	1.0
Tierra Rejada Valley HSA	700	250	100	0.5
Gillibrand HSA	900	350	50	1.0
Simi Valley HSA				
Deep aquifers	1,200	600	150	1.0
Shallow aquifer[l]	None Specified			
Thousand Oaks HSA	1,400	700	150	1.0

.....Endnotes

a. Upper aquifers are of very poor quality and not used for domestic, agricultural, or industrial water supply in any significant quantity. Water quality in shallow aquifers shall be maintained at existing levels in accordance with "Resolution 68-16". This is to be accomplished on case-by-case basis as part of the requirements imposed upon dischargers to the shallow aquifers.

b. Excludes aquifer in Bouquet Canyon and tributaries.

c. Shallow alluvial aquifer is of very poor quality and not used. Water quality in shallow aquifer shall be maintained at existing levels in accordance with "Resolution 68-16". This is to be accomplished on a case-by-case basis as part of the requirements imposed upon dischargers to the shallow aquifer.

d. See endnote b.

e. Includes aquifer in Bouquet Canyon and tributaries but excludes aquifer in Castaic Creek and the South Fork of Santa Clara River and tributaries.

f. Includes aquifer in Castaic Creek and tributaries.

g. Includes aquifer in Piru Creek and tributaries.

h. Excludes aquifer in Piru Creek and tributaries.

i. Semiperched aquifer is generally of poor quality, but locally may be used for agricultural and domestic purposes in northwestern parts of the Oxnard Plain. Where shallow well or drainage ditch waters clearly exceed these objectives, requirements should be set on a case-by-case basis according to "Resolution 68-16".

j. See endnote a.

k. Some isolated wells along Los Angeles Avenue in the Arroyo Las Posas flood plain have higher mineral levels. Requirements for these areas should be set on a case-by-case basis according to "Resolution 68-16".

l. See endnote a.

Water Quality Objectives for Ground Waters
Los Angeles River Basin (4B)

Area	Objective in mg/L			
	TDS	Sulfate	Chloride	Boron
Malibu Hydrologic Unit				
Topanga Hydrologic Area (HA)	2,000	500	500	2.0
Malibu Creek Hydrologic Subarea (HSA)	2,000	500	500	2.0
Las Virgenes HSA	2,000	500	500	2.0
Lindero Canyon HSA	2,000	500	500	2.0
Triunfo Canyon HSA	2,000	500	500	2.0
Russell Valley HSA	1,500	500	250	1.0
Sherwood HSA	1,000	250	250	1.0
Point Dume HA	1,000	250	250	1.0
Camarillo HA	1,000	250	250	1.0
Los Angeles-San Gabriel River Hydrologic Unit				
Coastal Plain HA				
West Coast Basin	800	250	250	1.5
Santa Monica Basin	1,000	250	250	0.5
Hollywood Basin	750	100	100	1.0
Central Basin	700	250	250	1.0
San Fernando HA				
Sylmar Basin	600	150	100	0.5
Eagle Rock Basin	800	150	100	0.5
Verdugo Basin	600	150	100	0.5
San Fernando Basin-Overall	800	300	100	1.5
Narrows Area[a]	900	300	150	1.5
Foothill Wells Area[b]	400	100	50	1.0
Headworks Area[c]	700	300	100	1.5
North Hollywood-Burbank Area[d]	600	250	100	1.5
Raymond HA				
Monk Hill HSA	450	100	100	0.5
Pasadena HSA	450	100	100	0.5
Santa Anita HSA	450	100	100	0.5
San Gabriel Valley HA				
Puente Basin[e]	1,000	300	150	1.0
Main San Gabriel Basin-Overall	550	150	100	1.0
Westerly Portion[f]	450	100	100	0.5
Easterly Portion[g]	600	100	100	0.5
Spadra Hydro HA				
Spadra HSA	550	200	120	1.0
Pomona HSA	300	100	50	0.5
Live Oak HSA	450	150	100	0.5
Anaheim HA	1,000	250	250	1.0
San Pedro Channel Island Hydrologic Unit				
Santa Catalina HA	1,000	250	250	1.0
San Clemente Island HA	no significant sources			
Santa Barbara Island HA	no significant sources			
Santa Ana River Hydrologic Unit				
Middle Santa Ana River HA	220	50	50	0.5

.....Endnotes

a. Narrows Area is defined as that area of the San Fernando Basin adjacent to the Los Angeles River lying south of Verdugo Wash.

b. Foothill Wells is the main extraction area in the Sundland-Tujunga Area.

c. Headworks Area is that area lying adjacent to the Los Angeles River upstream of the confluence with Verdugo Wash encompassing in general the City of Los Angeles' Headworks, Crystal Springs, and Verdugo wells and the City of Glendale's wells among others.

d. The North Hollywood-Burbank Area refers to the principal extraction area which includes the City of Burbank's wells, and the City of Los Angeles, North Hollywood, Erwin, and Whitnall wells among others.

e. The Puente Basin lies adjacent to San Jose Creek upstream of the Puente Narrows. The Puente Basin and the Puente Narrows are described in the Judgment of the Upper San Gabriel Valley Municipal Water District versus City of Alhambra et al No.924128.

f. The westerly portion of the Main San Gabriel Basin which lies west of Walnut Creek, Big Dalton Wash, and Little Dalton Wash.

g. The easterly portion of the Main San Gabriel Basin which lies east of Walnut Creek, Big Dalton Wash, and Little Dalton Wash but does not include the Puente Basin.

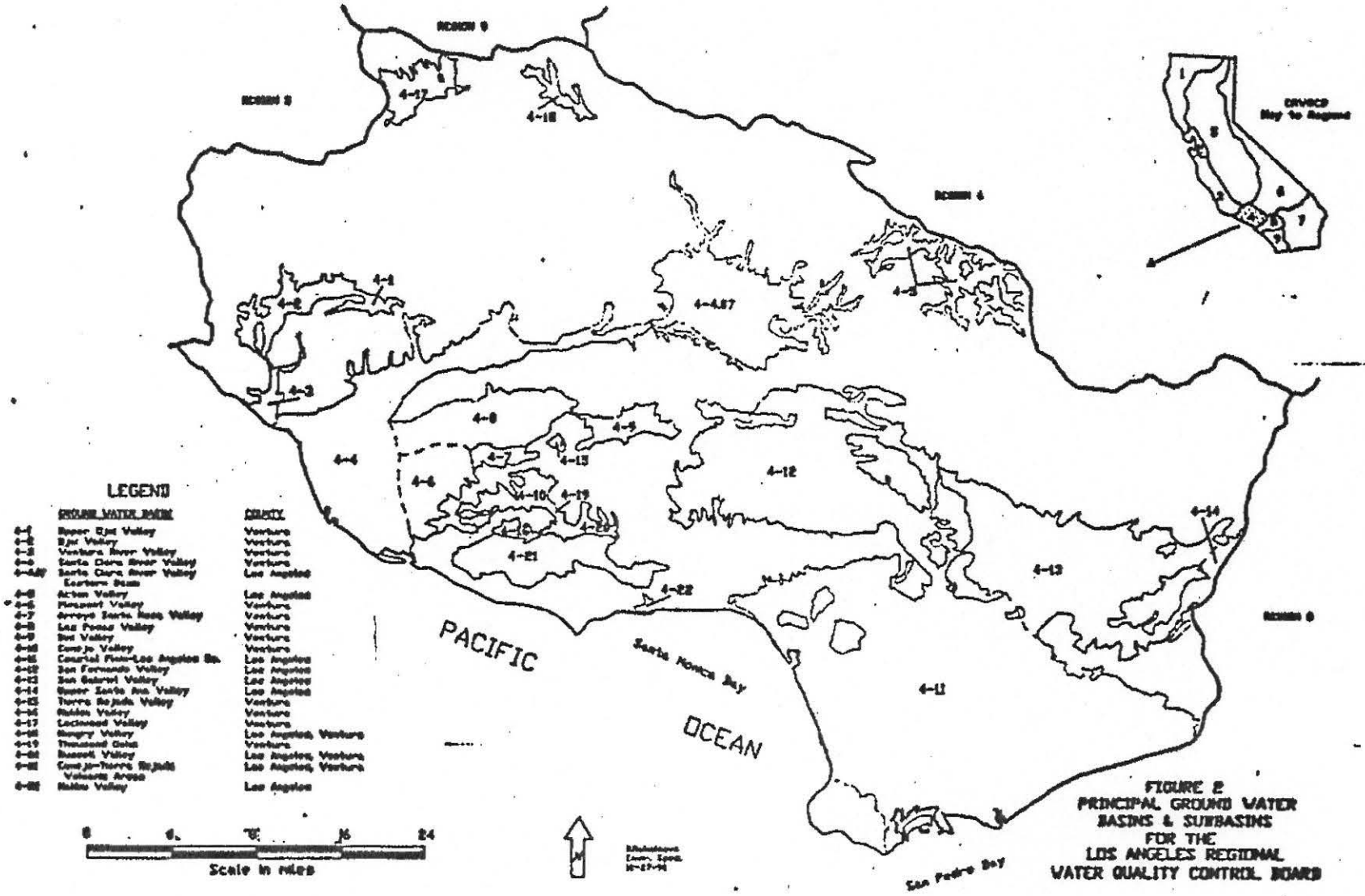


FIGURE 2
PRINCIPAL GROUND WATER
BASINS & SUBBASINS
FOR THE
LOS ANGELES REGIONAL
WATER QUALITY CONTROL BOARD

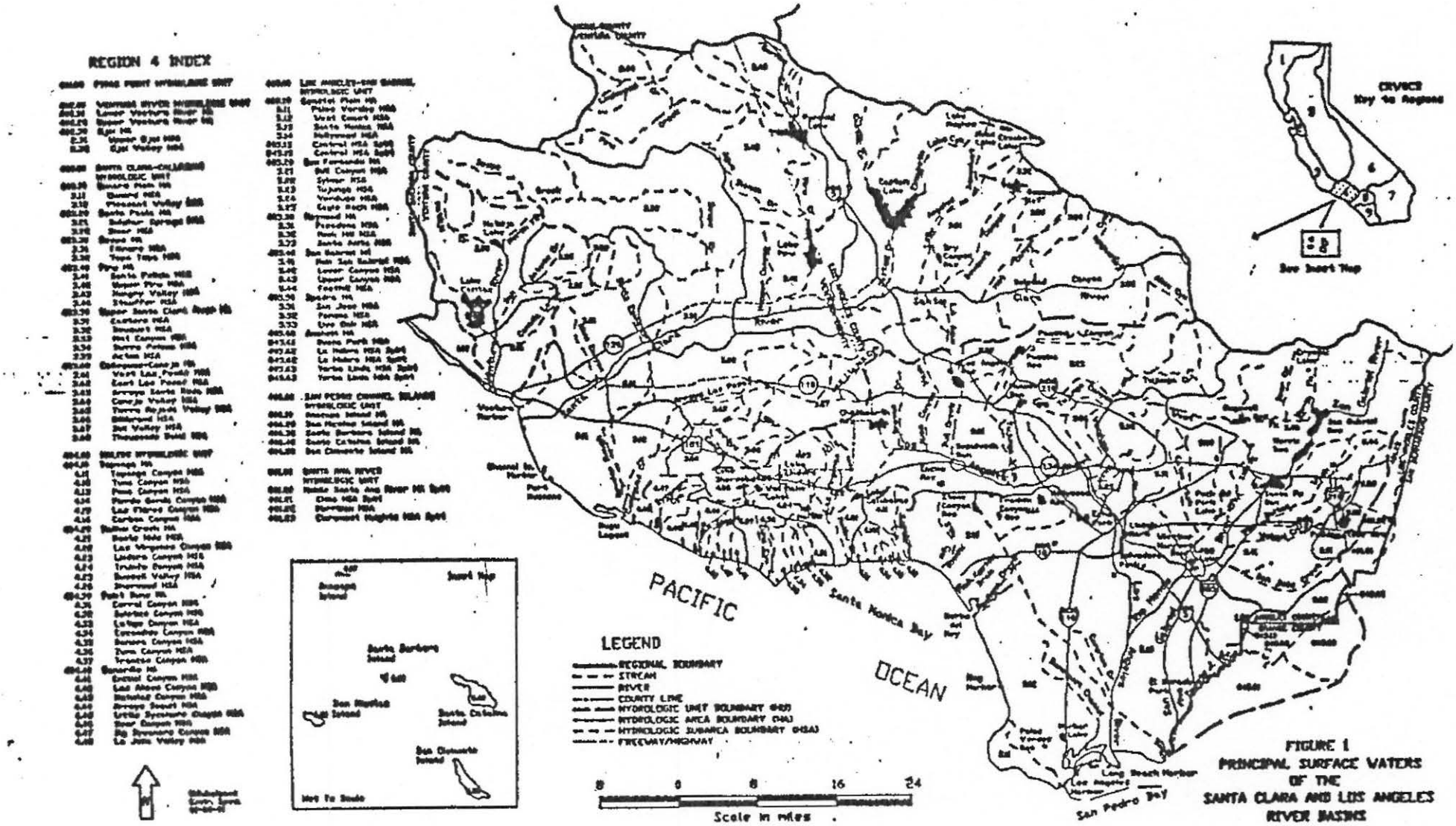


FIGURE 1
PRINCIPAL SURFACE WATERS
OF THE
SANTA CLARA AND LOS ANGELES
RIVER BASINS

Attachment "B"

State Department of Health Services
Primary Drinking Water Standards
Secondary Drinking Water Standards

Priority Pollutants

State DHS Primary Drinking Water Standards, Maximum Contaminant Level (MCL)			
MCL	Constituent	MCL	Constituent
Organic Compounds, MCL units of milligrams per liter (mg/L)			
0.005	1,1-Dichloroethane (1,1-DCA)	0.006	1,1-Dichloroethylene (1,1-DCE)
0.200	1,1,1-Trichloroethane (1,1,1-TCA)	1.2	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)
0.032	1,1,2-Trichloroethane (1,1,2-TCA)	0.001	1,1,2,2-Tetrachloroethane
0.0005	1,2-Dichloroethane (1,2-DCA)	0.005	1,2-Dichloropropane (Propylene dichloride)
*a[1]	1,3-Dichloropropane	*a	1,3-Dichloropropane
0.005	1,4-Dichlorobenzene (p-DCB)	0.1	2,4-D
0.05	2,4,5-TP (Silvex)	0.003	Atrazine (AAtrex)
0.018	Bentazon (Basagran)	0.001	Benzene
*a	Bromodichloromethane	*a	Bromoform
0.018	Carbofuran (Furadan)	0.0005	Carbon tetrachloride
0.0001	Chlordane	0.030	Chlorobenzene (Monochlorobenzene)
*a	Chloroform	0.006	cis-1,2-Dichloroethylene
0.004	Di(2-ethylhexyl)phthalate (DEHP)	*a	Dibromochloromethane
0.0002	Dibromochloropropane (DBCP)	0.0002	Endrin
0.680	Ethylbenzene (Phenylethane)	0.00002	Ethylene dibromide (EDB)
0.7	Glyphosate	0.00001	Heptachlor epoxide
0.00001	Heptachlor	0.004	Lindane (gamma-BHC)
0.1	Methoxychlor	0.02	Molinate (Ordram)
0.01	Simazine (Princep)	0.005	Tetrachloroethene (PCE)
0.07	Thiobencarb (Bolero)	0.005	Toxaphene
0.01	trans-1,2-Dichloroethylene	0.005	Trichloroethene (TCE)
0.15	Trichlorofluoromethane (Freon 11)	0.0005	Vinyl chloride (VC)
1.75	Xylenes		

State DHS Primary Drinking Water Standards, Maximum Contaminant Level (MCL)			
MCL	Constituent	MCL	Constituent
Inorganic/Physical Constituents, MCL units of milligrams/liter (mg/L)			
1.0	Aluminum (Al)	0.05	Arsenic (As)
1.0	Barium (Ba)	0.01	Cadmium (Cd)
0.05	Chromium, total (Cr)	2.4	Fluoride (F) temp < 53.7 °F
2.2	Fluoride (F) temp 53.8-58.3 °F	2.0	Fluoride (F) temp 58.4-63.8 °F
1.8	Fluoride (F) temp 63.9-70.6 °F	1.6	Fluoride (F) temp 70.7-79.2 °F
1.4	Fluoride (F) temp 79.3-90.5 °F	0.05	Lead (Pb)
0.002	Mercury (Hg)	45.0	Nitrate (NO_3)
0.01	Selenium (Se)	0.05	Silver (Ag)
Radio Chemistry, MCL units of pico Curies per liter (pCi/L)			
15 (pCi/L)	Gross Alpha (α)	50 (pCi/L)	Gross Beta (β)
5 (pCi/L)	Combined Radium 226+228 ($Ra^{226,228}$)	8 (pCi/L)	Strontium-90 (Sr^{90})

State DHS Secondary Drinking Water Standards			
MCL (units)	Constituent	MCL (units)	Constituent
250 mg/L	Chloride (Cl)	15 units	Color
900 µmhos	Conductivity	1.0 mg/L	Copper (Cu)
0.5 units	Foaming agent (MBAS)	0.3 mg/L	Iron (Fe)
0.05 mg/L	Manganese (Mn)	250 mg/L	Sulfate (SO_4)
500 mg/L	Total dissolved solids (TDS)	5 units	Turbidity
5.0 mg/L	Zinc (Zn)		

Priority Pollutants: Acid Extractables		
2,4,Trichlorophenol	P-Chloro-M-Cresol	2-Chlorophenol
2,4-Dichlorophenol	2,4-Dimethylphenol	2-Nitrophenol
4-Nitrophenol	2,4-Dinitrophenol	4,6-Dinitro-o-cresol
Pentachlorophenol	Phenol	

Priority Pollutants: Base/Neutral Extractables		
Acenaphthene	Benzidine	1,2,4-Trichlorobenzene
Hexachlorobenzene	Hexachloroethane	Bis (2-Chloroethyl) ether
2-Chloronaphthalene	1,2-Dichlorobenzene	1,3-Dichlorobenzene
1,4-Dichlorobenzene	3,3'-Dichlorobenzidine	2,4-Dinitrotoluene
2,6-Dinitrotoluene	1,2-Diphenylhydrazine	Fluoranthene
4-Chlorophenyl phenyl ether	4-Bromophenyl phenyl ether	Bis (2-chloroisopropyl) ether
Bis (2-Chloroethoxy) methane	Hexachlorobutadiene	Hexachlorocyclopentadiene
Isophorone	Naphthalene	Nitrobenzene
N-Nitrosodimethylamine	N-Nitrosodi-n-propylamine	M-Nitrosodiphenylamine
Bis (2-Ethylhexyl) phthalate	Butyl benzyl phthalate	Di-N-Butyl phthalate
Di-N-Octyl phthalate	Diethyl phthalate	Dimethyl phthalate
Benzo (A) Anthracene	Benzo (A) pyrene	Benzo (B) fluoranthene
Benzo (K) Fluoranthene	Chrysene	Acenaphthylene
Anthracene	1,12-Benzoperylene	Fluorene
Phenanthrene	1,2,5,6-Dibenzanthracene	Indeno (1,2,3-CD) pyrene
Pyrene	TCDD	

Priority Pollutants: Pesticides		
Aldrin	Chlordane	Dieldrin
4,4'-DDT	4,4'-DDE	4,4'-DDD
Alpha endosulfan	Beta endosulfan	Endosulfan sulfate
Endrin	Endrin aldehyde	Heptachlor
Heptachlor expoxide	Alpha BHC	Beta BHC
Gamma BHC	Delta BHC	Toxaphene
PCB 1016	PCB 1221	PCB 1232
PCB 1242	PCB 1248	PCB 1254
PCB 1260		

Priority Pollutants: Volatile Organics		
Acrolein	Acrylonitrile	Benzene
Carbon tetrachloride	Chlorobenzene	1,2-Dichloroethane
1,1,1-Trichloroethane	1,1-Dichloroethane	1,1,2-Trichloroethane
1,1,2,2-Tetrachloroethane	Chloroethane	Chloroform
1,1-Dichloroethylene	1,2-Transdichloroethylene	1,2-Dichloropropane
1,2-Dichloropropylene	Ethylbenzene	Methylene chloride
Methyl chloride	Methyl bromide	Bromoform
Bromodichloromethane	Dibromochloromethane	Tetrachloroethylene
Toluene	Trichloroethylene	Vinyl chloride
2-Chloroethyl vinyl ether		

Priority Pollutants: Metals & Miscellaneous		
Antimony (Sb)	Arsenic (As)	Beryllium (Be)
Cadmium (Cd)	Chromium (Cr)	Copper (Cu)
Lead (Pb)	Mercury (Hg)	Nickel (Ni)
Selenium (Se)	Silver (Ag)	Thallium (Tl)
Zinc (Zn)	Cyanide (CN^-)	Asbestos ($H_4Mg_3Si_2O_9$)

.....Endnote

1. $a^{\#}$ = (DHS note) Unregulated: monitoring required for all community and non-transient, non-community water systems

STANDARD PROVISIONS
APPLICABLE TO WASTE DISCHARGE REQUIREMENTS

1. DUTY TO COMPLY

The discharger must comply with all conditions of these waste discharge requirements. A responsible party has been designated in the Order for this project, and is legally bound to maintain the monitoring program and permit. Violations may result in enforcement actions, including Regional Board orders or court orders requiring corrective action or imposing civil monetary liability, or in modification or revocation of these waste discharge requirements by the Regional Board. [CWC Section 13261, 13263, 13265, 13268, 13300, 13301, 13304, 13340, 13350]

2. GENERAL PROHIBITION

Neither the treatment nor the discharge of waste shall create a pollution, contamination or nuisance, as defined by Section 13050 of the California Water Code (CWC). [H&SC Section 5411, CWC Section 13263]

3. AVAILABILITY

A copy of these waste discharge requirements shall be maintained at the discharge facility and be available at all times to operating personnel. [CWC Section 13263]

4. CHANGE IN OWNERSHIP

The discharger must notify the Executive Officer, in writing at least 30 days in advance of any proposed transfer of this Order's responsibility and coverage to a new discharger containing a specific date for the transfer of this Order's responsibility and coverage between the current discharger and the new discharger. This agreement shall include an acknowledgement that the existing discharger is liable for violations up to the transfer date and that the new discharger is liable from the transfer date on. [CWC Sections 13267 and 13263]

5. CHANGE IN DISCHARGE

In the event of a material change in the character, location, or volume of a discharge, the discharger shall file with this Regional Board a new Report of Waste Discharge. [CWC Section 13260(c)]. A material change includes, but is not limited to, the following:

(a) Addition of a major industrial waste discharge to a discharge of essentially domestic sewage, or the addition of a new process or product by an industrial facility resulting in a change in the character of the Waste.

(b) Significant change in disposal method, e.g., change from a land disposal to a direct discharge to water, or change in the method of treatment which would significantly alter the characteristics of the waste.

(c) Significant change in the disposal area, e.g., moving the discharge to another drainage area, to a different water body, or to a disposal area significantly removed from the original area potentially causing different water quality or nuisance problems.

(d) Increase in flow beyond that specified in the waste discharge requirements.

(e) Increase in the area or depth to be used for solid waste disposal beyond that specified in the waste discharge requirements. [CCR Title 23 Section 2210]

6. REVISION

These waste discharge requirements are subject to review and revision by the Regional Board. [CCR Section 13263]

7. TERMINATION

Where the discharger becomes aware that it failed to submit any relevant facts in a Report of Waste Discharge or submitted incorrect information in a Report of Waste Discharge or in any report to the Regional Board, it shall promptly submit such facts or information. [CWC Sections 13260 and 13267]

8. VESTED RIGHTS

This Order does not convey any property rights of any sort or any exclusive privileges. The requirements prescribed herein do not authorize the commission of any act causing injury to persons or property, do not protect the discharger from his liability under Federal, State or local laws, nor do they create a vested right for the discharger to continue the waste discharge. [CWC Section 13263(g)]

9. SEVERABILITY

Provisions of these waste discharge requirements are severable. If any provision of these requirements are found invalid, the remainder of the requirements shall not be affected. [CWC Section 921]

10. OPERATION AND MAINTENANCE

The discharger shall, at all times, properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the discharger to achieve compliance with conditions of this Order. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls including appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of this Order. [CWC Section 13263(f)]

11. HAZARDOUS RELEASES

Except for a discharge which is in compliance with these waste discharge requirements, any person who, without regard to intent or negligence, causes or permits any hazardous substance or sewage to be discharged in or on any waters of the State, or discharged or deposited where it is, or probably will be, discharged in or on any waters of the State, shall, as soon as (a) that person has knowledge of the discharge, (b) notification is possible, and (c) notification can be provided without substantially impeding cleanup or other emergency measures, immediately notify the Office of Emergency Services of the discharge in accordance with the spill reporting provision of the State toxic disaster contingency plan adopted pursuant to Article 3.7 (commencing with Section 8574.7) of Chapter 7 of Division 1 of Title 2 of the Government Code, and immediately notify the State Board or the appropriate Regional Board of the discharge. This provision does not require reporting of any discharge of less than a reportable quantity as provided for under subdivisions (f) and (g) of Section 13271 of the Water Code unless the discharger is in violation of a prohibition in the applicable Water Quality Control plan. [CWC Section 1327(a)]

12. PETROLEUM RELEASES

Except for a discharge which is in compliance with these waste discharge requirements, any person who without regard to intent or negligence, causes or permits any oil or petroleum product to be discharged in or on any waters of the State, or discharged or deposited where it is, or probably will be, discharged in or on any waters of the State, shall, as soon as (a) such person has knowledge of the discharge, (b) notification is possible, and (c) notification can be provided without substantially impeding cleanup or other emergency measures, immediately notify the Office of Emergency Services of the discharge in accordance with the spill reporting provision of the State oil spill contingency plan adopted pursuant to Article 3.5 (commencing with Section 8574.1) of Chapter 7 of Division 1 of Title 2 of the Government Code. This provision does not require reporting of any discharge of less than 42 gallons unless the discharge is also required to be reported pursuant to Section 311 of the Clean Water Act or the discharge is in violation of a prohibition in the applicable Water Quality Control Plan. [CWC Section 13272]

13. ENTRY AND INSPECTION

The discharger shall allow the Regional Board, or an authorized representative upon the presentation of credentials and other documents as may be required by law, to:

(a) Enter upon the discharger's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this Order;

(b) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Order;

(c) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order; and

(d) Sample or monitor at reasonable times, for the purposes of assuring compliance with this Order, or as otherwise authorized by the California Water Code, any substances or parameters at any location. [CWC Section 13267]

14. MONITORING PROGRAM AND DEVICES

The discharger shall furnish, under penalty of perjury, technical monitoring program reports; such reports shall be submitted in accordance with specifications prepared by the Executive Officer, which specifications are subject to periodic revisions as may be warranted. [CWC Section 13267]

All monitoring instruments and devices used by the discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated as necessary to ensure their continued accuracy. All flow measurement devices shall be calibrated at least once per year, or more frequently, to ensure continued accuracy of the devices. Annually, the discharger shall submit to the Executive Office a written statement, signed by a registered professional engineer, certifying that all flow measurement devices have been calibrated and will reliably achieve the accuracy required.

Unless otherwise permitted by the Regional Board Executive officer, all analyses shall be conducted at a laboratory certified for such analyses by the State Department of Health Services. The Regional Board Executive Officer may allow use of an uncertified laboratory under exceptional circumstances, such as when the closest laboratory to the monitoring location is outside the State boundaries and therefore not subject to certification. All analyses shall be required to be conducted in accordance with the latest edition of "Guidelines Establishing Test Procedures for Analysis of Pollutants" [40CFR Part 136] promulgated by the U.S. Environmental Protection Agency. [CCR Title 23, Section 2230]

15. TREATMENT FAILURE

In an enforcement action, it shall not be a defense for the discharger that it would have been necessary to halt or to reduce the permitted activity in order to maintain compliance with this Order. Upon reduction, loss, or failure of the treatment facility, the discharger shall, to the extent necessary to maintain compliance with this Order, control production or all discharges, or both, until the facility is restored or an alternative method of treatment is provided. This provision applies, for example, when the primary source of power of the treatment facility fails, is reduced, or is lost. [CWC Section 13263(f)]

16. DISCHARGE TO NAVIGABLE WATERS

Any person discharging or proposing to discharge to navigable waters from a point source (except for discharge of dredged or fill material subject to Section 404 fo the Clean Water Act and discharge subject to a general NPDES permit) must file an NPDES permit application with the Regional Board. [CCR Title 2 Section 22357]

17. ENDANGERMENT TO HEALTH AND ENVIRONMENT

The discharger shall report any noncompliance which may endanger health or the environment. Any such information shall be provided verbally to the Executive Officer within 24 hours from the time the discharger becomes aware of the circumstances. A written submission shall also be provided within five days of the time the discharger becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected; the anticipated time it is expected to continue and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance. The Executive officer, or an authorized representative, may waive the written report on a case-by-case basis if the oral report has been received within 24 hours. The following occurrence(s) must be reported to the Executive Office within 24 hours:

(a) Any bypass from any portion of the treatment facility.

(b) Any discharge of treated or untreated wastewater resulting from sewer line breaks, obstruction, surcharge or any other circumstances.

(c) Any treatment plan upset which causes the effluent limitation of this Order to be exceeded. [CWC Sections 13263 and 13267]

18. MAINTENANCE OF RECORDS

The discharger shall retain records of all monitoring information including all calibration and maintenance records, all original strip chart recordings for continuous monitoring instrumentation, copies off all reports required by this Order, and record of all data used

to complete the application for this Order. Records shall be maintained for a minimum of three years from the date of the sample, measurement, report, or application. This period may be extended during the course of any unresolved litigation regarding this discharge or when requested by the Regional Board Executive Officer.

Records of monitoring information shall include:

(a) The date, exact place, and time of sampling or measurement;

(b) The individual(s) who performed the sampling or measurement;

(c) The date(s) analyses were performed;

(d) The individual(s) who performed the analyses;

(e) The analytical techniques or method used; and

(f) The results of such analyses.

19. (a) All application reports or information to be submitted to the Executive Office shall be signed and certified as follows:

(1) For a corporation – by a principal executive officer or at least the level of vice president.

(2) For a partnership or sole proprietorship – by a general partner or the proprietor, respectively.

(3) For a municipality, state, federal, or other public agency – by either a principal executive officer or ranking elected official.

(b) A duly authorized representative of a person designated in paragraph (a) of this provision may sign documents if:

(1) The authorization is made in writing by a person described in paragraph (a) of this provision.

(2) The authorization specifies either an individual or position having responsibility for the overall operation of the regulated facility or activity; and

(3) The written authorization is submitted to the Executive Officer.

Any person signing a document under this Section shall make the following certification:

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. [CWC Sections 13263, 13267, and 13268]"

20. OPERATOR CERTIFICATION

Supervisors and operators of municipal wastewater treatment plants and privately owned facilities regulated by the PUC, used in the treatment or reclamation of sewage and industrial waste shall possess a certificate of appropriate grade in accordance with Title 23, California Code of Regulations Section 3680. State Boards may accept experience in lieu of qualification training. In lieu of a properly certified wastewater treatment plant operator, the State Board may approve use of a water treatment plan operator of appropriate grade certified by the State Department of Health Services where reclamation is involved.

Each plan shall be operated and maintained in accordance with the operation and maintenance manual prepared by the municipality through the Clean Water Grant Program [CWC Title 23, Section 2233(d)]

ADDITIONAL PROVISIONS APPLICABLE TO
PUBLICLY OWNED TREATEMENT WORKS' ADEQUATE CAPACITY

21. Whenever a publicly owned wastewater treatment plant will reach capacity within four years the discharger shall notify the Regional Board. A copy of such notification shall be sent to appropriate local elected officials, local permitting agencies and the press. The discharger must demonstrate that adequate steps are being taken to address the capacity problem. The discharger shall submit a technical report to the Regional Board showing flow volumes will be prevented from exceeding capacity, or how capacity will be increased, within 120 days after providing notification to the Regional Board, or within 120 days after receipt of notification from the Regional Board, of a finding that the treatment plant will reach capacity within four years. The time for filing the required technical report may be extended by the Regional Board. An extension of 30 days may be granted by the Executive Officer, and longer extensions may be granted by the Regional Board itself. [CCR Title 23, Section 2232]

STATE OF CALIFORNIA
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

MONITORING AND REPORTING PROGRAM NO. CI-9869
FOR
VENTURA COUNTY WATERSHED PROTECTION DISTRICT
J STREET DRAIN PROJECT

ENROLLMENT UNDER REGIONAL BOARD
ORDER NO. 93-010 (SERIES NO. 044)
FILE NO. 12-099

I. REPORTING REQUIREMENTS

A. The Ventura County Watershed Protection District (hereinafter Discharger) shall implement this Monitoring and Reporting Program on the effective date of this enrollment (November 9, 2012) under Regional Board order No. 93-010. The first monitoring report under this monitoring program is due by December 15, 2012. Monitoring reports shall be submitted monthly and must be received by the Regional Board by the fifteenth day of the second month following the sampling period.

B. If there is no discharge during any reporting period, the report shall so state.

C. By January 30th of each year, the Discharger shall submit an annual summary report to the Regional Board. The report shall contain both tabular and graphical summaries of the monitoring data obtained during the previous calendar year. In addition, the Discharger shall discuss the compliance record and the corrective actions taken, or planned, which may be needed to bring the discharge into full compliance with the waste discharge requirements.

D. Laboratory analyses – all chemical, bacteriological, and toxicity analyses shall be conducted at a laboratory certified for such analyses by the California Department of Public Health Environmental Laboratory Accreditation Program (ELAP). A copy of the laboratory certification shall be provided each time a new and/or renewal is obtained from ELAP.

E. The method limits (MLs) employed for effluent analyses shall be lower than the permit limits established for a given parameter, unless the Discharger can demonstrate that a particular ML is not attainable and obtains approval for a higher ML from the Executive Officer. At least once a year, the Discharger shall submit a list of the analytical methods employed for each test and the associated laboratory quality assurance/quality control (QA/QC) procedures.

F. Water/wastewater samples must be analyzed within allowable holding time limits as specified in 40 CFR Part 136.3. All QA/QC samples must be run on the same dates when samples were actually analyzed. The Discharger shall make available

for inspection and/or submit the QA/QC documentation upon request by Regional Board staff.

G. Each monitoring report must affirm in writing that "All analyses were conducted at a laboratory certified for such analyses by the California Department of Public Health, and in accordance with current United States Environmental Protection Agency (USEPA) guideline procedures or as specified in this Monitoring Program." Proper chain of custody procedures must be followed and a copy of the completed chain of custody form shall be submitted with the report.

H. For every item where the requirements are not met, the Discharger shall submit a statement of the cause(s), and actions undertaken or proposed which will bring the discharge into full compliance with waste discharge requirements at the earliest possible time, including a timetable for implementation of those actions.

I. The Discharger shall maintain all sampling and analytical results, including strip charts; date; exact place, and time of sampling; dates analyses were performed; analyst's name; analytical techniques used; and results of all analyses. Such records shall be retained for a minimum of three years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge, or when requested by the Regional Board

J. In reporting the monitoring data, the Discharger shall arrange the data in tabular form so that the date, the constituents, and the concentrations are readily discernible. The data shall be summarized to demonstrate compliance with the requirements and, where applicable, shall include results of receiving water observations.

K. Any mitigation/remedial activity including any pre-discharge treatment conducted at the site must be reported in the quarterly monitoring report.

II. WATER QUALITY MONITORING REQUIREMENTS

A. Maintenance reporting: The Discharger shall submit a monthly operation and maintenance report of the disposal area of extracted groundwater. The information to be contained in the report shall include, at a minimum, the following:

1. The name and address of the person or company responsible for the operation and maintenance of the area;

2. Type of maintenance (preventive or corrective action performed);

3. Frequency of maintenance, if preventive;

4. Estimated amount of water used for compaction and for dust control;

5. Description of any changes in the dewatering approach, if any;

6. Verification that there is no runoff from the disposal area to surface waters; and

7. Maintenance records for the pumping, discharge, and wastewater disposal system.

B. Effluent Monitoring: Sampling stations shall be located where representative samples of the discharged groundwater from dewatering area can be obtained. The following shall constitute the effluent monitoring program:

Constituent[1]	Unit[2]	Type of[3] Sample	Minimum Frequency of Analysis
Total flow	gal/day	N/A	Daily
pH	pH Units	grab	monthly
Total dissolved solids	mg/L	grab	monthly
Sulfate	mg/L	grab	monthly
Chloride	mg/L	grab	monthly
Boron	mg/L	grab	monthly
Priority pollutants[4]	mg/L	grab	Twice[5]

[1] If any constituent exceeds the baseline water quality data, then the frequency of analyses shall increase to weekly until at least three test results have been obtained and there is no more exceeding constituent, after which the frequency of analyses shall revert to monthly.
[2] mg/L: milligram per liter
[3] Samples shall be obtained at the point where water is used for dust control.
[4] Priority Pollutants are listed in Attachment B of General WDR Order No. 93-010.
[5] Two effluent samples shall be collected and analyzed during the dewatering operation. One sample shall be collected during the first day of dewatering and the other shall be collected by the last day of the dewatering activities.

III. MONITORING FREQUENCY

Specifications in this monitoring program are subject to periodic revisions. Monitoring requirements may be modified or revised by the Executive Officer based on review of monitoring data submitted pursuant to this Order. Monitoring frequencies may be adjusted to a less frequent basis or parameters and locations dropped by the Executive Officer if the Discharger makes a request and the request is backed by statistical trends of monitoring data submitted.

IV. CERTIFICATION STATEMENT

Each report shall contain the following completed declaration:

"I certify under penalty of law that this document, including all attachments and supplemental information, was prepared under my direction or

supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine and imprisonment.

Executed on the _____day of _____ at _____.

_____(Signature)

_____(Title)"

V. ELECTRONIC SUBMITTAL OF INFORMATION (ESI) TO GEOTRACKER

The Discharger shall comply with the Electronic Submittal of Information (ESI) requirements by submitting all reports required under the MRP, including groundwater monitoring data, discharge location data, correspondence, and pdf monitoring reports to the State Water Resources Control Board GeoTracker database under Global ID WDR100007795.

All records and reports submitted in compliance with this Order are public documents and will be made available for inspection during business hours at the office of the California Regional Water Quality Control Board, Los Angeles Region, upon request by interested parties. Only proprietary information, and only at the request of the Discharger, will be treated as confidential.

Ordered by: Samuel Unger
Samuel Unger, P.E.
Executive Officer

Date: November 9, 2012

82322-13

CALIFORNIA
Water Boards

RECEIVED
OCT 01 2012
Design & Construction Division

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

Los Angeles Regional Water Quality Control Board

September 21, 2012

Kirk Norman
Ventura County Watershed Protection District
800 South Victoria Avenue
Ventura, CA 93009

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
7000 0600 0029 1196 8069

Dear Mr. Stephan:

COVERAGE UNDER GENERAL NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM AND WASTE DISCHARGE REQUIREMENTS—VENTURA COUNTY WATERSHED PROTECTION DISTRICT, J STREET STORM DRAIN EXPANSION PROJECT, OXNARD, CALIFORNIA (NPDES NO. CAG994004, CI-9867)

We have completed our review of your application for a permit to discharge groundwater under the National Pollutant Discharge Elimination System (NPDES).

Based on the information provided, the proposed discharge of groundwater from the construction dewatering project at the above-referenced facility meets the conditions to be regulated under Order No. R4-2008-0032, *General National Pollutant Discharge Elimination System and Waste Discharge Requirements for Discharges of Groundwater from Construction and Project Dewatering to Surface Waters in Coastal Watersheds of Los Angeles and Ventura Counties*, adopted by this Board on June 5, 2008.

Enclosed are your Waste Discharge Requirements, which also serve as your NPDES permit, consisting of Order No. R4-2008-0032 and Monitoring and Reporting Program No. CI-9867. The discharge limitations in Part V. Table 1 of Order No. R4-2008-0032 for the specific constituents listed in the Table with the enclosed Fact Sheet are applicable to your discharge. The groundwater discharge flows to Coastal Streams of the Pacific Ocean. Therefore, discharge limitations in Attachment B of Order No. R4-2008-0032 are not applicable to your discharge. Prior to starting discharge, a representative sample of the effluent shall be obtained and analyzed to determine compliance with the discharge limitations.

The Monitoring and Reporting Program requires you to implement the monitoring program on the effective date of coverage under this permit. All monitoring reports should be sent to the Regional Board, ATTN: Information Technology Unit. When submitting monitoring or technical reports to the Regional Board per these requirements, please include a reference to "Compliance File No. CI-9867 and NPDES No. CAG994004", which will assure that the reports are directed to the appropriate file and staff. Also, please do not combine other reports with your monitoring reports. Submit each type of report as a separate document.

Kirk Norman
Ventura County Watershed Protection District

September 21, 2012

The Regional Board is implementing a paperless office system to reduce paper use, increase efficiency *and* provide a more effective way for our staff, the public and interested parties to view water quality documents. Therefore, please convert all regulatory documents, submissions, data and correspondence that you would normally submit to us as hard copies to a searchable Portable Document Format (PDF). Documents that are less than 10 MB should be emailed to losangeleswaterboards.ca.gov. Documents that are 10 MB or larger should be transferred to a disk and mailed to the address listed above. If you need additional information regarding electronic submittal of documents please visit the Regional Board's website listed above and navigate to Paperless Office.

To avoid paying future annual fees, please submit written request for termination of your enrollment under the general permit in a separate letter, when your project has been completed and the permit is no longer needed.

We are sending a copy of Order No. R4-2008-0032 only to the applicant. For those on the mailing list, please refer to the Board Order sent to you previously or download a copy of the Order from our website at *http://www.waterboards.ca.gov/losangeles/board_decisions*.

If you have any questions, please contact Namiraj Jain at (213) 620-6003.

Sincerely,

Samuel Unger

Samuel Unger, P.E.
Executive Officer

Enclosures:

Order No. R4-2008-0032, General NPDES Permit No. CAG994004
Fact Sheet
Monitoring and Reporting Program No. CI-9867

cc: Environmental Protection Agency, Region 9, Permit Section (WTR-5)
State Water Resources Control Board, NPDES_Wastewater@waterboards.ca.gov
U.S. Army Corps of Engineers
NOAA, National Marine Fisheries Service
Department of Interior, U.S. Fish and Wildlife Service
California Department of Fish and Game, Marine Resources, Region 5
Ventura County Department of Public Works, Flood Control and Drainage
Ventura County Department of Environmental Program
Jae Kim, Tetratech

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STATE OF CALIFORNIA
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION
320 West 4th Street, Suite 200, Los Angeles, California 90013

FACT SHEET
WASTE DISCHARGE REQUIREMENTS
FOR

VENTURA COUNTY WATERSHED PROTECTION DISTRICT,
J STREET STORM DRAIN EXPANSION PROJECT
(ORDER NO. R4-2004-0032, SERIES NO.129)
NPDES NO. CAG994004
CI-9867

FACILITY ADDRESS
J Street & Hueneme Road
Oxnard, CA 90028

FACILITY MAILING ADDRESS
800 South Victoria Avenue
Ventura, CA 93009

PROJECT DESCRIPTION:

Ventura County Watershed Protection District (Discharger) proposes to discharge groundwater from the storm drain construction project located at the intersection of J Street and Hueneme Road in the city of Oxnard. The Discharger is planning to expand the storm drain system to accommodate excess storm water runoff from the surrounding area. Shallow groundwater will be encountered during construction project. The Discharger proposes to discharge maximum of 2.5 million gallons per day (mgd) of groundwater will be discharged from the project site for a period of 10 months during construction phase of the project. High volume of groundwater discharges are necessary to facilitate construction activities. The Discharger is authorized to discharge a maximum of 2.5 mgd of groundwater during the first 6 months of the construction project. Thereafter the maximum discharge shall be 1.0 mgd. The groundwater will be discharged to Perkins Channel that drains to Pacific Ocean.

VOLUME AND DESCRIPTION OF DISCHARGE:

A maximum of 2.5 million gallons per day (mgpd) of groundwater will be discharged to Perkins Channel at Discharge Point M-001 (Latitude: N34°08'26", Longitude: W119°11'16"). The discharge flows to Coastal Streams of the Pacific Ocean a water of the United States. The site location map is shown in Figure 1.

APPLICABLE EFFLUENT LIMITATIONS

Based on the information provided in the NPDES Application Supplemental Requirements, discharge limitations listed in the other column of the Order are applicable to your discharge. The following constituents listed in the Table below have been determined to show reasonable potential to exist in the discharge. The discharge flows into the Pacific Ocean. Therefore the effluent limitations in Attachment B of the Order are not applicable to your discharge.

This Table lists the specific constituents and effluent limitations applicable to the discharge.

Constituents	Units	Discharge Limitations	
		Daily Maximum	Monthly Average
Total Suspended Solids	mg/L	150	50
Turbidity	NTU	150	50
BOD_5 20°C	mg/L	30	20
pH	pH units	6.5 to 8.5	----
Oil and Grease	mg/L	15	10
Settleable Solids	ml/L	0.3	0.1
Sulfides	mg/L	1.0	----
Phenols	mg/L	1.0	----
Total Residual Chlorine	mg/L	0.1	----

FREQUENCY OF DISCHARGE:

The discharge of groundwater will be intermittent and last for a duration of 10 months.

REUSE OF WATER:

It is not economically feasible to haul the groundwater for off-site disposal. It is not feasible to discharge the water to the sanitary sewer system. Therefore, the groundwater will be discharged to the storm drain in compliance with the requirements of the attached Order.

Figure 1. Site Location Map

STATE OF CALIFORNIA
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

MONITORING AND REPORTING PROGRAM NO. CI-9848
FOR
DISCHARGES OF GROUNDWATER FROM CONSTRUCTION AND PROJECT DEWATERING TO SURFACE WATERS
IN
COASTAL WATERSHEDS OF LOS ANGELES AND VENTURA COUNTIES

(GENERAL NPDES PERMIT NO. CAG994004, SERIES NO. 129)

This Order was adopted by the Regional Water Board on:	June 4, 2009
This Order shall become effective on:	September 21, 2012
This Order shall expire on:	June 4, 2014
The U.S. Environmental Protection Agency (USEPA) and the Regional Water Board have classified this discharge as a minor discharge.	

Ordered By: Samuel Unger
Samuel Unger, P.E.
Executive Officer

Date: September 21, 2012

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Attachment E – Monitoring and Reporting Program (MRP)

The Code of Federal Regulations section 122.48 requires that all NPDES permits specify monitoring and reporting requirements. Water Code Sections 13267 and 13383 also authorize the Regional Water Quality Control Board (Regional Water Board) to require technical and monitoring reports. This MRP establishes monitoring and reporting requirements, which implement the federal and California regulations.

I. GENERAL MONITORING PROVISIONS

A. An effluent sampling station shall be established for Discharge Point M-001 and shall be located where representative samples of that effluent can be obtained. Provisions shall be made to enable visual inspections before discharge. In the event of presence of oil sheen, debris, and/or other objectionable materials or odors, discharge shall not commence until compliance with the requirements is demonstrated. All visual observations shall be included in the monitoring report.

B. This Regional Board shall be notified in writing of any change in the sampling stations once established or in the methods for determining the quantities of pollutants in the individual waste streams.

C. Effluent samples shall be taken downstream of any addition to treatment works and prior to mixing with the receiving waters.

D. Pollutants shall be analyzed using the analytical methods described in 40 CFR §§136.3, 136.4, and 136.5 (revised March 12, 2007); or, where no methods are specified for a given pollutant, by methods approved by this Regional Water Board or the State Water Board.

E. Laboratories analyzing effluent samples and receiving water samples shall be certified by the California Department of Public Health Environmental Laboratory Accreditation Program (ELAP) or approved by the Executive Officer and must include QA/QC data in their reports. A copy of the laboratory certification shall be provided each time a new certification and/or renewal of the certification is obtained from ELAP.

F. For any analyses performed for which no procedure is specified in the USEPA guidelines or in the MRP, the constituent or parameter analyzed and the method or procedure used must be specified in the monitoring report.

G. Each monitoring report must affirm in writing that "all analyses were conducted at a laboratory certified for such analyses by the Department of Public Health or approved by the Executive Officer and in accordance with current USEPA guideline procedures or as specified in this Monitoring and Reporting Program".

H. The monitoring reports shall specify the analytical method used, the MDL, and the ML for each pollutant. For the purpose of reporting compliance with numerical limitations, performance goals, and receiving water limitations, analytical data shall be reported by one of the following methods, as appropriate:

1. An actual numerical value for sample results greater than or equal to the ML; or

2. "DNQ" if results are greater than or equal to the laboratory's MDL but less than the ML; or,

3. "ND" for sample results less than the laboratory's MDL with the MDL indicated for the analytical method used.

Analytical data reported as "less than" for the purpose of reporting compliance with permit limitations shall be the same or lower than the permit limit(s) established for the given parameter.

Current MLs (Attachment G) are those published by the State Water Resources Control Board in the *Policy for the Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California*, March 2, 2000.

I. Where possible, the MLs employed for effluent analyses shall be lower than the permit limitations established for a given parameter. If the ML value is not below the effluent limitation, then the lowest ML value and its associated analytical method shall be selected for compliance purposes. At least once a year, the Discharger shall submit a list of the analytical methods employed for each test and associated laboratory QA/QC procedures.

The Regional Water Board, in consultation with the State Water Board Quality Assurance Program, shall establish a ML that is not contained in Attachment G to be included in the Discharger's permit in any of the following situations:

1. When the pollutant under consideration is not included in Attachment G;

2. When the Discharger and Regional Water Board agree to include in the permit a test method that is more sensitive than that specified in 40 CFR Part 136 (revised March 12, 2007);

3. When the Discharger agrees to use an ML that is lower than that listed in Attachment G;

4. When the Discharger demonstrates that the calibration standard matrix is sufficiently different from that used to establish the ML in Attachment G, and proposes an appropriate ML for their matrix; or,

5. When the Discharger uses a method whose quantification practices are not consistent with the definition of an ML. Examples of such methods are the USEPA-approved method 1613 for dioxins and furans, method 1624 for volatile organic substances, and method 1625 for semi-volatile organic substances. In such cases, the Discharger, the Regional Water Board, and the State Water Board shall agree on a lowest quantifiable limit and that limit will substitute for the ML for reporting and compliance determination purposes.

J. Water/wastewater samples must be analyzed within allowable holding time limits as specified in 40 CFR §136.3. All QA/QC items must be run on the same dates the samples were actually analyzed, and the results shall be reported in the Regional Water Board format, when it becomes available, and submitted with the laboratory reports. Proper chain of custody procedures must be followed, and a copy of the chain of custody shall be submitted with the report.

K. All analyses shall be accompanied by the chain of custody, including but not limited to date and time of sampling, sample identification, and name of person who performed sampling, date of analysis, name of person who performed analysis, QA/QC data, method detection limits, analytical methods, copy of laboratory certification, and a perjury statement executed by the person responsible for the laboratory.

L. The Discharger shall calibrate and perform maintenance procedures on all monitoring instruments and to insure accuracy of measurements, or shall insure that both equipment activities will be conducted.

M. The analytical laboratory shall have an acceptable written quality assurance (QA) plan for laboratory analyses. The annual monitoring report shall also summarize the QA activities for the previous year. Duplicate chemical analyses must be conducted on a minimum of ten percent (10%) of the samples, or at least one sample per sampling period, whichever is greater. A similar frequency shall be maintained for analyzing spiked samples.

N. When requested by the Regional Water Board or USEPA, the Discharger will participate in the NPDES discharge monitoring report QA performance study. The Discharger must have a success rate equal to or greater than 80%.

O. For parameters that both monthly average and daily maximum limitations are specified and the monitoring frequency is less than four times a month, the following shall apply. If an analytical result is greater than the monthly average limitation, the Discharger shall collect four additional samples at approximately equal intervals during the month, until compliance with the monthly average limitation has been demonstrated. All five analytical results shall be reported in the monitoring report for that month, or 45 days after results for the additional samples were received, whichever is later. In the event of noncompliance with a monthly average effluent limitation, the sampling frequency for that constituent shall be increased to weekly and shall continue at this level until compliance with the monthly average effluent limitation has been demonstrated. The Discharger shall provide for the approval of the Executive Officer a program to ensure future compliance with the monthly average limitation.

P. In the event wastes are transported to a different disposal site during the report period, the following shall be reported in the monitoring report:

1. Types of wastes and quantity of each type;

2. Name and address for each hauler of wastes (or method of transport if other than by hauling); and

3. Location of the final point(s) of disposal for each type of waste.

If no wastes are transported off-site during the reporting period, a statement to that effect shall be submitted.

Q. Each monitoring report shall state whether or not there was any change in the discharge as described in the Order during the reporting period.

All monitoring reports shall include the discharge limitations in the Order, tabulated analytical data, the chain of custody form, and the laboratory report (including but not limited to date and time of sampling, date of analyses, method of analysis and detection limits).

R. Sample collection requirements (as appropriate)

1. Daily samples shall be collected each day.

2. Weekly samples shall be collected on a representative day of each week.

3. Monthly samples shall be collected on a representative day of each month.

4. Quarterly samples shall be collected in February, May, August, and November.

5. Semi-annual samples shall be collected in May and November.

6. Annual samples shall be collected in November.

S. Before commencing a new discharge, a representative sample of the effluent shall be collected and analyzed for toxicity and for all the constituents listed in Fact Sheet, and the test results must meet all applicable limitations of Order No. R4-2009-0068.

II. MONITORING LOCATIONS

The Discharger shall establish the following monitoring locations to demonstrate compliance with the effluent limitations, discharge specifications, and other requirements in this Order:

Table 1. Monitoring Location

Discharge Point Name	Monitoring Location Name	Monitoring Location Description
Discharge Point 1	M-001	Wastewater effluent before contact with the receiving water and/or dilution by any other water or waste.
Discharge Point 2	M-002	If more than one discharge point is authorized under the General Permit, compliance monitoring locations shall be named M-002, M-003, etc. and shall be located so as to allow collection of wastewater effluent before contact with receiving water and/or dilution by any other water or waste.

III. EFFLUENT MONITORING REQUIREMENTS

A. The Discharger shall monitor the effluent at Discharge Point M-001 as follows.

Table 2. Monitoring Constituents

Constituent	Unit	Type of Sample	Minimum Frequency of Analysis
Total Waste Flow	gal/day	totalizer	monthly
pH	pH unit	grab	monthly
Temperature	°F	grab	monthly
Total Suspended Solids	mg/L	grab	monthly
Turbidity	NTU	grab	monthly
BOD_5 20°C	mg/L	grab	monthly
Oil and Grease	mg/L	grab	monthly
Settleable Solids	ml/L	grab	monthly
Total Residual Chlorine	mg/L	grab	monthly
Sulfides	mg/L	grab	monthly
Phenols	mg/L	grab	monthly
Acute Toxicity	% survival	grab	annually

IV. WHOLE EFFLUENT TOXICITY TESTING REQUIREMENTS

A. Definition of Toxicity

Acute Toxicity

The MRP requires an annual test for acute toxicity which measures primarily lethal effects that occur over a 96-hour period. Acute toxicity shall be measured in percent survival measured in undiluted (100%) effluent.

B. Acute Toxicity Effluent Monitoring Program

1. The Discharger shall conduct acute toxicity tests on effluent grab samples by methods specified in 40 CFR Part 136 which cites USEPA's *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, Fifth Edition, October 2002, USEPA, Office of Water, Washington D.C. (EPA/821-R-02-012) or a more recent edition to ensure compliance in 100 % effluent.

2. The fathead minnow, *Pimephales promelas*, shall be used as the test species for fresh water discharges and the topsmelt, *Atherinops affinis*, shall be used

as the test species for brackish effluent. The method for topsmelt is found in USEPA's *Short-term Method for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms*, First Edition, August 1995 (EPA/600/R-95/136), or a more recent edition.

3. In lieu of conducting the standard acute toxicity testing with the fathead minnow, the Discharger may elect to report the results or endpoint from the first 48 hours of the chronic toxicity test as the results of the acute toxicity test.

4. Accelerated Toxicity Monitoring: If the results of the toxicity test yield a survival of less than 90%, then the frequency of analyses shall increase to monthly until at least three test results have been obtained and full compliance with effluent limitations has been demonstrated, after which the frequency of analyses shall revert to annually. Results of toxicity tests shall be included in the first monitoring report following sampling.

5. Effluent samples shall be collected after all treatment processes and before discharge to the receiving water.

C. Reporting

1. The Discharger shall submit a full report of the toxicity test results, including any accelerated testing conducted during the month as required by this permit. Test results shall be reported as % survival for acute toxicity test results with the self monitoring reports (SMR) for the month in which the test is conducted.

2. If an initial investigation indicates the source of toxicity and accelerated testing is unnecessary, then those results also shall be submitted with the SMR for the period in which the investigation occurred.

   a. The full report shall be submitted on or before the end of the month in which the SMR is submitted.

   b. The full report shall consist of (1) the results; (2) the dates of sample collection and initiation of each toxicity test; (3) the acute toxicity average limit.

3. Test results for toxicity tests also shall be reported according to the appropriate manual chapter on Report Preparation and shall be attached to the SMR. Routine reporting shall include, at a minimum, as applicable, for each test:

   a. Sample date(s);

   b. Test initiation date;

   c. Test species;

d. End point values for each dilution (e.g., number of young, growth rate, percent survival);

e. Any applicable charts; and,

f. Available water quality measurements for each test (e.g., pH, D.O., temperature, conductivity, hardness, salinity, ammonia).

4. The Discharger shall provide a compliance summary, which includes a summary table of toxicity data from all samples collected during that year.

The Discharger shall notify by telephone or electronically, this Regional Water Board of any toxicity exceedance of the limit or trigger within 24 hours of receipt of the results followed by a written report within 14 calendar days of receipt of the results. The verbal or electronic notification shall include the exceedance and the plan the Discharger has taken or will take to investigate and correct the cause(s) of toxicity. It may also include a status report on any actions required by the permit, with a schedule for actions not yet completed. If no actions have been taken, the reasons shall be given.

V. LAND DISCHARGE MONITORING REQUIREMENTS

Not Applicable.

VI. RECLAMATION MONITORING REQUIREMENTS

Not Applicable.

VII. RECEIVING WATER MONITORING REQUIREMENTS – SURFACE WATER AND GROUNDWATER

Not Applicable.

VIII. OTHER MONITORING REQUIREMENTS

Not Applicable.

IX. REPORTING REQUIREMENTS

A. General Monitoring and Reporting Requirements

1. The Discharger shall comply with all Standard Provisions (Attachment D) related to monitoring, reporting, and recordkeeping.

2. If there is no discharge during any reporting period, the report shall so state.

3. Each monitoring report shall contain a separate section titled "Summary of Non-Compliance" which discusses the compliance record and corrective actions taken or planned that may be needed to bring the discharge into full compliance with waste discharge requirements. This section shall clearly list all non-compliance with waste discharge requirements, as well as all excursions of effluent limitations.

4. The Discharger shall inform the Regional Water Board well in advance of any proposed construction activity that could potentially affect compliance with applicable requirements.

B. Self Monitoring Reports (SMRs)

1. At any time during the term of this permit, the State or Regional Water Board may notify the Discharger to electronically submit Self-Monitoring Reports (SMRs) using the State Water Board's California Integrated Water Quality System (CIWQS) Program Web site (http://www.waterboards.ca.gov/ciwqs/index.html). Until such notification is given, the Discharger shall submit hard copy SMRs. The CIWQS Web site will provide additional directions for SMR submittal in the event there will be service interruption for electronic submittal.

2. The Discharger shall report in the SMR the results for all monitoring specified in this MRP. The Discharger shall submit SMRs including the results of all required monitoring using USEPA-approved test methods or other test methods specified in this Order. If the Discharger monitors any pollutant more frequently than required by this Order, the results of this monitoring shall be included in the calculations and reporting of the data submitted in the SMR.

3. Monitoring periods and reporting for all required monitoring shall be completed according to the following schedule:

Table 3. Monitoring Periods and Reporting Schedule

Sampling Frequency	Monitoring Period Begins On	Monitoring Period	SMR Due Date
Continuous	September 21, 2012	All	Submit with quarterly SMR
Weekly	Sunday following permit effective date or on permit effective date if on a Sunday	Sunday through Saturday	Submit with quarterly SMR
Monthly	First day of calendar month following permit effective date or on permit effective date if that date is first day of the month	1st day of calendar month through last day of calendar month	Submit with quarterly SMR
Quarterly	Closest of January 1, April 1, July 1, or	January 1 through March 31. April 1 through June	45 days from the end of the

	October 1	30. July 1 through September 30. October 1 through December 31	monitoring period
Annually	January 1	January 1 through December 31	45 days from the end of the monitoring period

4. Reporting Protocols. The Discharger shall report with each sample result the applicable Reporting Level (RL) and the current Method Detection Limit (MDL), as determined by the procedure in Part 136.

   The Discharger shall report the results of analytical determinations for the presence of chemical constituents in a sample using the following reporting protocols:

   a. Sample results greater than or equal to the RL shall be reported as measured by the laboratory (i.e., the measured chemical concentration in the sample).

   b. Sample results less than the RL, but greater than or equal to the laboratory's MDL, shall be reported as "Detected, but Not Quantified," or DNQ. The estimated chemical concentration of the sample shall also be reported.

      For the purposes of data collection, the laboratory shall write the estimated chemical concentration next to DNQ as well as the words "Estimated Concentration" (may be shortened to "Est. Conc."). The laboratory may, if such information is available, include numerical estimates of the data quality for the reported result. Numerical estimates of data quality may be percent accuracy (± a percentage of the reported value), numerical ranges (low to high), or any other means considered appropriate by the laboratory.

   c. Sample results less than the laboratory's MDL shall be reported as "Not Detected," or ND.

   d. Dischargers are to instruct laboratories to establish calibration standards so that the ML value (or its equivalent if there is differential treatment of samples relative to calibration standards) is the lowest calibration standard. At no time is the Discharger to use analytical data derived from *extrapolation* beyond the lowest point of the calibration curve.

5. The Discharger shall submit SMRs in accordance with the following requirements:

   a. The Discharger shall arrange all reported data in a tabular format. The data shall be summarized to clearly illustrate whether the facility is operating in compliance with interim and/or final effluent limitations. The Discharger is not required to duplicate the submittal of data that is entered in a tabular format within CIWQS. When electronic submittal of data is required and CIWQS does not provide for entry into a tabular

format within the system, the Discharger shall electronically submit the data in a tabular format as an attachment.

b. The Discharger shall attach a cover letter to the SMR. The information contained in the cover letter shall clearly identify violations of the WDRs; discuss corrective actions taken or planned; and the proposed time schedule for corrective actions. Identified violations must include a description of the requirement that was violated and a description of the violation.

c. SMRs must be submitted to the Regional Water Board, signed and certified as required by the Standard Provisions (Attachment D), to the address listed below:

C. Notification

1. The Discharger shall notify the Executive Officer in writing prior to discharge of any chemical that may be toxic to aquatic life. Such notification shall include:

   a. Name and general composition of the chemical,

   b. Frequency of use,

   c. Quantities to be used,

   d. Proposed discharge concentrations, and,

   e. EPA registration number, if applicable.

   No discharge of such chemical shall be made prior to obtaining the Executive Officer's approval.

2. The Discharger shall notify the Regional Board via telephone and/or fax within 24 hours of noticing an exceedance above the effluent limits in Order No. R4-2009-0068. The Discharger shall provide to the Regional Board within 14 days of observing the exceedance a detailed statement of the actions undertaken or proposed that will bring the discharge into full compliance with the requirements and submit a timetable for correction.

D. Monitoring Frequencies Adjustment

Monitoring frequencies may be adjusted by the Executive Officer to a less frequent basis if the Discharger requests same and the request is backed by statistical trends of monitoring data submitted.

E. Discharge Monitoring Reports (DMRS)

1. At any time during the term of this permit, the State or Regional Water Board may notify the Discharger to electronically submit SMRs that will satisfy federal requirements for submittal of Discharge Monitoring Reports (DMRs). Until such notification is given, the Discharger shall submit SMRs in accordance with the requirements described below.

2. SMRs must be signed and certified as required by the standard provisions (Attachment D). The Discharge shall submit the original SMR to the address listed below:

   California Regional Water Quality Control Board
   Los Angeles Region
   320 W. 4th Street, Suite 200
   Los Angeles, CA 90013
   Attention: Information and Technology Unit.

82322+13

California Regional Water Quality Control Board

Los Angeles Region

Recipient of the 2001 *Environmental Leadership Award* from Keep California Beautiful

Linda S. Adams
Secretary for Environmental Protection

320 W. 4th Street, Suite 200, Los Angeles, California 90013
Phone (213) 576-6600 FAX (213) 576-6640 - Internet Address: http://www.waterboards.ca.gov/losangeles

Arnold Schwarzenegger
Governor

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Design & Construction Division

ORDER NO. R4-2008-0032

WASTE DISCHARGE REQUIREMENTS
FOR
DISCHARGES OF GROUNDWATER FROM CONSTRUCTION AND PROJECT DEWATERING
TO SURFACE WATERS
IN
COASTAL WATERSHEDS OF LOS ANGELES AND VENTURA COUNTIES

(GENERAL NPDES PERMIT NO. CAG994004)

This Order was adopted by the Regional Water Quality Control Board on:	**June 5, 2008**
This Order shall become effective on:	**July 5, 2008**
This Order shall expire on:	**June 5, 2013**
The Discharger shall file a Report of Waste Discharge (Notice of Intent) in accordance with title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than:	**60 days from the date of notification of adoption of this Order**
The U.S. Environmental Protection Agency (USEPA) and the Regional Water Board have classified this discharge as a minor discharge.	

IT IS HEREBY ORDERED, that Order No. R4-2003-0111 is rescinded upon the effective date of this Order except for enforcement purposes, and, in order to meet the provisions contained in Division 7 of the California Water Code (CWC) and regulations adopted thereunder, and the provisions of the federal Clean Water Act (CWA), and regulations and guidelines adopted thereunder, the Discharger shall comply with the requirements in this Order.

I, Tracy J. Egoscue, Executive Officer, do hereby certify the following is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Los Angeles Region, on June 5, 2008.

Tracy J. Egoscue, Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

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I. FACILITY/DISCHARGE INFORMATION

1. This Order (hereafter, General Permit) is intended to authorize discharges of treated or untreated groundwater generated from permanent, temporary dewatering operations or other applicable wastewater discharges not specifically covered in other general NPDES permit. Discharges from facilities to waters of the United States that do not cause, have the reasonable potential to cause, or contribute to an in-stream excursion above any applicable state or federal Water quality objectives/criteria or cause acute or chronic toxicity in the receiving water are authorized discharge in accordance with the conditions set forth in this Order.

II. NOTIFICATION REQUIREMENTS

A. Eligibility Criteria

1. This order covers discharges to surface waters of treated or untreated groundwater from dewatering operations and other wastewaters.

2. To be covered under this Order, a discharger must:

   a. Demonstrate that pollutant concentrations in the discharge shall not cause violation of any applicable water quality objective for the receiving waters, including discharge prohibitions;

   b. Demonstrate that discharge shall not exceed the water quality criteria for toxic pollutants (Attachment B and Part V of this Order), and there shall be no reasonable potential to cause or contribute to an excursion above the criteria.

   c. Perform reasonable potential analysis using a representative sample of groundwater or wastewater to be discharged. The sample shall be analyzed and the data compared to the water quality screening criteria for the constituents listed on Attachment A to determine the most appropriate permit. If the analytical test results exceeds the water quality screening criteria listed on Attachment A, then a reasonable potential for discharge of toxics shall be considered to exist.

      i. If the analytical test results of the discharge show that only petroleum products or only volatile organic compounds (VOCs) exceed the water quality screening criteria listed on Attachment A, then the discharger may not be enrolled under this Order, but will be enrolled under Regional Board Order Nos. R4-2007-0021 or R4-2007-0022, as appropriate.

      ii. If the analytical test results of the discharge show that petroleum products, VOCs and other toxics exceed the water quality screening criteria listed on Attachment A, then the discharger will be enrolled under this permit and treatment of the groundwater will be required for discharge.

      iii. If the analytical test results of the discharge show that toxics are below the screening levels in Attachment A, then the discharger will be enrolled under this permit and treatment of the groundwater for toxics will not be required for discharge.

   d. The discharge shall not cause acute nor chronic toxicity in receiving waters;

e. If necessary, the discharge shall pass through a treatment system designed and operated to reduce the concentration of contaminants to meet the effluent limitations of this Order; and

f. The discharger shall be able to comply with the terms or provisions of this General Permit.

3. New discharges and existing discharges regulated under existing general or individual permits, which meet the eligibility criteria, may be regulated under this Order.

4. For the purpose of renewal of existing individual NPDES permits with this General Permit, provided that all the conditions of this General Permit are met, renewal is effective upon issuance of a notification by the Executive Officer and issuance of a new monitoring program.

5. When an individual NPDES permit with more specific requirements is issued to a discharger, the applicability of this Order to that discharger is automatically terminated on the effective date of the individual permit.

B. Ineligibility

The discharge of wastewater contaminated with toxic pollutants with no effluent limitations in this permit are not eligible for enrollment under this General Permit.

C. Authorization

To be authorized to discharge under this Order, the discharger must submit a Notice of Intent (NOI) in accordance with the requirements of Part D of this Order. Upon receipt of the application, the Executive Officer shall determine the applicability of this Order to such a discharge. If the discharge is eligible, the Executive Officer shall notify the discharger that the discharge is authorized under the terms and conditions of this Order and prescribe an appropriate monitoring and reporting program. For new discharges, the discharge shall not commence until receipt of the Executive Officer's written determination of eligibility for coverage under this general permit or until an individual NPDES permit is issued by the Regional Board.

D. Notice of Intent

1. Deadline for Submission

a. Renewal of permits of existing dischargers covered under individual permits that meet the eligibility criteria and have submitted a NOI will consist of a letter of determination from the Executive Officer of coverage under this Order.

b. Existing dischargers covered under Order No. R4-2003-0111 will be sent a NOI form that must be completed and returned to the Regional Board within 60 days of receipt; otherwise permit coverage may be revoked. Existing dischargers enrolling under this Order are required to collect a representative groundwater/wastewater sample and analyze it for all the constituents listed on Attachment A. Dischargers shall conduct this

analysis and submit the result with a NOI, otherwise the existing authorization may be terminated. If the analytical sample result of any constituent other than those listed in Item V. of this Order exceeds the water quality screening criteria listed on Attachment A, the discharge will be considered ineligible for enrollment under this permit. However, the discharge will be enrolled under other appropriate general permit, and then, the existing coverage under this general permit will be terminated. Existing discharges that has been enrolled under the existing permit within the last one year can re-submit the analytical data used for their initial enrollment with their NOI.

c. New dischargers shall file a complete application at least 45 days before commencement of the discharge.

2. Forms for Report of Waste Discharge

a. Dischargers shall use the NOI Form or appropriate USEPA Forms.

b. The discharger, upon request, shall submit any additional information that the Executive Officer deems necessary to determine whether the discharge meets the criteria for coverage under this Order, to prescribe an appropriate monitoring and reporting program, or both.

c. The discharger must obtain and analyze (using appropriate methods) a representative sample of the groundwater to be treated and discharged under this Order. The analytical method used shall be capable of achieving a detection limit at or below the minimum level, otherwise, a written explanation shall be provided. The analytical result shall be submitted with the NPDES application. The data shall be tabulated and shall include the results for every constituent listed on Attachment A.

d. The following should be included with the NOI Form:

i. The feasibility study on reuse and/or alternative disposal methods of the wastedwater;

ii. Description of the treatment system;

iii. The type of chemicals that will be used (if any) during the operation and maintenance of the treatment system;

iv. Flow diagram of the influent to the discharge point; and

v. Preventive maintenance procedures and schedule for the treatment system.

vi. **Creekside construction dewatering operations.** Creekside construction dewatering operations for the purposes of this permit are defined as the dewatering of groundwater (1) where the dewatering is necessary during construction operations and (2) where the groundwater has a direct hydrologic connection with, and

similar mineral chemistry for TDS, chloride and sulfate to, the surface waterbody to which it will be discharged. For creekside construction dewatering operations, the following additional information shall be submitted with the ROWD.

i. Best Management Practices (BMPs) for preventing degradation of water quality or impairment of receiving water beneficial uses,

ii. Demonstration of direct hydrologic connection and similar water chemistry between the groundwater and the surface water body must be substantiated with hydrogeological and analytical data, and certified by registered hydrogeologist. Water isotope tracing and other geophysical techniques may be used to demonstrate hydrologic connectivity. In addition, when feasible evidence of the physical connection between the groundwater and the surface water body could be demonstrated by stream depletion or drawdown by test well dewatering operation,

iii. The treatment system to be used for removing toxic compounds from the wastewater (if applicable),

iv. A demonstration that the discharger has considered sewering, re-use, or other discharge options and that it is infeasible to discharge to the sanitary sewer system, to re-use the dewatered groundwater/wastewater, or to otherwise lawfully discharge the dewatered groundwater/wastewater.

e. Title 23 of the California Code of Regulations (CCR), Division 3, Chapter 9, Article (1)(A), section 2200, *Annual Fee Schedule,* requires that all discharges subject to a specific general permit shall pay the same annual fee.

1. Notice of Termination

Dischargers shall submit a Notice of Termination or Transfer (NOTT) when coverage under this General Permit is no longer needed. An NOTT contains the Waste Discharge Identification Number (WDID), the name and address of the owner of the facility, and is signed and dated by the owner certifying that the Dischargers associated with Permit No. CAG994004 have been eliminated or that there has been a change in ownership. Upon submission, the Discharger is no longer authorized to discharge wastewater associated with this General Permit.

2. Change of Ownership

Coverage under this Order may be transferred in case of change of ownership of land or discharge facility provided the existing discharger notifies the Executive Officer at least 30 days before the proposed transfer date, and the notice includes a written agreement between the existing and new dischargers containing a specific

date of transfer of coverage, responsibility for compliance with this Order, and liability between them.

III. FINDINGS

The California Regional Water Quality Control Board, Los Angeles Region (hereinafter Regional Water Board), finds:

A. Background

1. On August 7, 2003, the Regional Board adopted Order No. R4-2003-0111 General NPDES Permit No. CAG994004-Waste Discharge Requirements for Discharges from construction and project dewatering to surface waters. This General Permit expires on August 7, 2008. Approximately 281 dischargers are enrolled under this General Permit. This Order now renews the requirements of this General Permit.

2. On September 22, 1989, the United States Environmental Protection Agency (USEPA) granted the State of California, through the State Water Resources Control Board (State Board) and the Regional Boards, the authority to issue general National Pollutant Discharge Elimination System (NPDES) permits pursuant to 40 Code of Federal Regulations (40 CFR) parts 122 and 123.

3. 40 CFR section 122.28 provides for issuance of general permits to regulate a category of point sources if the sources:

   a. Involve the same or substantially similar types of operations;
   b. Discharge the same type of waste;
   c. Require the same type of effluent limitations or operating conditions;
   d. Require similar monitoring; and
   e. Are more appropriately regulated under a general permit rather than individual permits.

4. General waste discharge requirements and NPDES permits enable Regional Board staff to expedite the processing of requirements, simplify the application process for dischargers, better utilize limited staff resources, and avoid the expense and time involved in repetitive public noticing, hearings, and permit adoptions.

B. Facility and Discharge Description

1. Discharges covered under this permit include treated or untreated groundwater generated from permanent or temporary dewatering operations or other appropriate wastewater discharge not specifically covered in other general NPDES permit. In addition, this permit covers discharge from cleanup of contaminated sites where other project specific General Permits may not be appropriate, such as groundwater impacted by metals and/or other toxic compounds. This permit also covers discharges from dewatering operations in the vicinity of creeks where surface waters and groundwaters are hydrologically connected and have similar water chemistry. Creekside discharges which qualify under this permit will not be required to comply with the waterbody specific limitations for total dissolved solids (TDS), sulfate or chloride. The purpose of this approach to regulating creekside

discharges is to avoid requiring a discharger to treat a surface waterbody to lower than naturally occurring, background, mineral content. In such circumstance, cycling the extracted creekside water back into the waterbody would not cause any decrease in the quality of the waterbody or degradation.

2. Wastewater discharge from permanent or temporary dewatering activities include, but are not limited to the following:

   a. Treated or untreated wastewater from permanent or temporary construction dewatering operations
   b. Groundwater pumped as a aid in the containment and/or cleanup of contaminant plume
   c. Groundwater extracted during short-term and long-term pumping/aquifer tests
   d. Groundwater generated from well drilling, construction or development and purging of wells
   e. Equipment decontamination water
   f. Subterranean seepage dewatering
   g. Incidental collected stormwater from basements

3. Other wastewater discharges covered by this permit include process and non-process wastewater that meet the eligibility criteria and could not be covered under other specific general NPDES permit.

4. To enroll under this general permit, a discharger must certify that there is no reasonable potential for pollutants other than those regulated by this permit to be in the discharge. Existing and new dischargers enrolling under this permit are required to collect a representative groundwater or wastewater sample and analyze it for all the constituents listed on Attachment A. Existing dischargers shall conduct this analysis and submit the result with a Notice of Intent Form, otherwise the existing authorization will be terminated.

5. Pursuant to section 2, Article X, California Constitution, and section 275 of the California Water Code on preventing waste and unreasonable use of waters of the state, this Regional Board encourages, wherever practical, water conservation and/or re-use of wastewater. To obtain coverage under this Order, the discharger shall first investigate the feasibility of conservation, land disposal and/or reuse of the wastewater.

6. This Regional Board adopted *Waste Discharge Requirements for Municipal Storm Water and Urban Runoff Discharges within the County of Los Angeles* contained in Order No. 01-182 [NPDES No. CAS614001] and *Waste Discharge Requirements for Municipal Stormwater and Urban Runoff Discharges within Ventura County Flood Control District, County of Ventura, and the Cities of Ventura County* contained in Order No. 00-108 [NPDES No. CAS004002] on July 15, 1996, and July 27, 2000, respectively. These Orders prohibit non-stormwater discharges to storm drain systems unless they are covered by separate NPDES permits. This prohibition, in general, does not apply to rising groundwater, uncontaminated groundwater infiltration discharges, discharges from potable water distribution

system releases[1], foundation and footing drains discharges, and water from crawl space pumps. The municipality may allow discharge of these types of discharges into the storm drain system. However, the municipality or the Regional Board may prohibit these discharges if they are determined to cause, or threaten to cause, degradation of water quality, violation of water quality objectives, cause nuisance and/or impair beneficial uses of receiving waters.

C. Legal Authorities

This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations adopted by the U.S. Environmental Protection Agency (USEPA) and chapter 5.5, division 7 of the California Water Code (commencing with section 13370). It shall serve as a NPDES permit for point source discharges from this facility to surface waters. This Order also serves as Waste Discharge Requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the Water Code (commencing with section 13260).

D. Background and Rationale for Requirements

The Regional Water Board developed the requirements of this Order based on information submitted as part of the applications for several like facilities, through monitoring and reporting programs, and through special studies and the following information.

1. The effluent limitations for discharges covered under this permit are calculated assuming no dilution. For most practical purposes, discharges from facilities covered under this permit do not flow directly into receiving water with significant flow volume to consider dilution credit or to allocate a mixing zone. Most discharges flows to storm drain systems that discharge to creeks and streams. Many of these creeks and streams are dry during the summer months. Therefore, for many months of the year, these discharges may represent all or nearly all of the flow in some portions of the receiving creeks or streams. These discharges therefore have the potential to recharge groundwaters protected as drinking waters.

   An exception to this policy may be applied based on approved mixing zone study and based on demonstration of compliance with water quality objectives in the receiving water as prescribed in the Basin Plan. This exception process is more appropriate for an individual permit, and would not be appropriate for a general permit, that should be protective of most stringent water quality objectives and beneficial uses. If discharger requests that a dilution credit be included in the computation of effluent limit or that a mixing zone be allowed, an individual permit will be required. However, if no mixing zone is proposed, this general permit provides coverage for all discharges to receiving water bodies in Coastal Watersheds of Los Angeles and Ventura Counties.

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1 "Potable Water Distribution Systems Releases" means sources of flows from drinking water storage, supply and distribution systems including flows from system failures, pressure releases, system maintenance, distribution line testing, fire hydrant flow testing; and flushing and dewatering of pipes, reservoirs, vaults, and minor non-invasive well maintenance activities not involving chemical addition(s). It does not include wastewater discharges from activities that occur at wellheads, such as well construction, well development (i.e., aquifer pumping tests, well purging, etc.), or major well maintenance.

2. This order regulates the discharge of groundwater that may or may not be impacted by toxic compounds and/or conventional pollutants.

   Various biological, chemical, physical, thermal treatment systems could be employed to remove these toxic or conventional pollutants in groundwater to applicable permit limits. For example, air stripping, carbon absorption, chemical oxidation treatment systems could be used to remove volatile organic compounds in groundwater. Reverse osmosis, ion exchange, or pH adjustment could be used as treatment technologies to remove conventional pollutants and metals. Biological systems could be used to degrade or remove semi-volatile organic compounds. This permit does not provide specific treatment technologies for the universe of toxic compounds that could be found in groundwater. When treatment is required prior to discharge, dischargers will be required to submit schematics of treatment flow diagrams with descriptions of the treatment system including statements on the effectiveness of the system to achieve the applicable permit limits during the permit process.

3. This permit includes effluent limitations for metals in discharges from dewatering or other operations to both freshwater and saltwater. For purposes of this permit, saltwater is defined as waterbodies with saline, estuarine or marine beneficial use designations. Additional clarification for applying saltwater objectives is contained in the CTR. All other inland surface waters are considered freshwater. The toxicity of certain metals in freshwater including cadmium, chromium III, copper, lead, nickel, silver, and zinc is dependent on water hardness. The CTR expresses the objectives for these metals through equations where the hardness of the receiving water is a variable. To simplify the permitting process, it is necessary that fixed hardness values be used in these equations. This order requires the discharger to propose appropriate receiving water hardness or effluent hardness based on analytical results of receiving water or effluent samples. Upon approval of the Executive Officer, this hardness value will be used to determine the appropriate metal limitation from the appropriate table of limits (E. 2. b. i.) in the Order.

4. Total Maximum Daily Load (TMDLs) for metals, nutrients and other toxic pollutants have been developed for various watersheds in Los Angeles and Ventura County Watersheds. Where ever applicable, Section V.B. of this Order prescribes appropriate TMDL for these pollutants. Generally where wet weather and dry weather TMDLs are specified this permit applies only dry weather TMDL to streamline the permitting process. However, where wet weather TMDL is specified and no dry weather TMDL is specified, then wet weather TMDL is specified in this permit. Receiving water with specified TMDL include Los Angeles River and tributaries (copper, cadmium, lead, zinc and silver), Ballona Creek and tributaries (copper, lead, zinc, and silver), San Gabriel River and tributaries (copper, lead, zinc, and silver), Calleguas Creek and tributaries and Mugu Lagoon (copper, nickel, lead, zinc, silver and pesticides). TMDL limitations will not be prescribed for discharges that show no reasonable potential for these constituents to be in the effluent above the applicable screening criteria. If Discharge can not meet these effluent limitations immediately, Discharger can apply for individual permit and seek a Time Schedule Order with interim limits for the pollutants of concern.

6. Because this Order is intended to serve as a general NPDES permit and covers discharges to all surface waters in the Los Angeles Region, the effluent limitations establish pursuant to this general order are established to protect the most protective water quality objective for the surface water beneficial uses in the Los Angeles Region.

E. California Environmental Quality Act (CEQA)

Under Water Code section 13389, this action to adopt an NPDES permit is exempt from the provisions of CEQA, Public Resources Code sections 21100-21177.

F. Technology-Based Effluent Limitations

Section 301(b) of the CWA and implementing USEPA permit regulations at section 122.44, title 40 of the Code of Federal Regulations[2], require that permits include conditions meeting applicable technology-based requirements at a minimum, and any more stringent effluent limitations necessary to meet applicable water quality standards. The discharge authorized by this Order must meet minimum federal technology-based requirements based on Best Professional Judgment (BPJ) in accordance with Part 125, section 125.3 of CWA.

G. Water Quality-Based Effluent Limitations

Section 301(b) of the CWA and section 122.44(d) require that permits include limitations more stringent than applicable federal technology-based requirements where necessary to achieve applicable water quality standards.

Section 122.44(d)(1)(i) mandates that permits include effluent limitations for all pollutants that are or may be discharged at levels that have the reasonable potential to cause or contribute to an exceedance of a water quality standard, including numeric and narrative objectives within a standard. Where reasonable potential has been established for a pollutant, but there is no numeric criterion or objective for the pollutant, water quality-based effluent limitations (WQBELs) must be established using: (1) USEPA criteria guidance under CWA section 304(a), supplemented where necessary by other relevant information; (2) an indicator parameter for the pollutant of concern; or (3) a calculated numeric water quality criterion, such as a proposed state criterion or policy interpreting the state's narrative criterion, supplemented with other relevant information, as provided in section 122.44(d)(1)(vi). The WQBELs are based on the Basin Plan, other State plans and policies, or USEPA water quality criteria which are taken from the California Toxics Rule (CTR). These requirements, as they are met, will protect and maintain existing beneficial uses of the receiving water. The attached fact sheet for this Order includes specific bases for the effluent limitations.

H. Water Quality Control Plans.

The Regional Water Board adopted a Water Quality Control Plan for the Los Angeles Region (hereinafter Basin Plan) on June 13, 1994, that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies

[2] All further statutory references are to title 40 of the Code of Federal Regulations unless otherwise indicated.

to achieve those objectives for all waters addressed through the plan. In addition, the Basin Plan implements State Water Resources Control Board Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply.

1. Basin Plan. The Basin Plan contains water quality objectives for, and lists the beneficial uses of, specific water bodies (receiving waters) in the Los Angeles Region. Typical beneficial uses covered by this Order include the following:

    a. Inland surface waters above an estuary - municipal and domestic supply, industrial service and process supply, agricultural supply, groundwater recharge, freshwater replenishment, aquaculture, warm and cold freshwater habitats, inland saline water and wildlife habitats, water contact and noncontact recreation, fish migration, and fish spawning, preservation of rare and endangered species, preservation of biological habitats, and shellfish harvesting.

    b. Inland surface waters within and below an estuary - industrial service supply, marine and wetland habitats, estuarine and wildlife habitats, water contact and noncontact recreation, commercial and sport fishing, aquaculture, migration of aquatic organisms, fish migration, fish spawning, preservation of rare and endangered species, preservation of biological habitats, and shellfish harvesting.

    c. Coastal Zones (both nearshore and offshore) - industrial service supply, navigation, water contact and noncontact recreation, commercial and sport fishing, marine habitat, wildlife habitat, fish migration and spawning, shellfish harvesting, and rare, threatened, or endangered species habitat.

Requirements of this Order implement the Basin Plan.

Total Maximum Daily Loads: Section 303(d) of the CWA requires states to identify specific water bodies where water quality standards are not expected to be met after implementation of technology-based effluent limitations on point sources. Los Angeles Region has been developing TMDLs for metals, nutrients and other toxic compounds. This Order implements approved and relevant TMDLs. Attachment B prescribes the limits for the pollutants that are waterbody specific. Detailed discussion on TMDLs is provided in the Attachment F.

2. The State Board adopted a *Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Water and Enclosed Bays and Estuaries of California* (Thermal Plan) on May 18, 1972, and amended this plan on September 18, 1975.

3. The State Board adopted a *Water Quality Control Policy for the Enclosed Bays and Estuaries of California* in May 1974 (Policy). The Policy contains narrative and numerical water quality objectives that are designed to prevent water quality degradation and protect beneficial uses in enclosed bays and estuaries.

The Policy also lists principles of management that include the State Board's goal to phase out all discharges (excluding cooling waters), particularly industrial process water,

to enclosed bays and estuaries as soon as practicable. The waste described above is not considered an industrial process wastewater.

I. National Toxics Rule (NTR) and California Toxics Rule (CTR)

USEPA adopted the NTR on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the CTR. The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

J. State Implementation Policy

On March 2, 2000, the State Water Board adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (State Implementation Policy or SIP). The SIP became effective on April 28, 2000 with respect to the priority pollutant criteria promulgated for California by the USEPA through the NTR and to the priority pollutant objectives established by the Regional Water Board in the Basin Plan. The SIP became effective on May 18, 2000 with respect to the priority pollutant criteria promulgated by the USEPA through the CTR. The State Water Board adopted amendments to the SIP on February 24, 2005 that became effective on July 13, 2005. The SIP establishes implementation provisions for priority pollutant criteria and objectives and provisions for chronic toxicity control. Requirements of this Order implement the SIP.

K. Compliance Schedules and Interim Requirements (Not Applicable)

L. Alaska Rule.

On March 30, 2000, USEPA revised its regulation that specifies when new and revised State and Tribal water quality standards become effective for CWA purposes (40 CFR §131.21, 65 FR 24641, April 27, 2000). Under USEPA's new regulation (also known as the Alaska rule), new and revised standards submitted to USEPA after May 30, 2000, must be approved before being used for CWA purposes. The final rule also provides that standards already in effect and submitted to USEPA by May 30, 2000, may be used for CWA purposes, whether or not approved by USEPA.

M. Stringency of Requirements for Individual Pollutants

This Order contains both technology-based and water quality-based effluent limitations for individual pollutants that are no more stringent than required by CWA. This Order's technology-based pollutant restrictions implement the minimum, applicable federal technology-based requirements. Water quality-based effluent limitations have been scientifically derived to implement water quality objectives that protect beneficial uses. Both the beneficial uses and the water quality objectives have been approved pursuant to federal law and are the applicable federal water quality standards.

N. Antidegradation Policy

Section 131.12 of 40 CFR requires that State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16, which incorporates the requirements of the federal antidegradation policy. Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. As discussed in detail in the Fact Sheet (Attachment F), the permitted discharge is consistent with the antidegradation provision of 40 CFR §131.12 and State Water Board Resolution No. 68-16.

O. Anti-Backsliding Requirements

Sections 402(o)(2) and 303(d)(4) of the CWA and federal regulations at 40 CFR §122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as the effluent limitations in the previous Order.

P. Endangered Species Act.

This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 U.S.C.A. sections 1531 to 1544). This Order requires compliance with effluent limits, receiving water limits, and other requirements to protect the beneficial uses of waters of the state. The discharger is responsible for meeting all requirements of the applicable Endangered Species Act.

Q. Monitoring and Reporting

Section 122.48 of 40 CFR requires that all NPDES permits specify requirements for recording and reporting monitoring results. Sections 13267 and 13383 of the CWC authorize the Regional Water Boards to require technical and monitoring reports. The Monitoring and Reporting Program (hereinafter MRP) establishes monitoring and reporting requirements to implement federal and State requirements. This MRP is provided in Attachment E.

R. Standard and Special Provisions

Standard Provisions, which apply to all NPDES permits in accordance with section 122.41, and additional conditions applicable to specified categories of permits in accordance with section 122.42, are provided in Attachment D. The discharger must comply with all standard provisions and with those additional conditions that are applicable under section 122.42. The Regional Water Board has also included in this Order special provisions applicable to the Discharger. A rationale for the special provisions contained in this Order is provided in the attached Fact Sheet.

S. Provisions and Requirements Implementing State Law (Not Applicable)

T. Notification of Interested Parties.

The Regional Water Board has notified the Discharger and interested agencies and persons of its intent to prescribe Waste Discharge Requirements for the discharge and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet (Attachment F) of this Order.

U. Consideration of Public Comment.

The Regional Water Board, in a public meeting, heard and considered all comments pertaining to the discharge. Details of the Public Hearing are provided in the Fact Sheet (Attachment F) of this Order.

IV. DISCHARGE PROHIBITIONS

A. The discharge of wastes other than those which meet eligibility requirements of this Order is prohibited unless the discharger obtains coverage under another general permit or an individual permit that regulates the discharge of such wastes.

B. Bypass or overflow of untreated or partially treated contaminated groundwater to waters of the State either at the treatment system or from any of the collection or transport systems or pump stations tributary to the treatment system is prohibited.

C. The discharge shall not cause, have a reasonable potential to cause, or contribute to an in-stream excursion above any applicable criterion promulgated by USEPA pursuant to section 303 of the CWA, or water quality objective adopted by the State or Regional Board.

D. The discharge of any radiological, chemical, or biological warfare agent or high level radiological waste is prohibited.

E. The purposeful or knowing discharge of ploychlorinated biphenols (PCBs) is prohibited.

V. EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

1. Discharge of an effluent from the outfall location(s) listed in the enrollment authorization factsheet in excess of the following limitations is prohibited. (In the authorization letter, when a discharger is enrolled under this permit, the Executive Officer shall list in the factsheet each constituent(s) from the appropriate limitations table(s) below that is applicable to the specific discharge).

a. Limits applicable to discharges to freshwater or saltwater bodies

i. Table 1-General Constituents

Constituents	Units	Discharge Limitations	
		Daily Maximum	Monthly Average
Total Suspended Solids	mg/L	150	50
Turbidity	NTU	150	50
BOD_5 20°C	mg/L	30	20
Oil and Grease	mg/L	15	10
Settleable Solids	ml/L	0.3	0.1
Sulfides	mg/L	1.0	
Phenols	mg/L	1.0	
Residual Chlorine	mg/L	0.1	
Methylene Blue Active Substances (MBAS)	mg/L	0.5	

ii. Table 2-Organic compounds

Constituent	Units	Discharge Limitations			
		Other Waters		MUN[3]	
		Daily Max	Monthly Avg.	Daily Max	Monthly Avg.
Volatile Organic Compounds					
1,1,2,2-tetrachloroethane	µg/L	1		0.34	0.17[4]
1,1,2-trichloroethane	µg/L	5		1.2	0.6
1,1,1-trichloroethane	µg/L	200		200	
1,1-dichloroethane	µg/L	5		5	
1,1-dichloroethylene	µg/L	6	3.2	0.11	0.057[4]
1,2-dichloroethane	µg/L	0.50		0.50	0.38[4]
1,2-dichloropropane	µg/L	5		1.1	0.52[4]
1,2-trans-dichloroethylene	µg/L	10		10	
1,3-dichloropropylene	µg/L	0.5		0.5	
Acrolein	µg/L	100		100	
Acrylonitrile	µg/L	1.7	0.66	0.12	0.059[4]
Acetone	µg/L	700		700	
Benzene	µg/L	1.0		1.0	
Bromoform	µg/L	720	360	8.6	4.3
Carbon tetrachloride	µg/L	0.5		0.5	0.25
Chlorobenzene	µg/L	30		30	
Chlorodibromomethane	µg/L	68	34	0.81	0.40[4]

[3] MUN refers to discharges to those waterbodies designated MUN (Municipal and Domestic Supply) identified in the Basin Plan with an "E" or and "I" designation.

[4] If the reported detection level is greater than the effluent limit for this constituent, then a non-detect using ML detection is deemed to be in compliance.

