SRI International

Final Volume II • April 2009

ENVIRONMENTAL IMPACT STATEMENT/ENVIRONMENTAL IMPACT REPORT FOR REPLACEMENT OF NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, NATIONAL MARINE FISHERIES SERVICE SOUTHWEST FISHERIES SCIENCE CENTER, LA JOLLA, CALIFORNIA

TECHNICAL APPENDICES

Prepared by

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Prepared for

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EIS/EIR SCOPING SUMMARY REPORT

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NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

SCOPING SUMMARY REPORT

ENVIRONMENTAL IMPACT STATEMENT / ENVIRONMENTAL IMPACT REPORT FOR THE RELOCATION OF SOUTHWEST FISHERIES SCIENCE CENTER, LA JOLLA, CALIFORNIA

Prepared by

Envirotechnical Program
SRI International

May 19, 2008

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A. DEFINITION OF SCOPING AND LEAD AGENCIES

National Oceanic and Atmospheric Administration (NOAA) proposes to relocate Southwest Fisheries Science Center (SWFSC) to mitigate bluff-retreat hazards and modernize facilities. In conformance with National Environmental Policy Act (NEPA) and NOAA Administrative Order (NAO) 216-6, NOAA plans to prepare an Environmental Impact Statement (EIS) analyzing relocation of SWFSC. Both existing SWFSC facilities and the preferred relocation site are on the campus of University of California, San Diego/Scripps Institution of Oceanography (UCSD/SIO), which is a state entity subject to the California Environmental Quality Act (CEQA). Therefore, a CEQA Environmental Impact Report (EIR) is also required. To satisfy the requirements of both NEPA and CEQA and promote efficiency in the environmental review process, NOAA and UCSD/SIO are collaborating in preparation of a joint EIS/EIR conforming to both NEPA and CEQA requirements.

Public and agency scoping is an early step in the EIS process. NAO 216-6 provides direction to NOAA line offices on proper implementation of NEPA. Section 5.02a of NAO 216-6 describes scoping as a process "to identify the concerns of the affected public and Federal agencies, states, and Indian tribes, involve the public early in the decision making process, facilitate an efficient EIS/EA [Environmental Assessment] preparation process, define the issues and alternatives that will be examined in detail, and save time by ensuring draft documents adequately address relevant issues." CEQA has a similar requirement for EIRs.

NEPA and CEQA require the identification of lead agencies for environmental review. The lead agency for NEPA purposes is NOAA, who is proposing and funding the proposed action. The lead agency for CEQA purposes is the University of California, who is the owner of the existing and preferred sites. SRI International is the EIS/EIR preparation consultant, working under contract to NOAA.

B. NOTICE OF INTENT/NOTICE OF PREPARATION

NAO 216-6, Section 5.02c1, requires that NOAA formally notify the public and responsible government agencies of the intent to prepare an EIS; CEQA implementing regulations, Section 21083, require the same for EIRs. The NEPA notice is termed a Notice of Intent (NOI) and the CEQA notice is termed a Notice of Preparation (NOP). To meet these requirements, NOAA and UCSD/SIO published an NOI/NOP in a number of sources to meet requirements of and officially inform the public and agencies of the official scoping period. The publication dates are listed below and certifications of publication are reprinted in Appendix A.

- *Federal Register*—February 11, 2008
- *La Jolla Light*—February 14, 2008
- *La Jolla Village News*—February 14, 2008
- *San Diego Union Tribune*—February 16, 2008
- California State Clearing House—submitted February 8, 2008

C. SCOPING MEETINGS

NOAA and UCSD/SIO participated in regularly scheduled meetings of two local civic associations to inform them of the planned EIS/EIR and to solicit comments. Those meetings are listed below, and planning notes, minutes and sign-in sheets are included in Appendix B.

La Jolla Community Planning Association
Thursday, January 3, 2008 @ 6:00 p.m.
La Jolla Recreation Center
615 Prospect Street
La Jolla, California
Chair: Tim Golba

La Jolla Shores Association
Wednesday, January 9, 2008 @ 7:00 p.m.
Scripps Institution of Oceanography
Building T-29
La Jolla, California
Chair: Jim Heaton

NOAA and UCSD/SIO jointly hosted a formal scoping meeting held at SWFSC on February 20, 2008. Sign-in sheets and a transcript of that meeting are included in Appendix C.

February 20, 2008 @ 6:00 p.m.
South West Fisheries Science Center Lab
Building A, Large Conference Room
8604 La Jolla Shores Drive
La Jolla, California
Host: Meghan Donahue

C.1. Scoping Input Received by NOAA

A number of written responses were received from the public and agencies and are reprinted in Appendix D. The contents are summarized below.

Visual Aesthetics. Many members of the local public expressed concern about visual aesthetics. Issues raised were the mass and bulk of new construction and the potential for the relocated SWFSC to block views of the coast and ocean from La Jolla Shores Drive. The Local Community Planning document states that La Jolla Shores Drive is an established scenic route. A berm was constructed along La Jolla Shores Drive adjacent to the preferred site about 30 years ago and obstructs the views to the west and southwest from La Jolla Shores Drive. Some of the local residents would like this berm removed to open views.

Parking and Traffic. Parking is an important issue that a number of scoping participants want addressed in the EIS/EIR. On-campus and off-campus parking in the vicinity of the existing SWFSC and preferred relocation site is limited and causes overflow of parked vehicles onto local public streets during peak demand periods. Concerns were also expressed about increased traffic congestion on La Jolla Shores Drive and traffic and pedestrian safety issues. Nearby residents also inquired about the possible future use of the existing SWFSC buildings by SIO after NOAA vacates them and whether this would cause additional parking in front of their homes.