Constituent	Units	Discharge Limitations			
		Other Waters		MUN[3]	
		Daily Max	Monthly Avg.	Daily Max	Monthly Avg.
Dichlorobromomethane	µg/L	92	46	1.1	0.56
Chloroethane	µg/L	100		100	
Chloroform	µg/L	100		100	
Methyl ethyl ketone	µg/L	700		700	
Ethylbenzene	µg/L	700		700	
Ethylene dibromide	µg/L	0.05		0.05	
Methyl tertiary butyl ether (MTBE)	µg/L	5		5	
Methylbromide	µg/L	10		10	
Methylchloride	µg/L	3		3	
Methylene chloride	µg/L	3,200	1,600	9.5	4.7
Tetrachloroethylene	µg/L	5.0		1.6	0.8
Toluene	µg/L	150		150	
Trichloroethylene	µg/L	5.0		5.0	2.7
Vinyl chloride	µg/L	0.5		0.5	
Xylenes	µg/L	1750		1750	
Pesticides and PCBs					
4,4'-DDD	µg/L	0.0017	0.00084	0.0017	0.00083[4]
4,4'-DDE	µg/L	0.0012	0.00059	0.0012	0.00059[4]
Aldrin	µg/L	0.00028	0.00014	0.00027	0.00013[4]
alpha-BHC	µg/L	0.026	0.013	0.0079	0.0039[4]
beta-BHC	µg/L	0.092	0.046	0.028	0.014
Endosulfan Sulfate	µg/L	480	240	220	110
Endrin Aldehyde	µg/L	1.6	0.81	1.5	0.76
Gamma-BHC	µg/L	0.12	0.063	0.039	0.019[4]
PCBs	µg/L	0.00034	0.00017	0.00034	0.00017[4]
Semi-Volatile Organic Compounds					
1,2 Dichlorobenzene	µg/L	600		600	
1,2-Diphenylhydrazine	µg/L	1.1	0.54	0.081	0.040[4]
1,3 Dichlorobenzene	µg/L	5,200	2,600	800	400
1,4 Dichlorobenzene	µg/L	5		5	
2,4,6-Trichlorophenol	µg/L	13	6.5	4.3	2.1[4]
2,4-Dichlorophenol	µg/L	1600	790	190	93
2,4-Dimethylphenol	µg/L	4,600	2,300	1100	540
2,4-Dinitrophenol	µg/L	28,000	14,000	140	70
2,4-Dinitrotoluene	µg/L	18	9.1	0.23	0.11[4]
2-Chloronaphthalene	µg/L	8,600	4,300	3,400	1,700
2-Chlorophenol	µg/L	800	400	241	120
2-Methyl-4,6-Dinitrophenol	µg/L	1540	765	26.9	13.4
3,3-Dichlorobenzidine	µg/L	0.16	0.077	0.088	0.04[4]
Acenaphthene	µg/L	5,400	2,700	2,400	1,200
Anthracene	µg/L	220,000	110,000	19,000	9,600

Constituent	Units	Discharge Limitations			
		Other Waters		MUN[3]	
		Daily Max	Monthly Avg.	Daily Max	Monthly Avg.
Benzidine	µg/L	0.0011	0.00054	0.00025	0.00012[4]
Benzo(a)Anthracene	µg/L	0.098	0.049	0.0089	0.0044[4]
Benzo(a)Pyrene	µg/L	0.098	0.049	0.0089	0.0044[4]
Benzo(b)Fluoranthene	µg/L	0.098	0.049	0.0089	0.0044[4]
Benzo(k)Fluoranthene	µg/L	0.098	0.049	0.0089	0.0044[4]
Bis(2-Chloroethyl)Ether	µg/L	2.8	1.4	0.063	0.031[4]
Bis(2-Chloroisopropyl)Ether	µg/L	340,000	170,000	2,800	1,400
Bis(2-Ethylhexyl)Phthalate	µg/L	11	5.9	3.7	1.8[4]
Butylbenzyl Phthalate	µg/L	10,000	5,200	6,000	3,000
Chrysene	µg/L	0.098	0.049	0.0089	0.0044[4]
Dibenzo(a,h)Anthracene	µg/L	0.098	0.049	0.0089	0.0044[4]
Diethyl Phthalate	µg/L	240,000	120,000	46,000	23,000
Dimethyl Phthalate	µg/L	5,800,000	2,900,000	629,000	313,000
Di-n-Butyl Phthalate	µg/L	24,000	12,000	5,400	2,700
Fluoranthene	µg/L	740	370	600	300
Fluorene	µg/L	28,000	14,000	2,600	1,300
Hexachlorobenzene	µg/L	0.0016	0.00077	0.0015	0.00075[4]
Hexachlorobutadiene	µg/L	100	50	0.89	0.44[4]
Hexachlorocyclopentadiene	µg/L	34,000	17,000	480	240
Hexachloroethane	µg/L	18	8.9	3.8	1.9
Indeno(1,2,3-cd) Pyrene	µg/L	0.098	0.049	0.0088	0.0044[4]
Isophorone	µg/L	1200	600	17	8.4
Naphthalene	µg/L	21		21	
Nitrobenzene	µg/L	3,800	1,900	34	17
N-Nitrosodimethyl amine (NDMA)	µg/L	16	8.1	0.0014	0.00069[4]
N-Nitrosodi-n-Propylamine	µg/L	2.8	1.4	0.011	0.005[4]
N-Nitrosodiphenylamine	µg/L	32	16	10	5.0
Phenol	µg/L	1,000	no limit	1,000	no limit
Pyrene	µg/L	22,000	11,000	1930	960
Miscellaneous					
Asbestos	fib/L	no limit	no limit	14,000,000	7,000,000
Di-isopropyl ether (DIPE)	µg/L	0.8	0	0.8[4]	
1,4-Dioxane	µg/L	3		3	
Perchlorate	µg/L	6		6	
2,3,7,8-TCDD (Dioxin)	µg/L	0.000000028	0.000000014	0.000000026	0.000000013[4]
Tertiary butyl alcohol (TBA)	µg/L	12		12	
Total petroleum hydrocarbons	µg/L	100		100	

b. <u>Limits applicable to discharges to freshwater waterbodies where no TMDLs has been established</u>

i. Table 3-Hardness-dependent metals

Hardness (mg/L)	Units	up to 200		200 – 300		300 and above	
		Monthly Avg.	Daily Max.	Monthly Avg.	Daily Max.	Monthly Avg.	Daily Max.
Cadmium	µg/L	2.8	5	4.1	5	5	5
Copper	µg/L	10.4	20.8	16.6	33.3	22.1	44.4
Lead	µg/L	4.4	8.7	8.3	16.7	12.8	25.6
Nickel	µg/L	60	100	90	100	100	100
Silver	µg/L	4.0	8.1	10	20	20	41
Zinc	µg/L	86	170	130	260	170	350

ii. Table 4-Other compounds

Constituents	Units	Discharge Limitations			
		Other Waters		MUN[3]	
		Daily Max.	Monthly Avg.	Daily Max.	Monthly Avg.
Metals					
Antimony	µg/L	6		6	
Arsenic	µg/L	10		10	
Beryllium	µg/L	4		4	
Chromium III	µg/L	50		50	
Chromium VI	µg/L	16	8	16	8
Cyanide	µg/L	8.5	4.2	8.5	4.2[5]
Mercury	µg/L	0.1	0.05[4]	0.1	0.05[5]
Selenium	µg/L	8	4	8	4
Thallium	µg/L	13	6	3.4	1.7
Organic Compounds					
Pentachlorophenol	µg/L	1.5	0.73	0.56	0.28[5]
Chlordane	µg/L	0.0012	0.00059	0.0012	0.00057[5]
4,4'-DDT	µg/L	0.0012	0.00059	0.0012	0.00059[5]
Dieldrin	µg/L	0.00028	0.00014	0.00028	0.00014[5]
alpha-Endosulfan	µg/L	0.092	0.046	0.092	0.046[5]
beta-Endosulfan	µg/L	0.092	0.046	0.092	0.046[5]
Endrin	µg/L	0.059	0.029	0.059	0.029[5]
Heptachlor	µg/L	0.00042	0.00021	0.00042	0.00021[5]
Heptachlor Epoxide	µg/L	0.00022	0.00011	0.00020	0.00010[5]
Toxaphene	µg/L	0.0015	0.00075	0.0015	0.00073[5]

c. Limits applicable to discharges to freshwater waterbodies where TMDLs has been established

iii. Table 5-Los Angeles River and Tributaries Metals TMDL[6]

[5] If the reported detection level is greater than the effluent limit for this constituent, then a non detect using ML detection is deemed to be in compliance.

Reach	Units	Copper		Lead		Zinc		Selenium		Cadmium	
		Daily Max.	Monthly Avg.	Daily Max.	Monthly Avg.	Daily Max.	Monthly Avg.	Daily Max.	Monthly Avg.	Daily Max.	Monthly Avg.
Reach 5 and 6	µg/L	30	15	19	9.5			5	2.5	3.1	1.6
Reach 4	µg/L	26	13	10	5					3.1	1.6
Reach 3 above LA-Glendale WRP and Verdugo	µg/L	23	11.5	12	6					3.1	1.6
Reach 3 below LA-Glendale WRP	µg/L	26	13	12	6					3.1	1.6
Burbank Western Channel (above WRP)	µg/L	26	13	14.	7					3.1	1.6
Burbank Western Channel (below WRP)	µg/L	19	9.5	9.1	4.5					3.1	1.6
Reach 2 and Arroyo Seco	µg/L	22	11	11	5.5					3.1	1.6
Reach 1	µg/L	23	11.5	12	6					3.1	1.6
Compton Creek	µg/L	19	9.5	8.9	4.5					3.1	1.6
Rio Hondo Rch. 1	µg/L	13	12.5	5.0	2.5	131	65.5			3.1	1.6

ii. Table 6-Ballona Creek and Tributaries Metals TMDL[6]

Constituents	Units	Discharge Limitations	
		Daily Max.	Monthly Avg.
Metals			
Copper	µg/L	24	12.5
Lead	µg/L	13	6.5
Selenium	µg/L	5	2.5
Zinc	µg/L	304	152

iii Table 7-San Gabriel River and its Tributaries

Reach	Units	Copper	Lead	Zinc	Selenium

[6] This effluent limit shall be deemed vacated at such time as Regional Board Resolutions R05-006 and R05-007 are vacated in compliance with a writ of mandate in the mater of Cities of Bellflower et al v. State Water Resources Control Board et al, Los Angeles Superior Court #BS101732. The Regional Board shall provide notice to the discharger of any such action.

		Daily Max.	Monthly Avg.	Daily Max.	Monthly Avg.	Daily Max.	Monthly Avg.	Daily Max.	Monthly Avg.
San Jose Creek Reach 1 (Confluence to temple street)	µg/L							5	2.5
San Jose Creek Reach 2 (Temple St. to I-10 at White Ave.)	µg/L							5	2.5
San Gabriel River Reach 1 (Firestone to Estuary)	µg/L	18	9						
San Gabriel River Reach 2 (Whittier Narrows to Firestone)	µg/L			166	83				
Coyote Creek	µg/L	20	10	106	53	158	79		
Estuary	µg/L	3.7	1.8						

iv. Table 8-Calleguas Creek, its Tributaries and Mugu Lagoon

Reach	Units	Copper		Nickel		Selenium	
		Daily Max.	Monthly Avg.	Daily Max.	Monthly Avg.	Daily Max.	Monthly Avg.
1-Mabu Lagoon	µg/L	----	5.6	----	8.2	----	----
2- Calleguas Creek South	µg/L	----	13.7	----	8.2	----	----
3- Revolon Slough	µg/L	----	27	----	149	----	----
4- Calleguas Creek North	µg/L	----	3.7	----	8.3	----	5
5-Beardsley Channel	µg/L	----	3.7	----	8.3	----	5
6-Arroyo Las Posas	µg/L	----	----	----	----	----	----
7-Arroyo Simi	µg/L	----	----	----	----	----	----
8-Tapo Canyon	µg/L	----	----	----	----	----	----
9-Conejo Creek	µg/L	----	29.1	----	160	----	----
10-Hill Canyon reach of Conejo Creek	µg/L	----	29.1	----	160	----	----
11-Arroyo Santa Rosa	µg/L	----	29.1	----	160	----	----
12-North Fork Conejo Creek	µg/L	----	29.1	----	160	----	----
13-Arroyo Conejo (S.Fork Conejo Cr)	µg/L	----	29.1	----	160	----	----

Table 9-TMDL for Organochloride (OC) Pesticides, Polycholrinated Biphenyls (PCBs) in Calleguas Creek, Its Tributaries, and Magu Lagoon

Constituents	Units	Discharge Limitations	
		Daily Max.	Monthly Avg.
Chlordane	ng/L	1.2	0.59[5]
4,4-DDD	ng/L	1.7	0.84[5]
4,4-DDE	ng/L	1.2	0.59[5]
4,4-DDT	ng/L	1.2	0.59[5]
Dieldrin	ng/L	0.28	0.14[5]
PCBs	ng/L	0.34	0.17[5]
Toxaphene	ng/L	0.33	0.16[5]

d. Table 10-Limits applicable to discharges to saltwater waterbodies

Constituents	Units	Discharge Limitations	
		Daily Max.	Monthly Avg.
Metals			
Antimony	µg/L	6	
Arsenic	µg/L	10	5
Beryllium	µg/L		
Cadmium	µg/L	5	
Chromium III	µg/L	50	
Chromium VI	µg/L	82	41
Copper	µg/L	5.8	2.9
Cyanide	µg/L	1.0	0.50[5]
Lead	µg/L	14	7
Mercury	µg/L	0.1	0.05[5]
Nickel	µg/L	14	6.7
Selenium	µg/L	120	58
Silver	µg/L	2.2	1.1
Thallium	µg/L	13	6
Zinc	µg/L	95	47
Organic Compounds			
Pentachlorophenol	µg/L	13	6.4
Chlordane	µg/L	0.0012	0.00059[5]
4,4'-DDT	µg/L	0.0012	0.00059[5]
Dieldrin	µg/L	0.00028	0.00014[5]
Alpha-Endosulfan	µg/L	0.014	0.0071[5]
Beta-Endosulfan	µg/L	0.014	0.0071[5]
Endrin	µg/L	0.0038	0.0019[5]
Heptachlor	µg/L	0.00042	0.00021[5]
Heptachlor Epoxide	µg/L	0.00022	0.00011[5]
Toxaphene	µg/L	0.00033	0.00016[5]

d. The turbidity to increase to the extent that such an increase causes nuisance or adversely affects beneficial uses; such increase shall not exceed 20% when the natural turbidity is over 50 NTU or 10% when the natural turbidity is 50 NTU or less.

e. Residual chlorine in concentrations that persist and impairs beneficial uses.

f. Any individual pesticide or combination of pesticides in concentrations that adversely affect beneficial uses or increase pesticide concentration in bottom sediments or aquatic life.

3. The discharge shall not alter the color, create a visual contrast with the natural appearance, nor cause aesthetically undesirable discoloration of the receiving waters.

4. The discharge shall not degrade surface water communities and population including vertebrate, invertebrate, and plant species.

5. The discharge shall not damage, discolor, nor cause formation of sludge deposits on flood control structures or facilities nor overload their design capacity.

6. The discharge shall not cause problems associated with breeding of mosquitoes, gnats, black flies, midges, or other pests.

B. Groundwater Limitations

Not Applicable.

VII. PROVISIONS

A. Standard Provisions

1. The Discharger shall comply with all Standard Provisions included in Attachment D of this Order.

2. The Discharger shall comply with the following provisions:

a. The Executive Officer may require any discharger authorized under this Order to apply for and obtain an individual NPDES permit with more specific requirements. The Executive Officer may require any discharger authorized to discharge under this permit to apply for an individual permit only if the discharger has been notified in writing that a permit application is required. This notice shall include a brief statement of the reasons for this decision, an application form, a statement setting a deadline for the discharger to file the application, and a statement that on the effective date of the individual permit, the authority to discharge under this general permit is no longer applicable.

b. The discharger shall comply with all the applicable items of the *Standard Provisions and Reporting for Waste Discharge Requirements* (Standard Provisions), which are part of this general permit (Attachment D). If there is any conflict between provisions stated herein and the Standard Provisions, those provisions stated herein prevail.

c. Prior to application, the discharger shall submit for Executive Officer's approval the list of chemicals and proprietary additives that may affect the discharge, including rates/quantities of application, compositions, characteristics, and material safety data sheets, if any.

d. Oil or oily materials, chemicals, refuse, or other materials that may cause pollution in storm water and/or urban runoff shall not be stored or deposited in areas where they may be picked up by rainfall/urban runoff and discharged to surface waters. Any spill of such materials shall be contained, removed and cleaned immediately.

e. This Order neither exempts the discharger from compliance with any other laws, regulations, or ordinances that may be applicable, nor legalizes the waste disposal facility.

f. The discharger shall at all times properly operate and maintain all facilities and systems installed or used to achieve compliance with this Order.

h. Any discharge authorized under this Order may request to be excluded from the coverage of this Order by applying for an individual permit.

i. Failure to comply with provisions or requirements of this Order, or violation of other applicable laws or regulations governing discharges from treatment facility, may subject the Discharger to administrative or civil liabilities, criminal penalties, and/or other enforcement remedies to ensure compliance. Additionally, certain violations may subject the Discharger to civil or criminal enforcement from appropriate local, state, or federal law enforcement entities.

B. Monitoring and Reporting Program Requirements

The Executive Officer is herby authorized to prescribe a Monitoring and Reporting Program for each authorized discharger. The Discharger shall comply with the MRP accompanying the transmittal for enrollment under this General NPDES permit, and future revisions thereto. If there is any conflict between provisions stated in the MRP and the Regional Water Board Standard Provisions, those provisions stated in the MRP shall prevail.

C. Special Provisions

1. Reopener Provision

a. This Order may be modified, revoked and reissued, or terminated for cause. Reasons for modification may include new information on the impact of discharges regulated under this Order become available, promulgation of new effluent standards and/or regulations, adoption of new policies and/or water quality objectives, and/or new judicial decisions affecting requirements of this Order.

b. Pursuant to 40 CFR sections 122.62 and 122.63, this Order may be modified, revoked and reissued, or terminated for cause. Reasons for modification may include new information on the impact of discharges regulated under this Order become available, promulgation of new effluent standards and/or regulations, adoption of new policies and/or water quality objectives, and/or new judicial decisions affecting requirements of this Order. In addition, if receiving water quality is threatened due to discharges covered under this permit, this permit will be reopened to incorporate more stringent effluent limitations for the constituents creating the threat. TMDLs have not been developed for all the parameters and receiving waters on the 303(d) list. When TMDLs are developed this permit may be reopened to incorporate appropriate limits. In addition, if TMDL identifies that a particular discharge covered under this permit is a load that needs to be reduced; this permit will be reopened to incorporate appropriate TMDL based limit and/or to remove any applicable exemptions.

2. Special Studies, Technical Reports and Additional Monitoring Requirements

Not Applicable

3. Best Management Practices and Pollution Prevention

All Dischargers are encouraged to implement Best Management Practices and Pollution Prevention Plans to minimize pollutant concentrations in the discharge.

4. Construction, Operation and Maintenance Specifications

All owners or operators authorized discharge under the General Permit shall maintain and update, as necessary, a Groundwater Treatment System Operation and Maintenance (O&M) Manual to assure efficient and effective treatment of contaminated groundwater (pollutants concentrations above water quality criteria and goals). The O&M Manual shall address, but not limited to, the following.

The O&M manual shall specify both normal operating and critical maximum or minimum values for treatment process variables including influent concentrations, flow rates, water levels, temperatures, time intervals, and chemical feed rates.

The O&M manual shall specify an inspection and maintenance schedule for active and reserve system and shall provide a log sheet format to document inspection observations and record completion of maintenance tasks.

The O&M manual shall include a Contingency and Notification Plan. The plan shall include procedures for reporting personnel to assure compliance with this General Permit, as well as authorization letters from the Executive Officer.

The O&M manual shall specify safeguards to prevent noncompliance with limitations and requirements of the General Permit resulting from equipment failure, power loss, vandalism, or ten-year return frequency rainfall.

5. Engineering Design Report

For all new dischargers and existing dischargers where significant changes have made since prior submittals to the Regional Water Board, the NOI shall be accompanied by treatment flow schematic diagram and a certification, which demonstrates that the treatment process and the physical design of the treatment components will ensure compliance with the prohibitions, effluent limitations, and other conditions of the General Permit.

7. Special Provisions for Municipal Facilities (POTWs Only)

Not Applicable

8. Other Special Provisions

a. Expiration and Continuation of this Order

This Order expires on June 5, 2013; however, for those dischargers authorized to discharge under this Order, it shall continue in full force and effect until a new order is adopted. Notwithstanding Provision J (Expiration and Continuation of this Order) of Order No. R4-2003-0111, discharges regulated under Order No. R4-2003-0111 on or before sixtieth day of notification of adoption of this Order, that has submitted a completed NOI may continue under Order No. R4-2003-0111 until enrolled under this General Permit.

b. Reauthorization

Upon reissuance of a new general permit order, dischargers authorized under this Order shall file a Notice of Intent or a new Report of Waste Discharge within 60 days of notification by the Executive Officer.

c. Rescission

Except for enforcement purposes, Order No. R4-2003-0111, adopted by this Regional Board on August 7, 2003, is rescinded effective June 5, 2008.

9. Compliance Schedules

Not Applicable

VIII. COMPLIANCE DETERMINATION

Compliance with the effluent limitations contained in section V of this Order will be determined as specified below:

A. General.

Compliance with effluent limitations for priority pollutants shall be determined using sample reporting protocols defined in the MRP and Attachment A of this Order. For purposes of reporting and administrative enforcement by the Regional and State Water Boards, the Discharger shall be deemed out of compliance with effluent limitations if the concentration of the priority pollutant in the monitoring sample is greater than the effluent limitation and greater than or equal to the reporting level (RL).

B. Multiple Sample Data.

When determining compliance with an AMEL for priority pollutants and more than one sample result is available, the Discharger shall compute the arithmetic mean unless the data set contains one or more reported determinations of "Detected, but Not Quantified" (DNQ) or "Not Detected" (ND). In those cases, the Discharger shall compute the median in place of the arithmetic mean in accordance with the following procedure:

1. The data set shall be ranked from low to high, ranking the reported ND determinations lowest, DNQ determinations next, followed by quantified values (if any). The order of the individual ND or DNQ determinations is unimportant.

2. The median value of the data set shall be determined. If the data set has an odd number of data points, then the median is the middle value. If the data set has an even number of data points, then the median is the average of the two values around the middle unless one or both of the points are ND or DNQ, in which case the median value shall be the lower of the two data points where DNQ is lower than a value and ND is lower than DNQ.

C. Average Monthly Effluent Limitation (AMEL).

If the average (or when applicable, the median determined by subsection B above for multiple sample data) of daily discharges over a calendar month exceeds the AMEL for a given parameter, this will represent a single violation, though the Discharger will be considered out of compliance for each day of that month for that parameter (e.g., resulting in 31 days of non-compliance in a 31-day month). If only a single sample is taken during the calendar month and the analytical result for that sample exceeds the AMEL, the Discharger will be considered out of compliance for that calendar month. The

Discharger will only be considered out of compliance for days when the discharge occurs. For any one calendar month during which no sample (daily discharge) is taken, no compliance determination can be made for that calendar month.

D. Average Weekly Effluent Limitation (AWEL).

If the average (or when applicable, the median determined by subsection B above for multiple sample data) of daily discharges over a calendar week exceeds the AWEL for a given parameter, this will represent a single violation, though the Discharger will be considered out of compliance for each day of that week for that parameter, resulting in 7 days of non-compliance. If only a single sample is taken during the calendar week and the analytical result for that sample exceeds the AWEL, the Discharger will be considered out of compliance for that calendar week. The Discharger will only be considered out of compliance for days when the discharge occurs. For any one calendar week during which no sample (daily discharge) is taken, no compliance determination can be made for that calendar week.

E. Maximum Daily Effluent Limitation (MDEL).

If a daily discharge <(or when applicable, the median determined by subsection B above for multiple sample data of a daily discharge)> exceeds the MDEL for a given parameter, the Discharger will be considered out of compliance for that parameter for that 1 day only within the reporting period. For any 1 day during which no sample is taken, no compliance determination can be made for that day.

F. Instantaneous Minimum Effluent Limitation.

If the analytical result of a single grab sample is lower than the instantaneous minimum effluent limitation for a parameter, the Discharger will be considered out of compliance for that parameter for that single sample. Non-compliance for each sample will be considered separately (e.g., the results of two grab samples taken within a calendar day that both are lower than the instantaneous minimum effluent limitation would result in two instances of non-compliance with the instantaneous minimum effluent limitation).

G. Instantaneous Maximum Effluent Limitation.

If the analytical result of a single grab sample is higher than the instantaneous maximum effluent limitation for a parameter, the Discharger will be considered out of compliance for that parameter for that single sample. Non-compliance for each sample will be considered separately (e.g., the results of two grab samples taken within a calendar day that both exceed the instantaneous maximum effluent limitation would result in two instances of non-compliance with the instantaneous maximum effluent limitation).

DEFINITIONS, ACRONYMS & ABBREVIATIONS

DEFINITIONS

Arithmetic Mean (μ), also called the average, is the sum of measured values divided by the number of samples. For ambient water concentrations, the arithmetic mean is calculated as follows:

Arithmetic mean = $\mu = \Sigma x / n$ where: Σx is the sum of the measured ambient water concentrations, and n is the number of samples.

Average Monthly Effluent Limitation (AMEL): the highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.

Average Weekly Effluent Limitation (AWEL): the highest allowable average of daily discharges over a calendar week (Sunday through Saturday), calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week.

Daily Discharge: Daily Discharge is defined as either: (1) the total mass of the constituent discharged over the calendar day (12:00 am through 11:59 pm) or any 24-hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g., concentration).

The daily discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day or other 24-hour period defined as a day) or by the arithmetic mean of analytical results from one or more grab samples taken over the course of the day.

For composite sampling, if 1 day is defined as a 24-hour period other than a calendar day, the analytical result for the 24-hour period will be considered as the result for the calendar day in which the 24-hour period ends.

Detected, but Not Quantified (DNQ) are those sample results less than the RL, but greater than or equal to the laboratory's MDL.

Dilution Credit is the amount of dilution granted to a discharge in the calculation of a water quality-based effluent limitation, based on the allowance of a specified mixing zone. It is calculated from the dilution ratio or determined through conducting a mixing zone study or modeling of the discharge and receiving water.

Effluent Concentration Allowance (ECA) is a value derived from the water quality criterion/objective, dilution credit, and ambient background concentration that is used, in conjunction with the coefficient of variation for the effluent monitoring data, to calculate a long-term average (LTA) discharge concentration. The ECA has the same meaning as waste load allocation (WLA) as used in U.S. EPA guidance (Technical Support Document For Water Quality-based Toxics Control, March 1991, second printing, EPA/505/2-90-001).

Enclosed Bays means indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance

between the headlands or outermost harbor works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays include, but are not limited to, Humboldt Bay, Bodega Harbor, Tomales Bay, Drake's Estero, San Francisco Bay, Morro Bay, Los Angeles-Long Beach Harbor, Upper and Lower Newport Bay, Mission Bay, and San Diego Bay. Enclosed bays do not include inland surface waters or ocean waters.

Estimated Chemical Concentration is the estimated chemical concentration that results from the confirmed detection of the substance by the analytical method below the ML value.

Estuaries means waters, including coastal lagoons, located at the mouths of streams that serve as areas of mixing for fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and seawater. Estuarine waters included, but are not limited to, the Sacramento-San Joaquin Delta, as defined in Water Code section 12220, Suisun Bay, Carquinez Strait downstream to the Carquinez Bridge, and appropriate areas of the Smith, Mad, Eel, Noyo, Russian, Klamath, San Diego, and Otay rivers. Estuaries do not include inland surface waters or ocean waters.

Inland Surface Waters are all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Instantaneous Maximum Effluent Limitation: the highest allowable value for any single grab sample or aliquot (i.e., each grab sample or aliquot is independently compared to the instantaneous maximum limitation).

Instantaneous Minimum Effluent Limitation: the lowest allowable value for any single grab sample or aliquot (i.e., each grab sample or aliquot is independently compared to the instantaneous minimum limitation).

Maximum Daily Effluent Limitation (MDEL) means the highest allowable daily discharge of a pollutant, over a calendar day (or 24-hour period). For pollutants with limitations expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Median is the middle measurement in a set of data. The median of a set of data is found by first arranging the measurements in order of magnitude (either increasing or decreasing order). If the number of measurements (n) is odd, then the median = $X_{(n+1)/2}$. If n is even, then the median = $(X_{n/2} + X_{(n/2)+1})/2$ (i.e., the midpoint between the $n/2$ and $n/2+1$).

Method Detection Limit (MDL) is the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero, as defined in title 40 of the Code of Federal Regulations, Part 136, Attachment B, revised as of July 3, 1999.

Minimum Level (ML) is the concentration at which the entire analytical system must give a recognizable signal and acceptable calibration point. The ML is the concentration in a sample that is equivalent to the concentration of the lowest calibration standard analyzed by a specific analytical procedure, assuming that all the method specified sample weights, volumes, and processing steps have been followed.

Mixing Zone is a limited volume of receiving water that is allocated for mixing with a wastewater discharge where water quality criteria can be exceeded without causing adverse effects to the overall water body.

Not Detected (ND) are those sample results less than the laboratory's MDL.

Ocean Waters are the territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Water Board's California Ocean Plan.

Persistent pollutants are substances for which degradation or decomposition in the environment is nonexistent or very slow.

Pollutant Minimization Program (PMP) means waste minimization and pollution prevention actions that include, but are not limited to, product substitution, waste stream recycling, alternative waste management methods, and education of the public and businesses. The goal of the PMP shall be to reduce all potential sources of a priority pollutant(s) through pollutant minimization (control) strategies, including pollution prevention measures as appropriate, to maintain the effluent concentration at or below the water quality-based effluent limitation. Pollution prevention measures may be particularly appropriate for persistent bioaccumulative priority pollutants where there is evidence that beneficial uses are being impacted. The Regional Water Board may consider cost effectiveness when establishing the requirements of a PMP. The completion and implementation of a Pollution Prevention Plan, if required pursuant to Water Code section 13263.3(d), shall be considered to fulfill the PMP requirements.

Pollution Prevention means any action that causes a net reduction in the use or generation of a hazardous substance or other pollutant that is discharged into water and includes, but is not limited to, input change, operational improvement, production process change, and product reformulation (as defined in Water Code section 13263.3). Pollution prevention does not include actions that merely shift a pollutant in wastewater from one environmental medium to another environmental medium, unless clear environmental benefits of such an approach are identified to the satisfaction of the State or Regional Water Board.

Reporting Level (RL) is the ML (and its associated analytical method) chosen by the Discharger for reporting and compliance determination from the MLs included in this Order. The MLs included in this Order correspond to approved analytical methods for reporting a sample result that are selected by the Regional Water Board either from Appendix 4 of the SIP in accordance with section 2.4.2 of the SIP or established in accordance with section 2.4.3 of the SIP. The ML is based on the proper application of method-based analytical procedures for sample preparation and the absence of any matrix interferences. Other factors may be applied to the ML depending on the specific sample preparation steps employed. For example, the treatment typically applied in cases where there are matrix-effects is to dilute the sample or sample aliquot by a factor of ten. In such cases, this additional factor must be applied to the ML in the computation of the RL.

Satellite Collection System is the portion, if any, of a sanitary sewer system owned or operated by a different public agency than the agency that owns and operates the wastewater treatment facility that a sanitary sewer system is tributary to.

Source of Drinking Water is any water designated as municipal or domestic supply (MUN) in a Regional Water Board Basin Plan.

Standard Deviation (σ) is a measure of variability that is calculated as follows:

$$\sigma = (\Sigma[(x - \mu)^2]/(n - 1))^{0.5}$$

where:

x is the observed value;

μ is the arithmetic mean of the observed values; and

n is the number of samples.

Toxicity Reduction Evaluation (TRE) is a study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE, if appropriate. (A TIE is a set of procedures to identify the specific chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.)

ACRONYMS & ABBREVIATIONS

AMEL	Average Monthly Effluent Limitation
B	Background Concentration
BAT	Best Available Technology Economically Achievable
Basin Plan	*Water Quality Control Plan for the Coastal Watersheds of Los Angeles and Ventura Counties*
BCT	Best Conventional Pollutant Control Technology
BMP	Best Management Practices
BMPPP	Best Management Practices Plan
BPJ	Best Professional Judgment
BOD	Biochemical Oxygen Demand
BPT	Best practicable treatment control technology
C	Water Quality Objective
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CTR	California Toxics Rule
CV	Coefficient of Variation
CWA	Clean Water Act
CWC	California Water Code
DMR	Discharge Monitoring Report
DNQ	Detected But Not Quantified
ECA	Effluent Concentration Allowance
ELAP	California Department of Health Services Environmental Laboratory Accreditation Program
ELG	Effluent Limitations, Guidelines and Standards
gpd	gallons per day
IC	Inhibition Coefficient
IC_{15}	Concentration at which the organism is 15% inhibited
IC_{25}	Concentration at which the organism is 25% inhibited
IC_{40}	Concentration at which the organism is 40% inhibited
IC_{50}	Concentration at which the organism is 50% inhibited
LA	Load Allocations
LOEC	Lowest Observed Effect Concentration
LTA	Long-Term Average
MDEL	Maximum Daily Effluent Limitation
MDL	Method Detection Limit
MEC	Maximum Effluent Concentration
MGD	Million Gallons Per Day
mg/L	Milligrams per Liter
ML	Minimum Level
MRP	Monitoring and Reporting Program
ND	Not Detected
NOEC	No Observable Effect Concentration
NPDES	National Pollutant Discharge Elimination System
NSPS	New Source Performance Standards
NTR	National Toxics Rule
OAL	Office of Administrative Law

POTW	Publicly-Owned Treatment Works
PMP	Pollutant Minimization Plan
QA	Quality Assurance
QA/QC	Quality Assurance/Quality Control
RPA	Reasonable Potential Analysis
RWQCB	Regional Water Quality Control Board
SCP	Spill Contingency Plan
SIP	State Implementation Policy (*Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California*)
SMR	Self Monitoring Reports
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	Test Acceptability Criteria
TDS	Total Dissolved Solids
TIE	Toxicity Identification Evaluation
TMDL	Total Maximum Daily Load
TOC	Total Organic Carbon
TRE	Toxicity Reduction Evaluation
TSD	Technical Support Document
TSS	Total Suspended Solid
TU	Toxicity Unit
USEPA	United States Environmental Protection Agency
WDR	Waste Discharge Requirements
WET	Whole Effluent Toxicity
WLA	Waste Load Allocations
WQBEL	Water Quality-Based Effluent Limitation
µg/L	Micrograms per Liter

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, California 93003

IN REPLY REFER TO:
08EVEN00-2012-F-0531

December 12, 2012

Antal Szijj, Senior Project Manager
Department of the Army
Los Angeles District, Corps of Engineers
2151 Alessandro Drive, Suite 110
Ventura, California 93001

Subject: Final Programmatic Biological and Conference Opinion for Ventura County Watershed Protection District's Routine Operation and Maintenance Program, Ventura County, California (8-8-11-F/C-12)

This document transmits the U.S. Fish and Wildlife Service's (Service) biological and conference opinion regarding the Ventura County Watershed Protection District's (District) routine operations and maintenance program (O&M Program) proposed for authorization by the U.S. Army Corps of Engineers (Corps). At issue are the effects of this action on the federally endangered tidewater goby (*Eucyclogobius newberryi*) and its critical habitat, least Bell's vireo (*Vireo bellii pusillus*), southwestern willow flycatcher (*Empidonax traillii extimus*) and its proposed critical habitat, California least tern (*Sterna antillarum browni*), arroyo toad (*Anaxyrus* californicus), Ventura marsh milk-vetch (*Astragalus pycnostachyus* var. *lanosissimus*), marsh sandwort (*Arenaria paludicola*), Gambel's watercress (*Nasturtium* [*Rorippa*] *gambellii*), and the federally threatened California red-legged frog (*Rana draytonii*) and its critical habitat, coastal California gnatcatcher (*Polioptila californica*) and its critical habitat, and the western snowy plover (*Charadrius nivosus nivosus*) and its critical habitat in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act) (16 U.S.C. 1531 *et seq*.).

The District's O&M Program involves routine maintenance, minor repair, mitigation/restoration, and implementation of the Beach Elevation Management Plan (BEMP) necessary to maintain the conveyance of stormwater throughout Ventura County. A majority of the work done under the O&M Program is routine maintenance that occurs periodically at District facilities; however, the O&M Program is not static. The location and extent of maintenance that occurs each year fluctuates depending on facility conditions and budgets: unpredictable repairs to facilities are necessary following storm events; mitigation/restoration is implemented as necessary; and new facilities may be added to the O&M Program at any time.

To accommodate the dynamic nature of the O&M Program, this document is structured to provide a program-level assessment of effects to listed species and critical habitats, and will be amended by the submittal of work plans outlining specific tasks as they are proposed to the Corps for authorization. To achieve this flexibility this document includes two components:

1) a program-wide concurrence for species and critical habitats that the Corps determined are not likely to be adversely affected by any aspect of the O&M Program; this concurrence concludes Section 7 consultation for this subset of species and critical habitat; and 2) a programmatic consultation and conference opinion for species or critical habitats that may be affected by one or more of the specific projects within the O&M Program; for this set of species a determination will be made by the Corps whether each project "may affect, and is likely to adversely affect" or "may affect, and is not likely to adversely affect" one or more of the covered species. A summary of how all of the species described above are covered by this document is shown in Table 1.

Table 1. Summary table of species and critical habitats that are covered through the program-wide concurrence or are subject to the programmatic consultation.

Species	Corps Determination	Service Response
California red-legged frog	May affect, likely to adversely affect *or* not likely to adversely affect	**Programmatic Consultation**
California red-legged frog designated critical habitat	May affect, likely to adversely affect *or* not likely to adversely affect	
Least Bell's vireo	May affect, likely to adversely affect *or* not likely to adversely affect	
Southwestern willow flycatcher	May affect, likely to adversely affect *or* not likely to adversely affect	
Southwestern willow flycatcher proposed critical habtiat[1]	May affect, likely to adversely affect *or* not likely to adversely affect	
Tidewater goby	May affect, likely to adversely affect *or* not likely to adversely affect	
Tidewater goby designated critical habtiat	May affect, likely to adversely affect *or* not likely to adversely affect	
Coastal California gnatcatcher	May affect, not likely to adversely affect	**Program-wide Concurrence**
Coastal California gnatcatcher designated critical habitat	May affect, not likely to adversely affect	
Gambel's watercress	May affect, not likely to adversely affect	
Marsh sandwort	May affect, not likely to adversely affect	
California least tern	May affect, not likely to adversely affect	
Western snowy plover	May affect, not likely to adversely affect	
Western snowy plover critical habtiat	May affect, not likely to adversely affect	
Arroyo toad [2]	No effect	**No Response**
Ventura marsh milk-vetch[2]	No effect	

[1] A programmatic conference opinion is provided that will convert to a biological opinion upon final designation of critical habitat for the southwestern willow flycatcher.

[2] The Corps and Service are not required to consult on "no effect" determinations.

This biological opinion is based on information provided by the Corps and the District including the Final Environmental Impact Report (District 2008), Impact Analysis for Federally-listed

Species (District 2010), survey reports for listed species in the project area, site visit notes, correspondence between my staff and the District, and information in our files. A complete record of this consultation can be made available at the Ventura Fish and Wildlife Office.

CONSULTATION HISTORY

July 31, 2008	The Corps submitted a request for consultation on the subject project and made the following determinations about the projects effects to listed species: Tidewater goby – may affect Tidewater goby critical habitat – not likely to adversely affect California red-legged frog – not likely to adversely affect California red-legged frog critical habitat – not likely to adversely affect Arroyo toad – not likely to adversely affect Arroyo toad critical habitat – not likely to adversely affect Western snowy plover – not likely to adversely affect Western snowy plover critical habitat – not likely to adversely affect Least Bell's vireo – not likely to adversely affect California gnatcatcher – not likely to adversely affect California gnatcatcher critical habitat – not likely to adversely affect California least tern – not likely to adversely affect Ventura marsh milk-vetch – not likely to adversely affect
October 17, 2008	The Service concurred with your not likely to adversely affect determinations for the routine activities performed by the O&M Program, and requested additional information necessary to initiate formal consultation for the tidewater goby.
2009	During ongoing discussions between the Corps, District and Service, it became clear that the development of a programmatic biological opinion covering the breadth of activities and continual addition of new facilities and mitigation sites associated with the District's O&M Program would allow the Corps flexibility to quickly approve and implement the District's projects that may affect listed species. During the discussions that led up to the issuance of this biological opinion, the Service continued to engage in individual consultations with the Corps for District projects on an as needed basis.
August 19, 2010	The Corps submitted to the Service a document developed by the District titled, "Ventura County Watershed Protection District Operations and Maintenance Program Impact Analysis for Federally-Listed Species," in support of your July 31, 2008 request for consultation.
October 2010- January 2011	The Corps, District and Service held meetings and conducted site visits to discuss the consultation and evaluate the various types of facilities and habitats that would be subject to the programmatic consultation.

January 19, 2011	The Corps submitted a consultation request including the following determinations: Least Bell's vireo – may affect California red-legged frog – may affect California red-legged frog critical habitat – may affect Southwestern willow flycatcher – no effect Arroyo toad – no effect Ventura marsh milk-vetch – no effect Tidewater goby – may affect Tidewater goby critical habitat – may affect Western snowy plover – not likely to adversely affect Western snowy plover critical habitat – not likely to adversely affect California least tern – not likely to adversely affect Coastal California gnatcatcher – not likely to adversely affect Coastal California gnatcatcher critical habitat – not likely to adversely affect
March 23, 2011	The Service, Corps, and District met and discussed the anticipated release of proposed critical habitat for the southwestern willow flycatcher, which included areas where District facilities are located, and potential for marsh sandwort and Gambel's watercress to occur within District facilities.
December 20, 2011	The Corps amended the consultation request to add/revise the following effects determinations: Marsh sandwort - not likely to adversely affect Gambel's watercress - not likely to adversely affect Southwestern willow flycatcher – may affect Southwestern willow flycatcher proposed critical habitat – may affect
February 1, 2012	The Service issued an acknowledgement letter stating that the biological opinion is estimated to be issued 6 weeks following the receipt of all necessary information.
May 24, 2012	The District transmitted the final information necessary to complete the consultation.

PROGRAM-WIDE CONCURRENCE AND ACKNOWLEDGEMENT

You determined that the O&M Program may affect, but is not likely to adversely affect Gambel's watercress, marsh sandwort, coastal California gnatcatcher and its critical habitat, western snowy plover and its critical habitat, and California least tern. We concur with your determination based on the following:

Gambel's watercress and marsh sandwort

- The District will conduct comprehensive surveys within the 6.98 acres of facilities identified as having suitable habitat within the first year following the issuance of the Corps authorization for the O&M Program (District 2011);
- The Service will provide the District with a list of individuals that are qualified to positively identify both plants, or will provide training to District biologists so that they are qualified to identify both plants;
- District staff will opportunistically survey for Gambel's watercress and marsh sandwort while conducting routine biological surveys throughout the life of the O&M Program; and
- If any Gambel's watercress or marsh sandwort is found, no project activities that could injure or destroy the plants would take place until additional consultation can be conducted.

Coastal California gnatcatcher and its critical habitat

- No suitable nesting habitat is located within maintenance areas;
- Currently, none of the suitable habitat adjacent to District facilities is known to be occupied by coastal California gnatcatchers;
- Where suitable habitat for the coastal California gnatcatcher occurs adjacent to District facilities if long-term operations (more than 1 day) with heavy equipment are planned for the facility reaches identified with adjacent suitable habitat, a qualified biologist will survey for coastal California gnatcatchers for three mornings within 7 days prior to such work to determine presence or absence. If work will last longer than 3 days, the monitor will conduct morning surveys every other day before work begins to check for adjacent California gnatcatcher activity. If gnatcatchers are present in adjacent habitats, work will stop and the Corps and District will coordinate with the Service to achieve the appropriate level of consultation (District 2010); and
- The District maintains three sedimentation basins within designated critical habitat for the coastal California gnatcatcher; however, the basins do not support the primary constituent elements of coastal California gnatcatcher critical habitat.

Western snowy plover and its critical habitat

- No District facilities are located within areas known to support western snowy plover nesting;
- If beach grooming activities associated with the BEMP (described below) are conducted during the nesting season for the western snowy plover (March 1 to September 15), the District will conduct surveys or coordinate with western snowy plover monitors in the area to ensure that no nesting is occurring within the grooming location or access route. If a nest is detected, grooming activities will not commence until appropriate consultation is reached.
- BEMP equipment will travel along the same path that is currently used by lifeguard vehicles to reduce disturbance of western snowy plover habitat;
- BEMP activities would not affect the primary constituent elements of the western snowy plover critical habitat;

California least tern

- No District facilities are located within areas known to support California least tern nesting;
- Foraging and roosting in the vicinity of District facilities near the Ventura River estuary, Santa Clara River estuary, and Mugu Lagoon would not be precluded by O&M activities;

- If beach grooming activities associated with the BEMP are conducted during the nesting season for the California least tern (March 15 to August 15), the District will conduct surveys or coordinate with western snowy plover monitors in the area to ensure that no California least tern nesting is occurring within the grooming location or access route. If a nest is detected, grooming activities will not commence until appropriate consultation is reached.
- BEMP equipment will travel along the same path that is currently used by lifeguard vehicles to reduce disturbance of California least tern habitat;

You have also determined that the proposed project will have no effect on the arroyo toad and Ventura marsh milk-vetch. We acknowledge your determination.

ADMINISTRATION OF THE PROGRAMMATIC CONCURRENCE, BIOLOGICAL OPINION, AND CONFERENCE OPINION

Each year the District would prepare an annual work plan that outlines the O&M Program activities to be conducted in the following year. Although the District attempts to anticipate all O&M Program work that would be necessary throughout the year, additional projects may be proposed and transmitted to the Corps in an addendum to the work plan. The Corps would review the District's work plan to determine if the proposed activities would be authorized under the Regional General Permit, and to determine how the proposed projects would affect tidewater gobies, California red-legged frogs, least Bell's vireos, southwestern willow flycatcher and their respective designated critical habitat. All proposed projects that the Corps determines may affect, but are not likely to adversely affect these species and critical habitats would be subject to the programmatic concurrence procedures below. Projects that the Corps determines may affect, and will likely adversely affect these species and critical habitat would be subject to the programmatic biological opinion and conference opinion.

Programmatic Concurrence
For projects where effects to tidewater goby, California red-legged frog, least Bell's vireo, and/or southwestern willow flycatcher and their designated critical habitats are insignificant, discountable, or completely beneficial, a "not likely to adversely affect" determination is appropriate. The Service defines these thresholds as follows:

- Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Based on best judgment, a person would not be able to meaningfully measure, detect, or evaluate insignificant effects;

- Discountable effects are those extremely unlikely to occur. Based on best judgment a person would not expect discountable effects to occur;

- Beneficial effects are contemporaneous positive effects without any adverse effects to the species.

In order for activities to be incorporated into the programmatic concurrence, the Corps must notify our office in writing or via electronic mail (email), at least 30 days prior to the start of project activities. We will review the Corps' notification and respond in writing or via email

with our concurrence or non-concurrence. If we do not concur with the Corps' determination, the activity would be subject to the programmatic biological opinion and/or conference opinion. The Service will strive to respond within 30 days, but will request an extension if additional processing time is necessary.

Programmatic Biological Opinion and Conference Opinion

All proposed projects within the District's O&M Program that the Corps determines may affect, and are likely to adversely affect the tidewater goby, California red-legged frog, least Bell's vireo, and/or southwestern willow flycatcher and their respective designated critical habitats will be subject to this biological opinion. The programmatic consultation and conference opinion in this document is based on an appended programmatic consultation approach, which is a two-stage consultation process. This document represents the first stage and includes the initial development of a programmatic biological opinion that analyzes the potential landscape-level effects that may result from implementing the District's O&M Program. The second stage involves the development of documentation that outlines the specific project activities that are proposed to be implemented under the auspices of this biological opinion (i.e., annual work plans or annual work plan addenda). Upon submission of the work plans by the District, the Corps will determine whether the projects within the work plan are consistent with the tasks outlined in the "Description of the Proposed Action" section of this biological opinion, and whether the proposed activities and anticipated effects fall within the scope of the effects analysis of the biological opinion, and associated incidental take statement. If all projects within the work plan are determined to be sufficiently evaluated by this biological opinion, the work plan is then appended to the programmatic biological opinion. This programmatic document, together with the appended project-specific documentation, encompasses the complete consultation document for each individual work plan. If projects are deemed to be inadequately covered by this biological opinion, a separate consultation must be initiated.

At least 30 days prior to conducting any O&M Program activities that are likely to adversely affect the tidewater goby, California red-legged frog, least Bell's vireo, and/or southwestern willow flycatcher and/or designated critical habitat for these species, the Corps will notify the Ventura Fish and Wildlife Office, in writing, of projects they propose to authorize under the auspices of this biological opinion. At a minimum, the following information will accompany the Corps' project notification to the Service:

1. Facility names and numbers (or for mitigation projects that are not located at District facilities, provide a description of the location);

2. Activity codes or brief activity description;

3. Extent of the effects in acres;

4. Species and critical habitats affected; and

5. Description of any proposed modifications to the Best Management Practices (BMP) or minimization measures.

We will review the Corps' notification and respond in writing, or via email, to acknowledge that activities are being conducted under the Programmatic Biological Opinion and Conference Opinion, and to notify the Corps of any concerns or questions regarding the proposed action, or if we feel that there would be effects that would necessitate a separate consultation. Again, the Service will strive to respond within 30 days, but will request an extension if additional processing time is necessary.

BIOLOGICAL AND CONFERENCE OPINION

DESCRIPTION OF THE PROPOSED ACTION

The Corps proposes to issue a Regional General Permit (RGP) to the District for implementation of the O&M Program. The permit would be valid for a period of 5 years. The Corps' permitting process allows for streamlined renewal/reissuance of the RGP after the 5-year permit term elapses if certain criteria are met. If the Corps proposes to reissue the RGP without substantial changes, and none of the consultation reinitiation criteria specified at 50 CFR 402.16 have been otherwise triggered, the Service may reissue the biological opinion without substantial changes as well. Proposed activities within the O&M Program involve routine maintenance and repair of District facilities including implementation of the BEMP program, and mitigation/restoration activities. The Corps' RGP and this biological opinion do not consider emergency actions, the construction of entirely new facilities, or projects that substantially expand facilities, and such actions will not be discussed further in this consultation.

The District only maintains its own facilities and does not routinely conduct activities in natural channels or facilities owned and operated by other agencies. District facilities are located throughout Ventura County and occur in each of the three major watersheds of Ventura County-the Ventura River, Santa Clara River, and Calleguas Creek, as well as tributaries to Malibu Creek, and smaller watersheds, which are not hydrologically connected to these major watersheds, such as Ormond Lagoon (Figure 1). District facilities vary in age from recent to over 50 years old and comprise primarily four basic types: debris and detention basins, rock bank protection/levees, channels and confluences, and stream gauges. Important features for each of the District facilities are provided in the District's Catalog of Facilities (District 2008), including type, location, size, routine maintenance actions, and special-status species known to occur or potentially occur in the area.

The specific maintenance actions that are implemented on or near District facilities vary from year to year, as are the specific areas that require maintenance. The type, extent, and frequency of activities undertaken by the District during a given year are dependent on several factors, including the condition of flood-control facilities, the degree of flood hazard, weather forecasts, the environmental impacts of the maintenance activities, and budgetary constraints.

Prior to each work year, the District undergoes a planning process and identifies activities that will be included in the annual work plan for that year. The District then submits the annual work plan to the Corps, National Marine Fisheries Service, California Department of Fish and Game, and the Service for review. Most facilities require the same maintenance actions every year, including vegetation removal and sediment management, and are included in the work plan as

routine maintenance items. The number and type of small repair projects varies each year, and these are included in the annual work plan with details regarding facility, repair type (in-kind or out-of-kind), quantities, work footprint, schedule, potential natural resource impacts, and any proposed compensatory mitigation. After agency review, the annual work plan is revised, if necessary, to respond to any agency comments, or to parse out any projects, which the agencies feel warrant further review, mitigation, or separate consultation. After budgetary approval, the projects are scheduled and implemented.

The annual work plan is also the vehicle to add new facilities to the O&M Program. Each year, if new facilities are constructed or acquired from other entities, they are included in the work plan along with relevant details (i.e., description of facility location, size, species present, O&M activities to be performed, etc.) as were provided for the other facilities.

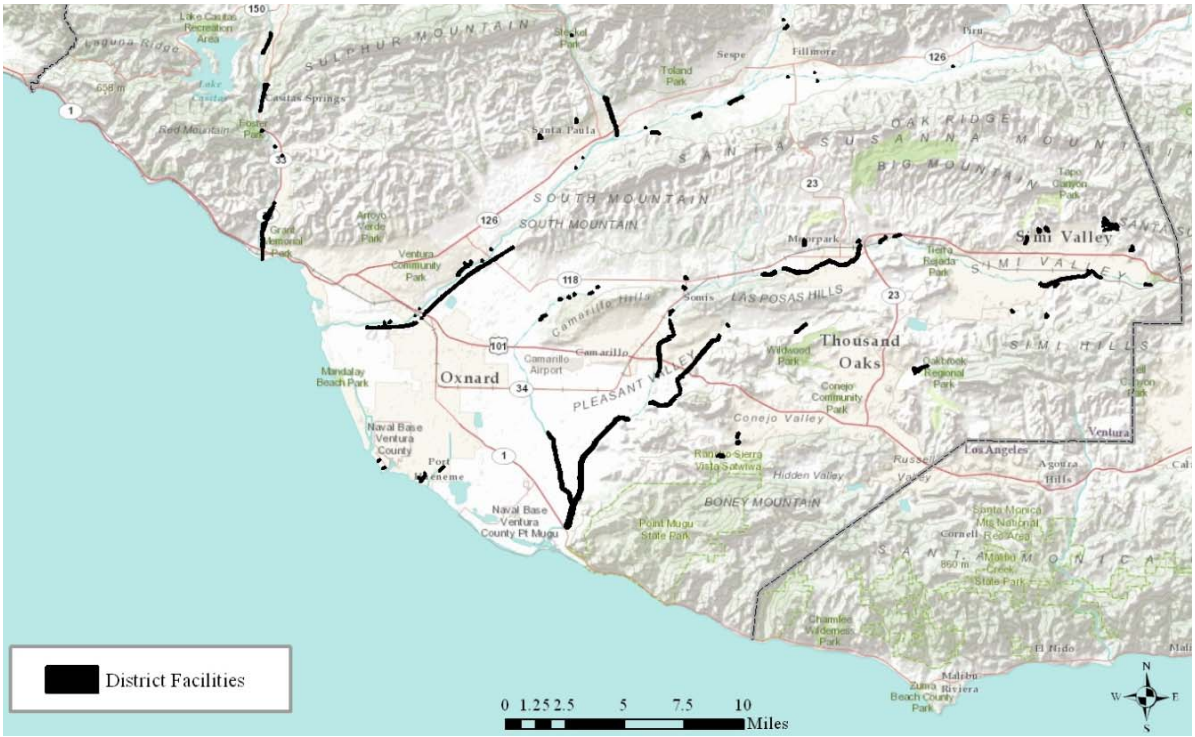

Figure 1. Location of District facilities throughout Ventura County that are within or adjacent to suitable habitat for threatened or endangered species.

Routine Maintenance Activities

The breadth of activities that may appear on annual work plans are summarized below (Table 2).

Table 2. Routine maintenance activity codes and descriptions.

Code	Routine Maintenance Description
PS41	BRUSH & WEED CONTROL, SPRAY WITH BOOM. The application of herbicides, to designated areas, with a boom-mounted spray bar to prevent new growth and/or control existing vegetation, for the purpose of insuring the capacity and integrity of District facilities.
PS42	WEED CONTROL, HAND SPRAY. The application of herbicides, to designated areas, by hand spray to prevent new growth and/or control existing vegetation, for the purpose of insuring the capacity and integrity of District facilities.
PT20	UNIMPROVED CHANNEL CLEANOUT, SEDIMENT REMOVAL WITH CRANE. The removal, hauling, and disposal of sediment and other materials deposited in unimproved channels, to restore the channel capacity.
PT21	UNIMPROVED CHANNEL CLEANOUT, SEDIMENT REMOVAL WITH EXCAVATOR. The removal, hauling, and disposal of sediment and other materials deposited in unimproved channels, to restore the channel capacity.
PT22	UNIMPROVED CHANNEL CLEANOUT TRASH. The removal, hauling, and disposal of trash deposits and other materials from unimproved channels, to prevent channel blockages, accelerated debris deposition, and to restore the channel capacity.
PT23	IMPROVED CHANNEL CLEANOUT, SEDIMENT REMOVAL WITH CRANE. The removal by crane, hauling, and disposal of sediment and other materials deposited in improved channels, to restore the channel capacity.
PT24	IMPROVED CHANNEL CLEANOUT, SEDIMENT REMOVAL WITH EXCAVATOR. The removal by excavator, hauling and disposal of sediment and other materials deposited in improved channels, to restore the channel capacity.
PT25	IMPROVED CHANNEL CLEANOUT, SEDIMENT REMOVAL WITH LOADER. The removal by loader, hauling, and disposal of sediment and other materials deposited in improved channels, to restore the channel capacity.
PT26	IMPROVED CHANNEL CLEANOUT, TRASH AND GROWTH WITH CRANE. The hauling, and disposal of trash deposits; weed and willow growth; or other materials from improved channels and large accessible conduits to prevent blockages, accelerated debris depositing, and to restore the channel capacity.
PT27	IMPROVED CHANNEL CLEANOUT, TRASH LOADER/CRANE. The removal, hauling, and disposal of trash, vegetative growth, and other materials from channels to restore the channel capacity.
PT28	IMPROVED CHANNEL CLEANOUT, TRASH AND VEGATATIVE GROWTH/EXCAVATOR. The manual removal of trash, vegetative growth or sediment from channels where other methods are not applicable to prevent blockages and accelerated debris depositing and to restore the channel capacity.
PT29	CONDUIT CLEANOUT. The removal of debris of any type from within conduits by: flushing with water; or by physically entering the conduit and manually removing debris, to restore full capacity.
PT31	STORAGE AREA OR STOCKPILE CLEAN-UP. The clean-up of designated storage sites, drying, separating of trash, removal of sediment stockpile. Fire prevention, weed and brush control. Grading shall be in compliance with National Pollution Discharge Elimination System requirements.
PT32	EARTHWORK, BY HAND. The replacement and compaction of material removed by erosion, using hand tools or other methods, to restore flood control channels, supporting embankments, levees or access roads.
PT33	EARTHWORK-PREPARATION. The mechanical preparation for the repairing of earthen levees, access roads and supporting embankments.
PT34	EARTHWORK, MECHANICAL. The mechanical replacement and compaction of material removed by erosion to restore flood control channels, supporting embankment, levees or access roads, or the removal of material not covered by a facility clean out activity.
PT35	DAM AND DEBRIS BASIN SEDIMENT REMOVAL WITH SCRAPER. Removal by scraper, including disposal, of sediment deposited in dams or debris basins to restore full capacity and original shape.

PT36	DAM AND DEBRIS BASIN SEDIMENT REMOVAL. Removal by crane, (including hauling, and disposal) of sediment deposited in dams or debris basins to restore full capacity and original shape.
PT38	BLEEDER PIPE MAINTENANCE AND REPAIR. The removal of debris by hand or mechanically to restore proper bleeder operations.
PT39	CONTRACT - DEBRIS BASIN. Use this activity code to track all contract effort for debris basin cleanout. Actions mirror those described under PT36 Dam and Debris Basin Sediment Removal.
PT40	WEED CONTROL - NON SPRAY. The minor maintenance and repair of the spray trucks, the maintenance of inventory and other records, applicable to the herbicide crew and site evaluation.
PT41	BRUSH AND WEED CONTROL, SPRAY WITH BOOM. The application of herbicides, to designated areas, with a boom-mounted spray bar to prevent new growth and/or control existing vegetation, for the purpose of insuring the capacity and integrity of flood control facilities.
PT42	WEED CONTROL, HAND SPRAY. The application of herbicides, to designated areas, by hand spray to prevent new growth and/or control existing vegetation, for the purpose of insuring the capacity and integrity of flood control facilities.
PT43	WEED CONTROL, HAND CREW. The manual removal of brush and weeds using hand tools to control existing vegetation, for the purpose of insuring the capacity and integrity of flood control facilities.
PT44	CHANNEL ACTIVITIES, MECHANICAL. The mechanical removal (i.e., mowing and/or discing) of brush and weeds to provide for unobstructed flow through channels, and to maintain channels, access roads and dams free of vegetation. This includes pilot channel work where low flow is redefined in channel.
PT45	BACKPACK WEED SPRAY. Brush and weed control by all spray methods, performed solely for the purpose of improving the appearance of Flood Control rights-of-way beyond limits of channels and access roads.
PT47	BRUSH & WEED CONTROL, EXCAVATOR. Brush and weed control by mechanical methods performed solely for the purpose of improving the appearance of District rights-of-way beyond the limits of channels and access roads.
PT48	WEED CONTROL, FIRE ABATEMENT. Brush and weed removal by hand or mechanical methods performed solely for the purpose of eliminating potential fire hazards.
PT49	TUMBLEWEED ABATEMENT. The hand removal and disposal of tumbleweeds (*Salsola* sp.) along channel rights-of-way, to maintain proper channel flow and access. Hauling shall be included in this activity if required.
PT51	CONSTRUCTION OR REPLACEMENT OF ACCESS ROAD. The construction of new or replacement of access roads by placing, shaping and compacting base material. Such roads are constructed to provide access to District facilities at new locations or where existing access roads are severely damaged, or where no road exists.
PT52	A.C. ACCESS ROAD. Repair asphalt concrete access road by overlay, slurry seal, crack repair, with or without surface grinding. Also covers replacement of asphalt concrete road by fully removing existing asphalt and base material, placing and compacting new base, then applying new asphalt concrete layer(s). Includes repair and replacement of asphalt concrete curbs. No asphalt may be placed within the banks or bottoms of facilities where water flows.
PT53	REBASING & SHAPING OF ACCESS ROADS. The non-routine, mechanical, scarification and overlaying of access roads to include adding road base, re-grading and re-compacting. This work is done to re-establish drainage and compaction when such roads have become rutted and are soft when wet.
PT55	ROUTINE GRADING OF ACCESS ROADS. Mechanical grading of access roads to remove minor ruts and erosion and restore normal shape and cross slope, for access to District facilities.
PT56	GRADER OPERATIONS ON ACCESS ROADS AND V-DITCHES. Mechanical grading of haul roads used during cleanout of District facilities to insure safe, smooth operation on haul roads. Grading of roads where no base material or roller compaction is necessary.
PT57	MAINTENANCE OF MISC ACCESS ROAD STRUCTURES. Hand or mechanical debris removal and cleanout of pipe, inlets and outlets, small ditches and overpours along access roads to assure proper drainage of roads and adjacent areas. Hauling and dumping of debris is included when required.
PT60	FENCE REPAIR. The repair and/or re-establishment of downed or damaged fences to restore fence to proper condition and to provide right-of-way control.
PT61	MISC FENCE MAINTENANCE. The minor or temporary repair of fences to restore fence to proper

	condition and to provide right-of-way control or temporary and integrity.
PT62	FENCE CONSTRUCTION. Construction of chain link and other fences and the installation of gates of similar fence material to provide proper right-of-way control.
PT64	GATE REPAIR/CHAINLINK. The routine adjusting of gates, the repair of damaged or downed gates, and the repair or replacement of locks and chains to provide proper control of access to channel rights-of-way.
PT65	GATE CONSTRUCTION CHAINLINK. Shop, field fabrication, or purchase of chain link gates, and their installation, at points of access onto District rights-of-way to provide proper right-of-way control.
PT66	PIPE/GATE CONSTRUCTION/REPAIR. Shop and field fabrication of gates, and their installation, at points of access of District rights-of-way to provide proper right-of-way control.
PT68	PIPE AND WIRE REVETMENT REPAIR. The removal of backfill and repair of pipe and wire revetments to restore integrity of bank protection or stabilizer.
PT70	RIPRAP REPAIR. Repair of damaged areas of riprap slopes to restore riprap to original condition. This work is done to prevent further deterioration and eliminate potential erosion problems.
PT72	BANK PROTECTION CONSTRUCTION. Hand or mechanical construction or replacement of protective concrete, riprap or other durable material against channel sides or banks to protect them from erosion.
PT74	STABILIZER CONSTRUCTION/REPAIR. Placement of concreted riprap stabilizer across unlined channels to stabilize the channel bottom and prevent progressive head-cutting.
PT76	CONCRETE CONSTRUCTION/REPAIR. Repair of damaged concrete structures including small structures, channel linings, retaining walls, etc. to original condition and prevent further deterioration.
PT77	SURFACE DRAINAGE FACILITY CONSTRUCTION. Hand or mechanical construction by the most productive method of surface drainage facilities including over-pours, headwalls, pipes and other facilities to dispose of surface runoff onto District rights-of-way.
PT80	PIPE/FLAP GATE MAINT AND REPAIR. The maintenance, repair or replacement of damaged or deteriorated flap, pipe gates and sucker rod and fencing to restore them to their proper function.
PT83	TRASH RACK CLEANING. The removal of trash and debris from trash racks to eliminate obstructions and insure normal flow.
PT85	SUB-DRAIN FLUSHING & REAMING. The flushing and reaming of sub-drains and cleaning weep holes to remove debris and prevent blockage.
PT86	PUMP STATION MAINTENANCE AND STORM PREPARATION. The routine inspection and maintenance of pump stations and their outlet structures to include lubrication and operational testing. Also included is the required storm preparation to assure that outlets are unblocked and pump systems are operational at the beginning of and during significant storms.
PT88	STOCKPILE AND STORAGE AREA WORK. The blading of designated stockpile and storage area sites to keep them in a neat uncluttered condition. Rip and push material into piles to be loaded out for use elsewhere.
PT89	MISCELANEOUS MAINTENANCE. All work performed that is not described in previous activities. A description of activities that would fall under this category would be provided in the workplan.
PT90	STORM PROTECTION. Patrol and inspection of District facilities during and just after storms to identify problems, either existing or potential and where damage has occurred.
PT91	SAFETY INSPECTION. Patrol and inspection of District facilities during and just after significant disaster events to identify problems, either existing or potential and where damage has occurred.
PT92	WORK RELEASE. Perform hand weed control outside of normal work hours; i.e. weekends, using personnel furnished by Ventura County Work Release program.
PT93	NPDES INSPECTION/MAINTENANCE. The inspection/maintenance of NPDES structures and facilities, within the District's responsibility.
PT97	MISCELANEOUS CRANE ACTIVITY. The inspection/minor repair, maintenance and cleaning of the truck crane.

Repair Activities
As District facilities are damaged by flood flows and natural degradation, the District must conduct repairs to maintain conveyance and flood control. Repair activities may take many forms and could involve replacing riprap, diverting water, vegetation trimming, etc. Repair activities primarily occur within existing District facilities. Temporary or permanent impacts may occur outside existing facility footprints. Details of each repair project will be listed in the annual work plans. The repair activity may or may not be covered by this programmatic biological opinion depending on the magnitude and location of the impacts to the affected species or critical habitats.

Beach Elevation Management Plan (BEMP)
In addition to the routine maintenance activities described above, the District has a Beach Elevation Management Plan in place that will be implemented when the criteria described below are met. BEMP activities are considered to be a part of the O&M Program. The Ormond Beach Lagoon inlet normally remains in a semi-closed condition due to sand accretion on Ormond Beach, but during most winters it breaches naturally to allow free outflow during storms and some high tides. These events do not drain the lagoon entirely, as urban runoff and high tides contribute fresh and salt water flows. To date, there has been one instance of the inlet remaining closed during a minor storm event and causing upstream flooding; this took place on January 18, 2010. This event flooded the Oxnard Waste Water Treatment Plant, which was at risk of releasing untreated sewage effluent into the surrounding waterways, roads, and residential properties due to electrical failure of inundated equipment. To prepare for the reoccurrence of the combination of the outlet being closed, the lagoon water surface being above a high threshold level, and a storm being forecast, a BEMP has been developed. The BEMP defines a maximum safe beach height, and provides for a coordinated response to groom the sand berm at a pre-specified location immediately prior to a predicted storm event. The purpose of the BEMP is to protect the lives and well-being of the communities and industrial facilities along J Street Drain and Ormond Beach Lagoon by maintaining water levels below a predetermined safe elevation.

The BEMP is a guideline to assist the District in responding to the potential flood threat caused by persistence of the sand berm during potentially damaging storm events of varying magnitudes. It should be noted that the BEMP would be implemented when conditions warrant, which may be more than once annually, to avoid an emergency. Therefore, implementation of the BEMP would constitute a new maintenance activity associated with operation of the J Street Drain and pump station facilities.

The lead role of the District in flood emergency avoidance is aided by Ventura County Automated Local Evaluation in Real Time (ALERT) system. ALERT is a flood warning system for Ventura County developed by the National Weather Service of the National Oceanic and Atmospheric Administration that has been in operation since 1979. ALERT provides reliable rainfall and flow information for determination of storm magnitude. ALERT will be used as the primary source for rainfall and storm event data in the BEMP. The District water level gauge(s) in the J Street Drain will be used as the primary means to monitor water surface elevation.

Grooming Criteria

Normal Ormond Beach Lagoon conditions result in a natural breaching of the sand berm before the lagoon water elevation reaches its highest recorded elevation of about 7.5 feet National Geodetic Vertical Datum (NGVD) (9.9 feet North American Vertical Datum (NAVD)). This has resulted in the sand berm naturally breaching each year, typically in the early months of the fall rainy season. The sand berm naturally breaches during this time because increased drainage from seasonal storm water raises the lagoon water level sufficiently above sea level prompting a breach. The breach closes as sand blows and washes in, and freshwater drainage diminishes. The condition that would initiate the BEMP is a combination of the following three threshold conditions. The BEMP coordinates the grooming response with sensitivity to environmental resources.

The BEMP threshold conditions are:

1. The Ormond Beach Lagoon is fully enclosed by the Ormond Beach sand berm;

2. The Ormond Beach sand berm elevation adjacent to the lagoon is observed to be above 6.5 feet NGVD (8.9 feet NAVD); and

3. A 72-hour prediction of a storm event affecting the watershed is received, which would likely cause the designed capacity of the J Street Drain to be exceeded if the lagoon water surface elevation cannot overtop the observed adjacent beach sand elevation.

Any one of the above conditions alone may not trigger initiation of the BEMP. All three conditions must occur simultaneously to enact the BEMP.

Grooming Procedure

The grooming would be performed by a tracked dozer and initiated by the O&M Deputy Director in coordination with the District Director or his/her designee. Once the O&M Deputy Director determines that the BEMP threshold criteria have been met, the dozer shall be pre-positioned at the south side parking lot of Port Hueneme Beach Park. As soon as the BEMP is enacted, the dozer operator accompanied by District environmental staff would move the dozer to the designated beach grooming location, and shave the sand berm down to the maximum safe beach elevation. The dozer access path to the groom location would be the same as the one currently used by lifeguards from Port Hueneme Beach Park. The grooming width would measure approximately 100 feet parallel to the coastline (Figure 2). The removed sands would be placed on the beach adjacent to the groomed area. The grooming procedure would be completed within several hours, including removal of equipment from the beach. The designated grooming area would be permanently marked with rods driven deep into the sand. Elevation markings would be depicted on the rods. The grooming location would be coordinated with the Service to limit potential impact to habitat areas. Work would be conducted via PT34 Earthwork, Mechanical. BMPs 3, 4, 8, 21, 22, 24, and 25 (described below) would be implemented as appropriate.

During the grooming operation, the work site would be secured by the District to prevent interruption by or injury of the general public. Members of the Ventura County Sheriff

Department or lifeguards, as well as their designees, may assume responsibility for the protective duty.

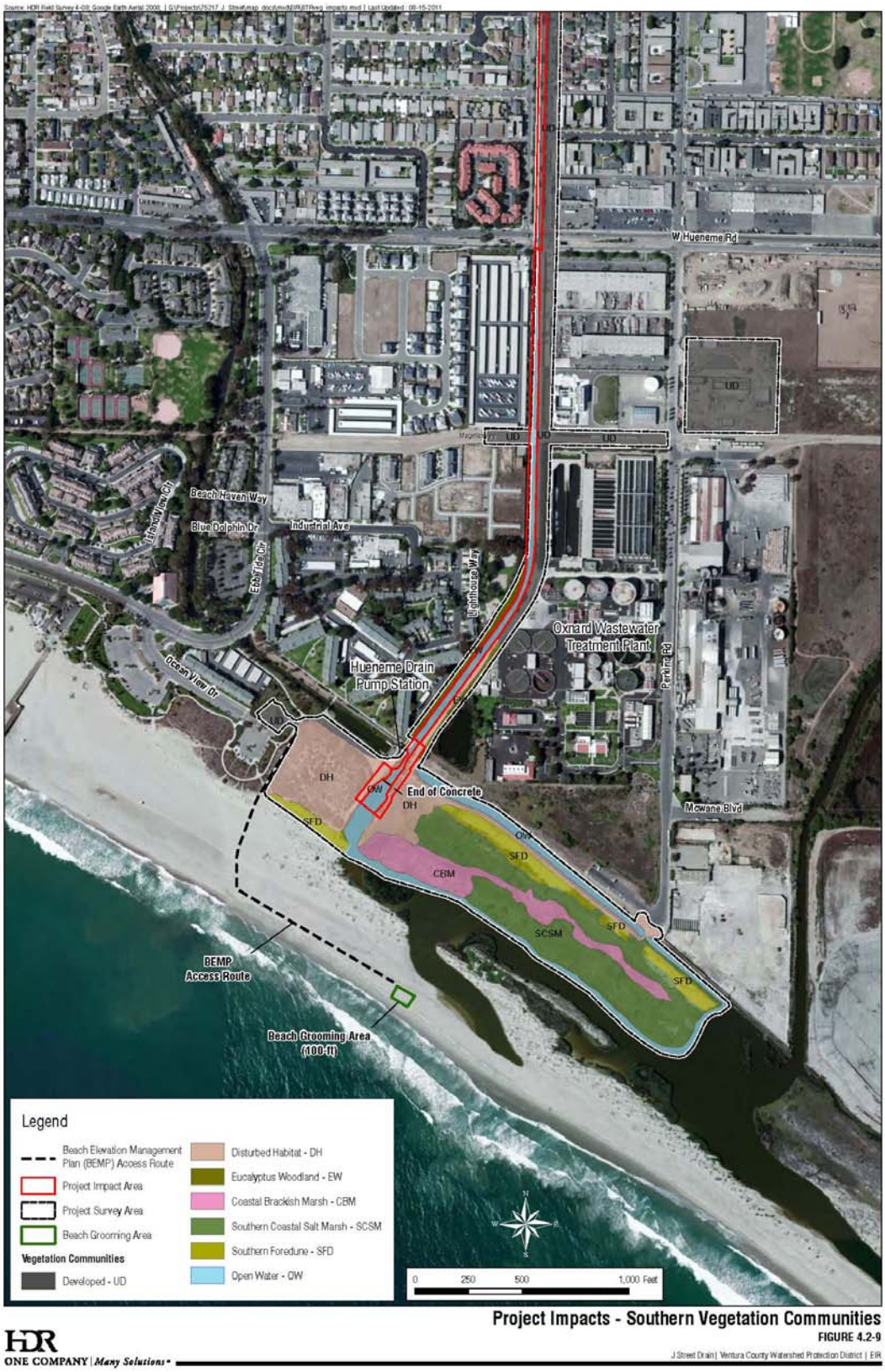

Figure 2. Beach Elevation Management Plan access route and grooming area.

Mitigation Activities

The District implements habitat restoration work both as grant projects and as compensatory mitigation for capital improvement or repair projects. Actions conducted by District staff and contractors include:

a. periodic site inspection;
b. irrigation installation, operation and maintenance;
c. hand, mechanical, and chemical weeding;
d. seeding;
e. planting of container stock;
f. rodent control;
g. and minor grading.

Activities with the potential to affect sensitive species are described by the activity code in the following text. The District evaluates mitigation sites for the potential to support sensitive species, and implements BMPs or avoids work during the breeding season for the Least Bell's vireo and southwestern willow flycatcher, as appropriate. Proposed mitigation activities for each year will be included in the District's annual work plan that will be submitted to the Corps and reviewed for compliance and inclusion in this biological and conference opinion.

Table 3. Mitigation/Restoration task descriptions

Code	Mitigation/Restoration Task Descriptions
PM04	MITIGATION ANNUAL REPORT. Field and report review/writing time associated with production of an annual report, includes site data collection, map drafting and data work.
PM05	MITIGATION SITE INSPECTION. Field inspection by District staff when no contractors are out on site to check site needs/conditions.
PM06	MITIGATION FIELDWORK. When O&M Staff conduct irrigation repairs and spot treatments of weeds, access road maintenance, and fencing/signage tasks on mitigation sites.
PM11	MITIGATION CONTRACTOR MANAGEMENT AND INSPECTION. Used for field inspections when contractor is working or has worked at site to verify tasks, personnel, equipment, and other information.
PM13	MITIGATION CONTRACTOR FIELD WORK. Contractor field work such as mowing, herbicide application, grading, planting, etc.

The Corps and District will submit a mitigation/restoration plan to the Service for approval at least 30 days prior to initiating project activities that includes:

- Location and description of the mitigation/restoration to be performed;
- Information about the presence and extent of least Bell's vireo and southwestern willow flycatcher territories in the vicinity of the mitigation project based on known data and average territory size;
- An estimate of how many territories or portions of territories will be affected by the vegetation removal;
- Information on the presence and extent of tidewater gobies or California red-legged frogs, and how these species are anticipated to be affected by the project;
- An estimated level of take associated with the project, and comparison to the level of take allowed in the Incidental Take Statement associated with this biological opinion; and

- A description of monitoring and maintenance that will be conducted following the vegetation removal.

Minimization Measures
To reduce adverse effects to listed species and migratory birds the District has incorporated numerous general BMPs into their project description (District 2008; District 2010). The proposed BMPs are summarized below.

General BMPs

BMP 1	Avoid Channel Work during the Rainy Season
BMP 2	Prevent Discharge of Silt-Laden Water during Concrete Channel Cleaning
BMP 3	Location of Temporary Stockpiles
BMP 4	Survey for Habitat Prior to Routine Maintenance Work
BMP 5	Survey for Steelhead (*Oncorhynchus mykiss*) Migration Conditions and Sensitive Aquatic Species
BMP 6	Survey for Steelhead Rearing Habitat and Sensitive Aquatic Species
BMP 7	Continue Existing Procedures for Sediment Removal and Vegetation Control for Calleguas Creek, Conejo Creek, and Revolon Slough
BMP 8	Avoid Disturbance to Native Beach or Wetland Species
BMP 9	Aquatic Pesticide BMPs
BMP 10	Leave Vegetation on Upper Basin Slopes
BMP 11	Leave Patches of Vegetation in Channel Bottom
BMP 12	Leave Herbaceous Wetland Vegetation in Channel Bottom
BMP 13	Maximum 15-foot Vegetation-Free Zone at the Toe of the Bank
BMP 14	Avoid Road Base Discharge
BMP 15	Mitigate/Replace Temporary Impacts to Habitat
BMP 16	Oak Tree Mitigation Ratio
BMP 17	Concrete Wash-Out Protocols
BMP 18	Water Diversion Guide
BMP 19	Minimize Erosion from Stream Gauge Maintenance
BMP 20	Implementation of Integrated Pest Management Program
BMP 21	Avoid Spills and Leaks
BMP 22	Biological Surveys in Appropriate Habitat Prior to Vegetation Maintenance
BMP 23	Invasive Plant Removal Protocols
BMP 24	Air Quality BMPs
BMP 25	Construction Noise BMPs (BMP 24 in Los Angeles Regional Water Quality Control Board Permit)

The District has also incorporated the following species-specific measures to minimize adverse effects to California red-legged frogs, tidewater gobies, least Bell's vireos and southwestern willow flycatchers.

California red-legged frog (CRLF) minimization measures

CRLF-1 A Service-approved biologist will conduct daily pre-project surveys each morning prior to conducting O&M Program activities at facilities that are potentially occupied by California red-legged frogs, and will relocate all life stages of California red-legged frogs that are likely to be injured or killed by work activities.

CRLF-2 The Service-approved biologist(s) will relocate the California red-legged frogs the shortest distance possible to a location that contains suitable habitat and will not be affected by activities associated with O&M Program activities.

CRLF-3 The Service-approved biologist(s) will maintain detailed records of any individuals that are moved (e.g., size, coloration, any distinguishing features, photographs [digital preferred]) to assist him or her in determining whether translocated animals are returning to the original point of capture.

CRLF-4 Before any activities begin on a project, a Service-approved biologist(s) will conduct a training session for all construction personnel. At a minimum, the training will include a description of the California red-legged frog and its habitat, the specific measures that are being implemented to conserve the California red-legged frog for the current project, and the boundaries within which the project may be accomplished.

CRLF-5 The Service-approved biologist(s) will be present at the work site until all California red-legged frogs have been removed, workers have been instructed, and removal of vegetation in suitable habitat has been completed.

CRLF-6 Service-approved biologists will permanently remove individuals of non-native species to the maximum extent possible.

Tidewater goby (TWG) minimization measures

TWG-1 The District will only conduct channel cleanout activities in J Street drain downstream of Hueneme Road and in the concrete lined portion of the Oxnard Industrial drain upstream and downstream of Hueneme Road if surface water is absent (not from diversion or pumping).

TWG-2 Prior to initiation of dewatering or sediment removal work at facilities in tidewater goby habitat where water is present, a Service-approved biologist will install 1/8 inch block nets outside the impact areas and across the stream a minimum of 20 feet above and below the locations proposed for excavation. If widely separated sites are involved, more than one set of block nets will be placed to protect the work area. The nets will be installed on the first day of work and monitored thereafter for the duration of the work.

TWG-3 Should dewatering occur, any pumps used will be fitted with an anti-entrapment device(s) to prevent tidewater gobies from being drawn into the pump or impinged on intake screening.

TWG-4 Once the block nets are secured, Service-approved biologist(s) will remove all tidewater gobies found between the block nets using a 1/8 inch seine and dip nets, and relocate tidewater gobies to suitable habitat downstream of the proposed project site.

TWG-5 A Service-approved biologist will remain onsite and observe for tidewater gobies and turbidity levels within the work areas during all creek dewatering activities, and will capture and relocate tidewater gobies to suitable habitat as necessary.

TWG-6 If operations cannot be completed in one day, block nets will remain in place overnight or nets will be reinstalled prior to work each day, with subsequent surveys and capture/relocation performed accordingly. The decision of whether to leave nets up overnight or to install new nets at the beginning of each work day will be at the discretion of the Service-approved tidewater goby biologist. All nets left up overnight will be inspected to ensure they are in proper functioning condition and to ensure that fish have not re-entered the work area overnight.

TWG-7 In the case of multiple-day projects, tidewater gobies released from one day's work will not be released into areas projected to be excavated on successive days.

<u>Least Bell's vireo (LBV) and southwestern willow flycatcher minimization measures</u>

LBV-1 Prior to routine maintenance and repair activities performed during the period March 1 to September 15, a District biologist or consulting biologist shall determine if suitable habitat is present for native breeding birds in or within 500 feet of the work area. Project activities shall be postponed to September 15 if such habitat is present in the work area or within 500 feet of the work area, to the extent possible.

LBV-2 In the event that operations and maintenance activities in suitable habitat for least Bell's vireo and/or southwestern willow flycatcher cannot be postponed until after the end of the breeding season (September 15), and if the activities involve the direct disturbance of habitat for these species (i.e., vegetation trimming or removal), the District will conduct surveys according to Service guidance to determine presence or absence of least Bell's vireos and southwestern willow flycatcher. A modified survey protocol may be appropriate on a case-by-case basis and must be approved by the Service.

LBV-3 If a least Bell's vireo or southwestern willow flycatcher nest is detected within the project area during pre-project surveys, a Service-approved biologist will establish a buffer zone around the nest that they deem sufficient to avoid the abandonment of the nest by the adults. The Service generally recommends a minimum 500 foot buffer around nests where no work is to occur; however, a

smaller buffer can be established if deemed protective by the Service-approved biologist and approved by the Service. The Service-approved biologist must monitor the nests during all O&M Program activities occur immediately adjacent to buffer zones to determine the effects of project activities on the nesting least Bell's vireos and southwestern willow flycatcher. The Service-approved biologist will have the authority to stop work if deemed necessary to protect the nesting birds.

LBV-4 For mitigation/restoration projects where non-native plant species are targeted for removal within suitable habitat for Least Bell's vireos or southwestern willow flycatchers, native vegetation will be left in place to the maximum extent practical; willows (*Salix* sp.) and cottonwoods (*Populus* sp.) with a diameter at breast height of 8 inches or greater may be trimmed, but will be left in place.

ANALYTICAL FRAMEWORK FOR THE JEOPARDY AND ADVERSE MODIFICATION DETERMINATIONS

Jeopardy Determination

The jeopardy analysis in this Biological Opinion relies on four components: (1) the *Status of the Species*, which evaluates the range-wide condition of the tidewater goby, California red-legged frog, least Bell's vireo, and southwestern willow flycatcher and the factors responsible for that condition, and their survival and recovery needs; (2) the *Environmental Baseline*, which evaluates the condition of the tidewater goby, California red-legged frog, least Bell's vireo, and southwestern willow flycatcher in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of these species and subspecies; (3) the *Effects of the Action*, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the tidewater goby, California red-legged frog, least Bell's vireo, and southwestern willow flycatcher; and (4) the *Cumulative Effects*, which evaluates the effects of future, non-Federal activities in the action area on the tidewater goby, California red-legged frog, least Bell's vireo, and southwestern willow flycatcher.

In accordance with policy and regulation, the jeopardy determination is made by evaluating the effects of the proposed Federal action in the context of the current status of the tidewater goby, California red-legged frog, least Bell's vireo, and southwestern willow flycatcher, taking into account any cumulative effects, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of the tidewater goby, California red-legged frog, least Bell's vireo, and southwestern willow flycatcher, in the wild.

The jeopardy analysis in this biological opinion places an emphasis on consideration of the range-wide survival and recovery needs of the tidewater goby, California red-legged frog, least Bell's vireo, and southwestern willow flycatcher, and the role of the action area in their survival and recovery, as the context for evaluating the significance of the effects of the proposed Federal action, taken together with cumulative effects, for purposes of making the jeopardy determination.

Adverse Modification Determination

The Biological Opinion does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 CFR 402.02. Instead, we rely on the statutory provisions of the Act to complete the following analysis with respect to critical habitat.

In accordance with policy and regulation, the adverse modification analysis in this Biological Opinion relies on four components: (1) the *Status of Critical Habitat*, which evaluates the range-wide condition of designated critical habitat for the tidewater goby, California red-legged frog and southwestern willow flycatcher in terms of primary constituent elements (PCEs), the factors responsible for that condition, and the intended recovery function of the critical habitat overall; (2) the *Environmental Baseline*, which evaluates the condition of the critical habitat in the action area, the factors responsible for that condition, and the recovery role of the critical habitat in the action area; (3) the *Effects of the Action*, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated and interdependent activities on the PCEs and how that will influence the recovery role of the affected critical habitat units; and (4) *Cumulative Effects*, which evaluates the effects of future non-Federal activities in the action area on the PCEs and how that will influence the recovery role of affected critical habitat units.

For purposes of the adverse modification determination, the effects of the proposed federal action on the critical habitat of the tidewater goby, California red-legged frog and southwestern willow flycatcher are evaluated in the context of the range-wide condition of the critical habitat, taking into account any cumulative effects, to determine if the critical habitat range-wide would remain functional (or would retain the current ability for the PCEs to be functionally established in areas of currently unsuitable but capable habitat) to serve its intended recovery role for the tidewater goby, California red-legged frog and southwestern willow flycatcher.

The analysis in the Biological Opinion places an emphasis on using the intended range-wide recovery function of critical habitat for the tidewater goby, California red-legged frog and southwestern willow flycatcher and the role of the action area relative to that intended function as the context for evaluating the significance of the effects of the proposed Federal action, taken together with cumulative effects, for purposes of making the adverse modification determination.

STATUS OF THE SPECIES

Tidewater goby

The tidewater goby was listed as endangered on March 7, 1994 (59 Federal Register (FR) 5494). On June 24, 1999, the Service proposed to remove the populations occurring north of Orange County, California, from the endangered species list (64 FR 33816). In November 2002, the Service withdrew this proposed delisting rule and determined it appropriate to retain the tidewater goby's listing as endangered throughout its range (67 FR 67803). A recovery plan for the tidewater goby was completed on December 12, 2005 (Service 2005). A 5-Year Review for the tidewater goby was completed in September 2007 (Service 2007). Detailed information on the biology of the tidewater goby can be found in Wang (1982), Irwin and Soltz (1984), Swift *et al*. (1989), Worcester (1992), and Swenson (1995); much of the information from this account was taken from these sources.

The tidewater goby is endemic to California and typically inhabits coastal lagoons, estuaries, and marshes, preferring relatively low salinities of approximately 12 parts per thousand (ppt). Tidewater goby habitat is characterized by brackish estuaries, lagoons, and lower stream reaches where the water is fairly still but not stagnant. They tend to be found in the upstream portions of lagoons. Tidewater gobies can withstand a range of habitat conditions and have been documented in waters with salinity levels that range from 0 to 41 ppt, temperatures from 46 to 77 degrees Fahrenheit, and depths from approximately 10 inches to 6.5 feet.

The tidewater goby is primarily an annual species in central and southern California, although some variation in life history has been observed. If reproductive output during a single season fails, few (if any) tidewater gobies survive into the next year. Reproduction typically peaks from late April or May to July and can continue into November or December depending on the seasonal temperature and amount of rainfall. Males begin the breeding ritual by digging burrows (3 to 4 inches deep) in clean, coarse sand of open areas. Females then deposit eggs into the burrows, averaging 400 eggs per spawning effort. Males remain in the burrows to guard the eggs. They frequently forego feeding, which may contribute to the mid-summer mortality observed in some populations. Within 9 to 10 days, larvae emerge and are approximately 0.20 to 0.27 inch in length. Tidewater gobies live in vegetated areas in the lagoon until they are 0.60 to 0.70 inch long. When they reach this life stage, they become substrate-oriented, spending the majority of time on the bottom rather than in the water column. Both males and females can breed more than once in a season, with a lifetime reproductive potential of 3 to 12 spawning events. Vegetation is critical for over-wintering tidewater gobies because it provides refuge from high water flows.

Tidewater gobies feed on small invertebrates, including mysids, amphipods, ostracods, snails, aquatic insect larvae, and particularly chironomid larvae. Tidewater gobies of less than 0.30 inch in length probably feed on unicellular phytoplankton or zooplankton, similar to many other early stage larval fishes.

Historically, the tidewater goby occurred in at least 135 California coastal lagoons and estuaries from Tillas Slough near the Oregon border south to Agua Hedionda Lagoon in northern San Diego County. The southern extent of its distribution has been reduced by approximately 8 miles. The species is currently known to occur in about 112 locations, although the number of sites fluctuates with climatic conditions. Currently, the most stable populations are in lagoons and estuaries of intermediate size (5 to 124 acres) that are relatively unaffected by human activities. Six regional clades based on morphological differences (Ahnelt et. al. 2004) that are supported by genetic work done by Dawson et al. (2001) have been used to define recovery units for the tidewater goby (Service 2005). The recovery plan describes 26 recovery sub-units for the tidewater goby (Service 2005).

Tidewater gobies enter the marine environment when sandbars are breached during storm events. The species' tolerance of high salinities (up to 60 ppt) for short periods of time enables it to withstand marine environment conditions where salinities are approximately 35 ppt, thereby allowing the species to re-establish or colonize lagoons and estuaries following flood events. However, genetic studies indicate that individual populations rarely have contact with other populations so natural recolonization may be rare. In Santa Barbara County during the fall of

1994, tidewater gobies were reported as common in the Santa Ynez River 4 miles upstream from the lagoon (Swift et al. 1997); however, by January 1995, they were absent at the upstream sites. Tidewater gobies that are found upstream of lagoons in summer and fall tend to be juveniles. The highest densities of tidewater gobies are typically present in the fall.

Recovery Plan for the Tidewater Goby

The goal of the tidewater goby recovery plan is to conserve and recover the tidewater goby throughout its range by managing threats and perpetuating viable metapopulations within each recovery unit while maintaining morphological and genetic adaptations to regional and local environmental conditions. The decline of the tidewater goby is attributed primarily to habitat loss or degradation resulting from urban, agricultural, and industrial development in and around coastal wetlands. The recovery plan identifies 6 recovery units: North Coast Unit, Greater Bay Unit, Central Coast Unit, Conception Unit, LA/Ventura Unit, and South Coast Unit.

The recovery plan specifics that the tidewater goby may be considered for downlisting when:

1. Specific threats to each metapopulation (e.g., coastal development, upstream diversion, channelization of rivers and streams, etc.) have been addressed through the development and implementation of individual management plans that cumulatively cover the full range of the species.

2. A metapopulation viability analysis based on scientifically credible monitoring over a 10-year period indicates that each Recovery Unit is viable. The target for downlisting is for individual sub-units within each recovery unit to have a 75 percent or better chance of persistence for a minimum of 100 years.

The tidewater goby may be considered for delisting when downlisting criteria have been met and a metapopulation viability analysis projects that all recovery units are viable and have a 95 percent probability of persistence for 100 years.

Tidewater goby critical habitat

We originally designated critical habitat for the tidewater goby on November 20, 2000 (65 FR 69693). In January 2008, revised designated critical habitat was finalized (73 FR 5920). On October 19, 2011, another revision to critical habitat was proposed (76 FR 64996). The proposed rule is scheduled to be finalized in November 2012, therefore when this biological and conference opinion is finalized it is anticipated that the currently designated critical habitat will be in place, and subsequently, the currently proposed critical habitat will be finalized and supersede the currently designated critical habitat.

Under the Act and its implementing regulations, we are required to identify the physical and biological features essential to the conservation of tidewater goby in areas occupied at the time of listing, focusing on the features' primary constituent elements. We consider primary constituent elements to be the elements of physical and biological features that, when laid out in the appropriate quantity and spatial arrangement to provide for a species' life-history processes, are essential to the conservation of the species. The primary constituent elements specific to tidewater goby are substantially the same in the designated and proposed rule, and include:

Persistent, shallow (in the range of about 0.3 to 6.6 feet) still-to-slow-moving, coastal aquatic habitat most commonly ranging in salinity from 0.5 ppt to about 10 to 12 ppt, which provides adequate space for normal behavior and individual and population growth that contain:

- Substrates (e.g., sand, silt, mud) suitable for the construction of burrows for reproduction;
- Submerged and emergent aquatic vegetation, such as *Potamogeton pectinatus, Ruppia maritime, Typha latifola,* and *Scirpus* spp., that provides protection from predators and high flow events; or
- Presence of a sandbar(s) across the mouth of a lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, thereby providing relatively stable water levels and salinity.

In total, approximately 10,003 acres fall within the boundaries of the final revised critical habitat designation. The revised critical habitat is located in Del Norte, Humboldt, Mendocino, Sonoma, Marin, San Mateo, Santa Cruz, Monterey, San Luis Obispo, Santa Barbara, Ventura, and Los Angeles Counties, California.

In total, approximately 12,157 ac are included in the proposed critical habitat rule. The proposed critical habitat is located in Del Norte, Humboldt, Mendocino, Sonoma, Marin, San Mateo, Santa Cruz, Monterey, San Luis Obispo, Santa Barbara, Ventura, Los Angeles, Orange, and San Diego Counties, California.

California red-legged frog

The California red-legged frog was federally listed as threatened on May 23, 1996 (61 FR 25813). The Service completed a recovery plan for the species in 2002 (Service 2002a).

Detailed information on the biology of California red-legged frogs can be found in Storer (1925), Stebbins (2003), and Jennings et al. (1992). This species is the largest native frog in the western U.S., ranging from 1.5 to 5.1 inches long. The abdomen and hind legs of adults are largely red; the back is characterized by small black flecks and larger irregular dark blotches with indistinct outlines on a brown, gray, olive, or reddish background color. Dorsal spots usually have light centers, and dorsolateral folds are prominent on the back. Tadpoles range from 0.6 to 3.1 inches long and are dark brown and yellow with dark spots.

The California red-legged frog uses a variety of habitat types, including various aquatic systems, riparian, and upland habitats. The diet of California red-legged frogs is highly variable. Hayes and Tennant (1985) found invertebrates to be the most common food item of adults. Vertebrates, such as Pacific treefrogs (*Pseudacris regilla*) and California mice (*Peromyscus californicus*), represented over half of the prey mass eaten by larger frogs (Hayes and Tennant 1985). Feeding activity occurs along the shoreline and on the surface of the water. Hayes and Tennant (1985) found juveniles to be active diurnally and nocturnally, whereas adults were largely nocturnal.

California red-legged frogs breed from November through March; earlier breeding has been recorded in southern localities (Storer 1925). Males appear at breeding sites from 2 to 4 weeks before females (Storer 1925). California red-legged frogs are often prolific breeders, typically laying their eggs during or shortly after large rainfall events in late winter and early spring.

Female California red-legged frogs deposit egg masses on emergent vegetation so that the masses float on the surface of the water (Hayes and Miyamoto 1984). Egg masses contain about 2,000 to 5,000 moderately-sized (0.08 to 0.11 inch) in diameter, dark reddish brown eggs (Storer 1925, Jennings and Hayes 1985). Eggs hatch in 6 to 14 days (Storer 1925). Larvae undergo metamorphosis between 3.5 to 7 months after hatching (Storer 1925, Wright and Wright 1949). Sexual maturity can be attained at 2 years of age by males and 3 years of age by females and is usually reached at 3 to 4 years of age (Jennings and Hayes 1985); adults may live 8 to 10 years (Jennings et al. 1992) although the average life span is considered to be much lower.

California red-legged frogs spend most of their lives in and near sheltered backwaters of ponds, marshes, springs, streams and reservoirs. Deep pools with dense stands of overhanging willows and an intermixed fringe of cattails (*Typha* spp.) are considered optimal habitat. California red-legged frogs breed in aquatic habitats. Eggs, larvae, transformed juveniles and adults also have been found in ephemeral creeks and drainages and in ponds that do not have riparian vegetation. California red-legged frogs frequently breed in artificial impoundments such as stock ponds, if conditions are appropriate. Although California red-legged frogs successfully breed in streams and riparian systems, high seasonal flows and cold temperatures in streams often make these sites risky environments for eggs and tadpoles. The importance of riparian vegetation for this species is not well understood. When riparian vegetation is present, California red-legged frogs spend considerable time resting and feeding in it; the moisture and camouflage provided by the riparian plant community likely provide good foraging habitat and may facilitate dispersal in addition to providing pools and backwater aquatic areas for breeding. Accessibility to sheltering habitat is essential for the survival of California red-legged frogs within a watershed, and can be a factor limiting population numbers and distribution.

Juvenile and adult California red-legged frogs may disperse long distances from breeding sites throughout the year. They can be encountered living within streams at distances exceeding 1.8 miles from the nearest breeding site, and have been found up to 400 feet from water in adjacent dense riparian vegetation (Bulger et al. 2003). Some California red-legged frogs have moved long distances over land between water sources during winter rains. Adult California red-legged frogs have been documented to move more than 2 miles in northern Santa Cruz County “without apparent regard to topography, vegetation type, or riparian corridors” (Bulger et al. 2003). Most of these overland movements occur at night. These individual California red-legged frogs were observed to make long-distance movements that are straight-line, point to point migrations over variable upland terrain rather than using riparian corridors for movement between habitats. For the California red-legged frog, suitable habitat is considered to include all aquatic and riparian areas within the range of the species and includes any landscape features that provide cover and moisture (61 FR 25813).

California red-legged frogs have been found at elevations that range from sea level to about 5,000 feet. In the Sierra Nevada Mountains, California red-legged frogs typically occur below

4,000 feet in elevation (61 FR 25813). The historical range of the California red-legged frog extended coastally from southern Mendocino County and inland from the vicinity of Redding, California, southward to northwestern Baja California, Mexico (Jennings and Hayes 1985, Storer 1925). The California red-legged frog has been extirpated or nearly extirpated from 70 percent of its former range. Historically, this species was found throughout the Central Valley and Sierra Nevada foothills. At present, California red-legged frogs are known to occur in 243 streams or drainages in 22 counties, primarily in central coastal California. Four additional occurrences have been recorded in the Sierra Nevada foothills since listing, bringing the total to five extant populations, compared to approximately 26 historical records (61 FR 25813).

Currently, California red-legged frogs are known from three disjunct regions in 26 California counties and one region in Baja California, Mexico (Grismer 2002, Fidenci 2004, Smith and Krofta 2005). The most secure aggregations of California red-legged frogs are found in aquatic sites that support substantial riparian and aquatic vegetation and lack non-native predators. Over-harvesting, habitat loss, non-native species introduction, and urban encroachment are the primary factors that have negatively affected the California red-legged frog throughout its range (Jennings and Hayes 1985, Hayes and Jennings 1988). Habitat loss and degradation, combined with over-exploitation and introduction of exotic predators, were important factors in the decline of the California red-legged frog in the early to mid-1900s. Continuing threats to the California red-legged frog include direct habitat loss due to stream alteration and loss of aquatic habitat, indirect effects of expanding urbanization, competition or predation from non-native species including the bullfrog (*Rana catesbeiana*), catfish (*Ictalurus* spp.), bass (*Micropterus* spp.), mosquitofish (*Gambusia affinis*), and crayfish (*Procambarus clarkii*). Chytrid fungus (*Batrachochytrium dendrobatidis*) is a waterborne fungus that can decimate amphibian populations, and is considered a threat to California red-legged frog populations.

Although the presence of California red-legged frogs is correlated with still water deeper than approximately 1.6 feet, riparian shrubbery, and emergent vegetation (Jennings and Hayes 1985), there are numerous locations in the species' historical range where these elements are well represented yet California red-legged frogs appear to be absent. The cause of local extirpations does not appear to be restricted solely to loss of aquatic habitat. The most likely causes of local extirpation are thought to be changes in faunal composition of aquatic ecosystems (i.e., the introduction of non-native predators and competitors) and landscape-scale disturbances that disrupt California red-legged frog population processes, such as dispersal and colonization. The introduction of contaminants or changes in water temperature may also play a role in local extirpations. These changes may also promote the spread of predators, competitors, parasites and diseases.

<u>Recovery Plan for the California Red-Legged Frog</u>

The recovery plan for the California red-legged frog identifies eight recovery units (Service 2002a). These recovery units are based on the Recovery Team's determination that various regional areas of the species' range are essential to its survival and recovery. The status of this species is considered within the smaller scale of Recovery Units as opposed to the overall range. These recovery units are delineated by major watershed boundaries as defined by U.S. Geological Survey hydrologic units and the limits of the range of the California red-legged frog. The goal of the recovery plan is to protect the long-term viability of all extant populations within

each recovery unit. Within each recovery unit, core areas have been delineated and represent contiguous areas of moderate to high California red-legged frog densities that are relatively free of exotic species such as bullfrogs. The goal of designating core areas is to protect metapopulations that, combined with suitable dispersal habitat, will allow for the long term viability of existing populations. This management strategy will allow for the recolonization of habitat within and adjacent to core areas that are naturally subjected to periodic localized extinctions, thus assuring the long-term survival and recovery of California red-legged frogs.

A summary of the recovery criteria, which must be met in order for the Service to consider delisting the species, is below.

1. Suitable habitats within all core areas are protected and/or managed for California red-legged frog in perpetuity, and the ecological integrity of these areas is not threatened by adverse anthropogenic habitat modification;

2. Existing populations, throughout the range, are stable;

3. Populations are geographically distributed in a manner that allows for the continued existence of viable metapopulations despite fluctuations in the status of individual populations;

4. The subspecies is successfully reestablished in portions of its historical range such that at least one reestablished population is stable/increasing at each core area where frogs are currently absent; and

5. The amount of additional habitat needed for population connectivity, recolonization, and dispersal has been determined, protected, and managed for California red-legged frogs.

California red-legged frog critical habitat

Critical habitat was designated for the species on April 13, 2006 (71 FR 19244). On March 17, 2010, the Service revised the designation of critical habitat to encompass an area more than three times larger than the 2006 designation for the species (75 FR 12815).

In accordance with section 3(5)(A)(i) of the Act and regulations at 50 CFR 424.12, in determining which areas to designate as critical habitat, we are required to identify the known physical and biological features (also known as Primary Constituent Elements (PCEs)) essential to the conservation of the California red-legged frog. All areas designated as critical habitat for California red-legged frogs are occupied, are within the species' historical geographic range, and contain sufficient PCEs to support at least one life history function. Based on our current knowledge of the life history, biology, and ecology of the species and the requirements of the habitat to sustain the essential life history functions of the species, we have determined that the PCEs for California red-legged frog critical habitat are:

1. Aquatic Breeding Habitat. Standing bodies of fresh water (with salinities less than 7.0 ppt), including: natural and manmade (e.g., stock) ponds, slow moving streams or pools within

streams, and other ephemeral or permanent water bodies that typically become inundated during winter rains and hold water for a minimum of 20 weeks in all but the driest of years.

2. Non-Breeding Aquatic Habitat. Fresh water habitats, as described above, that may or may not hold water long enough for the species to hatch and complete its aquatic life cycle but that do provide for shelter, foraging, predator avoidance, and aquatic dispersal for juvenile and adult California red-legged frogs. Other wetland habitats that would be considered to meet these elements include, but are not limited to: plunge pools within intermittent creeks; seeps; quiet water refugia during high water flows; and springs of sufficient flow to withstand the summer dry period.

3. Upland Habitat. Upland areas within 200 feet of the edge of the riparian vegetation or dripline surrounding aquatic and riparian habitat and comprises various vegetation series such as grasslands, woodlands, and/or wetland/riparian plant species that provides the California red-legged frog shelter, forage, and predator avoidance. Upland features are also essential in that they are needed to maintain the hydrologic, geographic, topographic, ecological, and edaphic features that support and surround the wetland or riparian habitat. These upland features contribute to the filling and drying of the wetland or riparian habitat and are responsible for maintaining suitable periods of pool inundation for larval California red-legged frogs and their food sources, and provide breeding, non-breeding, feeding, and sheltering habitat for juvenile and adult California red-legged frogs (e.g., shelter, shade, moisture, cooler temperatures, a prey base, foraging opportunities, and areas for predator avoidance). Upland habitat can include structural features such as boulders, rocks and organic debris (e.g. downed trees, logs), as well as small mammal burrows and moist leaf litter.

4. Dispersal Habitat. Accessible upland or riparian dispersal habitat within designated units and between occupied locations within 0.7 mi (1.2 km) of each other that allows for movement between such sites. Dispersal habitat includes various natural habitats and altered habitats such as agricultural fields, which do not contain barriers to dispersal. An example of a barrier to dispersal is a heavily traveled road (Vos and Chardon 1998) constructed without bridges or culverts. Dispersal habitat does not include moderate to high density urban or industrial developments with large expanses of asphalt or concrete, nor does it include large reservoirs over 50 ac (20 ha) in size, or other areas that do not contain those features identified in PCE 1, 2, or 3 as essential to the conservation of the species. This designation is designed for the conservation of PCEs necessary to support the life history functions and essential to the conservation of the species. Because not all life history functions require all the PCEs, not all areas designated as critical habitat will contain all the PCEs. Each of the areas designated as critical habitat have been determined to contain sufficient PCEs to provide for one or more of the life history functions of the California red-legged frog.

Least Bell's Vireo

The least Bell's vireo was federally listed as endangered on May 2, 1986 (51 FR 16474) and critical habitat was designated for the subspecies on February 2, 1994 (59 FR 4845). A draft recovery plan was completed in 1998 (Service 1998); no final plan has been published. The Service completed a 5-year review for the least Bell's vireo in September 2006 in which we

indicated that, due to new information on the subspecies and an improved understanding of ongoing recovery actions to reduce threats, the recovery goals and strategies should be modified and refined. In addition, we recommended that the least Bell's vireo should be down listed from endangered status to threatened status because of a 10-fold increase in population size since its listing in 1986, expansion of locations with breeding least Bell's vireo throughout southern California, and conservation and management of suitable breeding habitat throughout its range (Service 2006). Additional information on the least Bell's vireo may be found in Wilbur (1980), Garrett and Dunn (1981), Zembal et al. (1985), Miner (1989), Pike and Hays (1992), and Service (1998).

The least Bell's vireo is a small, migratory songbird that nests and forages almost exclusively in riparian woodland habitats. The least Bell's vireo is in the family Vireonidae and is one of four subspecies of Bell's vireo (*Vireo bellii*) that have been recognized (American Ornithological Union (AOU) 1998), with each subspecies isolated from one another throughout the year (Hamilton 1962; Service 1998). They are site-tenacious across breeding seasons, highly territorial, and almost exclusively insectivorous. Least Bell's vireos are obligate riparian breeders, typically inhabiting structurally diverse woodlands along watercourses that feature dense cover within 3 to 6 feet of the ground and a dense, stratified canopy (Goldwasser 1981; Salata 1983; Gray and Greaves 1984; Service 1998). The understory within this riparian habitat is typically dominated by mulefat (*Baccharis salicifolia*), California wild rose (*Rosa californica*), poison oak (*Toxicodendron diversiloba*), sandbar willow (*Salix hindsiana*), young individuals of other willow species, and several perennial species (Service 1998). Important canopy species include mature arroyo willows (*S. lasiolepis*) and black willows (*S. gooddingii*), and occasional cottonwoods, western sycamore (*Platanus racemosa*), or coast live oak (*Quercus agrifolia*). Least Bell's vireos primarily forage and nest in riparian habitat, but they may also use adjoining upland scrub habitat (Salata 1983; Kus and Miner 1989).

Least Bell's vireos primarily feed on invertebrates, especially lepidopteran larvae, within willow stands or associated riparian vegetation (Miner 1989; Brown 1993). Least Bell's vireos occasionally forage in nonriparian vegetation such as coastal sage scrub, chaparral, and oak woodlands, although foraging in these other habitats usually occurs within 100 feet of the edge of riparian vegetation (Salata 1983; Gray and Greaves 1984; Kus and Miner 1989). Least Bell's vireo feeding behavior largely consists of gleaning prey from leaves or woody surfaces while perched or hovering, and less frequently by capturing prey by aerial pursuit (Salata 1983; Miner 1989). Least Bell's vireos concentrate most of their foraging between 0 to 20 feet above ground level (Salata 1983; Miner 1989).

Least Bell's vireos generally arrive in southern California breeding areas by mid-March to early April, with males arriving before females and older birds arriving before first-year breeders (Service 1998). Least Bell's vireos generally remain on the breeding grounds until late September, although some post-breeding migration may begin as early as late July (Service 1998). Male least Bell's vireos establish and defend breeding territories through singing and physically chasing intruders (Barlow 1962; Beck 1996; Service 1998). Although territories typically range in size from 0.5 to 7.5 acres (Service 1998), no relationship appears to exist between territory size and various measures of territory quality (Newman 1992).

Nest building commences a few days after pair formation, with the female selecting a nest-site location and both sexes constructing the nest (Pitelka and Koestner 1942; Barlow 1962; Service 1998). Nests are typically suspended in forked branches within 3 feet above the ground with no clear preference for any particular plant species as the nest host (Nolan 1960; Barlow 1962; Gray and Greaves 1984; Service 1998). Typically 3 or 4 eggs are laid on successive days shortly after nest construction (Service 1998). The eggs are incubated by both parents for about 14 days with the young remaining in the nest for another 10 to 12 days (Pitelka and Koestner 1942; Nolan 1960; Barlow 1962). Each nest appears to be used only once with new nests constructed for each nesting attempt (Greaves 1987). Least Bell's vireos may attempt up to five nests within a breeding season, but they are typically limited to one or two successful nests within a given breeding season (Service 1998).

Multiple long-term monitoring studies indicate that approximately 59 percent of nests successfully produce fledglings, although on average only 1.8 chicks fledge per nest (Service 1998). Although least Bell's vireo nests appear to be more accessible to terrestrial predators because of their relatively low placement (Franzreb 1989), western scrub-jays (*Aphelocoma californica*) have been documented to account for the majority of documented depredation events (Peterson 2002; Peterson et al. 2004); depredation by jays and other avian predators may have selected for relatively low nest placement (Ferree 2002). Predation rates can exceed 60 percent of the least Bell's vireo nests in a given area within a year (Kus 1999), but typical nest predation rates average around 30 percent (Franzreb 1989), which is comparable to predation rates for other North American passerines (Martin and Clobert 1996; Grishaver et al. 1998; Ferree 2002).

Nest parasitism by cowbirds is another major source of failure for least Bell's vireo nests (Franzreb 1989; Service 1998; Kus 1999, 2002; Griffith and Griffith 2000; Sharp 2002); nests that are parasitized are either abandoned or fledge cowbird chicks rather than least Bell's vireos. Cowbirds did not historically occur within the least Bell's vireo's range, and therefore least Bell's vireos have not evolved adequate defenses to avoid loss of productivity due to parasitism (Franzreb 1989; Kus 2002). Parasitism of least Bell's vireo nests may exceed 42 percent in some locations (Kus 1999), but extensive cowbird trapping and focused nest monitoring can substantially reduce parasitism or its effects (Franzreb 1989; Service 1998; Griffith and Griffith 2000; Kus 2002).

Cowbird trapping has proven a successful tool to halt least Bell's vireo population declines over the short term within a limited area, but Kus and Whitfield (2005) have argued that trapping may not be the best method for long-term recovery of the least Bell's vireo because maintaining cowbird populations at low levels may not allow the least Bell's vireo to evolve resistance to cowbird parasitism. The issue of cowbird trapping remains unclear as to the best way to manage this threat over the long term, and additional research is needed to determine whether there are any alternatives to the intensive cowbird trapping programs currently being implemented (Service 2006).

Fledgling least Bell's vireos expand their dispersal distances from about 35 feet the first day to about 200 feet several weeks after fledging (Hensley 1950; Nolan 1960). This distance has been shown to increase to at least 1 mile prior to their first fall migration (Gray and Greaves 1984).

Banding records indicate that while most first-year breeding least Bell's vireos return to their natal drainage after winter migration, some disperse considerable distances to other breeding locations (Greaves and Labinger 1997; Service 1998; Kus and Beck 1998). Movement by least Bell's vireos between drainages within San Diego County is not uncommon (Kus and Beck 1998). Additionally, several least Bell's vireos banded as nestlings in San Diego County have been resighted as breeding adults in Ventura County, and the opposite movement from Ventura to San Diego has also been observed (Greaves and Labinger 1997). The maximum dispersal distance currently documented is approximately 130 miles (Service 1998), but this is probably an underestimate due to the limited number of least Bell's vireos that are banded and insufficient re-sighting efforts. Although movement between sites by older birds may occur, site fidelity by least Bell's vireos after the first breeding season is generally high, and most dispersal between sites occurs between the time that least Bell's vireos fledge from their nest and their first breeding season (Service 1998).

The least Bell's vireo historically occupied willow riparian habitats from Tehama County, in northern California, southward to northwestern Baja California, Mexico, and as far east as Owens Valley, Death Valley, and the Mojave River (Grinnell and Miller 1944; Service 1998). Although originally considered to be abundant locally, regional declines of this subspecies were noticeable by the 1940s (Grinnell and Miller 1944), and the least Bell's vireo was believed to have been extirpated from California's Central Valley by the early 1980s (Franzreb 1989). Except for a few outlying pairs, the least Bell's vireo is currently restricted to southern California south of the Tehachapi Mountains and northwestern Baja California (Wilbur 1980; Garrett and Dunn 1981; Franzreb 1989; U.S. Geological Survey (USGS) 2002). The largest current concentrations of least Bell's vireos are in San Diego County along the Santa Margarita River on Camp Pendleton and in Riverside County at the Prado flood control basin (Service 2006).

Historically, the San Joaquin and Sacramento Valleys were considered to be the center of the least Bell's vireo's breeding range (60 to 80 percent of the historical population; 51 FR 16474), but the least Bell's vireo has not yet meaningfully re-colonized those areas. In 2005 and 2006, the first breeding pair of least Bell's vireos detected in the San Joaquin Valley since the listing of the this subspecies successfully bred at the San Joaquin National Wildlife Refuge in Stanislaus County (Service 2006). There have been no sightings of least Bell's vireos in the Sacramento Valley since prior to the listing, and it is unlikely that any breeding least Bell's vireos have occurred within recent years in the Sacramento Valley (Service 2006).

Greater than 99 percent of the remaining least Bell's vireos were concentrated in southern California (Santa Barbara County and southward) at the time of the listing in 1986 (51 FR 16474), with San Diego County containing 77 percent of the population. Greater than 99 percent still remain in southern California, although the populations are now more evenly distributed in southern California with 54 percent of the total population occurring in San Diego County and 30 percent of the population occurring in Riverside County (Service 2006); however, there has been only a slight shift northward in the subspecies' overall distribution. Thus, despite a significant increase in overall population numbers, the population remains restricted to the southern portion of its historical range (Service 2006).

Causes for decline of the least Bell's vireo included destruction or degradation of habitat, river channelization, water diversions, lowered water tables, gravel mining, agricultural development, and cowbird parasitism (Service 1986, 1994, 1998). Habitat losses had fragmented most remaining populations into small, disjunct, widely dispersed subpopulations (Franzreb 1989). Habitat fragmentation negatively affects abundance and distribution of neotropical migratory songbirds, in part by increasing incidence of nest predation and parasitism (Whitcomb et al. 1981; Small and Hunter 1988; Yahner and DeLong 1992; Sharp 2002; Peterson 2002). Least Bell's vireos nesting in areas containing a high proportion of degraded habitat have lower productivity (e.g., hatching success) than those in areas of high quality riparian woodland (Pike and Hays 1992).

The least Bell's vireo population in the U.S. has increased 10-fold since its listing in 1986, from 291 to 2,968 known territories (Service 2006). The population has grown during each 5-year period since the original listing, although the rate of increase has slowed over the last 10 years. Population growth has been greatest in San Diego County and Riverside County, with lesser but significant increases in Orange County, Ventura County, San Bernardino County, and Los Angeles County. The population in Santa Barbara County has declined since the listing in 1986, although it is uncertain whether this population was historically significant. Kern, Monterey, San Benito, and Stanislaus counties have had a few isolated individuals and/or breeding pairs since the original listing, but these counties have not supported any sustained populations (Service 2006).

Draft Recovery Plan for the Least Bell's vireo

The 1998 draft recovery plan for the least Bell's vireo states that the goal of recovery efforts is the reclassification of the subspecies from endangered to threatened and, ultimately, delisting of the subspecies. The draft plan states that reclassification to threatened status may be considered when there are stable or increasing population/metapopulations of least Bell's vireos for a period of 5 consecutive years, each consisting of several hundred or more breeding pairs at the following sites: Tijuana River, Dalzura/Jamul Creek/Otay River, Sweetwater River, San Diego River, San Luis Rey River, Camp Pendleton/Santa Margarita River, Santa Ana River, an Orange County/Los Angeles County metapopulation, Santa Clara River, Santa Ynez River, and an Anza Borrego Desert metapopulation. The draft plan states that each of these populations and metapopulations should be protected and managed.

The draft plan states that delisting of the least Bell's vireo may be considered when the subspecies meets the criterion for downlisting and there are stable or increasing least Bell's vireo population/metapopulations for a period of 5 consecutive years established at the following currently unoccupied areas of the subspecies' historical range: Salinas River, a San Joaquin Valley metapopulation, and a Sacramento Valley metapopulation. The draft plan states that each of these populations and metapopulations should be protected and managed.

Lastly, the draft plan states that threats to the least Bell's vireo at the aforementioned sites should be reduced or eliminated so that these populations/metapopulations are capable of persisting without significant human intervention, or perpetual endowments are secured for cowbird trapping and exotic plant control in riparian habitat occupied by the least Bell's vireos.

The draft recovery plan describes a strategy for reclassification, recovery, and delisting. Instrumental to this strategy is securing and managing riparian habitat within the historical breeding range of the least Bell's vireo, annual monitoring and rangewide surveys, and research activities necessary to monitor and guide the recovery effort.

Southwestern Willow Flycatcher

The southwestern willow flycatcher was federally listed as endangered on February 27, 1995 (60 FR 10694). The final recovery plan for the subspecies was completed in August 2002 (Service 2002b).

The southwestern willow flycatcher breeds in southern California (north to the Santa Ynez River, Kern River, and Independence on the Owens River), southern Nevada, southern Utah, Arizona, New Mexico, and extreme western Texas. All subspecies of the willow flycatcher are completely migratory. The species as a whole winters from southern Mexico south through Central America to Panama and western Venezuela. Subspecies *extimus* has been collected in winter in Guatemala, El Salvador, Honduras, and Costa Rica (Unitt 1987).

Unitt (1987) concluded that the southwestern willow flycatcher was once fairly common in the Los Angeles Basin, where habitat is virtually absent now. Approximately 616 acres of riparian habitat has regenerated along the South Fork Kern River since the early 1980s, but fluctuations in the number of territories in this area has made it difficult to determine a trend in the population for the area (Whitfield et al. 1999). Downstream from the South Fork Kern River, willow flycatchers (unknown subspecies) were common breeders in the early 1900s, but today virtually no riparian habitat remains. Outside of the Kern River, southwestern willow flycatcher populations are present along the Owens, San Luis Rey, and Santa Margarita (Camp Pendleton) Rivers. Changes in land use along the San Luis Rey River have improved habitat quality and extent, which has resulted in an increase in the number of territorial southwestern willow flycatcher males from 12 in the late 1980s (Unitt 1987) to more than 40 in 1999 (Kus et al. 1999). In contrast, the populations on Camp Pendleton have remained fairly constant for the past two decades despite apparently suitable habitat to support population expansion. The remaining southwestern willow flycatcher populations in southern California, most of which number fewer than five territories, occur at scattered sites along drainages that have changed little in the past 15 years.

The southwestern willow flycatcher breeds only in riparian woodland, typically adjacent to or over water. Surface water or saturated soil is usually present in or adjacent to nesting sites during at least the initial portion of the nesting period (Muiznieks et al. 1994, Tibbits et al. 1994). Riparian woodland used by willow flycatchers typically has a canopy and an understory of shrubs or saplings. Native willows dominate the habitat commonly represented in current and historical records.

Southwestern willow flycatchers do nest in some riparian habitats containing and even dominated by salt cedar (*Tamarisk* sp.)_ (McKernan and Braden 1999, Paradzick et al. 2000). In terms of southwestern willow flycatcher productivity, the suitability of tamarisk dominated habitats is not known. Southwestern willow flycatcher productivity in some sites dominated by non-native vegetation is lower than in some native-dominated habitats (Sferra et al. 1997, Sogge

et al. 1997). The reverse is also true, however, within some tamarisk-dominated habitats where southwestern willow flycatcher productivity is similar or higher than nearby native-dominated sites (McKernan and Braden 1999, Paradzick et al. 1999).

The southwestern willow flycatcher is a diurnal insectivore, catching its prey on the wing usually in the middle story of riparian woodland. Males maintain and advertise a territory by singing to attract females. There is little information on the factors a southwestern willow flycatcher female uses to select a mate, though it may be related to some factor of habitat quality or potential quality of the male (Service 2002b). Territorial defense begins immediately after spring arrival. Females occasionally sing, apparently when stimulated by territorial disputes (Sogge et al. 1997). Male southwestern willow flycatchers sing most persistently early in the breeding season, but song rate declines as the season progresses, particularly once the male finds a mate and nesting efforts begin (Finch et al. 2000). Their response to taped playback of songs during surveys has also been known to decrease as the nesting season progresses. Mapped breeding territory sizes are 0.15 to 0.5 acre on the Colorado River (Sogge et al. 1997), 0.5 to 1.25 acres along the Verde River, Arizona (Sogge 1995), and 0.35 to 5.7 acres along the Kern River, California (Whitfield and Enos 1996).

Southwestern willow flycatchers typically arrive on breeding grounds from late April to early June (Maynard 1995, Skaggs 1996, Sferra et al. 1997). Evidence gathered during multi-year studies of color-banded populations show that although most southwestern willow flycatchers return to former breeding areas, they regularly move among sites within and between years (Netter et al. 1998). From 1997 to 2000, 66 to 78 percent of southwestern willow flycatchers returned to the same breeding site (Luff et al. 2000). Within drainage movements are more common than between drainage movements.

Nests are initiated usually within one week of pair formation, 10 to 14 days after spring arrival. Building nests takes 3 to 8 days. In historical egg collections from southern California, 86 percent of nests were in willow, 4 percent in *Urtica dioica* (stinging nettles), and 10 percent in other plants (Unitt 1987). Females typically lay one egg per day, until the nest contains three to four eggs. Incubation begins after the last egg is laid, and lasts 12 to 13 days (Service 2002b). For the southwestern willow flycatcher, incubation generally lasts 12 to 15 days from the date that the last egg was laid. During incubation, females spend approximately 50 percent of the day attending (incubating or shading) the eggs and incubate throughout the night. Incubation and shading bouts can last from less than 1 to more than 60 minutes (Finch et al. 2000).

Southwestern willow flycatcher young usually leave the nest 12 to 15 days after hatching. During the brooding period, the young are cared for by both the male and female. Feeding trips during the peak of this period can reach 30 trips per hour during days 5 to 10 (Finch et al. 2000). Fledglings stay close to the nest and each other for 3 to 5 days, and may repeatedly return to and leave the nest during this period (Spencer et al. 1996).

The decline of the southwestern willow flycatcher is attributed to numerous factors, including nest depredation and brood parasitism by the brown-headed cowbird. However, large scale loss of southwestern wetlands, particularly cottonwood-willow riparian habitat, is the principal reason for the southwestern willow flycatcher's current status. Habitat loss is a result of urban and

agricultural development, water diversion and impoundment, livestock grazing, and hydrological changes attributable to these and other land uses (60 FR 10694). In some cases, willow flycatchers are faced with situations that force movement, such as when catastrophic habitat loss occurs from fire or flood. Several such cases have been documented, with some of the resident willow flycatchers moving to remaining habitat within the breeding site, some moving to other sites 1.2 to 16.8 miles away (Paxton et al. 1997, Owen and Sogge 1997), and others disappearing without being seen again. For a discussion on the status of riparian habitat, see the status of the least Bell's vireo above.

Recovery Plan for the Southwestern Willow Flycatcher

The 2002 final recovery plan for the southwestern willow flycatcher identifies that the goal of recovery efforts is the reclassification of the subspecies from endangered to threatened and, ultimately, delisting of the subspecies. The plan states that reclassification to threatened status may be considered when either of the following criteria has been met:

Criterion A: Increase the total known population to a minimum of 1,950 territories (equating to approximately 3,900 individuals), geographically distributed to allow proper functioning as metapopulations, so that the southwestern willow flycatcher is no longer in danger of extinction. For reclassification to threatened status, these prescribed numbers and distributions must be reached as minimum, and maintained over a 5 year period.

Criterion B: Increase the total known populations to a minimum of 1,500 territories (equating to approximately 3,000 individuals), geographically distributed among Management Units and Recovery Units, so that the southwestern willow flycatcher is no longer in danger of extinction. Recovery Units are large watershed or hydrologic areas, while Management Units are a subset of the Recovery units and encompass local drainages and distinct geographic features. For reclassification to threatened status, these prescribed numbers and distributions must be reached as a minimum, and maintained over a 3 year period, and the habitats supporting this subspecies must be protected from threats and loss.

The recovery plan states that the southwestern willow flycatcher may be removed from the list of threatened and endangered species when both of the following criteria have been met:

Criterion 1: Meet and maintain, at a minimum, the population levels and geographic distribution specified under reclassification to threatened Criterion A.

Criterion 2: Provide protection from threats and create/secure sufficient habitat to assure maintenance of these populations and/or habitat over time. The sites containing southwestern willow flycatcher breeding groups, in sufficient number and distribution to warrant downlisting, must be protected into foreseeable future through development and implementation of conservation management agreements (e.g., public land management planning process for Federal lands, habitat conservation plans (under Section 10 of the Act), conservation easements, and land acquisition agreements for private lands, and intergovernmental conservation agreements with Tribes). Prior to delisting, the Service must confirm that the agreements have been created and executed in such a way as to achieve their role in southwestern willow flycatcher recovery, and individual agreements for all areas within all Management Units

(public, private, and Tribal) that are critical to metapopulation stability (including suitable, unoccupied habitat) must have demonstrated their effectiveness for a period of at least 5 years.

The recovery plan categorizes recovery actions into nine types: (1) increase and improve occupied, suitable, and potential breeding habitat; (2) increase metapopulation stability; (3) improve demographic parameters; (4) minimize threats to wintering and migration habitat; (5) survey and monitor; (6) conduct research; (7) provide public education and outreach; (8) assure implementation of laws, policies, and agreements that benefit the southwestern willow flycatcher; and (9) track recovery progress.

Critical habitat for the southwestern willow flycatcher
Critical habitat was designated for the subspecies on October 19, 2005 (70 FR 60886). In California, units are located in Kern, Santa Barbara, San Bernardino, and San Diego counties; critical habitat is not designated in the action area. However, on August 15, 2011, revised critical habitat was proposed including riparian areas within the Ventura River and Santa Clara River (76 FR 50542). The proposed rule is anticipated to be finalized in December 2012.

In total, approximately 2,090 stream miles are being proposed for designation as critical habitat. These areas are being proposed as stream segments, with the lateral extent including the riparian areas and streams that occur within the 100-year floodplain or flood-prone areas.

In accordance with sections 3(5)(A)(i) and 4(b)(1)(A) of the Act and regulations at 50 CFR 424.12, in determining which areas within the geographical area occupied by the species (in this case a subspecies) at the time of listing to designate as critical habitat, we consider the physical or biological features essential to the conservation of the flycatcher and which may require special management considerations or protection. These include, but are not limited to:

1. Space for individual and population growth and for normal behavior;

2. Food, water, air, light, minerals, or other nutritional or physiological requirements;

3. Cover or shelter;

4. Sites for breeding, reproduction, or rearing (or development) of offspring; and

5. Habitats that are protected from disturbance or are representative of the historical, geographical, and ecological distributions of a species.

ENVIRONMENTAL BASELINE

The implementing regulations for section 7(a)(2) define the action area being addressed in a consultation as the area that may be directly or indirectly affected by the proposed action (50 *Code of Federal Regulations* 402.02). We consider the action area for this biological opinion to include anywhere in Ventura County where the District currently has facilities, where the District may have facilities in the future, and where the District conducts mitigation related to the O&M Program.

Ventura County contains three major watersheds, the Ventura River watershed, Santa Clara River watershed, and the Calleguas Creek watershed. In addition to these three large watersheds, there are numerous smaller drainages that lead directly or indirectly to the Pacific Ocean. These watersheds provide a variety of habitats including sandy beaches, estuaries, riparian channels and floodplains, grasslands, woodlands, coastal scrub, chaparral, and other habitats.

Facilities that are known to currently be within suitable habitat for the tidewater goby and its critical habitat, California red-legged frog and its critical habitat, least Bell's vireo, and the Southwestern willow flycatcher and its proposed critical habitat are shown in Figure 3 and listed in Appendix A. Additional facilities may be added or taken out of the O&M Program over time. The District will update these tables as necessary when new facilities are entered into the O&M Program.

Tidewater goby

Within Ventura County, tidewater gobies are known to occur in the Ventura River estuary, Santa Clara River Estuary, Ormond Lagoon, Calleguas Creek/Mugu Lagoon, and Sycamore Cover. O&M Program facilities that are located in habitat that is potentially suitable for tidewater gobies are listed in Appendix A, and summarized in Table 4. Habitat that is considered potentially suitable includes lower watershed areas that may be inundated and support vegetation during various times of year or as estuary morphology changes. Not all potentially suitable habitat is suitable at all times.

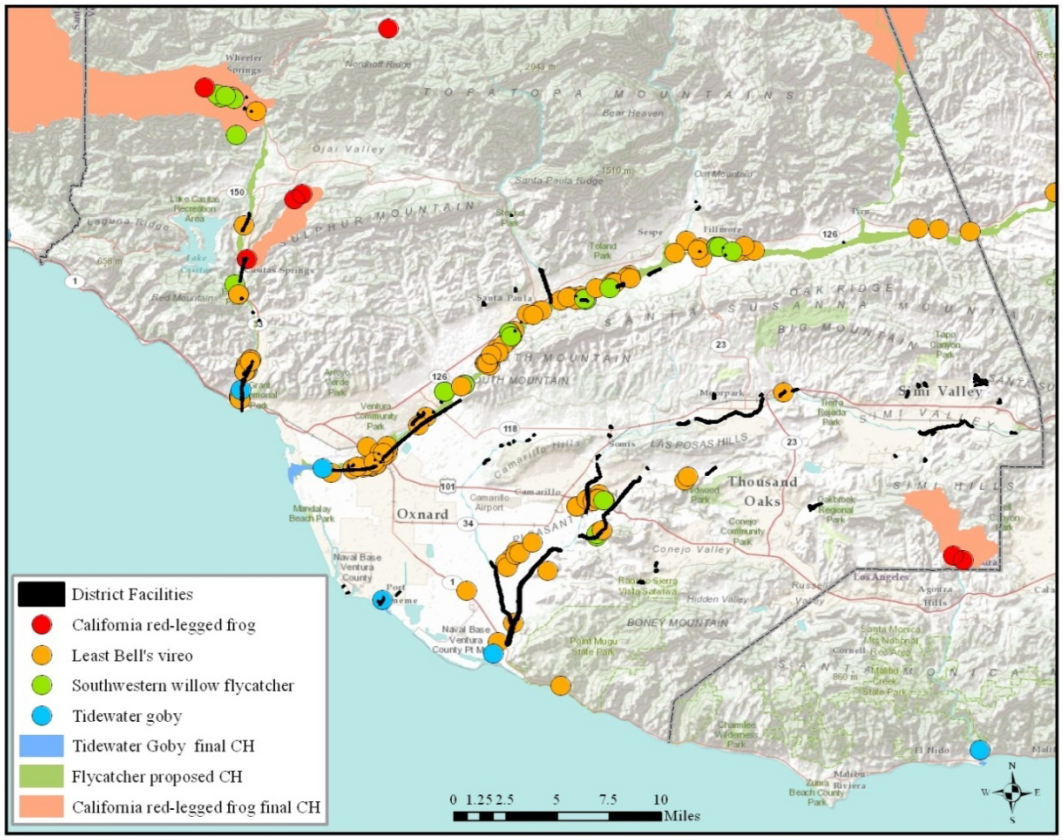

Figure 3. Location of O&M Program facilities and occurrences of California red-legged frogs, southwestern willow flycatchers, least bell's vireos, tidewater gobies, and their designated and proposed critical habitats within Ventura County.

Table 4. Total potential habitat, and facilities in potential habitat for tidewater gobies.

	Total potential habitat (Acres)	Facilities in potential habitat (Acres)
Ventura River	202	29
Santa Clara River	532	1
Ormond Lagoon	121	1
Calleguas Creek	677	213
TOTAL	1,532	244

Tidewater gobies were detected in the Ventura River in 1998 and 2005, which is currently presumed occupied. The available tidewater goby habitat in the Ventura River encompasses approximately 2 to 25 acres. The mouth of the Ventura River occurs at a public beach, owned by the City of Ventura. Upstream of the estuary, much of the land adjacent to the river is privately owned. The District maintains a levee from the Pacific Ocean to just north of Stanley Avenue as well as 14 side drains and short channels that convey stormwater into the river. The levee toe and side drains are in contact with surface water and potentially occupied tidewater goby habitat along about 10 to 20 percent of its length in any given year.

In the Santa Clara River, tidewater goby habitat encompasses approximately 75 to 125 acres. Tidewater gobies have been detected in the Santa Clara River estuary in 1998 and 2004. In 2010 the estuary was artificially breached and numerous tidewater gobies were flushed out of the lagoon and washed up dead on the shores surrounding the estuary. Similar breaching events have impacted this estuary in the past, and will likely occur again in the future. These unnatural events may be artificially depressing the tidewater goby population in this area; however there are locations within the estuary that likely provide refugia for tidewater gobies during these events and it is unlikely that extirpation has occurred.

In Ormond Lagoon, the available tidewater goby habitat encompasses approximately 0.7 to 2.5 acres and is hydrologically connected with the Oxnard Industrial Drain and J Street Drain. Tidewater gobies were first collected here in 1993 and then were observed again in 1998, 2004, 2005, 2006, 2008, and 2011. In 2005 and 2006, the District conducted 215 seine hauls in the J-Street drain, in order to relocate tidewater gobies out of their project area and captured and released a total of 4,437 individuals (Mulder and Swift 2007). Tidewater gobies were the most abundant species captured followed by mosquitofish (*Gsambusia* sp.), sailfin mollies (*Poecilia latipinna*) , and crayfish (*Orconectes* sp.) (Mulder and Swift 2007). In 2011 the Environmental Protection Agency detected abundant tidewater gobies in Ormond Lagoon during sampling for the remedial investigation of the Halaco Superfund Site, further confirming the species presence in this location.

Historically, Calleguas Creek and its tributaries were intermittent and flowed seasonally from its headwaters near the City of Simi Valley onto the Oxnard Plain. Due to development, Calleguas Creek is now primarily a perennial stream predominantly fed by treated wastewater flows, with secondary surface flows originating from groundwater, agricultural and urban runoff, and periodic stormwater flows. Revolon Slough is a major tributary of Calleguas Creek that flows into the creek near Highway 1 (Pacific Coast Highway), just prior to the creek's outflow into Mugu Lagoon.

Much of the available tidewater goby habitat in Calleguas Creek/Mugu Lagoon is owned by Naval Base Ventura County. Tidewater gobies were detected at the site in 1940 (Swift et al. 1989), but then were not detected during surveys in 2001 and 2002 by Lafferty and Swift (Service 2005). On July 20, 2011, tidewater gobies were found in Calleguas Creek above the Highway 1 Bridge (BonTerra Consulting 2011). The District performed surveys of the downstream portions of Calleguas Creek and Revolon Slough, in August and September 2011. The results of the survey indicated that tidewater gobies were present in the lower reaches of both channels, but suggested that during winter flows, individuals are expected to move a considerable distance upstream (Cardno Entrix 2011). The dispersal limit for tidewater gobies in both drainages is about 4 miles upstream of Highway 1 due to the dam on Calleguas Creek and the concrete channel in Revolon Slough that starts at Wood Road (Cardno Entrix 2011).

Recovery of the tidewater goby

All tidewater goby populations within Ventura County are within the Los Angeles/Ventura Recovery Unit. The tidewater goby populations and habitats within the Los Angeles/Ventura Recovery Unit are shown in Table 5. Of these, only the Ventura River, Santa Clara River, Ormond Lagoon, and Calleguas Creek/Mugu Lagoon are anticipated to be affected by O&M Program activities.

Table 5. Tidewater goby populations within the Los Angeles/Ventura Recovery Unit along with occupancy status at the time the recovery plan was developed (2005), and current status.

Sub-Unit	Status in the Recovery Plan	Current Status
Ventura River	Occupied	Occupied
Santa Clara River	Occupied	Occupied
Ormond Lagoon	Occupied	Occupied
Calleguas Creek/Malibu Lagoon	Extirpated	Occupied
Sycamore Canyon	No historical records	Occupied
Arroyo Sequit	No historical records	No historical records
Zuma Canyon	No historical records	No historical records
Malibu Creek	Occupied	Occupied
Topanga Creek	Occupied	Occupied
Santa Monica Artesian Springs	Extirpated	Extirpated
Ballona Creek	No historical records	No historical records

Tidewater goby critical habitat

Within Ventura County, tidewater goby designated critical habitat is located within the Ventura River (VEN-1), Santa Clara River (VEN-2), and Ormond Lagoon (VEN-3). Proposed tidewater goby critical habitat is located in these same areas and in one additional unit located in Big Sycamore Canyon (VEN-4). The unit boundaries for VEN-1 in the designated and proposed rules are identical. The unit boundaries for VEN-2 in the designated and proposed rules are similar, with the primary difference being less proposed critical habitat in an area that is currently a sand bar and does not contain PCEs. The unit boundaries for VEN-3 in the designated and proposed rules are significantly different with the designated rule covering

Ormond Lagoon, and the proposed rule covering Ormond Lagoon and the adjacent wetlands on property owned by The Nature Conservancy. No District facilities or O&M Program activities would occur within the additional area identified in the proposed critical habitat rule, therefore the nature and extent of impacts to VEN-3 is anticipated to be the same for the designated and proposed rules, despite the difference in unit size. Each of these critical habitat units is currently known to support all of the PCEs.

Table 6. Designated and proposed tidewater goby critical habitat within Ventura County.

Unit	Location	Designated CH (Acres)	Proposed CH (Acres)
VEN-1	Ventura River Estuary	50.3	50.3
VEN-2	Santa Clara River Estuary	360.5	322.1
VEN-3	Ormond Lagoon	44.4	121.0
VEN-4	Big Sycamore Canyon	N/A	0.69

The unit boundaries that are presented in the proposed revision of critical habitat are similar to the currently designated critical habitat units such that the effect of the O&M Program on the proposed critical habitat would be the same as currently designated critical habitat.

California red-legged frog

Within Ventura County, California red-legged frogs are known to occur in the Ventura River watershed and in Las Virgenes Creek near the City of Calabasas (Figure 1). In the Ventura River watershed, California red-legged frogs are known to occur in San Antonio Creek downstream of Soule Park to the Ventura River confluence, in Matilija Creek upstream of Matilija Dam, and in the lower Ventura River at Foster Park. Each of these areas typically supports perennial river flow, although the water levels can be low during summer months. Due to suitable habitat within the mainstem of the Ventura River, and lack of barriers to dispersal, it is feasible that California red-legged frogs could be located anywhere within the Ventura River mainstem. California red-legged frogs are also known to occur in Las Virgenes Creek, near the City of Calabasas on the border of Ventura County and Los Angeles County; however, no District facilities are located in the vicinity of these occurrences.

Currently 25 acres of O&M Program facilities are located within suitable habitat for California red-legged frogs (Appendix A). A majority of this area is maintained vegetation-free and may or may not be inundated depending on the time of year and river morphology. The entire Ventura River riparian corridor is potentially suitable habitat for California red-legged frogs, and totals approximately 1,500 acres from the estuary to Matilija Dam. The Ventura River likely acts as a movement corridor regardless of presence of vegetation. California red-legged frogs may use the riprap levees as sheltering habitat. Additionally up to 10 acres per year of mitigation/restoration may occur within suitable habitat for the California red-legged frog in Calleguas Creek.

<u>Recovery of the California red-legged frog</u>

Ventura County is split between Recovery Unit 7 (Northern Transverse Ranges and Tehachapi Mountains) and Recovery Unit 8 (Southern Transverse Ranges and Peninsular Ranges). Recovery Unit 7 includes portions of Santa Barbara, San Luis Obispo, Kern, Ventura, and Los Angeles Counties and includes the Ventura River and Santa Clara River tributaries. Recovery

Unit 8 includes portions of Ventura, Los Angeles, San Bernardino, Riverside, Orange, and San Diego counties, however the portions of Ventura County within this recovery unit do not support any District facilities that are the subject of this biological opinion, and Recovery Unit 8 will not be considered further in this consultation.

The Ventura River and tributaries to the Santa Clara River make up Core Area 26 of the California red-legged frog recovery plan. Conservation needs for this core area include restoring habitat, controlling non-native predators and non-native plants, and removing Matilija Dam.

California red-legged frog critical habitat

Within the Ventura River watershed, critical habitat for the California red-legged frog is designated above Matilija Dam to the headwaters of the Santa Ynez River, extending approximately 1.6 miles below the dam (STB-7), and in San Antonio Creek including approximately 0.4 miles of the Ventura River at the confluence of San Antonio Creek and the Ventura River (VEN-1) (Figure 3). There are currently 1.9 acres of District facilities within unit STB-7 and 0.4 acres of District facilities within VEN-1. The District facility located within STB-7 does not contain the PCEs for the California red-legged frog. The District facility within VEN-1 is generally thought to support PCEs for aquatic breeding habitat, aquatic non-breeding habitat, and/or dispersal habitat. Invasive vegetation including giant reed (*Arundo donax*), salt cedar, and tree of heaven (*Ailanthus altissima*) are pervasive within the Ventura River watershed, including within STB-7 and VEN-1. The O&M Program contains a mitigation/restoration component that may target the removal of these invasive vegetation species. We anticipate up to 10 acres of invasive vegetation removal within the Ventura River watershed each year. This vegetation removal could occur partially or fully within STB-7 or VEN-1.

Table 7. Designated critical habitat units that may be affected by O&M Program activities.

Unit	Location	Designated CH (Acres)
STB-7	Upper Santa Ynez River and Matilija Creek	145,121
VEN-1	San Antonio Creek	2,915

Least Bell's vireo

Within Ventura County, least Bell's vireos are known to occur within the Ventura River, Santa Clara River, and in various locations within the Calleguas Creek watershed (Figure 3). The suitable habitat within these watersheds is located within the floodplain but will change in extent and configuration when large storms scour vegetation, and regrowth occurs in the following seasons. Because of this dynamic, the entire primary floodplain area of each of these watersheds provides potentially suitable habitat and is quantified in table 8, along with the acres of District facilities that are within these suitable habitat areas in each watershed. Facilities currently included in the O&M Program that may affect least Bell's vireo are listed in Appendix A, Table 2. A summary of these facilities is shown in Table 8.

Table 8. Total potential habitat and facilities within potential habitat for least Bell's vireo.

	Total potential habitat (Acres)	Facilities in potential habitat (Acres)
Ventura River	1,500	35
Santa Clara River	6,700	46
Calleguas Creek	2,300	174
TOTAL	10,500	255

In the Ventura River watershed, least Bell's vireos have routinely been observed near the Main Street Bridge, just above the estuary. Here, District facilities include 3.5 miles of levee on the east bank of the river and 17 side drains. Least Bell's vireos may also occur in the upper mainstem of the Ventura River from the Santa Ana Road bridge upstream to Matilija Dam. Willow thicket habitat is patchy, but present in this area. The District maintains nearly 1-mile of levee on the west side of the river, as well as the tributary channels of Cozy Dell and Live Oak Creek Diversion. In the upper watershed, least Bell's vireos have been observed upstream of the dam in habitat that was recently cleared of giant reed (VCWPD 2010). The District conducts minor vegetation management and dam maintenance in this area.

In the Santa Clara River watershed least Bell's vireo habitat occurs in extensive patches within the floodplain of the mainstem and in tributaries such as Santa Paula Creek and Sespe Creek. Much of the river and creek bottom area is open and sandy. The system is highly dynamic and the mosaic of willow thickets and open sandy channels change location frequently. Approximately 5,000 acres of river bottom occur along the Santa Clara River over more than 30 miles from the river mouth to the Ventura County line. The District maintains approximately 9.1 miles of levees on the main stem and 23 tributary channels and side drains that enter the Santa Clara River or Sespe Creek as well as three stream gauges and hydrography sampling locations, and the Piru storage and stockpile site. Additionally, the Corps recently constructed approximately 3-miles of channel facility in lower Santa Paula Creek. The District has not yet taken this facility over for maintenance, but is expected to in the next few years. Facilities that are within habitat that could become suitable for Least Bell's vireos if not property maintained, total approximately 46 acres.

The Calleguas Creek watershed is an alternating mix of heavily disturbed reaches and more natural channels. Starting downstream near Mugu Lagoon, Calleguas Creek is a channelized facility with levees on both banks from Highway 1 to just upstream of University Drive bridge at Camarillo Regional Park, a distance of 5.8 miles. In this area the District maintains the vegetation in an early seral state by discing, leaving a vegetated strip along alternating sides of the low flow channel every other year. This allows for a slightly more developed vegetation band along the water for wildlife use. Revlon slough is similar to lower Calleguas Creek in that the District maintains the channel and levees with annual discing and leaving a vegetated strip. Adjacent land uses comprise primarily active agricultural fields, limiting the availability of adjacent upland foraging habitat. Much of these reaches are not suitable for least Bell's vireo nesting, but may serve as foraging habitat for traveling birds nesting upstream.

From Conejo Creek to Pleasant Valley Road (approximately 2 miles), Calleguas Creek is a natural channel and the District does not conduct maintenance in this reach. Upstream of

Pleasant Valley Road, the District maintains bank protection facilities and levees on one or both sides of Calleguas Creek for approximately 3.2 miles to the former Seminary Road Bridge. Willow habitat is sparse and likely not suitable for least Bell's vireo nesting in this stretch.

Upstream of Upland Road in Camarillo, Calleguas Creek changes names to Arroyo Las Posas. Another 4-miles upstream, District bank protection facilities begin near the Moorpark Waste Water Treatment Plant. Low quality habitat occurs within this reach upstream to Grimes Canyon. Patches of willows and cattails are allowed to remain in this reach, but the slopes and 15 feet at the toe are maintained vegetation free through herbicide application (glyphosate). At Hitch Boulevard, Arroyo Las Posas changes names again to Arroyo Simi. For the next 4-miles through Moorpark the channel is mostly rock riprap on both banks with an earthen bottom, maintained mostly vegetation free and provides little habitat value for least Bell's vireo. Several areas include only rock slopes on the north bank. Between Gabbert Canyon and Beltramo Road, approximately 4,700 linear feet of the Arroyo Simi south bank supports willow scrub habitat and perennial flows where least Bell's vireos could potentially nest and raise young. Through the Virginia Colony area the perennial creek is dense with willows and giant reed, and has largely unprotected banks. Least Bell's vireos are known to occur in this area. The only District facility here is the outlet of Canyon 2 near Collins Road. The only other suitable habitat for least Bell's vireo in the Arroyo Simi occurs in the Parker Ranch reach near Stearns Street and the Metrolink Station. The District is in negotiations with the landowner to take over maintenance of a 1-mile facility in this area.

The District also maintains several ancillary basins and washes that are maintained fully or partially vegetation free and may support marginal habitat for least-Bell's vireo within or adjacent to these facilities. The District does not conduct any maintenance along the Arroyo Santa Rosa from the confluence with Conejo Creek in Santa Rosa Park upstream to Blanchard Road Drain. Least Bell's vireos have been observed in Arroyo Santa Rosa near the Hill Canyon Road bridge.

At the time the draft recovery plan was issued (1998), the Santa Clara River watershed was thought to support 60 pairs of least Bell's vireos and the Ventura river was thought to support 1 to 2 pairs (Service 1998). As of 2001, the comprehensive estimate of least Bell's vireo territories in the Santa Clara river was 119 (Service 2006). In 2005 and 2006 avian surveys were conducted in the Santa Clara River watershed by Jim Greaves and Zev Labinger. These surveys detected 84 male least Bell's vireos in 2005 and 67 males in 2006 in the portion of the Santa Clara River that is within Ventura County (Labinger at al. 2011). The locations thought to support the largest areas of breeding habitat for least Bell's vireo are predominately in the lower Santa Clara River watershed, within Ventura County (Labinger et al. 2011). The largest known populations in the Santa Clara River are centered around the Freeman diversion, Fillmore fish hatchery, and Hedrick Ranch.

<u>Recovery of the Least Bell's vireo</u>

The draft recovery plan identified the O&M Program area to be within the historical and current range of the least Bell's vireo. The recovery plan identified 14 vireo "population/metapopulation units," which must show stable or increasing populations in order to downlist the least Bell's vireo to threatened status. The Santa Clara River is one of these 14 population/metapopulation

units essential to the recovery of the species. The proximity of the Ventura River and Calleguas Creek watersheds to the Santa Clara River makes these habitats a valuable resource for achieving a stable or increasing population in the Santa Clara River unit. If habitat within the Ventura River and Calleguas Creek watersheds becomes increasingly utilized by least Bell's vireos, this area could provide a source population for birds that may ultimately select territories in the Santa Clara River watershed.

Southwestern willow flycatcher

Within Ventura County, southwestern willow flycatchers are known to occur within the Ventura River, Santa Clara River, and in various locations within the Calleguas Creek watershed (Figure 3). The suitable habitat within these watersheds is located within the floodplain but will change in extent and configuration when large storms scour vegetation, and regrowth occurs in the following seasons. Because of this dynamic, the entire primary floodplain area of each of these watersheds provides potentially suitable habitat and is quantified in table 9, along with the acres of District facilities that are within these suitable habitat areas in each watershed. Facilities currently included in the O&M Program that may affect southwestern willow flycatchers are listed in Appendix A, Table 4.

Table 9. Total potential habitat and facilities within potential habitat for southwestern willow flycatcher.

	Total potential habitat (Acres)	Facilities in potential habitat (Acres)
Ventura River	1,500	32
Santa Clara River	6,700	45
Calleguas Creek	2,300	84
TOTAL	10,500	161

In the Ventura River watershed, the habitat conditions for southwestern willow flycatcher match those of the Least Bell's vireo, described in the section above. Southwestern willow flycatchers have been identified in the Ventura River, approximately 1 mile below the confluence with San Antonio Creek and above Matilija Dam. Nesting has not been documented in the Ventura River below Matilija Dam, where various District facilities are located, however, there is suitable habitat present and as habitat conditions continue to improve in local watersheds, the probability of the Ventura River supporting nesting activity in the future is high.

In the Santa Clara River watershed, the habitat conditions for southwestern willow flycatcher are similar to those of the Least Bell's vireo, described in the section above; however, southwestern willow flycatchers tend to prefer a more complex riparian structure that includes cottonwoods, willows, and a herbaceous understory. Southwestern willow flycatchers are known to occur in extensive thickets of willow scrub at the California Department of Fish and Game hatchery east of the City of Fillmore, near the confluence with Balcom Canyon, and just west of Santa Paula near South Mountain Road. The Santa Clara River system is highly dynamic, and the mosaic of willow thickets and open sandy channels change frequently. In any given year or series of years, a low flow channel can persist during the spring potentially supporting the development of riparian habitat suitable for flycatcher nesting, so all district facilities in the floodplain could potentially be located within or adjacent to suitable habitat for the flycatcher.

In the Calleguas Creek watershed, the creeks are generally narrow, which is thought to be less suitable for this species' riparian foraging and nesting requirements, and therefore the amount of suitable habitat for the southwestern willow flycatcher is likely less than described for the least Bell's vireo in the section above. Southwestern willow flycatchers have been observed in Conejo Creek and in Hill Canyon near the wastewater treatment plants, but not elsewhere in the watershed.

A majority of southwestern willow flycatcher observations in Ventura County were in late May and early June when willow flycatchers of several races are migrating in concentrated numbers. These birds are likely migrating through the area and are using habitat in the Ventura River, Santa Clara River and Calleguas Creek watersheds as stop-over habitat for resting and foraging. In 2006 singing birds were observed at United Water property near Highway 118, Hedrick Ranch Nature Area, and west of the Fillmore Fish Hatchery (Labinger at al. 2011) indicating that breeding attempts may be likely in these areas.

Recovery of the Southwestern Willow Flycatcher

The action area is located within the Coastal California Recovery Unit identified in the final recovery plan. As described in the 2002 recovery plan, this recovery unit stretches along the coast of southern California from just north of Point Conception south to the Mexico border. As of 2002 there were 186 known southwestern willow flycatcher territories in this recovery unit, representing 19 percent of the rangewide total, distributed along 15 relatively small watersheds, mostly in the southern third of the recovery unit. All known territories in this recovery unit were found in native or native-dominated habitats. The recovery unit is further divided into management units. The Santa Clara River is designated as a management unit within the Central California Recovery Unit. The metapopulation in his management unit has been identified for increased population stability and enhancement. The minimum number of territories targeted for this management unit before the southwestern willow flycatcher can be reclassified to threatened is 25.

Southwestern willow flycatcher territories have been detected in small numbers in the Santa Clara Management Unit, ranging from 0 to 13 territories annually between 1995 and 2001 (Service 2002b). In 2007 there were 8 territories estimated to be occupied throughout the Santa Clara Management Unit (Durst et al. 2008). In 2005 and 2006 Labinger and Greaves detected 7 southwestern willow flycatchers in the Ventura County portion of the Santa Clara River (Labinger et al. 2011).

Southwestern willow flycatcher critical habitat

Within Ventura County, designated critical habitat is located in the Santa Clara Management Unit, and includes the Ventura River, Santa Clara River and Piru Creek. The proposed critical habitat units are summarized in Table 6 and are shown in Figure 3.

Table 10. Proposed southwestern willow flycatcher critical habitat units within Ventura County and VCWPD facilities within proposed critical habitat (calculated based on GIS overlays of VCWPD facilities and critical habitat boundaries).

Unit	Location	Proposed CH (Acres)	Facilities in CH (Acres)
Ventura River	Ventura River from the ocean to Matilija Dam	1,445	29
Santa Clara River	Santa Clara River from the ocean to the City of Santa Clarita, including Castaic Creek.	9,505	31
Piru Creek	Piru Creek from the confluence of the Santa Clara River to just past the Ventura County Line	1,862	0

Southwestern willow flycatcher habitat within the action area is characterized by riparian vegetation dominated by native willows, cottonwoods, sycamores, and invasive giant reed and salt cedar. The extent and quality of southwestern willow flycatcher habitat within these critical habitat units naturally fluctuates through time as large storm events scour vegetation and subsequent low flow seasons allow vegetation to regrow. Channel morphology in these units also changes drastically with large storm events such that vegetation may not regrow in the same locations after storm events, thereby causing the locations of territories to shift as conditions change.

Approximately 60 acres of facilities are currently within proposed critical habitat for the southwestern willow flycatcher. Much of the area within existing facilities is maintained as bare earth or hardscape and does not support the primary constituent elements of southwestern willow flycatcher critical habitat. For example, the District currently maintains a 15-foot vegetation-free area at the foot of levees. These areas may fall within proposed critical habitat boundaries but do not currently support the primary constituent elements. Other areas subject to O&M Program activities including mitigation/restoration projects support ideal habitat for the species.

EFFECTS OF THE ACTION

Tidewater goby

Tidewater gobies and their eggs located adjacent to District facilities may be injured or killed during maintenance activities that occur within standing water within lower portions of the Ventura River, Santa Clara River, Ormond Lagoon and Calleguas Creek. A variety of O&M Program activities will adversely affect tidewater gobies in these areas including routine maintenance activities, facility repair; BEMP activities; and mitigation/restoration activities. Current facilities subject to the O&M Program activities that would adversely affect tidewater gobies are listed in Appendix A, Table 1. The Service anticipates that additional facilities may be added to the O&M Program over time, and that the effects to tidewater gobies from these facilities would be equivalent to the effects described below.

Tidewater gobies may be directly injured or killed by heavy equipment entering occupied habitat for the removal of sediment, vegetation, or other routine maintenance, repair, or mitigation/restoration activities. The District has proposed to work within suitable habitat for tidewater gobies when conditions are dry and will not support the species to the maximum extent possible thereby minimizing potential effects to the species. In the Ventura River, some habitat near the levees and drains may never go dry and therefore maintenance and repair activities

would need to be conducted within occupied habitat. Additionally, mitigation/restoration activities may occur in the lower Ventura River where tidewater gobies may occur; however project activities are anticipated to occur outside of wetted areas, and the BMPs and minimization measures are anticipated to avoid injury or killing of tidewater gobies during mitigation/restoration activities.

In the Santa Clara River, maintenance within suitable habitat is restricted to one stream gauge and one outlet and may require work when tidewater gobies are present. In Ormond Lagoon, routine maintenance is only anticipated to occur when the channel is dry thereby precluding adverse effects to tidewater gobies from routine maintenance activities. However, repair activities at Facilities within Ormond Lagoon may require work when water is present.

In Calleguas Creek, vegetation mowing, discing, sediment removal and trash removal occurs when flow is confined to a small channel. Tidewater gobies have been documented up to 2,800 feet above Highway 1 in Calleguas Creek, and this distance will likely fluctuate through time as storm conditions alter passage conditions for tidewater gobies. Tidewater gobies could be crushed whenever heavy equipment traverses the low flow channel. The total area of potential tidewater goby habitat within Calleguas Creek is large (213 acres) however, because O&M Program activities would only occur during low flow conditions, the amount of habitat potentially affected in any given year is anticipated to be much lower.

The potential exists for the O&M Program to conduct repair or other activities that would require relocating tidewater gobies out of the project area. These activities are estimated to affect no more than 10 percent of facilities within potential tidewater goby habitat in the Ventura River, Santa Clara River, and Ormond Lagoon, and 1 percent of facilities within suitable habitat in Calleguas Creek in any given year (Table 11). These effects are anticipated to occur within the footprint of existing facilities, and therefore this 10 percent and 1 percent per year does not represent a compounding effect to habitat; rather, these effects would be confined to a specific footprint where optimal habitat is not expected to generally occur.

Table 11. Acreage of facilities within potential habitat for tidewater gobies and the amount of habitat anticipated to require tidewater goby relocation in any given year.

	Facilities in potential habitat (Acres)	Habitat requiring goby capture/relocation (Acres)
Ventura River	29	3
Santa Clara River	1	0.1
Ormond Lagoon	1	0.1
Calleguas Creek	213[1]	2[2]
TOTAL	244	4.2

Dewatering activities may result in the death of any tidewater gobies in the dewatered area due to stranding resulting in desiccation, suffocation, or opportunistic predation. To minimize stranding the District has proposed to relocate all tidewater gobies out of areas to be dewatered. Tidewater

[1] Includes entire channel area of Revolon slough and Calleguas Creek to the first dispersal barrier approximately 4 miles upstream in both drainages. Under low flow conditions far less area provides suitable habitat.
[2] Represents 1% of facilities in potential tidewater goby habitat.

gobies may be injured or killed during relocation activities, from mishandling, physiological stress, or from capture and relocation equipment. To minimize these potential effects the District proposes to use personnel with experience relocating tidewater gobies and follow guidelines in the Service's tidewater goby survey protocol. However, the potential exists that some tidewater gobies may not be located or may still be killed or injured during the capture and relocation procedures. Furthermore, tidewater gobies may be breeding during the proposed project, and any eggs located within the dewatering area would not be detectable. These eggs may be injured or killed during the proposed project.

Sedimentation that would occur during O&M activities may result in tidewater goby injury, death, and lowered breeding success. Sediment may affect tidewater gobies by impairing the efficiency of their gill filaments and exposing them to higher salinities and/or predation as they flee downstream. Direct effects of sedimentation include mortality, reduced physiological function, and burrow smothering. Indirect effects of sedimentation include potential alteration to the food web which could create cascading effects to higher trophic levels. A reduction in phytoplankton can be attributed to increased turbidity, which can therefore reduce zooplankton, in turn reducing benthic macroinvertebrates, and thus reducing prey available to tidewater gobies (Henley et al. 2000). These effects would be minimized by the District's proposed implementation of standard BMPs for the project, which includes measures to minimize erosion and sedimentation.

Construction equipment and materials that have the potential to contribute pollutants to storm water discharges include vehicle fluids (e.g., oil, grease, petroleum, coolants, etc.), raw landscaping materials and wastes (e.g., plant materials, etc.), and general litter. These materials may injure or kill tidewater gobies. The release of these materials into tidewater goby habitats would be minimized by the implementation of the general BMPs, which includes measures to minimize or avoid the release of contaminants into tidewater goby habitat.

Maintenance activities would include weed control. Herbicides may be used if other non-chemical weed control methods have been exhausted. The specific herbicide that would be used in all aquatic habitat areas is glyphosate with Agri-dex or similar aquatically-approved surfactant. Tidewater gobies can be exposed to herbicides in aquatic habitats through direct overspray of wetlands, drift from treated areas, or contaminated runoff from treated areas.

Glyphosate is a systemic herbicide that will kill broadleaf and grass species by inhibiting the production of aromatic amino acids in plants and some microorganisms that are necessary to build proteins (Devine et al. 1993). Because many animals lack the amino acid synthesis pathway that glyphosate disrupts, it is considered to have low potential to cause toxicity in animals (Devine et al. 1993). The half-life of glyphosate in pond water ranges between 12 days and 10 weeks depending on environmental conditions (Extoxnet 1996), however, the half-life in brackish or saline water may be different. No information is available regarding the toxicity of glyphosate products specifically to tidewater goby. Toxicity studies on bluegill sunfish (*Lepomis macrochirus*) and rainbow trout (*Oncorhynchus mykiss*) indicate that Aquamaster herbicide is

practically non-toxic[3] to these species (Monsanto 2005). Studies compiled by the Pesticide Action Network indicate that glyphosate ranges from not acutely toxic to moderately toxic depending on the species of fish[4] (Kegley et al., 2010). Because the toxicity of glyphosate-containing products can vary significantly between species, a conservative assumption would be that glyphosate-containing products are moderately toxic to tidewater gobies. Because tidewater gobies would only be exposed to glyphosate through overspray, the actual glyphosate concentration that tidewater gobies would be exposed to is anticipated to be much less than the application concentration, due to dilution by estuary/lagoon waters. This diluted concentration is anticipated to not result in toxic effects to tidewater gobies.

Most glyphosate products are formulated to contain surfactants that allow the active ingredients to spread over and penetrate the plant cuticles. Surfactants can be the most toxic portion of a pesticide product. The glyphosate used in aquatic areas will be formulated without a surfactant. When a surfactant is absolutely necessary the product Agri-dex by Helena Chemicals, will be used (BMP-9), and has been approved for aquatic applications due to its low toxicity.

Effects of the BEMP program on tidewater goby

When the criteria for initiating activities under the BEMP program are met, the sand berm between Ormond Lagoon and the ocean would be groomed to decrease the beach elevation such that Ormond Lagoon would be allowed to breach at a lower elevation than it would if the grooming did not occur. The BEMP program is designed such that the beach grooming itself would not cause a breach, rather, the BEMP program will lower the elevation of the berm such that a subsequent rain event would raise the water level of Ormond Lagoon and allow a natural breach to occur. Natural breaches that occur due to storm events have been demonstrated to have very little adverse effects on tidewater goby populations while artificial breaches can substantially adversely affect the species.

During natural breach events, a limited number of tidewater gobies may be washed out to the ocean, while the majority of fish are able to persist within the estuary/lagoon. In a study by Lafferty et al. (1999), tidewater goby populations throughout Santa Barbara and Ventura Counties were surveyed before and after large flood events. Results showed that all of the populations that were surveyed persisted through the flood events, and that the density of tidewater gobies prior to and after the storms were not significantly different (Lafferty et al. 1999). Tidewater gobies can survive in ocean water for a limited amount of time and may be able to disperse to another estuary/lagoon or back into the same feature they came from. This is the mechanism that is thought to have sustained tidewater goby metapopulations throughout their range and underscores the importance of local populations, not individual fish, as the important unit for conservation (Lafferty et al. 1999).

This is in contrast to unnatural breach events, where tidewater gobies and other estuarine fish are not queued by precipitation events to find refuge, and large numbers of individuals can become stranded on the estuary shores or be killed by a quick transition to high saline water as they are

[3] The concentration that causes the mortality of 50 percent of exposed individuals was greater than 1,000 milligram/liter (mg/L) for both species.

[4] The concentrations that caused the mortality of 50 percent of exposed individuals was between 1 mg/L and greater than 1,000 mg/L for several species of fish.

washed into the ocean. Tidewater gobies are thought to be weak swimmers and are intolerant of currents, preferring slack-water habitats (Swenson 1995). These habitats may become abruptly dewatered during un-natural breaching events that do not occur with a simultaneous influx of water as would happen during a storm, and can leave tidewater gobies stranded on the inner shores of the lagoon. Furthermore, tidewater gobies have wide tolerances of salinity (0 – 41 parts per thousand) (Sewnson 1995), but require some time to acclimate and may not be able to survive a quick transition from low saline lagoon waters to the full salinity of the ocean that would occur during an unnatural breach event (C. Swift pers comm 2010).

In September 2010, the Santa Clara River estuary was artificially breached by an unidentified party, and the flats of the lagoon and the outer ocean beach to the north were "littered with dead small fish, mostly flathead minnows, green sunfish, and tidewater gobies" (C. Swift pers comm 2010). The tidewater goby mortality was attributed primarily to stranding, while a minority of the fish were potentially killed because they were exposed too rapidly to full saline water (C. Swift pers comm 2010).

The BEMP program is not anticipated to cause a breach without a storm event and is therefore not anticipated to have the adverse effects to tidewater gobies that an artificial breaching event would. The BEMP program has the potential to increase the number of naturally-occurring breaches that occur, however we do not anticipate this to substantially adversely affect tidewater gobies due to their documented persistence of tidewater gobies in lagoons following storm events and natural breaches.

Recovery of the tidewater goby

The goal of the tidewater goby recovery plan is to conserve and recover the tidewater goby throughout its range by managing threats and perpetuating viable metapopulations within each recovery unit while maintaining morphological and genetic adaptations to regional and local environmental conditions. We do not expect the O&M Program to substantially affect the conservation of the tidewater goby within the Los Angeles/Ventura Recovery Unit, in terms of the recovery strategy described in the recovery plan because:

1. The tidewater goby recovery plan emphasizes the importance of the conservation of population units rather than individual fish, and the effects of the O&M Program are not expected to cause population-level declines in the Ventura River, Santa Clara River, Ormond Lagoon or Calleguas Creek; and

2. The O&M Program would not adversely affect the metapopulation dynamics between each individual population in the Los Angeles/Ventura Recovery Unit.

In summary, the proposed action could adversely affect tidewater goby adults, juveniles, and/or eggs that may occur within the Ventura River, Santa Clara River, Ormond Lagoon, and Calleguas Creek through capture and relocation, stranding, crushing, increased sedimentation, exposure to glyphosate, and implementation of the BEMP. These effects will be minimized by the District's implementation of the minimization measures described above, and are not anticipated to substantially affect the survival of the species in the Ventura River, Santa Clara River, Ormond Lagoon or Calleguas Creek. These routine maintenance, repair, and

mitigation/restoration projects are not anticipated to compromise the recovery of the tidewater goby.

Tidewater goby critical habitat

Critical habitat for the tidewater goby may be adversely affected by the routine maintenance, repair, and mitigation/restoration components of the O&M Program through the removal of vegetation and sediment that contribute to primary constituent elements. Vegetation removal may be temporary or permanent depending on the specific project activity. For example, vegetation within 15 feet of levees will be permanently removed, whereas invasive vegetation in mitigation/restoration areas would be temporarily removed to allow native vegetation to grow back. Most of the O&M Program Facilities are maintained vegetation-free and do not support this component of the PCEs for tidewater gobies. Infrequently, areas that are intended to be maintained vegetation-free are not maintained and vegetation grows back to support the PCEs once again. In these cases, permanent vegetation removal is required, but the footprint of such removal will always be within that of existing District facilities. For the purposes of this consultation, we will assume that all District facilities are intended to be maintained vegetation free, but that 10 percent per year have mature vegetation that regrew and requires removal or require some kind of repair that may affect critical habitat. Because the District has proposed to avoid activities within Ormond Lagoon when water is present, we do not anticipate adverse effects to unit VEN-3. There are no district facilities within VEN-2.

The removal of vegetation associated with the construction of new District facilities is not covered under this biological opinion. Such new facilities would be permitted individually and then added to the O&M Program once initial vegetation removal activities have occurred. Therefore, the addition of new facilities to the O&M Program will not generate additional adverse effects of critical habitat that have not been adequately analyzed in other consultations.

O&M Program activities also include mitigation/restoration activities such as invasive plant removal. Mitigation/restoration activities may occur within VEN-1 and VEN-2; however, the vegetation species generally targeted for removal (e.g. giant reed, tamarisk, tree of heaven, etc.) is not typically characteristic of tidewater goby habitat. Mitigation/restoration activities may occur adjacent to habitat that contains PCEs, but is not anticipated to occur within habitat that supports the PCEs. Mitigation/restoration activities are not anticipated to occur within VEN-3 or VEN-4.

The BEMP program would affect critical habitat unit VEN-3 (Ormond Lagoon), and has the potential to increase the number of breaches that occur. The frequency at which the BEMP would be initiated is difficult to determine; however, based on the program criteria, and frequency of implementation in the past, we anticipate that the BEMP would be initiated approximately one time per year. Because the habitat in VEN-3 has developed along with a flood/breach regime, and because the breaches under the program would still be initiated by natural conditions (freshwater input from storm runoff) the potential additional breaches are anticipated to have an insignificant effect on the PCEs for tidewater goby critical habitat.

Table 12. Maximum yearly tidewater goby critical habitat anticipated to be affected by O&M Program activities.

Unit	Designated CH (Acres)	Facilities within Designated CH (Acres)	CH Affected by routine maintenance and repair (Acres)	CH Affected by mitigation/ restoration (Acres)
VEN-1	50.3	1.7	0.2	0
VEN-2	360.5	0	0	0
VEN-3	44.4	0.78	0	0
VEN-4	N/A	0	0	0

In summary, as described in the Environmental Baseline section above, the critical habitat units in the designated and proposed critical habitat rules are similar such that we anticipate that effects to designated and proposed critical habitat are equivalent. Routine maintenance and repair activities may adversely affect up to 0.2 acres of tidewater goby critical habitat in unit VEN-1 per year, however these effects are small in comparison to the total habitat available (0.4 percent) and are not anticipated to compromise the function of VEN-1.

California red-legged frog

The only California red-legged frog populations that are anticipated to be affected by the O&M Program are within the Ventura River watershed. District facilities within the Ventura River contain habitat for California red-legged frog breeding, feeding, and sheltering. California red-legged frogs may be injured or killed during the implementation of O&M Program activities. The Service anticipates that additional facilities within the Ventura River watershed may be added to the O&M Program over time, and that the effects to California red-legged frogs from these facilities will be the equivalent to the effects described below.

The Ventura River currently contains approximately 25 acres of facilities within suitable habitat for California red-legged frogs. Within any given year, up to 10 percent of these facilities (2.5 acres) may require maintenance or repair activities that involve activities that could injure or kill California red-legged frogs. Additionally, up to 10 acres of mitigation/restoration activities per year may occur within suitable habitat for California red-legged frogs; however, the amount of suitable habitat within any given 10-acre restoration project site is not anticipated to be entirely suitable for California red-legged frogs. Based on the records of California red-legged frogs in the Ventura River, we anticipate approximately 10 California red-legged frogs may be present per acre of suitable habitat; however, this number may be larger or smaller depending on site specific conditions. Based on this estimate of California red-legged population density we expect that up to 25 California red-legged frogs may be affected by maintenance and repair activities each year. We also estimate that up to 50 California red-legged frogs may be affected by mitigation/restoration activities each year.

California red-legged frogs may be injured or killed by inadvertent trampling by workers from foot traffic and operation of equipment during the removal of sediment, vegetation, or other routine maintenance, repair, or mitigation/restoration activities. This effect would be minimized by the District's proposal to conduct pre-construction surveys and to have a biologist present during vegetation clearing activities in order to identify California red-legged frogs in the project area. Any California red-legged frogs found and determined by the biologist to be at risk would be relocated to a nearby suitable habitat. It is possible that not all California red-legged frogs

within the proposed disturbance area would be detected during these surveys, and may be injured or killed despite survey efforts intended to detect their presence.

California red-legged frogs could be injured or killed if they are improperly handled or contained during capture and relocation efforts. Larval amphibians have been shown to be sensitive to latex, nitrile, and vinyl, with latex and nitrile causing up to 100 percent tadpole mortality following only 30 to 90 seconds of direct contact (Cashins et al. 2008). Effects of these materials on adult frogs are less well documented. Rinsed vinyl gloves appear to be the least toxic alternative, when the use of gloves is necessary (Cashins et al. 2008). If gloves containing these products are worn during capture and relocation activities, there is the potential that California red-legged frogs could be injured or killed. Additionally, adverse effects due to handling and relocation could be increased or prolonged if a suitable relocation area is not identified prior to initiating surveys. These threats should be minimized by the District's proposed use of biologists with experience in the capture and relocation of these species.

Relocated California red-legged frogs may be at risk of injury or death through predation or dehydration during an attempt to return to a work area from which they had been moved. This risk may increase with the distance of the relocation site from the work area. However, relocating individuals will minimize the direct risk of injury or mortality as a result of construction activities.

Handling California red-legged frogs, or introducing equipment into their breeding ponds, can also result in the spread of chytrid fungus (*Batrachochytrium dendrobatidis*), a pathogen linked to declines in amphibians. Chytrid fungus is a water-borne fungus that can be spread through direct contact between aquatic animals and by a spore that can move short distances through the water. The fungus can decimate amphibian populations, causing fungal dermatitis, which usually results in death in 1 to 2 weeks. Infected animals may spread the fungal spores to other ponds and streams before they die. Once a pond has become infected with chytrid fungus, the fungus stays in the water for an undetermined amount of time. If California red-legged frogs that are relocated from the project are infected with chytrid fungus, they may spread the fungal spores to uninfected individuals in the relocation areas. If they are not infected, they may become infected through exposure to infected amphibians inhabiting the relocation area.

California red-legged frogs are known to be more surface active (e.g., foraging, dispersing) at night. If trenches or other excavations are left open overnight, California red-legged frogs may fall in and become trapped. Trapped individuals may be more vulnerable to predators *(*e.g., raccoons (*Procyon lotor*)) or they may exhaust themselves trying to get out. If they remain in the trench until daylight, they may desiccate in the sun, be exposed to daytime predators (e.g. great blue herons (*Ardea herodias*)), or be found in harm's way when trench installation activities resume.

Glyphosate is the active ingredient in a variety of herbicides including Roundup, Rodeo, Aquamaster, Buccaneer, Glyfos, Honcho, Touchdown, Vision, Duramax, Rattler, and others. Glyphosate is a systemic herbicide that will kill broadleaf and grass species by inhibiting the production of aromatic amino acids in plants and some microorganisms that are necessary to build proteins (Devine et al. 1993). Because many animals lack the amino acid synthesis

pathway that glyphosate disrupts, it is considered to have low potential to cause toxicity in animals (Devine et al. 1993). Most glyphosate products are formulated to contain surfactants that allow the active ingredients to spread over and penetrate the plant cuticles. Surfactants can be the most toxic portion of a pesticide product. The surfactant associated with many glyphosate products is a polyethoxylated tallowamine (POEA) surfactant.

California red-legged frog eggs, tadpoles, juveniles and adults can be exposed to glyphosate products and POEA surfactants in aquatic habitats through direct overspray of wetlands, drift from treated areas, or contaminated runoff from treated areas. The half-life of glyphosate in pond water ranges between 12 days and 10 weeks (Extoxnet 1996). Additionally, juvenile and adult California red-legged frogs can be exposed in terrestrial habitats that have been treated. Glyphosate and POEA readily sorbs to soil particles and can be degraded by microbes in 7 to 70 days depending on soil conditions (Giesy et al. 2000).

No information is available regarding the toxicity of glyphosate products specifically to California red-legged frogs. Studies exploring the lethal and sublethal effects of glyphosate products on other amphibians, including ranids, are available but are largely focused on aquatic stages of the species and formulations of glyphosate that include surfactants. Roundup Original Max, a glyphosate product with POEA surfactant, was demonstrated to be moderately to highly toxic to nine species of frog and toad tadpoles including five Ranidae species: wood frog (*Rana sylvatica),* leopard frog (*Rana pipiens*), Cascades frog (*Rana cascadae*), green frog (*Rana clamitans*), and American bullfrog (*Rana catesbeiana*) (Relyea and Jones 2009). The mortality of tadpoles is hypothesized to be caused by the lysis (i.e. destruction) of gill cells from exposure to surfactants (Lajmanovich et al. 2003, Edington et al. 2004) indicating that the life stage during which frogs and toads have gills may be particularly vulnerable. Glyphosate products containing POEA surfactants have also been shown to have sub-lethal effects to amphibians including decreased size, increased time to metamorphosis, tail malformations, and gonadal abnormalities (Govindarajulu 2008, Howe et al. 2004).

Several studies suggest that the toxicity of glyphosate products is linked with the surfactant, and not the glyphosate. Howe et al. (2004) compared the toxicity of glyphosate alone, to glyphosate with POEA surfactant, and POEA alone, on green frogs. Results indicated that the toxicity of glyphosate with POEA surfactant was similar to the POEA surfactant alone, which was much greater than glyphosate alone, indicating that the POEA was responsible for the toxic effects. In a comprehensive review of studies involving the effects of glyphosate on amphibians Govindarajulu (2008) concluded that the toxic effect of glyphosate products containing POEA are due to the POEA rather than the active glyphosate ingredient.

These studies indicate that glyphosate products formulated with POEA surfactants will likely kill or injure California red-legged frogs in aquatic habitats, with tadpoles being particularly vulnerable. Because glyphosate and POEA readily bind to soil and sediments, these chemicals may be less available to California red-legged frogs on land, however, research is needed to determine toxicity mechanisms and thresholds from terrestrial exposure. Effects to California red-legged frogs from the use of glyphosate products will be minimized by the District's proposal to use a glyphosate formulation that does not contain a surfactant. When a surfactant is absolutely necessary, the District will use Agri-dex, produced by Helena Chemicals.

Recovery of the California red-legged frog

As stated above in the Status of the Species Section, the recovery status of the California red-legged frog is considered within the scale of the Recovery Unit as opposed to the overall range. Because of the varied status of this species and differing levels of threats throughout its range, recovery strategies differ by recovery unit to best meet the goal of delisting the species. The goal of the recovery plan is to protect the long-term viability of all extant populations within each recovery unit. Overall, the strategy for the recovery of the California red-legged frog involves: (1) protecting existing populations by reducing threats; (2) restoring and creating habitat that would be protected and managed in perpetuity; (3) surveying and monitoring populations and conducting research on the biology and threats to the species; and (4) reestablishing populations of the species within its historical range (Service 2002a).

We do not expect the proposed project to substantially affect the conservation of the California red-legged frog within the Northern Transverse Ranges Recovery Unit, in terms of the recovery strategy described in the recovery plan (Service 2002a) because:

1. The proposed project would not increase the threats currently impacting the California red-legged frog in the Northern Transverse Ranges Recovery Unit;

2. The proposed project would not preclude our ability to survey and monitor populations of California red-legged frog or conduct research on the biology and threats to the species;
3. The proposed project would not preclude our ability to reestablish populations of the California red-legged frog within its historical range; and

4. Mitigation/restoration projects conducted in the Ventura River by the O&M Program may restore habitat and remove non-native plants, which are activities listed as "conservation needs" in the recovery plan.

In summary, projects within the O&M Program could adversely affect California red-legged frogs by capture and relocation, trampling by workers, crushing by equipment and entrapment in excavations. These effects will be minimized by the District's implementation of the minimization measures described above. These routine maintenance, repair, and mitigation/restoration projects are not anticipated to compromise the recovery of California red-legged frogs. We anticipate that up to 25 California red-legged frogs may be affected by maintenance and repair activities, and up to 50 California red-legged frogs could be affected by mitigation each year. We anticipate that only a small portion of these individuals affected would be injured or killed. We do not expect the loss of these few California red-legged frog adults, subadults, egg masses, or tadpoles to compromise the ability of the species to survive and recover.

California red-legged frog critical habitat

The District facilities that are located within designated critical habitat for the California red-legged frog currently total approximately 1.9 acres in STB-7 and 0.4 acres in VEN-1. The facility within STB-7 comprises the Matilija Dam and gauge (hardscape) and only supports PCEs peripheral to the hardscape. Within VEN-1, the facility within critical habitat is a stream gauge that would require vegetation trimming as the primary maintenance activity and may

affect up to 0.4 acres per year. In addition to routine maintenance and repair activities, up to 10 acres of mitigation/restoration activities may occur within the Ventura River watershed each year. This mitigation may occur entirely, partially, or not at all within either STB-7 or VEN-1.

California red-legged frog critical habitat may be adversely affected through vegetation trimming during routine maintenance activities within VEN-1 and STB-7. Vegetation surrounding the stream gauge in VEN-1 is maintained at a low height, trimming activities are conducted to bring the vegetation back to that low height. Trimming may adversely affect aquatic breeding habitat, non-aquatic breeding habitat and dispersal habitat depending on river morphology at the time of maintenance. Critical habitat in VEN-1 and STB-7 may also be affected by mitigation/ restoration activities within STB-7 and VEN-1. Vegetation removal would target invasive species such as giant reed, tamarisk and tree of heaven. These activities may temporarily affect aquatic breeding habitat, non-aquatic breeding habitat and dispersal habitat, depending on the location and extent of the mitigation/restoration activities, however, these effects would be temporary in nature and the long-term effect on critical habitat would ultimately be beneficial.

Table 13. Summary of potential annual effects to critical habitat for the California red-legged frog.

Unit	Designated CH (Acres)	Facilities in CH (Acres)	CH Affected by routine maintenance and repair (Acres)	CH Affected by mitigation/ restoration (Acres)
STB-7	145,121	1.9	1.9	10
VEN-1	2,915	0.4	0.4	10

In summary, the amount of critical habitat that would be affected by the O&M Program is small in comparison to the amount of critical habitat available in STB-7 and VEN-1, and is not anticipated to substantially affect the recovery function of these units. The mitigation/restoration projects may ultimately have a beneficial effect on California red-legged frog critical habitat after native vegetation has regrown and matured such that these areas support the PCEs.

Least Bell's vireo and southwestern willow flycatcher

Various District facilities within the Ventura River, Santa Clara River, and Calleguas Creek watersheds are within or adjacent to habitat that supports least Bell's vireo and southwestern willow flycatcher breeding, foraging, and sheltering. Least Bell's vireos and southwestern willow flycatchers may be injured, or killed during the implementation of O&M Program activities.

Approximately 255 acres of District Facilities occur in areas that have the potential to support habitat for least Bell's vireo, and 161 acres of District facilities are in areas that have the potential to support habitat for southwestern willow flycatchers (Tables 8 and 9). These facilities were predominantly designed to be maintained vegetation-free as described in the Environmental Baseline section above; however, if frequent vegetation control does not occur, suitable habitat may become established in these areas. The Service anticipates that additional facilities within the Ventura River, Santa Clara River, and Calleguas Creek watersheds may be added to the O&M Program over time, and that the effects to least Bell's vireos and southwestern willow flycatchers from these facilities will be equivalent in nature to the effects described below.

Up to 10 percent of District facilities each year may require maintenance or repair that would involve the removal of vegetation that provides suitable habitat for least Bell's vireos and southwestern willow flycatchers. This vegetation removal is anticipated to occur predominantly within the footprint of existing facilities that are managed vegetation-free, and therefore this 10 percent per year vegetation removal does not represent a compounding loss of habitat; rather this vegetation removal is confined to a specific footprint where habitat is not expected to generally occur.

Mitigation/restoration projects required by the Corps, California Department of Fish and Game, and others, which involve protecting and enhancing habitat for the least Bell's vireo and southwestern willow flycatcher by removing invasive vegetation, will help to offset the effect of habitat loss for both of these species. We estimate that up to 10 acres per year of mitigation/restoration would occur in the Ventura River and Calleguas Creek watersheds and up to 15 acres per year would occur in the Santa Clara River. In the first few years following invasive vegetation removal, the habitat value for least Bell's vireo and southwestern willow flycatcher is anticipated to be reduced, but as native vegetation grows back in, the mitigation/restoration sites are anticipated to provide higher quality habitat for the species.

Table 14. Estimated annual habitat removal for least Bell's vireo and southwestern willow flycatcher from maintenance and repair activities where vegetation has matured or repair activities that require vegetation removal are necessary, and from mitigation/restoration activities.

EXPECTED ANNUAL HABITAT REMOVAL (Acres)				
	Least Bell's Vireo		*Southwestern Willow Flycatcher*	
	Maintenance & Repair	Mitigation/ Restoration	Maintenance & Repair	Mitigation/ Restoration
Ventura River	3.5	10	3.2	10
Santa Clara River	4.6	15	4.5	15
Calleguas Creek	17.4	10	8.4	10
TOTAL	60.5		51.1	

To analyze the effects to least Bell's vireo and southwestern willow flycatcher from losing the amount of suitable habitat quantified in Table 14, we followed a three step process:

- **Estimation Method 1:** We estimated the theoretical maximum number of breeding pairs that could be affected by the O&M Program by calculating the maximum number of territories that could occur within the impact area, assuming full occupancy of territories. This estimation method is most appropriate for high quality habitat, where breeding pairs may be found in tight clusters, fully occupying the habitat (Table 15).

- **Estimation Method 2:** Because we know that the project area also contains habitat of moderate to low quality where all potential breeding territories are not occupied, we also estimated the pairs affected by the O&M Program using the average density of birds throughout the watershed (pairs of breeding birds per acre). This estimate would be accurate if the birds and their suitable habitat were distributed evenly throughout the floodplain, which does not account for the clustering of territories observed in Least Bell's vireos or irregular distribution of habitat (Table 16).

- Based on our knowledge of least Bell's vireos and southwestern willow flycatchers within the project area we synthesized the two methodologies described above to arrive at our best estimate of the expected number of breeding pairs for each species that we expect to be affected by the O&M Program; and that final result is depicted in Table 17.

The first method used to estimate the number of pairs of least Bell's vireos and southwestern willow flycatchers that would be affected by the O&M Program is designed to calculate the theoretical maximum pairs that could potentially be affected. Based upon the published territory sizes for the least Bell's vireo (0.5 to 7.5 acres per pair) and assuming a uniform distribution of territories and saturation of suitable habitat, the O&M Program could theoretically result in the removal of habitat for 11 to 122 pairs of least Bell's vireos from maintenance, repair, and mitigation/restoration activities. Based on the range of territory sizes for southwestern willow flycatcher (0.15 to 5.7 acres per pair) and assuming a uniform distribution of territories and saturation, the O&M Program could result in the removal of habitat for 13 to 347 pairs of southwestern willow flycatchers from maintenance, repair and mitigation/restoration activities. A breakdown of these effects by watershed is shown in Table 15.

Table 15. Theoretical maximum number of pairs of least Bell's vireo and southwestern willow flycatcher potentially affected annually, based on minimum and maximum territory size and assuming full occupancy of all territories. Numbers in parenthesis indicate the mean.

METHOD 1: THEORETICAL MAXIMUM PAIRS AFFECTED				
	Least Bell's Vireo		*Southwestern Willow Flycatcher*	
	Maintenance & Repair	Mitigation/ Restoration	Maintenance & Repair	Mitigation/ Restoration
Ventura River	1-7 (4)	2-20 (6)	3-21 (12)	2-67 (35)
Santa Clara River	1-10 (6)	2-30 (9)	1-30 (16)	3-100 (52)
Calleguas Creek	3-35 (19)	2-20 (6)	2-56 (29)	2-67 (35)
TOTAL	11-122 (50)		13-341 (179)	

These estimates based on territory size, and assuming full occupancy of suitable habitat, represent the theoretical maximum number of pairs that could be affected, however the number of pairs actually anticipated to be affected is far less based on the small proportion of suitable habitat and number of potential territories that are actually occupied by breeding pairs each year. This is particularly true for the Southwestern willow flycatcher, which has only been observed in very low densities throughout the Santa Clara River, and nesting has not been documented in the Ventura River and Calleguas Creek watersheds.

In order to obtain a more accurate estimate of the actual number of least Bell's vireos and southwestern willow flycatchers that may be affected by the O&M Program, we used the Santa Clara River floodplain as a proxy for the entire project area and calculated the average density of least Bell's vireos and southwestern willow flycatchers in the project area. To do this, we used biological survey data (described in the Environmental Baseline section) to estimate the total number of pairs of least Bell's vireos and southwestern willow flycatchers within the Ventura County portion of the Santa Clara River floodplain and divided the total potential habitat area by the total number of pairs.

Based on survey data for least Bell's vireos, the trajectory of least Bell's vireo population numbers, and expansion of habitat for least Bell's vireo in the Santa Clara River since the last survey data in 2006, we estimate that the portion of the Santa Clara River floodplain within Ventura County may currently support approximately 100 territorial males. For the purposes of this estimation, we will assume all 100 males are successful in attracting a mate, and therefore there are 100 pairs within this 6,700-acre area of potential suitable habitat. Using this estimation method, there would be an average of one pair of least Bell's vireos for every 67 acres of potentially suitable habitat within the Ventura County portion of the Santa Clara River floodplain.

Survey data for the southwestern willow flycatcher in the Santa Clara River floodplain is less robust than for the least Bell's vireo and therefore a watershed-wide total number of pairs is more difficult to determine. Durst et al. (2008) reported 8 pairs within the Santa Clara River management unit in 2007 (inclusive of the Ventura River, Piru Creek, San Francisquito Creek, Soledad canyon, and Big Tujunga Creek and portions of the San Gabriel River). Labinger et al (2011) reported 7 pairs throughout the Santa Clara River during surveys conducted in 2005 and 2006, although all suitable habitat was not surveyed. These survey results likely under-represent the actual number of birds present because southwestern willow flycatchers are difficult to detect after a pairs has formed (i.e., the male may no longer respond to taped calls played during surveys) and because surveys have only been conducted in limited areas of the Santa Clara River. For purposes of this estimation, we will assume that 8 pairs are located within the Ventura County portion of the Santa Clara River floodplain, within the project area. Using this estimation method, there would be an average of 1 pair of southwestern willow flycatchers for every 840 acres of potentially suitable habitat within the Ventura County portion of the Santa Clara River floodplain.

Table 16 shows the average number of pairs of least Bell's vireos and southwestern willow flycatchers we anticipate could be affected by the O&M Program throughout the project area based on the total occupancy and total potential suitable habitat area for the Santa Clara River. Because watershed-wide survey data for the Ventura River and Calleguas Creek watersheds is not available, we used the average least Bell's vireo density (one pair per 67 acres) and average southwestern willow flycatcher density (one pair per 840 acres) calculated for Santa Clara River for these watersheds.

Table 16. Average number of pairs of least Bell's vireos and southwestern willow flycatchers estimated to be affected by maintenance and repair and mitigation activities based on calculated average density of these species throughout the entire watershed.

METHOD 2: PAIRS AFFECTED BASED ON AVERAGE DENISTY				
	Least Bell's Vireo		*Southwestern Willow Flycatcher*	
	Maintenance & Repair	Mitigation/ Restoration	Maintenance & Repair	Mitigation/ Restoration
Ventura River	1	1	1	1
Santa Clara River	1	1	1	1
Calleguas Creek	1	1	1	1
TOTAL	6		6	

Using the theoretical maximum number of pairs affected (Method 1 - Table 15) would produce a substantial overestimate because this method assumes that all suitable habitat is occupied. The estimate based on average number of pairs (Method 2 - Table 16) also has uncertainty associated with it because it assumes a uniform distribution of least Bell's vireos and southwestern willow flycatchers and uniform distribution of suitable habitat over the entire watershed area, which is not biologically valid, particularly for least Bell's vireos. In the lower Santa Clara River, least Bell's vireos aggregate their nesting in high quality habitat areas, creating nodes where there may be several territories closely spaced together, but separated by other nodes by otherwise apparently suitable habitat.

Habitat for least Bell's vireo and southwestern willow flycatchers at District facilities covers the full spectrum from high to low quality. The theoretical maximum estimates (Method 1, Table 15) are more appropriate for estimating least Bell's vireo pairs affected by O&M Program activities in high quality habitat, and the density-based estimates (Method 2, Table 16) are more appropriate for estimating least Bell's vireo pairs in medium to low quality habitat. Therefore, for purposes of this biological opinion, we expect that the number of least Bell's vireos pairs that could be affected by the O&M Program annually is the mean of the estimates projected using the theoretical maximum (Method 1) and density-based estimates (Method 2), as shown in Table 17. Because southwestern willow flycatcher nesting is thought to be very low throughout the project area and has not been observed in the aggregated spatial orientation typical of least Bell's vireos in this area (Labinger et al. 2011, Service 2011), the expected number of pairs potentially affected by District activities are more realistically represented by the density-based projections (Method 2). The expected number of pairs of least Bell's vireos and southwestern willow flycatchers anticipated to be affected by the O&M Program annually is shown in Table 17.

Table 17. Expected pairs of least Bell's vireos and southwestern willow flycatchers projected to be affected by the O&M Program annually.

EXPECTED PAIRS AFFECTED ANNUALLY				
	Least Bell's Vireo		*Southwestern Willow Flycatcher*	
	Maintenance & Repair	Mitigation/ Restoration	Maintenance & Repair	Mitigation/ Restoration
Ventura River	3	6	1	1
Santa Clara River	4	9	1	1
Calleguas Creek	10	6	1	1
TOTAL	38		6	

The anticipated effects are likely to be predominately from habitat removal during the non-breeding season, when the birds are not present. Removal of suitable habitat for least Bell's vireo and southwestern willow flycatchers may occur when routine maintenance has been neglected at a facility thereby allowing establishment of suitable habitat, when repair activities are necessary, and during mitigation/restoration projects. Vegetation removed from habitat for the least Bell's vireo and southwestern willow flycatcher, even during the time of year when adults are not present can adversely affect these species. Least Bell's vireo and southwestern willow flycatcher adults often return to the previous season's territory to breed and are strongly territorial. Temporary or permanent loss of habitat may cause the species to seek out new

territories and breeding sites. Moving to an unfamiliar territory may expose least Bell's vireo or southwestern willow flycatchers to exhaustion and reduced fitness or starvation associated with decreased foraging opportunities, increased predation risk, inter- and intra-species interactions, and decreased probability of nesting success. The loss of habitat within a territory could also diminish available foraging and sheltering habitat for the birds. These effects will be minimized by the District's proposed measures to avoid vegetation removal during the breeding season (March 1 to September 15) to the maximum extent practical; to conduct surveys in any areas where vegetation removal would occur during the nesting season; and to avoid any active nests by a buffer distance established by Service-approved biologists.

If O&M Program activities occur when active nests are present in the action area, worker foot traffic and construction equipment could dislodge the nests and crush eggs. Young fledglings in the action area could be flushed from protected areas by worker or construction vehicle presence, excessive noise, or physical impact. The District has proposed to minimize these effects by conducting the surveys described in LBV-2 and establishing buffer zones described in LBV-3.

Anecdotal evidence also suggests that human presence can attract predators to least Bell's vireo and southwestern willow flycatcher habitat areas. Predators and cowbirds may both be capable of "homing in" on agitated least Bell's vireos and southwestern willow flycatchers, and subsequently destroy or parasitize nearby nests (The Nature Conservancy 1997, Chace et al. 2002). Project-induced alterations, reductions, or disturbances of occupied and potential least Bell's vireo and southwestern willow flycatcher habitat and an increased human presence may induce higher rates of cowbird parasitism and nest depredation. To minimize this effect, the District has proposed to conduct as much work as possible outside of the nesting season for these subspecies.

The O&M Program includes various activities that would occur adjacent to suitable habitat, but would not affect the habitat itself. Activities such as mechanical grading and paving access roads as well as repairing damaged concrete structures will produce noise and human traffic in areas adjacent to least Bell's vireo and Southwestern willow flycatcher nests. The least Bell's vireo and southwestern willow flycatcher are sensitive to prolonged, loud noise. In addition, excessive airborne or deposited dust may degrade habitat to the point that it is no longer suitable for the species. Project activities causing noise and dust include hammering piles, grading the access road, and moving vehicles on dirt roads. In particular, construction-related noise, vibration, and night lighting could adversely affect nesting and breeding behavior, resulting in a decrease in nesting success. If construction activity or noise increases once a least Bell's vireo or southwestern willow flycatcher pair has established a nest or breeding territory near the project activities, the pair may abandon their nest, resulting in a failed breeding attempt and an unnecessary expenditure of energy. This could cause failure of a nesting attempt, death of eggs and fledglings, exposure of adults to increased predation risk, violent inter- and intraspecific interactions, and decreased foraging opportunities. Moreover, birds rely on auditory signals in the form of songs, alarm and scolding calls, to establish and defend territories, attract a mate, feed and care for young at the nest, and to locate and evade potential predators (e.g., Scherzinger 1979). Ambient noise levels may hinder vital calls by the least Bell's vireo and southwestern willow flycatcher.

We have used 60 decibels (dB) as a practical threshold above which substantial impacts to the least Bell's vireo and southwestern willow flycatcher might occur. The 60 dB threshold is considered average conversation level from 3-feet away and is typically the level encountered under ambient conditions (i.e., without noise sources such as vehicles or tools). Based upon this threshold, RECON (1989) estimated that noise levels above 60 dB from March 15 to September 15 may impact least Bell's vireo reproductive success. While least Bell's vireos often continue to occupy areas subject to noise levels above 60 dB, one study has documented significantly reduced reproductive success due to noise impacts (U.S. Marine Corps 1995). A power mower at a distance of 3 feet is approximately 107 dB and a power saw at 3 feet is approximately 110 dB (Galen Carol Audio 2007).

The District proposes to avoid work adjacent to suitable habitat for least Bell's vireo and southwestern willow flycatchers during the breeding season to the maximum extent possible; however, due to the extent of O&M Program activities required each year, it is not feasible to entirely avoid work adjacent to occupied habitat throughout the breeding season. The duration required to complete O&M Program tasks adjacent to suitable habitat varies by the activity type. Typical durations for representative O&M activities in each of the three watersheds from data recorded between 2005 and 2011 are shown in Appendix B. These data show that on average, O&M Program activities require 4 days of work per facility per year, but that this duration will vary based on facility type and required maintenance. The highest number of days worked at any of these facilities over a 7 year timespan was 41 days. These data are representative of work activities that occur throughout the entire year, and therefore the number of days worked when least Bell's vireos and southwestern willow flycatchers are present would be lower. The average work duration adjacent to suitable habitat of 4 days per facility per year represents a low frequency of disturbance that is not likely to have a substantial adverse effect on least Bell's vireos and southwestern willow flycatchers that may inhabit areas adjacent to O&M Program activities.

Trash left during or after project activities could attract predators to work sites, which could prey on least Bell's vireos and southwestern willow flycatchers. For example, coyotes (*Canis latrans*) and raccoons are attracted to trash and could also prey opportunistically on many bird species. This potential impact will be reduced or avoided by careful control of trash at all O&M Program sites as specified in the BMPs.

<u>Recovery of least Bell's vireo</u>
The draft recovery plan for the least Bell's vireo calls for stable or increasing populations of "several hundred or more breeding pairs" within each of the population/metapopulation units in order for the species to be downlisted from endangered to threatened. Delisting will be considered when populations are stable or increasing over a 5-year period and when threats are reduced or eliminated so that populations/metapopulations are capable of persisting without significant human intervention or when perpetual endowments are secured for cowbird trapping and exotic plant control in riparian habitat.

We do not expect the proposed project to substantially affect the conservation of the least Bell's vireo, in terms of the recovery strategy described in the recovery plan because:

1. The current trend in the Santa Clara River population/metapopulation unit is increasing (Service 2006), and this increasing trend has been observed over a period during which the O&M Program has been operating in a manner proposed in this biological opinion (1996 to 2005); and

2. The mitigation/restoration portion of the O&M Program will target exotic plants for removal and may support cowbird trapping, thereby facilitating the reduction of these major threats to the species identified in the recovery plan.

Recovery of southwestern willow flycatcher

Within Ventura County the Santa Clara River is the most important watershed for the recovery of southwestern willow flycatchers, with the Ventura River and Calleguas Creek acting as supporting habitats that may facilitate metapopulation health. The Santa Clara River is one area within the Santa Clara River Management Unit within the Central California Recovery Unit. The metapopulation in this management unit has been identified for increased population stability and enhancement. The minimum number of territories targeted for this management unit before the southwestern willow flycatcher can be reclassified to threatened is 25.

We do not expect the proposed project to substantially affect the conservation of the southwestern willow flycatcher, in terms of the recovery strategy described in the recovery plan because:

1. The current trend in the Santa Clara River Management Unit is stable, and this trend has been observed over a period during which the O&M Program has been operating in a manner proposed in this biological opinion (1993 to 2007); and

2. The mitigation/restoration portion of the O&M Program will target exotic plants for removal and may support cowbird trapping, thereby facilitating the reduction of these major threats to the species identified in the recovery plan, and promoting the establishment of additional pairs.

In summary, projects within the O&M Program could adversely affect least Bell's vireos and southwestern willow flycatchers by removing habitat, or working in close proximity to nests during the breeding season. These effects will be minimized by the District's implementation of the minimization measures described above. These routine maintenance, repair, and mitigation/restoration projects are not anticipated to compromise the recovery of least Bell's vireos and southwestern willow flycatchers. We anticipate that a maximum of 25.5 acres of suitable habitat for least Bell's vireo containing approximately 17 pairs; and a maximum of 16.1 acres of suitable habitat for southwestern willow flycatchers containing approximately 3 pairs may be adversely affected each year by maintenance and repair activities. The effects to least Bell's vireos and southwestern willow flycatchers are anticipated to be predominately non-lethal (i.e., birds returning to territories where suitable habitat has been removed is the predominant adverse effect), and because habitat removal associated with maintenance and repair activities is confined to a defined footprint that is generally maintained free of suitable habitat, we do not expect the maintenance and repair activities to compromise the survival and recovery of least Bell's vireos or southwestern willow flycatchers.

We anticipate that a maximum of 35 acres of suitable habitat for least Bell's vireos and southwestern willow flycatchers containing approximately 21 pairs of least Bell's vireos and 3 pairs of southwestern willow flycatchers may be adversely affected each year by mitigation/restoration activities. The adverse effects from these activities are anticipated to be temporary in nature, and mitigation/restoration will ultimately benefit the species by enhancing native vegetation that provides higher quality habitat, allowing a higher number of pairs to occupy the area after the restoration is complete.

Southwestern willow flycatcher critical habitat

Critical habitat for the southwestern willow flycatcher would be adversely affected by the O&M Program routine maintenance, repair, and mitigation/restoration components through the removal of vegetation that supports suitable breeding, foraging, and sheltering habitat for the subspecies. Vegetation removal may be temporary or permanent depending on the specific project activity. For example, vegetation within 15 feet of levees will be permanently removed, whereas invasive vegetation in mitigation/restoration areas would be temporarily removed to allow native vegetation to grow back. Most of the O&M Program Facilities are maintained vegetation-free and do not support the PCEs for southwestern willow flycatcher. Infrequently, areas that are intended to be maintained vegetation-free are not maintained and vegetation grows back to support the PCEs once again. In these cases, permanent vegetation removal is required, but the footprint of such removal will always be within that of existing District facilities.

The removal of vegetation associated with the construction of new District facilities is not covered under this biological and conference opinion. Such new facilities would be permitted individually and then added to the O&M Program once initial vegetation removal activities have occurred. Therefore, the addition of new facilities to the O&M Program will not generate additional losses of critical habitat that have not been adequately analyzed in other consultations.

O&M Program activities also include mitigation/restoration activities such as invasive plant removal. These activities may occur anywhere within Ventura County, inside or outside of critical habitat units. All mitigation/restoration activities are anticipated to ultimately benefit habitat for southwestern willow flycatchers and will only have temporary impacts to critical habitat as described above.

For the purposes of this consultation, we will assume that all District facilities are intended to be maintained vegetation free, but that 10 percent per year have mature vegetation that unintentionally regrew and requires removal. We will also assume that the District will conduct 10 acres of mitigation/restoration work in the Ventura River and 15 acres of mitigation/restoration in the Santa Clara River per year. Based on these assumptions, we anticipate that up to 13 acres of critical habitat within the Ventura River and 18 acres of critical habitat within the Santa Clara River may be adversely affected each year (Table 18).

Table 18. Summary of potential annual effects to critical habitat for the southwestern willow flycatcher.

Unit	Proposed CH (Acres)	Facilities in CH (Acres)	CH Affected by routine maintenance and repair (Acres)	CH Affected by mitigation/ restoration (Acres)
Ventura River	1,445	29	3	10
Santa Clara River	9,505	31	3	15
Piru Creek	1,862	0	0	0

The amount of critical habitat that would be affected by the O&M Program is small in comparison to the amount of critical habitat available in the Ventura River and Santa Clara River units, and is not anticipated to substantially affect the function of the Santa Clara Complex. The mitigation/restoration projects may ultimately have a beneficial effect on southwestern willow flycatcher critical habitat after native vegetation has regrown and matured to the point where these areas support the PCEs.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future state, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological and conference opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

We are unaware of any non-federal actions that are reasonably certain to occur and are likely to adversely affect the tidewater goby and its critical habitat, California red-legged frog and its critical habitat, least Bell's vireo, southwestern willow flycatcher and/or critical habitat for the southwestern willow flycatcher.

CONCLUSION

The O&M Program includes routine maintenance, repair, and mitigation/restoration activities associated with the upkeep of flood control facilities throughout Ventura County. These activities will adversely affect tidewater gobies and their critical habitat, California red-legged frogs and their critical habitat, least Bell's vireos, and southwestern willow flycatchers and their critical habitat. The impacts of the O&M Program will change from year-to year; however, a majority of District facilities are maintained vegetation-free and the routine maintenance and repair activities are designed to keep them in that condition, which does not generally support habitat for listed species. Habitat removal is only anticipated to occur in areas where vegetation has been allowed to grow into suitable habitat and in areas where repair projects require temporary removal of habitat. Therefore, the effects of O&M Program maintenance and repair activities are anticipated to be limited to a small portion of habitat available for tidewater gobies, California red-legged frogs, least Bell's vireo and southwestern willow flycatchers (Table 19). Furthermore any permanent removal of habitat will be primarily confined to the footprint of existing facilities. Any permanent removal of habitat beyond the existing footprint will be minor and not represent a substantial loss of habitat. Overall, the O&M program is not anticipated to generate an additional loss of habitat.

O&M Program mitigation/restoration activities are anticipated to impact a maximum of 10 acres of habitat in the Ventura River, 15 acres of habitat in the Santa Clara River, and 10 acres of habitat in Calleguas Creek per year and may occur within or outside the boundaries of District facilities. Mitigation/restoration activities are anticipated to have temporary adverse effects to tidewater gobies, California red-legged frogs and their critical habitat, least Bell's vireos and southwestern willow flycatchers and their critical habitat; however the long-term effects of mitigation/restoration projects are anticipated to be beneficial to these species and critical habitats.

Table 19. Summary of anticipated effects to threatened and endangered species and their critical habitats

	Ventura River	Santa Clara River	Ormond Lagoon	Calleguas Creek	TOTAL
Tidewater Goby					
Suitable habitat affected by maintenance and repair activities (acres/year)	3	0.1	0.1	2	5.2
Expected take by maintenance and repair	All individuals within the affected area				Indeterminate
Suitable habitat affected by mitigation activities (acres/year)	0	0	0	0	0
Expected take by mitigation	0	0	0	0	0
Tidewater Goby Critical Habitat					
Critical habitat affected by maintenance and repair activities (acres/year)	0.2	0	0	N/A	0.2
Critical habitat affected by mitigation activities (acres/year)	0	0	0	N/A	0
California Red-Legged Frog					
Suitable habitat affected by maintenance and repair activities (acres/year)	2.5	N/A	N/A	N/A	2.5
Expected take by maintenance and repair (individuals)	25	N/A	N/A	N/A	25
Suitable habitat affected by mitigation activities (acres/year)	10	N/A	N/A	N/A	10
Expected take by mitigation (individuals)	50	N/A	N/A	N/A	50
California Red-legged Frog Critical Habitat					
Critical habitat affected by maintenance and repair activities (acres/year)	2.3	N/A	N/A	N/A	2.3
Critical habitat affected by mitigation activities (acres/year)	10	0	N/A	N/A	10
Least Bell's Vireo					
Suitable habitat affected by maintenance and repair activities (acres/year)	3.5	4.6	N/A	17.4	25.5
Expected take by maintenance and repair (pairs)	3	4	N/A	10	17
Suitable habitat affected by mitigation activities (acres/year)	10	15	N/A	10	35
Expected take by mitigation (pairs)	6	9	N/A	6	21
Southwestern Willow Flycatcher					
Suitable habitat affected by maintenance and repair activities (acres/year)	3.2	4.5	N/A	8.4	16.1
Expected take by maintenance and repair (pairs)	1	1	N/A	1	3
Suitable habitat affected by mitigation activities (acres/year)	10	15	N/A	10	35
Expected take by mitigation (pairs)	1	1	N/A	1	3
Southwestern Willow Flycatcher Critical Habitat					
Critical habitat affected by maintenance and repair activities (acres/year)	3	3	N/A	N/A	6
Critical habitat affected by mitigation activities (acres/year)	10	15	N/A	N/A	25

Tidewater goby
The O&M program is not anticipated to substantially interfere with the reproduction, numbers, and distribution of the tidewater goby because:

- O&M Program activities may require the temporary relocation of tidewater gobies out of a small portion of their habitat within the Ventura River, Santa Clara River, Ormond Lagoon and Calleguas Creek; however, the vast majority of each of these populations will be unaffected, and reproduction within each of these populations as a whole will not be compromised, therefore reproduction necessary to maintain the species-wide metapopulation will not be compromised.

- O&M Program activities are anticipated to result in the detection of no more than 10 dead tidewater gobies throughout the action area each year. This represents an insignificant number in comparison to the thousands of individuals that are projected to inhabit each of these populations, and is not a substantial decrease in numbers of tidewater gobies that exist range-wide.

- The O&M Program is not anticipated to interfere with metapopulation dynamics that facilitate the distribution of the species and maintain their distribution range-wide.

California red-legged frog
The O&M program is not anticipated to substantially interfere with the reproduction, numbers, and distribution of the California red-legged frog because:

- O&M Program activities may require the temporary relocation of California red-legged frogs out of a small portion of their habitat within the Ventura River, however, relocations will predominantly occur during the time of year that avoids the breeding season for California red-legged frogs, and reproduction within the Ventura River will not be substantially affected. The O&M program is not anticipated to have a substantial effect to reproduction when considering the species range-wide.

- O&M Program activities are anticipated to result in the take of up to 75 eggs, tadpoles, adults and juveniles each year, primarily through relocation. We anticipate the detection of no more than 1 dead adult or juvenile, 5 dead tadpoles, or 1 disturbed egg mass each year. The loss of this number of individuals is low in comparison to the number of individuals that are projected to inhabit the Ventura River, and is not a substantial decrease in numbers of California red-legged frogs that exist range-wide. Furthermore, restoration actions are anticipated to facilitate an increased number of individuals in the future.

- The O&M Program will not affect the distribution of California red-legged frogs range-wide, because the population will continue to persist in the Ventura River.

Least Bell's vireo
The O&M program is not anticipated to substantially interfere with the reproduction, numbers, and distribution of the least Bell's vireo because:

- O&M Program activities may require the removal of habitat primarily from areas where habitat does not routinely exist, and may interfere with reproduction of individuals that return to a territory that has been partially or fully removed. Because of the abundance of habitat that generally exists adjacent to affected areas, most of the affected least Bell's vireos are anticipated to find suitable alternative habitat, and reproduction within the Ventura River, Santa Clara River and Calleugas Creek as a whole will not be substantially affected. Therefore the overall reproduction of the species is not anticipated to be substantially affected.

- O&M Program activities are anticipated to result in the take of up to 38 least Bell's vireo each year, primarily through harm associated with finding alternative habitat. We anticipate the detection of no more than 1 dead adult or juvenile least Bell's vireo or the abandonment of no more than 1 active nest each year. The loss of this number of individuals is low in comparison to the number of individuals that are projected to inhabit the action area, and is not a substantial decrease in numbers of least Bell's vireos that exist range-wide. Furthermore, restoration actions are anticipated to facilitate an increased number of individuals in the future, which will vastly outweigh the loss of these few individuals.

- The O&M Program will not affect the distribution of least Bell's vireo range-wide, because the population will continue to persist throughout the action area and no barriers to dispersal will be created by the O&M Program.

Southwestern willow flycatcher
The O&M program is not anticipated to substantially interfere with the reproduction, numbers, and distribution of the southwestern willow flycatcher because:

- O&M Program activities may require the removal of habitat primarily from areas where habitat does not routinely exist, and may interfere with reproduction of individuals that return to a territory that has been partially or fully removed. Because of the abundance of habitat that generally exists adjacent to affected areas, most of the affected southwestern willow flycatchers are anticipated to find suitable alternative habitat, and reproduction within the Ventura River, Santa Clara River and Calleugas Creek as a whole will not be substantially affected. Therefore the O&M program will not interfere with overall reproduction of the species range-wide.

- O&M Program activities are anticipated to result in the take of up to 6 paris of southwestern willow flycatchers each year, primarily through harm associated with finding alternative habitat. We do not anticipate the detection of any dead southwestern willow flycatchers or the abandonment of any active nests. Restoration actions are anticipated to facilitate an increased number of individuals in the future that will promote increased numbers of southwestern willow flycatchers within the action area. On whole, we do not anticipate the O&M Program to substantially affect the number of southwestern willow flycatchers range-wide.

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- The O&M Program will not affect the distribution of southwestern willow flyactchers range-wide, because the population will continue to persist throughout the action area and no barriers to dispersal will be created by the O&M Program.

After reviewing the current status of the tidewater goby and its critical habitat, California red-legged frog and its critical habitat, least Bell's vireo, and southwestern willow flycatcher and its proposed critical habitat, the environmental baseline for the action area, the effects of the project activities on the reproduction, number and distribution of each species, and the cumulative effects, it is the Service's biological and conference opinion that the Corps' approval of the District's O&M Program is not likely to jeopardize the continued existence of the tidewater goby, California red-legged frog, least Bell's vireo, and southwestern willow flycatcher and is not likely to destroy of adversely modify designated critical habitat for the tidewater goby, California red-legged frog, and the proposed critical habitat for the southwestern willow flycatcher.

This concludes formal conference for the proposed action. The Corps may request that the Service confirm the conference opinion on the proposed critical habitat of the southwestern willow flycatcher as a biological opinion if the critical habitat designation is finalized. The request must be in writing. If the Service reviews the proposed action and finds that there have been no significant changes in the action as planned or in the information used during the conference, the Service will confirm the conference opinion as the biological opinion on the project and no further consultation would be necessary. After designation of the southwestern willow flycatcher critical habitat and adoption of this conference opinion as a biological opinion, the Corps must request reinitiation if any of the criteria described in the Reinitiation Notice at the end of this document are met.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened wildlife species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are non-discretionary, and must be undertaken by the Corps so that they become binding conditions of any grant or permit issued to the District, as appropriate, for the exemption in section 7(o)(2) to apply. The Corps has a continuing duty to regulate the

activity covered by this incidental take statement. If the Corps (1) fails to assume and implement the terms and conditions or (2) fails to require the District to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, the Corps or District must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement. [50 CFR 402.14(i)(3)]

Tidewater goby

The Service anticipates that all tidewater gobies within up to 5.2 acres of occupied habitat per year could be taken in the form of harm or harassment through capture and relocation, crushing, stranding, and lowered breeding success as a result of O&M Program activities that require dewatering or other activities that directly affect occupied habitat. The exact number of tidewater gobies that could be affected cannot be predicted because of the natural fluctuations in numbers that these species experience and the difficulty in determining how many individuals are present at any given time. The Service anticipates that all individuals of all life stages of the tidewater goby within the area that will be netted and seined during dewatering activities will be taken as a result of capture, and that a subset of these individuals may be killed or injured during handling and release during routine maintenance, repair and mitigation/restoration activities. We also anticipate that tidewater goby eggs many be killed through damage to, and destruction of, burrows during maintenance and repair activities that involve dewatering or disturbance to wetted habitat. Additionally, O&M Program activities may also have effects to tidewater gobies through increased sedimentation; however, with the implementation of the BMPs and minimization measures, these activities are anticipated to have insignificant effects to tidewater gobies.

Because we cannot definitively anticipate the number of tidewater gobies that may be taken, yet must provide a trigger for reinitiation, if more than ten (10) tidewater gobies in any one year are found dead or injured, and those deaths or injuries can be attributed to the proposed actions, the Corps should require the District to stop work and contact our office immediately so we can review the project activities to determine if additional protective measures are needed.

California red-legged frog

The Service anticipates that all California red-legged frogs within 2.5 acres per year, estimated at 25 individuals, could be taken as a result of monitoring and repair activities. We also anticipate that all California red-legged frogs within 10 acres per year, estimated at 50 individuals, may be taken as a result of mitigation/restoration activates. The incidental take is expected to be in the form of capture. Any individuals in affected habitats that are not detected and relocated may be injured or killed by heavy equipment and personnel in the project area.

Incidental take of California red-legged frog adults, subadults, or tadpoles may be difficult to detect for the following reasons: (1) the California red-legged frog is generally difficult to detect due to its small body size; (2) finding a dead or impaired specimen is unlikely; and (3) losses may be masked by seasonal fluctuations in hydrology unrelated to the project. Because we must provide a limit at which consultation must be reinitiated, we anticipate that no more than 1 adult or subadult California red-legged frogs, 1 egg mass, or 10 tadpoles will be injured or killed in a given year. If more than 1 California red-legged frog adult, or 5 California red-legged frog tadpoles are found dead or if more than 1 eggmass is detected within a project area, the Corps

should require the District to stop work and contact our office immediately so we can review the project activities to determine if additional protective measures are needed.

Least Bell's vireo
The Service anticipates that up to 25.5 acres of suitable habitat for least Bell's vireo each year may be affected during routine maintenance and repair activities and up to 35 acres per year may be affected by mitigation/restoration activities. Based on the range of documented territory sizes, watershed-wide survey data, and total potential habitat, we anticipate that up to 17 pairs of least Bell's vireos per year could be taken by maintenance and repair activities and up to 21 pairs per year will be taken through mitigation/restoration activities. The nature of this taking consists primarily of non-lethal harm through habitat removal that occurs during the non-breeding season, where birds with territories that have been cleared of vegetation will be harmed by the effort required to find alternative breeding and feeding habitat. We also anticipate that least Bell's vireos will be taken through harassment by O&M Program activities that occur during the nesting season through work activities adjacent to nests that may cause birds to flush from the nests or attract predators to nests. The likelihood of detecting dead individuals is low due to the birds' small size and cryptic coloring, therefore if more than 1 least Bell's vireo is found dead or more than 1 active nest is identified to be damaged or abandoned due to O&M program activities in any given year, the Corps should require the District to stop work and contact our office immediately so we can review the project activities to determine if additional protective measures are needed.

Southwestern willow flycatcher
The Service anticipates that up to 16.1 acres of suitable habitat for the southwestern willow flycatcher each year may be affected during routine maintenance and repair activities and up to 35 acres per year may be affected by mitigation activities. Based on watershed-wide survey data, and total potential habitat, we anticipate that up to 3 pairs of southwestern willow flycatchers will be taken by maintenance and repair activities, and up to 3 pairs per year will be taken by mitigation/restoration activities. The nature of this taking consists primarily of habitat removal that occurs during the non-breeding season, where birds with territories that have been cleared of vegetation will be harmed by the effort required to find alternative habitat. If any southwestern willow flycatchers are found dead or if any active nests are determined to be damaged or permanently abandoned due to O&M Program activities, the Corps should require the District to stop work and contact our office immediately so we can review the project activities to determine if additional protective measures are needed.

In summary, the anticipated maximum annual take of tidewater gobies, California red-legged frogs, least Bell's vireos and southwestern willow flycatchers is summarized in Table 20.

Table 20. Reinitiation criteria based on habitat affected and documented mortality. The consultation must be reinitiated if these estimates are exceeded in any given year.

	Habitat Affected by Maintenance & Repair	Habitat affected by Mitigation/Restoration	Dead Individuals
Tidewater goby	5.2 acres	0 acres	10 individuals
California red-legged frog	2.5 acres	10 acres	1 adult or juvenile; 5 tadpoles; 1 eggmass
Least Bell's vireo	25.5 acres	35 acres	1 adult or juvenile; 1 active nest abandoned or destroyed
Southwestern willow flycatcher	16.1 acres	35 acres	No adults or juveniles; No active nests abandoned or destroyed

REASONABLE AND PRUDENT MEASURES

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The Federal agency must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize the incidental take of tidewater gobies, California red-legged frogs, least Bell's vireos and southwestern willow flycatchers:

1. Take of tidewater gobies must be minimized by using qualified individuals to conduct monitoring, capture, and relocation;

2. The take of California red-legged frogs from capture, relocation, and construction activities must be minimized by employing qualified biologists who are able to handle California red-legged frogs safely and without transmitting diseases or pathogens; and

3. The taking of least Bell's vireos and southwestern willow flycatchers must be minimized by using qualified biologists to conduct surveys and other activities related to the protection of these species.

TERMS AND CONDITIONS

To be exempt from the prohibitions of section 9 of the Act, the Corps must ensure that the District complies with the following terms and conditions, which implement the reasonable and prudent measures described above and outline reporting and monitoring requirements. These terms and conditions are non-discretionary.

The following term and condition implements reasonable and prudent measure 1:

a. Only qualified personnel authorized under the auspices of this biological opinion can survey for, capture, and relocate tidewater gobies. The District and the Corps must request our approval of any biologists they wish to employ to survey for, capture and relocate tidewater gobies from work areas. The request must be in writing and be received by us at least 30 days prior to any such activities being conducted.

The following terms and conditions implement reasonable and prudent measure 2:

a. Only qualified personnel authorized under the auspices of this biological opinion can survey for, capture, and relocate California red-legged frogs. The District and the Corps must request our approval of any biologists they wish to employ to survey for, capture and relocate California red-legged frogs from work areas. The request must be in writing and be received by us at least 30 days prior to any such activities being conducted.

b. Any steep-walled holes or trenches that will be left open overnight in suitable habitat for California red-legged frogs must be covered such that they will not entrap California red-legged frogs.

c. Latex or nitrile gloves must not be used when handling California red-legged frogs. Clean hands, free of lotions, sun screens, and fragrances are recommended. If gloves are necessary, the use of well-rinsed vinyl gloves is recommended.

d. To ensure that diseases are not conveyed between work sites by Service-approved biologists, the fieldwork code of practice developed by the Declining Amphibian Populations Task Force must be followed at all times. A copy of the code of practice is enclosed as Appendix C of this document. The Service-approved biologist may substitute a bleach solution (0.5 to 1.0 cup of bleach to 1.0 gallon of water) for the ethanol solution. Care must be taken so that all traces of the disinfectant are removed before entering the next aquatic habitat.

The following term and condition implements reasonable and prudent measure 3:

a. Only qualified personnel authorized under the auspices of this biological opinion can survey for, designate suitable buffers, and monitor for least Bell's vireos and southwestern willow flycatchers. The District and the Corps must request our approval of any biologists they wish to employ to conduct these activities in

association with the O&M Program. The request must be in writing and be received by us at least 30 days prior to any such activities being conducted.

REPORTING REQUIREMENTS

Pursuant to 50 CFR 402.14(i)(3), Corps must report the progress of the action and its impact on the species to the Service as specified in this incidental take statement. The Corps or the District, on behalf of the Corps, will provide an annual report in August of each year. The report must describe all activities that were conducted under the auspices of this biological opinion, including activities that were described in the project description and required under the terms and conditions. The report must include the following:

- Documentation of the number of tidewater gobies, California red-legged frogs, least Bell's vireo and southwestern willow flycatcher that were found along with the location where they were found;

- Documentation of the number of tidewater gobies, California red-legged frogs, least Bell's vireo and southwestern willow flycatchers that were taken during project activities, and the nature of the taking (e.g., capture, injury, etc.);

- Description of the nature and extent of tidewater goby, California red-legged frog, and southwestern willow flycatcher designated critical habitat adversely affected;

- Description of instances of when the BEMP was implemented, dates when subsequent storms occurred, and when breaching occurred; and

- A brief discussion of any problems encountered in implementing minimization measures.

DISPOSITION OF DEAD OR INJURED SPECIMENS

As part of this incidental take statement and pursuant to 50 CFR 402.14(i)(1)(v), upon locating a dead or injured tidewater goby, California red-legged frog, least Bell's vireo, southwestern willow flycatcher, initial notification within three working days of its finding must be made by telephone and in writing to the Ventura Fish and Wildlife Office (805-644-1766). The report must include the date, time, location of the carcass, a photograph, cause of death or injury, if known, and any other pertinent information.

Care must be taken in handling injured animals to ensure effective treatment and care, and in handling dead specimens to preserve biological material in the best possible state. Injured animals must be transported to a qualified veterinarian. Should any treated tidewater goby, California red-legged frog, least Bell's vireo, southwestern willow flycatcher survive, the Service should be contacted regarding the final disposition of the animals. The Service should be contacted to determine the appropriate deposition location for any dead specimens that are identified.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

- Work with landowners throughout the Calleguas Creek watershed to modify flood control facilities so that they may provide enhanced habitat for least Bell's vireos, southwestern willow flycatchers, and tidewater gobies.

- Coordinate mitigation/restoration projects in the Santa Clara River with The Nature Conservancy, and in the Ventura River with the Ventura Hillsides Conservancy and Ojai Valley Land Conservancy.

- Where possible, consolidate small mitigation/restoration projects into a focused area to have a larger cumulative benefit through the restoration of larger contiguous areas.

- Conduct species monitoring before and after the completion of mitigation/restoration projects to document the beneficial effects of such activities.

The Service requests notification of the implementation of any conservation recommendations so we may be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats.

REINITIATION NOTICE

This concludes formal consultation on the Corps' authorization for activities conducted through the District's O&M Program. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, the exemption issued pursuant to section 7(o)(2) will have lapsed and any further take would be a violation of section 4(d) or 9. Consequently, we recommend that any operations causing such take cease pending reinitiation.

Sincerely,

Diane K. Noda

Diane K. Noda
Field Supervisor

Appendices

1. Appendix A – O&M Program Facilities and Habitat
2. Appendix B – Average Work Duration at O&M Program Facilities
3. Appendix C – Declining Amphibian Taskforce Field Work Code of Practice

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PERSONAL COMMUNICATION

Camm Swift. 2010. Tidewater goby technical expert, retired. Email correspondence, September 19, 2010.

APPENDIX A. TABLE 1 – TIDEWATER GOBY

VENTURA RIVER WATERSHED FACILITIES	LENGTH	HARD	FAC HAB	TOTAL	ADJ HAB	DAYS	DAYS	DAYS
Levees	**Feet**	**Acres**	**Acres**	**Acres**	**Acres**	**Avg.**	**Low**	**High**
41011 Bank Protection/Levee: Ocean to Main St.*	2,800	4.42	0.59	**5.01**	32.81	7.6	1	18
Note: incl. 1.09 acres of willow habitat removal within 630 linear feet of toe hardscape.								
41012 Bank Protection/Levee (Main St. to Hwy 33)*	10,115	23.20	0.00	**23.20**	91.40	24.9	19	34
SUBTOTALS	**12,915**	**27.62**	**0.59**	**28.21**	**124.21**			
Outlets to Ventura River								
41728 Cal-trans Secondary Outlet*	40	0.00	0.01	**0.01**	9.27			
41131 Canada de San Joaquin Channel & Outlet	195	0.00	0.18	**0.18**	12.39			
41110 Stanley Ave. Drain Outlet*	440	0.00	0.62	**0.62**	12.94			
41121 Dent Drain Outlet	180	0.00	0.46	**0.46**	9.01	1	0	3
41721 Dent Secondary Outlet	380	0.00	0.52	**0.52**	12.38			
41751 Freeway Side Drain #1 Outlet*	270	0.00	0.37	**0.37**	12.46	0.6	0	1
41752 Freeway Side Drain #2 Outlet*	250	0.00	0.27	**0.27**	10.15			
41753 Freeway Side Drain #3 Outlet*	170	0.00	0.20	**0.20**	8.56			
41754 Freeway Side Drain #4 Outlet*	395	0.00	0.52	**0.52**	10.81			
41755 Freeway Side Drain #5 Outlet*	50	0.05	0.00	**0.05**	8.60	0.1	0	1
41729 Peking & 41727 Harrison Secondary Outlets*	1175	0.00	2.50	**2.50**	23.17	4.1	0	9
41730 Ramona St. Secondary Outlet*	240	0.00	0.39	**0.39**	10.78			
41731 Simpson St. Secondary Outlet*	375	0.00	0.77	**0.77**	17.03	3	0	9
41732 Vince St. Secondary Outlet*	200	0.00	0.19	**0.19**	7.81			
SUBTOTALS	**4,360**	**0.05**	**6.97**	**7.02**	**165.36**			
Mitigation/Restoration Sites								
Lower Ventura River Giant Reed Removal Phase 1*	2,400	0.000	9.850	**9.85**	49.13	6	4	10
Lower Ventura River Giant Reed Removal Phase 2*	2,330	0.000	11.240	**11.24**	43.78	6	4	10
SUBTOTALS	**4,730**	**0.00**	**21.09**	**21.09**	**92.91**			
Ventura River Watershed Grand TOTALS	**22,005**	**27.67**	**28.66**	**56.33**	**382.48**			
SANTA CLARA RIVER WATERSHED	**LENGTH**	**HARD**	**FAC HAB**	**TOTAL**	**ADJ HAB**	**DAYS**	**DAYS**	**DAYS**
Ormond Beach Channels	**Feet**	**Acres**	**Acres**	**Acres**	**Acres**	**Avg**	**Low**	**High**
42302 Oxnard Industrial Drain RR to Pleasant Val. Rd.* ^	1000	2.00	0.00	**2.00**	0.56	16	9	32
42321 J Street Drain Pacific Ocean to Pump Sta.**^	500	0.00	0.78	**0.78**	4.13	11.3	5	33
42322 J Street Drain Pump Station to RR Spur*^	1600	1.58	0.00	**1.58**	2.51	21.1	15	27
SUBTOTALS	**3,100**	**3.58**	**0.78**	**4.36**	**7.20**			

Levees and Stream Gauges								
42012 Santa Clara River Harbor Blvd to Victoria Avenue	4000	6.95	0.00	**6.95**	49.62	0.6	0	2
42017 Santa Clara River Victoria Ave to Ventura Road	7216	14.60	0.00	**14.60**	4.63			
723 Santa Clara River at Victoria Stream Gauge	100	0.00	0.88	**0.88**	14.75			
Note: Maint. done by Vta County Transportation Dept.								
Victoria Ave Drain Secondary Outlet	0	0.00	0.16	**0.16**	9.25			
SUBTOTALS	**11,316**	**21.55**	**1.04**	**22.60**	**78.25**			
Mitigation/Restoration Sites								
None								
SUBTOTALS	**0**	**0.00**	**0.00**	**0.00**	**0.00**			
Santa Clara River Watershed GRAND TOTALS	**14,416**	**25.13**	**1.82**	**26.95**	**85.45**			
CALLEGUAS CREEK WATERSHED FACILITIES	**LENGTH**	**HARD**	**FAC HAB**	**TOTAL**	**ADJ HAB**	**DAYS**	**DAYS**	**DAYS**
Channels	**Feet**	**Acres**	**Acres**	**Acres**	**Acres**	**Avg**	**Low**	**High**
45021 Calleguas Creek Hwy 1 to Broome Ranch Crossing*^	21,120	30.41	109.74	**140.15**	5.80	23.4	14	30
45023 Calleguas Creek Broome Ranch to Hueneme Rd*^	8660	28.02	73.11	**101.13**	0.02			
45101 Revolon Slough Hwy 1 to Las Posas Rd.*^	21,120	17.28	30.20	**47.48**	5.93	6.9	5	11
SUBTOTALS	**50,900**	**75.72**	**213.04**	**288.75**	**11.75**			
Calleguas Creek Watershed GRAND TOTALS	**50,900**	**75.72**	**213.04**	**288.75**	**11.75**			
GRAND TOTAL ALL WATERSHEDS	**87,321**	**128.52**	**243.52**	**372.03**	**479.69**			

* Known or presumed occupied habitat within water present

** Designated critical habitat

^: Hardscape concrete lined channel is potentially occupied or known occupied habitat for tidewater goby

HARD = FACILITY HARDSCAPE: access road, rock, concrete, compacted earth slopes, etc. with no habitat value

FAC POT = FACILITY POTENTIAL HABITAT: maintained facility areas with potential to support species (earth bottom, wet channels, etc.)

ADJ HAB = ADJACENT SUITABLE HABITAT: non-facility areas with suitable habitat for species adjacent to District facilities.

DAYS: Average annual work days, with low and high numbers of days for the period January 1, 2005 through December 27, 2011. If blank, data were not analyzed for this facility.

Mitigation/Restoration Sites: not covered by other BOs or permits.

PT Codes: 20, 21, 26, 27, 28, 32, 34, 41, PS41, 42, PS42, 43, 44, 45, 48, 49, 53, 55, 56, 57, 76, 80, 85, 86, 87, 89, 92.

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APPENDIX A. TABLE 2 – CALIFORNIA RED-LEGGED FROG

VENTURA RIVER WATERSHED FACILITIES	LENGTH	HARD	FAC HAB	TOTAL	ADJ HAB	DAYS	DAYS	DAYS
Levees/Dams	**Feet**	**Acres**	**Acres**	**Acres**	**Acres**	**Avg**	**Low**	**High**
41021 Casitas Spgs Bank Protection: Fresno Cyn to Hwy 33*^	5,810	9.65	1.86	**11.51**	70.97	9.6	5	17
Note: includes 1.7 ac of existing willow riparian vegetation to be removed at toe upon issuance of permits.								
41031 Live Oak Acs Bank Protect/ Levee u/s Santa Ana	4,640	5.95	1.72	**7.67**	55.74	5.8	1	9
Note: includes 1.0 acre of willow scrub to be removed upon issuance of permits.								
41023 Santa Ana Road Bridge Sediment Removal*	240	0.00	1.07	**1.89**	10.85			
41181 Fresno Canyon Outlet to Ventura River*	220	0.00	0.22	**0.22**	11.23			
41901 Matilija Dam and Gage Maintenance**	215	1.88	0.00	**1.88**	31.71	17	4	35
SUBTOTALS	**11,125**	**17.48**	**4.86**	**23.17**	**180.50**			
Stream Gauges								
602 Matilija Creek at Matilija Hot Springs Stream Gage*	100	0.00	0.30	**0.30**	23.28	15	6	30
604 North Fork Matilija Creek at Hwy 33 Stream Gage	65	0.00	0.08	**0.08**	2.48	18	6	30
605 San Antonio Creek at Casitas Springs Stream Gage**	100	0.00	0.33	**0.33**	14.90	12	6	30
608 Ventura River at Foster Park Stream Gage*	100	0.00	0.85	**0.85**	7.68	11	6	30
ME-VR2 WQ Gage at Ventura River at OVSD Facility*	150	0.00	0.10	**0.10**	5.50	10	5	20
SUBTOTALS	**515**	**0.00**	**1.66**	**1.66**	**53.84**			
Mitigation/Restoration Sites								
None								
SUBTOTALS	**0**	**0.00**	**0.00**	**0.00**	**0.00**			
Ventura River Watershed GRAND TOTALS	**11,640**	**17.48**	**6.51**	**24.82**	**234.34**			

* Known or presumed occupied habitat if water present

** Designated critical habitat

^: Hardscape rock riprap is potential habitat for frog.

HARD = FACILITY HARDSCAPE: access road, rock, concrete, compacted earth slopes, etc. with no habitat value

FAC HAB = FACILITY POTENTIAL HABITAT: Maintained facility areas with potential to support species (earth bottom, wet channels, etc.)

ADJ HAB = ADJACENT SUITABLE HABITAT: non-facility areas with suitable habitat for species adjacent to District facilities.

DAYS: Average annual work days, with low and high numbers of days for the period January 1, 2005 through December 27, 2011. If no data supplied, the facility was not analyzed.

Notes: Current condition includes overgrown vegetation within routine maintenance area (15 foot width along the toe).

Mitigation/Restoration Sites: not covered by other BOs or permits.

PT Codes: 30, 32, 33, 34, 41, PS41, 42, 43, 45, 48, 53, 55, 57, 77, 89, 92

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APPENDIX A. TABLE 3 – LEAST BELL'S VIREO

VENTURA RIVER WATERSHED FACILITIES	LENGTH FT	HARD	FAC HAB	TOTAL	ADJ HAB	DAYS	DAYS	DAYS
Levees	**Feet**	**Acres**	**Acres**	**Acres**	**Acres**	**Avg**	**Low**	**High**
41021 Casitas Springs Bank Protection	5,810	9.65	1.86	**11.51**	71.50	4.7	3	7
Note: includes 1.7 ac of existing willow riparian vegetation to be removed at toe upon issuance of permits.								
41011 Bank Protection/Levee (Ocean to Main St.)*	2,800	4.42	0.59	**5.01**	32.79	4.4	0	11
Note: incl. 1.09 acres of willow habitat removal within 630 linear feet of toe hardscape.								
41012 Bank Protection/Levee (Main St. to Hwy 33)*	10,115	23.20	0.00	**23.20**	91.39	12.3	7	21
41031 Live Oak Ac Bank Protect./Levee u/s Santa Ana Rd.*	4,640	5.95	1.72	**7.67**	55.75	3.7	1	8
SUBTOTALS	**23,365**	**43.22**	**4.17**	**47.39**	**251.43**			
Outlets to Ventura River								
41131 Canada de San Joaquin Channel and Outlet*	195	0.00	0.18	**0.18**	12.40			
41110 Stanley Ave. Drain Outlet*	440	0.00	0.62	**0.62**	12.95			
41121 Dent Drain Outlet*	180	0.00	0.46	**0.46**	9.01	0	0	0
41152 Canada Larga Channel & Outlet	240	0.28	0.00	**0.28**	1.17			
41181 Fresno Canyon Outlet to Ventura River*	220	0.00	0.22	**0.22**	11.23			
41721 Dent Secondary Outlet*	380	0.00	0.52	**0.52**	12.38			
41728 Cal-trans Secondary Outlet*	40	0.00	0.01	**0.01**	9.27			
41729 Peking Secondary & 41727 Harrison Secondary Outlets*	1175	0.00	2.50	**2.50**	23.18	0.4	0	3
41730 Ramona St. Secondary Outlet*	240	0.00	0.39	**0.39**	10.78			
41731 Simpson St. Secondary Outlet*	375	0.00	0.77	**0.77**	17.03	0	0	0
41732 Vince St. Secondary Outlet*	200	0.00	0.19	**0.19**	7.81			
41751 Freeway Side Drain #1 Outlet*	270	0.00	0.37	**0.37**	12.46	0	0	0
41752 Freeway Side Drain #2 Outlet*	250	0.00	0.27	**0.27**	10.15			
41753 Freeway Side Drain #3 Outlet*	170	0.00	0.20	**0.20**	8.56	0	0	0
41754 Freeway Side Drain #4 Outlet*	395	0.00	0.52	**0.52**	10.81			
41755 Freeway Side Drain #5 Outlet*	50	0.05	0.00	**0.05**	8.57	0	0	0
SUBTOTALS	**4,820**	**0.33**	**7.22**	**7.55**	**177.76**			
Other Facilities								
41901 Matilija Dam and Gage Maintenance*	215	1.88	0.00	**1.88**	1.26	4.1	2	14
41023 Santa Ana Road Bridge Sediment Removal	240	0.00	0.89	**0.89**	10.85			
SUBTOTALS	**455**	**1.88**	**0.89**	**2.77**	**12.11**			

Stream Gages								
602 Matilija Creek at Matilija Hot Springs Stream Gage*	100	0.00	0.30	**0.30**	2.66	15	6	30
604 North Fork Matilija Creek at Hwy 33 Stream Gage	65	0.00	0.08	**0.08**	2.48	18	6	30
605 San Antonio Creek at Casitas Springs Stream Gage	100	0.00	0.30	**0.30**	6.03	12	6	30
608 Ventura River at Foster Park Stream Gage	100	0.00	0.85	**0.85**	7.69	11	6	30
ME-VR2 WQ Gage at Ventura River at OVSD Facility	150	0.00	0.10	**0.10**	5.46	10	5	20
SUBTOTALS	**515**	**0.00**	**1.63**	**1.63**	**24.32**			
Mitigation/Restoration Sites								
Lower Ventura River Giant Reed Removal Phase 1*	2,400	0.00	9.85	**9.85**	49.16	6	4	10
Lower Ventura River Giant Reed Removal Phase 2*	2,330	0.00	11.24	**11.24**	43.80	6	4	10
SUBTOTALS	**4,730**	**0.00**	**21.09**	**21.09**	**92.96**			
Ventura River Watershed GRAND TOTALS	**33,885**	**45.43**	**35.00**	**80.43**	**558.58**			
SANTA CLARA RIVER WATERSHED FACILITIES	**LENGTH FT**	**HARD**	**FAC HAB**	**TOTAL**	**ADJ**	**DAYS**	**DAYS**	**DAYS**
Levees and Bank Protection	**Feet**	**Acres**	**Acres**	**Acres**	**Acres**	**Avg**	**Low**	**High**
42012 Santa Clara River Harbor Blvd to Victoria Levee *	4000	6.95	0.00	**6.95**	55.24	0.3	0.0	1.0
42017 Santa Clara River Victoria Ave to Ventura Rd Levee*	7200	13.32	0.00	**13.32**	92.43			
42030 Santa Clara River Weir Field	n/a	1.85	0.78	**2.63**	30.34			
42021 Santa Clara River 101 Fwy to South Mountain Levee*	24929	92.57	0.00	**92.57**	273.66	4.7	0.0	11.0
42025 Sudden Barranca to Saticoy Ave Levee*	2545	7.01	0.92	**7.93**	28.89	1.3	0.0	4.0
42026 Santa Clara River North Bank Groins*	1500	2.79	1.09	**3.88**	36.72			
42036 Groins @ South Mtn Road*	1825	1.72	0.57	**2.29**	32.15	0.9	0.0	4.0
42037 Bardsdale Levee	3836	5.12	1.23	**6.35**	49.39			
43061 &43062 Santa Paula Creek Corps Project	9000	31.68	21.66	**53.34**	8.61			
43308 Sespe Bank Protection at Goodenough Road	990	0.89	0.00	**0.89**	14.62			
SUBTOTALS	**55825**	**163.90**	**26.25**	**190.15**	**622.05**			
Outlets to Santa Clara River								
43161 Bardsdale Ditch Outlet	30	0	0.02	**0.02**	10.08			
43191 Basolo Ditch Outlet	30	0	0.05	**0.05**	10.90			
42511 Brown Barranca Outlet	30	0	0.05	**0.05**	10.93	0.6	0	2
42205 Central Ave. Drain Outlet	30	0	0.02	**0.02**	10.12	0.3	0	1
42491 Clark Barranca Outlet	30	0	0.07	**0.07**	8.96			
42391 El Rio Drain Outlet*	30	0	0.02	**0.02**	9.78	9.6	3	26
43051 Fagan Canyon Outlet	30	0	0.03	**0.03**	9.57			

42531 Franklin Barranca Outlet*	30	0	0.17	**0.17**	9.80			
43181 Grimes Canyon Outlet	30	0	0.03	**0.03**	10.67	5.6	0	21
42471 Harmon Barranca Outlet*	30	0	0.05	**0.05**	8.33			
43351 Jepson Wash Outlet to Sespe Creek	30	0	0.02	**0.02**	9.48			
43361 Keefe Ditch Outlet to Sespe Creek	30	0	0.09	**0.09**	11.15	4.1	0	15
42701 Montalvo Golf Course Secondary Outlet*	600	0.43	0.30	**0.73**	12.42	2	0	6
42461 Moon Ditch Outlet*	30	0	0.05	**0.05**	10.03	3.6	3	4
43041 Peck Road Drain Outlet*	30	0	0.02	**0.02**	10.12	1.4	0	3
43201 Pole Creek Outlet	30	0	0.01	**0.01**	13.35			
43251 Real Canyon Outlet	30	0	0.05	**0.05**	2.42			
42021 Stroube Drain Outlet*	200	0.07	0.21	**0.28**	12.71			
42501 Sudden Barranca Outlet*	30	0	0.02	**0.02**	9.48			
42704 Victoria Ave. Drain Secondary Outlet*	30	0	0.16	**0.16**	12.45	0.7	0	3
43701 Willard Road Secondary Outlet*	30	0	0.02	**0.02**	12.87			
SUBTOTALS	**1370**	**0.50**	**1.46**	**1.96**	**215.62**			
Mitigation/Restoration Sites								
SCR Upstream of Balcom Cyn Wash *	2000	0.00	15.57	**15.57**	38.31			
SCR So. Mountain Rd. Mitigation Site 1*	275	0.00	0.58	**0.58**	12.28			
SCR So. Mountain Rd. Mitigation Site 2*	270	0.00	0.50	**0.50**	12.86			
SUBTOTALS	**2545**	**0.00**	**16.65**	**16.65**	**63.45**			
Stream Gages								
709 Santa Paula Crk at Mupu Br Stream Gage (Steckel Pk)	100	0.00	0.24	**0.24**	3.89			
723 Santa Clara River at Victoria Stream Gage*	100	0.00	0.88	**0.88**	29.88			
SUBTOTALS	**200**	**0.00**	**1.12**	**1.12**	**33.77**			
Santa Clara River Watershed GRAND TOTALS	**59,940**	**164.40**	**45.48**	**209.88**	**934.89**			
CALLEGUAS CREEK WATERSHED FACILITIES	**LENGTH FT**	**HARD**	**FAC HAB**	**TOTAL**	**ADJ**	**DAYS**	**DAYS**	**DAYS**
Channels	**Feet**	**Acres**	**Acres**	**Acres**	**Acres**	**Avg**	**Low**	**High**
45021 Calleguas Creek Hwy 1 to Broome Ranch Crossing*	21120	30.41	0.00	**30.41**	0.00	14.3	0	24
45023 Calleguas Creek Broome Ranch to Hueneme Rd	8660	28.02	0.00	**28.02**	0.00	7.3	0	12
45025 Calleguas Creek Hueneme Rd to Lewis Rd	7670	18.01	0.00	**18.01**	0.92	2	0	5
45027 Calleguas Creek Lewis Rd to 850 ft u/s University Drive	2420	5.03	9.31	**14.34**	3.32	0.8	0	2
45033 Calleguas Creek Pleasant Valley Rd. to Hwy 101	3860	8.37	1.39	**9.76**	16.42	2.3	0	4
45035 Calleguas Creek Hwy 101 to Adolfo Rd	2900	8.8	1.37	**10.17**	16.56	0.4	0	2

45037 Calleguas Creek Adolfo Rd to Seminary Rd.	2720	11.72	3.62	**15.34**	65.72	0.1	0	1
45051 Arroyo Las Posas @ Seminary	1500	2.26	0.53	**2.79**	18.86	0	0	0
45063 Arroyo Las Posas WWTP to S. Grimes Cyn	2800	7.49	12.66	**20.15**	13.99	0.3	0	2
47011 Arroyo Simi Hitch Blvd to Gabbert Cyn*	2740	7.53	6.60	**14.13**	2.81	1.7	0	3
47012 Arroyo Simi Gabbert Cyn to Beltramo Rd*	5790	10.16	4.67	**14.83**	15.89	0.1	0	1
47013 Arroyo Simi Beltramo Rd to Moorpark Rd (Spring St.)	7640	17.12	11.58	**28.70**	3.38	2.4	0	9
47014 Arroyo Simi Moorpark Rd. to SPRR	3525	12.93	7.69	**20.62**	5.91	0.3	0	1
47015 Arroyo Simi SPRR to No. 2 Canyon	2700	4.08	0.92	**5.00**	21.86			
47031 Arroyo Simi Tapo Cyn Rd to Parker Ranch	3750	16.07	3.30	**19.37**	0.61	0.3	0	1
47031 Arroyo Simi Parker Ranch to Lined Section	2410	1.23	1.67	**2.90**	4.52	0.3	0	1
45240 Beardsley Wash u/s of Zone 2	1500	3.22	1.35	**4.57**	1.66			
45241 Beardsley Wash Drop Structure #2	100	0.07	0.00	**0.07**	2.26	0	0	0
45243 Beardsley Wash Drop Structure #3 @ Bella Vista	235	1.06	0.00	**1.06**	5.79	0.1	0	1
45245 Beardsley Wash Drop Structure #4 (d/s Triple arch)	160	1.17	0.00	**1.17**	4.56			
45247 Beardsley Wash Connelly Triple Arch	160	0.69	0.00	**0.69**	4.58	0	0	0
46011 Conejo Creek: Calleguas Crk to Pancho Rd	3250	4.51	5.13	**9.64**	11.71	5.3	0	8
46012 Conejo Creek Pancho Rd to Howard Rd	3260	5.54	17.02	**22.56**	1.90	0	0	0
46013 Conejo Creek Howard Rd to u/s end Sanitation Plant*	2240	1.66	1.56	**3.22**	13.35	0	0	0
46014 Conejo Creek u/s end WWTP to Hwy 101 + Gage	5560	7.01	13.25	**20.26**	15.93			
46015 Conejo Creek Hwy 101 to Mission Oaks Drain	5980	4.35	29.56	**33.91**	2.06	1.1	0	5
46016 Conejo Creek Mission Oaks Drain to Upland Drain	5090	5.72	20.03	**25.75**	11.87	1.9	0	11
45251 Honda Barr. Milligan Barranca to Center School Rd.	1050	0	1.80	**1.80**	2.69	0.6	0	4
45252 Honda Barranca Center School Rd. to Hwy 118	310	0.56	0.00	**0.56**	0.86	0.7	0	5
45101 Revolon Slough Hwy 1 to Las Posas Rd.	6870	17.31	0.00	**17.31**	0.00	3.7	3	5
45103 Revolon Slough Las Posas Rd. to Hueneme Rd.	8210	22.51	0.00	**22.51**	0.00	7.4	3	11
45105 Revolon Slough Hueneme Rd. to Wood Rd.	7940	20.49	0.00	**20.49**	0.00	7.6	3	12
46116 So. Branch Arroyo Conejo Chan Kimber to Maurice	1140	0.22	2.99	**3.21**	3.83	0	0	0
46074 Arroyo Santa Rosa Blanchard Rd Drain to Santa Rosa Rd.	2960	4.82	0.47	**5.29**	0.51			
SUBTOTALS	**138220**	**290.14**	**158.47**	**448.61**	**274.33**			

Channel Outlets								
47201 No. 2 Canyon Outlet to Arroyo Simi	1530	2.07	1.41	**3.48**	7.71	1.9	0	7
46076 Camrosa Drain Outlet to Conejo Creek & Gage	30	0.00	0.39	**0.39**	3.17	0.1	0	1
SUBTOTALS	**1,560**	**2.07**	**1.80**	**3.87**	**10.88**			
Dams and Basins								
45911 Coyote Debris Basin	510	0.92	1.68	**2.60**	5.76	13	2	41
45910 Fox Debris Basin	740	0.45	1.89	**2.34**	2.73	5.6	0	17
Mt. Sinai Debris and Detention Basins*	935	0.00	7.04	**7.04**	1.90			
So. Branch Arroyo Conejo Detention Basin	500	0.56	3.43	**3.99**	1.53			
SUBTOTALS	**2,685**	**1.93**	**14.04**	**15.97**	**11.92**			
Restoration Sites								
None								
Calleguas Creek Watershed GRAND TOTALS	**142,465**	**294.14**	**174.31**	**468.45**	**297.13**			
GRAND TOTAL ALL WATERSHEDS	**236,290**	**503.97**	**254.79**	**758.76**	**1,790.60**			

* Known or presumed occupied habitat adjacent to facility

** Designated critical habitat

HARD = FACILITY HARDSCAPE: access road, rock, concrete, compacted earth slopes, etc. with no habitat value

FAC HAB = FACILITY POTENTIAL HABITAT: Maintained facility areas with potential to support species (earth bottom, wet channels, etc.)

ADJ HAB = ADJACENT SUITABLE HABITAT: non-facility areas with suitable habitat for species adjacent to District facilities.

DAYS: Average annual work days, with low and high numbers of days for the period January 1, 2005 through December 27, 2011. If no data supplied, the facility was not analyzed.

Mitigation/Restoration Sites: not covered by other BOs or permits.

PT Codes: 20-28, 32-39, 40-49, PS41, PS42, 51-57, 68-87, 89, 92.

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APPENDIX A. TABLE 4 – SOUTHWESTERN WILLOW FLYCATCHER

VENTURA RIVER WATERSHED FACILITIES	LENGTH FT	HARD	FAC HAB	TOTAL	ADJ HAB	DAYS	DAYS	DAYS
Levees	**Feet**	**Acres**	**Acres**	**Acres**	**Acres**	**Avg**	**Low**	**High**
41021 Casitas Springs Bank Protection	5,810	9.65	1.86	**11.51**	71.50	4.7	3	7
Note: includes 1.7 ac of existing willow riparian vegetation to be removed at toe upon issuance of permits.								
41011 Bank Protection/Levee (Ocean to Main St.)*	2,800	4.42	0.59	**5.01**	32.79	4.4	0	11
Note: incl. 1.09 acres of willow habitat removal within 630 linear feet of toe hardscape.								
41012 Bank Protection/Levee (Main St. to Hwy 33)*	10,115	23.20	0.00	**23.20**	91.39	12.3	7	21
SUBTOTALS	**18,725**	**37.27**	**2.45**	**39.72**	**195.68**			
Outlets to Ventura River								
41131 Canada de San Joaquin Channel and Outlet*	195	0.00	0.18	**0.18**	12.40			
41110 Stanley Ave. Drain Outlet*	440	0.00	0.62	**0.62**	12.95			
41121 Dent Drain Outlet*	180	0.00	0.46	**0.46**	9.01	0	0	0
41152 Canada Larga Channel & Outlet	240	0.28	0.00	**0.28**	1.17			
41181 Fresno Canyon Outlet to Ventura River*	220	0.00	0.22	**0.22**	11.23			
41721 Dent Secondary Outlet*	380	0.00	0.52	**0.52**	12.38			
41728 Cal-trans Secondary Outlet*	40	0.00	0.01	**0.01**	9.27			
41729 Peking Secondary & 41727 Harrison Secondary	1175	0.00	2.50	**2.50**	23.18	0.4	0	3
41730 Ramona St. Secondary Outlet*	240	0.00	0.39	**0.39**	10.78			
41731 Simpson St. Secondary Outlet*	375	0.00	0.77	**0.77**	17.03	0	0	0
41732 Vince St. Secondary Outlet*	200	0.00	0.19	**0.19**	7.81			
41751 Freeway Side Drain #1 Outlet*	270	0.00	0.37	**0.37**	12.46	0	0	0
41752 Freeway Side Drain #2 Outlet*	250	0.00	0.27	**0.27**	10.15			
41753 Freeway Side Drain #3 Outlet*	170	0.00	0.20	**0.20**	8.56	0	0	0
41754 Freeway Side Drain #4 Outlet*	395	0.00	0.52	**0.52**	10.81			
41755 Freeway Side Drain #5 Outlet*	50	0.05	0.00	**0.05**	8.57	0	0	0
SUBTOTALS	**4,820**	**0.33**	**7.22**	**7.55**	**177.76**			
Other Facilities								
41901 Matilija Dam and Gage Maintenance*	215	1.88	0.00	**1.88**	1.26	4.1	2	14
SUBTOTALS	**215**	**1.88**	**0.00**	**1.88**	**1.26**			

Stream Gages								
602 Matilija Creek at Matilija Hot Springs Stream Gage*	100	0.00	0.30	**0.30**	2.66	15	6	30
604 North Fork Matilija Creek at Hwy 33 Stream Gage	65	0.00	0.08	**0.08**	2.48	18	6	30
605 San Antonio Creek at Casitas Springs Stream Gage	100	0.00	0.33	**0.33**	6.03	12	6	30
608 Ventura River at Foster Park Stream Gage	100	0.00	0.85	**0.85**	7.69	11	6	30
ME-VR2 WQ Gage at Ventura River at OVSD Facility	150	0.00	0.10	**0.10**	5.46	10	5	20
SUBTOTALS	**515**	**0.00**	**1.66**	**1.66**	**24.32**			
Mitigation/Restoration Sites								
Lower Ventura River Giant Reed Removal Phase 1*	2,400	0.00	9.85	**9.85**	49.16	6	4	10
Lower Ventura River Giant Reed Removal Phase 2*	2,330	0.00	11.24	**11.24**	43.80	6	4	10
SUBTOTALS	**4,730**	**0.00**	**21.09**	**21.09**	**92.96**			
Ventura River Watershed GRAND TOTALS	**29,005**	**39.48**	**32.42**	**71.90**	**491.98**			
SANTA CLARA RIVER WATERSHED FACILITIES	**LENGTH**	**HARD**	**FAC HAB**	**TOTAL**	**ADJ**	**DAYS**	**DAYS**	**DAYS**
Levees and Bank Protection	**Feet**	**Acres**	**Acres**	**Acres**	**Acres**	**Avg**	**Low**	**High**
42012 Santa Clara River Harbor Blvd to Victoria Levee *	4000	6.95	0.00	**6.95**	54.15	0.3	0.0	1.0
42017 Santa Clara River Victoria Ave to Ventura Rd	7200	13.32	0.00	**13.32**	92.43			
42021 Santa Clara River 101 Fwy to South Mountain	24929	92.57	0.00	**92.57**	273.66	4.7	0.0	11.0
42025 Sudden Barranca to Saticoy Ave Levee*	2545	7.17	0.92	**8.09**	28.89	1.3	0.0	4.0
42026 Santa Clara River North Bank Groins*	1500	2.79	1.09	**3.88**	36.72			
42030 Santa Clara River Weir Field	n/a	1.85	0.78	**2.63**	30.34			
42036 Groins @ South Mtn Road*	1825	1.72	0.57	**2.29**	32.15	0.9	0.0	4.0
42037 Bardsdale Levee	3836	5.12	1.23	**6.35**	49.39			
43061 &43062 Santa Paula Creek Corps Project	9000	31.68	21.66	**53.34**	8.61			
SUBTOTALS	**54835**	**163.17**	**26.25**	**189.42**	**606.34**			

Outlets to Santa Clara River								
43161 Bardsdale Ditch Outlet	30	0	0.02	**0.02**	10.08			
43191 Basolo Ditch Outlet	30	0	0.05	**0.05**	10.90			
42511 Brown Barranca Outlet	30	0	0.05	**0.05**	10.93	0.6	0	2
42205 Central Ave. Drain Outlet	30	0	0.02	**0.02**	10.12	0.3	0	1
42491 Clark Barranca Outlet	30	0	0.07	**0.07**	8.96			
42391 El Rio Drain Outlet*	30	0	0.02	**0.02**	9.78	9.6	3	26
43051 Fagan Canyon Outlet	30	0	0.03	**0.03**	9.57			
42531 Franklin Barranca Outlet*	30	0	0.17	**0.17**	9.80			
43181 Grimes Canyon Outlet	30	0	0.03	**0.03**	10.67	5.6	0	21
42471 Harmon Barranca Outlet*	30	0	0.05	**0.05**	8.33			
42701 Montalvo Golf Course Secondary Outlet*	600	0.43	0.30	**0.73**	12.42	2	0	6
42461 Moon Ditch Outlet*	30	0	0.05	**0.05**	10.03	3.6	3	4
43041 Peck Road Drain Outlet*	30	0	0.02	**0.02**	10.12	1.4	0	3
43201 Pole Creek Outlet	30	0	0.01	**0.01**	13.35			
43251 Real Canyon Outlet	30	0	0.05	**0.05**	2.42			
42021 Stroube Drain Outlet*	200	0.07	0.21	**0.28**	12.71			
42501 Sudden Barranca Outlet*	30	0	0.02	**0.02**	9.48			
42704 Victoria Ave. Drain Secondary Outlet*	30	0	0.16	**0.16**	12.45	0.7	0	3
43701 Willard Road Secondary Outlet*	30	0	0.02	**0.02**	12.87			
SUBTOTALS	**1310**	**0.50**	**1.35**	**1.85**	**194.99**			
Mitigation/Restoration Sites								
SCR Upstream of Balcom Cyn Wash*	2000	0.00	15.57	**15.57**	38.31			
SCR So. Mountain Rd. Mitigation Site 1*	275	0.00	0.58	**0.58**	12.28			
SCR So. Mountain Rd. Mitigation Site 2*	270	0.00	0.50	**0.50**	12.86			
SUBTOTALS	**2545**	**0.00**	**16.65**	**16.65**	**63.45**			
Stream Gages								
723 Santa Clara River at Victoria Stream Gage*	100	0.00	0.88	**0.88**	29.88			
SUBTOTALS	**100**	**0.00**	**0.88**	**0.88**	**29.88**			
Santa Clara River Watershed GRAND TOTALS	**58,790**	**163.67**	**45.13**	**208.80**	**894.66**			

CALLEGUAS CREEK WATERSHED FACILITIES	LENGTH	HARD	FAC HAB	TOTAL	ADJ	DAYS	DAYS	DAYS
Channels	**Feet**	**Acres**	**Acres**	**Acres**	**Acres**	**Avg**	**Low**	**High**
45063 Arroyo Las Posas WWTP to S. Grimes Cyn	2800	7.49	12.66	**20.15**	14.06	0.3	0	2
47011 Arroyo Simi Hitch Blvd to Gabbert Cyn	2740	7.53	6.60	**14.13**	2.81	1.7	0	3
47012 Arroyo Simi Gabbert Cyn to Beltramo Rd	5790	10.16	4.67	**14.83**	14.47	0.1	0	1
47013 Arroyo Simi Beltramo Rd to Moorpark Rd (Spring St.)	7640	17.12	11.58	**28.70**	3.38	2.4	0	9
47014 Arroyo Simi Moorpark Rd. to SPRR	3525	12.93	7.69	**20.62**	4.84	0.3	0	1
47015 Arroyo Simi SPRR to No. 2 Canyon	2700	4.08	0.92	**5.00**	21.86			
47031 Arroyo Simi Parker Ranch to Lined Section	2410	1.23	1.67	**2.90**	4.52	0.3	0	1
46011 Conejo Creek: Calleguas Crk to Pancho Rd	3250	4.51	5.13	**9.64**	11.71	5.3	0	8
46012 Conejo Creek Pancho Rd to Howard Rd	3260	5.54	17.02	**22.56**	1.90	0	0	0
46013 Conejo Creek Howard Rd to u/s end Sanitation	2240	1.66	1.56	**3.22**	13.35	0	0	0
46014 Conejo Creek u/s end WWTP to Hwy 101 + Gage	5560	7.01	13.25	**20.26**	11.35			
SUBTOTALS	**41915**	**79.26**	**82.75**	**162.01**	**104.25**			
Channel Outlets								
47201 No. 2 Canyon Outlet to Arroyo Simi	1530	2.07	1.41	**3.48**	7.71	1.9	0	7
SUBTOTALS	**1,530**	**2.07**	**1.41**	**3.48**	**7.71**			
Dams and Basins								
None								
Stream Gages								
None								
Restoration Sites								
None								
Calleguas Creek Watershed GRAND TOTALS	**43,445**	**81.33**	**84.16**	**165.49**	**111.96**			
GRAND TOTAL ALL WATERSHEDS	**131,240**	**284.48**	**161.71**	**446.19**	**1,498.60**			

* Known or presumed occupied habitat adjacent to facility

HARD = FACILITY HARDSCAPE: access road, rock, concrete, compacted earth slopes, etc. with no habitat value

FAC POT = FACILITY POTENTIAL HABITAT: Maintained facility areas with potential to support species (earth bottom, wet channels, etc.)

ADJ HAB = ADJACENT SUITABLE HABITAT: non-facility areas with suitable habitat for species adjacent to District facilities.

DAYS: Average annual work days, with low and high numbers of days for the period January 1, 2005 through December 27, 2011. If no data supplied, the facility was not analyzed.

Mitigation/Restoration Sites: not covered by other BOs orpermits.

PT Codes: 20-28, 32-39, 40-49, PS41, PS42, 51-57, 68-87, 89, 92.

5.24.2012

Revised 6.27.2012

APPENDIX B

Table 1. Days worked at representative O&M Program facilities in habitat for least Bell's vireo between 2005 and 2011 (VCWPD 2012).

VENTURA RIVER WATERSHED FACILITIES	LENGTH FT	DAYS WORKED PER YEAR		
	Feet	Avg	Low	High
41021 Casitas Springs Bank Protection	5,810	4.7	3	7
41011 Bank Protection/Levee (Ocean to Main St.)*	2,800	4.4	0	11
41012 Bank Protection/Levee (Main St. to Hwy 33)*	10,115	12.3	7	21
41031 Live Oak Ac Bank Protect./Levee u/s Santa Ana Rd.*	4,640	3.7	1	8
41121 Dent Drain Outlet*	180	0	0	0
41729 Peking Secondary & 41727 Harrison Secondary Outlets*	1175	0.4	0	3
41901 Matilija Dam and Gage Maintenance*	215	4.1	2	14
602 Matilija Creek at Matilija Hot Springs Stream Gage*	100	15	6	30
604 North Fork Matilija Creek at Hwy 33 Stream Gage	65	18	6	30
605 San Antonio Creek at Casitas Springs Stream Gage	100	12	6	30
608 Ventura River at Foster Park Stream Gage	100	11	6	30
ME-VR2 WQ Gage at Ventura River at OVSD Facility	150	10	5	20
Lower Ventura River Giant Reed Removal Phase 1*	2,400	6	4	10
Lower Ventura River Giant Reed Removal Phase 2*	2,330	6	4	10
SANTA CLARA RIVER WATERSHED FACILITIES	**Feet**	**Avg**	**Low**	**High**
42012 Santa Clara River Harbor Blvd to Victoria Levee *	4000	0.3	0.0	1.0
42036 Groins @ South Mtn Road*	1825	0.9	0.0	4.0
42021 Santa Clara River 101 Fwy to South Mountain Levee*	24929	4.7	0.0	11.0
42025 Sudden Barranca to Saticoy Ave Levee*	2545	1.3	0.0	4.0
42511 Brown Barranca Outlet	30	0.6	0	2
42205 Central Ave. Drain Outlet	30	0.3	0	1
42391 El Rio Drain Outlet*	30	9.6	3	26
43181 Grimes Canyon Outlet	30	5.6	0	21
43361 Keefe Ditch Outlet to Sespe Creek	30	4.1	0	15
42701 Montalvo Golf Course Secondary Outlet*	600	2	0	6
42461 Moon Ditch Outlet*	30	3.6	3	4
43041 Peck Road Drain Outlet*	30	1.4	0	3
42704 Victoria Ave. Drain Secondary Outlet*	30	0.7	0	3
CALLEGUAS CREEK WATERSHED FACILITIES	**Feet**	**Avg**	**Low**	**High**
45021 Calleguas Creek Hwy 1 to Broome Ranch Crossing*	21120	14.3	0	24
45023 Calleguas Creek Broome Ranch to Hueneme Rd	8660	7.3	0	12
45025 Calleguas Creek Hueneme Rd to Lewis Rd	7670	2	0	5
45027 Calleguas Creek Lewis Rd to 850 ft u/s University Drive	2420	0.8	0	2
45037 Calleguas Creek Adolfo Rd to Seminary Rd.	2720	0.1	0	1
45051 Arroyo Las Posas @ Seminary	1500	0	0	0
45063 Arroyo Las Posas WWTP to S. Grimes Cyn	2800	0.3	0	2
47011 Arroyo Simi Hitch Blvd to Gabbert Cyn*	2740	1.7	0	3
47012 Arroyo Simi Gabbert Cyn to Beltramo Rd*	5790	0.1	0	1
47013 Arroyo Simi Beltramo Rd to Moorpark Rd (Spring St.)	7640	2.4	0	9
47014 Arroyo Simi Moorpark Rd. to SPRR	3525	0.3	0	1
47031 Arroyo Simi Parker Ranch to Lined Section	2410	0.3	0	1
47031 Arroyo Simi Tapo Cyn Rd to Parker Ranch	3750	0.3	0	1
45241 Beardsley Wash Drop Structure #2	100	0	0	0
45243 Beardsley Wash Drop Structure #3 @ Bella Vista	235	0.1	0	1
46015 Conejo Creek Hwy 101 to Mission Oaks Drain	5980	1.1	0	5
45247 Beardsley Wash Connelly Triple Arch	160	0	0	0
46011 Conejo Creek: Calleguas Crk to Pancho Rd	3250	5.3	0	8
46016 Conejo Creek Mission Oaks Drain to Upland Drain	5090	1.9	0	11
45251 Honda Barr. Milligan Barranca to Center School Rd.	1050	0.6	0	4
45252 Honda Barranca Center School Rd. to Hwy 118	310	0.7	0	5
45101 Revolon Slough Hwy 1 to Las Posas Rd.	6870	3.7	3	5
45103 Revolon Slough Las Posas Rd. to Hueneme Rd.	8210	7.4	3	11
46076 Camrosa Drain Outlet to Conejo Creek & Gage	30	0.1	0	1
47201 No. 2 Canyon Outlet to Arroyo Simi	1530	1.9	0	7
45910 Fox Debris Basin	740	5.6	0	17
45911 Coyote Debris Basin	510	13	2	41
Overall Average, Absolute Lowest, and Absolute Highest Days Worked		**4.0**	**0**	**41**

APPENDIX C

The Declining Amphibian Task Force Fieldwork Code of Practice

1. Remove mud, snails, algae, and other debris from nets, traps, boots, vehicle tires, and all other surfaces. Rinse cleaned items with sterilized (e.g., boiled or treated) water before leaving each study site.

2. Scrub boots, nets, traps, and other types of equipment used in the aquatic environment with 70 percent ethanol solution or a bleach solution of one-half to one cup of bleach in one gallon of water and rinse clean with sterilized water between study sites. Avoid cleaning equipment in the immediate vicinity of a pond, wetland, or riparian area.

3. In remote locations, clean all equipment with 70 percent ethanol or a bleach solution, and rinse with sterile water upon return to the lab or a "base camp." Elsewhere, when laundry facilities are available, remove nets from poles and wash (in a protective mesh laundry bag) with bleach on a "delicate" cycle.

4. When working at sites with known or suspected disease problems, or when sampling populations of rare or isolated species, wear disposable, non-latex, gloves and change them between handling each animal. Dedicate separate sets of nets, boots, traps, and other equipment to each site being visited. Clean and store them separately at the end of each field day.

5. Safely dispose of used cleaning materials and fluids. Do not dispose of cleaning materials and fluids in or near ponds, wetland, and riparian areas; if necessary, return them to the lab for proper disposal. Safely dispose of used disposable, non-latex, gloves in sealed bags.

6. When amphibians are collected, ensure the separation of animals from different sites and take great care to avoid indirect contact (e.g., via handling or reuse of containers) between them or with other captive animals. Do not expose animals to unsterilized vegetation or soils which have been taken from other sites. Always use disinfected and disposable husbandry equipment.

7. If a dead amphibian is found, place it in a sealable plastic bag and refrigerate (do not freeze). If any captured live amphibians appear unhealthy, retain each animal in a separate plastic container that allows air circulation and provides a moist environment from a damp sponge or sphagnum moss. For each collection of live or dead animals, record the date and time collected, location of collection, name of collector, condition of animal upon collection, and any other relevant environmental conditions observed at the time of collection. Immediately contact the Ventura Fish and Wildlife Office at (805) 644-1766 for further instructions.

The Fieldwork Code of Practice has been produced by the Declining Amphibian Populations Task Force with valuable assistance from Begona Arano, Andrew Cunningham, Tom Langton, Jamie Reaser, and Stan Sessions.

For further information on this Code, or on the Declining Amphibian Populations Task Force, contact John Wilkinson, Biology Department, the Open University, Walton Hall, Milton Keynes, MK7 6AA, UK.
Email: DAPTF@open.ac.uk

Ventura County
Watershed Protection District

City of Oxnard Floodplain Analysis Industrial Drain, Rice Road Drain, J-Street Drain, Hueneme Drain, and Ormond Lagoon

November 2005

Prepared By:

TETRA TECH, INC.
17770 Cartwright Road, Suite 500
Irvine, California 92614

City of Oxnard Floodplain Analysis Industrial Drain, Rice Road Drain, J-Street Drain, Hueneme Drain, and Ormond Lagoon

November 2005

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Appendix A

Figure A-1. Revised Model Floodplain Map
Figure A-2. PACE Model Floodplain Map
Figure A-3. Approximate Ormond Beach Lagoon Breach Time – 2-Year Storm Event with Initial Lagoon Flow Depth at 4.0 Feet
Figure A-4. Approximate Ormond Beach Lagoon Breach Time – 2-Year Storm Event with Initial Lagoon Flow Depth at 6.5 Feet
Figure A-5. Ormond Beach Floodplain Map – 2-Year Storm Event
Figure A-6. Approximate Ormond Beach Lagoon Breach Time – 100-Year Storm Event with Initial Lagoon Flow Depth at 4.0 Feet
Figure A-7. Approximate Ormond Beach Lagoon Breach Time – 100-Year Storm Event with Initial Lagoon Flow Depth at 6.5 Feet
Figure A-8. Ormond Beach Floodplain Map – 100-Year Storm Event with Berm Intact
Figure A-9. Ormond Beach Floodplain Map – 100-Year Storm Event with Berm Breach

Introduction

The City of Oxnard is located within Ventura County. Within the City several open channels carry flow to the Pacific Ocean. The main channels are J Street, Hueneme Drain, and Rice/Industrial Drain. All 3 channels convey flow to Ormond Beach Lagoon. Water that overtops the sand berm along the lagoon flows into the ocean. These channels, which are owned and operated by Ventura County Watershed Protection District (District) are currently undersized for large storm events which results in flooding within the City of Oxnard.

The goal of this study is to define the flooding in the City of Oxnard associated with a 100-year storm event. The study area is shown in Figure 1. Because of the complex urban setting, the District determined that a 2-dimensional model study would be appropriate for the study areas. FLO-2D was selected as the flood routing model.

An initial model of the study area was prepared by Pacific Advanced Civil Engineering, Inc. (PACE). Those models were updated as part of this study effort. In addition a more detailed study was performed at Ormond Beach Lagoon in order to assess the event (frequency) at which the lagoon berm is overtopped.

Oxnard Modeling

The PACE report that was submitted to the District is dated January 26, 2005. The final PACE model input files that support the results in that report are dated March 3, 2005. These models were used as the base for the updates. Modifications were made to the PACE models to reflect both corrections to the model input as well as improved information based on calibration analyses. Calibration analyses were made using the existing hydrologic models that were provided by the District. These hydrologic models were developed using the District's VCRAT (Ventura County Rational Method) computer program. The details of the model modifications are described below. The following table identifies the peak discharge result from the FLO-2D model at various locations throughout the study area.

Location	**100-year Peak Discharge (cfs)**
J Street Drain	
Along Pleasant Valley Road	1289
At Outlet	1528
Hueneme Drain	
Along Bard Road	268
At Outlet	505
Rice Road Drain	
Along Wooley Road	1498
Industrial Drain	
Along Redwood Street	1137
At Outlet	1582

Storm Distribution

The PACE model used an SCS Type II storm distribution. This distribution is valid for most of the United States; however, a Type I distribution is recommended for the western half of California. In addition, the Type I storm gives peak discharges closer to the VCRAT results. This distribution was used in all of the subsequent modeling.

Roughness Coefficients

Several roughness coefficients are used in the FLO-2D model. One is identified as the Manning's n roughness coefficient and can be a measure of the roughness of a channel or floodplain element. A second roughness coefficient is a measure of the shallow overland roughness. This refers to the roughness of the floodplain element when the total flow depth is less than 0.5 feet..

A Manning's n-value of 0.04 was used to represent the concrete channels in the PACE models. A typical value for concrete is 0.015 when it is new. This channel is relatively clean, but is not new. Using engineering judgment, the n-value was revised to 0.025 to better represent the physical conditions. This value is slightly higher than the County recommended value of 0.02; however, during the calibration process it was decided by the District that the use of 0.025 provided a better calibration with the VCRAT results.

The PACE models used floodplain Manning's n-values ranging from 0.04 – 0.05. A series of models were run with varying n-values in order to calibrate the flows with the VCRAT results. A floodplain Manning's n-value of 0.40 was needed to obtain a reasonable calibration with the VCRAT results. This n-value is high relative to typical floodplain n-values associated with the existing land use though the shallow depths in the floodplain indicate that a somewhat higher n-value is appropriate. The District determined that this n-value was acceptable for use in this project due to the calibration requirement.

In the PACE model the n-value used for shallow overland flow for Rice Road and Industrial Drain model was 0.4 and 0.8 in the Hueneme Drain model and J Street Drain model. To match District guidance, these values were changed to 0.2.

Hydraulic Structures

The submitted PACE models included rating curves for the numerous hydraulic structures in the study area; however, this hydraulic structure module in FLO-2D was disabled. As a result the effect of hydraulic structures throughout the model area was not assessed. The hydraulic structure routines were enabled and the rating curves were modified. FLO-2D requires the rating curve to show the amount of flow that is passed through the culvert at water surface elevation intervals. The rating curve in the PACE model combined the flow that would pass through the culvert as well as the flow that would overtop the roadway or spill over the banks.

Other Changes

The existing PACE models do not allow for flow traveling between watershed boundaries. The model results indicate that this watershed overflow occurs at the following locations:

Source watershed, location	**Destination watershed, location**
Industrial Drain at Oxnard Boulevard	J Street Drain at Oxnard Boulevard
J Street Drain at Yucca Street	Industrial Drain at Yucca Street
J Street Drain at Bard Road	Industrial Drain at Bard Road
J Street Drain at Pleasant Valley Road	Industrial Drain at Pleasant Valley Road
J Street Drain at Teakwood Street	Hueneme Drain at Teakwood Street

In order to account for the overflow, the outflow hydrograph from the source was used as an inflow hydrograph to the destination.

Area reduction factors of 0.4 and 0.5 are used in the Hueneme Drain and in the J Street Drain, Industrial Drain and Rice Road Drain to represent the average building area within the developed areas, respectively. The PACE models did not include any area reduction factors.

The revised models are included on the CD provided with this report.

Oxnard Floodplain Results

Figure A-1 in Appendix A shows the revised floodplains associated with J Street Drain, Hueneme Drain, and Rice/Industrial Drain. It should be noted that the floodplains shown are those as a result of overflow from the channel as well as local ponding in depressions caused by precipitation that does not reach the channel. Figure A-2 in Appendix A shows the floodplain associated with the original PACE models. The following table compares the inundation areas (flow depth greater than or equal to 0.5 feet) determined in the revised model compared to those determined in the PACE models.

Flooding Source	PACE floodplain Inundated Area (Acres)	Revised floodplain Inundated Area (Acres)	Increased floodplain area (Acres)
Hueneme Drain	125	140	15
J Street Drain	130	217	87
Industrial Drain & Rice Road Drain	1174	1297	123

As shown by a comparison of Figure A-1 and A-2, the revised model estimated larger inundation areas throughout the study area. The increased floodplain area is most significant north of Wooley Road and east of Industrial Drain.

Ormond Beach Lagoon Modeling

Tidal action causes a sand berm to develop on Ormond Beach. The berm results in ponding of water that is conveyed to the beach along J Street Drain, Hueneme Drain, and Rice / Industrial Drain. The ponded water is referred to as the Ormond Beach lagoon. A FLO-2D model was developed in the vicinity of the lagoon to determine (1) at what point in the 2-year and 100-year storm the berm is overtopped and (2) to map the floodplain and maximum flow depths associated with the 2-year and 100-year storm event.

A new FLO-2D model was prepared for the Ormond Beach area. The model includes portions of the drainage areas of Hueneme Drain, J-street Drain, and Industrial Drain from south of the Hueneme Road to the Pacific Ocean. The lagoon study area is bounded on the north by East Hueneme Road. A total of 9,341 grid elements that are 50 ft by 50 ft were used to model the area. A 50-foot grid size was used to allow for additional detail in the model compared to the 100-foot grid element size used to model the city area. The outflow from the J Street Drain, Hueneme Drain, Rice Drain, and Industrial Drain and the overland flows along Hueneme Road were used as inputs to the Ormond Beach Lagoon Model. These outflows were established at 2-year (a storm that is know to cause breaching of the berm) and 100-year storm frequencies in order to analyze the frequent and infrequent storms that relate to the berm breach.

The existing topography shows a berm elevation of approximately 10 feet to 11 feet mean sea level (msl). The topography shows the lagoon at an elevation of approximately 6.5 feet msl. Information from the District indicates that the bottom of the lagoon is approximately 4.0 to 4.5 feet msl per 1996 topographic map. Thus, the modeling considers a lagoon invert of both 6.5 feet msl and 4.0 feet msl in both the 2-year and 100-year storm analyses. It was further assumed that any storage available below the 6.5-foot or 4.0-foot elevation would contain water and would be considered as dead storage.

Results of the 2-year Storm Event

The 2-year storm event was modeled with the berm in places. The results of the FLO-2D model indicate that overtopping of the berm will begin approximately at hour 11.00 and hour 10.25 for an initial lagoon water surface elevation 4.0 ft and 6.5 ft, respectively. Figure A3 and Figure A4 identify the grid elements that are located along the berm and the discharge above the berm elevation for each element throughout the 2-year storm event. Based on the SCS Type I storm distribution, the peak rainfall occurs approximate at hour 10 of the storm time and the rainfall mass is approximate 55% and 62% for storm hour 10.25 and storm hour 11.00, respectively. The estimated inundated areas for the 2-year storm event are 182 acres and 197 acres for initial lagoon elevations of 4.0 feet and 6.5 feet, respectively. The maximum flow depths resulting from the lagoon elevation at 4.0 feet and 6.5 feet are very similar. The maximum flow depths associated with the lagoon elevation at 6.5 feet are shown on Figure A5.

Results of the 100-year Storm Event

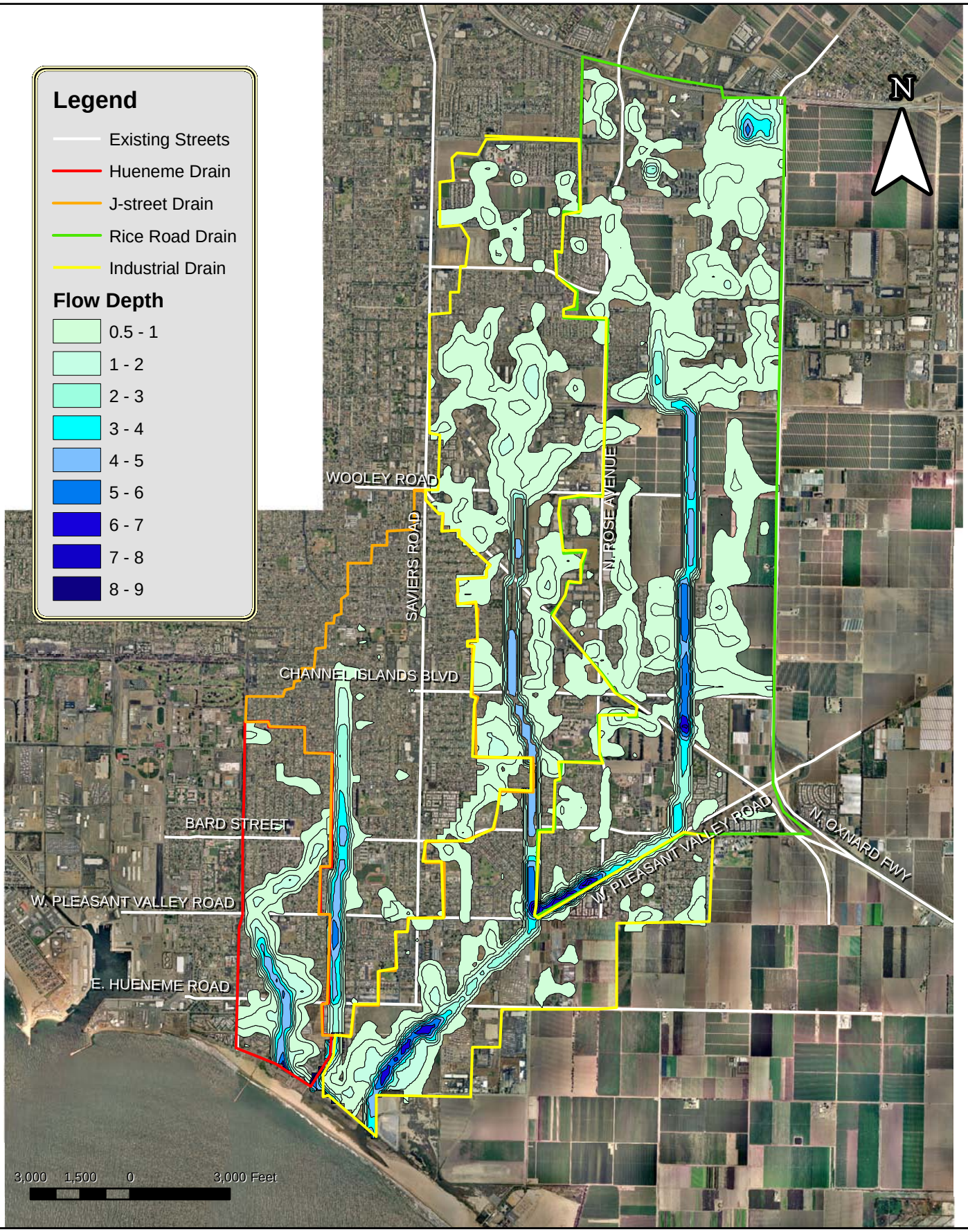
The results of the FLO-2D model indicate that overtopping of the berm will begin approximately at hour 7.75 and hour 7.25 for an initial lagoon water surface elevation of 4.0 ft and 6.5 ft, respectively. Figure A6 and Figure A7 identify the grid elements that are located along the berm and the discharge above the berm elevation for each element throughout the 100-year storm event. Based on the SCS Type I storm distribution, the peak rainfall occurs approximate at hour 10 of the storm time and the rainfall mass is approximate 16% and 18% for storm hour 7.25 and storm hour 7.75, respectively. The estimated inundated areas are 454 acres and 458 acres for the initial lagoon elevations of 4.0 feet and 6.5 feet, respectively. The maximum flow depths resulting from the lagoon elevation at 4.0 feet and 6.5 feet are very similar. The maximum flow depths associated with the lagoon elevation at 6.5 feet are shown on Figure A8. In this model the berm was kept in place and flow allowed to overtop the berm once the water surface elevation exceeded the existing elevation of the berm.

The results of the 2-year and 100-year modeling with the berm in place indicate that for both flood events the berm is overtopped only in the southeast portion of the lagoon. A separate model was run in which the berm height along this reach was reduced to an elevation of 6.5 feet. This reflects the scenario of the berm washing out in the reach where it overtops. The floodplain resulting from this model is shown in Figure A9. At the breach location the water depth is reduced by approximately 1 foot. No other significant changes occur in the study area. This suggests that the existing drainage channels have limited capacity to convey flow into the lagoon and flooding in the area is more strongly influenced by this lack of capacity then the capacity of the lagoon itself.

The inundated areas south of East Hueneme Road are similar in Figure A1 and Figure A8. Both figures indicate ponded water along South Ventura Road which serves as the western boundary of the model. The development west of South Ventura Road is bordered by a berm (approximate elevation of 20 feet) that is significantly higher than the water surface elevation (approximately 14 feet) and will contain flow along and to the east of South Ventura Road.

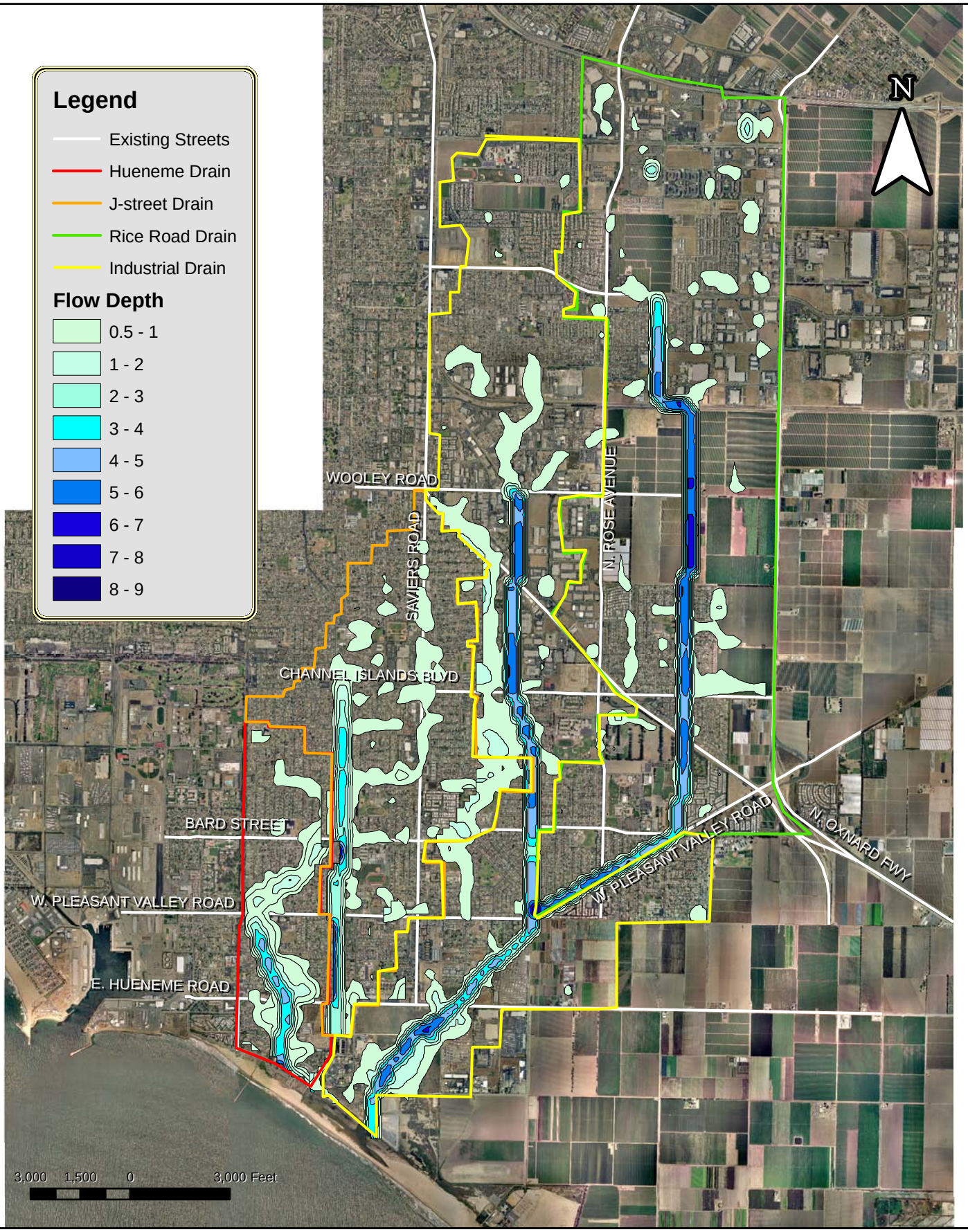
Appendix A

Floodplain Figures & Graphs



City of Oxnard Flooplain Analysis

FIGURE A1: REVISED 100-YEAR FLOODPLAIN MAP



City of Oxnard Flooplain Analysis

FIGURE A2: PACE 100-YEAR FLOODPLAIN MAP

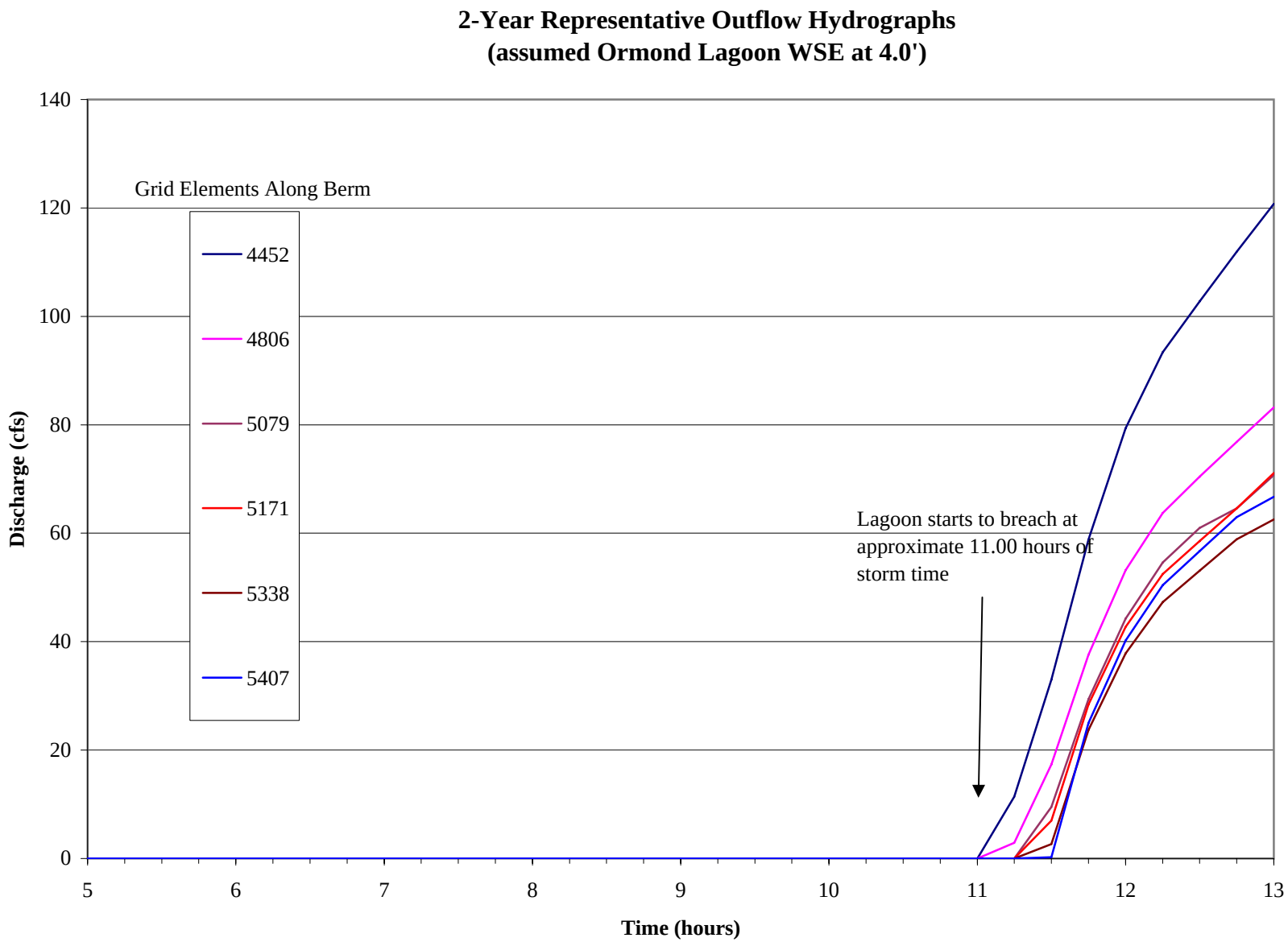


Figure A3: Approximate Ormond Beach Lagoon Breach Time – 2-Year Storm Event with Initial Lagoon Flow Depth at 4.0 Feet

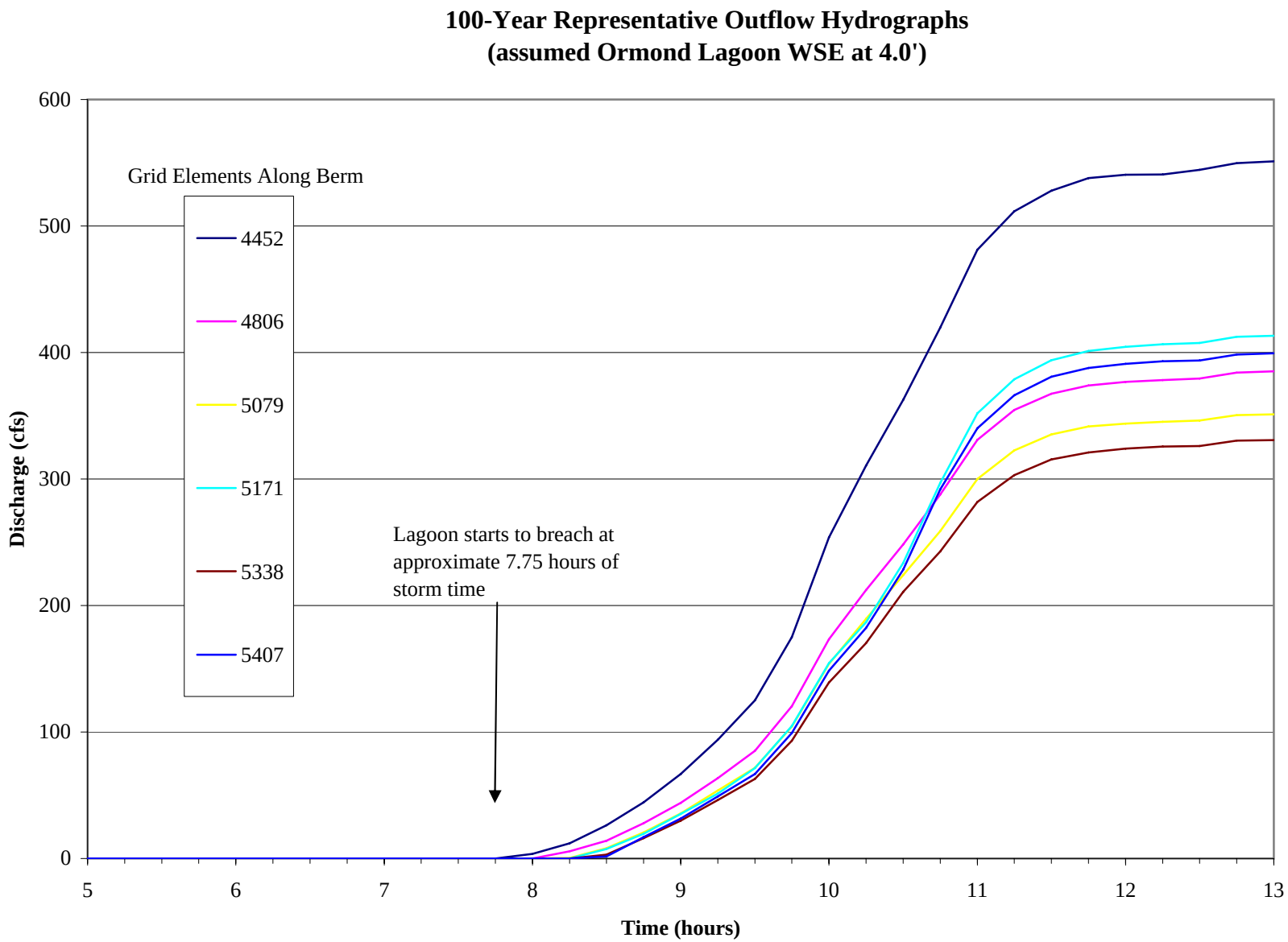
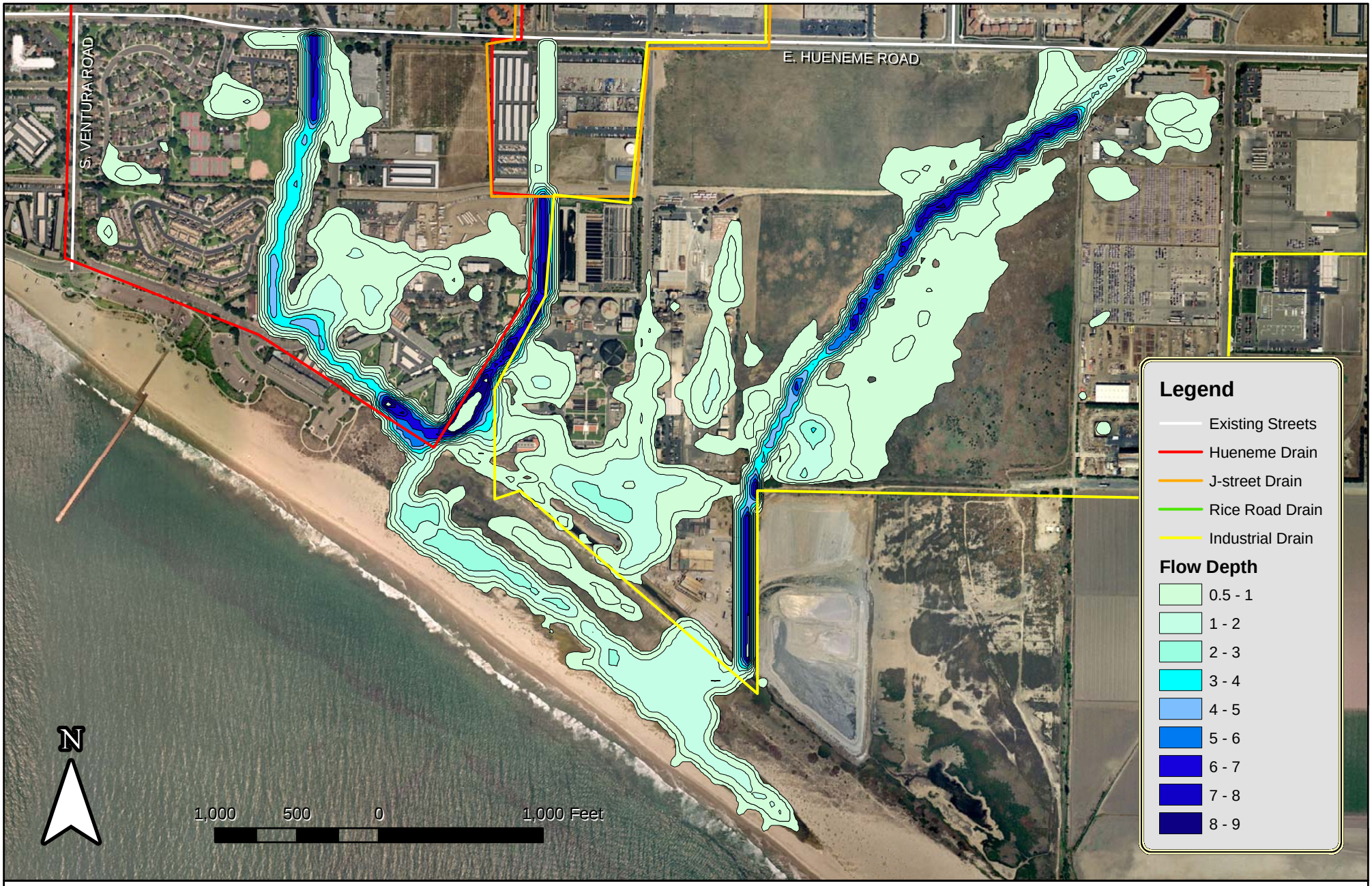


Figure A4: Approximate Ormond Beach Lagoon Breach Time – 2-Year Storm Event with Initial Lagoon Flow Depth at 6.5 Feet



City of Oxnard Flooplain Analysis

FIGURE A5: ORMOND BEACH FLOODPLAIN - 2 YEAR STORM EVENT

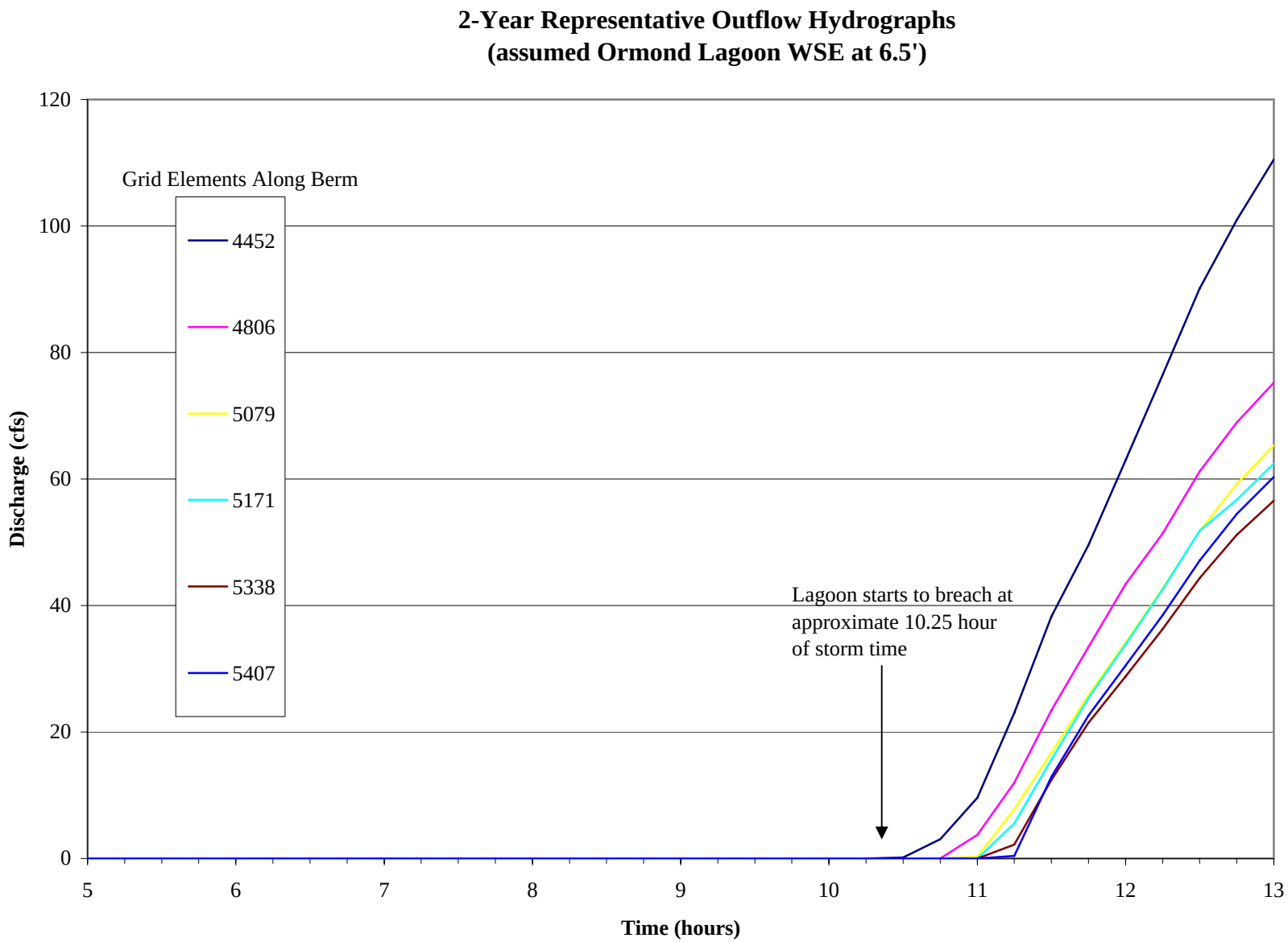


Figure A6: Approximate Ormond Beach Lagoon Breach Time – 100-Year Storm Event with Initial Lagoon Flow Depth at 4.0 Feet

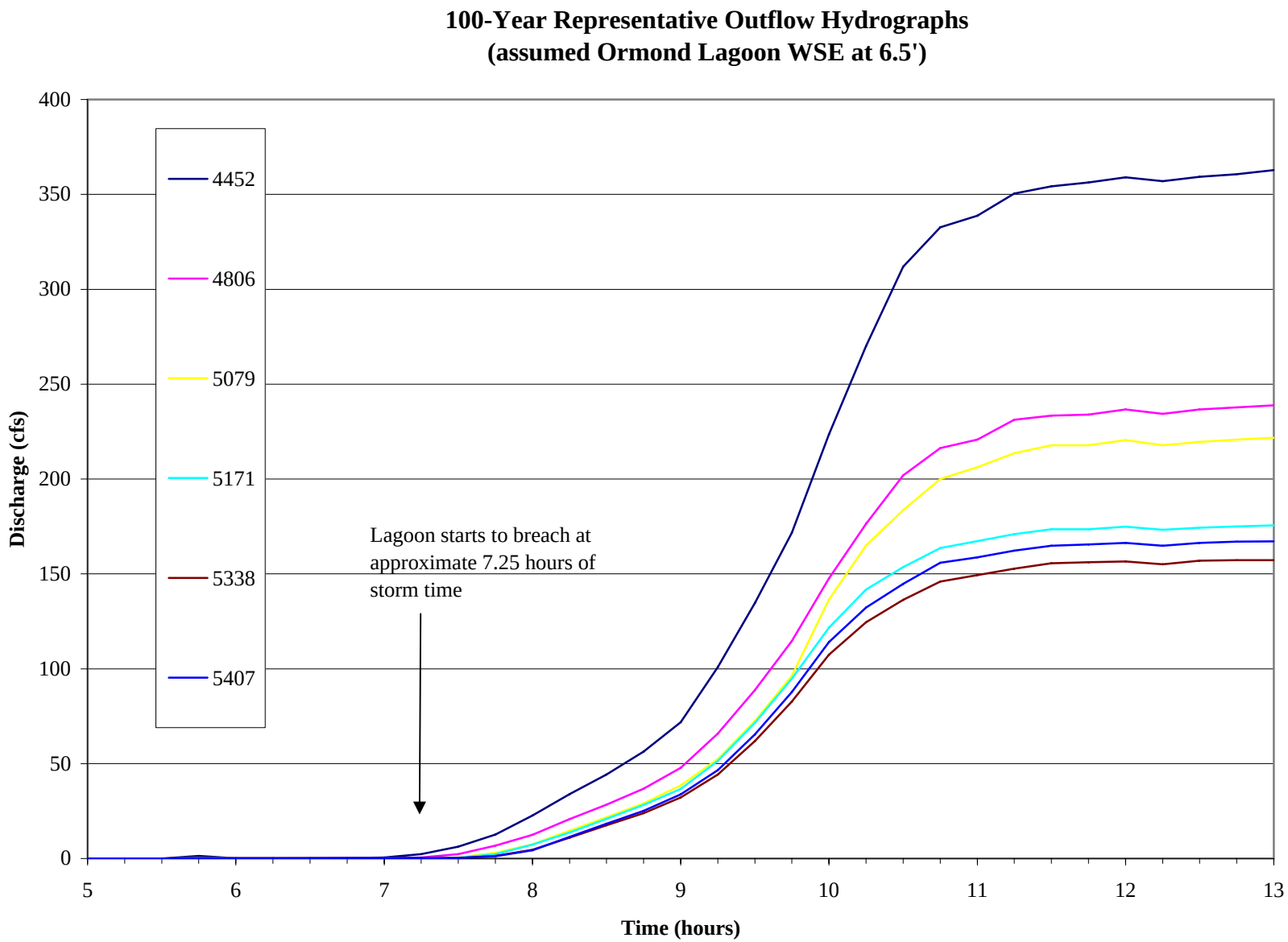
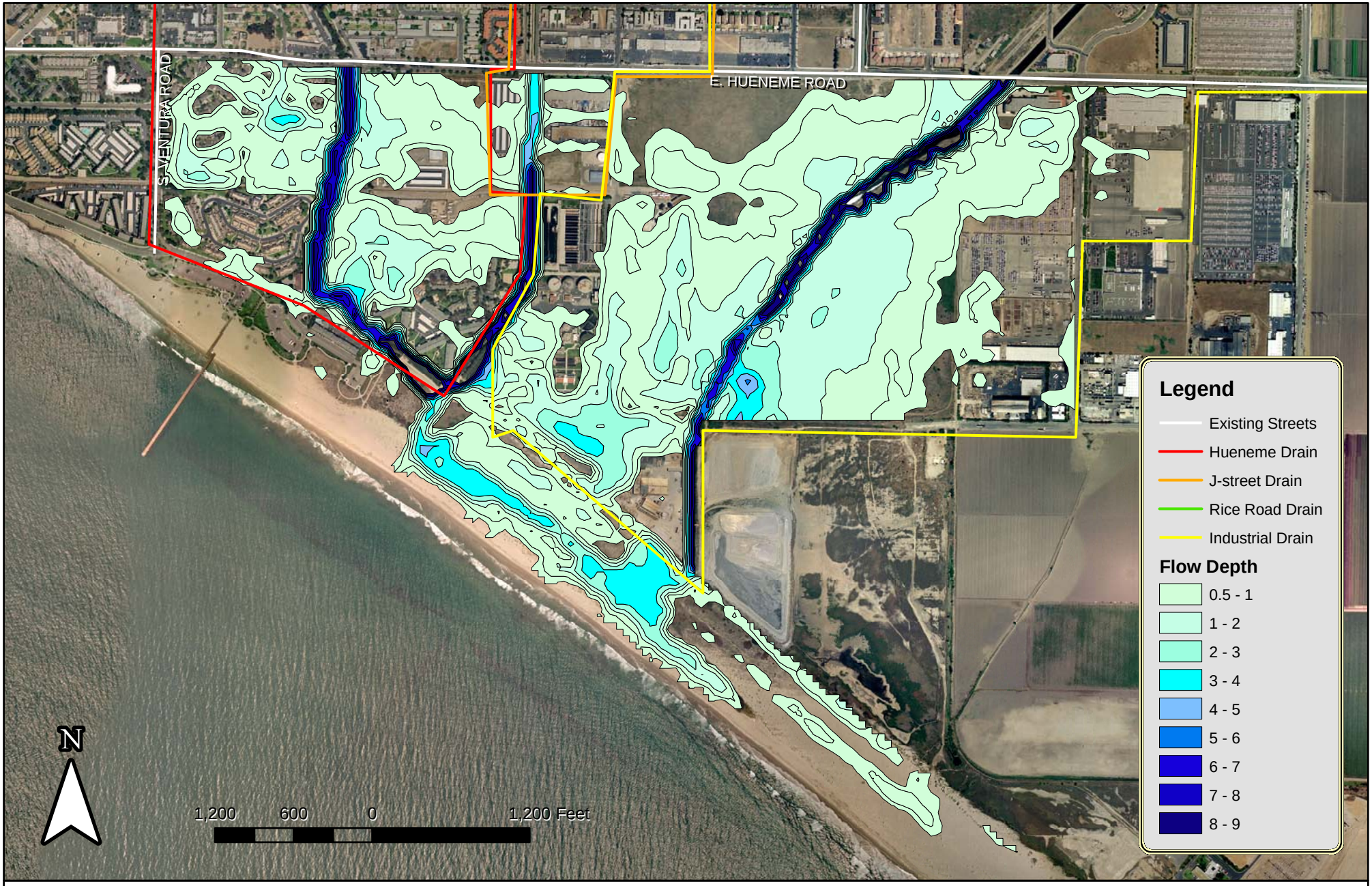
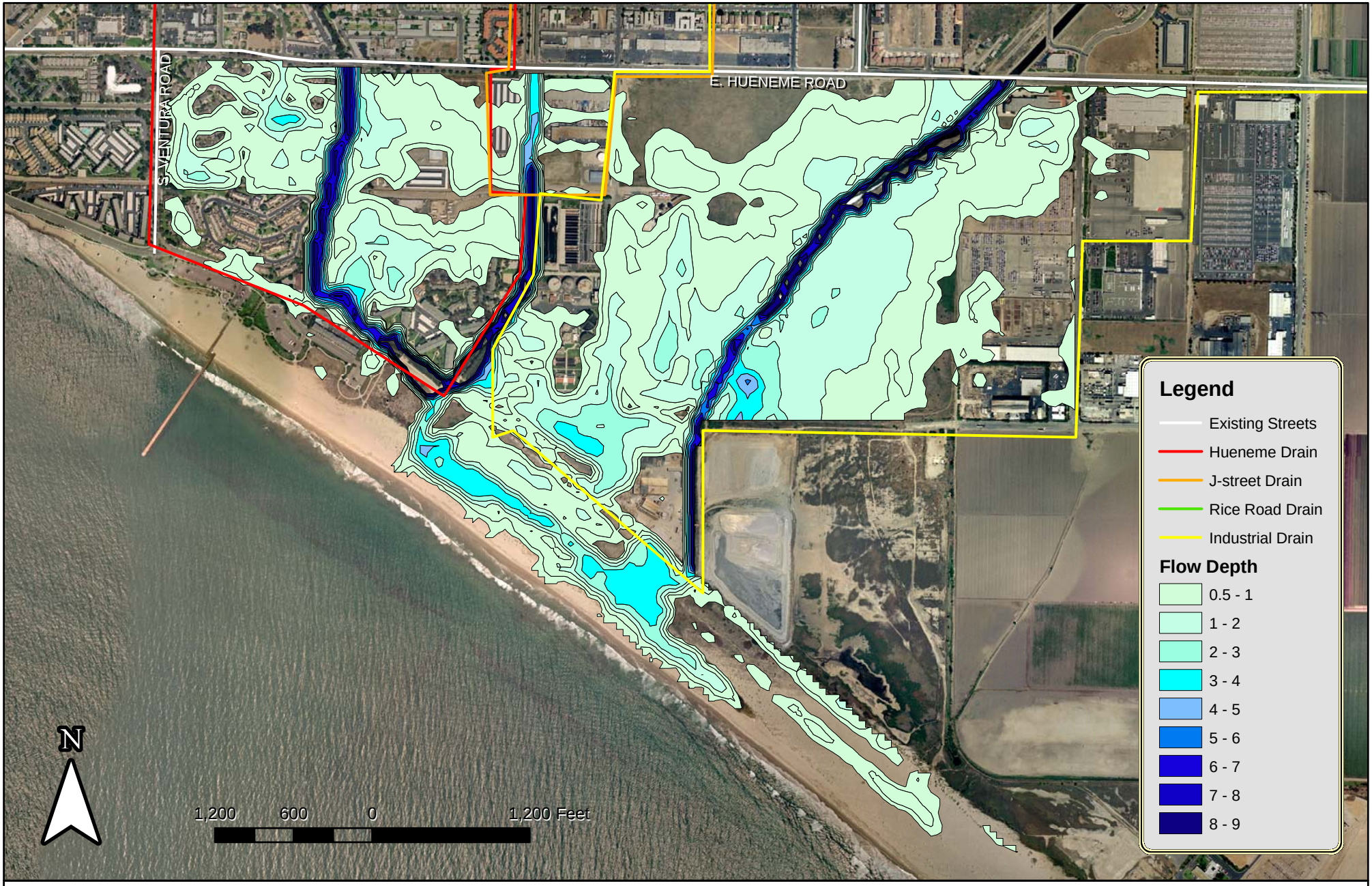


Figure A7: Approximate Ormond Beach Lagoon Breach Time - 100-Year Storm Event with Initial Lagoon Flow Depth at 6.5 Feet



City of Oxnard Flooplain Analysis

FIGURE A8: ORMOND BEACH FLOODPLAIN - 100 YEAR STORM EVENT WITH BERM INTACT



City of Oxnard Flooplain Analysis

FIGURE A9: ORMOND BEACH FLOODPLAIN - 100 YEAR STORM EVENT WITH BERM FAILED

FINAL REPORT

J STREET DRAIN CHANNEL IMPROVEMENT STUDY AND PRELIMINARY DESIGN

Prepared for

Ventura County Watershed Protection District
800 South Victoria Avenue
Ventura, CA 93009

November 17, 2005

URS

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1.0 INTRODUCTION

This report summarizes a proposed plan to improve the existing flood conveyance capacity of the J Street Drain Channel located in the City of Oxnard, California. Figure 1-1 depicts the location of the project vicinity. Technical procedures, assumptions, and analysis results of the design process are provided in the following sections. The study involved the development of a preliminary design plan for the 2.2-mile long J Street Drain Channel to improve its current capacity to the 100-year flood level.

1.1 PROJECT SITE DESCRIPTION

The J Street Drain Channel is a fully-lined concrete channel located within an urbanized area of Oxnard. The channel is located along the centerline of J Street and begins upstream at the Redwood Street crossing and ends downstream at the west boundary of the Ormond Beach Lagoon. Figure 1-2 shows the extent of the J Street Drain Channel and the surrounding area. The J Street Drain Channel is a fully-lined trapezoidal concrete channel built in the 1960s to discharge runoff into the ocean at Ormond Beach. The facility has a bottom width of 20 to 30 feet with 1:1 side slopes. The depth of the channel is about 4 feet.

According to Ventura County Watershed Protection District (VCWPD), the channel's limited capacity and backwater effects at the street crossings have resulted in flooding in the adjacent neighborhood. The channel's capacity was estimated at 500 to 600 cubic feet per second (cfs), which is equivalent to the peak of a 5-year event.

The outlet of the channel is constrained by a sand berm surrounding the Ormond Beach lagoon. This sand berm was established by the action of tidal waves and caused the formation of the lagoon. The sand berm blocks the direct flow path of the J Street Drain channel and the lagoon acts as a reservoir to the channel's flow. Prior to 1992, VCWPD regularly breached the sand berm to maintain a discharge path and prevent water and silt buildup in the channel. Since 1992, due to environmental concerns and restrictions, routine breaching of the sand berm has stopped. In September 1994, a storm caused water level in the lagoon to reach 7.5 feet above mean sea level, resulting in a breach of the sand berm into the ocean, which allowed discharge of the lagoon water and runoff of the upstream channel. To minimize the lagoon backwater effect, it is necessary to maintain an ocean passage for the J Street Drain Channel flood runoff.

Information presented in this report provides the basis of design for improving the existing flood carrying capacity of the J Street Drain Channel. The feasibility of creating channel's outlet with engineered solutions at the Ormond Beach lagoon was also evaluated.

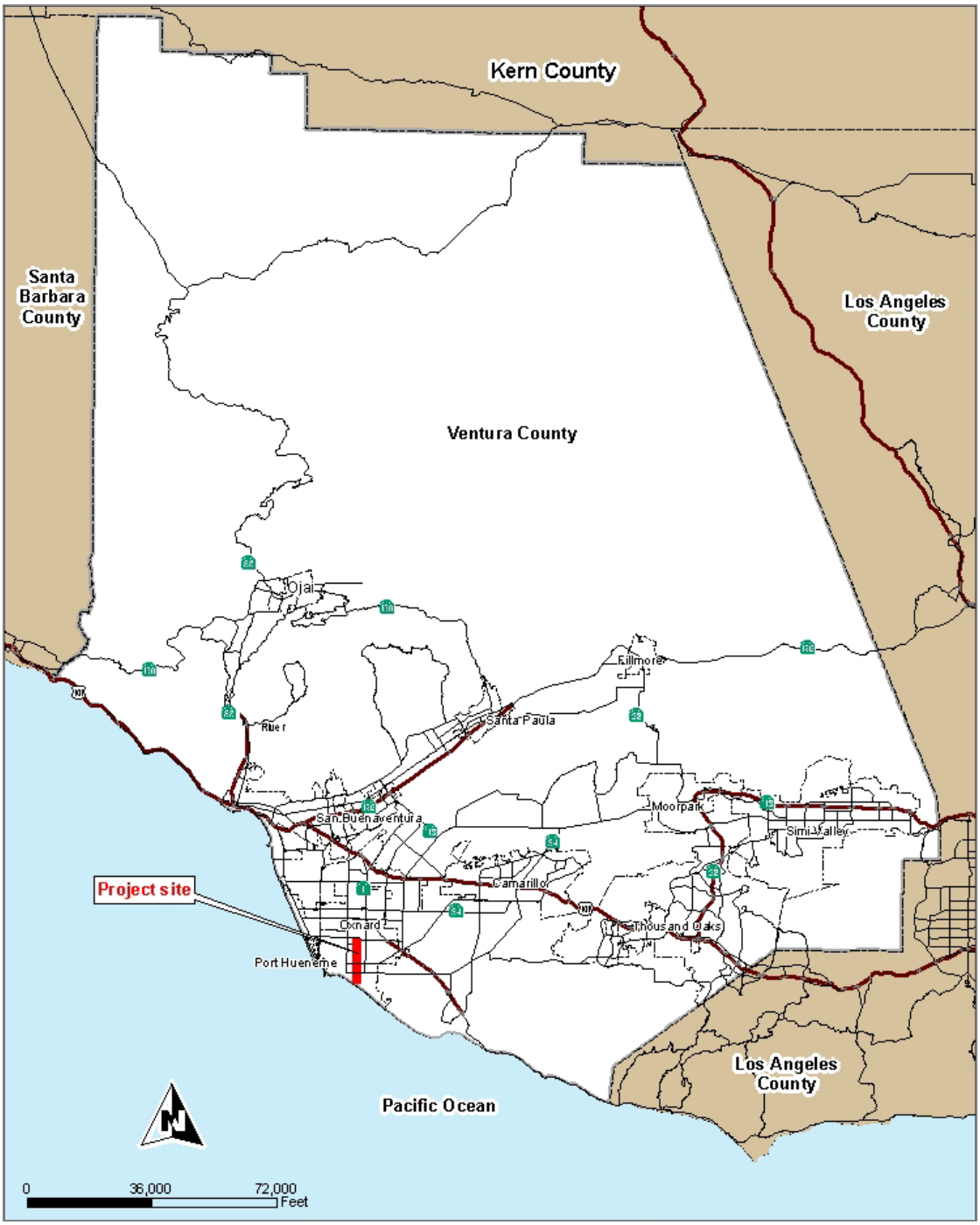


Figure 1-1. Project Location Map

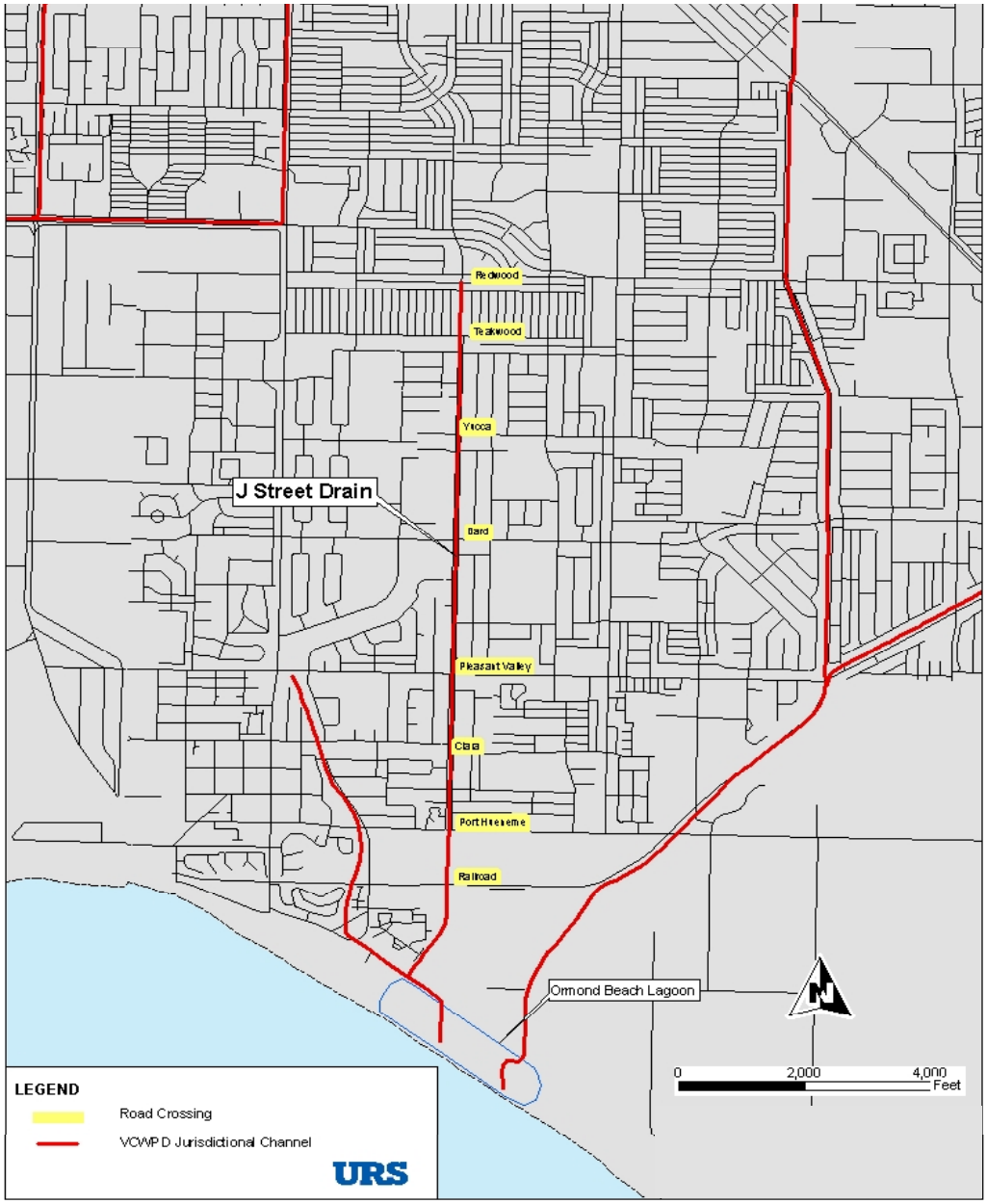


Figure 1-2. Extent of J Street Channel and Surrounding Area

1.2 PROJECT SCOPE OF WORK

The Proposed J Street Drain Channel improvement design involved the following scope of work elements:

- **Hydraulic Analysis of Existing Channel** – Performed an existing condition channel hydraulic analysis using the Corps of Engineers' HEC-RAS backwater model to determine the flood characteristics associated with the 100-year storm event and estimate the existing flood carrying capacity of the channel.
- **Development of Channel Improvement Alternatives** – Identified options for improving the existing channel and selected a feasible alternative that will meet the flood control objective and right-of-way constraint.
- **Proposed Condition Hydraulic Analysis** – Conducted a hydraulic analysis of the J Street Drain Channel under the proposed dimension to ensure that the facility will achieve the desired performance during a 100-year event.
- **Preliminary Construction Cost Estimates** – Prepared a preliminary construction cost estimate for the channel improvement project.
- **Flood Damage Estimate and Benefit Cost Analysis –** Estimated the value of flood damage for the properties affected by the J Street Drain Channel 100-year flood and identified a preliminary benefit/cost ratio for the channel improvement.
- **Ormond Beach Channel Outlet Alternatives Evaluation** – Developed and evaluated alternatives to establish or restore the outlet at Ormond Beach for the channel to ensure unconstrained discharge connection to the ocean.
- **Preliminary Channel Design (30% level)** – Prepared design drawings with 30% completion for the J Street Drain Channel improvement with plan, profile, and cross-sectional geometries.

2.0 EXISTING CONDITION HYDRAULIC ANALYSIS

2.1 HYDROLOGY

The hydrology for the project area was provided by VCWPD and was prepared based upon the VCRAT models of the J Street Drain Channel watershed area under a range of storm events. Table 2.1 provides a summary of the peak flow values at various locations along the channel.

Table 2-1. J Street Drain Channel Hydrology Summary

Location Description	100-Year Peak (cfs)	50-Year Peak (cfs)	10-Year Peak (cfs)	2-Year Peak (cfs)
Redwood St	880	723	555	239
Teawood Street	958	796	611	263
Yucca St	1,036	869	667	287
Bard St	1,605	1,337	1026	442
Pleasant Valley Rd	1,775	1,485	1150	487
Hueneme Rd	1,775	1,479	1145	485
Hueneme Drains	2,059	1,649	1277	541

2.2 HYDRAULIC ANALYSIS

To estimate the existing capacity of the J Street Drain Channel, a HEC-RAS model was prepared using the available as-built drawings. Three sets of drawing were received as follows:

(1) Oxnard Drainage South, from D/S of Teawood St Alley (As-built drawing Sta –0+00.62) to Hueneme Drain (As-built drawing Sta 111+75), by County of Ventura Department of Public Works, Flood Control District, in September 1956;

(2) Oxnard Drainage South Channel Lining, from Teawood Street (As-built drawing Sta 0+00) to Pleasant Valley Road (As-built drawing Sta 55+88.90), by County of Ventura Department of Public Works, Flood Control District, in April 1959; and

(3) Oxnard Drainage South Channel Lining, from Yucca Street (As-built drawing Sta. 16+55.09) to Hueneme Drain (As-built drawing Sta 108+25) by County of Ventura Department of Public Works, Flood Control District, in March 1961.

The existing condition hydraulic analysis considered the flood discharges listed in Table 2-1.The following subsections describe the model setup and results of the hydraulic calculations.

2.2.1 Existing Channel Geometry

Using the channel configuration from the as-built drawings, the existing condition HEC-RAS model for the J Street Drain was developed as described in the following paragraphs:

Cross-section Stationing - The HEC-RAS Model was constructed to analyze the J Street Drain from the beach sand berm (HEC-RAS station 2+25) to a location just downstream of Redwood Street (HEC-RAS station 128+55). The as-built drawing stationing is in the opposite direction to that of the HEC-RAS. The HEC-RAS stationing was started from the beach sand berm, using HEC-RAS Station 9+00 as a reference point to match the as-built drawing Station 108+25. To facilitate discussions, a channel alignment map was developed with the HEC-RAS stations as shown on Figures 2-1a and 2-1b.

Channel Reaches - The existing condition of the hydraulic model was constructed with the slope and cross-sections as shown in the as-built drawings. Because the as-built drawings were revised from 1956 to 1961, the latest drawing revision was used. For the channel reach between Stations 0+00 to 16+55.09, the 1959 drawings were used. For the reach from Stations 16+55.09 to 108+25, the 1961 drawings were used.

Elevation Datum - The vertical datum used in the hydraulic model was NGVD29 to be consistent with that in the as-built drawings.

Cross-Sections - The model cross-sections were spaced to represent changes in slope and cross-section geometry, including the road crossing culverts and their 25-foot long transition structures. Additional cross-sections were added in long reach lengths with the maximum cross-section spacing not to exceed 500 feet.

Manning's n - Per the VCWPD Hydraulic Design Manual (1968), lined channels and culverts were modeled with a Manning's n value of 0.015 and maintained earth channels were given an n value of 0.030. Existing road culverts were given entrance and exit loss coefficients of 0.5 and 1.0, respectively. Proposed road crossing culverts were assumed to have well-rounded entrances with entrance and exit loss coefficients of 0.2 and 1.0, respectively.

Boundary Conditions - At the most downstream area, where the beach sand berm exists, the J Street Drain Channel turns east. The beach sand berm height varies from 7 to 9 feet, at an average elevation of 8 feet. The following downstream boundary conditions were assumed for the flood events analyzed:

- For the 2-year and 10-year flood events, the downstream boundary water surface elevation was assumed as the height of the sand berm, which is at elevation 8 feet. Floodwater associated with these two events would likely accumulate behind the berm before the berm breaches.
- For the 50-year and 100-year floods, the sand berm was assumed as being already washed out and an outlet to the ocean established by the breaching. Under this scenario, the downstream boundary condition in the HEC-RAS was set at normal depth following the channel's lower reach slope of 0.000308.

Figure 2-1a. J Street Drain Channel Alignment Map with HEC-RAS Stations

Figure 2-1b. J Street Drain Channel Alignment Map with HEC-RAS Stations (continued)

2.2.2 Existing Channel Capacity

Using the established channel geometry as described above, the hydraulic capacity of the J Street Drain Channel under existing conditions was estimated. Table 2-2 summarizes the flow capacity, which varies along the channel, based upon the normal depth calculations.

Table 2-2. Existing Flow Capacity of J Street Drain

Reach	Channel Alignment Station	Channel Capacity (cfs)
Redwood Street to Teakwood Street	128+55	460
Teawood Street to Yucca Street	119+00	440
Yucca Street to Bard Street	101+62	400
Bard Street to Pleasant Valley Road	83+50	500
Pleasant Valley Road to Hueneme Road	61+36	600
Hueneme Road to Hueneme Drain Confluence	35+24	500
Downstream of Hueneme Drain Confluence	9+00	900

The existing hydraulic capacity of the J Street Drain Channel was also demonstrated through a HEC-RAS model. Figure 2-2 shows the water surface profile when the channel is at a full capacity.

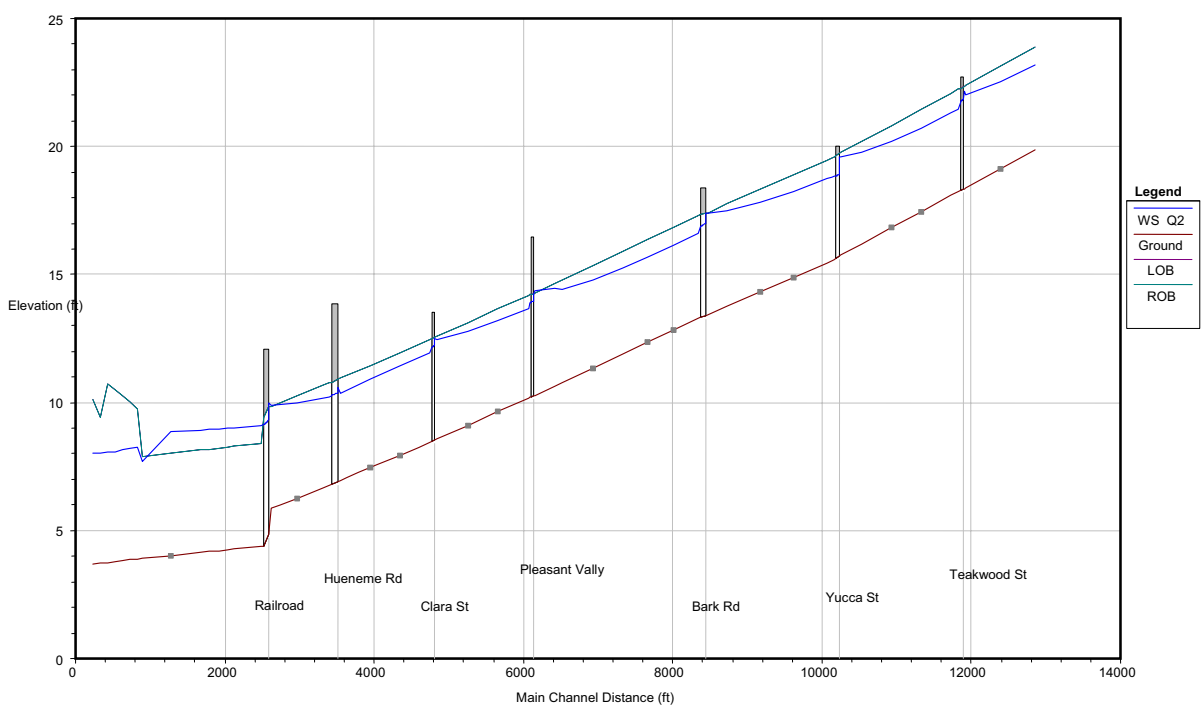


Figure 2-2. J Street Drain Channel Water Surface Profile at Full Capacity

2.2.3 Design Flood Hydraulics and Water Surface Profile

Hydraulic characteristics of the existing J Street Drain Channel under the 100-year flood peak were analyzed with the HEC-RAS procedure. The analysis results are summarized in the Table 2-3.

Table 2-3. 100-year Flood Existing Condition Hydraulic Summary

Reach	Average 100-year Flood Peak (cfs)	Average Flow Depth (feet)	Average Flow Velocity (ft/sec)
Redwood Street to Teakwood Street	900	5.08	6.64
Teawood Street to Yucca Street	958	5.06	7.08
Yucca Street to Bard Street	1027	5.71	6.01
Bard Street to Pleasant Valley Road	1565	6.77	5.95
Pleasant Valley Road to Clara Street	1775	6.91	6.91
Clara Street to Hueneme Road	1775	8.24	4.45
Hueneme Road to Railroad Crossing	1775	8.61	5.15
Railroad Crossing to Downstream End	1917	7.05	5.29

The existing channel has an average depth of 4 to 5 feet, which would be overtopped should a 100-year flood take place. Figure 2-3 shows the 100-year flood peak water surface profile along the channel. In addition to the insufficient cross-sectional size, the flow is severely constricted at the street crossings.

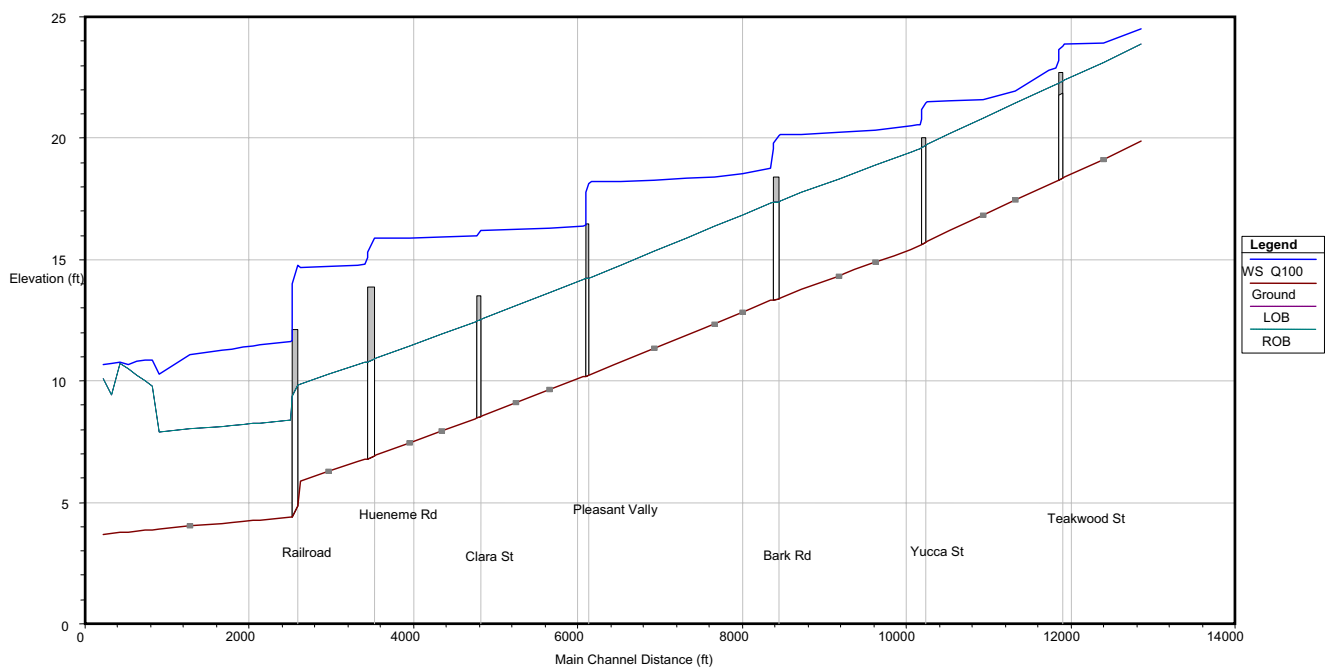


Figure 2-3. J Street Drain Channel 100-year Flood Water Surface Profile under Existing Conditions

3.0 PROPOSED CHANNEL IMPROVEMENT

To improve the flood carrying capacity of the J Street Drain Channel, several improvement alternatives were investigated. The alternatives included deepening the existing channel invert and constructing a bypass channel or storm drains parallel to the existing channel. Construction of bypass facilities may require additional right-of-way acquisition and significantly interferes with the massive existing utilities located close to or within the existing flood control right-of-way along the J Street Drain. Furthermore, additional discharge outlets at the Ormond Beach may be required and would face physical as well as environmental constraints.

Deepening the existing channel invert was selected as the preferred improvement alternative for the J Street Drain Channel because it would be less environmentally sensitive and costly than building a new parallel facility. Improvement of the Ormond Beach outlet was also considered in this design study. Its feasibility, however, would be very low due to its impact on the existing lagoon habitat, expected difficult regulatory permitting process, and high cost. The beach outlet evaluation is provided in Appendix A.

3.1 PROPOSED IMPROVEMENT DESCRIPTION

The following paragraphs describe the proposed improvement alternative for the J Street Drain Channel:

Cross-sectional Geometry - The existing trapezoidal concrete channel would be converted to a rectangular concrete channel with an invert about 4 feet below the existing channel bottom. The top of the proposed channel lining would follow that of the existing channel. A typical cross-section is illustrated on Figure 3-1.

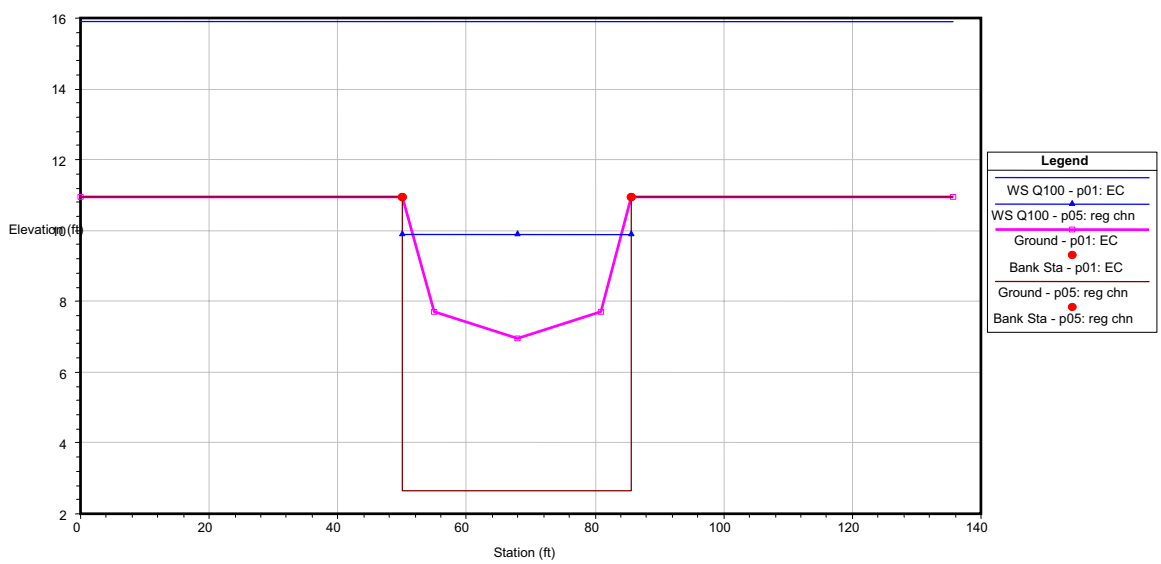


Figure 3-1. Proposed Channel Cross-section (retrieved from the HEC-RAS model)

Invert Slope – The proposed slope for the channel invert varies as follows:

Downstream End to Railroad Crossing	0.000308
Railroad Crossing to Bard Road	0.0015
Bard Road to Redwood Street	0.0018

Culvert Crossings – The existing culverts under the street crossings would also be replaced by larger structures to improve flow conveyance. Table 3-1 summarizes the proposed dimensions.

Table 3-1. Existing and Improved Street Crossing Culverts

Crossing	Existing Culverts	Proposed Culverts
Teakwood Street	Three 8 x 4 RCB	Two 14 x 6 RCB
Yucca Street	Two 10 x 4 RCB	Two 14.5 x 7 RCB
Bard Road	Two 10 x 4 RCB	Two 16 x 7 RCB
Pleasant Valley Road	Three 10 x 4 RCB	Two 17 x 8 RCB
Clara Street	Three 10 x 4 RCB	Two 18 x 8 RCB
Hueneme Road	Three 10 x 4 RCB	Two 19 x 8 RCB
Railroad Crossing	Five 60" CMP	Two 19 x 8 RCB

Downstream End – The existing J Street Drain Channel concrete lining terminates near the Hueneme Drain confluence. The earthen portion of the channel continues downstream before turning east at the sand berm (see Figure 2.1). Since the lined portion of the channel invert would be lowered about 4 feet to create the required capacity, the excavation is proposed to continue along the downstream earthen invert towards the sand berm. The finished invert would be daylighted to the sand berm at a 5:1 slope. The sand berm is expected to breach when the water surface reaches its height with an elevation of 7.5 to 8 feet. According to an estimate by the VCWPD, a 2-year event would produce enough runoff volume to fill the Ormond Beach Lagoon, which can cause the berm to breach. Since breaching would likely occur during smaller storms, an ocean outlet would have already been created to allow the 100-year event to pass through.

A set of 30% complete design drawings was prepared for the proposed J Street Drain Channel improvement, which included plan, profile, and typical cross-sections of the rectangular concrete channel and enlarged crossing culverts. These drawings are provided in Appendix B of this report.

3.2 OTHER IMPROVEMENT OPTIONS

Several other improvement options were considered for the J Street Drain Channel and have been discarded because of the perceived physical and environmental constraints. These options are briefly described in the following paragraphs:

Bypass Culverts – Two 8 foot diameter circular pipes or two 8 feet by 8 feet box culverts would be required for a bypass facility. Due to the shallow slope of the existing channel, a new pump station would

need to be provided at the downstream end (near the Hueneme Drain confluence) to allow discharge from the bypass structure. While this option avoids the modification of the existing channel, it would require excavation along J Street and relocation of a vast number of existing utilities including sanitary sewer, water, gas and storm drain lines on both sides of the J Street Drain.

Earthen Channel – To increase capacity and also provide environmental values, the existing J Street Drain Channel may be replaced with a widened earthen trapezoidal channel with vegetated banks. Due to the increased roughness values and 2:1 side-slopes for this design, a channel bottom width of approximately 80 feet would be required from Bard Road to the Hueneme Drain confluence. This would significantly exceed the VCWPD right-of-way of 70.5 feet in this reach and require encroaching into J Street.

Floodwalls - Another considered improvement option was to enclose the channel with floodwalls to increase the flow head to drive it through the undersized road crossing culverts. Floodwalls 15 feet in height were added to the channel and road crossings in the existing channel HEC-RAS model. The model results showed that flows continued to overtop the floodwalls in the vicinity of the road crossings due to the undersized existing culverts. This measure was also rejected as infeasible.

4.0 PROPOSED CONDITION HYDRAULIC ANALYSIS

4.1 DESIGN FLOOD WATER SURFACE PROFILE

The hydraulic performance of the proposed J Street Drain Channel improvement was evaluated under the 100-year flood peak using the HEC-RAS. The geometry modeled in the analysis included the proposed rectangular cross-section and the improved street crossings. The results indicated that the 100-year flood would be contained in the channel and the 100-year floodwater surface profile is depicted on Figure 4-1.

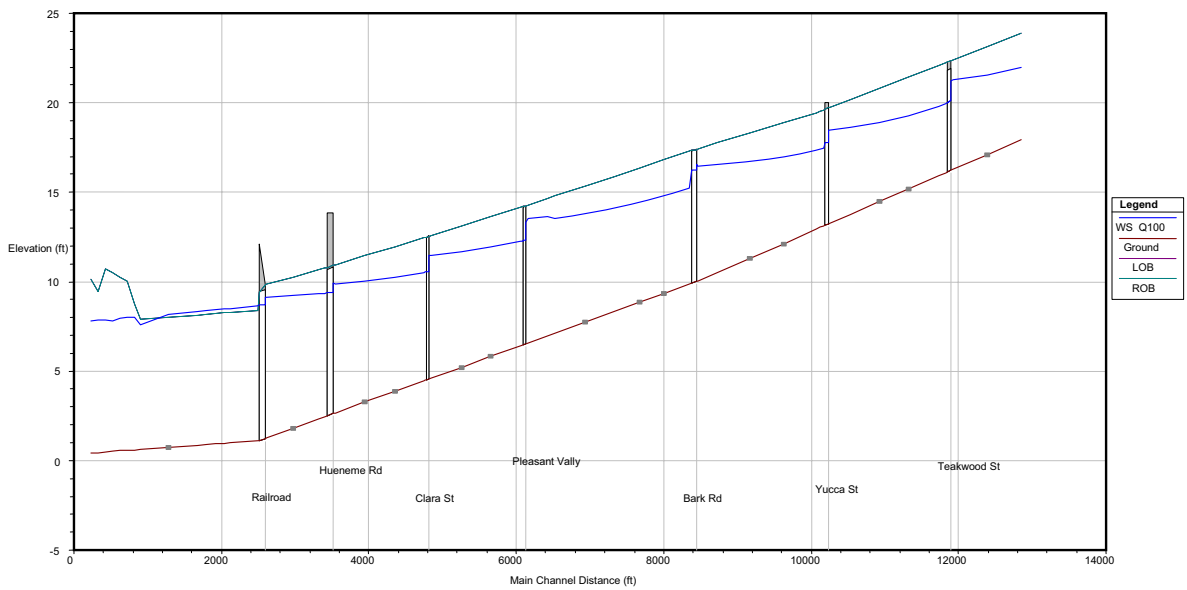


Figure 4-1. J Street Drain Channel 100-year Flood Water Surface Profile Under Proposed Condition

It should be noted that the starting water surface at the downstream end of the channel was set at normal depth based upon the expectation that the sand berm would have already breached prior to the 100-year event and an ocean outlet created to allow discharge of the channel flow.

4.2 CHANNEL FREEBOARD REQUIREMENT

The VCWPD design criteria stipulate that channel design be based on providing capacity for the 100-year flow in the channel-full condition or for the 50-year storm plus freeboard, whichever is greater. Therefore, the depth of the improved J Street Drain Channel was designed to meet both of these requirements. Section 324.20 of the Design Manual provides a description of four freeboard factors, including factors for air entrainment, unstable zone flow, superelevation, and residual freeboard.

Air entrainment – Air entrainment is required for flow with Froude Numbers (F) greater than 2. This was not considered in the J Street Drain design since the flow does not have Froude Numbers in that range.

Unstable Zone Flow - For flow in the unstable zone, the maximum required freeboard for unstable flow ($0.7<F^2<1.3$) is 25% of the critical depth. The maximum F^2 for J Street Drain 50-year flood flow is 0.59, which is less than 0.7. No unstable zone was present.

Superelevation - Superelevation provides sufficient flood protection height for the water surface transverse slope due to centrifugal force based on the radius of curvature and the flow velocity. This freeboard component was calculated for the curved section of the channel between the downstream end and Railroad crossing.

Residual Freeboard – Residual freeboard is a minimum freeboard above the calculate water surface. The allowance in reinforce concrete lined channels is 0.5 feet plus 10 %of the flow depth.

The depth of the improved channel was designed to contain the 50-year flood flow depth plus the freeboard allowances. The design has also met the 100-year flood peak condition.

4.3 EVALUATION OF SMALLER FLOOD EVENTS

The proposed J Street Drain improvement was also evaluated with the 2- and 10-year floods to ensure that they would be contained in the channel even with an unbreached sand berm downstream. The initial downstream water surface elevations for these two events were assumed at the height of the sand berm in the HEC-RAS model. The computed water surface profiles are plotted on Figure 4-2and are below the top of the channel.

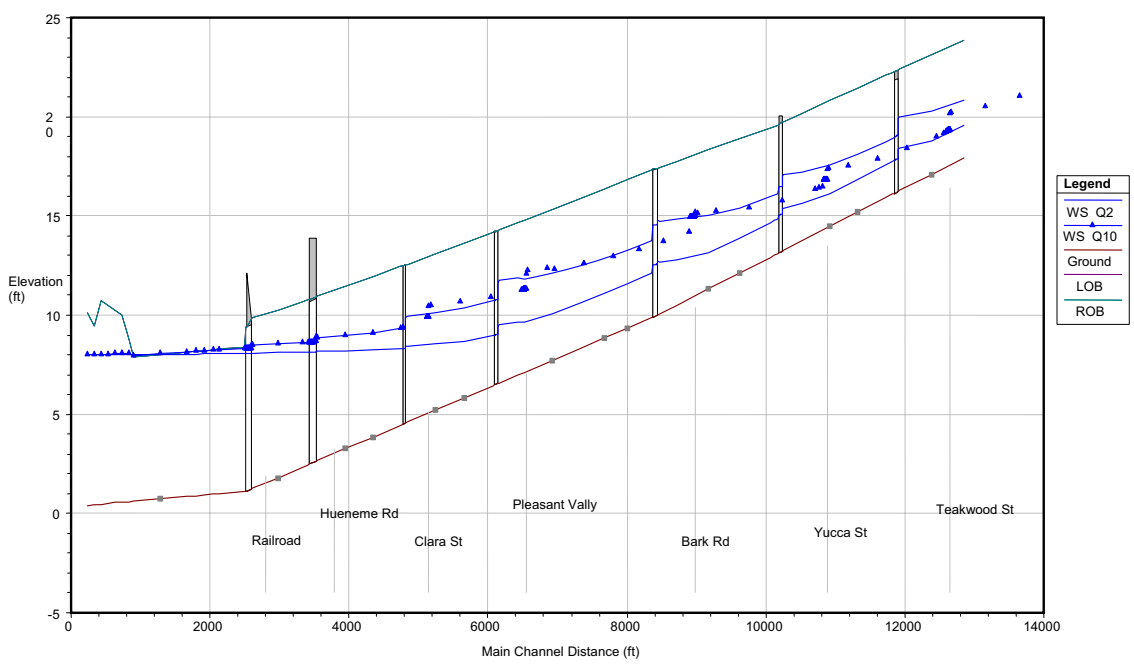


Figure 4-2. J Street Drain Channel 2- and 10-year Water Surface Profiles Under Improved Condition

5.0 PRELIMINARY CONSTRUCTION COST ESTIMATES

Preliminary cost estimates were prepared for the proposed J Street Drain channel improvement and are summarized in Table 5-1. The unit cost information was based on cost data used to develop project costs for VCWPD's capital facilities planning studies and other cost information provided by VCWPD.

Table 5-1. Preliminary Construction Cost Estimates for J Street Drain Improvement

Activity	Quantity	Unit Cost	Unit	Item Cost
Demolition of Existing Culverts	2,721	$15	SY	$40,815
Demolition of Existing Channel Lining	56,000	$15	SY	$840,000
Excavation to Deepen Channel	72,000	$12	CY	$864,000
Crossing Reconstruction				
Railroad	314	$700	CY	$219,800
Hueneme Road	357	$700	CY	$249,900
Clara St	163	$700	CY	$114,100
Pleasant Valley Road	283	$700	CY	$198,100
Bard Road	250	$700	CY	$175,000
Yucca St	198	$700	CY	$138,600
Teakwood St	148	$700	CY	$103,600
Channel Construction				
Total RC Lining	21,024	$700	CY	$14,716,800
Surveying	1	$30,000	LS	$30,000
Project Design	1	$1,766,072	LS	$1,766,072
Utility Relocation	1	$300,000	LS	$300,000
Construction Mitigation	1	$2,199,286	LS	$2,119286
Permitting and Regulatory	1	$883,036	LS	$883,036
			TOTAL	**$22,759,108**

6.0 BENEFIT/COST ANALYSIS

The benefit for the J Street Drain Channel improvement project was evaluated based on the elimination or reduction of future flood damages or losses. Flood damages were estimated using the depth of flooding in the residential and commercial areas along J Street, the structural value data obtained from VCWPD, and the 1975 revised depth-damage curves for residential and small business structures calculated by the Federal Insurance Administration (FIA). These depth damage curves, which were provided by VCWPD, are also called the "HUD Curves" and are used by the United States Department of Housing and Urban Development. The benefit cost analysis (BCA) was conducted using estimated pre-project flood damages and losses to calculate benefits. The calculated project benefits were divided by the project cost to ultimately determine a benefit coat ratio (BCR). In general, a BCR equal to or greater than 1 indicates a cost effective mitigation project.

The following sections describe how the flood damage was estimated for each of the property types affected (single-family residential, multi-family residential, and commercial properties) and how the BCR was calculated.

6.1 FLOOD DAMAGE ESTIMATE

The 100-yr flood-damaged area, which was the computed result from the Flo-2D model, was provided by the County. The result presented the flooded depth along J-Street, illustrated on Figure 6-1. As described in Section 2.2.3, hydraulic characteristics of the existing J Street Drain Channel under the 100-year flood peak were analyzed and the existing channel would be overtopped should a 100-year flood take place.

6.1.1 Calculation Methodology

To determine potential structural damages and damages to contents, the value of the single-family, multi-family, and commercial structures had to be determined.

Single-Family Homes

To estimate the current value of a typical single-family residence, the published 2004 sale prices for the homes in the city of Oxnard were used as a reference. As shown in Table 6-1, an average value of $426,563 and an average price per square foot value of $348 were derived. The FIA assumes that the content value for single-family homes is equal to 35% of the structure value. The 1975 revised depth-damage curves from the FIA were used for calculating potential damages to building contents.

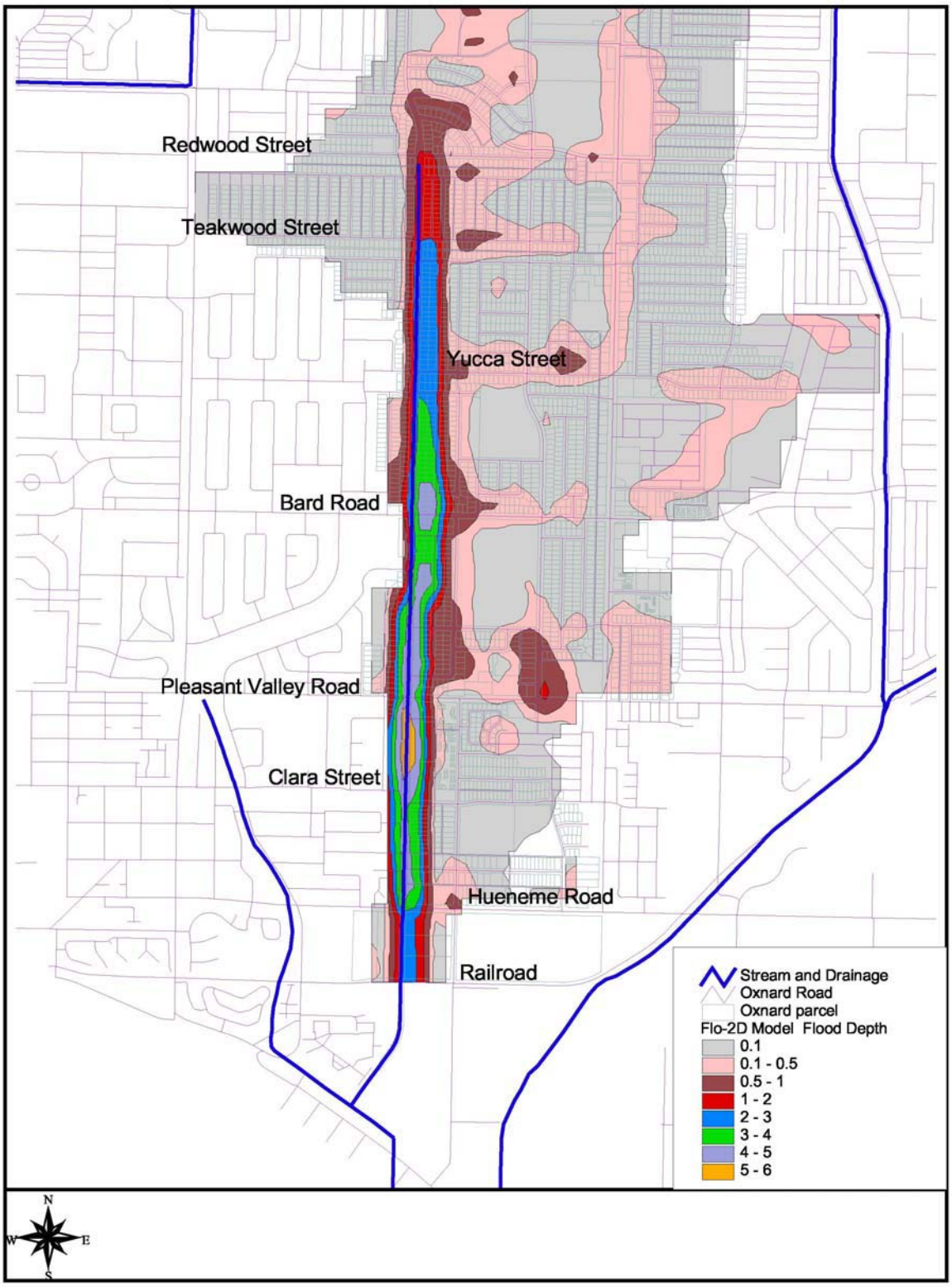


Figure 6-1. Flood Damage Estimate Map

Table 6-1. Typical Oxnard Home Sale Prices

Property Address	Proximity (miles)	Sales Price ($)	Sales Date	Bedrooms	Square Feet	Year Built
4801 S G	0.05	293,000	12/31/2002	3	1000	1960
4820 S G	0.07	325,000	6/4/2003	3	1000	1960
4601 S J	0.13	350,000	10/6/2003	3	1250	1955
4715 S J	0.08	360,000	11/25/2003	3	1250	1955
4914 S F	0.15	355,000	2/12/2004	3	1000	1960
4930 S J	0.06	442,000	5/28/2004	3	1000	1960
4920 S J	0.05	420,000	7/15/2004	3	1000	1960
710 SONOMA	0.12	450,000	8/4/2004	3	1250	1960
4830 S J	0.01	465,000	9/24/2004	4	1250	1960
320 CUESTA DEL MAR	1.46	565,000	3/5/2004	N/A	N/A	1960
401 CUESTA DEL MAR	1.45	575,000	3/18/2004	N/A	N/A	N/A
410 CUESTA DEL MAR	1.47	550,000	3/18/2004	N/A	N/A	N/A
231 CUESTA DEL MAR	1.44	550,000	3/19/2004	N/A	N/A	N/A
301 CUESTA DEL MAR	1.44	550,000	3/19/2004	N/A	N/A	N/A
331 CUESTA DEL MAR	1.44	575,000	3/23/2004	N/A	N/A	N/A
Average 2004 sales price		**426,563**	**Average price per square foot**		**348**	

Multi-Family Units

Multi-family units, including apartments, convalescent-care homes, and town homes, are located on both sides of the J-Street drain between Pleasant Valley Road and Hueneme Road. Recent sales information for multi-family homes was unavailable, but assessed values were available from the parcel data. A conservative, representative value of $100 per square foot was used to determine the structure replacement value for multi-family homes. Similar to the single-family units, the content value in a multi-family unit was assumed to equal 35% of the structure value.

Commercial Units

The commercial units in the flooded area include convenience stores, storage buildings, and warehouses. Current commercial unit values were estimated from recent sales and a representative value of $60 per square foot was used to determine the structure replacement value. The contents value was calculated to be 35% of the structure replacement value.

Depth Damage Calculations

Assuming each structure pad is at 1.0 feet above the surface of J Street, the depth of water calculated by the Flo-2D model was decreased by 1.0. The flood damage was estimated using depth-damage curves developed by the FIA. A depth-damage curve indicates a building's vulnerability to flood damage by showing the expected levels of damage as a percentage of the building value for each flood depth.

The structure depth-damage curve estimates the potential damage to occur to a building at each flood depth. The contents depth-damage curve indicates the vulnerability of the building's contents to flood damage by showing the expected levels of damage, as a percentage. Table 6-2 identifies the depth-damage curves developed by FIA and used for this project analysis.

Table 6-2. FIA Depth Damage Curves for a One Story Building Without a Basement and Two Story Building Without a Basement

Flood Depth (feet)	One Story Building		Two Story Building	
	Building Depth-Damage Curve (%)	Contents Depth-Damage Curve (%)	Building Depth-Damage Curve (%)	Contents Depth-Damage Curve (%)
	0	0	0	0
-2	0	0	0	0
-1	0	0	0	0
0	7	10	5	7
1	10	17	9	9
2	14	23	13	17
3	26	29	18	22
4	28	35	20	28
5	29	40	22	33
6	41	45	24	39

The same method was applied to single-family, multi-family, and commercial structures to estimate the flood damage.

The depth of flooding for each structure was recorded using the Flo-2D data. The following table identifies the total number of structures at each flood depth.

Table 6-3. Flood Depths and Structure Types

Flood Depth	Single-Family	Multi-Family	Commercial
<0.5	Not Counted	Not Counted	Not Counted
1	121	1	1
2	136	1	3
3	98	8	1
4	47	3	1
5	0	1	0
Totals			

The totals for potential damage to structure and contents were then added for 405 single-family units, 13 multi-family units, and 6 commercial structures. A total of $55.7 million was estimated as shown in Table 6-4.

Table 6-4. J Street Drain Channel Flood Damage Estimates

Categories	Units Flooded	Total Building Replacement Value ($)	Building Damages ($)	Content Damages ($)	Total Damages ($)
Single-Family Unit	405	187,181,892	32,040,910	15,628,549	47,669,459
Multi-Family Unit	13	22,037,500	5,130,078	2,369,059	7,499,137
Commercial Unit	6	8,328,000	383,668	195,915	579,583
Total	**424**	**217,554,656**	**37,673,048**	**18,193,523**	**55,748,179**

6.1.2 Total Estimated Flood Damage

In summary, a total of $55.7 million was estimated as the damage that would result from a 100-year flood in the J Street Drain Channel.

6.2 BENEFIT/COST RATIO

The benefit cost ratio for the proposed J Street Drain Channel improvement is 2.45, based on the estimated project cost of $22.8 million and the 100-year flood damage (benefit) of $55.7 million.

7.0 CONCLUSIONS

The proposed J Street Drain Channel improvement would involve replacing the existing facility with a deepened rectangular concrete-lined channel. The proposed channel would maintain the existing top width, but have an additional 4-foot depth below the existing channel invert to provide sufficient flood conveyance during a 100-year storm event. The proposed project would require replacing the existing culverts under the street crossings with larger structures to minimize the backwater effect caused by the undersized openings.

The channel's beach outlet is currently blocked by the buildup of a sand berm, which has resulted in the formation of the Ormond Beach Lagoon. A number of alternatives were identified and evaluated during this design study to create a permanent channel outlet with structural measures. A permanent ocean outlet, however, will significantly impact the lagoon habitat and require expensive construction and maintenance. Permitting would also be a difficult process. On the other hand, a man-made channel outlet may not be necessary because past storm events have caused the sand berm to breach, resulting in a hydraulic connection to the ocean when water in the lagoon reached top of the berm. It is likely that the breaching will take place during future storm events as long as there is enough water built up behind the berm. According to an estimate provided by VCWPD, a 2-year storm runoff from the J Street Drain Channel will produce enough volume of water to fill up the lagoon. Therefore, it is anticipated that the sand berm breaching would occur long before the 100-year event and a nature established ocean outlet created for the J Street Drain Channel.

To determine the financial viability of the J Street Drain channel improvement project, a benefit/cost ratio of 2.45 was estimated by comparing the cost for the improvement and the 100-year flood property damage. The flood property damage was computed based on a two-dimensional floodplain analysis (FLO-2D) result provide by VCWPD.

A set of 30% complete design drawings for the proposed J Street Drain Channel improvement showing plan, profile, and cross-sections is included in Appendix B. Estimated locations of utilities that may be affected by the project have been delineated on the drawings. Many of these utilities would require temporary relocation and the cost has been identified in the total project cost. Their exact locations may need to be verified during the final design phase.

Appendix A

Beach Outlet Evaluation

Ormond Beach Outlet Alternatives

A total of six alternatives for improving the J Street outlet near the lagoon were considered in the study, including the No Project alternative. The alternatives were designed to satisfy the following design criteria:

1. Improve the conveyance capacity of the J Street Drain outlet.
2. Minimize the disturbance to tidewater goby habitat downstream of the J Street lined channel or develop additional habitat within the lagoon to mitigate any habitat loss.
3. Maintain dry weather recharge to the Ormond Beach Lagoon from J Street and Hueneme Drains.
4. Minimize operation and maintenance requirements, especially during storms.
5. Minimize effects on water quality of the lagoon.
6. Minimize backwater effects from Oxnard Industrial Drain (OID) from affecting proposed solution.

The alternatives vary in the degree of hydraulic connection between the J St Drain and the Ormond Beach Lagoon. A backwater condition up to elevation 7.5 NGVD develops during dry weather periods due to the buildup of the sand berm between the lagoon and the ocean. Over the last year, significant runoff events (April, 2004, and October, 2004) have led to the formation of a breach in the berm at the Oxnard Industrial Drain end of the lagoon, leading to lagoon dewatering and a hydraulic connection with the ocean.

Previous analyses by the VCWPD have estimated that Hueneme Drain and Oxnard Industrial Drain (OID) are the primary sources of dry-weather recharge to the lagoon (2.02 and 2.82 cfs, respectively), with only trace amounts of dry weather recharge occurring from the J St Drain. Based on 100-year peak flows for Hueneme Drain, J St Drain, and Oxnard Industrial Drain (440, 1,775, and 4,759 cfs respectively) the wet weather recharge to the lagoon is approximately 6 percent from Hueneme Drain, 25 percent from J St Drain, and the remainder from OID. Any alternative to improve the J St Drain capacity that provides a significant connection between the J St Drain and the lagoon during storm events may be impacted by flow from the OID.

Based on limited sampling in the lagoon and its tributaries, the water quality is concluded to be better in the Hueneme and J St Drains than in OID. Water quality in OID is affected by historic industrial and agricultural activities along the drain. Fish surveys found populations of Tidewater Gobies in the unlined portion of the J St Drain, in the lagoon, and in the Hueneme Drain. No juveniles were found in the Hueneme Drain, possibly due to the silty conditions found in that channel. The gobies are reported to prefer a sandy substrate for reproduction. Shorebirds were reported to use the lagoon to obtain fish for their food.

The outlet improvement alternatives are described in the following sections.

Alternative 1: Two Rubber Dams

- Berm downstream of J St Channel excavated down to MHHW line
- Rubber dam installed in existing opening between J St Drain and lagoon to prevent flow from OID from causing a backwater condition in the J St Drain during stormflow before berm is breached. Dam would be inflated prior to storm to disconnect the two systems.
- Rubber dam installed in sand berm at channel outlet to maintain water levels in J St Drain and lagoon. O&M staff would deflate dam after channel/lagoon dam is inflated at beginning of storm to release backwater.

- Sand berm dam would be reflated at end of storm to restore backwater in lagoon and channel to desired depth. Channel/lagoon dam would be deflated to restore channel/lagoon connection.

Advantages:

- Lagoon and channel generally remain connected, minimal loss of habitat downstream of lined channel.
- Lagoon depth can be maintained as desired
- No changes to lagoon dry weather recharge
- J St storm flow can be diverted through lagoon when berm is breached to provide flushing.

Disadvantages:

- Requires active management of dams and maintenance to prevent seepage under corrosive beach conditions.
- Fish downstream of lined channel may be discharged to ocean during storm.
- May lead to fewer breaches and decreased breach periods due to decreased inflow from J St Drain to lagoon.

Alternative 2: Rubber Dam and Permanent Weir

- Berm downstream of J St Channel excavated out to MHHW line and permanent concrete weir approximately 100' wide installed downstream of lagoon/ J St Drain channel confluence at elevation 4.5 NGVD.
- Rubber dam installed between J St channel and lagoon to be inflated during storms, preventing OID flow from causing a backwater in J St Drain if berm is not breached.

Advantages:

- Lagoon and channel generally remain connected, minimal loss of habitat downstream of lined channel.
- Less active management of channel/lagoon system than Alternative 1.
- Lagoon depth can be maintained as desired
- Backwater in J St Channel maintained at minimum 4.5 ft elevation and subjecting fish downstream of lined channel to lower flow velocities during storms.
- J St storm flow can be diverted through lagoon when breach is present to provide flushing.

Disadvantages:

- Requires active management of dam and maintenance to prevent seepage under corrosive beach conditions.
- May lead to fewer breaches and decreased breach periods due to decreased inflow from J St Drain to lagoon.

Alternative 3: Ocean Outfall

- Install pump station and sump at downstream end of J St Channel with capacity to discharge 100-yr storm peak flow (1,775 cfs) into ocean outfall.

- Install rubber dam across channel/lagoon opening to prevent OID flow from causing backwater condition during storm in J St Drain if berm is not breached. Inflate at beginning of storm and deflate at end of storm.

Advantages:

- No loss of habitat at end of lined channel.
- Water level in lagoon and J St will fluctuate naturally depending on recharge and breach conditions
- No changes to dry weather lagoon recharge sources if J St flow if pumps are shut off during dry weather periods.
- Water quality impacts in near-shore zone minimized.
- Pump station can be turned of so that J St storm flow can be diverted through lagoon when breach is present to provide flushing action.

Disadvantages:

- Expensive ocean outfall and pump station, including energy costs.
- Requires pump station maintenance and trash removal.
- Requires rubber dam installation and active management during storms.
- Fish downstream of lined channel may be sucked into pumps while operating.
- More permitting issues

The existing wastewater treatment plant outfall extends approximately 5,000 feet into the ocean, and ranges in size from a 30-in CIP to a 48-in RCP at the ocean end. Its capacity is 50 mgd, or about 77 cfs. City of Oxnard officials report that there is no additional capacity for storm flow and the flow capacity is too small to be used as an alternative for J Street Drain flow. An 11-ft diameter ocean outfall extending 3.5 miles out to sea in San Diego had a capacity of 333 mgd, or about 515 cfs, at a cost of $200 million in 1998. The flow velocity of this outfall during full flow conditions is about 5.4 fps. Based on these data, it was concluded that this alternative was very expensive, would not provide sufficient capacity, and required no further study.

Alternative 4: Extend Eastern Levee Across Lagoon Opening (Preferred)

- Levee between J St Channel and lagoon extended across existing lagoon opening,
- Sand berm downstream of J St Channel excavated out to MHHW line by O&M staff prior to winter storms
- Perkins Drain berm removed in lagoon and excavation done to provide additional tidewater goby habitat.
- Hueneme Drain discharge pipes rerouted to discharge dry weather flow into newly excavated portion of the lagoon and create low-salinity environment for tidewater gobies
- Hueneme Drain storm flow can be diverted to lagoon to encourage breaching or outletted into J St Drain for discharge to ocean
- Option: Install catch basin in J St Drain next to pump station to divert low flow into sump for pumping into lagoon with Hueneme flow.

Advantages:

- Lagoon depth will fluctuate naturally depending on sand berm height and OID and Hueneme Drain inflow.

- Does not require active management of lagoon levels by O&M staff.
- No changes to dry weather lagoon recharge sources if J St flow is routed through Hueneme pump station and into lagoon.
- Most efficient hydraulic design for J St and Hueneme Drain discharge- no backwater condition in J St Drain.

Disadvantages:

- Loss of habitat in unlined portion of J St Drain.
- May lead to fewer breaches and decreased breach periods due to decreased storm flow from J St Drain to lagoon.
- Flushing action provided by J St and possibly Hueneme Drain wet weather flows when breach occurs would be eliminated.
- Requires O&M staff to excavate accumulated sand prior to winter storms to provide adequate outlet conveyance.

Alternative 5: High Flow Bypass in J St Drain, Levee between Lagoon and Channel

- Weir added downstream of pump station to divert low flow into lagoon, prevent backwater from forming in J St Channel.
- Earth berm extended to block connection between J St and lagoon.
- Low flows diverted into lagoon through low flow inlet with flap gate from J St Drain when lagoon elevations are low. Flap gate prevents backflow into J St channel when lagoon elevations are high from OID flow.

Advantages:

- Lagoon depths will fluctuate naturally according to OID and Hueneme Drain inflow.

Disadvantages:

- Loss of habitat downstream of lined channel
- May lead to fewer breaches and decreased breach periods due to decreased storm flow from J St Drain and Hueneme Drain to lagoon.
- Flushing action provided by J St and possibly Hueneme Drain wet weather flows when breach occurs would be eliminated.
- Backwater condition caused by the in-channel weir to the J St Drain channel.

Alternative 6: Side Weir and Bypass Channel

- Side weir with top elevation of 5.5 ft NGVD and bypass channel constructed adjacent to existing J St channel downstream of pump station to discharge storm flows to ocean. Hydraulic analysis indicates that a side weir with length of 270 ft would be required to divert 1,775 cfs into bypass channel. The analysis assumes that the Hueneme Drain storm flow would be discharged directly into bypass channel.

Advantages:

- Existing lagoon and channel connection would not be affected
- Lagoon depth up to side weir elevation of 5.5 ft NGVD will fluctuate naturally depending on sand berm height, breach presence, and inflow from drains.

- Existing habitat downstream of unlined channel not affected
- Portion of new channel constructed through disturbed habitat adjacent to pump station

Disadvantages:

- Requires construction of side weir- some impacts to dune habitat at outlet downstream end of bypass channel
- OID inflow to lagoon prior to berm breaching could cause backwater condition in J St channel and affect performance of side weir during storm flow.

No Action Alternative:

The No Project condition would keep the existing channel configuration and lagoon operation. Existing flooding problems would not be solved with this alternative.

Preliminary Cost Estimates

Cost estimates were prepared for the various outlet alternatives as shown in the following tables. The cost information was based on cost data used to develop project costs for VCWPD's capital facilities planning studies and other cost information provided by VCWPD.

Ormond Beach Outlet Alternatives:

Alternative 1- 2 Rubber Dams

Activity	Quantity	Unit Cost	Unit	Item Cost
Rubber dam between channel and lagoon, 100' long, 8' high with control systems and piping	1	$480,000	LS	$480,000
2 feet thick concrete foundation for channel/lagoon rubber dam, 5' deep cutoff wall	111	$ 700	CY	$77,778
Control House	1	$25,000	LS	$25,000
Rubber dam at channel outlet, 100' long, 8' high with control systems and piping	1	$480,000	LS	$480,000
2 feet thick concrete foundation for channel outlet dam, 5' deep cutoff wall	111	$ 700	CY	$77,778
Diversion, Control and Removal of Water	1	$50,000	LS	$50,000
Water Pollution Control	1	$5,000	LS	$5,000
Excavation through sand berm	2,570	$15	CY	$38,548
Geotextile Soil Protection Fabric	222	$20	SY	$4,444
Filter Fabric Material B	37.0	$100	CY	$3,704
1/4 Ton Rip-Rap Protection at Outlet	740.7	$70	CY	$51,852
Total				**$1,242,251**

Alternative 2 - Rubber Dam and Permanent Outlet Weir

Activity	Quantity	Unit Cost	Unit	Item Cost
Rubber dam between channel and lagoon, 100' long, 8' high with control systems and piping	1	$480,000	LS	$480,000
2 feet thick concrete foundation for channel/lagoon rubber dam, 5' deep cutoff wall	111	$ 700	CY	$77,778
Control House	1	$25,000	LS	$25,000

Concrete weir at channel outlet 100 ft long, 10 ft wide, 0.67 ft thick concrete, 5' deep cutoff walls	50	$ 700	CY	$34,741
Structural Backfill	500	$ 20	CY	$10,000
Diversion, Control and Removal of Water	1	$50,000	LS	$50,000
Water Pollution Control	1	$5,000	LS	$5,000
Excavation through sand berm	2,570	$15	CY	$38,548
Geotextile Soil Protection Fabric	444	$20	SY	$8,889
Filter Fabric Material B	74.1	$100	CY	$7,407
1/4 Ton Rip-Rap Protection at Outlet	740.7	$70	CY	$51,852
Total				**$789,214**

Alternative 4 Extend Levee

Activity	Quantity	Unit Cost	Unit	Item Cost
Structural Backfill for Levee	1,111	$ 20	CY	$22,222
Concrete weir at channel outlet 100 ft long, 10 ft wide, 0.67 ft thick concrete, 5' deep cutoff walls	50	$ 700	CY	$34,741
Diversion, Control and Removal of Water	1	$50,000	LS	$50,000
Water Pollution Control	1	$5,000	LS	$5,000
Excavation through sand berm	2,570	$15	CY	$38,548
Geotextile Soil Protection Fabric	667	$20	SY	$13,333
Filter Fabric Material B	111.1	$100	CY	$11,111
1/4 Ton Rip-Rap Protection at Outlet	740.7	$70	CY	$51,852
Total				**$226,807**

Alternative 5. Low Flow Diversion Weir Downstream of Pump Station

Activity	Quantity	Unit Cost	Unit	Item Cost
Structural Backfill for Earth Berm between Lagoon and Channel	1,111	$ 20	CY	$22,222
Concrete weir downstream of pump station 48 ft long, 10 ft wide, 1.5 feet high	27	$ 700	CY	$18,667
Low flow diversion and culvert inlet to lagoon with flap gate	1	$ 10,000	LS	$10,000
Diversion, Control and Removal of Water	1	$50,000	LS	$50,000
Water Pollution Control	1	$5,000	LS	$5,000
Excavation through sand berm	2,570	$15	CY	$38,548
Geotextile Soil Protection Fabric	667	$20	SY	$13,333
Filter Fabric Material B	111.1	$100	CY	$11,111
1/4 Ton Rip-Rap Protection at Outlet	740.7	$70	CY	$51,852
Total				**$220,733**

Alternative 6. Side Channel Weir, Unlined Bypass Channel

Activity	Quantity	Unit Cost	Unit	Item Cost

Side Weir 270 ft long, 0.67 ft thick concrete, 5.5 ft high, 10 ft thick	74	$ 700	CY	$51,852
Concrete channel stabilizer at outlet 50' wide, 6' deep, 0.67' thick, 5 ' cutoff walls	25	$ 700	CY	$17,370
Diversion, Control and Removal of Water	1	$50,000	LS	$50,000
Water Pollution Control	1	$5,000	LS	$5,000
Excavation	7,014	$15	CY	$105,214
Geotextile Soil Protection Fabric	596	$20	SY	$11,911
Filter Fabric Material B	99.3	$100	CY	$9,926
Total				**$251,274**

PRELIMINARY ENVIRONMENTAL ASSESSMENT

J STREET OUTLET ALTERNATIVES

The environmental and permitting issues associated with the J Street Outlet Alternatives are addressed in this section. The analysis is focused on the primary issues that could affect the cost and feasibility of the alternatives – biological resources such as wetlands and endangered species, water quality, and public access and recreation. The alternatives considered in this analysis are described in detail in previous sections of the Pre-Design Report, and are listed below:

1. Two Inflatable Dams
2. Inflatable Dam and Permanent Weir
3. Ocean Outfall
4. Earthen Levee Across Lagoon Connection (Preferred Alternative)
5. High Flow Bypass in the J Street Drain Channel with Levee Across Lagoon Connection
6. Side Weir and Bypass Channel for High Flows
7. No Action Alternative

The primary objective of the improvement alternatives is to improve the conveyance capacity of the J Street Drain outlet at the ocean in order to reduce upstream flooding during the winter, particularly during the initial storm events. The outlet is blocked by the sand berms on the beach, creating backwater in the J Street Drain that extends into the City of Oxnard. The project would be designed to convey winter flows from J Street Drain to the ocean in a reliable and controlled manner.

1. LAND USE AND ENVIRONMENTAL SETTING

The project site consists of the following elements:

- The terminus of the Hueneme Drain and the Hueneme Drain Pump Station which pumps water from the drain (summer baseflows from springs) and winter runoff into the J Street Drain Lower Channel
- The J Street Drain Lower Channel, which is defined as the terminus of the concrete-lined J Street Drain. The lower channel extends about 250 feet from the end of the concrete lining at the pump station towards the beach, where it is connected to the main channel or water body in the Ormond Beach Lagoon.
- The Ormond Beach Lagoon, which is a large complex of wetlands, dune, and open water habitats that has formed in the backdunes of Ormond Beach between J Street Drain and the Oxnard Industrial Drain. The J Street Drain Lower Channel is included in the boundaries of the lagoon because it is hydrologically connected to the main lagoon channel, and discharges water to the lagoon. Although the project is located on the eastern edge of the lagoon, the project could affect the entire lagoon by altering water levels in the lagoon.
- The East Hueneme Drain is a remnant of the drainage system developed prior to 1960 in which discharge from the Oxnard Industrial Drain was directed upcoast to the pump station, where it was siphoned under the J Street Drain, and then pumped back to the J Street Drain at the Hueneme Pump Station. It appears that the East Hueneme Drain is no longer discharging to the Hueneme Drain. It now is a non-functioning ditch without circulation that contains water-year round. It is directly connected to the rest of the Ormond Beach Lagoon.
- Ormond Beach consists of the broad sandy beach that is located seaward of the J Street Lower Channel and Ormond Beach Lagoon.

Hueneme Drain and the Hueneme Drain Pump Station are located in the City of Port Hueneme. The J Street Drain, Ormond Beach Lagoon, East Hueneme Drain, and Ormond Beach are located in the City of Oxnard. These features are all located in the Coastal Zone.

The Watershed Protection District (District) owns the right-of-way for the Hueneme Drain and the Hueneme Drain Pump and a maintenance easement for the J Street Drain Lower Channel. Ormond Beach Lagoon, to the high tide limit, is located on City of Oxnard property. The District does not have a maintenance easement on any other part of the Ormond Beach Lagoon. *<<WPD needs to confirm this information>>*

The Hueneme Drain and Pump Station are located directly south of, and adjacent to, the Surfside Condominiums. The pump station is also located at the eastern end of the 50-acre Hueneme Beach Park, which includes a pier, picnic areas, swimming beaches, and parking lots. The only park improvements near the pump station and J Street Drain Lower Channel are trails to the beach. Hueneme Drain is also part of the Bubbling Springs Recreational Corridor that extends from the project site into town and the Bubbling Springs Park. The corridor provides open space and pathways.

The north side of Ormond Beach Lagoon consists of industrial uses – the Oxnard Wastewater Treatment Plant and the Halaco Metal Recycling Facility. Public access is provided to the north edge of the lagoon at the terminus of Perkins Road, where a City of Oxnard public parking lot is located. Formal access to the lagoon is not provided from the parking lot because the parking lot is separated from the lagoon by the East Hueneme Drain. However, informal crossings of the ditch (i.e., drift wood bridge) are often erected by the public, allowing pedestrians to enter the lagoon. Beach access is not possible from this location unless the lagoon has been fully drained to the ocean. An isolated non-tidal wetland is located between East Hueneme Drain and the Oxnard Wastewater Treatment Plant on City of Oxnard Property.

The remaining north side of the Ormond Beach Lagoon abuts directly with the Halaco Metal Recycling Facility. No public access is present.

2. ENVIRONMENTAL SETTING

2.1 Hueneme Drain

Hueneme Drain is a man-made earthen channel with a trapezoidal shape. The channel is about 75 feet from tope of bank to top of bank near the pump station. The banks of the channel are dominated by annual weeds and perennial introduced grasses. The banks and tops of the banks are landscaped and maintained as part of the Bubbling Springs Recreation Corridor. Water levels in the drain are regulated by the pump station. In the summer, the water is maintained at 1-2 foot depths. Emergent wetlands and riparian plants (e.g., willows and mulefat) are not present in the channel. There are anecdotal observations of the endangered tidewater goby in the drain. As described below, this species is a resident of the Ormond Beach Lagoon. It could migrate into the Hueneme Drain under very limited conditions. Fish in the East Hueneme Drain (which is part of the lagoon) could move through the culvert under the J Street Drain into Hueneme Drain, upstream of the pump station. However, it appears that this culvert has been blocked for many years. As such, tidewater gobies are not expected to occur in the Hueneme Drain.

2.2 J Street Drain Lower Channel

The J Street Drain is a fully lined concrete channel that ends at the pump station. The channel downstream of the pump station is earthen, except for a concrete bottom that extends 100 feet downstream of the pump station. The lower channel extends about 325 feet from this concrete bottom to a bend in the channel that connects it to the lagoon. The channel width at top of bank is about 100 feet. The banks are uneven and exhibit erosion and sloughing. A 10-foot wide compacted sand and gravel path is located on the top of the western bank; the area east of the channel consists of stabilized sand dunes. The eastern bank is located in the lagoon area, and is dominated by a mixture of upland weeds and native wetland plants. The elevations of the banks are about 12 feet NGVD. The elevation of the concrete bottom is about 3 feet NGVD. The elevation of the sand dunes at the seaward end of the lower channel,

where it bends to the east, varies based on the extent of sand dune development, but appears to be about 7 or 8 feet NGVD at present time.

The banks of the lower channel contain a mixture of barren eroding areas, introduced weeds, and iceplant. No emergent wetlands or riparian vegetation is present along the banks or margins of the open water in the channel. The depth of the water in the lower channel matches that in the larger lagoon, and as such, is typically very high in the summer (3 to 4 feet) and less than 2 feet in the winters when the lagoon is open to the ocean.

The federally endangered tidewater goby (*Eucylogobius newberri*) resides in the Ormond Beach Lagoon (see below), including the J Street Drain Lower Channel. The distribution and abundance of the species in the lagoon water bodies are unknown. The occurrence of this species in the lagoon was first detected in 1996. Tidewater gobies exhibit a wide range of tolerance for water temperature, depth, and salinities. They breed in the areas with sandy substrates. They are typically found in the upper ends of lagoons in brackish water, usually in salinities of less than 10 parts per thousand (ppt), but have been found in water to range from 0 to 40 ppt. Tidewater gobies are bottom dwellers and are typically found at depths of less than three feet. In streams, they inhabit low-velocity areas. Tidewater gobies spawn throughout the year but spawning typically peaks in late April through early May. Spawning takes place in burrows dug 4 to 8 inches deep in coarse sand. Spawning is reported to take place at fairly low to moderate salinities (5 to 10 ppt). After hatching, the larval tidewater goby are planktonic (suspended in the water column) and are associated with aquatic plants in nearshore habitat. Juvenile tidewater goby are benthic dwellers similar to adults.

In April and September 2004, the District retained a fisheries expert to capture and temporarily relocated tidewater gobies from around the Hueneme Drain Pump Station during an upgrade project. Over 250 adult gobies were collected; the high number suggests that the lower channel provides favorable habitat conditions. The absence of aquatic and emergent vegetation in the channel would limit use by larvae.

Other native species that occur in the J Street Drain Lower Channel and the Ormond Beach Lagoon include Fish species captured and relocated out of the work area include topsmelt (*Atherinops affinis*), staghorn sculpin (*Leptocottus armatus*) and longjaw mudsucker (*Gillichthys mirabilis*). Exotic species include mosquitofish (*Gambusia* affinis) and crawfish.

Two federally listed bird species occur in and around Ormond Beach which could forage on occasion at the J Street Drain Lower Channel (and throughout the Ormond Beach Lagoon) for fish. The endangered California least tern (*Sterna antillarum browni*) and the California brown pelican (*Pelecanus occidentalis californicus*). The least tern nests on Ormond Beach south of the project site, but forages widely along the local beaches. The tern will forage for fish in the J Street Drain Lower Channel (and the Ormond Beach Lagoon) if there is sufficient water depth and fish density. The brown pelican forages widely along the coast and in the nearshore waters. It may occasionally forage for fish in the J Street Drain Lower Channel (and the Ormond Beach Lagoon), but it requires a greater water depth and surface area than terns, and is expected to be an infrequent forager at the project site.

2.3 Ormond Beach Lagoon

2.3.1 Origin and Current Hydrologic Conditions

The Ormond Beach Lagoon consist of a complex array of wetland, freshwater, estuarine, and marine habitats. It was formed through a complex interaction of natural hydraulic and tidal actions, and man-made drainage improvements involving the Oxnard Industrial Drain, Hueneme Drain, and J Street Drain. Prior to the 1960s, these drains discharged directly to the ocean. In the 1960s, the Oxnard Industrial Drain was directed upcoast to a pump station for discharge to the J Street Drain. Eventually, this system deteriorated, and a lagoon was formed on the beach from year-round flows from the Oxnard Industrial Drain. Prior to 1992, the District breached the sand berms on the beach that formed the lagoon to lower water levels in the lagoon that caused backwater flooding in the J Street Drain and Oxnard Industrial Drain. At this time, the water levels in the lagoon are not actively managed by any entity.

Under current conditions, the lagoon receives inflow throughout the year from the Hueneme Drain (pumped to the J Street Drain), J Street Drain, and Oxnard Industrial Drain. Water levels in the lagoon rise during the winter, and the lagoon may breach due to the combined hydraulic head from storm flows and the erosion of the upper beach sand dunes from winter wave action. The lagoon does not breach every year. Hence, water levels in the winter can vary greatly from 2 - 3 feet NGVD when the lagoon is fully open to the ocean, to 7 – 9 feet NGVD when the lagoon is impounded. Sand dune elevations along the upper beach can reach up to 9 feet NGVD.

The location of the outlet when the lagoon breaches has varied over the past 10 years. At one time, it was located at the center of the lagoon, but in recent years, it has been located downcoast from where the Oxnard Industrial Drain enters the lagoon. It does not appear that an outlet was ever formed in recent times at the J Street Drain Channel, indicating that the hydraulic forces from runoff that contribute to the natural breaching are stronger at the mouth of the Oxnard Industrial Drain which has a greater watershed than the J Street Drain.

During the summer, wave actions do not erode the sand dunes, and as such, the lagoon remains impounded. Water levels in the lagoon during the summer and fall are controlled by a combination of baseflows from Hueneme Drain and Oxnard Industrial Drain, evaporation, and seepage to and from the ocean through the beach sand. Typical summer water levels in the lagoon appear to be about 5 to 7 feet NGVD. Upstream flooding in the City of Oxnard occurs when water levels exceed 7 feet NGVD.

2.3.2 Wetland and Aquatic Habitats

The Ormond Beach Lagoon contains a mixture of fresh water and brackish water habitats, including vegetated marsh habitats with emergent and seasonally inundated plants, and open water aquatic habitats. The distribution and extent of these habitat types vary greatly on a seasonal and annual basis. The amount of open water habitat is controlled by the water elevation in the lagoon, described above. The occurrence of different habitat types also varies based on soil and water salinities. The lagoon receives ocean water through tidal influence during the winter months when the sand barrier is breached. Generally, low salinity and high water conditions occur during the summer when the lagoon is filled with fresh water inflows. Higher salinity and lower water levels occur in the winter if the sand dune berm has breached. At that time, extensive mudflats are present in the previously flooded areas.

The dominant species in the salt marsh areas are glasswort pickleweed *(Salicvrnia virginica), j*aumea *(Jaumea carnosa,)* and saltgrass *(Distichlis spicata)*. Other common species include alkali weed *(Cressa truxillensis),* alkali heath *(Frankenia grandifolia),* California sea blite *(Suaeda calif arnica),* brass buttons *(Cotula coronopifolia),* arrow-leaf saltbush *(Atriplex patula),* and sicklegrass *(Parapholis incurva).* The most common freshwater/brackish marsh species is bulrush *(Scirpus* sp.), which occurs in the lagoon area near the mouth of the Oxnard Industrial Drain, Rabbitsfoot grass *(Polypogon monspeliensis)* and white sweetclover *(Melilotus albus)* are also common along the water's edge south of Perkins Road. Aquatic ditch-grass *(Ruppia cirrhosa)* also occurs in the lagoon.

The sand dunes along the seaward edge of the lagoon are vegetated by silver beach bur *(Ambrosia chamissonis),* sea rocket *(Cakile maritima),* beach morning glory *(Calystegia soldanella),* red sand verbena *(Abronia maritima),* beach evening primrose *(Camissonia cheiranthifolia),* sea fig *(Carpobrotus chilensis),* and pink sand verbena *(Abronia umbellata* ssp. *umbellata).*

2.3.3 Special Interest Species

As described above in Section 2.2, the federally endangered tidewater goby (*Eucylogobius newberri*) resides in the Ormond Beach Lagoon. The distribution and abundance of the species in the lagoon water bodies are unknown. However, it is anticipated that the fish occur throughout the lagoon based on water temperature, depth, and salinity conditions that change seasonally and annual. The population is expected to exhibit a wide range from year to year based on the amount of open water in the lagoon.

As noted above, the endangered California least tern forages in the lagoon when there is sufficient water depth and fish density. The endangered brown pelican may also use the lagoon, but much on a more limited basis.

The threatened western snowy plover (*Charadrius alexandrinus nivosus*) nests at various locations along Ormond Beach, including in proximity to the lagoon. This species does not forage for fish, but instead forages for insects in the rack line of the upper beach and dune scrub area.

3. ENVIRONMENTAL IMPACTS AND ISSUES

3.1 Project Elements

The project alternatives involve a range of potential actions that could directly and indirectly affect the environmental resources at the project site. The key elements of the project alternatives that could result in environmental impacts are listed below and summarized in Table 1 for each alternative:

- Construction related disturbances (e.g., noise, traffic) associated with the construction of levees, channels, weirs, or rubber dams
- Temporary and permanent losses of habitat due to construction of levees, channels, weirs, or rubber dams
- Alteration of the hydrologic regime at the project site due to modified drainage patterns, which in turn could affect habitats, water quality, and endangered species
- Change in landforms and addition of new structures on or near a public beach

For all alternatives, the project would reduce upstream flooding in Oxnard, which would be a beneficial and desirable effect of the project. In addition, the project may provide opportunities to enhance habitat conditions at the project site through project design and mitigation.

A summary of the major project features of each alternative that could cause environmental impacts is provided in Table 1. The major physical features and structures associated with the alternatives include the following:

- Inflatable dams with associated concrete footings – Alternatives 1, 2, and 3
- Concrete weirs – Alternatives 2, 5, and 6
- Rip-rap – Alternatives 1 and 2
- Earthen dams – Alternatives 4 and 5
- Earthen channels – Alternatives 1, 2, 4, 5, and 6
- New pump station and buried ocean outfall – Alternative 3

The major hydrologic impacts of the alternatives are summarized in Table 2. The primary hydrologic effects are as follows:

- Possible reduction in the water depth and amount in the J Street Drain Lower Channel in the summer or winter
- Possible reduction in the amount of discharge to the Ormond Beach Lagoon due to diversion of J Street Drain winter storm flows to ocean, which could reduce the amount of water in the lagoon

All but two alternatives would maintain the current water levels in the J Street Drain Lower Channel in the summer. Alternatives 4 and 5 would result in lower water levels because the channel would be opened to the ocean in the summer.

In the winter, all of the alternatives would provide improved flows from the J Street Drain Lower Channel to the ocean. All but two alternatives could result in complete dewatering of the channel in between storm

events. Alternatives 2 and 6 would involve a permanent weir in the channel that would retain water in the channel at acceptable depths in the winter, preventing the complete dewatering of the channel.

Only one alternative would affect the water level in the Ormond Beach lagoon as a whole. The permanent weir on the by-pass channel for Alternative 6 would control the elevations of the lagoon throughout the year. For all other alternatives, the summer elevations in the lagoon would remain similar to current conditions. All alternatives would reduce inflows from J Street Drain to the lagoon in the winter, and as such, could create lower water levels in the lagoon, which in turn, could affect the frequency of breaching the sand berm at the beach. This effect is expected to be very small, as the flows from J Street Drain are minor compared to the Oxnard Industrial Drain.

3.2 Construction Disturbance

Alternative 3 would involve the greatest construction disturbance area and duration, as this alternative would involve a new pump station and an ocean outfall to be installed under the beach and under the bed of the nearshore waters.

Alternative 6 would involve construction of a new channel with a concrete weir adjacent to the existing J Street Drain Lower Channel.

The other alternatives would have a similar level of construction disturbance and duration. Alternatives 1, 2, and 5 would require less disturbance for construction in comparison, but would still involve the installation of concrete dam footings and/or weirs at the project site. Alternative 4 would require installation of a short earthen levee and new drain outlets from the Hueneme Pump Station in the lagoon.

In summary, the alternatives are listed below in decreasing order of relative construction disturbance:

Alt. 3. - Ocean Outfall

Alt. 6. - Side Weir and Bypass Channel for High Flows

Alt. 1. - Two Inflatable Dams; Alt. 2. - Inflatable Dam and Permanent Weir; Alt. 5. - High Flow Bypass in the J Street Drain Channel with Levee Across Lagoon Connection

Alt. 4. - Earthen Levee Across Lagoon Connection (Preferred Alternative)

3.3 Operations and Maintenance Requirements

Each alternative would long-term operations and maintenance requirements. For example, the inflatable dams would require personnel to inflate and deflate them at the appropriate time. The channel to convey winter storm flows across the beach would require periodic excavation during the year to remove sand accumulating from wind.

The alternatives are listed below in decreasing order of relative operation and maintenance requirements:

Alt. 3. - Ocean Outfall

Alt. 1. - Two Inflatable Dams; Alt. 2. - Inflatable Dam and Permanent Weir

Alt. 6. - Side Weir and Bypass Channel for High Flows

Alt. 5. - High Flow Bypass in the J Street Drain Channel with Levee Across Lagoon Connection

Alt. 4. - Earthen Levee Across Lagoon Connection (Preferred Alternative)

3.4 Effect on Beach Access and Recreation

Public access to the project site occurs along the foot path on the top of the west bank of the J Street Drain Lower Channel, and across the beach seaward of the channel and the Ormond Beach Lagoon. Beach users at and east of the project site are typically hiking or strolling on the beach. Swimming and wading primarily occurs at the beaches to the west, in Hueneme Beach Park where there are lifeguards. Hence, the potential for the project to directly and adversely affect beach access and recreational activities is low. The primary impacts of each alternative is listed below in decreasing order of magnitude.

- Alternative 3. This alternative would involve a new pump station on the west side of J Street Drain Lower Channel, and as such, would require relocation of a popular path to the beach.
- Alternative 6. This alternative would involve a new channel on the west side of J Street Drain Lower Channel, and as such, would require relocation of a popular path to the beach, as above.
- Alternatives. 1, 2, 4, and 5. These alternatives would involve establishment and periodic maintenance of a channel across the upper dunes, which would affect travel patterns by beach users, but would not create a lateral beach barrier.

3.4 Habitat Impacts

The project alternatives would have varying effects on wetland, open water, and beach dune habitats. A summary of the habitat impacts from direct disturbance associated with project facilities is provided in Table 3. Installation of the inflatable dams and weirs would cause small and localized impacts to wetland and open water habitats at the project site. The establishment and maintenance of a channel across the beach dune area would affect a greater area of habitat. The construction of the pump station (Alternative 3) or the by-pass channel (Alternative 6) would affect beach dune scrub habitat. For several alternatives, the eroded and weedy banks of the J Street Drain Lower Channel would be stabilized and restored with native plants.

The alternatives are listed below in decreasing order of relative habitat impacts:

Alt. 3. - Ocean Outfall (due to impacts to nearshore marine habitats)

Alt. 1. - Two Inflatable Dams; Alt. 2. - Inflatable Dam and Permanent Weir

Alt. 5. - High Flow Bypass in the J Street Drain Channel with Levee Across Lagoon Connection

Alt. 4. - Earthen Levee Across Lagoon Connection (Preferred Alternative)

Alt. 6. - Side Weir and Bypass Channel for High Flows

3.5 Impacts to Endangered Species

The proposed project could affect two endangered species – the California least tern and tidewater goby. The former species would be affected if the water levels in the Ormond Beach Lagoon were significantly reduced in the summer when this species is foraging in the lagoon. As shown in Table 2, all project alternatives are designed to avoid a reduction in the amount of water discharged to the lagoon in the summer from J Street Drain and Hueneme Drain. Note that Alternative 4 would require the pumping of summer flows in the J Street Drain to the lagoon to maintain current levels of inflow to the lagoon, while other alternatives would provide these flows in a passive manner. Hence, no significant impact on foraging habitat for the least tern is anticipated from any of the project alternatives.

The endangered tidewater goby occurs in the Ormond Beach Lagoon and in the J Street Drain Lower Channel. As noted above, the proposed project would not affect water levels in the lagoon in the summer. The impact of reduced flows to the lagoon in the winter (for all alternatives, see Table 2) is expected to be negligible, and would not have a significant impact on gobies in the lagoon in the winter. In the winter, all alternatives would cause a reduction in the amount of water in the J Street Drain Lower Channel as storm

flows are conveyed to the ocean. However, the amount of water that is retained in the channel between storms would vary from little to 4 or 5 feet. The project alternatives are listed below in decreasing order of impact on the tidewater gobies in the J Street Drain Lower Channel under winter conditions:

Alt. 6. - Side Weir and Bypass Channel for High Flows

Alt. 2. - Inflatable Dam and Permanent Weir

Alt. 1. - Two Inflatable Dams; Alt. 3. - Ocean Outfall (due to impacts to nearshore marine habitats); Alt. 4. - Earthen Levee Across Lagoon Connection (Preferred Alternative) and Alt. 5. - High Flow Bypass in the J Street Drain Channel with Levee Across Lagoon Connection

The alternatives would have varying levels of impacts on the tidewater gobies residing in the J Street Drain Lower Channel in the summer. For some alternatives, the channel would be mostly dewatered in the summer by conveying flows to the beach. Other alternatives would allow for impoundment of water in the channel, although the amount may be slightly less than under current conditions.

The project alternatives are listed below in decreasing order of impact on the tidewater gobies in the J Street Drain Lower Channel under summer conditions:

Alt. 4. - Earthen Levee Across Lagoon Connection (Preferred Alternative) and Alt. 5. - High Flow Bypass in the J Street Drain Channel with Levee Across Lagoon Connection

Alt. 3. - Ocean Outfall; Alt. 1. - Two Inflatable Dams; Alt. 2. - Inflatable Dam and Permanent Weir; Alt. 6. - Side Weir and Bypass Channel for High Flows

4. Mitigation Needs and Issues

Temporary and permanent impacts to wetland, open water, and dune habitats associated with each alternative would require offsetting mitigation in the form of habitat restoration at the project site. The amount of restoration would be based on the impact level. Hence, the relative habitat mitigation requirements for the alternatives would follow the order for habitat impact described in Section 3.4.

Impacts to the tidewater goby would also need to be mitigated, although mitigation would only be applied once it has been demonstrated that the District has avoided impacts to this endangered species to the extent practicable. Alternatives 4 and 5 would essentially remove the existing goby habitat in the J Street Drain Lower Channel. Mitigation for this impact would be to create new open water habitat in the lagoon and provide inflows of freshwater from the Hueneme Drain and J Street Drain, as under current conditions. This mitigation can be incorporated into Alternatives 4 and 5.

Similarly, Alternatives 1 – 3 would remove gobies and their habitat during the winters with high storm flows, essentially causing the annual loss of this population. This impact could also be mitigated by creating new open water habitat in the Ormond Beach Lagoon that is suitable for gobies.

Alternative 6 would retain summer and winter habitats for the gobies, and as such, would have a lesser requirement for mitigation for gobies.

5. ENVIRONMENTAL REVIEW REQUIREMENTS

The proposed project would represent a discretionary action to be funded, designed, and constructed by the District. The project must be approved by the District Board of Directors. The project is subject to the environmental review requirements of CEQA. The appropriate environmental document would be an Environmental Impact Report (EIR) because the project alternatives would have the potential to cause one or more significant impacts, such as impacts to wetlands, endangered species, and coastal resources.

The project is not expected to require a separate environmental document under the National Environmental Policy Act (NEPA) because the project is not being funded or proposed by a federal agency, nor occur on federal lands. The federal agencies involved in permitting (see below) would rely on

the District's EIR to complete their requirements under NEPA without a separate document and public review process.

6. PERMITTING REQUIREMENTS AND ISSUES

All of the project alternatives would require the following permits:

1. Coastal Development Permit from the City of Oxnard, appealable to the California Coastal Commission
2. Coastal Development Permit from the City of Port Hueneme, appealable to the California Coastal Commission
3. Section 10 and 404 permits from the Corps of Engineers for the discharge of dredge or fill material into "waters of the United States" and wetlands
4. Section 1600 Streambed Alteration Agreement from the California Department of Fish and Game Section 401 water quality certification and possible NPDES discharge permit from the Los Angeles Regional Water Quality Control Board
5. Biological Opinion from the US Fish and Wildlife Service regarding protection of the goby, snowy plover, and least tern

The most challenging permit issues are listed below, which could affect the feasibility of acquiring permits:

- Use of beach outfall - inconsistency with Coastal Act policies which would precluded permitting for Alternative 3
- Use of hard structures on the beach – inconsistency with Coastal Act policies which may affect permitting for Alternatives 1 and 2
- Substantial impact to goby population in the J Street Drain Lower Channel – conflicts with federal endangered species act which requires avoidance to the extent possible. This impact may affect feasibility of all alternatives.

7. COMPARISON OF ALTERNATIVES

A comparison of the relative importance of the environmental and permitting issues for each alternative is provided in Table 5. Alternative 3, which involves the ocean outfall, has the highest ranking for environmental impacts and permitting issues. The project should be considered infeasible because it is highly unlikely that a coastal development permit would be issued for a structure under the beach and in the nearshore waters.

Alternative 4 has the lowest ranking compared to other alternatives because of the following main reasons: (1) it does not include concrete structures such as inflatable dam footings, weirs, or rip-rip; and (2) it does not include inflatable dams which require new operations and maintenance on the beach. Similar to other alternatives, it would have a significant impact on the endangered tidewater goby in the J Street Drain Lower Channel. This impact would be mitigated in a similar manner for this and other alternatives – creation of additional suitable open water habitat in the Ormond Beach Lagoon and the supply of suitable summer inflows from the Hueneme Drain and J Street Drain to maintain this habitat. This alternative can be constructed and operated without altering the overall hydrologic regime in the Ormond Beach Lagoon and Oxnard Industrial Drain. In addition, the cost of this alternative appears to lower than other alternatives, and it can be removed or readily modified at a later date if there are unintended impacts or other ways to improve its performance and reduce its environmental impacts.

TABLE 1
SUMMARY OF MAJOR PROJECT FEATURES FOR EACH ALTERNATIVE

Alternative	Proposed Modifications or Facilities			
	J Street Drain Lower Channel	Ormond Beach Lagoon	Beach	Other
1. Two Inflatable Dams	Inflatable dam at the terminus of lower channel to prevent outflow to beach in the summer (inflate in summer only). Stabilize banks with geotextiles.	Inflatable dam at the connection between the J Street Drain Lower Channel and the lagoon to prevent inflow to J Street Channel from lagoon in winter (inflate in winter only)	Channel excavated and maintained through the sand dunes at MHHW to convey winter flows (excavate in winter only)	Rip-rap would be placed on the downstream end of the inflatable dam at the beach outlet
2. Inflatable Dam and Permanent Weir	100-foot wide concrete weir at 4.5 foot elevation NGVD at the terminus of lower channel to regulate outflow to beach in the summer and winter. Stabilize banks with geotextiles.	Inflatable dam at the connection between the J Street Drain Lower Channel and the lagoon to prevent inflow to J Street Channel from lagoon in winter (inflate in winter only)	Channel excavated and maintained through the sand dunes at MHHW to convey winter flows (excavate in winter only)	Rip-rap would be placed on the downstream end of the weir at the beach outlet
3. Ocean Outfall	Install new pump station on the west bank of the channel and buried pipeline across the beach and nearshore waters to pump storm flows only (up to 1,775 cfs).	Inflatable dam at the connection between the J Street Drain Lower Channel and the lagoon to prevent inflow to J Street Channel from lagoon in winter (inflate in winter only)	Install pipeline under beach at a depth where it would not be exposed during winter storms	Install pipeline in nearshore waters at a depth where it would not be exposed during winter storms
4. Earthen Levee Across Lagoon Connection (Preferred Alternative)	Close Hueneme Drain Pump Station outlet pipes. Stabilize banks with geotextiles.	Construct earthen dam at the connection between the J Street Drain Lower Channel and the lagoon to prevent outflow to J Street Channel from lagoon in winter.	Channel excavated and maintained through the sand dunes at MHHW to convey winter flows (excavate in winter only)	Re-route Hueneme Drain pump discharge to lagoon.
5. High Flow Bypass in the J Street Drain Channel with Levee Across Lagoon Connection	100-foot wide concrete weir at 4.5 foot elevation NGVD immediately below pump station to divert summer low flows to lagoon and to regulate outflow to beach in the summer. Stabilize banks with geotextiles.	Construct earthen dam at the connection between the J Street Drain Lower Channel and the lagoon to prevent outflow from lagoon to the beach during the summer.	Channel excavated and maintained through the sand dunes at MHHW to convey winter flows (excavate in winter only).	
6. Side Weir and Bypass Channel for High Flows	Concrete weir on west bank at 5.5 feet NGVD to by-pass high	None	Channel excavated and maintained through the sand	

Alternative	Proposed Modifications or Facilities			
	J Street Drain Lower Channel	Ormond Beach Lagoon	Beach	Other
	winter flows. 300-foot long earthen channel west of J Street Lower Channel that discharges to the beach.		dunes at MHHW to convey winter flows (excavate in winter only)	

TABLE 2
SUMMARY OF MAJOR HYDROLOGIC ELEMENTS OF EACH ALTERNATIVE

Alternative	J Street Drain Lower Channel			Ormond Beach Lagoon		
	Change in Hydrologic Conditions	Summer Water Level Lower?	Winter Water Level Lower?	Change in Hydrologic Conditions	Summer Inflow to Lagoon?	Winter Inflow to Lagoon?
1. Two Inflatable Dams	No change in summer. Channel is opened to the ocean during the winter. Hence, water depth is low in winter.	No	Yes	No change in summer. No connection in winter, so J Street flows don't enter lagoon	No change	Slight reduction
2. Inflatable Dam and Permanent Weir	Channel is open to the ocean all year at 4.5 foot elevation. Water maintained at this depth all year.	No	Slightly	No change in summer. No connection in winter, so J Street flows don't enter lagoon	No change	Slight reduction
3. Ocean Outfall	No change in summer. Water level in channel in the winter is lowered by pumping.	No	Yes	No change in summer. No connection in winter, so J Street flows don't enter lagoon	No change	Slight reduction
4. Earthen Levee Across Lagoon Connection (Preferred Alternative)	Channel water level is low in the summer and fall; permanently separated from lagoon	Yes	Yes	Construct earthen dam at the connection between the J Street Drain Lower Channel and the lagoon to prevent outflow to J Street Channel from lagoon in winter.	Slight reduction; can be mitigated by pumping J Street summer flows to lagoon	Slight reduction
5. High Flow Bypass in the J Street Drain Channel with Levee Across Lagoon Connection	Channel is reduced in length/size and water level lowered in summer.	Yes	Yes	Construct earthen dam at the connection between the J Street Drain Lower Channel and the lagoon to prevent outflow from lagoon to the beach during the summer.	No change	Slight reduction
6. Side Weir and Bypass Channel for High Flows	Channel is open to the ocean all year at 5.5 foot elevation. Water maintained at this depth all year.	No	No	None	No change	Slight reduction

TABLE 3
SUMMARY OF MAJOR HABITAT IMPACTS FOR EACH ALTERNATIVE

Alternative	J Street Drain Lower Channel		Beach Impacts	Other Habitat Impacts?	Habitat Improvements?
	Wetland Impacts	Open Water Impacts			
1. Two Inflatable Dams	1,000 SF for four dam footings	1,400 SF for two dams	5,000 SF dune habitat 9,000 SF open beach		Restore 950 LF of banks with native vegetation and geotextiles
2. Inflatable Dam and Permanent Weir	500 SF for two dam footings; 1,000 SF for weir and rip-rap	700 SF for one dam	5,000 SF dune habitat 9,000 SF open beach		Restore 950 LF of banks with native vegetation and geotextiles
3. Ocean Outfall	None	None		2,000 SF dune scrub for pump station; 1,000s SF for pipeline under beach and nearshore waters	
4. Earthen Levee Across Lagoon Connection (Preferred Alternative)	None	700 SF for levee	5,000 SF dune habitat 9,000 SF open beach		Restore 950 LF of banks with native vegetation and geotextiles
5. High Flow Bypass in the J Street Drain Channel with Levee Across Lagoon Connection	1,000 SF for weir to lagoon and weir in J Street channel	700 SF for levee	5,000 SF dune habitat 9,000 SF open beach		Restore 950 LF of banks with native vegetation and geotextiles
6. Side Weir and Bypass Channel for High Flows	None	None	5,000 SF dune habitat 9,000 SF open beach	10,000 SF dune scrub habitat for new channel	

TABLE 4
COMPARISON OF RELATIVE BIOLOGICAL IMPACTS FOR THE ALTERNATIVES

7.1.1 Alternative	J Street Drain Lower Channel		Beach Impacts	Other Habitat Impacts?	J Street Drain Lower Channel		Total
	Wetland Impacts	Open Water Impacts			Impacts to Gobies in the Summer	Impacts to Gobies in the Winter	
1. Two Inflatable Dams	2	3	1	0	0	3	9
2. Inflatable Dam and Permanent Weir	3	2	1	0	0	3	9
3. Ocean Outfall	0	0	0	3*	0	3	6*
4. Earthen Levee Across Lagoon Connection (Preferred Alternative)	0	2	1	0	3	3	9
5. High Flow Bypass in the J Street Drain Channel with Levee Across Lagoon Connection	2	2	1	0	3	2	10
6. Side Weir and Bypass Channel for High Flows	0	0	1	3	0	2	6

* Impacts to nearshore marine habitats would be extensive and significantly beyond the scale of this ranking system.
Scores: High values = high impacts (unfavorable). Low values = low impact (favorable). Scores of 1 to 3 were assigned to alternative in each column.

TABLE 5
COMPARISON OF RELATIVE ENVIRONMENTAL IMPACTS AND ISSUES FOR THE ALTERNATIVES

Alternative	Construction Impacts	Operations and Maintenance Requirements	Public Access and Recreation	Habitat Impacts	Endangered Species Impacts	Permitting Issues	Total
1. Two Inflatable Dams	2	4	1	4	2	2	15
2. Inflatable Dam and Permanent Weir	2	4	1	4	2	2	15
3. Ocean Outfall	4	5	3	5	2	3	22
4. Earthen Levee Across Lagoon Connection (Preferred Alternative)	1	1	1	2	2	1	8
5. High Flow Bypass in the J Street Drain Channel with Levee Across Lagoon Connection	2	2	1	3	2	1	11
6. Side Weir and Bypass Channel for High Flows	3	3	2	1	1	1	11

Scores: High values = high impacts (unfavorable). Low values = low impact (favorable). The ranking scores were assigned based on the number of rankings for each category, as presented in the text.

Appendix B

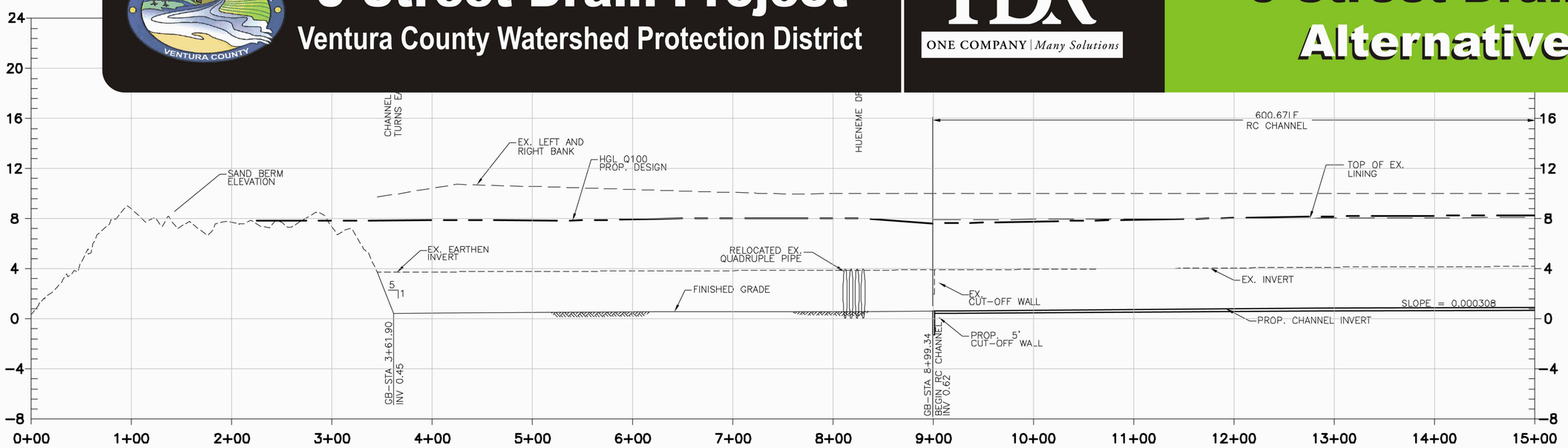
30% Complete Design Drawings

J Street Drain Project

Ventura County Watershed Protection District

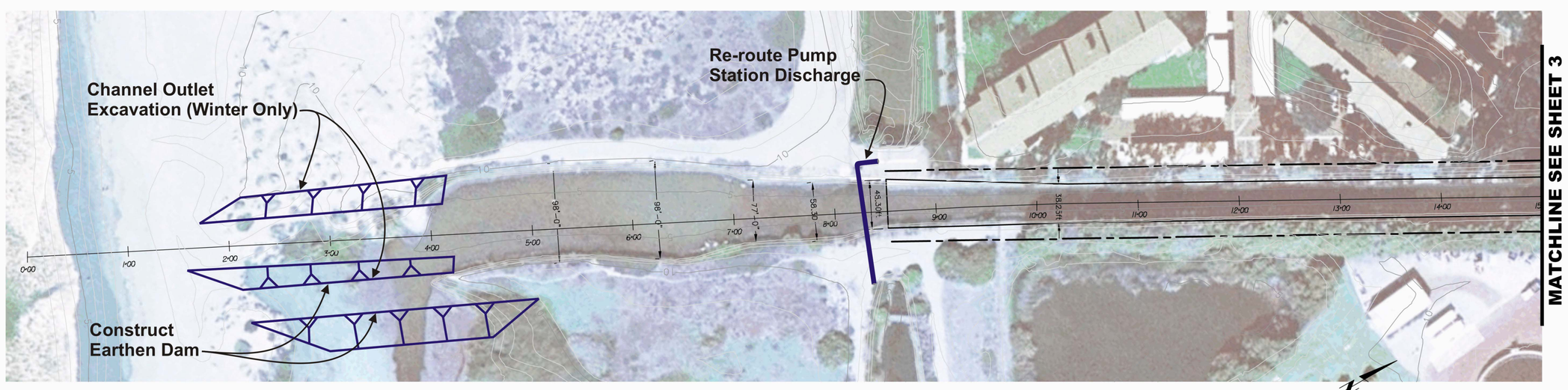
HDR ONE COMPANY | Many Solutions

J Street Drain Outlet Alternative No. 4



PROFILE

SCALE: HORIZONTAL 1" = 50'
VERTICAL 1" = 4'



PLAN

SCALE: 1" = 50'

REVISION	DESCRIPTION	APP.	DATE
D			
C			
B			
A			
△			

URS
2020 East First Street, Suite 400
Santa Ana, CA 92705
TEL: (714) 835-6686
FAX: (714) 973-4086

DESIGNED_____ DRAWN_____ CHECKED_____
PROJ. ENG._____ RECOMMENDED_____
REG. NO._____ DATE_____ APPROVED_____

COUNTY OF VENTURA - PUBLIC WORKS AGENCY
VENTURA COUNTY WATERSHED PROTECTION DISTRICT

SPEC. NO. SPEC
PROJ. NO. PROJ#

"J" STREET DRAIN CHANNEL IMPROVEMENT DESIGN
30% COMPLETION PRELIMINARY DESIGN
PLAN AND PROFILE STA. 0+00 TO STA. 15+00

SHEET 2 OF 12
DRAWING NO.

Appendix C

HEC-RAS Model Summary of Existing Channel

HEC-RAS Model Output for J-Street Drain

Existing Condition		(100-yr Flood)						
River Sta	Q	Min Ch	Water	Bank	Channel	As-built Chn	As-built Chn	Channel
	Total	Elevation	Surf. Elev.	Elevation	Velocity	Bottom Width	Top Width	Froude #
(ft)	(cfs)	(ft)	(ft)	(ft)	(ft/s)	(ft)	(ft)	
12855	880	19.88	24.49	23.88	7.95	19.5	27.75	0.73
12390	880	19.12	23.91	23.12	7.3	19.5	27.75	0.66
11925	880	18.4	23.86	22.4	5.49	19.5	27.75	0.46
11900	958	18.35	23.79	22.35	5.82	25	26	0.46
11899	Teakwood St							
11850	958	18.27	23.22	22.27	7.05	25	26	0.59
11825	958	18.23	22.89	22.23	8.19	25	26	0.76
11725	958	18.08	22.79	22.08	8.01	19.5	29.25	0.74
11325	958	17.45	21.94	21.45	8.89	19.5	29.25	0.84
10925	958	16.82	21.61	20.82	7.72	19.5	29.25	0.7
10525	958	16.19	21.54	20.19	6.05	19.5	29.25	0.51
10253	958	15.76	21.51	19.76	5.2	19.5	29.25	0.42
10228.5	958	15.72	21.47	19.72	5.49	22.5	22.5	0.41
10228	Yucca St							
10187	958	15.62	20.77	19.62	6.88	22.5	22.5	0.54
10162	1036	15.58	20.57	19.58	7.62	19.5	29.25	0.68
10125	1036	15.52	20.55	19.52	7.48	19.5	29.25	0.66
10070	1036	15.45	20.51	19.45	7.4	19.5	29.25	0.65
9621.7	1036	14.89	20.32	18.89	6.35	19.5	29.25	0.53
9173.4	1036	14.32	20.22	18.32	5.34	19.5	29.25	0.43
8725	1036	13.76	20.16	17.76	4.55	19.5	29.25	0.35
8469	1036	13.41	20.13	17.41	4.14	19.5	29.25	0.31
8444	1036	13.38	20.12	17.38	4.35	22.5	22.5	0.3
8443	Bard Rd							
8375	1036	13.35	19.56	17.35	5.1	22.5	22.5	0.36
8350	1605	13.31	18.77	17.31	8.8	23	32.75	0.73

Existing Condition		(100-yr Flood)						
River Sta	Q	Min Ch	Water	Bank	Channel	As-built Chn	As-built Chn	Channel
	Total	Elevation	Surf. Elev.	Elevation	Velocity	Bottom Width	Top Width	Froude #
(ft)	(cfs)	(ft)	(ft)	(ft)	(ft/s)	(ft)	(ft)	
8008.4	1605	12.84	18.55	16.84	8.04	23	32.75	0.65
7666.7	1605	12.36	18.42	16.36	7.16	23	32.75	0.56
7325	1605	11.89	18.34	15.89	6.39	23	32.75	0.48
6925	1605	11.34	18.26	15.34	5.61	23	32.75	0.4
6525	1605	10.78	18.22	14.78	4.95	23	32.75	0.34
6425	1605	10.64	18.23	14.64	4.51	23	32.75	0.31
6161	1605	10.27	18.21	14.27	4.19	23	32.75	0.28
6136	1775	10.24	18.15	14.24	4.72	31	31	0.3
6135	Pleasant Valley							
6094	1775	10.21	16.42	14.21	7.08	31	31	0.51
6069	1775	10.19	16.4	14.19	7.05	26	35.75	0.54
5659	1775	9.65	16.3	13.65	6.24	26	35.75	0.46
5249	1775	9.11	16.23	13.11	5.54	26	35.75	0.39
4839	1775	8.57	16.18	12.57	4.96	26	35.75	0.34
4814	1775	8.53	16.18	12.53	4.98	31	31	0.32
4813	Clara							
4772	1775	8.48	15.98	12.48	5.14	31	31	0.33
4747	1775	8.45	15.98	12.45	5.05	26	35.75	0.35
4347.7	1775	7.95	15.94	11.95	4.59	26	35.75	0.3
3948.4	1775	7.44	15.91	11.44	4.18	26	35.75	0.27
3549	1775	6.94	15.89	10.94	3.85	26	35.75	0.24
3524	1775	6.91	15.88	10.91	3.88	31	31	0.23
3523	Hueneme Rd							
3432	1775	6.79	15.09	10.79	4.37	31	31	0.27
3407	1775	6.76	14.79	10.76	5.78	28.5	38.25	0.38
3325	1775	6.67	14.78	10.67	5.71	28.5	38.25	0.37
2971.5	1775	6.27	14.73	10.26	5.42	28.5	38.25	0.35
2618	1775	5.86	14.69	9.86	5.14	28.5	38.25	0.32

Existing Condition		(100-yr Flood)						
River Sta	Q	Min Ch	Water	Bank	Channel	As-built Chn	As-built Chn	Channel
	Total	Elevation	Surf. Elev.	Elevation	Velocity	Bottom Width	Top Width	Froude #
(ft)	(cfs)	(ft)	(ft)	(ft)	(ft/s)	(ft)	(ft)	
2593	1775	4.83	14.75	9.83	4.45	36	36	0.25
2592	Railroad							
2521	1775	4.4	11.66	9.4	6.41	36	36	0.42
2496	1775	4.39	11.64	8.39	6.58	28.5	38.25	0.46
2125	1775	4.28	11.48	8.28	6.64	28.5	38.25	0.47
2045	1775	4.25	11.45	8.25	6.65	28.5	38.25	0.47
1920	1775	4.21	11.39	8.21	6.66	28.5	38.25	0.47
1795	1775	4.18	11.33	8.18	6.7	28.5	38.25	0.47
1670	1775	4.14	11.28	8.14	6.72	28.5	38.25	0.47
1285	1775	4.02	11.09	8.02	6.8	28.5	38.25	0.48
900	2059	3.9	10.26	7.9	9.06	28.5	38.25	0.68
825	2059	3.88	10.87	9.77	3.87	59	91	0.28
725	2059	3.85	10.86	10.01	3.35	77	97	0.24
625	2059	3.82	10.82	10.25	3.34	79	98	0.23
525	2059	3.78	10.7	10.49	3.9	59	98	0.3
425	2059	3.75	10.75	10.73	2.53	79	146.4	0.19
325	2059	3.72	10.72	9.43	2.66	79	146.4	0.19
225	2059	3.69	10.68	10.12	2.76	79	146.4	0.2
0	Beach edge							

Appendix D

HEC-RAS Model Summary of Improved Channel

HEC-RAS Model Output for J-Street Drain
Proposed Rectangular Channel Design
(100-yr flood)

River Sta	Q	Min Ch	Water	Bank	Channel	Wetted Chnl	Channel
	Total	Elevation	Surf. Elev.	Elevation	Velocity	Top Width	Froude #
(ft)	(cfs)	(ft)	(ft)	(ft)	(ft/s)	(ft)	
12855	880	17.94	21.99	23.88	7.83	27.75	0.69
12390	880	17.1	21.56	23.12	7.11	27.75	0.59
11925	880	16.27	21.28	22.4	6.32	27.75	0.5
11900	958	16.22	21.22	22.35	6.56	29.25	0.52
11899	Teakwood St						
11850	958	16.13	20	22.27	8.47	29.25	0.76
11825	958	16.09	19.96	22.23	8.46	29.25	0.76
11725	958	15.91	19.8	22.08	8.4	29.25	0.75
11325	958	15.19	19.28	21.45	8	29.25	0.7
10925	958	14.47	18.89	20.82	7.41	29.25	0.62
10525	958	13.75	18.61	20.19	6.73	29.25	0.54
10253	958	13.26	18.48	19.76	6.27	29.25	0.48
10228.5	958	13.21	18.47	19.72	6.23	29.25	0.48
10228	Yucca St						
10187	958	13.14	17.75	19.62	7.1	29.25	0.58
10162	1036	13.09	17.46	19.58	8.12	29.25	0.68
10125	1036	13.03	17.41	19.52	8.08	29.25	0.68
10070	1036	12.93	17.35	19.45	8.01	29.25	0.67
9621.7	1036	12.12	16.97	18.89	7.31	29.25	0.58
9173.4	1036	11.31	16.71	18.32	6.56	29.25	0.5
8725	1036	10.51	16.54	17.76	5.87	29.25	0.42
8469	1036	10.05	16.46	17.41	5.52	29.25	0.38
8444	1036	10	16.53	17.38	4.84	32.75	0.33
8443	Bard Rd						
8375	1036	9.9	16.24	17.35	4.99	32.75	0.35

River Sta	Q	Min Ch	Water	Bank	Channel	Wetted Chnl	Channel
	Total	Elevation	Surf. Elev.	Elevation	Velocity	Top Width	Froude #
(ft)	(cfs)	(ft)	(ft)	(ft)	(ft/s)	(ft)	
8350	1605	9.86	15.22	17.31	9.14	32.75	0.7
8008.4	1605	9.35	14.82	16.84	8.96	32.75	0.68
7666.7	1605	8.84	14.45	16.36	8.72	32.75	0.65
7325	1605	8.32	14.13	15.89	8.43	32.75	0.62
6925	1605	7.72	13.82	15.34	8.04	32.75	0.57
6525	1605	7.12	13.56	14.78	7.62	32.75	0.53
6425	1605	6.97	13.63	14.64	6.75	35.75	0.46
6161	1605	6.58	13.53	14.27	6.46	35.75	0.43
6136	1775	6.54	13.31	14.24	7.34	35.75	0.5
6135	Pleasant Valley						
6094	1775	6.48	12.27	14.21	8.56	35.75	0.63
6069	1775	6.44	12.25	14.19	8.54	35.75	0.62
5659	1775	5.82	11.93	13.65	8.13	35.75	0.58
5249	1775	5.21	11.67	13.11	7.68	35.75	0.53
4839	1775	4.59	11.46	12.57	7.23	35.75	0.49
4814	1775	4.56	11.45	12.53	7.2	35.75	0.48
4813	Clara						
4772	1775	4.49	10.54	12.48	8.21	35.75	0.59
4747	1775	4.46	10.52	12.45	8.19	35.75	0.59
4347.7	1775	3.86	10.26	11.95	7.76	35.75	0.54
3948.4	1775	3.26	10.04	11.44	7.32	35.75	0.5
3549	1775	2.66	9.87	10.94	6.88	35.75	0.45
3524	1775	2.62	9.94	10.91	6.34	38.25	0.41
3523	Hueneme Rd						
3432	1775	2.48	9.37	10.79	6.74	38.25	0.45
3407	1775	2.45	9.35	10.76	6.72	38.25	0.45
3325	1775	2.32	9.33	10.67	6.63	38.25	0.44
2971.5	1775	1.79	9.21	10.26	6.25	38.25	0.4
2618	1775	1.26	9.12	9.86	5.9	38.25	0.37

River Sta	Q	Min Ch	Water	Bank	Channel	Wetted Chnl	Channel
	Total	Elevation	Surf. Elev.	Elevation	Velocity	Top Width	Froude #
(ft)	(cfs)	(ft)	(ft)	(ft)	(ft/s)	(ft)	
2593	1775	1.22	9.12	9.83	5.88	38.25	0.37
2592	Railroad						
2521	1775	1.12	8.68	9.4	6.14	38.25	0.39
2496	1775	1.11	8.67	8.39	6.14	42	0.39
2125	1775	1	8.51	8.28	6.17	42	0.4
2045	1775	0.97	8.48	8.25	6.18	42	0.4
1920	1775	0.93	8.42	8.21	6.19	42	0.4
1795	1775	0.89	8.37	8.18	6.2	42	0.4
1670	1775	0.85	8.32	8.14	6.22	42	0.4
1285	1775	0.74	8.15	8.02	6.26	42	0.41
900	2059	0.62	7.59	7.9	7.72	38.25	0.52
825	2059	0.59	8	8.77	4.06	85.64	0.29
725	2059	0.59	8.01	10.01	3.4	88.99	0.23
625	2059	0.56	7.97	10.25	3.36	89.15	0.23
525	2059	0.5	7.79	10.49	4.28	78.09	0.3
425	2059	0.47	7.86	10.73	2.78	123.48	0.2
325	2059	0.44	7.83	9.43	2.85	117.59	0.2
225	2059	0.41	7.79	10.12	2.91	112.9	0.2
0	Beach edge						

HEC-RAS Model Output for J-Street Drain
Proposed Rectangular Channel Design
(50-yr flood)

River Sta	Q	Min Ch	Water	Bank	Channel	Wetted Chnl	Channel
	Total	Elevation	Surf. Elev.	Elevation	Velocity	Top Width	Froude #
(ft)	(cfs)	(ft)	(ft)	(ft)	(ft/s)	(ft)	
12855	723	17.94	21.44	23.88	7.44	27.75	0.7
12390	723	17.1	20.99	23.12	6.7	27.75	0.6
11925	723	16.27	20.71	22.4	5.86	27.75	0.49
11900	796	16.22	20.63	22.35	6.17	29.25	0.52
11899	Teakwood St						
11850	796	16.13	19.51	22.27	8.05	29.25	0.77
11825	796	16.09	19.47	22.23	8.04	29.25	0.77
11725	796	15.91	19.3	22.08	8.01	29.25	0.77
11325	796	15.19	18.72	21.45	7.7	29.25	0.72
10925	796	14.47	18.28	20.82	7.14	29.25	0.64
10525	796	13.75	17.98	20.19	6.43	29.25	0.55
10253	796	13.26	17.84	19.76	5.94	29.25	0.49
10228.5	796	13.21	17.83	19.72	5.9	29.25	0.48
10228	Yucca St						
10187	796	13.14	17.17	19.62	6.76	29.25	0.59
10162	869	13.09	16.84	19.58	7.94	29.25	0.72
10125	869	13.03	16.78	19.52	7.91	29.25	0.72
10070	869	12.93	16.71	19.45	7.86	29.25	0.71
9621.7	869	12.12	16.25	18.89	7.2	29.25	0.62
9173.4	869	11.31	15.95	18.32	6.41	29.25	0.52
8725	869	10.51	15.76	17.76	5.66	29.25	0.44
8469	869	10.05	15.68	17.41	5.27	29.25	0.39
8444	869	10	15.74	17.38	4.62	32.75	0.34
8443	Bard Rd						
8375	869	9.9	15.47	17.35	4.76	32.75	0.36
8350	1337	9.86	14.54	17.31	8.72	32.75	0.71

River Sta	Q	Min Ch	Water	Bank	Channel	Wetted Chnl	Channel
	Total	Elevation	Surf. Elev.	Elevation	Velocity	Top Width	Froude #
(ft)	(cfs)	(ft)	(ft)	(ft)	(ft/s)	(ft)	
8008.4	1337	9.35	14.11	16.84	8.58	32.75	0.69
7666.7	1337	8.84	13.71	16.36	8.37	32.75	0.67
7325	1337	8.32	13.36	15.89	8.1	32.75	0.64
6925	1337	7.72	13.02	15.34	7.71	32.75	0.59
6525	1337	7.12	12.74	14.78	7.26	32.75	0.54
6425	1337	6.97	12.8	14.64	6.42	35.75	0.47
6161	1337	6.58	12.7	14.27	6.11	35.75	0.43
6136	1485	6.54	12.49	14.24	6.98	35.75	0.5
6135	Pleasant Valley						
6094	1485	6.48	11.49	14.21	8.29	35.75	0.65
6069	1485	6.44	11.46	14.19	8.27	35.75	0.65
5659	1485	5.82	11.1	13.65	7.87	35.75	0.6
5249	1485	5.21	10.81	13.11	7.41	35.75	0.55
4839	1485	4.59	10.59	12.57	6.93	35.75	0.5
4814	1485	4.56	10.58	12.53	6.9	35.75	0.5
4813	Clara						
4772	1485	4.49	9.67	12.48	8.03	35.75	0.62
4747	1485	4.46	9.65	12.45	8	35.75	0.62
4347.7	1485	3.86	9.34	11.95	7.57	35.75	0.57
3948.4	1485	3.26	9.11	11.44	7.1	35.75	0.52
3549	1485	2.66	8.92	10.94	6.63	35.75	0.47
3524	1479	2.62	8.98	10.91	6.08	38.25	0.42
3523	Hueneme Rd						
3432	1479	2.48	8.44	10.79	6.5	38.25	0.47
3407	1479	2.45	8.42	10.76	6.47	38.25	0.47
3325	1479	2.32	8.39	10.67	6.37	38.25	0.46
2971.5	1479	1.79	8.27	10.26	5.96	38.25	0.41
2618	1479	1.26	8.18	9.86	5.59	38.25	0.37
2593	1479	1.22	8.17	9.83	5.56	38.25	0.37

River Sta	Q	Min Ch	Water	Bank	Channel	Wetted Chnl	Channel
	Total	Elevation	Surf. Elev.	Elevation	Velocity	Top Width	Froude #
(ft)	(cfs)	(ft)	(ft)	(ft)	(ft/s)	(ft)	
2592	Railroad						
2521	1479	1.12	7.78	9.4	5.8	38.25	0.4
2496	1479	1.11	7.77	8.39	5.81	38.25	0.4
2125	1479	1	7.61	8.28	5.85	38.25	0.4
2045	1479	0.97	7.57	8.25	5.86	38.25	0.4
1920	1479	0.93	7.52	8.21	5.87	38.25	0.4
1795	1479	0.89	7.46	8.18	5.89	38.25	0.4
1670	1479	0.85	7.4	8.14	5.9	38.25	0.41
1285	1479	0.74	7.22	8.02	5.96	38.25	0.41
900	1649	0.62	6.79	7.9	6.98	38.25	0.49
825	1649	0.59	7.12	8.77	3.8	79.44	0.29
725	1649	0.59	7.12	10.01	3.13	86.33	0.22
625	1649	0.56	7.08	10.25	3.09	86.5	0.22
525	1649	0.5	6.93	10.49	3.96	70.71	0.29
425	1649	0.47	6.98	10.73	2.6	116.4	0.2
325	1649	0.44	6.95	9.43	2.65	111.95	0.2
225	1649	0.41	6.91	10.12	2.7	108.85	0.2
0	Beach edge						

HEC-RAS Model Output for J-Street Drain
Proposed Rectangular Channel Design
(10-yr flood)

River Sta	Q	Min Ch	Water	Bank	Channel	Wetted Chnl	Channel
	Total	Elevation	Surf. Elev.	Elevation	Velocity	Top Width	Froude #
(ft)	(cfs)	(ft)	(ft)	(ft)	(ft/s)	(ft)	
12855	555	17.94	20.8	23.88	7	27.75	0.73
12390	555	17.1	20.28	23.12	6.3	27.75	0.62
11925	555	16.27	19.99	22.4	5.38	27.75	0.49
11900	611	16.22	19.92	22.35	5.65	29.25	0.52
11899	Teakwood St						
11850	611	16.13	18.95	22.27	7.41	29.25	0.78
11825	611	16.09	18.91	22.23	7.4	29.25	0.78
11725	611	15.91	18.73	22.08	7.39	29.25	0.78
11325	611	15.19	18.08	21.45	7.23	29.25	0.75
10925	611	14.47	17.55	20.82	6.77	29.25	0.68
10525	611	13.75	17.21	20.19	6.03	29.25	0.57
10253	611	13.26	17.06	19.76	5.5	29.25	0.5
10228.5	611	13.21	17.05	19.72	5.45	29.25	0.49
10228	Yucca St						
10187	611	13.14	16.45	19.62	6.31	29.25	0.61
10162	667	13.09	16.13	19.58	7.5	29.25	0.76
10125	667	13.03	16.07	19.52	7.49	29.25	0.76
10070	667	12.93	15.98	19.45	7.47	29.25	0.75
9621.7	667	12.12	15.4	18.89	6.96	29.25	0.68
9173.4	667	11.31	15.03	18.32	6.14	29.25	0.56
8725	667	10.51	14.81	17.76	5.3	29.25	0.45
8469	667	10.05	14.73	17.41	4.87	29.25	0.4
8444	667	10	14.78	17.38	4.26	32.75	0.34
8443	Bard Rd						
8375	667	9.9	14.55	17.35	4.38	32.75	0.36
8350	1026	9.86	13.75	17.31	8.06	32.75	0.72

8008.4	1026	9.35	13.28	16.84	7.96	32.75	0.71
7666.7	1026	8.84	12.85	16.36	7.8	32.75	0.69
7325	1026	8.32	12.47	15.89	7.55	32.75	0.65
6925	1026	7.72	12.1	15.34	7.15	32.75	0.6
6525	1026	7.12	11.81	14.78	6.68	32.75	0.54
6425	1026	6.97	11.86	14.64	5.88	35.75	0.47
6161	1026	6.58	11.76	14.27	5.54	35.75	0.43
6136	1150	6.54	11.57	14.24	6.4	35.75	0.5
6135	Pleasant Valley						
6094	1150	6.48	10.73	14.21	7.56	35.75	0.65
6069	1150	6.44	10.71	14.19	7.54	35.75	0.64
5659	1150	5.82	10.37	13.65	7.08	35.75	0.59
5249	1150	5.21	10.11	13.11	6.57	35.75	0.52
4839	1150	4.59	9.92	12.57	6.04	35.75	0.46
4814	1150	4.56	9.9	12.53	6.02	35.75	0.46
4813	Clara						
4772	1150	4.49	9.33	12.48	6.65	35.75	0.53
4747	1150	4.46	9.31	12.45	6.62	35.75	0.53
4347.7	1150	3.86	9.12	11.95	6.12	35.75	0.47
3948.4	1150	3.26	8.97	11.44	5.63	35.75	0.41
3549	1150	2.66	8.86	10.94	5.18	35.75	0.37
3524	1145	2.62	8.9	10.91	4.77	38.25	0.34
3523	Hueneme Rd						
3432	1145	2.48	8.62	10.79	4.88	38.25	0.35
3407	1145	2.45	8.62	10.76	4.85	38.25	0.34
3325	1145	2.32	8.6	10.67	4.77	38.25	0.34
2971.5	1145	1.79	8.54	10.26	4.44	38.25	0.3
2618	1145	1.26	8.49	9.86	4.14	38.25	0.27
2593	1145	1.22	8.49	9.83	4.12	38.25	0.27
2592	Railroad						
2521	1145	1.12	8.31	9.4	4.16	38.25	0.27
2496	1145	1.11	8.31	8.39	4.16	38.25	0.27

2125	1145	1	8.24	8.28	4.13	38.25	0.27
2045	1145	0.97	8.22	8.25	4.13	38.25	0.27
1920	1145	0.93	8.2	8.21	4.12	38.25	0.27
1795	1145	0.89	8.17	8.18	4.11	38.25	0.27
1670	1145	0.85	8.15	8.14	4.1	42	0.27
1285	1145	0.74	8.08	8.02	4.07	42	0.26
900	1277	0.62	7.93	7.9	4.56	42	0.3
825	1277	0.59	8.07	8.77	2.49	86.12	0.18
725	1277	0.59	8.07	10.01	2.09	89.26	0.14
625	1277	0.56	8.06	10.25	2.06	89.43	0.14
525	1277	0.5	8	10.49	2.57	79.84	0.18
425	1277	0.47	8.03	10.73	1.68	124.76	0.12
325	1277	0.44	8.01	9.43	1.72	119.06	0.12
225	1277	0.41	8	10.12	1.74	113.85	0.12
0	Beach edge						

HEC-RAS Model Output for J-Street Drain
Proposed Rectangular Channel Design
(2-yr flood)

River Sta	Q	Minimum Ch	Water	Bank	Channel	Wetted Chnl	Channel
	Total	Elevation	Surf. Elev.	Elevation	Velocity	Top Width	Froude #
(ft)	(cfs)	(ft)	(ft)	(ft)	(ft/s)	(ft)	
12855	239	17.94	19.54	23.88	5.38	27.75	0.75
12390	239	17.1	18.76	23.12	5.19	27.75	0.71
11925	239	16.27	18.38	22.4	4.07	27.75	0.49
11900	263	16.22	18.34	22.35	4.25	29.25	0.52
11899	Teakwood St						
11850	263	16.13	17.78	22.27	5.46	29.25	0.75
11825	263	16.09	17.73	22.23	5.46	29.25	0.75
11725	263	15.91	17.55	22.08	5.46	29.25	0.75
11325	263	15.19	16.83	21.45	5.46	29.25	0.75
10925	263	14.47	16.12	20.82	5.43	29.25	0.74
10525	263	13.75	15.6	20.19	4.84	29.25	0.63
10253	263	13.26	15.41	19.76	4.18	29.25	0.5
10228.5	263	13.21	15.39	19.72	4.12	29.25	0.49
10228	Yucca St						
10187	263	13.14	15.03	19.62	4.75	29.25	0.61
10162	287	13.09	14.84	19.58	5.62	29.25	0.75
10125	287	13.03	14.77	19.52	5.62	29.25	0.75
10070	287	12.93	14.67	19.45	5.63	29.25	0.75
9621.7	287	12.12	13.86	18.89	5.66	29.25	0.76
9173.4	287	11.31	13.14	18.32	5.38	29.25	0.7
8725	287	10.51	12.77	17.76	4.34	29.25	0.51
8469	287	10.05	12.66	17.41	3.75	29.25	0.41
8444	287	10	12.69	17.38	3.26	32.75	0.35
8443	Bard Rd						
8375	287	9.9	12.55	17.35	3.3	32.75	0.36
8350	442	9.86	12.1	17.31	6.03	32.75	0.71

River Sta	Q	Minimum Ch	Water	Bank	Channel	Wetted Chnl	Channel
	Total	Elevation	Surf. Elev.	Elevation	Velocity	Top Width	Froude #
(ft)	(cfs)	(ft)	(ft)	(ft)	(ft/s)	(ft)	
8008.4	442	9.35	11.59	16.84	6.02	32.75	0.71
7666.7	442	8.84	11.08	16.36	6.01	32.75	0.71
7325	442	8.32	10.58	15.89	5.97	32.75	0.7
6925	442	7.72	10.05	15.34	5.79	32.75	0.67
6525	442	7.12	9.64	14.78	5.36	32.75	0.59
6425	442	6.97	9.63	14.64	4.65	35.75	0.5
6161	442	6.58	9.51	14.27	4.21	35.75	0.43
6136	487	6.54	9.42	14.24	4.73	35.75	0.49
6135	Pleasant Valley						
6094	487	6.48	8.98	14.21	5.44	35.75	0.6
6069	487	6.44	8.96	14.19	5.4	35.75	0.6
5659	487	5.82	8.69	13.65	4.76	35.75	0.5
5249	487	5.21	8.53	13.11	4.1	35.75	0.4
4839	487	4.59	8.43	12.57	3.55	35.75	0.32
4814	487	4.56	8.43	12.53	3.52	35.75	0.31
4813	Clara						
4772	487	4.49	8.29	12.48	3.59	35.75	0.32
4747	487	4.46	8.29	12.45	3.56	35.75	0.32
4347.7	487	3.86	8.23	11.95	3.12	35.75	0.26
3948.4	487	3.26	8.19	11.44	2.76	35.75	0.22
3549	487	2.66	8.16	10.94	2.47	35.75	0.19
3524	485	2.62	8.17	10.91	2.28	38.25	0.17
3523	Hueneme Rd						
3432	485	2.48	8.12	10.79	2.25	38.25	0.17
3407	485	2.45	8.12	10.76	2.24	38.25	0.17
3325	485	2.32	8.11	10.67	2.19	38.25	0.16
2971.5	485	1.79	8.1	10.26	2.01	38.25	0.14
2618	485	1.26	8.09	9.86	1.86	38.25	0.13
2593	485	1.22	8.09	9.83	1.85	38.25	0.12

River Sta	Q	Minimum Ch	Water	Bank	Channel	Wetted Chnl	Channel
	Total	Elevation	Surf. Elev.	Elevation	Velocity	Top Width	Froude #
(ft)	(cfs)	(ft)	(ft)	(ft)	(ft/s)	(ft)	
2592	Railroad						
2521	485	1.12	8.06	9.4	1.83	38.25	0.12
2496	485	1.11	8.05	8.39	1.83	38.25	0.12
2125	485	1	8.04	8.28	1.8	38.25	0.12
2045	485	0.97	8.04	8.25	1.79	38.25	0.12
1920	485	0.93	8.03	8.21	1.79	38.25	0.12
1795	485	0.89	8.03	8.18	1.78	38.25	0.12
1670	485	0.85	8.03	8.14	1.77	38.25	0.12
1285	485	0.74	8.01	8.02	1.74	38.25	0.11
900	541	0.62	7.99	7.9	1.92	42	0.12
825	541	0.59	8.01	8.77	1.06	85.7	0.08
725	541	0.59	8.01	10.01	0.89	89.01	0.06
625	541	0.56	8.01	10.25	0.88	89.28	0.06
525	541	0.5	8	10.49	1.09	79.84	0.08
425	541	0.47	8	10.73	0.71	124.6	0.05
325	541	0.44	8	9.43	0.73	118.98	0.05
225	541	0.41	8	10.12	0.74	113.85	0.05
0	Beach edge						

HEC-RAS Model Output for J-Street Drain
Freeboard Calculation
(50-yr flood)

River Sta	Q	Min Ch	Water	Bank	Channel	Wetted Chnl	Channel	Froude #	Flow	H3	H4	Total H	Depth+	50-yr WSE+	100-yr W.S.
	Total	Elevation	Surf. Elev.	Elevation	Velocity	Top Width	Froude #	Square	Depth	Super-Elev	Residual	FB	FB	FB	FB
(ft)	(cfs)	(ft)	(ft)	(ft)	(ft/s)	(ft)		F^2	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
12855	723	17.94	21.44	23.88	7.44	27.75	0.7	0.49	3.5		0.85	0.85	4.35	22.29	21.99
12390	723	17.1	20.99	23.12	6.7	27.75	0.6	0.36	3.89		0.889	0.89	4.78	21.88	21.56
11925	723	16.27	20.71	22.4	5.86	27.75	0.49	0.24	4.44		0.944	0.94	5.38	21.65	21.28
11900	796	16.22	20.63	22.35	6.17	29.25	0.52	0.27	4.41		0.941	0.94	5.35	21.57	21.22
11899	Teakwood St														
11850	796	16.13	19.51	22.27	8.05	29.25	0.77	0.59	3.38		0.838	0.84	4.22	20.35	20
11825	796	16.09	19.47	22.23	8.04	29.25	0.77	0.59	3.38		0.838	0.84	4.22	20.31	19.96
11725	796	15.91	19.3	22.08	8.01	29.25	0.77	0.59	3.39		0.839	0.84	4.23	20.14	19.8
11325	796	15.19	18.72	21.45	7.7	29.25	0.72	0.52	3.53		0.853	0.85	4.38	19.57	19.28
10925	796	14.47	18.28	20.82	7.14	29.25	0.64	0.41	3.81		0.881	0.88	4.69	19.16	18.89
10525	796	13.75	17.98	20.19	6.43	29.25	0.55	0.30	4.23		0.923	0.92	5.15	18.90	18.61
10253	796	13.26	17.84	19.76	5.94	29.25	0.49	0.24	4.58		0.958	0.96	5.54	18.80	18.48
10228.5	796	13.21	17.83	19.72	5.9	29.25	0.48	0.23	4.62		0.962	0.96	5.58	18.79	18.47
10228	Yucca St														
10187	796	13.14	17.17	19.62	6.76	29.25	0.59	0.35	4.03		0.903	0.90	4.93	18.07	17.75
10162	869	13.09	16.84	19.58	7.94	29.25	0.72	0.52	3.75		0.875	0.88	4.63	17.72	17.46
10125	869	13.03	16.78	19.52	7.91	29.25	0.72	0.52	3.75		0.875	0.88	4.63	17.66	17.41
10070	869	12.93	16.71	19.45	7.86	29.25	0.71	0.50	3.78		0.878	0.88	4.66	17.59	17.35
9621.7	869	12.12	16.25	18.89	7.2	29.25	0.62	0.38	4.13		0.913	0.91	5.04	17.16	16.97
9173.4	869	11.31	15.95	18.32	6.41	29.25	0.52	0.27	4.64		0.964	0.96	5.60	16.91	16.71
8725	869	10.51	15.76	17.76	5.66	29.25	0.44	0.19	5.25		1.025	1.03	6.28	16.79	16.54
8469	869	10.05	15.68	17.41	5.27	29.25	0.39	0.15	5.63		1.063	1.06	6.69	16.74	16.46
8444	869	10	15.74	17.38	4.62	32.75	0.34	0.12	5.74		1.074	1.07	6.81	16.81	16.53
8443	Bard Rd														

River Sta	Q	Min Ch	Water	Bank	Channel	Wetted Chnl	Channel	Froude #	Flow	H3	H4	Total H	Depth+	50-yr WSE+	100-yr W.S.
	Total	Elevation	Surf. Elev.	Elevation	Velocity	Top Width	Froude #	Square	Depth	Super-Elev	Residual	FB	FB	FB	FB
(ft)	(cfs)	(ft)	(ft)	(ft)	(ft/s)	(ft)		F^2	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
8375	869	9.9	15.47	17.35	4.76	32.75	0.36	0.13	5.57		1.057	1.06	6.63	16.53	16.24
8350	1337	9.86	14.54	17.31	8.72	32.75	0.71	0.50	4.68		0.968	0.97	5.65	15.51	15.22
8008.4	1337	9.35	14.11	16.84	8.58	32.75	0.69	0.48	4.76		0.976	0.98	5.74	15.09	14.82
7666.7	1337	8.84	13.71	16.36	8.37	32.75	0.67	0.45	4.87		0.987	0.99	5.86	14.70	14.45
7325	1337	8.32	13.36	15.89	8.1	32.75	0.64	0.41	5.04		1.004	1.00	6.04	14.36	14.13
6925	1337	7.72	13.02	15.34	7.71	32.75	0.59	0.35	5.3		1.03	1.03	6.33	14.05	13.82
6525	1337	7.12	12.74	14.78	7.26	32.75	0.54	0.29	5.62		1.062	1.06	6.68	13.80	13.56
6425	1337	6.97	12.8	14.64	6.42	35.75	0.47	0.22	5.83		1.083	1.08	6.91	13.88	13.63
6161	1337	6.58	12.7	14.27	6.11	35.75	0.43	0.18	6.12		1.112	1.11	7.23	13.81	13.53
6136	1485	6.54	12.49	14.24	6.98	35.75	0.5	0.25	5.95		1.095	1.10	7.05	13.59	13.31
6135	Pleasant Valley														
6094	1485	6.48	11.49	14.21	8.29	35.75	0.65	0.42	5.01		1.001	1.00	6.01	12.49	12.27
6069	1485	6.44	11.46	14.19	8.27	35.75	0.65	0.42	5.02		1.002	1.00	6.02	12.46	12.25
5659	1485	5.82	11.1	13.65	7.87	35.75	0.6	0.36	5.28		1.028	1.03	6.31	12.13	11.93
5249	1485	5.21	10.81	13.11	7.41	35.75	0.55	0.30	5.6		1.06	1.06	6.66	11.87	11.67
4839	1485	4.59	10.59	12.57	6.93	35.75	0.5	0.25	6		1.1	1.10	7.10	11.69	11.46
4814	1485	4.56	10.58	12.53	6.9	35.75	0.5	0.25	6.02		1.102	1.10	7.12	11.68	11.45
4813	Clara														
4772	1485	4.49	9.67	12.48	8.03	35.75	0.62	0.38	5.18		1.018	1.02	6.20	10.69	10.54
4747	1485	4.46	9.65	12.45	8	35.75	0.62	0.38	5.19		1.019	1.02	6.21	10.67	10.52
4347.7	1485	3.86	9.34	11.95	7.57	35.75	0.57	0.32	5.48		1.048	1.05	6.53	10.39	10.26
3948.4	1485	3.26	9.11	11.44	7.1	35.75	0.52	0.27	5.85		1.085	1.09	6.94	10.20	10.04
3549	1485	2.66	8.92	10.94	6.63	35.75	0.47	0.22	6.26		1.126	1.13	7.39	10.05	9.87
3524	1479	2.62	8.98	10.91	6.08	38.25	0.42	0.18	6.36		1.136	1.14	7.50	10.12	9.94
3523	Hueneme Rd														
3432	1479	2.48	8.44	10.79	6.5	38.25	0.47	0.22	5.96		1.096	1.10	7.06	9.54	9.37
3407	1479	2.45	8.42	10.76	6.47	38.25	0.47	0.22	5.97		1.097	1.10	7.07	9.52	9.35

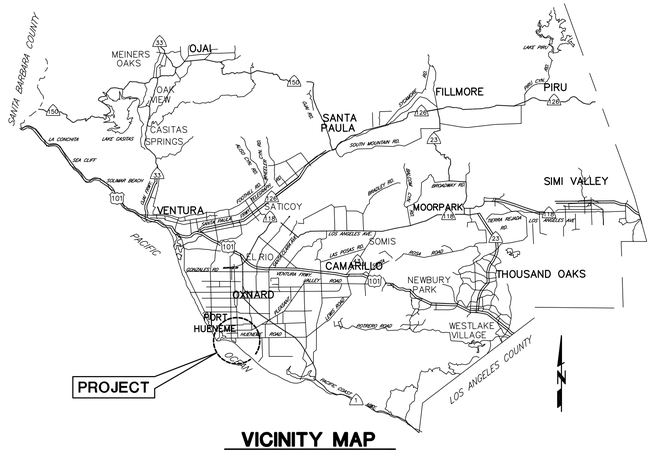
River Sta	Q	Min Ch	Water	Bank	Channel	Wetted Chnl	Channel	Froude #	Flow	H3	H4	Total H	Depth+	50-yr WSE+	100-yr W.S.
	Total	Elevation	Surf. Elev.	Elevation	Velocity	Top Width	Froude #	Square	Depth	Super-Elev	Residual	FB	FB	FB	FB
(ft)	(cfs)	(ft)	(ft)	(ft)	(ft/s)	(ft)		F^2	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
3325	1479	2.32	8.39	10.67	6.37	38.25	0.46	0.21	6.07		1.107	1.11	7.18	9.50	9.33
2971.5	1479	1.79	8.27	10.26	5.96	38.25	0.41	0.17	6.48		1.148	1.15	7.63	9.42	9.21
2618	1479	1.26	8.18	9.86	5.59	38.25	0.37	0.14	6.92		1.192	1.19	8.11	9.37	9.12
2593	1479	1.22	8.17	9.83	5.56	38.25	0.37	0.14	6.95		1.195	1.20	8.15	9.37	9.12
2592	Railroad														
2521	1479	1.12	7.78	10	5.8	38.25	0.4	0.16	6.66	0.0488	1.166	1.21	7.87	8.99	8.68
2496	1479	1.11	7.77	10	5.81	38.25	0.4	0.16	6.66	0.0490	1.166	1.21	7.87	8.98	8.67
2125	1479	1	7.61	10	5.85	38.25	0.4	0.16	6.61	0.0496	1.161	1.21	7.82	8.82	8.51
2045	1479	0.97	7.57	10	5.86	38.25	0.4	0.16	6.6	0.0498	1.16	1.21	7.81	8.78	8.48
1920	1479	0.93	7.52	10	5.87	38.25	0.4	0.16	6.59	0.0500	1.159	1.21	7.80	8.73	8.42
1795	1479	0.89	7.46	10	5.89	38.25	0.4	0.16	6.57	0.0503	1.157	1.21	7.78	8.67	8.37
1670	1479	0.85	7.4	10	5.9	38.25	0.41	0.17	6.55	0.0505	1.155	1.21	7.76	8.61	8.32
1285	1479	0.74	7.22	10	5.96	38.25	0.41	0.17	6.48	0.0515	1.148	1.20	7.68	8.42	8.15
900	1649	0.62	6.79	10	6.98	38.25	0.49	0.24	6.17	0.0707	1.117	1.19	7.36	7.98	7.59
825	1649	0.59	7.12	10	3.8	79.44	0.29	0.08	6.53		1.153	1.15	7.68	8.27	8
725	1649	0.59	7.12	10.01	3.13	86.33	0.22	0.05	6.53		1.153	1.15	7.68	8.27	8.01
625	1649	0.56	7.08	10.25	3.09	86.5	0.22	0.05	6.52		1.152	1.15	7.67	8.23	7.97
525	1649	0.5	6.93	10.49	3.96	70.71	0.29	0.08	6.43		1.143	1.14	7.57	8.07	7.79
425	1649	0.47	6.98	10.73	2.6	116.4	0.2	0.04	6.51		1.151	1.15	7.66	8.13	7.86
325	1649	0.44	6.95	9.43	2.65	111.95	0.2	0.04	6.51		1.151	1.15	7.66	8.10	7.83
225	1649	0.41	6.91	10.12	2.7	108.85	0.2	0.04	6.5		1.15	1.15	7.65	8.06	7.79
0	Beach edge														

COUNTY OF VENTURA
PUBLIC WORKS AGENCY
WATERSHED PROTECTION DISTRICT

ZONE 2

"J" STREET DRAIN IMPROVEMENT PHASE 1

IN THE CITY OF OXNARD



VICINITY MAP

N.T.S.

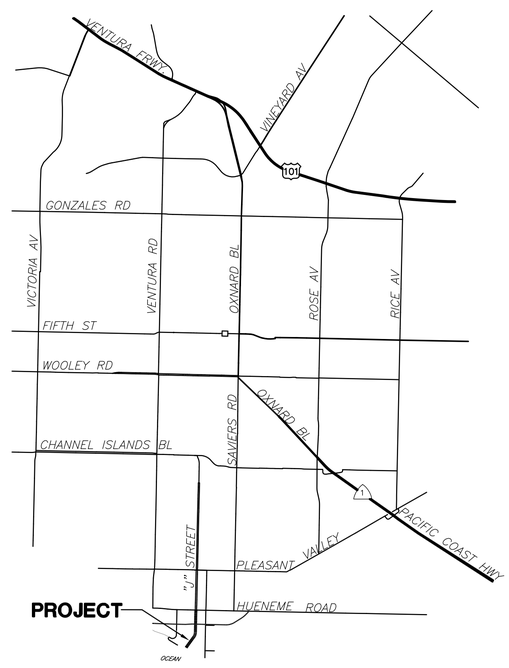
INDEX TO SHEETS

SHEET NO.	TITLE
1.	GENERAL PLAN
2.	PLAN AND PROFILE – STA 7+00 TO STA 12+00
3.	PLAN AND PROFILE – STA 12+00 TO STA 21+00
4.	PLAN AND PROFILE – STA 21+00 TO STA 30+00
5.	PLAN AND PROFILE – STA 30+00 TO STA 33+87
6.	VENTURA COUNTY RAIL ROAD
7.	VENTURA COUNTY RAIL ROAD DETAILS
8.	RC TRIPLE BOX CONDUIT UNDER RAILROAD STRUCTURAL SECTIONS
9.	RC TRIPLE BOX CONDUIT STRUCTURAL SECTIONS
10.	RC RECTANGULAR CHANNEL STRUCTURAL SECTIONS
11.	HUENEME DRAIN PUMP STATION
12.	HUENEME DRAIN PUMP STATION DETAILS
13.	HUENEME DRAIN PUMP STATION DETAILS
14.	SIDE DRAINS
15.	SUBDRAIN SYSTEM
16.	SUBDRAIN SYSTEM SECTIONS AND DETAILS
17.	OUTLET STRUCTURE
18.	MISCELLANEOUS DETAILS
19.	TYPICAL FENCE DETAILS
20.	CROSS SECTIONS – STA 7+00 TO STA 12+00
21.	CROSS SECTIONS – STA 13+00 TO STA 20+00
22.	CROSS SECTIONS – STA 21+00 TO STA 27+00
23.	CROSS SECTIONS – STA 28+00 TO STA 33+87
24.	SOIL BORINGS
25.	SURVEY CONTROL AND RIGHT–OF–WAY

GENERAL NOTES

1. ELEVATIONS SHOWN ARE IN US FEET, NGVD 1929, SCRP 1980
2. STATIONS SHOWN ON DRAWINGS ARE ALONG CENTERLINE OF CONSTRUCTION.
3. EGL AND HGL ARE BASED ON THE DESIGN DATA HEREON AND ARE SHOWN FOR FUTURE REFERENCE BY THE DISTRICT ONLY.
4. NUMBERS IN ⬡ INDICATE BID ITEMS UNDER WHICH PAYMENT WILL BE MADE.
5. LETTERS AND NUMBERS IN ⊖ INDICATE THE DETAIL CALL–OUT AND SHEET ON WHICH REFERENCE DETAIL IS SHOWN.
6. NUMBERS IN △ REFER TO NOTES ON THE SAME SHEET UNLESS OTHERWISE NOTED.
7. TREES DESIGNATED BY ▨ SHALL BE REMOVED. ALL OTHER TREES SHALL BE PROTECTED IN PLACE UNLESS OTHERWISE NOTED. TREES ARE SHOWN AS KNOWN TO EXIST AT TIME OF SURVEY, IN SEPTEMBER 2009.
8. TOPOGRAPHY AND CROSS SECTIONS FOR THIS PROJECT WERE TAKEN FROM SURVEYS PERFORMED IN APRIL 2008 AND SEPTEMBER 2009.
9. SOIL TEST BORINGS FOR THE PROJECT WERE MADE IN APRIL 2008, AND THEIR LOCATION IS MARKED BY THE SYMBOL ✥. SUBSURFACE SOIL INVESTIGATION RESULTS ARE FURNISHED FOR INFORMATION ONLY, IN ACCORDANCE WITH SUBSECTION 2–7 OF THE STANDARD SPECIFICATIONS, AND NO WARRANTY IS MADE THEREFOR.
10. ALL EXISTING IMPROVEMENTS SHALL REMAIN AND SHALL BE PROTECTED IN–PLACE UNLESS OTHERWISE NOTED. ANY DAMAGED IMPROVEMENTS SHALL BE REPLACED IN KIND TO A CONDITION EQUAL TO OR BETTER THAN THAT WHICH EXISTED PRIOR TO CONSTRUCTION.
11. SYMBOL △ INDICATES THE LOCATION OF THE HORIZONTAL AND VERTICAL CONTROL POINTS.
12. UTILITIES ARE SHOWN AS KNOWN TO EXIST AT TIME OF SURVEY. UTILITIES MAY HAVE BEEN OMITTED, MISPLACED, AND/OR RELOCATED. CONTRACTOR SHALL EXERCISE CARE AND SHALL PROTECT ALL UTILITIES IN–PLACE UNLESS OTHERWISE NOTED.
13. CONTRACTOR SHALL NOTIFY UTILITY OWNERS A MINIMUM OF 48 HOURS PRIOR TO STARTING WORK IN AREAS AFFECTING THEIR FACILITIES:

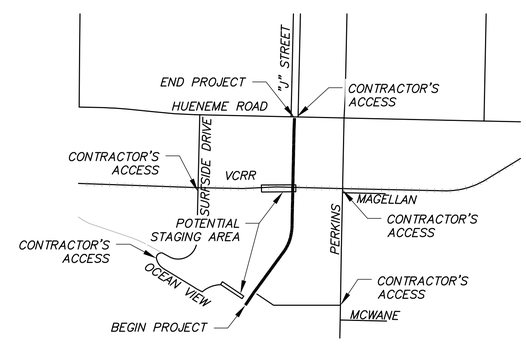
SOUTHERN CALIFORNIA EDISON	TEL. NO. (909) 394–8811	TERRY JONES
CITY OF OXNARD (WASTEWATER)	TEL. NO. (805) 271–2216	JEFF MILLER
CITY OF PORT HUENEME	TEL. NO. (805) 986–6658	KIT NELL
VENTURA COUNTY RAILWAY COMPANY	TEL. NO. (805) 488–3677	NICK NEILSON



GENERAL PLAN

5,000 0 5,000 10,000

SCALE OF FEET



PROJECT SITE PLAN

1,000 0 1,000 2,000

SCALE OF FEET

UNDERGROUND SERVICE ALERT

1–800–422–4133

CALL USA/SC

FOR UNDERGROUND LOCATION

2 WORKING DAYS BEFORE YOU DIG

DESIGN DATA

WATER SURFACE ELEVATION AT STATION 3+70	6.80 Ft
FLOW RATE DOWNSTREAM OF STATION 8+18	2127 CFS
FLOW RATE FROM STATION 8+55 TO STATION 33+87	1798 CFS
FREEBOARD FOR RC CHANNELS AND RC CULVERTS	NIL

PLOT DATE:1/22/13

SAVE DATE:1/18/13 DOKTORN K:\DC\PROJECTS\82322 J STREET DRAIN IMPROVEMENT\FINAL DESIGN\DESIGN DRAWINGS\100%\KR FOR ND\JSD-01-GP.DWG

	REVISION	DESCRIPTION	APP.	DATE
D				
C				
B				
A				
△				

REVIEWED BY: – CITY OF OXNARD DATE

APPROVED BY: – CITY OF OXNARD DATE

DEPUTY DIRECTOR DATE

DISTRICT DIRECTOR DATE

AGENCY DIRECTOR DATE

COUNTY OF VENTURA
PUBLIC WORKS AGENCY
WATERSHED PROTECTION DISTRICT

SPEC. NO. –

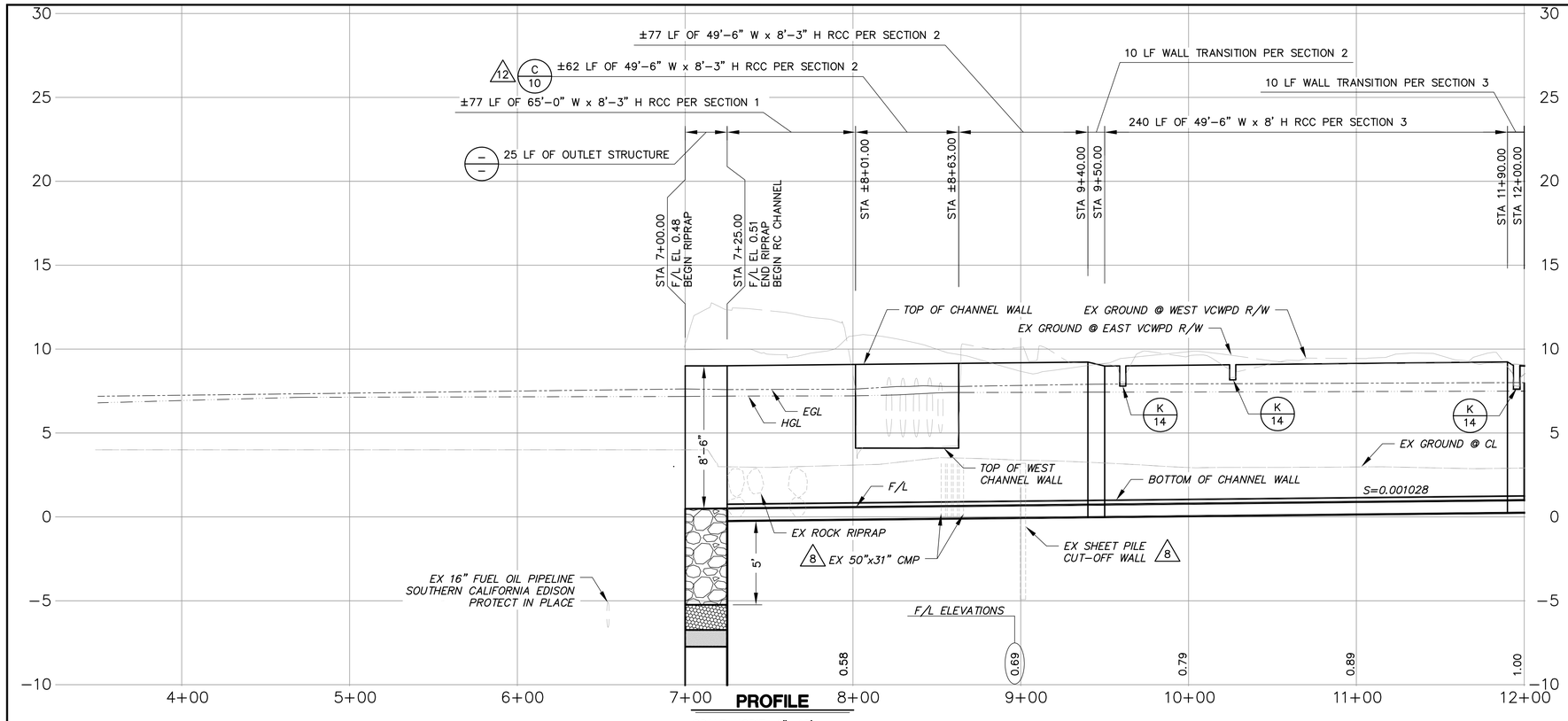
PROJ. NO. –

"J" STREET DRAIN IMPROVEMENT
PHASE 1

GENERAL PLAN

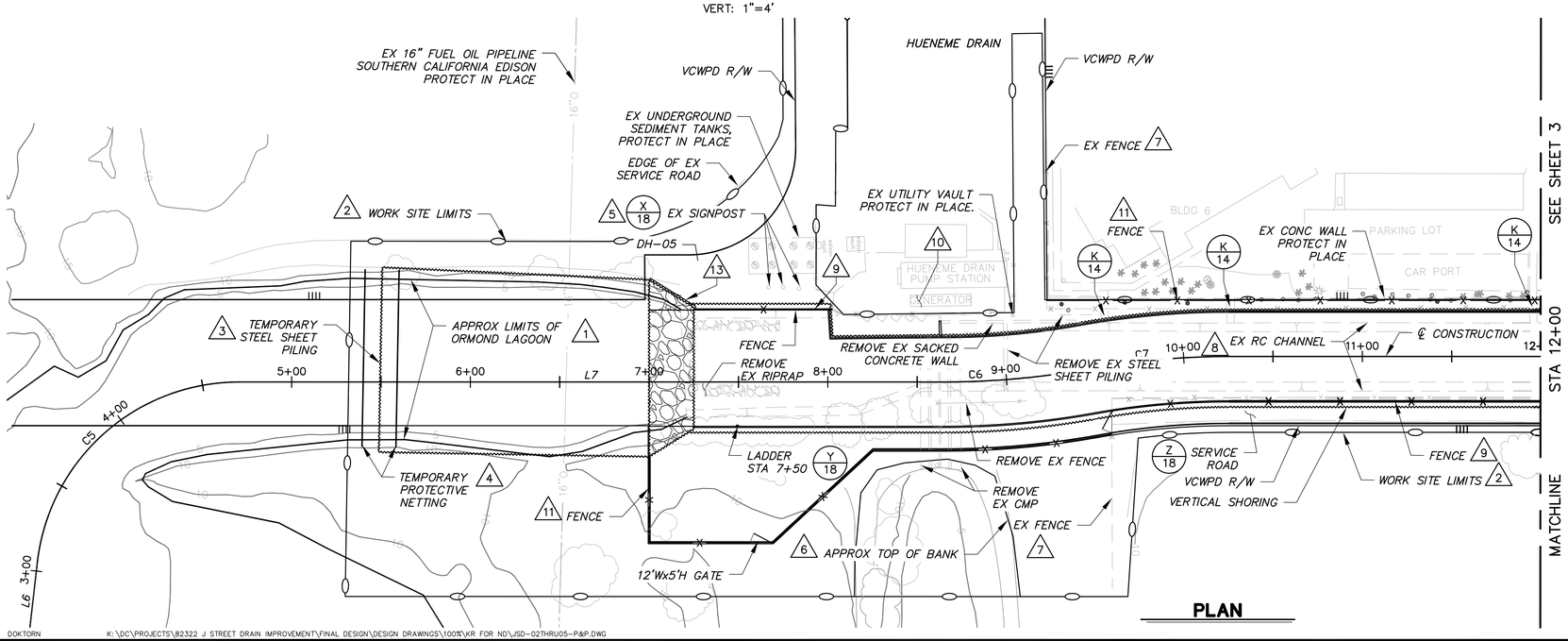
SHEET 1 OF –

DRAWING NO. Y–?–?



PROFILE

SCALE: HORIZ: 1"=40'
VERT: 1"=4'



PLAN

NOTES:

1. TOP 12 INCHES OF LAGOON TOPSOIL SHALL BE REMOVED, STOCKPILED AND REINSTALLED AFTER CONSTRUCTION.
2. INSTALL TEMPORARY FENCE ALONG WORK SITE LIMITS. WORK SITE LIMITS MAY BE ADJUSTED IN THE FIELD BY ENGINEER. ALL EQUIPMENT SHALL BE OPERATED WITHIN THE WORK SITE LIMITS.
3. TOP OF TEMPORARY STEEL SHEET PILING AT DOWNSTREAM END OF PROJECT, APPROX. STA 5+50 SHALL BE AT ELEVATION 7 FEET.
4. TEMPORARY PROTECTIVE NETTING SHALL BE INSTALLED BEFORE TEMPORARY STEEL SHEET PILING.
5. REMOVE AND REINSTALL AFTER CONSTRUCTION.
6. NO EARTH MOVEMENT WITHIN 10 FEET OF TOP OF BANK. FOOT ACCESS AND DEWATERING SYSTEM WORK ONLY.
7. REMOVE AND DISPOSE OF INTERFERING PORTION OF EX FENCE AT THE NEAREST POST OUTSIDE OF EXCAVATION.
8. REMOVE AND DISPOSE OF INTERFERING PORTION OF EX RIPRAP, CMP AND SHEET PILE CUT-OFF WALL. THE EX RIPRAP, CMP AND SHEET PILE CUT-OFF WALL ARE SHOWN ACCORDING TO VCWPD DRAWINGS Y-2-8 THROUGH Y-2-20 AND Y-2-150 THROUGH Y-2-158. CONTRACTOR TO VERIFY THEIR PRESENT EXISTENCE AND LOCATION.
9. INSTALL CHAIN LINK FENCE ON TOP OF CHANNEL WALL.
10. EMERGENCY GENERATOR SHALL BE PLACED AT HUENEME DRAIN PUMP STATION IN OCTOBER AND REMOVED IN APRIL. CONTRACTOR SHALL PROVIDE ACCESS THROUGH THE WORK SITE FROM OCEAN VIEW DRIVE TO THE PUMP STATION FOR THE PLACEMENT AND REMOVAL OF THE GENERATOR AS DIRECTED BY THE ENGINEER.
11. INSTALL CHAIN LINK FENCE 6 INCHES INSIDE VCWPD R/W.
12. WEST HALF OF SECTION 2 AT HUENEME DRAIN PUMP STATION SHALL BE IN ACCORDANCE WITH DETAILS ON SHEETS 11, 12 AND 13.
13. INSTALL CHAIN LINK FENCE 6 INCHES EAST OF STEEL SHEET PILING.

PLOT DATE: 1/22/13

SAVE DATE: 1/18/13 DOKTORN K:\DC\PROJECTS\82322 J STREET DRAIN IMPROVEMENT\FINAL DESIGN\DESIGN DRAWINGS\100%\KR FOR ND\JSD-02THRU05-P&P.DWG

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△	REVISION DESCRIPTION	APP.	DATE

DESIGNED –
DRAWN –
CHECKED –

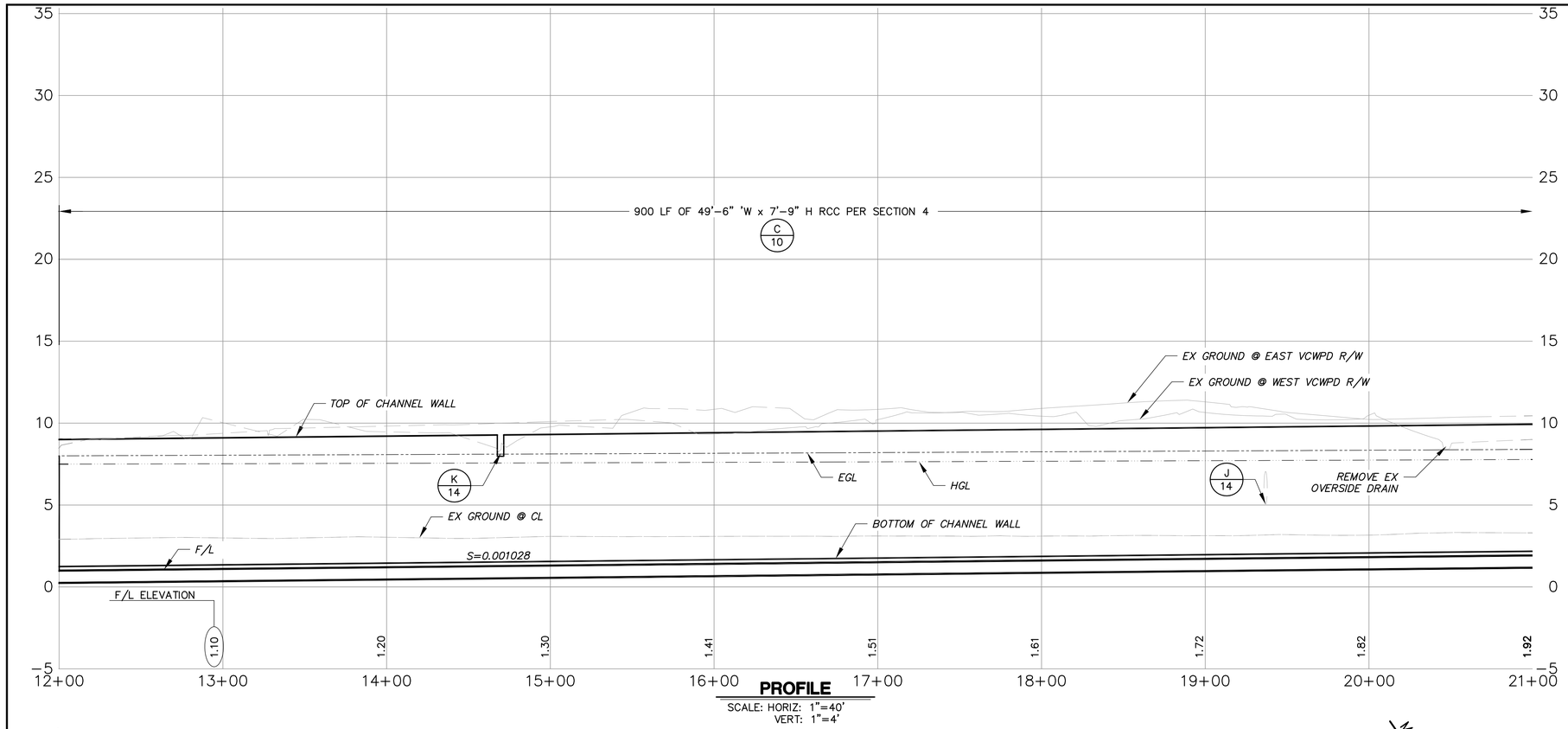
PROJECT MANAGER DATE
DEPUTY DIRECTOR DATE
DISTRICT DIRECTOR DATE

COUNTY OF VENTURA
PUBLIC WORKS AGENCY
WATERSHED PROTECTION DISTRICT

SPEC. NO. –
PROJ. NO. 82322

"J" STREET DRAIN IMPROVEMENT
PHASE 1
CHANNEL PLAN AND PROFILE
FROM STA 7+00 TO STA 12+00

SHEET 2 OF –
DRAWING NO. Y-?-?

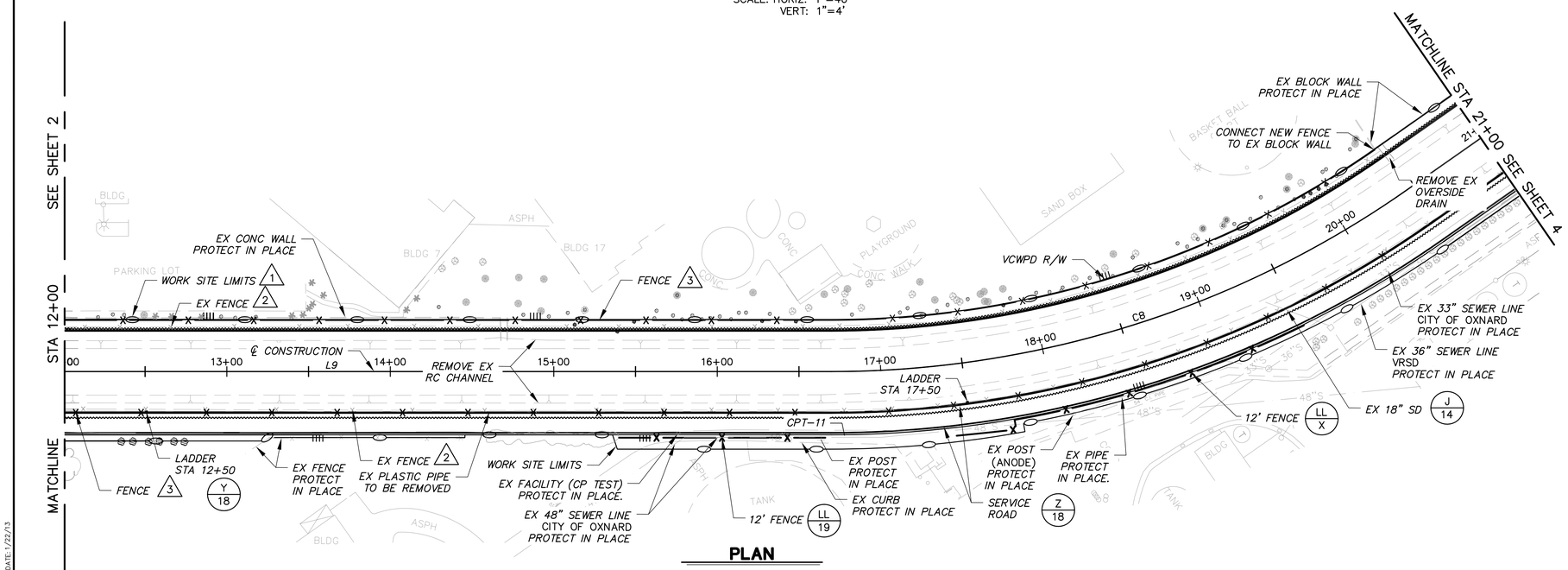


PROFILE

SCALE: HORIZ: 1"=40'
VERT: 1"=4'

NOTES:

1. INSTALL TEMPORARY FENCE ALONG WORK SITE LIMITS. WORK SITE LIMITS MAY BE ADJUSTED IN THE FIELD BY ENGINEER. ALL EQUIPMENT SHALL BE OPERATED WITHIN THE WORK SITE LIMITS.
2. REMOVE AND DISPOSE OF INTERFERING PORTION OF EX FENCE AND GATES AT THE NEAREST POST OUTSIDE OF EXCAVATION. REMAINDER OF EX FENCE SHALL BE PROTECTED IN PLACE UNLESS OTHERWISE NOTED.
3. INSTALL CHAIN LINK FENCE ON TOP OF CHANNEL WALL.
4. INSTALL CHAIN LINK FENCE 6 INCHES INSIDE VCWPD R/W.



PLAN

PLOT DATE: 1/22/13

SAVE DATE: 1/18/13 DOKTORN K:\DC\PROJECTS\82322 J STREET DRAIN IMPROVEMENT\FINAL DESIGN\DESIGN DRAWINGS\100%\KR FOR ND\JSD-02THRU05-P&P.DWG

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△	REVISION DESCRIPTION	APP.	DATE

DESIGNED –
DRAWN –
CHECKED –

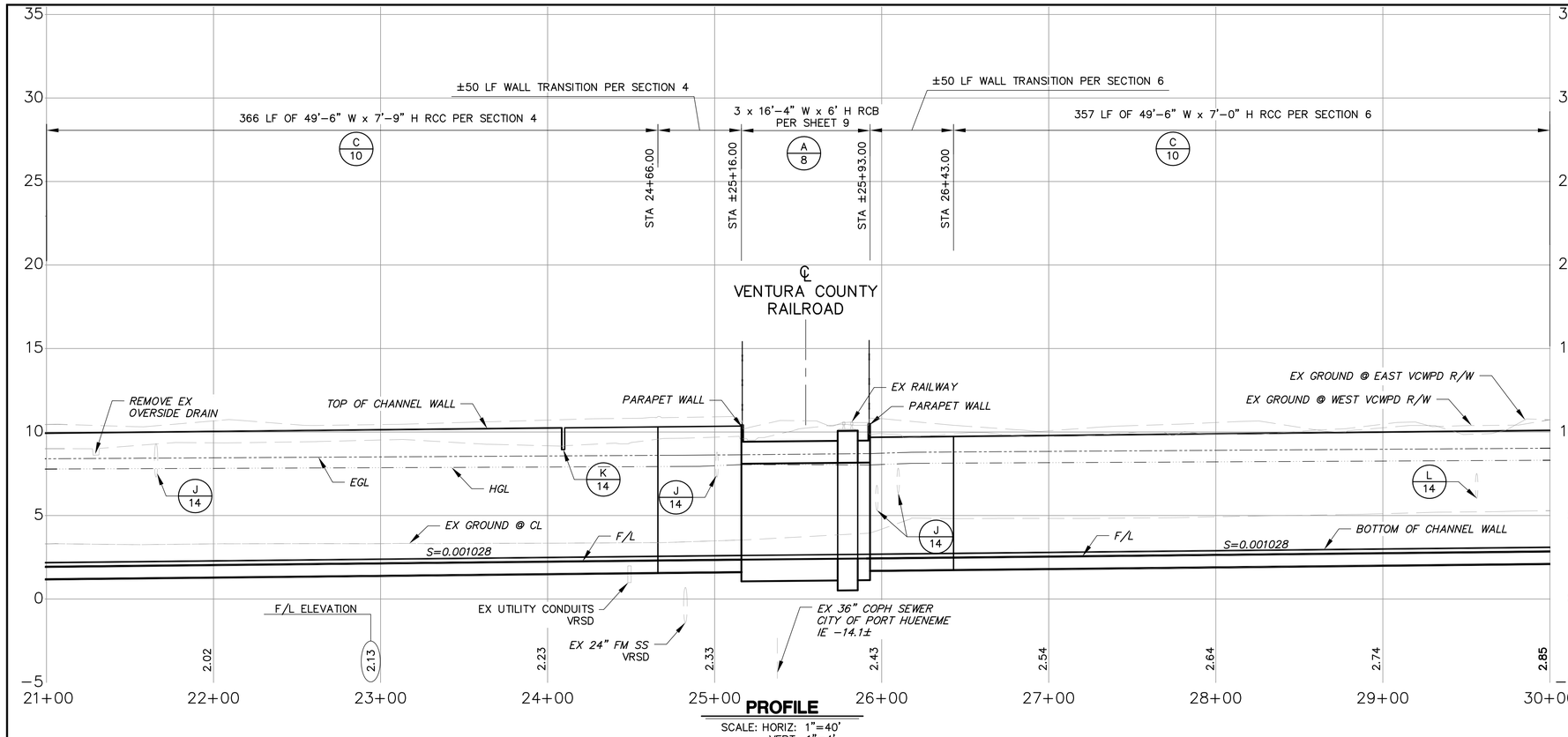
PROJECT MANAGER DATE
DEPUTY DIRECTOR DATE
DISTRICT DIRECTOR DATE

COUNTY OF VENTURA
PUBLIC WORKS AGENCY
WATERSHED PROTECTION DISTRICT

SPEC. NO. –
PROJ. NO. 82322

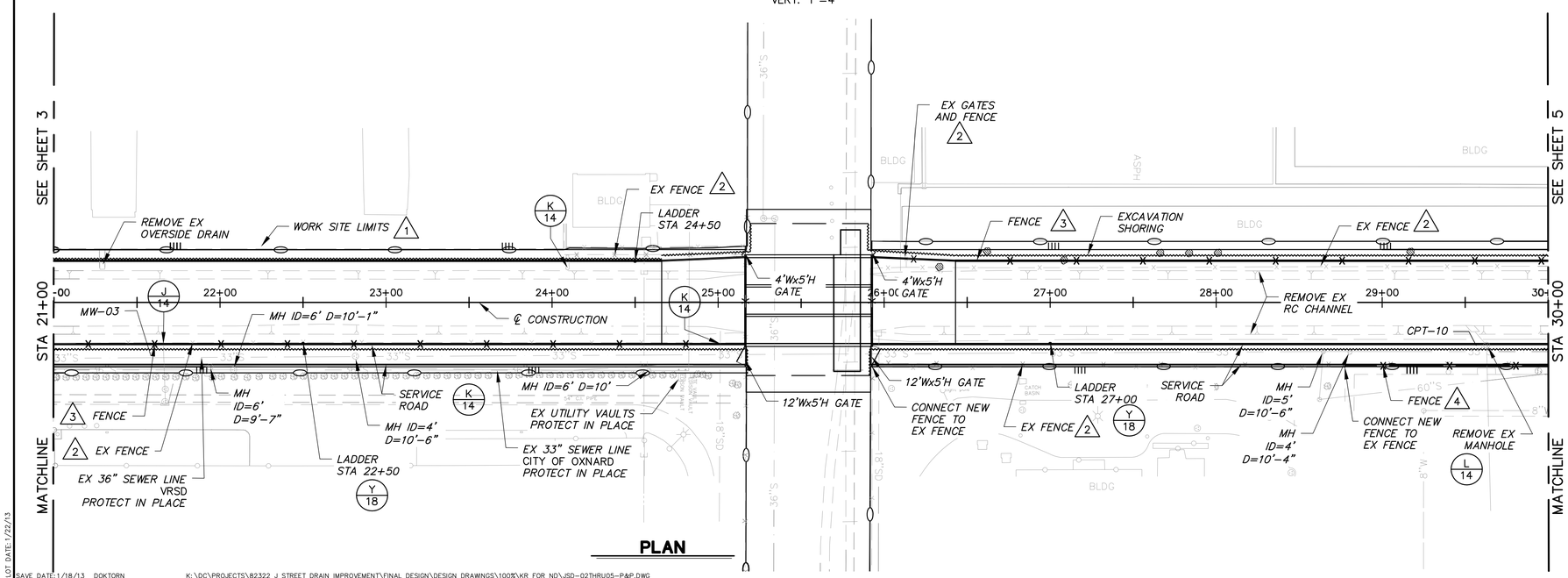
"J" STREET DRAIN IMPROVEMENT
PHASE 1
CHANNEL PLAN AND PROFILE
FROM STA 12+00 TO STA 21+00

SHEET 3 OF –
DRAWING NO. Y-?-?



PROFILE

SCALE: HORIZ: 1"=40'
VERT: 1"=4'



PLAN

NOTES:

1. INSTALL TEMPORARY FENCE ALONG WORK SITE LIMITS. WORK SITE LIMITS MAY BE ADJUSTED IN THE FIELD BY ENGINEER. ALL EQUIPMENT SHALL BE OPERATED WITHIN THE WORK SITE LIMITS.
2. REMOVE AND DISPOSE OF INTERFERING PORTION OF EX FENCE AND GATES AT THE NEAREST POST OUTSIDE OF EXCAVATION. REMAINDER OF EX FENCE SHALL BE PROTECTED IN PLACE UNLESS OTHERWISE NOTED.
3. INSTALL CHAIN LINK FENCE ON TOP OF CHANNEL WALL.
4. INSTALL CHAIN LINK FENCE 6 INCHES INSIDE VCWPD R/W.
5. ADJUST TO GRADE EX MANHOLES

PLOT DATE:1/22/13

SAVE DATE:1/18/13 DOKTORN K:\DC\PROJECTS\82322 J STREET DRAIN IMPROVEMENT\FINAL DESIGN\DESIGN DRAWINGS\100%\KR FOR ND\J5D-02THRU05-P&P.DWG

	REVISION	DESCRIPTION	APP.	DATE
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B				
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△				

DESIGNED –
DRAWN –
CHECKED –

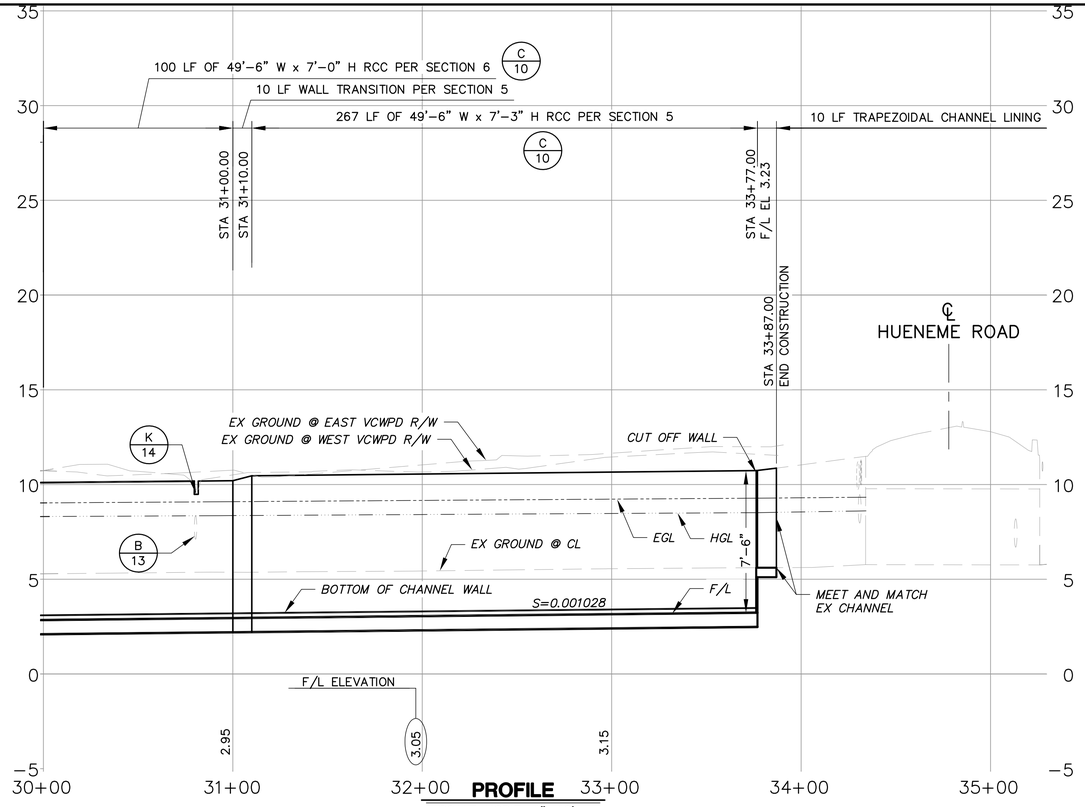
PROJECT MANAGER DATE
DEPUTY DIRECTOR DATE
DISTRICT DIRECTOR DATE

COUNTY OF VENTURA
PUBLIC WORKS AGENCY
WATERSHED PROTECTION DISTRICT

SPEC. NO. –
PROJ. NO. 82322

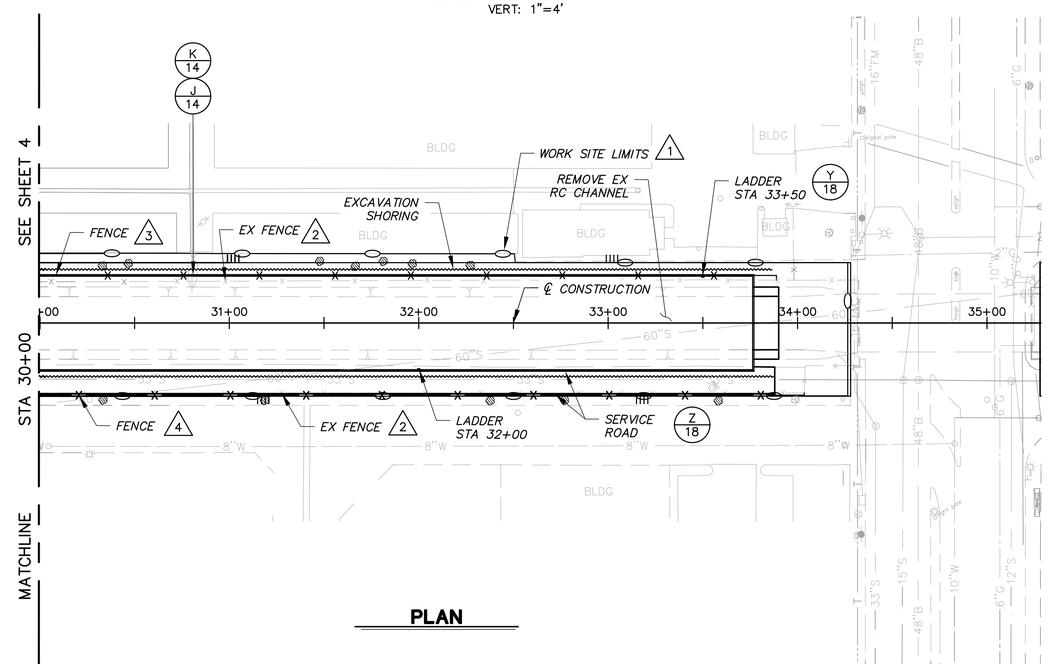
"J" STREET DRAIN IMPROVEMENT
PHASE 1
CHANNEL PLAN AND PROFILE
FROM STA 21+00 TO STA 30+00

SHEET 4
OF –
DRAWING NO. Y-?-?



PROFILE

SCALE: HORIZ: 1"=40'
VERT: 1"=4'



PLAN

NOTES:

1. INSTALL TEMPORARY FENCE ALONG WORK SITE LIMITS. WORK SITE LIMITS MAY BE ADJUSTED IN THE FIELD BY ENGINEER. ALL EQUIPMENT SHALL BE OPERATED WITHIN THE WORK SITE LIMITS.
2. REMOVE AND DISPOSE OF INTERFERING PORTION OF EX FENCE AND GATES AT THE NEAREST POST OUTSIDE OF EXCAVATION. REMAINDER OF EX FENCE SHALL BE PROTECTED IN PLACE UNLESS OTHERWISE NOTED.
3. INSTALL CHAIN LINK FENCE ON TOP OF CHANNEL WALL.
4. INSTALL CHAIN LINK FENCE 6 INCHES INSIDE VCWPD R/W.

PLOT DATE:1/22/13

SAVE DATE:1/18/13 DOKTORN K:\DC\PROJECTS\82322 J STREET DRAIN IMPROVEMENT\FINAL DESIGN\DESIGN DRAWINGS\100%\KR FOR ND\JSD-02THRU05-P&P.DWG

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△	REVISION DESCRIPTION	APP.	DATE

DESIGNED –
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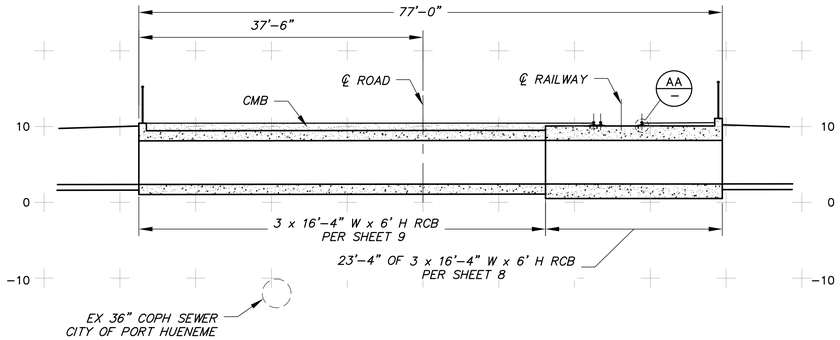
PROJECT MANAGER DATE
DEPUTY DIRECTOR DATE
DISTRICT DIRECTOR DATE

COUNTY OF VENTURA
PUBLIC WORKS AGENCY
WATERSHED PROTECTION DISTRICT

SPEC. NO. –
PROJ. NO. 82322

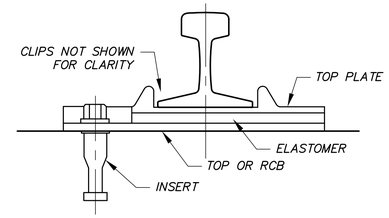
"J" STREET DRAIN IMPROVEMENT
PHASE 1
CHANNEL PLAN AND PROFILE
FROM STA 30+00 TO STA 33+87

SHEET 5 OF –
DRAWING NO. Y-?-?



SECTION A–A

SCALE: 1"=10'

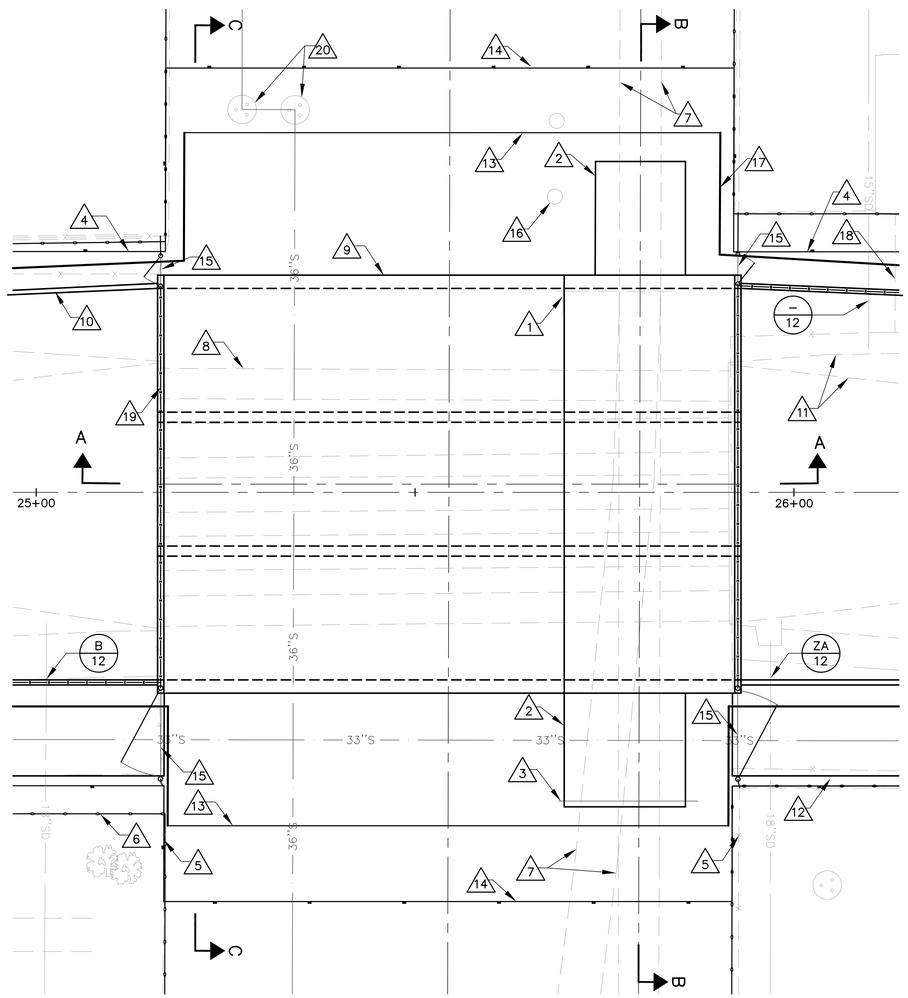


DIRECT FIXATION FASTENER ENVELOPE (AA)

NOT TO SCALE

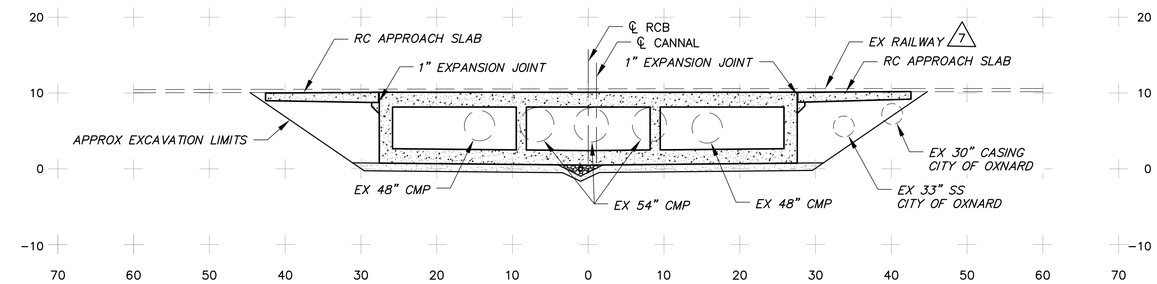
NOTES:

1. REPLACE EX RAILWAY SWITCH.
2. RC APPROACH SLAB.
3. PROTECT IN PLACE EX 30" CASING, CITY OF OXNARD.
4. VENTURA COUNTY WATERSHED PROTECTION DISTRICT RIGHT–OF–WAY (VCWPD R/W).
5. EX FENCE AND GATES, PROTECT IN PLACE OUTSIDE OF EXCAVATION. INTERFERING PORTION WITHIN THE LIMITS OF EXCAVATION SHALL BE REMOVED.
6. WORK SITE LIMITS. INSTALL TEMPORARY FENCE ALONG WORK SITE LIMITS. ALL EQUIPMENT SHALL BE OPERATED WITHIN THE WORK SITE LIMITS.
7. REMOVE THE INTERFERING PORTION OF RAILWAY TRACKS AND RECONSTRUCT AFTER CONSTRUCTION FOLLOWING THE EX ALIGNMENT AND ELEVATION.
8. EX CMP CULVERT, TO BE REMOVED.
9. RC BOX CULVERT.
10. RC CHANNEL.
11. EX RC TRAP CHANNEL, TO BE REMOVED.
12. CHAIN LINK FENCE.
13. APPROX EXCAVATION LIMITS.
14. NEW VCWPD R/W (EASEMENT)
15. CHAIN–LINK GATE.
16. EX POST, REMOVE AND REINSTALL AFTER CONSTRUCTION.
17. VERTICAL SHORING.
18. EX GATE, TO BE REMOVED.
19. CHAIN LINK FENCE ON TOP OF RC BOX CULVERT WALL.
20. EX MANHOLE, CITY OF PORT HUENEME.



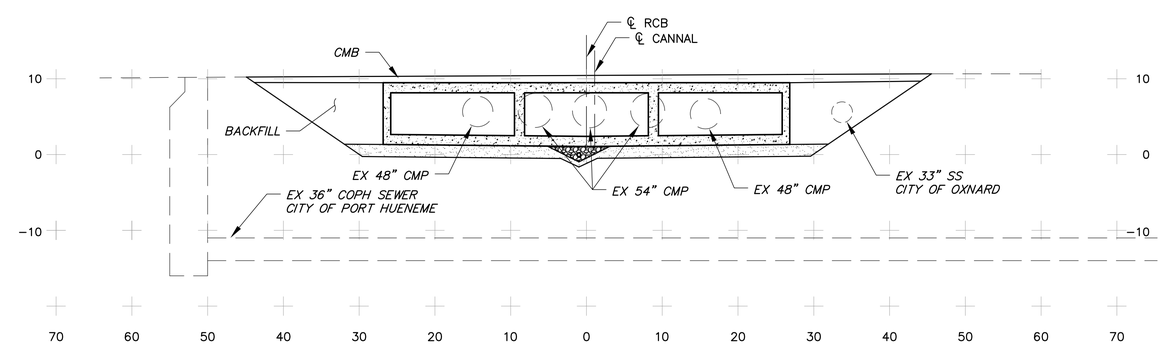
PLAN VIEW

SCALE: 1"=10'



SECTION B–B

SCALE: 1"=10'



SECTION C–C

SCALE: 1"=10'

PLOT DATE: 1/22/13

SAVE DATE: 1/18/13 ROUSSEK K:\DC\PROJECTS\82322 J STREET DRAIN IMPROVEMENT\FINAL DESIGN\DESIGN DRAWINGS\100%\KR FOR ND\JSD-06THRU07-RR.DWG

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△	REVISION DESCRIPTION	APP.	DATE

PORT OF HUENEME

RECOMMENDED BY _____ DATE _____
AECOM

APPROVED BY: _____ DATE _____
Port of Hueneme, Oxnard Harbor District

DESIGNED –
DRAWN –
CHECKED –

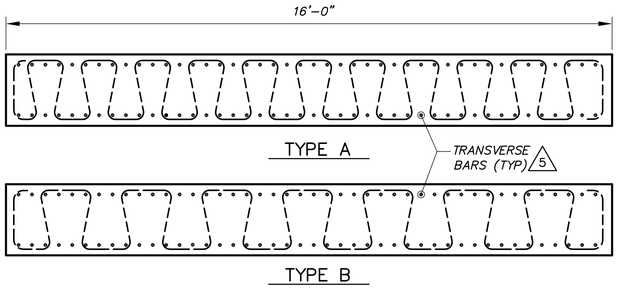
PROJECT MANAGER DATE
DEPUTY DIRECTOR DATE
DISTRICT DIRECTOR DATE

COUNTY OF VENTURA
PUBLIC WORKS AGENCY
WATERSHED PROTECTION DISTRICT

SPEC. NO. –
PROJ. NO. 82322

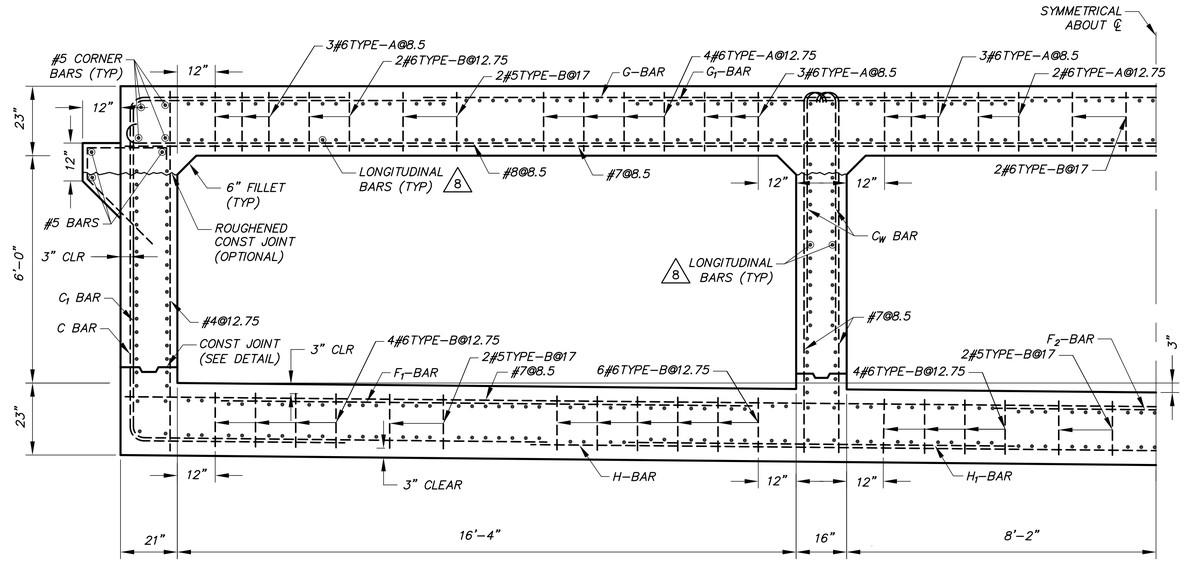
"J" STREET DRAIN IMPROVEMENT
PHASE 1
VENTURA COUNTY RAIL ROAD

SHEET 6
OF –
DRAWING NO. Y–?–?



STIRRUPS DETAIL

NOT TO SCALE



RC TRIPLE BOX CULVERT UNDER RAILROAD

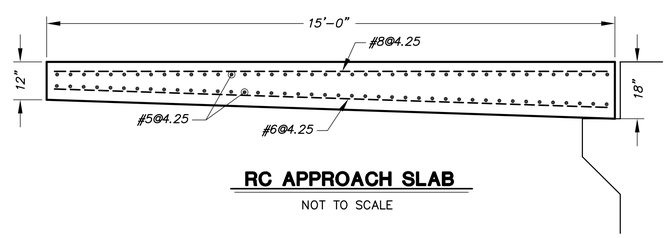
NOT TO SCALE

RC TRIPLE BOX UNDER RR		
C BAR	BAR NO. & SPACING	#9 @ 8.5"
	HORIZONTAL LENGTH – TOP	6'-0"
	HORIZONTAL LENGTH – BOTTOM	6'-0"
C_1 BAR	BAR NO. & SPACING	#7 @ 8.5"
	HORIZONTAL LENGTH – TOP	8'-6"
	HORIZONTAL LENGTH – BOTTOM	11'-3"
C_W BAR	BAR NO. & SPACING	#7 @ 8.5"
	LENGTH	6'-6"
F_1 BAR	BAR NO. & SPACING	#8 @ 8.5"
	LENGTH	14'-0"
F_2 BAR	BAR NO. & SPACING	#5 @ 8.5"
	LENGTH	8'-6"
G BAR	BAR NO. & SPACING	#9 @ 8.5"
	LENGTH	38'-6"
G_1 BAR	BAR NO. & SPACING	#9 @ 8.5"
	LENGTH	10'-3"
H BAR	BAR NO. & SPACING	#9 @ 8.5"
	LENGTH	33'-0"
H_1 BAR	BAR NO. & SPACING	#9 @ 8.5"
	LENGTH	10'-3"
NUMBER OF #4 LONGITUDINAL BARS	TOP SLAB	148
	BOTTOM SLAB	152
	SIDE WALLS	68
	INTERNAL WALLS	72
TOTAL #4 LONGITUDINAL BARS		440
CONCRETE QUANTITY (CY/LF)		9.20
STEEL QUANTITY (LBS/LF)		1,046

STRUCTURAL NOTES

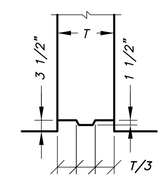
1. DIMENSIONS FROM FACE OF CONCRETE TO STEEL ARE TO THE NEAREST EDGE OF THE BAR AND SHALL BE TWO INCHES (2" CLEAR) UNLESS OTHERWISE SHOWN.
2. THE RC BOX CONDUIT DIMENSIONS SHALL BE MEASURED IN A HORIZONTAL AND VERTICAL DIRECTION ABOUT THE CENTERLINE OF THE STRUCTURE. OFFSET DIMENSIONS SHALL BE AT RIGHT ANGLES FROM THE CENTERLINE.
3. REINFORCEMENT DETAILS SHALL CONFORM TO AREMA MANUAL FOR RAILWAY ENGINEERING, LATEST EDITION.
4. THE TRANSVERSE REINFORCING STEEL SHALL TERMINATE 2" FROM THE CONCRETE SURFACES.
5. IF TRANSVERSE BARS ARE NOT SPECIFIED, #4 TRANSVERSE BARS SHALL BE ADDED TO CLOSE THE GAPS.
6. THE LONGITUDINAL BARS SHALL BE EQUALLY SPACED BETWEEN THE CORNERS OF THE STRUCTURAL SECTION WITH A MINIMUM SPACING OF 4.25 INCHES BETWEEN THE LONGITUDINAL BARS AND LONGITUDINAL BARS AND STIRRUPS. SEE THE TABLE FOR LONGITUDINAL BAR TOTALS.
7. CARRIER BARS SHALL BE PROVIDED AND INSTALLED TO FACILITATE PLACEMENT OF THE TRANSVERSE REINFORCING. CARRIER BARS PROVIDED AND INSTALLED SHALL BE AT CONTRACTOR'S EXPENSE.
8. EXPOSED EDGES OF CONCRETE MEMBERS SHALL BE ROUNDED OR BEVELED.
9. ALL LAP SPLICES SHALL CONFORM TO AREMA MANUAL FOR RAILWAY ENGINEERING, LATEST EDITION. STEEL SHALL BE LAPPED USING THE FOLLOWING TABLE:

BAR SIZE	#4	#5	#6	#7	#8	#9
LENGTH OF LAP SPLICE	29"	36"	43"	54"	71"	90"
THE LAP LENGTH SHALL BE BASED ON THE SMALLER SIZE BAR						



RC APPROACH SLAB

NOT TO SCALE



CONSTRUCTION JOINT DETAIL

NOT TO SCALE

DESIGN DATA

LIVE LOAD

E80 + IMPACT

DEAD LOAD

WEIGHT OF EARTH = 120 pcf
WEIGHT OF CONCRETE = 150 pcf

LATERAL LOAD

MINIMUM EFP = 40 pcf
MAXIMUM EFP = 120 pcf

ALLOWABLE STRESSES

f'_c = 4,000 psi
f_c = 1,600 psi
f_s = 24,000 psi
n = 8
v_c = 60 psi

PLOT DATE: 1/22/13

SAVE DATE: 1/18/13 DOKTORN K:\DC\PROJECTS\82322 J STREET DRAIN IMPROVEMENT\FINAL DESIGN\DESIGN DRAWINGS\100%\KR FOR ND\JSD-08THRU09-RCB.DWG

	REVISION	DESCRIPTION	APP.	DATE
D				
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PORT OF HUENEME
RECOMMENDED BY AECOM DATE
APPROVED BY: Port of Hueneme, Oxnard Harbor District DATE

DESIGNED –
DRAWN –
CHECKED –

PROJECT MANAGER DATE
DEPUTY DIRECTOR DATE
DISTRICT DIRECTOR DATE

COUNTY OF VENTURA
PUBLIC WORKS AGENCY
WATERSHED PROTECTION DISTRICT

SPEC. NO. –
PROJ. NO. 82322

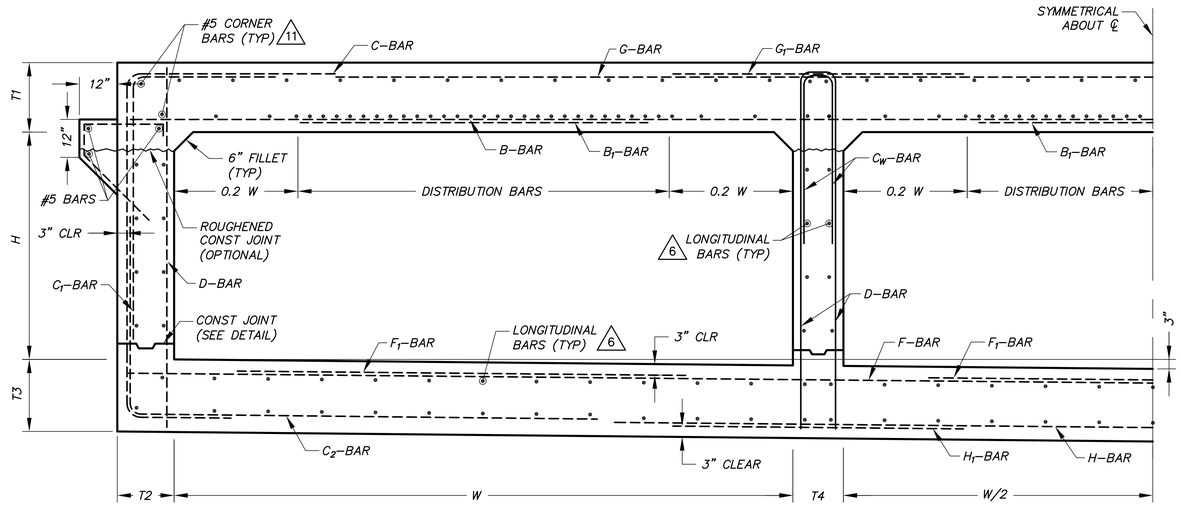
"J" STREET DRAIN IMPROVEMENT
PHASE 1
RC TRIPLE BOX CULVERT UNDER RAILROAD STRUCTURAL SECTIONS

SHEET 8 OF –
DRAWING NO. Y-?-?

STRUCTURAL NOTES

1. DIMENSIONS FROM FACE OF CONCRETE TO STEEL ARE TO THE NEAREST EDGE OF THE BAR AND SHALL BE TWO INCHES (2" CLEAR) UNLESS OTHERWISE SHOWN.
2. THE RC BOX CONDUIT DIMENSIONS SHALL BE MEASURED IN A HORIZONTAL AND VERTICAL DIRECTION ABOUT THE CENTERLINE OF THE STRUCTURE. OFFSET DIMENSIONS SHALL BE AT RIGHT ANGLES FROM THE CENTERLINE.
3. REINFORCEMENT DETAILS SHALL CONFORM TO THE LATEST EDITION OF ACI 318.
4. TRANSVERSE CONSTRUCTION JOINTS SHALL NOT BE PLACED AS SHOWN.
5. PROVIDE A 1 ½ INCH WIDE BY ¾ INCH DEEP TRIANGULAR FORMED GROOVE IN THE INSIDE FACE OF THE WALLS, THE BOTTOM OF THE TOP SLAB AND THE TOP OF THE BOTTOM SLAB AT THE TRANSVERSE CONSTRUCTION JOINT.
6. LONGITUDINAL STEEL SHALL BE CONTINUOUS AND EXTEND THROUGH ALL CONSTRUCTION JOINTS, UNLESS OTHERWISE SHOWN.
7. TRANSVERSE CONSTRUCTION JOINT KEYWAYS (IN BOTH SLABS AND WALLS) SHALL BE PLACED AT THE END OF EACH POUR, BUT THE SPACING THEREOF SHALL NOT EXCEED 50 FEET NOR BE LESS THAN 10 FEET, MEASURED ALONG THE CENTERLINE OF CONSTRUCTION.
8. AT THE BEGINNING AND END OF ALL POURS, A CURTAIN OF REINFORCEMENT COMPOSED OF B, C, C_2, D, F, G, H, AND C_W BARS SHALL BE PLACED THREE INCHES FROM THE TRANSVERSE CONSTRUCTION JOINT.
9. D AND C BARS MAY BE SPLICED AT THE LONGITUDINAL CONSTRUCTION JOINTS AT THE BASE OF THE WALL. THE LAP SPLICE SHALL BE IN ACCORDANCE WITH THE TABLE UNDER NOTE 15.
10. IF H AND/OR G BARS ARE NOT SPECIFIED, #4 TRANSVERSE BARS SHALL BE ADDED AT 36 INCH SPACING TO SUPPORT THE LONGITUDINAL BARS.
11. TWO LONGITUDINAL BARS SHALL BE PLACED AT EACH CORNER LOCATION AS SHOWN ON THE DETAIL. THE REMAINING LONGITUDINAL BARS SHALL BE EQUALLY SPACED BETWEEN THE CORNER BARS WITH A MAXIMUM SPACING OF 18 INCHES IN EACH FACE OF THE SLABS AND WALLS, AND NEED NOT CORRESPOND TO THE NUMBER OR LOCATION SHOWN ON THE DETAIL. SEE THE TABLE FOR LONGITUDINAL BAR TOTALS.
12. TYPE 'E' JOINT SEALANT SHALL BE INSTALLED IN 1 ½ INCH WIDE BY ¾ INCH DEEP FORMED GROOVE IN THE TOP OF THE TOP SLAB. SAND BLAST THE SIDES OF THE GROOVE AND PROVIDE A NON-BONDING AGENT IN THE BOTTOM OF THE GROOVE BEFORE INSTALLATION OF THE JOINT SEALANT.
13. THE NUMBER OF CARRIER BARS INDICATED IN THE TABLE SHALL BE PROVIDED AND INSTALLED TO FACILITATE PLACEMENT OF THE TRANSVERSE REINFORCING. ADDITIONAL CARRIER BARS PROVIDED AND INSTALLED FOR THE CONVENIENCE OF THE CONTRACTORS WILL BE AT HIS EXPENSE.
14. EXPOSED EDGES OF CONCRETE MEMBERS SHALL BE ROUNDED OR BEVELED.
15. ALL LAP SPLICES SHALL CONFORM TO THE LATEST EDITION OF ACI 318. LONGITUDINAL STEEL SHALL BE LAPPED 24 BAR DIAMETERS AT SPLICES. TRANSVERSE STEEL SHALL BE LAPPED USING THE FOLLOWING TABLE:

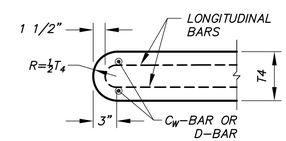
BAR SIZE	#4	#5	#6	#7	#8	#9
LENGTH OF LAP SPLICE	25"	31"	37"	54"	62"	70"
THE LAP LENGTH SHALL BE BASED ON THE SMALLER SIZE BAR						



RC TRIPLE BOX CULVERT - TYPICAL SECTION

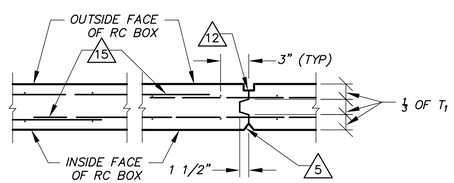
B – –

NOT TO SCALE

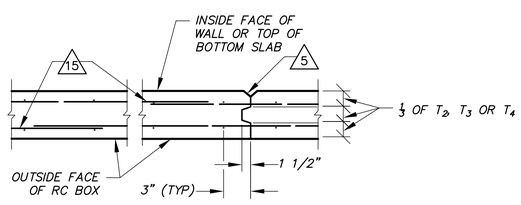


INTERNAL WALL END DETAIL

NOT TO SCALE



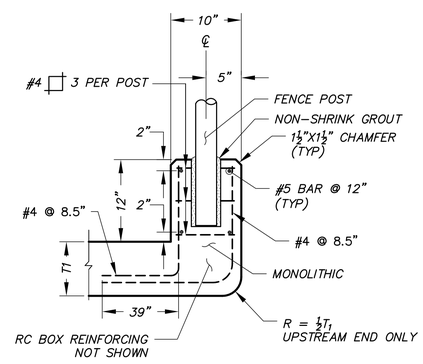
TOP SLAB



WALLS AND BOTTOM SLAB

TRANSVERSE CONSTRUCTION JOINT DETAILS

NOT TO SCALE



PARAPET - HEADWALL DETAIL

NOT TO SCALE

DESIGN DATA

DEAD LOAD

WEIGHT OF EARTH = 120 pcf
WEIGHT OF CONCRETE = 150 pcf

LATERAL LOAD

MINIMUM EFP = 37 pcf
MAXIMUM EFP = 120 pcf
INTERNAL WATER PRESSURE =62.4 psf

ALLOWABLE STRESSES

f'_c = 4,000 psi
f_c = 1,800 psi
f_s = 24,000 psi
n = 8
v_c = 70 psi

RC TRIPLE BOX CULVERT TABLE

LIVE LOAD			HS20
WIDTH		W	16'-4"
HEIGHT		H	6'-0"
THICKNESS (INCHES)	TOP OF SLAB	T_1	16
	SIDE WALL	T_2	12.5
	BOTTOM SLAB	T_3	16
	INTERNAL WALL	T_4	16
B BAR	BAR NO. & SPACING		#4 @ 8.5"
	LENGTH		52'-0"
B_1 BAR	BAR NO. & SPACING		#5 @ 8.5"
	LENGTH		9'-2"
C BAR	BAR NO. & SPACING		#6 @ 8.5"
	HORIZONTAL LENGTH (ROOF)		5'-9"
	HORIZONTAL LENGTH (INVERT)		3'-0"
	VERTICAL LENGTH		8'-2"
C_1 BAR	BAR NO. & SPACING		#7 @ 8.5"
	HORIZONTAL LENGTH		4'-0"
	VERTICAL LENGTH		6'-9"
C_2 BAR	BAR NO. & SPACING		#4 @ 8.5"
	HORIZONTAL LENGTH		12'-6"
	VERTICAL LENGTH		5'-6"
C_3 BAR	BAR NO. & SPACING		–
	HORIZONTAL LENGTH		–
	VERTICAL LENGTH		–
D BAR	BAR NO. & SPACING		#4 @ 8.5"
	LENGTH		8'-2"
F BAR	BAR NO. & SPACING		#4 @ 8.5"
	LENGTH		52'-0"
F_1 BAR	BAR NO. & SPACING		#5 @ 8.5"
	LENGTH		11'-10"
G BAR	BAR NO. & SPACING		#4 @ 8.5"
	LENGTH		26'-0"
G_1 BAR	BAR NO. & SPACING		#7 @ 8.5"
	LENGTH		7'-0"
H BAR	BAR NO. & SPACING		#5 @ 8.5"
	LENGTH		26'-9"
H_1 BAR	BAR NO. & SPACING		#7 @ 8.5"
	LENGTH		7'-0"
C_W BAR	BAR NO. & SPACING		#4 @ 8.5"
	LENGTH		4'-8"
DISTR BARS	BAR NO. & SPACING		#4 @ 4.25"
	NUMBER OF BARS		28
NUMBER OF #4 LONGITUDINAL BARS		TOP SLAB	52
		BOTTOM SLAB	72
		SIDE WALLS	16
		INTERNAL WALLS	16
TOTAL #4 LONGITUDINAL BARS			156
#4 CARRIER BARS		TOP	12
		BOTTOM	14
CONCRETE QUANTITY (CY/LF)			6.36
STEEL QUANTITY (LBS/LF)			495

PLOT DATE: 1/22/13

SAVE DATE: 1/18/13 DOKTORN K:\DC\PROJECTS\82322 J STREET DRAIN IMPROVEMENT\FINAL DESIGN\DESIGN DRAWINGS\100%\KR FOR ND\JSD-08THRU09-RCB.DWG

	REVISION	DESCRIPTION	APP.	DATE
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DEPUTY DIRECTOR DATE
DISTRICT DIRECTOR DATE

COUNTY OF VENTURA
PUBLIC WORKS AGENCY
WATERSHED PROTECTION DISTRICT

SPEC. NO. –
PROJ. NO. 82322

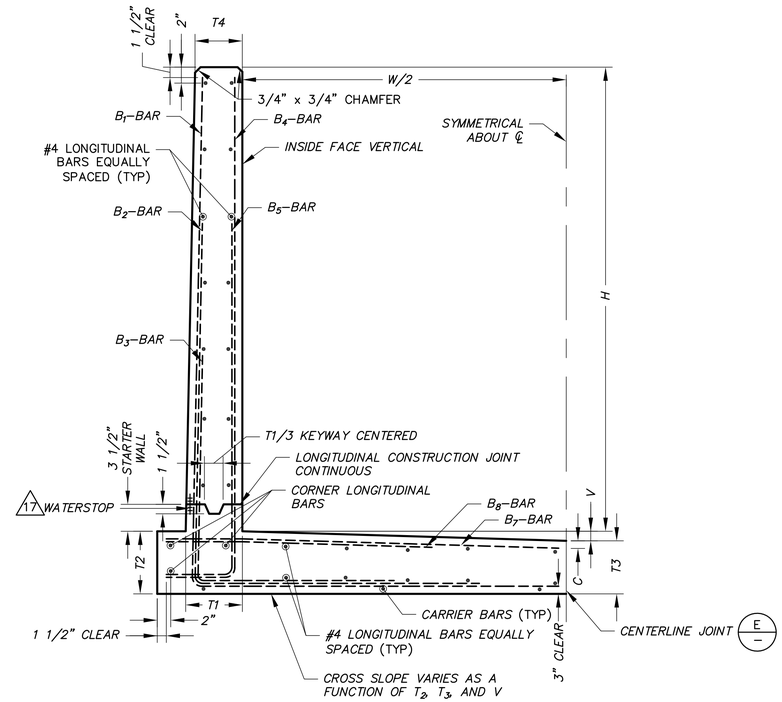
"J" STREET DRAIN IMPROVEMENT
PHASE 1
RC TRIPLE BOX CULVERT STRUCTURAL SECTIONS

SHEET 9 OF –
DRAWING NO. Y-?-?

STRUCTURAL NOTES

1. DIMENSIONS FROM FACE OF CONCRETE TO STEEL ARE TO THE NEAREST EDGE OF THE BAR AND SHALL BE TWO INCHES (2" CLEAR) UNLESS OTHERWISE SHOWN.
2. CONCRETE DIMENSIONS SHALL BE MEASURED HORIZONTALLY OR VERTICALLY ON THE PROFILE, AND PARALLEL TO OR AT RIGHT ANGLES (OR RADIALLY) TO CENTERLINE OF CHANNEL ON THE PLAN EXCEPT AS OTHERWISE SHOWN.
3. REINFORCEMENT DETAILS SHALL CONFORM TO THE LATEST EDITION OF ACI 318.
4. TRANSVERSE CONSTRUCTION JOINTS SHALL NOT BE PLACED WITHIN 30 INCHES OF OPENINGS FOR SIDE DRAINS OR INLETS.
5. TRANSVERSE CONSTRUCTION JOINTS IN WALLS AND SLABS SHALL BE IN THE SAME PLANE. NO STAGGERING OF JOINTS WILL BE PERMITTED. TRANSVERSE CONSTRUCTION JOINTS SHALL BE NORMAL OR RADIAL TO THE CENTERLINE OF CONSTRUCTION.
6. THE TRANSVERSE REINFORCING STEEL SHALL TERMINATE ONE AND ONE-HALF INCHES FROM THE CONCRETE SURFACES UNLESS OTHERWISE SHOWN ON THE PLANS.
7. EXPOSED EDGES OF CONCRETE MEMBERS SHALL BE CHAMFERED.
8. NO SPLICES IN TRANSVERSE STEEL REINFORCEMENT WILL BE PERMITTED OTHER THAN SHOWN IN THE DRAWING WITHOUT APPROVAL OF THE ENGINEER. NO MORE THAN ONE SPLICE SHALL BE PERMITTED IN ANY LONGITUDINAL BAR BETWEEN TRANSVERSE JOINTS. SPLICES SHALL BE STAGGERED.
9. LONGITUDINAL STEEL SHALL TERMINATE TWO INCHES FROM TRANSVERSE CONSTRUCTION JOINTS.
10. TRANSVERSE CONSTRUCTION JOINTS SHALL BE SPACED NOT TO EXCEED 50 FEET NOR BE LESS THAN 10 FEET, MEASURED ALONG THE CENTERLINE OF CONSTRUCTION, EXCEPT AS OTHERWISE SHOWN ON THE DRAWINGS.
11. TRANSVERSE CONSTRUCTION JOINTS SHALL BE PLACED AT THE JUNCTION OF RECTANGULAR OPEN CHANNEL SECTIONS WITH CLOSED CONDUIT SECTIONS.
12. THE MAXIMUM SPACING OF BARS IN CURVED SECTIONS SHALL NOT EXCEED THAT SHOWN ON THE TYPICAL SECTIONS, UNLESS OTHERWISE SHOWN ON THE DRAWINGS. STEEL SHALL BE PLACED RADIALLY FROM THE MAXIMUM SPACING.
13. AT THE BEGINNING AND ENDING OF ALL POURS, A COMPLETE CURTAIN OF REINFORCEMENT COMPOSED OF B_3, B_4, AND B_4 BARS SHALL BE PLACED THREE INCHES FROM THE TRANSVERSE CONSTRUCTION JOINT.
14. ALL TRANSVERSE JOINTS SHALL BE PROVIDED WITH 1 1/2" x 3/4" FORMED GROOVE IN THE INSIDE FACE AND TOP OF WALLS AND WITH 3/4" TOOLED JOINT IN THE BOTTOM SLAB.
15. THE BAR LENGTHS TABULATED FOR TRANSITIONS ARE APPLICABLE TO THE LARGER SECTION ONLY. THE BARS REQUIRING ADJUSTMENT ARE THOSE TABULATED IN THE TABLE HEREON AND SHALL BE ADJUSTED AS NECESSARY WITHIN THE TRANSITION.
16. TRANSVERSE WALL JOINTS SHALL HAVE A 4" POLYVINYL CHLORIDE WATERSTOP (SPLIT RIBBED CENTER BULB TYPE) WHICH SHALL BE CONTECH VINYLSTOP NO. 431S, BURKE VINYLOK WATERSTOP R.S.B. 316-4, OR AN APPROVED EQUAL.
17. THE LONGITUDINAL WALL JOINTS SHALL HAVE A 4" POLYVINYL CHLORIDE WATERSTOP (RIBBED TYPE) WHICH SHALL BE BURKE VINYLOK WATERSTOP R316-4, WATER SEALS INC. FLEXSTRIP OR AN APPROVED EQUAL. THE WATERSTOP SHALL BE TIED TO THE OUTSIDE OF THE REINFORCING STEEL AT THE TOP AND BOTTOM WITH ONE PIECE OF WIRE AT APPROXIMATELY 1'-0" SPACING, PUNCHING SHALL NOT BE ALLOWED. THE WATERSTOP SHALL BE CONTINUOUS FOR EACH WALL SECTION.
18. B_1 BARS MAY BE SPLICED ABOVE THE LONGITUDINAL CONSTRUCTION JOINT. USE LAP SHOWN IN THE TABLE HEREON.
19. THE LONGITUDINAL CONSTRUCTION JOINTS SHALL BE CONTINUOUS.
20. ALL LAP SPLICES SHALL CONFORM TO THE LATEST EDITION OF ACI 318. LONGITUDINAL STEEL SHALL BE LAPPED 24 BAR DIAMETERS AT SPLICES. TRANSVERSE STEEL SHALL BE LAPPED USING THE FOLLOWING TABLE:

BAR SIZE	#4	#5	#6	#7	#8	#9
LENGTH OF LAP SPLICE	25"	31"	37"	54"	62"	70"
THE LAP LENGTH SHALL BE BASED ON THE SMALLER SIZE BAR						



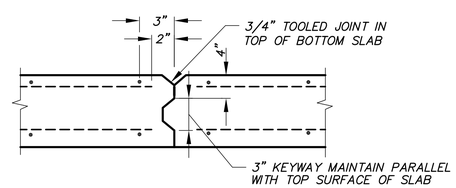
TYPICAL RC OPEN CHANNEL SECTION

C

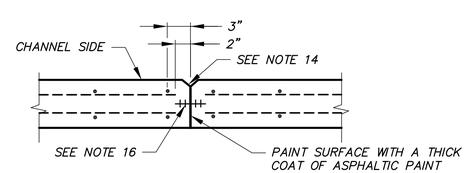
NOT TO SCALE

RC CHANNEL TABLE

SECTION NUMBER			1	2	3	4	5	6
WIDTH		W	65'-0"	49'-6"	49'-6"	49'-6"	49'-6"	49'-6"
HEIGHT		H	8'-3"	8'-3"	8'-0"	7'-9"	7'-3"	7'-0"
THICKNESS (INCHES)	BASE OF WALL	T_1	11"	11"	11"	11"	11"	11"
	SLAB AT FACE OF WALL	T_2	12"	12"	12"	12"	12"	12"
	SLAB AT ℄	T_3	9"	9"	9"	9"	9"	9"
	TOP OF WALL	T_4	8"	8"	8"	8"	8"	8"
INVERT DROP		V	3"	3"	3"	3"	3"	3"
STEEL CLEARANCE INVERT		C	2.5"	2.5"	2.5"	2.5"	2.5"	2.5"
B_1 BAR	BAR NO. & SPACING		#5@18"	#5@18"	#5@18"	#5@18"	#5@18"	#5@18"
	HORIZONTAL LENGTH		30'-6"	25'-4"	25'-4"	25'-4"	25'-4"	25'-4"
	VERTICAL LENGTH		8'-10"	8'-10"	8'-6"	8'-4"	7'-10"	7'-7"
B_2 BAR	BAR NO. & SPACING		#5@18"	#5@18"	#5@18"	#5@18"	#5@18"	#5@18"
	HORIZONTAL LENGTH		30'-6"	25'-4"	25'-4"	25'-4"	25'-4"	25'-4"
	VERTICAL LENGTH		6'-7"	6'-7"	6'-5"	6'-4"	4'-11"	4'-10"
B_3 BAR	BAR NO. & SPACING		#7@9"	#7@9"	#7@9"	#7@9"	#7@9"	#7@9"
	HORIZONTAL LENGTH		8'-4"	7'-5"	7'-5"	7'-5"	7'-5"	7'-5"
	VERTICAL LENGTH		4'-9"	4'-9"	4'-9"	4'-8"	4'-7"	4'-7"
B_4 BAR	BAR NO. & SPACING		#5@18"	#5@18"	#5@18"	#5@18"	#4@18"	#4@18"
	HORIZONTAL LENGTH		1'-1"	1'-1"	1'-1"	1'-1"	1'-1"	1'-1"
	VERTICAL LENGTH		8'-10"	8'-10"	8'-6"	8'-4"	7'-10"	7'-6"
B_5 BAR	BAR NO. & SPACING		#5@18"	#5@18"	#5@18"	#5@18"	#5@18"	#4@18"
	HORIZONTAL LENGTH		1'-1"	1'-1"	1'-1"	1'-1"	1'-1"	1'-1"
	VERTICAL LENGTH		3'-7"	3'-6"	3'-6"	3'-5"	3'-4"	3'-4"
B_7 BAR	BAR NO. & SPACING		#5@18"	#5@18"	#5@18"	#5@18"	#4@18"	#4@18"
	HORIZONTAL LENGTH		31'-1"	25'-10"	25'-10"	25'-10"	25'-10"	25'-10"
B_8 BAR	BAR NO. & SPACING		#5@18"	#5@18"	#5@18"	#5@18"	#5@18"	#5@18"
	HORIZONTAL LENGTH		31'-1"	25'-10"	25'-10"	25'-10"	25'-10"	25'-10"
# 4 LONGITUDINAL BARS		BOTTOM SLAB	90	74	74	74	74	74
		SIDE WALLS	28	28	28	28	26	24
TOTAL #4 LONGITUDINAL BARS			124	108	108	108	106	104
#4 CARRIER BARS IN BOTTOM SLAB			16	13	13	13	13	13
CONCRETE QUANTITY (CY/LF)			2.53	2.19	2.18	2.16	2.13	2.12
STEEL QUANTITY (LBS/LF)			236	206	205	204	192	190



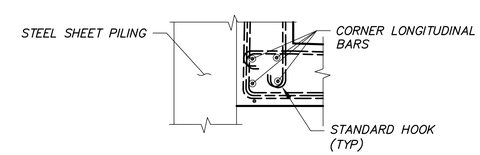
SLAB CONSTRUCTION JOINT



WALL CONSTRUCTION JOINT

TRANSVERSE JOINTS DETAILS

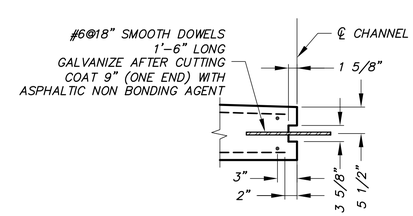
NOT TO SCALE



SHEET PILING NEXT TO WALL DETAIL

D

NOT TO SCALE



CENTERLINE JOINT DETAIL

E

NOT TO SCALE

DESIGN DATA:

LIVE LOAD

H20-44

LATERAL LOADS:

EXTERNAL: 80 psf (EFP)

INTERNAL: 40 psf (EFP)

ALLOWABLE STRESS

f'_c = 4,000 psi
f_c = 1,800 psi
f_s = 24,000 psi
v_c = 70 psi
n = 8

FOUNDATION MODULUS

50 #/in.^{3}

PLOT DATE: 1/22/13

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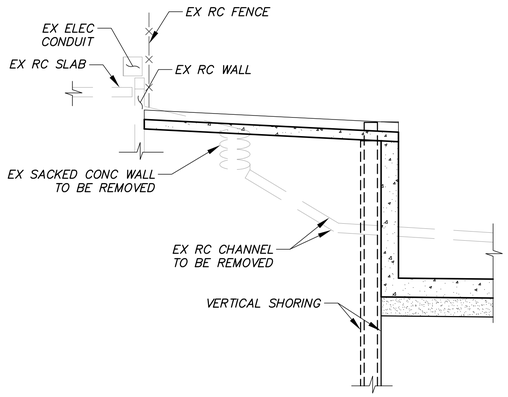
DEPUTY DIRECTOR DATE
DISTRICT DIRECTOR DATE

COUNTY OF VENTURA
PUBLIC WORKS AGENCY
WATERSHED PROTECTION DISTRICT

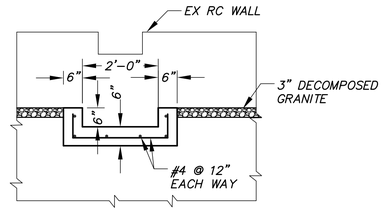
SPEC. NO. –
PROJ. NO. 82322

"J" STREET DRAIN IMPROVEMENT
PHASE 1
RC RECTANGULAR CHANNEL STRUCTURAL SECTIONS

SHEET 10 OF –
DRAWING NO. Y-?-?



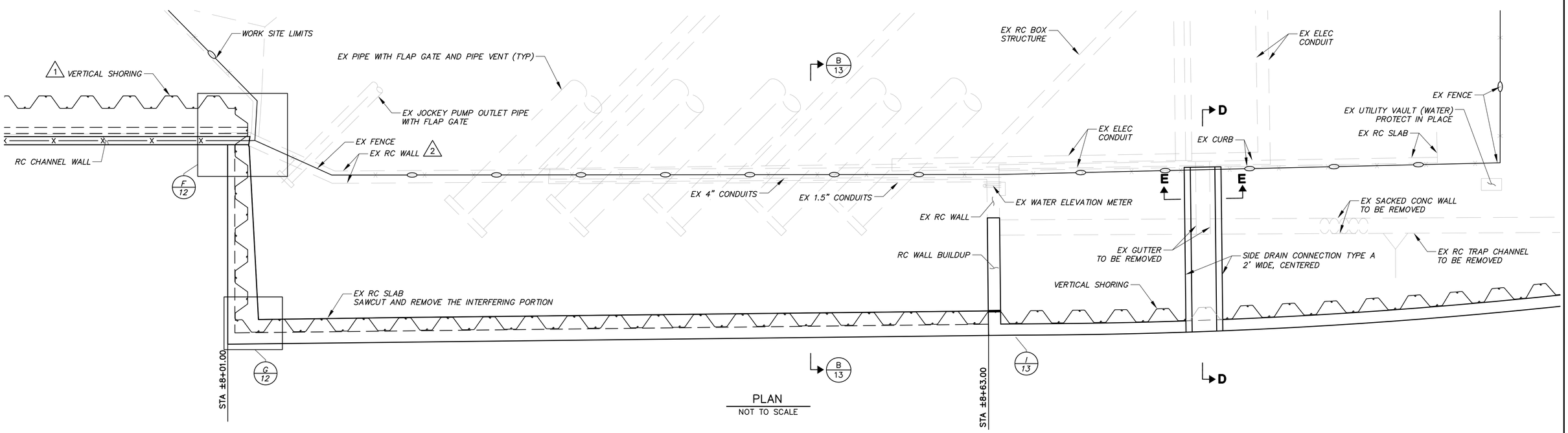
SECTION D–D
NOT TO SCALE



SECTION E–E

NOTES:

1. DESIGN AND INSTALL VERTICAL SHORING TO PROTECT AND SUPPORT EXISTING STRUCTURES IN PLACE.
2. ALL EX FACILITIES SHALL BE PROTECTED IN PLACE UNLESS NOTED OTHERWISE.



PLAN
NOT TO SCALE

PLOT DATE: 1/22/13

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DISTRICT DIRECTOR DATE

COUNTY OF VENTURA
PUBLIC WORKS AGENCY
WATERSHED PROTECTION DISTRICT

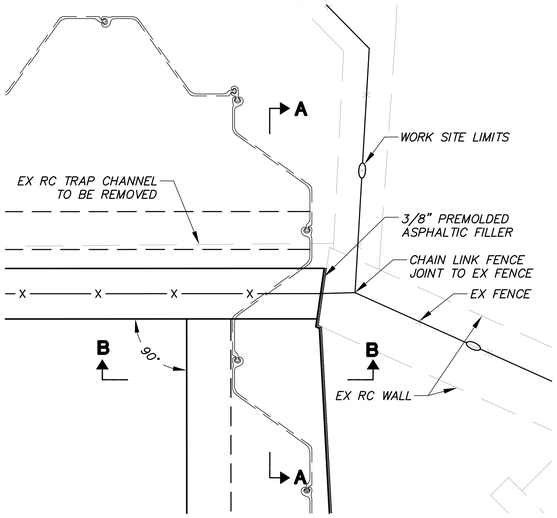
SPEC. NO. –
PROJ. NO. 82322

"J" STREET DRAIN IMPROVEMENT
PHASE 1
HUENEME DRAIN PUMP STATION

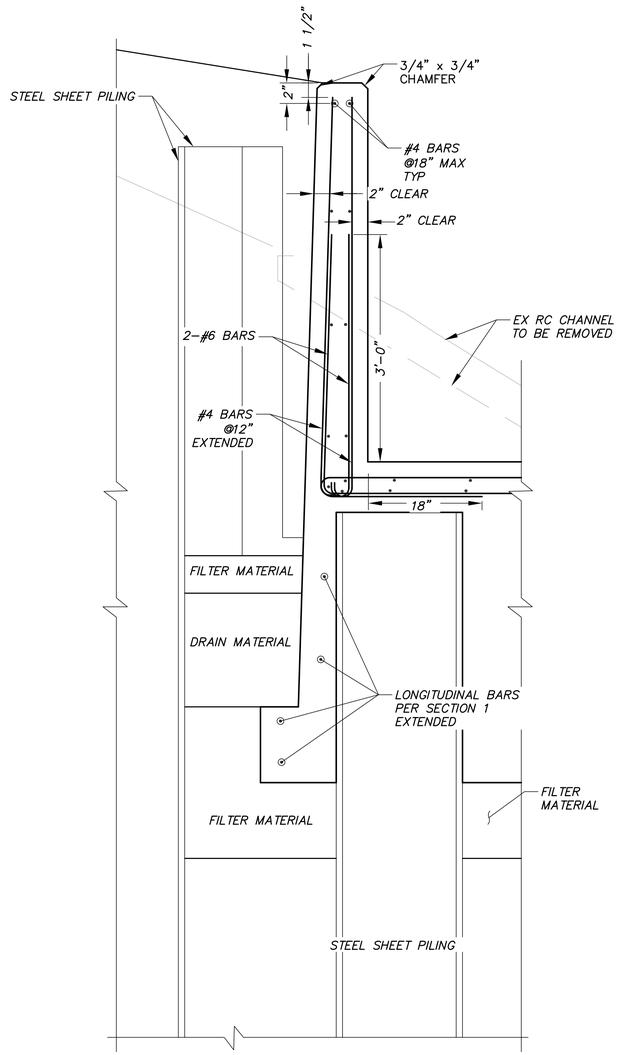
SHEET 11
OF –
DRAWING NO. Y–?–?

NOTES:

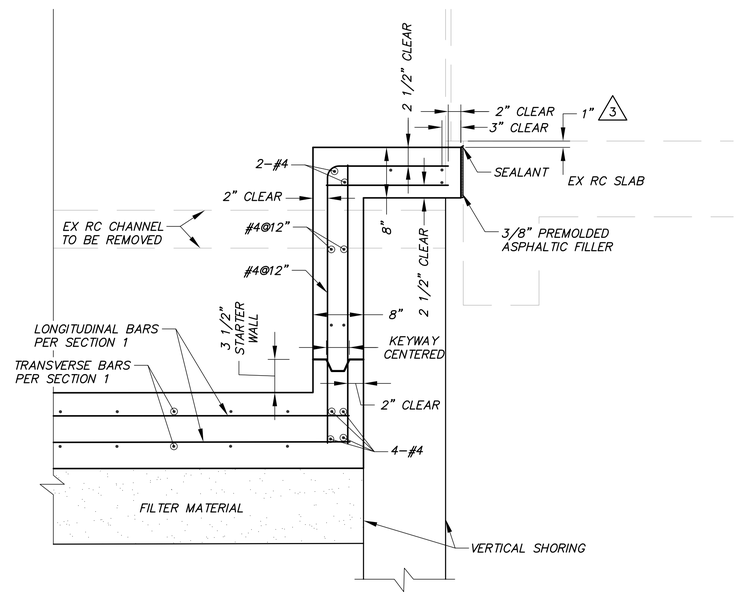
1. DESIGN AND INSTALL VERTICAL SHORING TO PROTECT AND SUPPORT EXISTING STRUCTURES IN PLACE.
2. ALL EX FACILITIES SHALL BE PROTECTED IN PLACE UNLESS NOTED OTHERWISE.
3. TOP OF CHANNEL WALL SHALL BE 1" BELOW TOP OF EX SLAB.



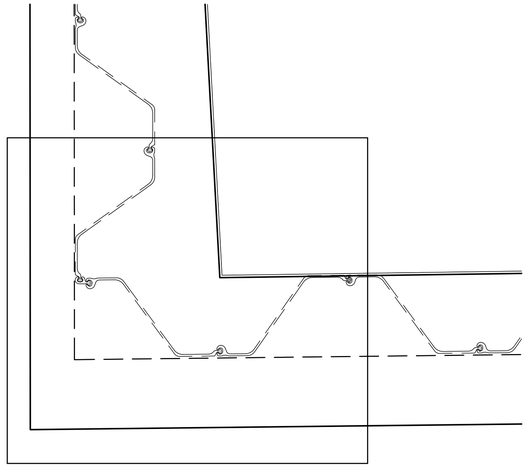
HDPS SW CORNER (F/–)
NOT TO SCALE



SECTION A–A
NOT TO SCALE



SECTION B–B
NOT TO SCALE



HDPS SE CORNER (G/–)
NOT TO SCALE

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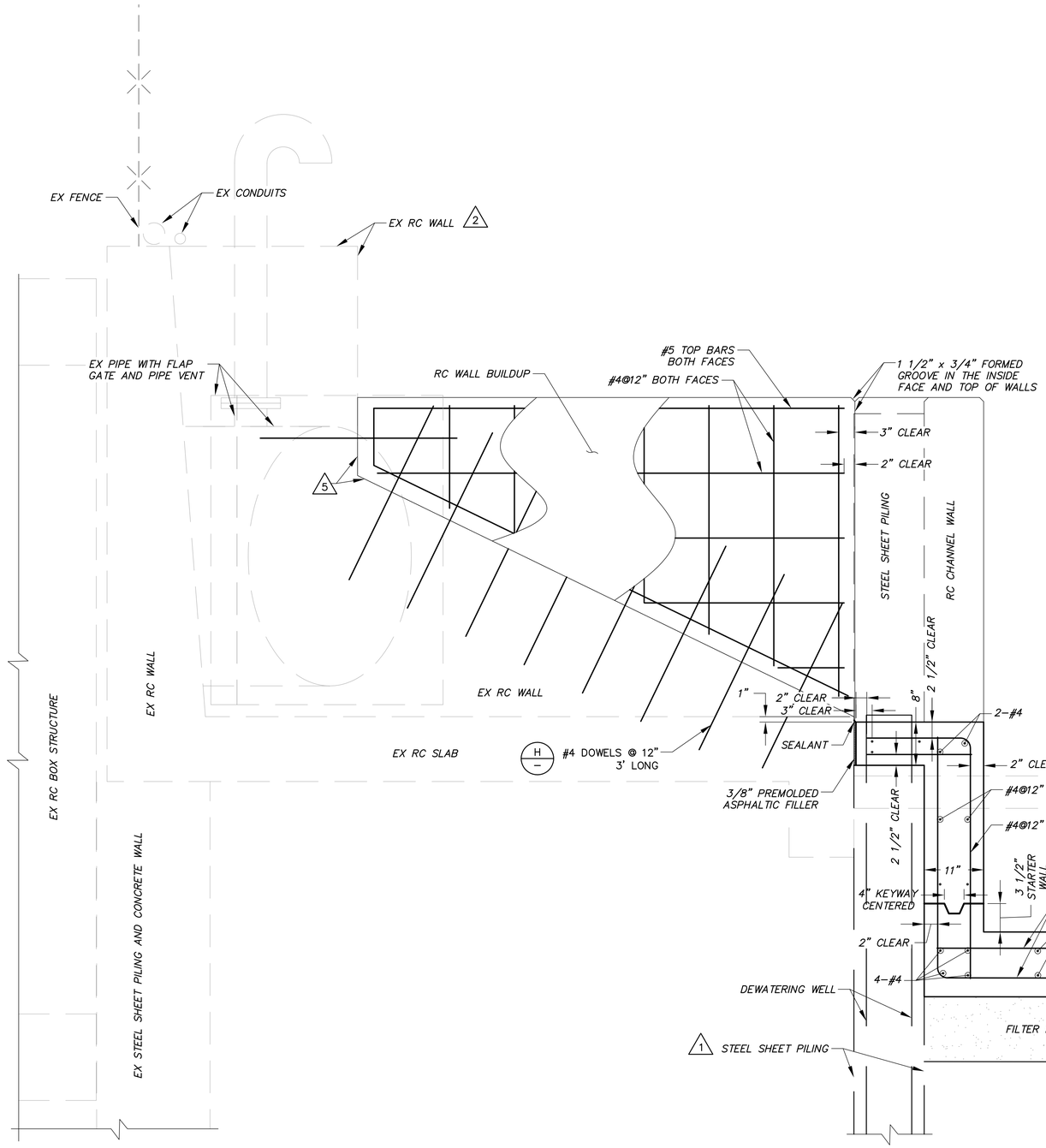
PUBLIC WORKS AGENCY
WATERSHED PROTECTION DISTRICT

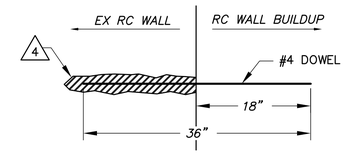
SPEC. NO. –
PROJ. NO. 82322

"J" STREET DRAIN IMPROVEMENT
PHASE 1
HUENEME DRAIN PUMP STATION DETAILS

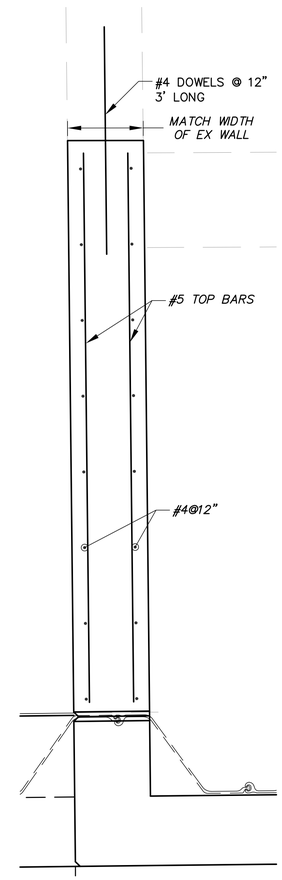
SHEET 12
OF –
DRAWING NO. Y-?-?



SECTION B-B
NOT TO SCALE



DOWEL DETAIL H
NOT TO SCALE



RC WALL BUILDUP DETAIL I
NOT TO SCALE

NOTES:

1. DESIGN AND INSTALL VERTICAL SHORING TO PROTECT AND SUPPORT EXISTING STRUCTURES IN PLACE.
2. ALL EX FACILITIES SHALL BE PROTECTED IN PLACE UNLESS NOTED OTHERWISE.
3. TOP OF CHANNEL WALL SHALL BE 1" BELOW TOP OF EX SLAB.
4. DRILL A ONE INCH DIAMETER HOLE AND INJECT AN APPROVED NON-SHRINK GROUT INTO THE HOLE PRIOR TO PLACEMENT OF THE BAR.
5. SANDBLAST THE EX SURFACE TO EXPOSE THE AGGREGATE.
6. THE REBAR HEREON APPLIES TO WEST HALF OF THE RC CHANNEL AT HUENEME DRAIN PUMP STATION (HDPS) ONLY.

PLOT DATE:1/22/13

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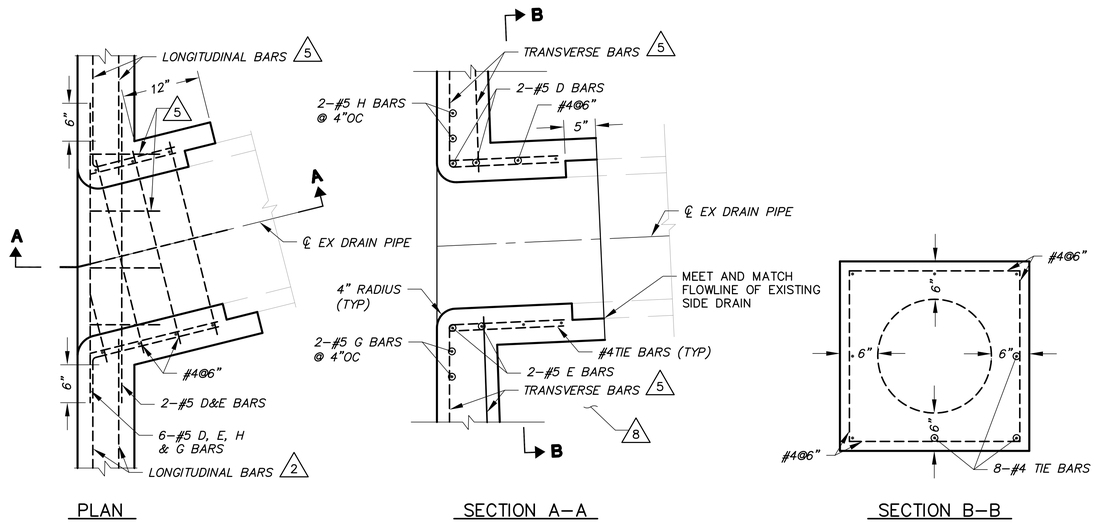
PUBLIC WORKS AGENCY
WATERSHED PROTECTION DISTRICT

SPEC. NO. –
PROJ. NO. 82322

"J" STREET DRAIN IMPROVEMENT
PHASE 1
HUENEME DRAIN PUMP STATION DETAILS

SHEET 13
OF –
DRAWING NO. Y-?-?



SIDE DRAIN CONNECTION TYPE - B (J / –)

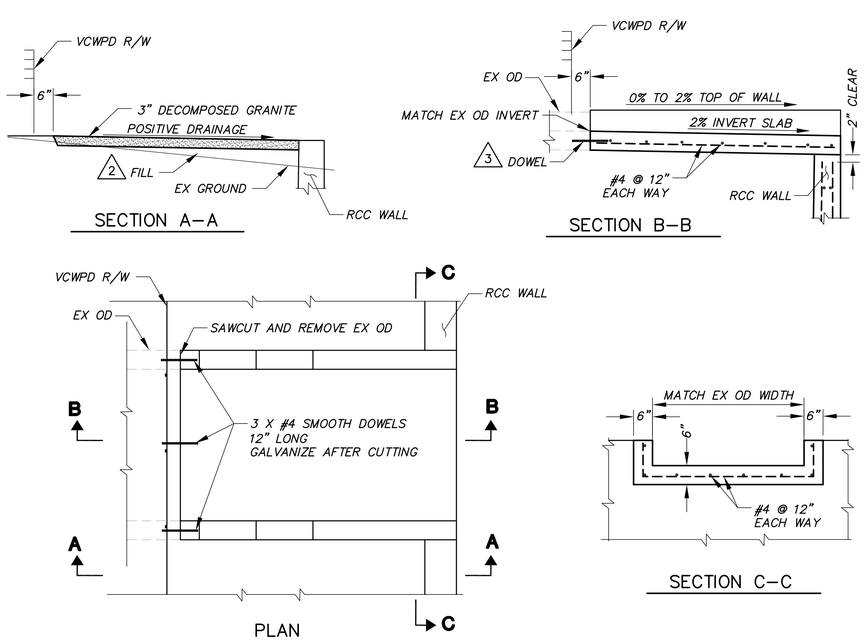
NOT TO SCALE

SIDE DRAINS CONNECTIONS		
STATION	SIZE	TYPE
±9+60	±4'W	A
±10+20	±4'W	A
±12+00	±4'W	A
±14+80	±4'W	A
±19+38	24"CMP	B
±21+65	24"CIP	B
±24+10	2'W	A
±25+02	18"CIP	B
±25+97	18"RCP	C
±26+10	15"RCP	B
±29+65	24"RCP	C
±30+80	15"RCP	B
±30+80	2'W	A

FLAPGATE DATA TABLE				
STATION	SIZE	A	B	C
±25+97	18"DIA	26"	6"	8"
±29+65	24"DIA	42"	8"	12"

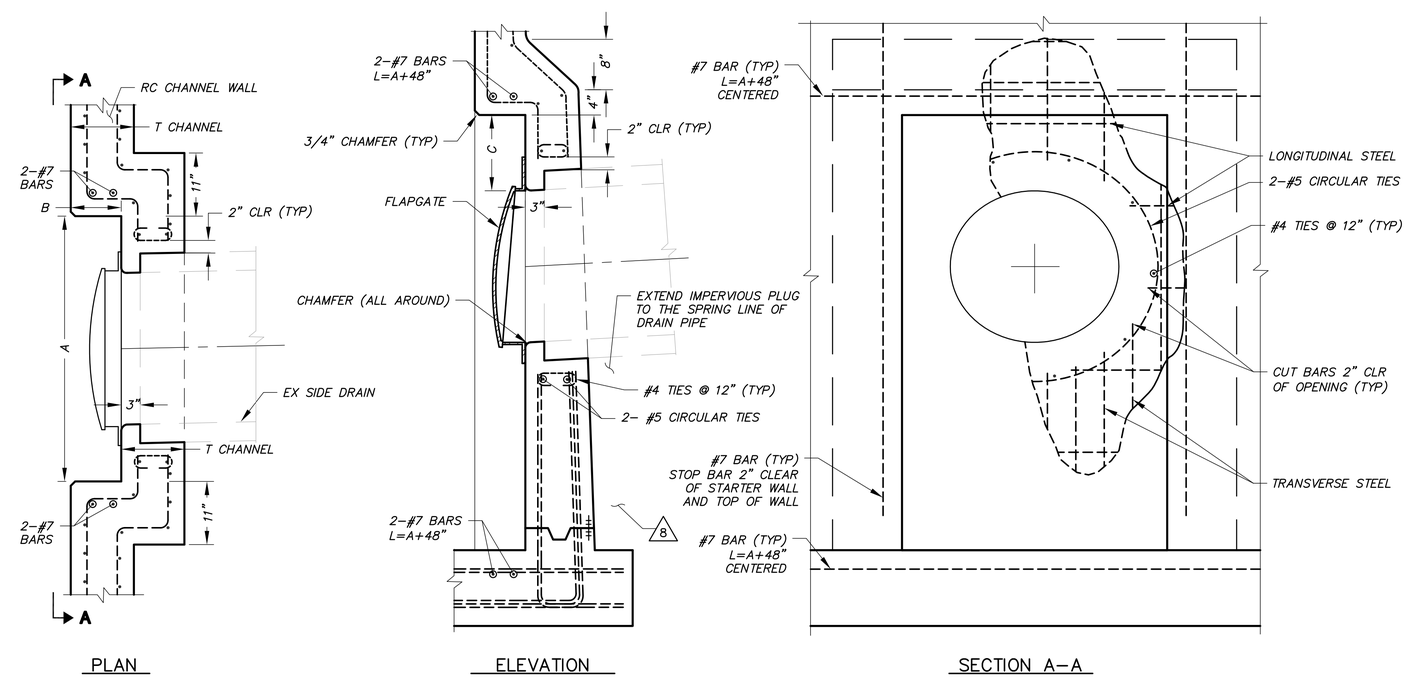
NOTES:

1. AT SURFSIDE III PROPERTY, SAWCUT EX OVERSIDE DRAIN (OD) 6 INCHES INSIDE VCWPD R/W. REMOVE AND DISPOSE OF EX OD EAST OF THE SAWCUT.
2. EXCAVATE, PLACE FILL OR GRADE THE EX GROUND AS NECESSARY TO MAINTAIN POSITIVE DRAINAGE TOWARD THE CHANNEL.
3. DRILL A ONE INCH DIAMETER HOLE AND INJECT AN APPROVED NON-SHRINK GROUT INTO THE HOLE PRIOR TO PLACEMENT OF THE BAR.
4. REINFORCING STEEL SHALL BE 1-1/2" CLEAR FROM FACE OF CONCRETE UNLESS OTHERWISE SHOWN
5. TRANSVERSE AND LONGITUDINAL BARS INSIDE FACE OF WALL SHALL BE CUT AND BENT INTO TOP, BOTTOM, AND SIDES OF JUNCTION STRUCTURE.
6. JUNCTION STRUCTURE SHALL BE POURED MONOLITHICALLY WITH THE WALL OF RC CHANNEL.
7. FLOOR OF JUNCTION STRUCTURE SHALL BE FORMED OR STEEL-TROWELED.
8. EXTEND IMPERVIOUS PLUGTO THE SPRING LINE OF DRAIN PIPE



SIDE DRAIN CONNECTION TYPE - A (K / –)

NOT TO SCALE



SIDE DRAIN CONNECTION TYPE - C (L / –)

NOT TO SCALE

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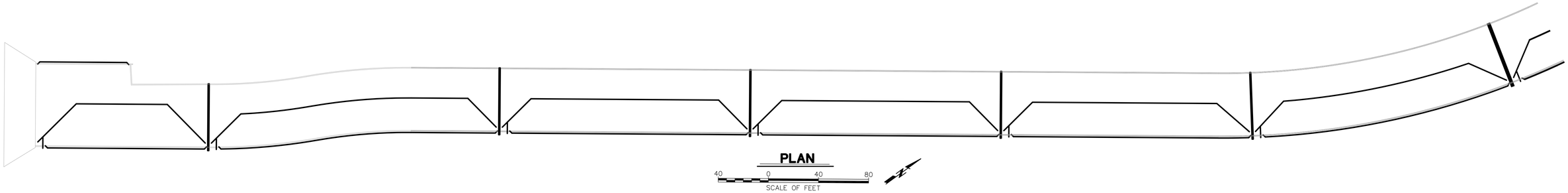
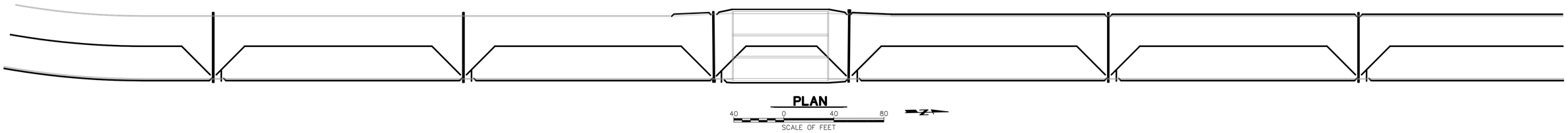
PUBLIC WORKS AGENCY
WATERSHED PROTECTION DISTRICT

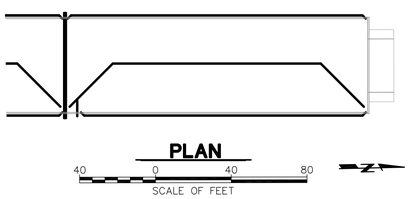
SPEC. NO. –
PROJ. NO. 82322

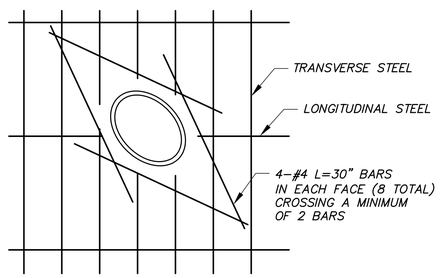
"J" STREET DRAIN IMPROVEMENT
PHASE 1
SIDE DRAINS

SHEET 14 OF –
DRAWING NO. Y-?-?



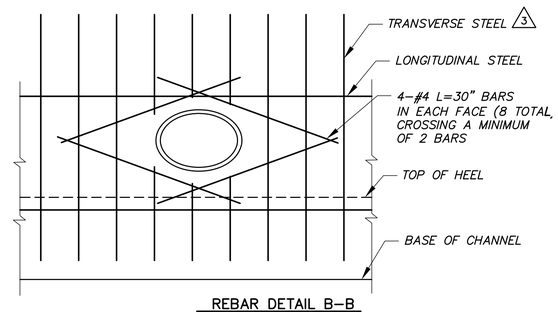






REBAR DETAIL A–A

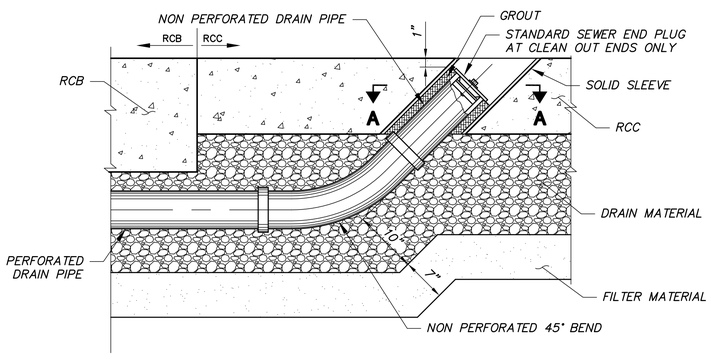
NOT TO SCALE



REBAR DETAIL B–B

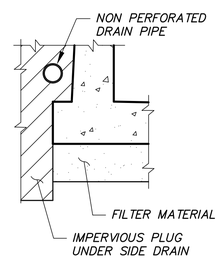
NOT TO SCALE

IMPERVIOUS PLUGS DATA TABLE
STATION
±8+64
10+96
12+96
14+96
16+96
19+00
21+01
23+01
±25+01
±26+09
28+16
30+16
32+16



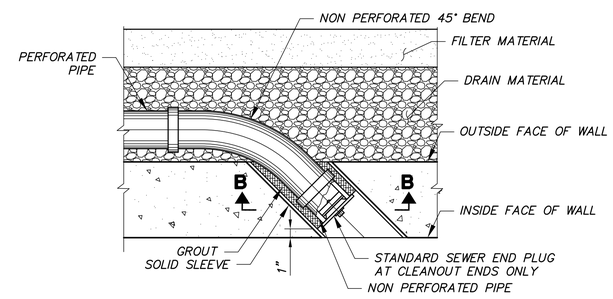
SUBDRAIN CONNECTION NEAR RCB TO RCC JOINT (M –)

NOT TO SCALE



DRAIN PIPE CROSSING IMPERVIOUS PLUG

NOT TO SCALE



WALL SUBDRAIN CONNECTION (N –)

NOT TO SCALE

NOTES

1. SUBDRAIN CLEANOUT ENDS AND OUTLETS SHALL BE LOCATED AT A MINIMUM OF 2' FROM TRANSVERSE JOINTS. ADJUST LOCATION OF IMPERVIOUS PLUGS AND/OR TRANSVERSE JOINTS TO COMPLY WITH THE ABOVE REQUIREMENT.
2. ADJUST LOCATION OF IMPERVIOUS PLUGS NEAR STA 25+01 AND STA 56+09 TO MATCH LOCATION OF SIDE DRAINS.
3. CUT OR BEND INTERFERING STEEL 2" CLEAR AROUND SOLID SLEEVE.
4. DRAIN MATERIAL SHALL BE PLACED UP TO PIPE INVERT PRIOR TO INSTALLING DRAIN PIPE.
5. SOLID SLEEVE I.D. SHALL BE 2" LARGER THAN O.D. OF PIPE.

PLOT DATE: 1/22/13

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COUNTY OF VENTURA
PUBLIC WORKS AGENCY
WATERSHED PROTECTION DISTRICT

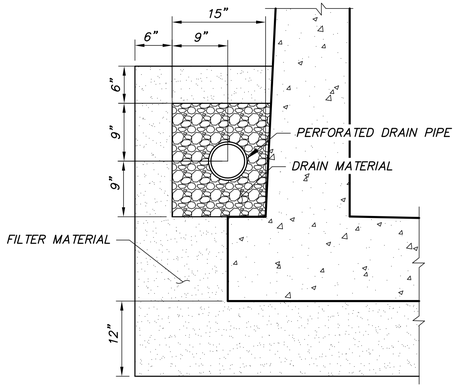
SPEC. NO. –
PROJ. NO. 82322

"J" STREET DRAIN IMPROVEMENT
PHASE 1
SUBDRAIN SYSTEM

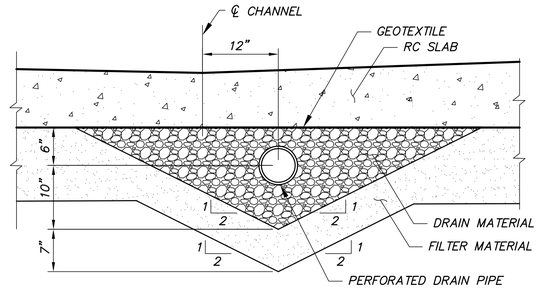
SHEET 15
OF –
DRAWING NO. Y–?–?

NOTES

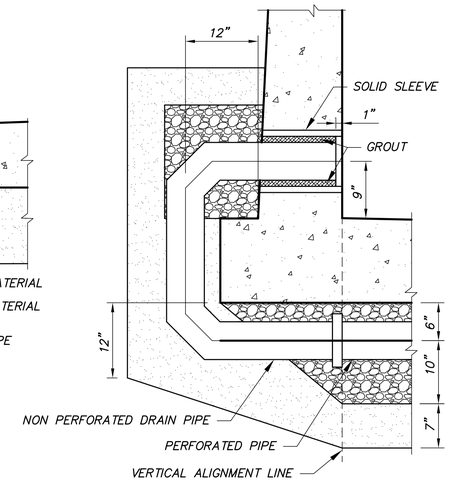
1. DRAIN MATERIAL SHALL BE PLACED UP TO PIPE INVERT PRIOR TO INSTALLING DRAIN PIPE.
2. CUT OR BEND INTERFERING STEEL 2" CLEAR AROUND SOLID SLEEVE.
3. SOLID SLEEVE I.D. SHALL BE 2" LARGER THAN O.D. OF PIPE.



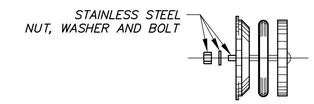
SECTION C–C
NOT TO SCALE



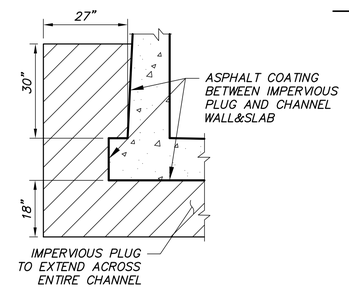
SECTION A – A
NOT TO SCALE



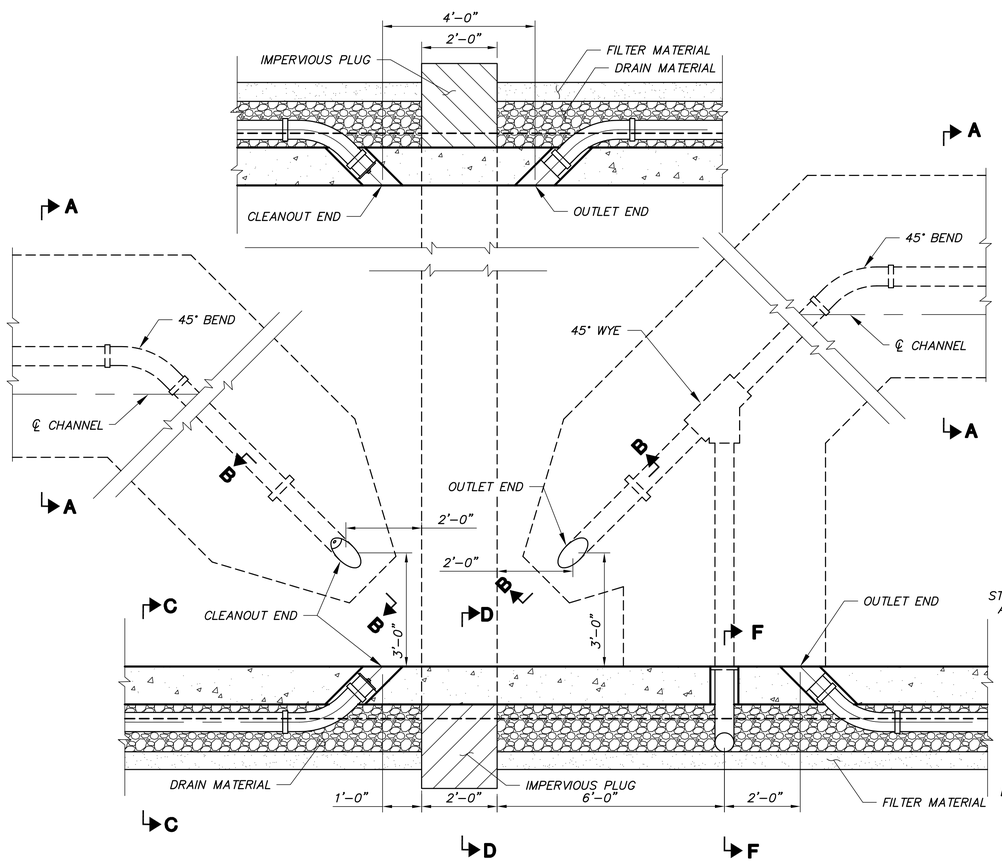
SECTION F – F
NOT TO SCALE



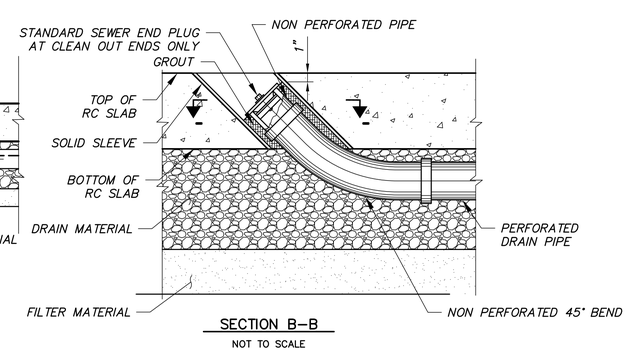
STANDARD SEWER END PLUG (O)
NOT TO SCALE



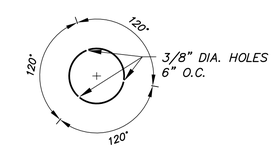
SECTION D–D
NOT TO SCALE



TYPICAL SETUP - PLAN
NOT TO SCALE



SECTION B–B
NOT TO SCALE



PERFORATED DRAIN PIPE (Q)
NOT TO SCALE

PLOT DATE: 1/22/13

SAVE DATE: 1/18/13 ROUSSEK K:\DC\PROJECTS\82322 J STREET DRAIN IMPROVEMENT\FINAL DESIGN\DESIGN DRAWINGS\100%\KR FOR ND\JSD-15THRU16-SS.DWG

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△	REVISION DESCRIPTION	APP.	DATE

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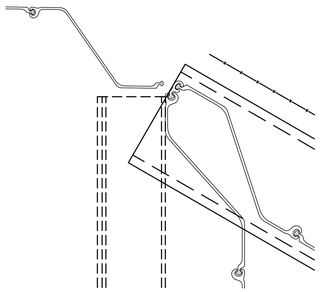
COUNTY OF VENTURA
PUBLIC WORKS AGENCY
WATERSHED PROTECTION DISTRICT

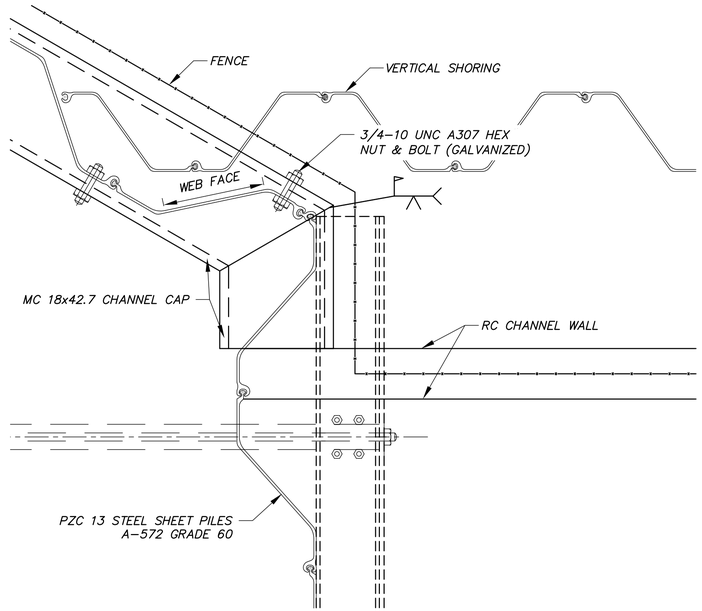
SPEC. NO. –
PROJ. NO. 82322

"J" STREET DRAIN IMPROVEMENT
PHASE 1
SUBDRAIN SYSTEM SECTIONS AND DETAILS

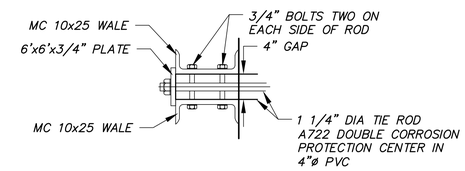
SHEET 16 OF –
DRAWING NO. Y–?–?



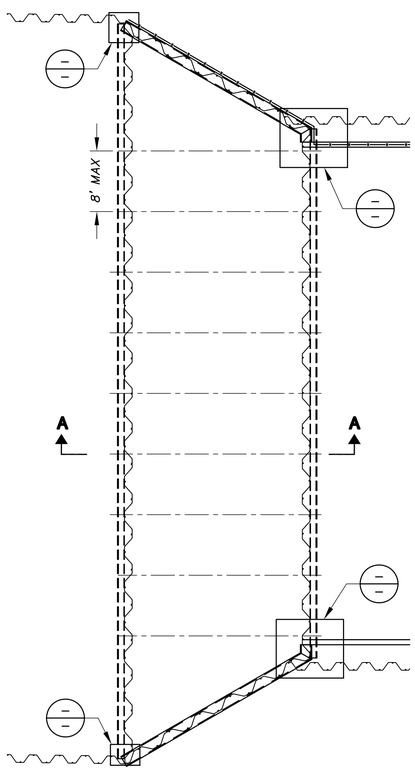
SW CORNER DETAIL (R / –)
NOT TO SCALE



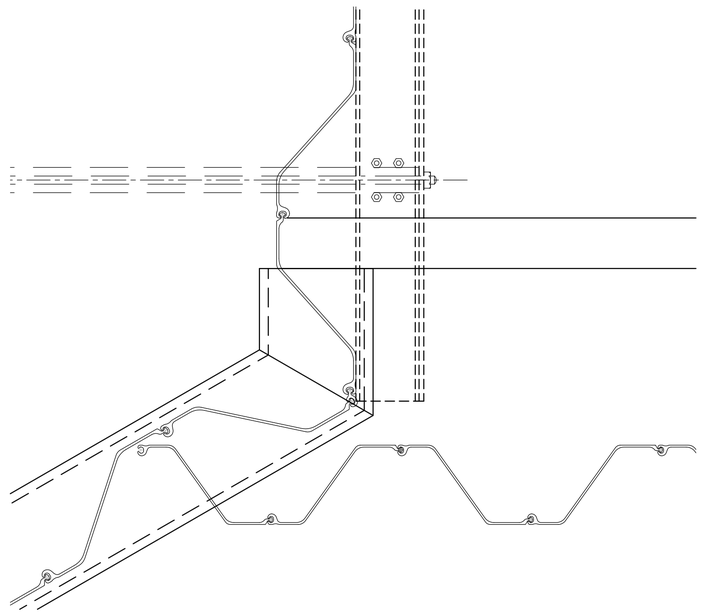
NW CORNER DETAIL (S / –)
NOT TO SCALE



TIE ROD DETAIL (U / –)
NOT TO SCALE



PLAN
NOT TO SCALE



NE CORNER DETAIL (T / –)
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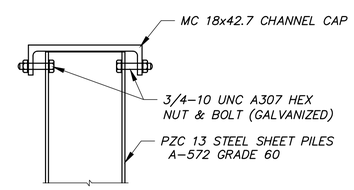
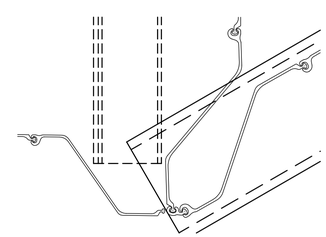
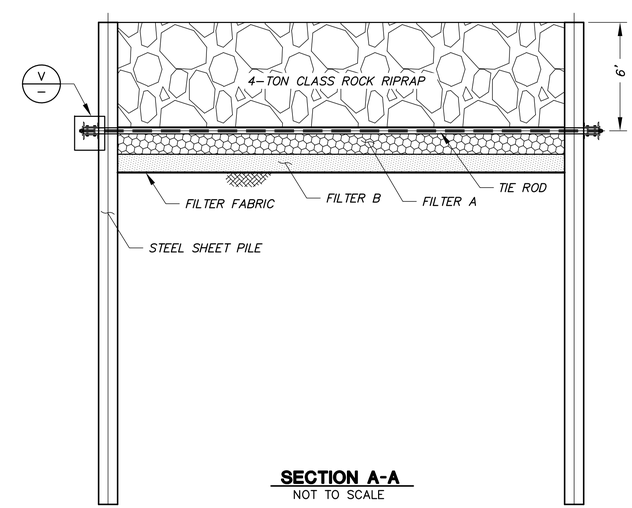


CHANNEL CAP DETAIL (V / –)
NOT TO SCALE



SE CORNER DETAIL (W / –)
NOT TO SCALE



SECTION A-A
NOT TO SCALE

PLOT DATE:1/22/13

SAVE DATE:1/18/13 ROUSSEK K:\DC\PROJECTS\82322 J STREET DRAIN IMPROVEMENT\FINAL DESIGN\DESIGN DRAWINGS\100%\KR FOR ND\JSD-17THRU18-MD.DWG

	REVISION	DESCRIPTION	APP.	DATE
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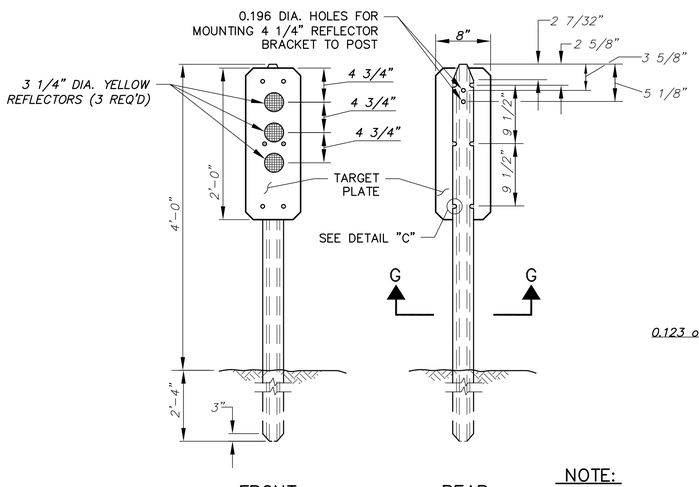
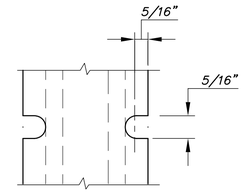
WATERSHED PROTECTION DISTRICT

SPEC. NO. –
PROJ. NO. 82322

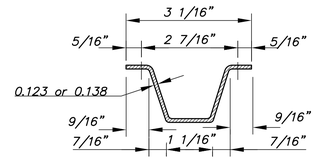
"J" STREET DRAIN IMPROVEMENTS
PHASE 1
OUTLET STRUCTURE

SHEET 17 OF –
DRAWING NO. Y–?–?





DETAIL "C"



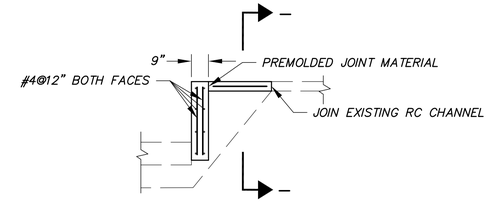
SECTION G – G

NOTE:

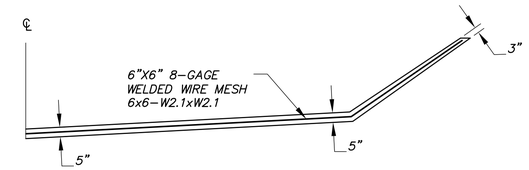
METAL MARKER POST TO BE AS SHOWN EXCEPT THAT MINOR VARIATIONS IN DESIGN AND DIMENSIONS WILL BE PERMITTED TO MEET MANUFACTURES STANDARDS.

CLEARANCE MARKER (X – X)

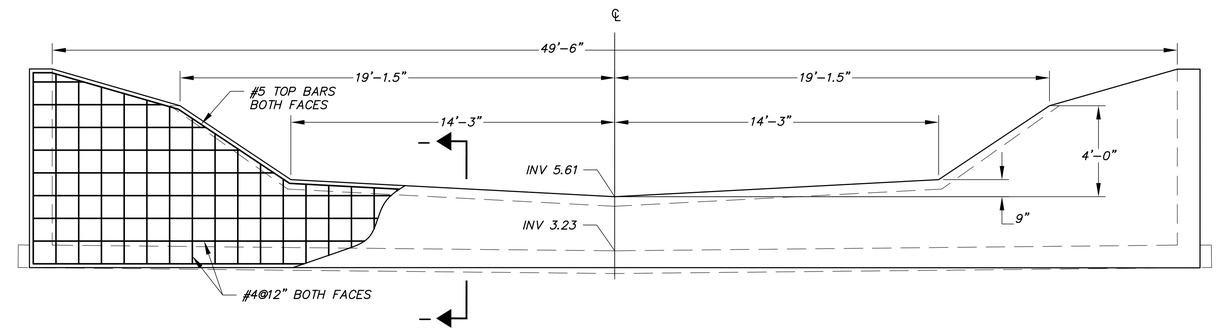
NOT TO SCALE



SECTION – – –

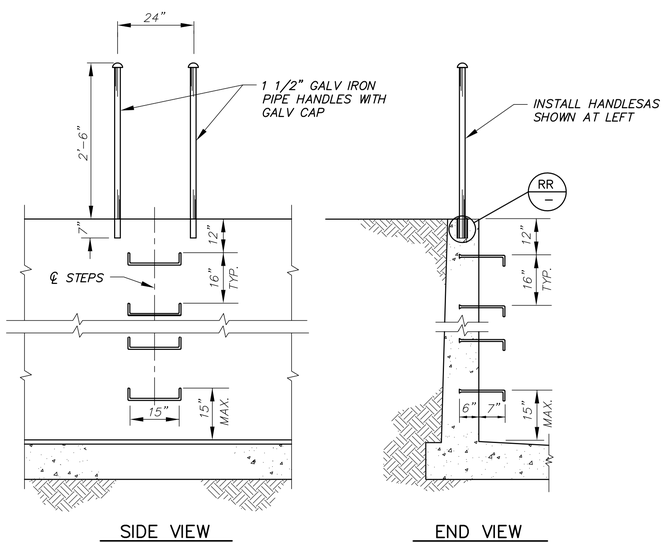


SECTION – – –



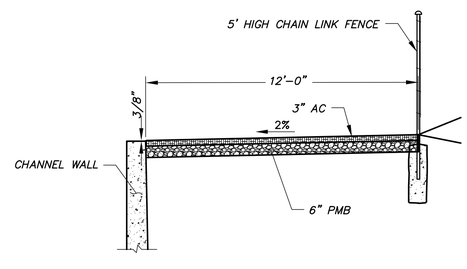
RC BULKHEAD ? STA 33+77 (ZA – X)

NOT TO SCALE



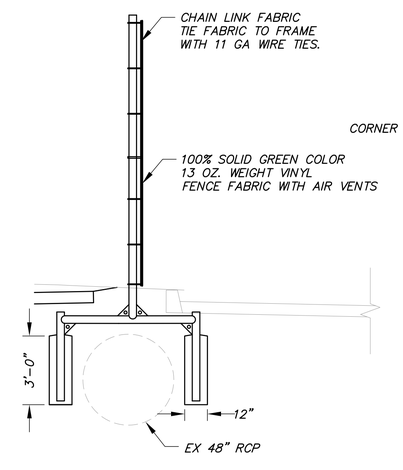
LADDER DETAILS (Y – X)

NOT TO SCALE



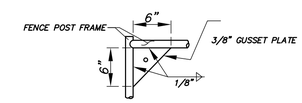
SERVICE ROAD DETAIL (Z –)

NOT TO SCALE



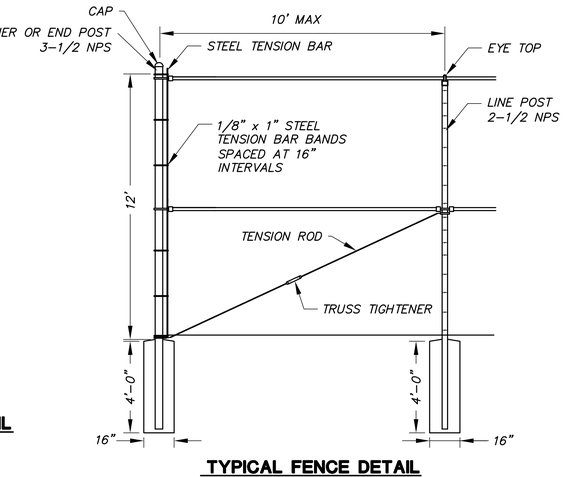
ALTERNATIVE POST FOUNDATION DETAIL

NOT TO SCALE



GUSSET DETAIL

NOT TO SCALE



TYPICAL FENCE DETAIL

NOT TO SCALE

12-FOOT FENCE

NOT TO SCALE

PLOT DATE: 1/22/13

SAVE DATE: 1/18/13 ROUSSEK K:\DC\PROJECTS\82322 J STREET DRAIN IMPROVEMENT\FINAL DESIGN\DESIGN DRAWINGS\100%\KR FOR ND\JSD-17THRU18-MD.DWG

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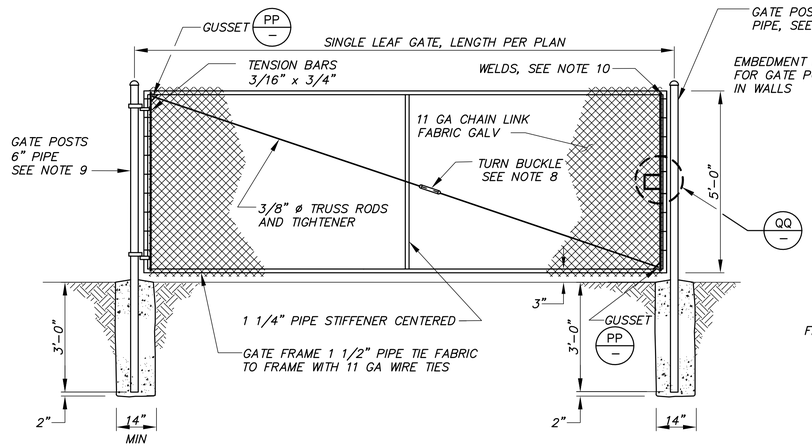
WATERSHED PROTECTION DISTRICT

SPEC. NO. –
PROJ. NO. 82322

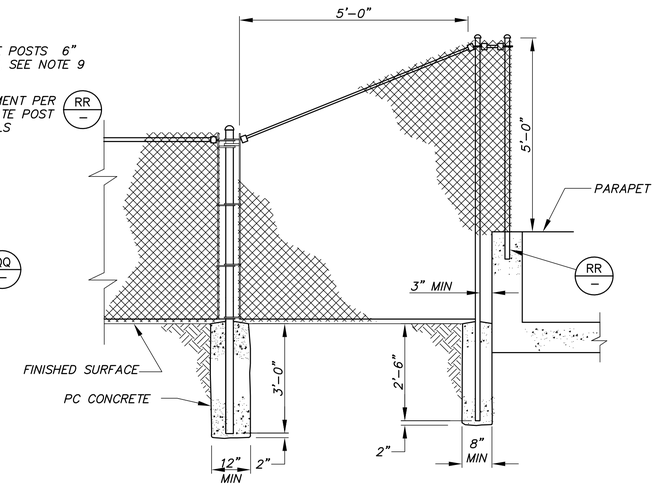
"J" STREET DRAIN IMPROVEMENTS
PHASE 1
MISCELLANEOUS DETAILS

SHEET 18
OF –
DRAWING NO. Y–?–?



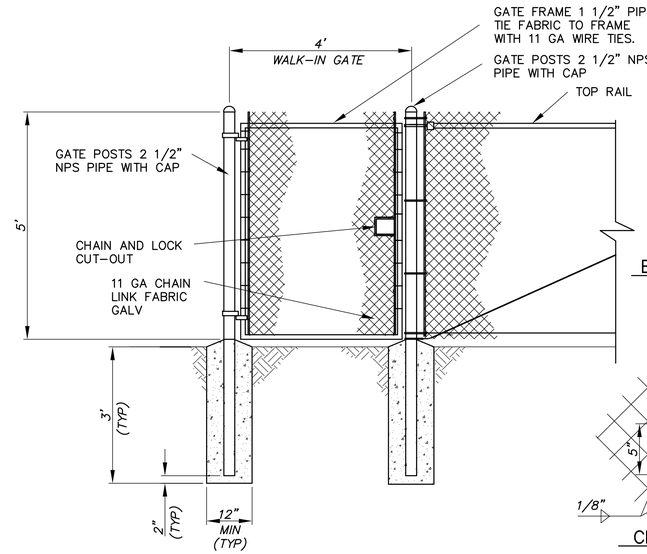
TYPICAL SINGLE LEAF GATE DETAIL MM

NOT TO SCALE



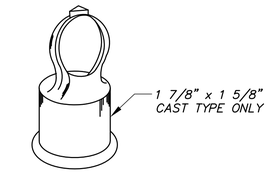
TYPICAL FENCE TRANSITION DETAIL NN

NOT TO SCALE



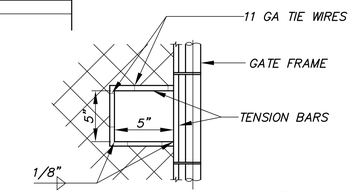
WALK-IN GATE DETAIL KK

NOT TO SCALE



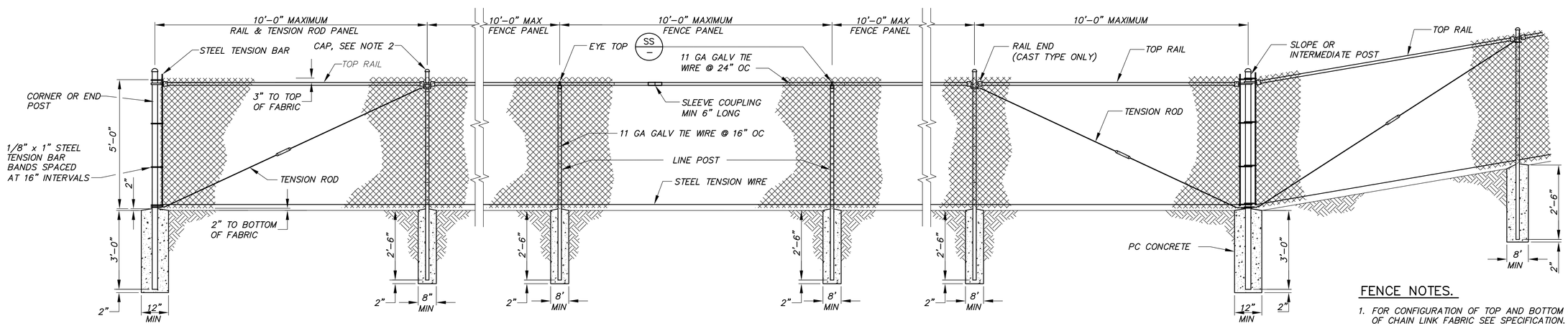
EYE TOP DETAIL SS

NOT TO SCALE



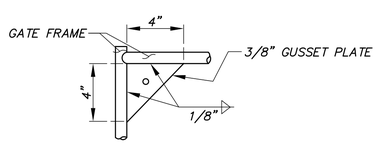
CHAIN AND LOCK CUT-OUT DETAIL QQ

NOT TO SCALE



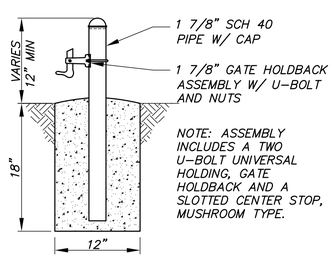
TYPICAL FENCE DETAIL LL

NOT TO SCALE



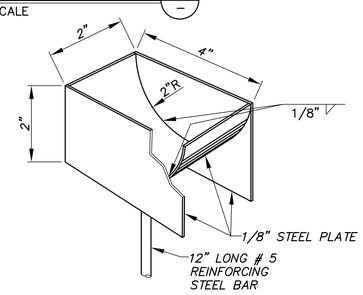
GUSSET DETAIL PP

NOT TO SCALE



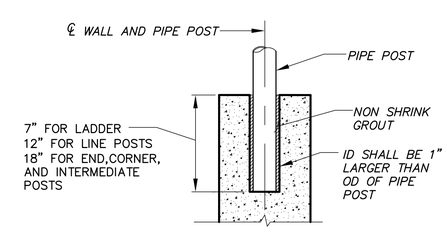
GATE LATCH DETAIL UU

NOT TO SCALE



PLUNGER ROD CUP DETAIL TT

NOT TO SCALE



POST EMBEDMENT IN REINFORCED CONCRETE DETAIL RR

NOT TO SCALE

FENCE NOTES.

1. FOR CONFIGURATION OF TOP AND BOTTOM EDGE OF CHAIN LINK FABRIC SEE SPECIFICATION.
2. SECURE DRIVE FIT GALVANIZED CAP TO POST WITH 1/4" ROUND HEAD RIVET.
3. INTERMEDIATE AND SLOPE POSTS SHALL BE INSTALLED AT NOT MORE THAN 300' INTERVALS ALONG FENCE LINE AND AT GRADE CHANGES EXCEEDING 5%.
4. SEE POST EMBEDMENT DETAIL SHOWN HEREON FOR POST EMBEDMENT IN CHANNEL WALL.
5. EYE TOPS MAY BE USED FOR LINE POSTS AT LOCATIONS WHERE NO TENSION ROD IS REQUIRED.
6. ALL SURFACES SHALL MEET THE MINIMUM REQUIREMENTS OF COATING AS PER SSPWC 210-3.2 AND TABLE 210-3.2(A)
7. GATE LATCH SHALL BE LOCATED SO THAT THE GATE IS HELD COMPLETELY OFF OF THE ACCESS ROAD AND SHALL ATTACH TO THE GATE BETWEEN 2/3 AND 3/4 OF THE DISTANCE FROM THE SWING GATE POST.
8. THREADED ROD WITH NUT MAYBE USED IN PLACE OF TURN BUCKLE.
9. GATE POSTS SHALL BE COMPLETELY FILLED WITH CONCRETE AND DOMED 2" ABOVE THE TOP EDGE OF PIPE.
10. WELDS SHALL BE SLOT OR FILLET WELDS EQUAL TO THICKNESS OF PIPE. WELD ALL JOINTS ALL AROUND.

PLOT DATE: 1/22/13

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WATERSHED PROTECTION DISTRICT

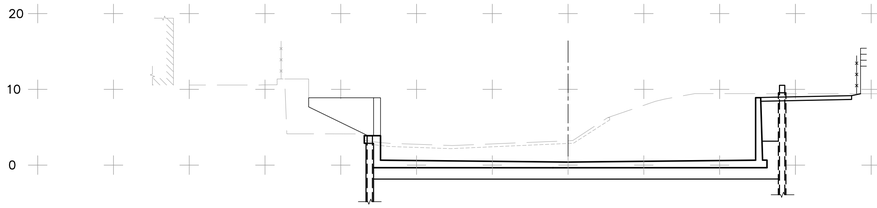
SPEC. NO. –
PROJ. NO. 82322

"J" STREET DRAIN IMPROVEMENT
PHASE 1
TYPICAL FENCE DETAILS

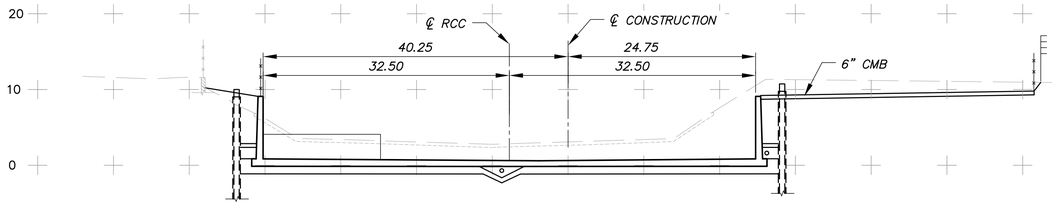
SHEET 19
OF –
DRAWING NO. Y-?-?

NOTES:

1. DEPTH AND LOCATION OF VERTICAL SHORING SHALL BE DETERMINED BY CONTRACTOR.



STA 8+60



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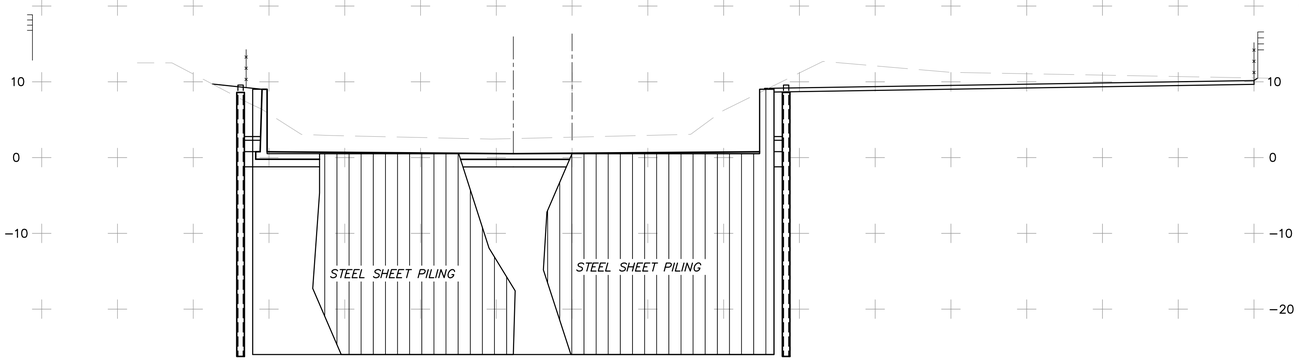
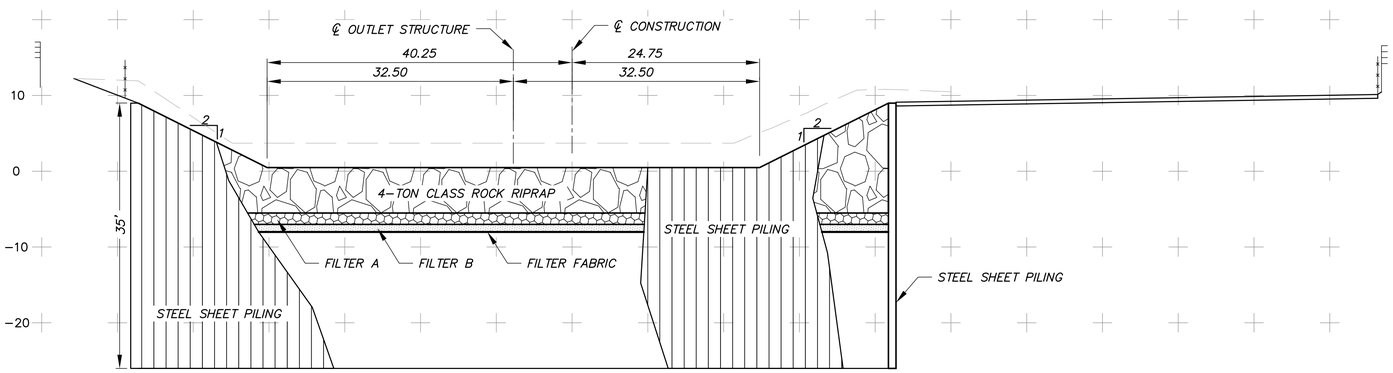


STA 7+25



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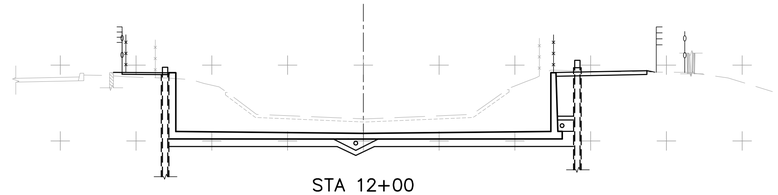
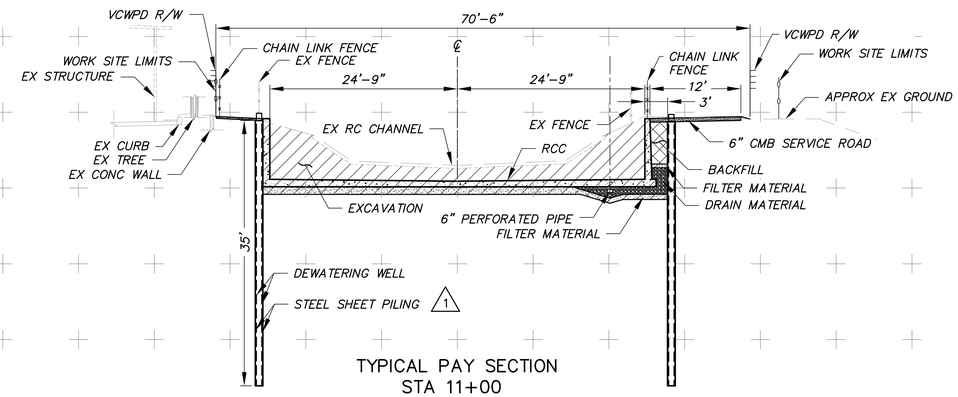
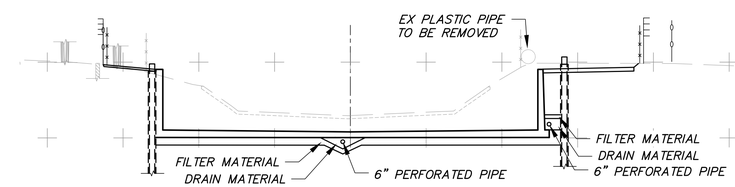


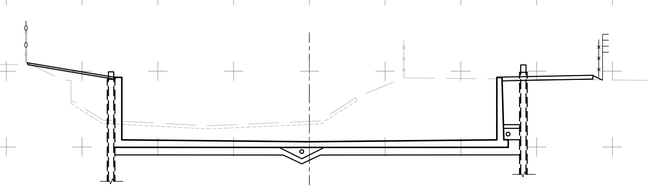
STA 12+00



TYPICAL PAY SECTION
STA 11+00



STA 10+00



STA 9+00

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	REVISION	DESCRIPTION	APP.	DATE
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WATERSHED PROTECTION DISTRICT

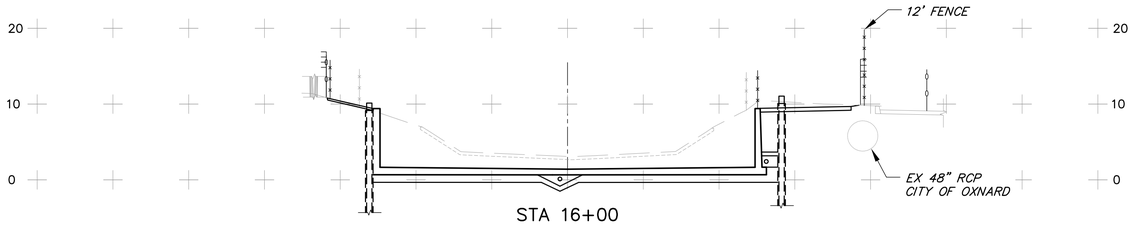
SPEC. NO. –
PROJ. NO. 82322

"J" STREET DRAIN IMPROVEMENT
PHASE 1
CROSS SECTIONS – STA 7+00 TO STA 12+00

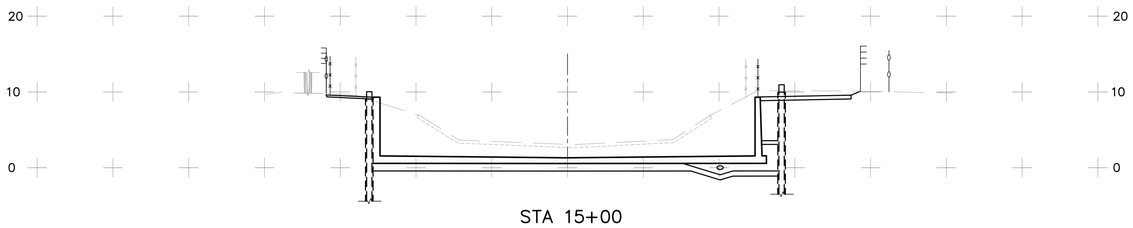
SHEET 20 OF –
DRAWING NO. Y-?-?

NOTES:

1. SEE TYPICAL PAY SECTION ON SHEET 20.



STA 16+00



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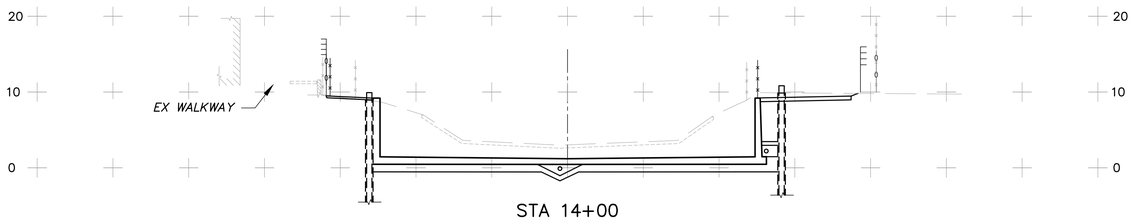

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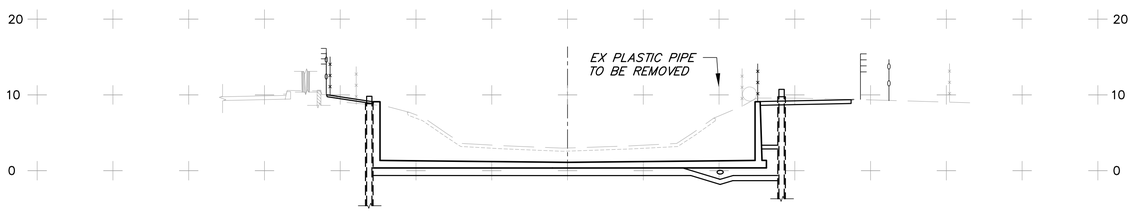
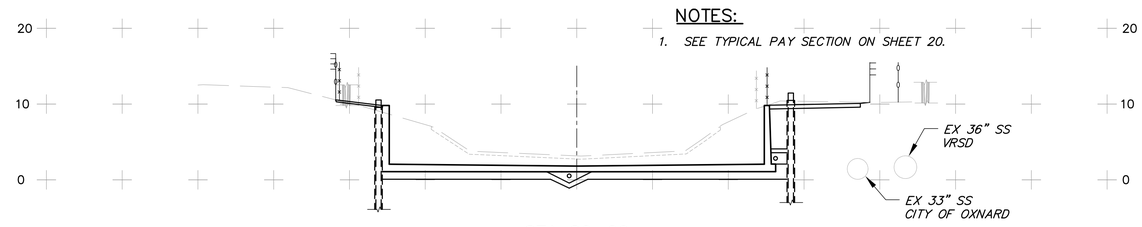


STA 13+00



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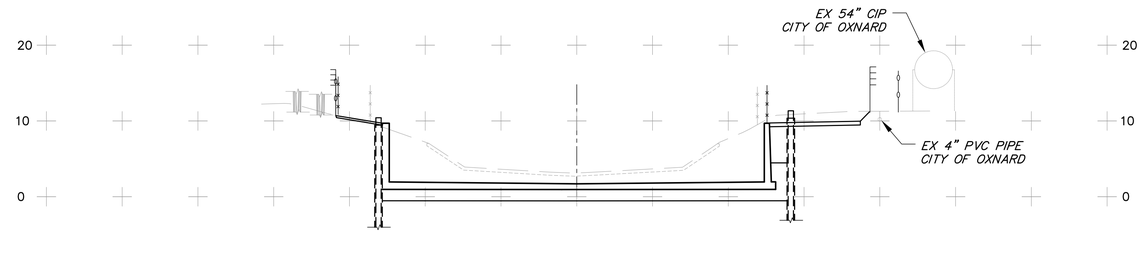

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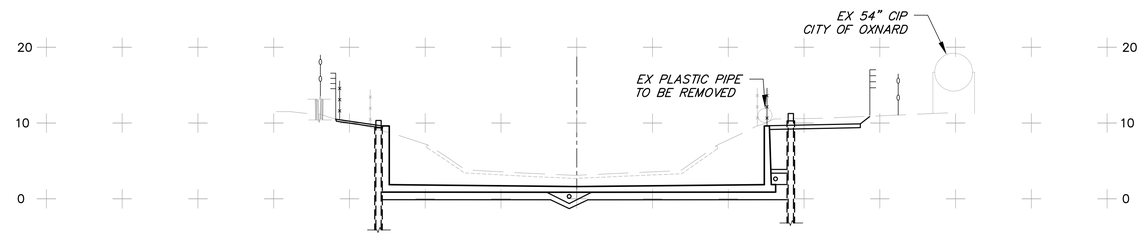
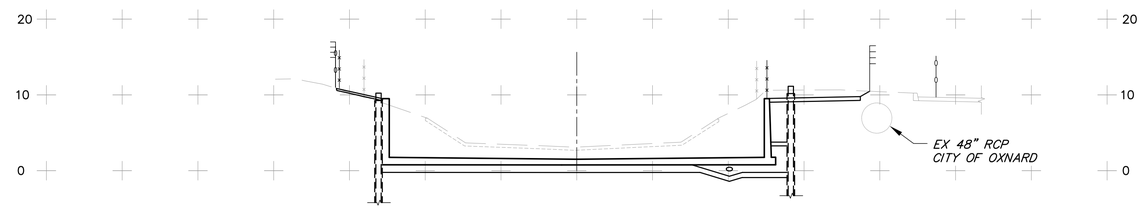


STA 18+00



STA 17+00

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PLOT DATE: 1/22/13

SAVE DATE: 1/18/13 ROUSSEK K:\DC\PROJECTS\82322 J STREET DRAIN IMPROVEMENT\FINAL DESIGN\DESIGN DRAWINGS\100%\KR FOR ND\JSD-20THRU23-XS.DWG

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COUNTY OF VENTURA
PUBLIC WORKS AGENCY
WATERSHED PROTECTION DISTRICT

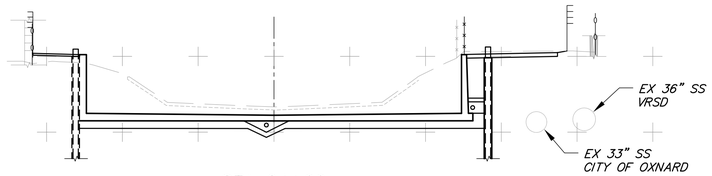
SPEC. NO. –
PROJ. NO. 82322

"J" STREET DRAIN IMPROVEMENT
PHASE 1
CROSS SECTIONS – STA 13+00 TO STA 20+00

SHEET 21 OF –
DRAWING NO. Y-?-?

NOTES:

1. SEE TYPICAL PAY SECTION ON SHEET 20.



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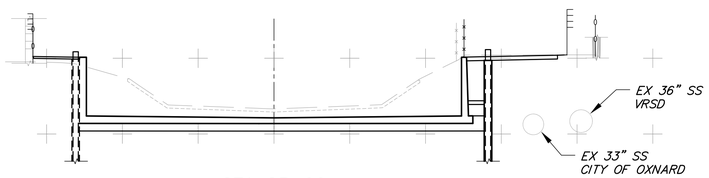

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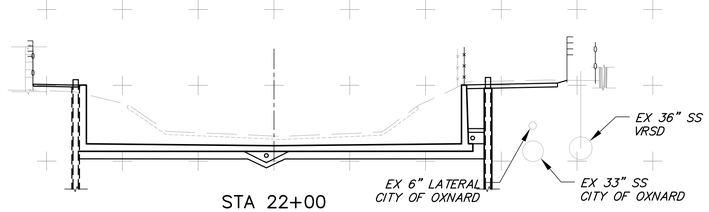

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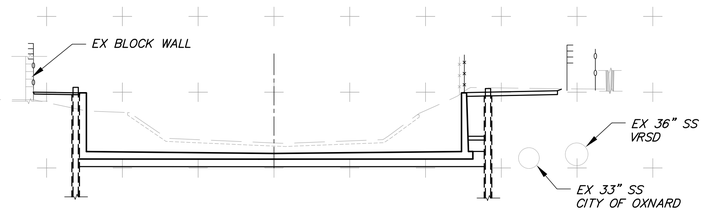
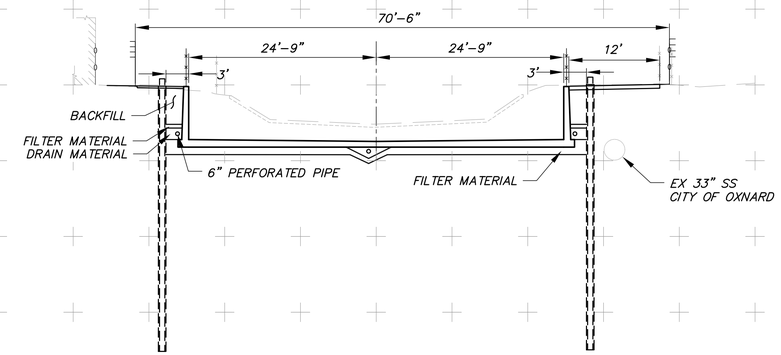


STA 21+00



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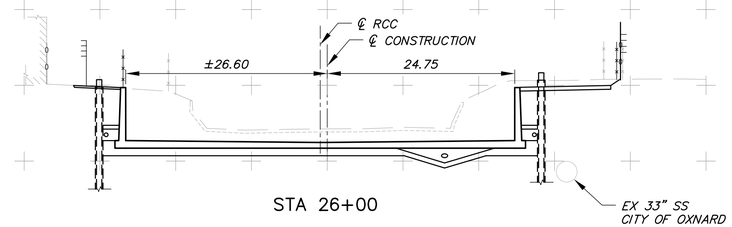

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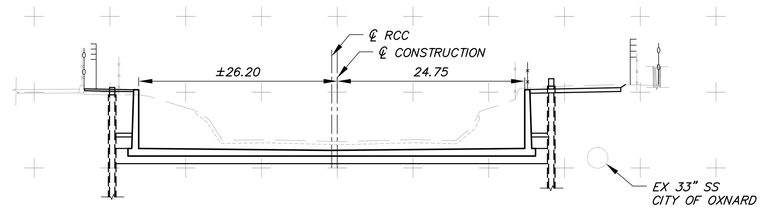

STA 25+00

PLOT DATE: 1/22/13

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	REVISION	DESCRIPTION	APP.	DATE
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DEPUTY DIRECTOR DATE
DISTRICT DIRECTOR DATE

COUNTY OF VENTURA
PUBLIC WORKS AGENCY
WATERSHED PROTECTION DISTRICT

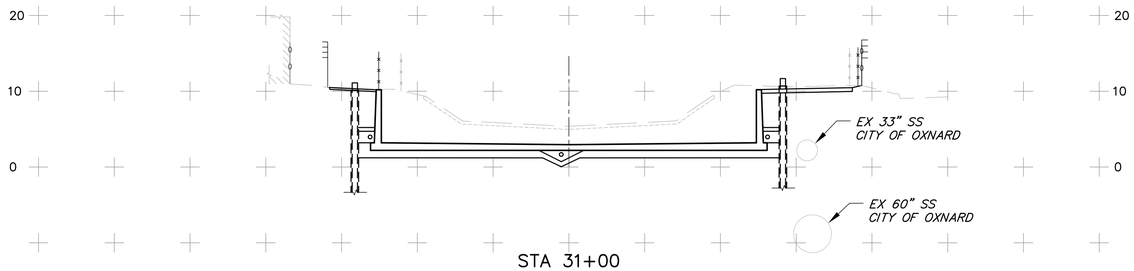
SPEC. NO. –
PROJ. NO. 82322

"J" STREET DRAIN IMPROVEMENT
PHASE 1
CROSS SECTIONS – STA 21+00 TO STA 27+00

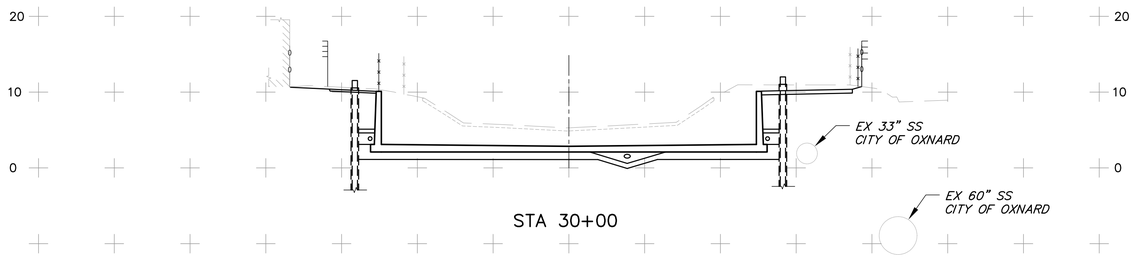
SHEET 22 OF –
DRAWING NO. Y-?-?

NOTES:

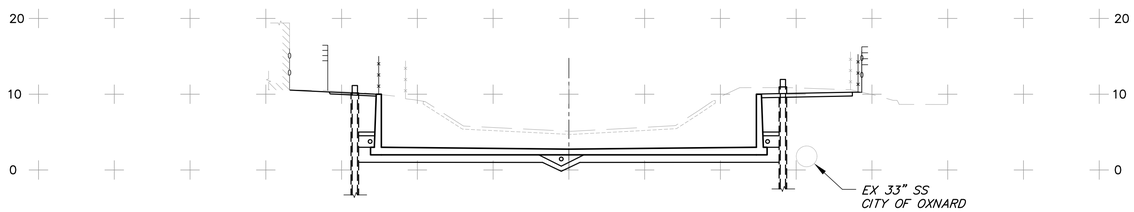
1. SEE TYPICAL PAY SECTION ON SHEET 20.



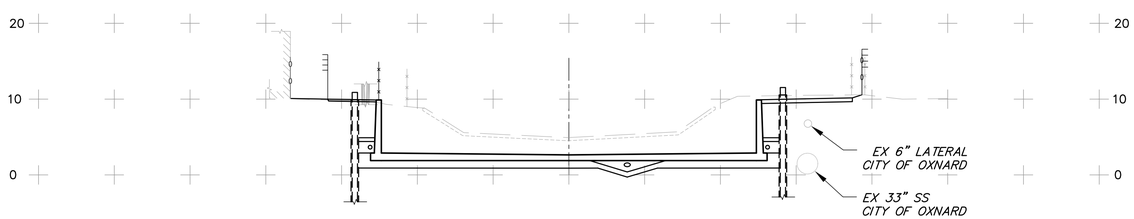
STA 31+00



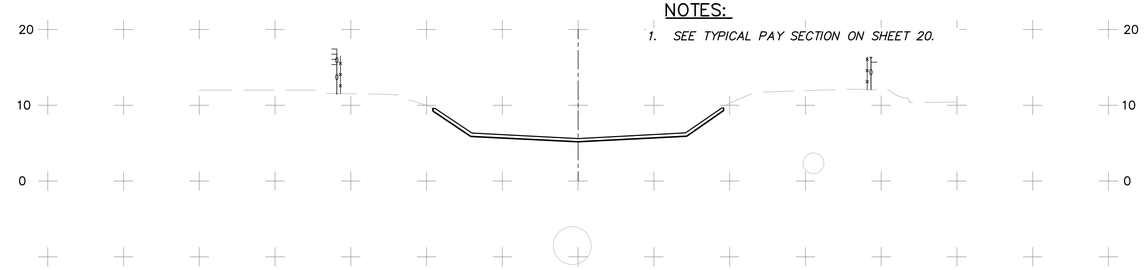
STA 30+00



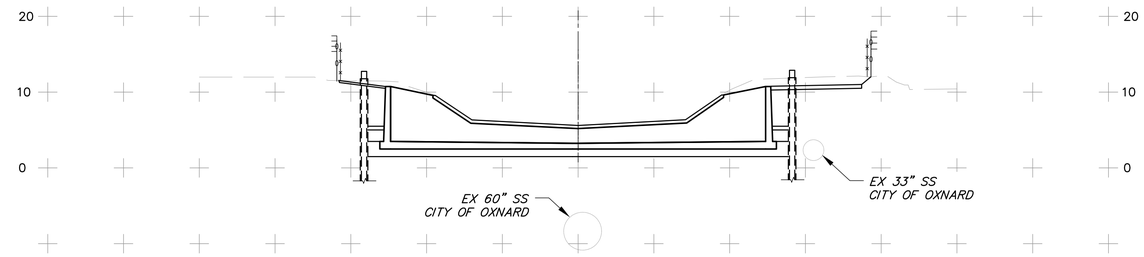
STA 29+00



STA 28+00



STA. 33+87



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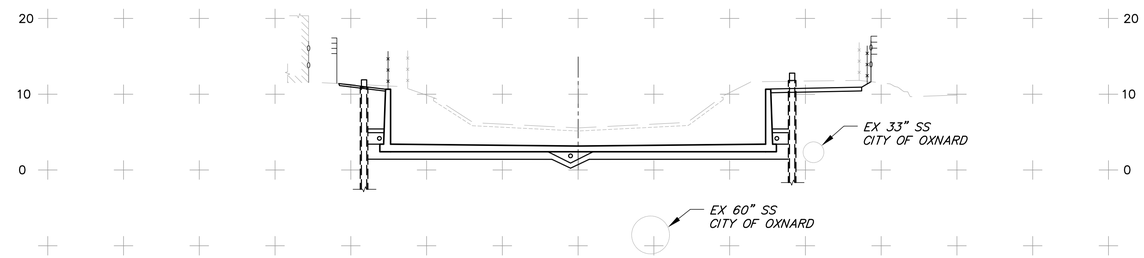
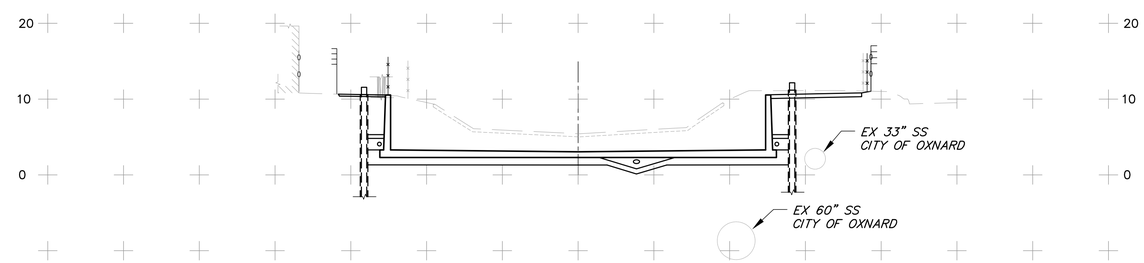


STA 33+00



STA 32+00

70 60 50 40 30 20 10 0 10 20 30 40 50 60 70

PLOT DATE: 1/22/13

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	REVISION	DESCRIPTION	APP.	DATE
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DISTRICT DIRECTOR DATE

COUNTY OF VENTURA
PUBLIC WORKS AGENCY
WATERSHED PROTECTION DISTRICT

SPEC. NO. –
PROJ. NO. 82322

"J" STREET DRAIN IMPROVEMENT
PHASE 1
CROSS SECTIONS – STA 28+00 TO STA 33+87

SHEET 23 OF –
DRAWING NO. Y–?–?

HDR Engineering, Inc.
Project No. 3161.014

LOCATION: Adjacent to the pump station, north of Ocean View Drive.N 235,240 E 1,640,668 NAD27, State Plane, Zone 5, feet

SURFACE EL: 12.5 ft +/- (rel. MSL datum)

TOP OF CHANNEL WALL

CHANNEL F/L ELEV

Sample No.	Sampler	Sampler Blow Count	Material Description	Unit Wet Weight, pcf	Unit Dry Weight, pcf	Water Content, %	% Passing #200 Sieve	Liquid Limit, %	Plasticity Index, %	Undrained Shear Strength, Su, ksf
Bulk			ARTIFICIAL FILL (af) Silty SAND (SM): brown to dark brown, damp, fine to medium sand, trace clay, trace gravel up to 1" in diameter							
		(14)	ALLUVIUM (Qal) Poorly-graded SAND (SP): loose, brown, damp, medium to coarse sand, trace silt	102	97	6	9			
1										
2		3	– fine to medium sand, at 7' – 1" thick clay lense, at 7.5'							
		(20)	Silty SAND (SM): medium dense, brown, wet, fine sand	120	101	18	26			
3										
4		17	Poorly-graded SAND (SP): medium dense, brown to olive gray, wet, fine sand, trace silt – dark gray, below 15'							
5		(53)	– dense, fine to medium sand, at 19'	132	108	21	7			
6		23	– medium dense, at 24'							
7		(5)	Fat CLAY (CH): soft, olive gray, wet, trace fine sand	115	80	44	94	52	27	
8		18	Silty SAND (SM): medium dense, dark gray, wet, fine to coarse sand							
9		(36)	– fine sand below 39'	125	97	29	25			

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 40.5 ft
DEPTH TO WATER: 11.3 ft
BACKFILLED WITH: Cuttings and bentonite, topped with concrete.
DRILLING DATE: April 28, 2008

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini Drilling Corporation
LOGGED BY: K. Nelson
CHECKED BY: LE Prentice R.G.

LOG OF BORING NO. DH-05
J Street Drain Improvements
Oxnard, California

PLATE A-17

HDR Engineering, Inc.
Project No. 3161.014

LOCATION: South of Ventura County RRN 236,319 E 1,641,419 NAD27, State Plane, Zone 5, feet

SURFACE EL: 10.4 ft +/- (rel. MSL datum)

TOP OF CHANNEL WALL

CHANNEL F/L ELEV

Sample No.	Sampler	Sampler Blow Count	Material Description	Unit Wet Weight, pcf	Unit Dry Weight, pcf	Water Content, %	% Passing #200 Sieve	Liquid Limit, %	Plasticity Index, %	Undrained Shear Strength, Su, ksf
1		8	ALLUVIUM (Qal) Silty SAND (SM): loose, dark brown, moist, fine sand							
2		(29)	– silty sand lenses, medium dense, at 3'	122	112	9	52			
3		8	– loose, brown, at 5'							
4		(4)	Lean CLAY with clayey fine sand pockets: soft, dark brown, moist, low plasticity Poorly-graded SAND (SP): medium dense, brown, wet, fine to medium sand, trace silt	157	127	24				
5		16								
6		(36)	– gray, below 19'	126	108	16	10			
7		20	– medium dense, below 24'							
8		(32)		133	116	15				

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 30.5 ft
DEPTH TO WATER: 10.0 ft
BACKFILLED WITH: Well Materials.
DRILLING DATE: April 29, 2008

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini Drilling Corporation
LOGGED BY: J. Hutchins
CHECKED BY: LE Prentice R.G.

LOG OF BORING NO. MW-03
J Street Drain Improvements
Oxnard, California

PLATE A-20

PLOT DATE: 1/22/13

SAVE DATE: 1/18/13 ROUSSEK K:\DC\PROJECTS\82322 J STREET DRAIN IMPROVEMENT\FINAL DESIGN\DESIGN DRAWINGS\100%\KR FOR ND\JSD-24-SB.DWG

	REVISION	DESCRIPTION	APP.	DATE
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COUNTY OF VENTURA
PUBLIC WORKS AGENCY
WATERSHED PROTECTION DISTRICT

SPEC. NO. –
PROJ. NO. 82322

"J" STREET DRAIN IMPROVEMENT
PHASE 1
SOIL BORINGS

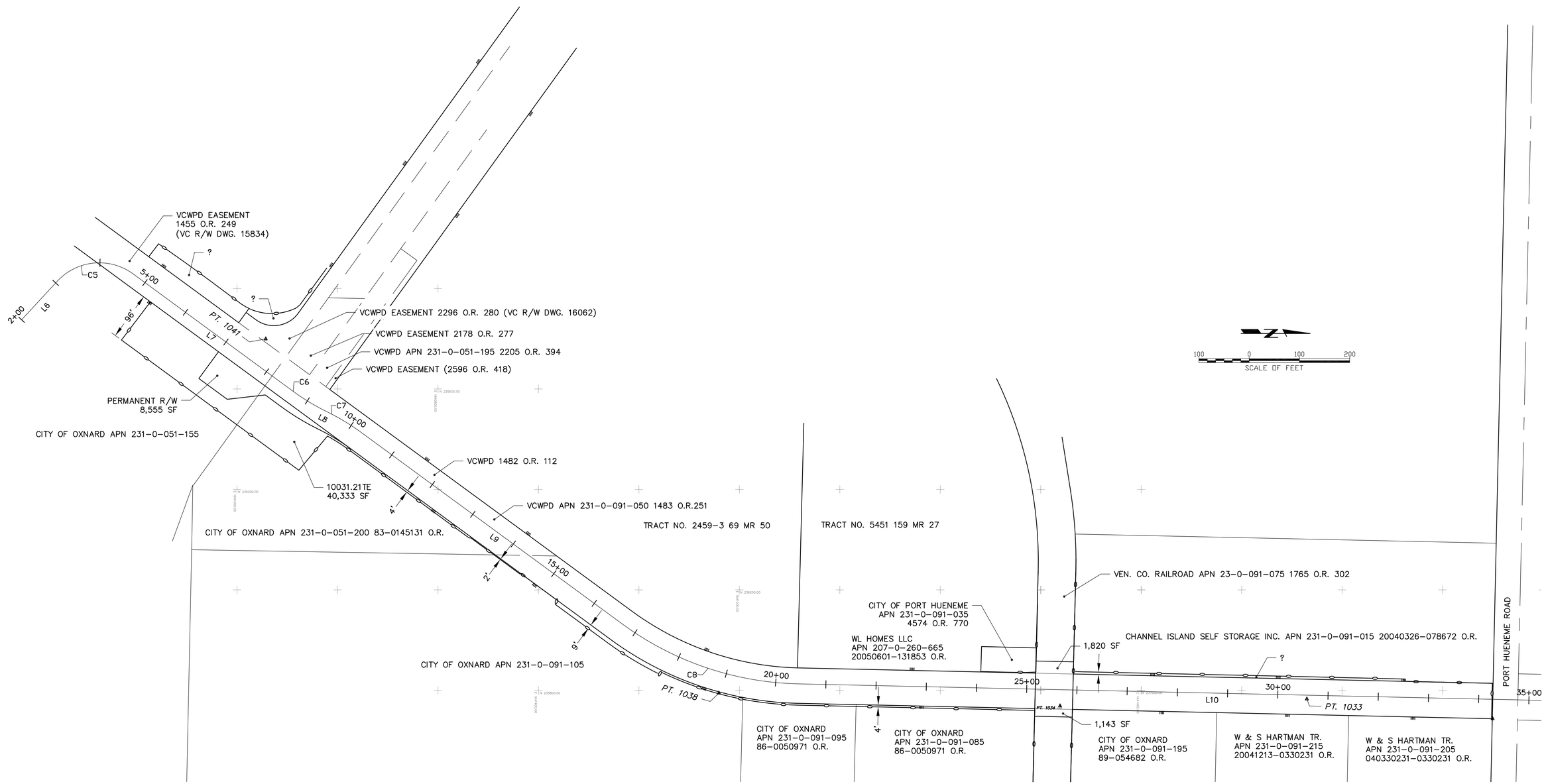
SHEET 24 OF –
DRAWING NO. Y-?-?

LINE DATA		
LINE	LENGTH	BEARING
L6	105.00'	N47°13'55"W
L7	394.50'	N36°16'36"E
L8	1.65'	N26°09'58"E
L9	644.15'	N36°16'36"E
L10	1655.07'	N1°16'36"E

CURVE DATA				
CURVE	DELTA	RADIUS	LENGTH	TANGENT
C5	83°30'31"	113.59'	165.56'	101.40'
C6	10°06'38"	450.00'	79.41'	39.81'
C7	10°06'38"	450.00'	79.41'	39.81'
C8	35°00'01"	614.32'	375.27'	193.70'

SURVEY CONTROL

Point	Northing	Easting	Elevation	Description	STA
1041	235257.30	1640700.26	12.07	1/2" REBAR	±7+60W
1038	236159.47	1641405.49	11.51	1/2" REBAR	±18+90E
1034	236838.58	1641431	10.75	1/2" REBAR	±25+70E
1033	237330.01	1641417.28	5.73	L & T W/ VC TAG	±30+60E
1031	237699.93	1641456.47	12.65	L & T, TAG RCE11332	±34+30E



PLOT DATE:1/29/13

SAVE DATE:1/24/13 ROUSSEK K:\DC\PROJECTS\82322 J STREET DRAIN IMPROVEMENT\FINAL DESIGN\DESIGN DRAWINGS\100%\KR\JSD-25-SC&RW.DWG

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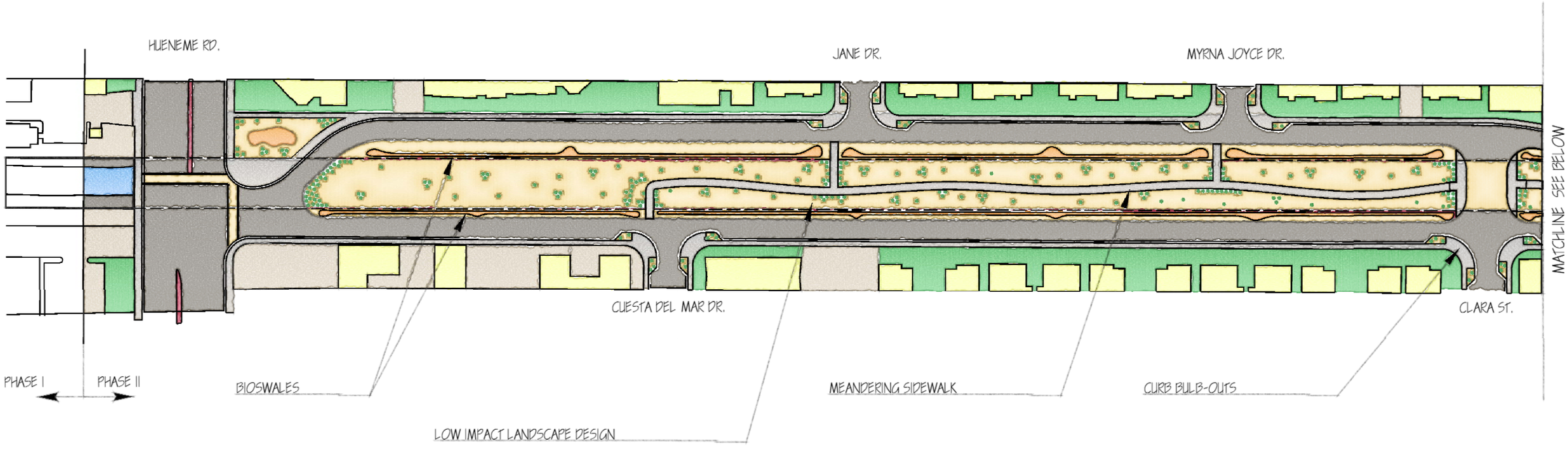
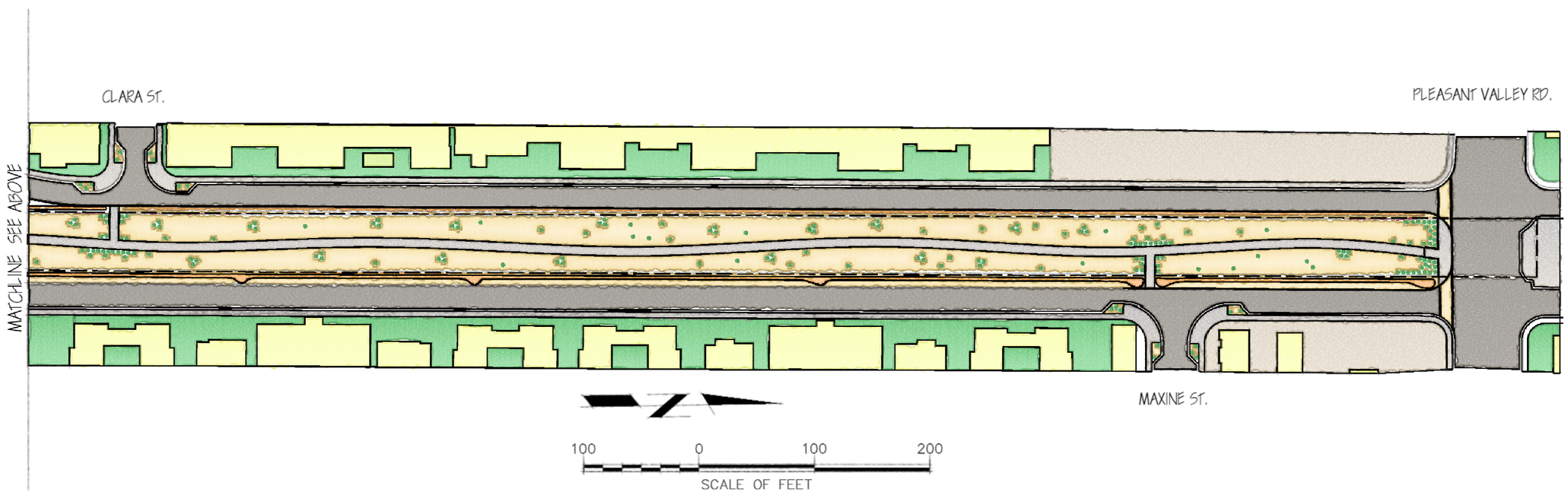
COUNTY OF VENTURA
PUBLIC WORKS AGENCY
WATERSHED PROTECTION DISTRICT

SPEC. NO. –
PROJ. NO. 82322

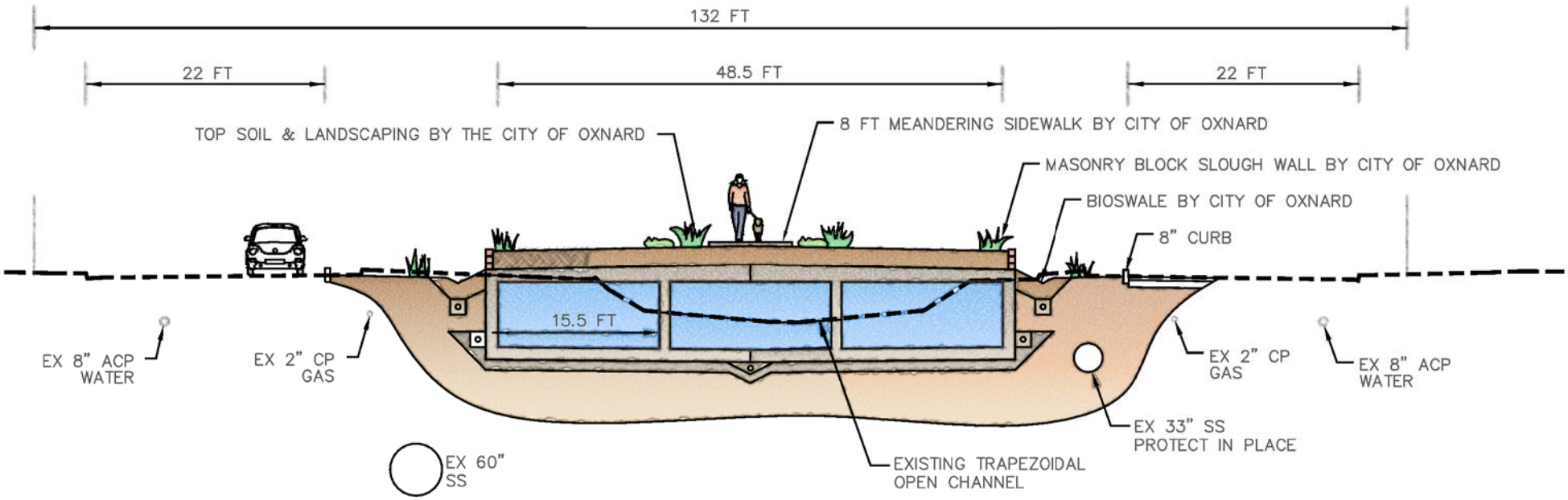
"J" STREET DRAIN IMPROVEMENT
PHASE 1
SURVEY CONTROL AND RIGHT-OF-WAY

SHEET 25
OF –
DRAWING NO. Y-?-?





South Oxnard Stormwater Flood Management Program
Phase 2 Conceptual Design with Future City of Oxnard Linear Park - Plan View



TYPICAL CROSS SECTION
STA 44+00

South Oxnard Stormwater Flood Management Program
Phase 2 Conceptual Design with Future City of Oxnard Linear Park