Historic and Cultural Resources. The Native American Heritage Commission requested that NOAA and UCSD/SIO consult listed Native American contacts and the South Coast Information Center, and complete a Sacred Lands File Search. The San Diego Archaeological Society requested inclusion on the EIS/EIR distribution list.

Hazardous Materials. The Department of Toxic Substances Control (DTSC) requested that NOAA and UCSD/SIO identify potentially contaminated sites within the proposed project area and mitigate these areas. DTSC asked that information on potential contamination be summarized in the EIS/EIR. DTSC also commented on the need for a National Pollutant Discharge Elimination System (NPDES) permit for stormwater.

Land Use/Coastal Zone Management. The California Coastal Commission (CCC) stated that the proposed action will require a Federal Consistency Determination to comply with CCC regulations implementing the Coastal Zone Management Act.

Air Quality. The Environmental Protection Agency (EPA) recommends that the alternatives discussion in the EIS/EIR include the following discussion areas: baseline or current ambient air conditions, National Ambient Air Quality Standards, criteria pollutant non-attainment areas, and potential air quality impacts. The EPA recommends including construction-related impacts analysis in the EIS/EIR and developing a Construction Emissions Mitigation Plan to mitigate any adverse effects to air quality. According to the EPA's comments, the EIS/EIR should address compliance with the Global Warming Solutions Act of 2006 and Executive Order (E.O.) S-03-05 in regard to reducing adverse air quality effects.

Biological Resources. The EPA requested that the EIS/EIR address how the proposed project will meet the requirements of E.O. 13112. E.O. 13112 calls for the restoration of native plant and tree species.

Water Resources. The EPA recommends NOAA include green infrastructure in its design plans for stormwater management, including but not limited to bioretention areas, vegetated swales, porous pavement, and filter strips. The EPA strongly recommends NOAA's proposed project be Leadership in Energy and Environmental Design (LEED) certified for sustainable site development, water savings, energy efficiency, materials selection and indoor air quality.

Energy Use. The EPA recommends the EIS/EIR discuss how the proposed project will comply with the Energy Independence and Security Act of 2007, requiring federal buildings to use 30% less energy over a 10-year period, from 2005 to 2015.

D. RECOMMENDATIONS FOR EIS/EIR

Visual Aesthetics. In response to public comments, aesthetics will be addressed in the EIS/EIR, especially impacts to the view corridor: La Jolla Shores Drive. The EIS/EIR will include photosimulations of the proposed SWFSC at the preferred site and will describe the extent to which the new SWFSC would obstruct public views of the coast and ocean.

Parking and Traffic. In response to much of the public comments, traffic and parking will be addressed in the EIS/EIR. The EIS/EIR will take into consideration concerns from nearby residents about the usage of the existing buildings by SIO and address parking mitigation measures. A traffic engineer will prepare a detailed analysis of traffic generation and distribution during the construction and operation periods and effects on level of service of local roads and

intersections. The traffic analysis will include consideration of cumulative build out in the local area in Year 2030, the horizon year established by the San Diego Association of Governments for cumulative traffic impact analysis. Parking demand and availability at the new SWFSC will also be analyzed. The EIS/EIR will contain appropriate recommendations for mitigation measures to address project impacts.

Historic and Cultural Resources. A cultural resources (CR) survey is in progress and will be summarized in the EIS/EIR. As part of that study, the CR consultant contacted the South Coast Information Center and performed a Sacred Lands File Search. This survey and discussions about any findings on site will be incorporated into the EIS/EIR.

Hazardous Materials. The EIS/EIR will identify past uses of the existing and preferred sites and the potential for those uses to have caused soil and/or groundwater contamination. The EIS/EIR will include mitigation for known or potentially contaminated sites within the proposed project area per the DTSC letter. The EIS/EIR will also contain recommendations for abatements of hazardous building materials at the existing site prior to demolition of Buildings A and D. Requirements for an NPDES stormwater permit will be summarized.

Land Use/Coastal Zone Management. The consistency of the proposed action and alternatives with enforceable policies of the CCC applicable to the proposed action will be analyzed in the EIS/EIR. Potential reuse by UCSD/SIO of the existing Buildings B and C (which are not threatened by the bluff retreat hazard) will be analyzed.

Air Quality. The EIS/EIR will quantify emissions of air pollutants resulting from the new SWFSC during construction and operation periods and compare those with thresholds established by the California Air Resources Board and the San Diego Air Quality Management District.

Biological Resources. The EIS/EIR will summarize the results of a biological study of the preferred site, currently in progress. The study will describe the plants, and identify sensitive habitats and protected species occurring or potentially occurring at the preferred site and possible impacts on those species. If necessary, measures to eliminate or reduce adverse effects on biological resources will be included.

Water Resources. Changes in runoff patterns and rates caused by construction of the new SWFSC will be analyzed in the EIS/EIR. NOAA intends to include Green Infrastructure and LEED principles in the design of the new SWFSC. These design features and their benefits will be described in the EIS/EIR.

Energy Use. The EIS/EIR will quantify existing energy use by the SWFSC and projected future energy use by the new SWFSC. Measures to reduce energy uses will be included in the EIS/EIR.

APPENDIX A
NOI/NOP PUBLICATION

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(CBP) shall assess, antidumping duties on all appropriate entries, pursuant to section 751(a)(1) of the Tariff Act and 19 CFR 351.212(b). The Department calculated an assessment rate for each importer of the subject merchandise covered by the review. Upon issuance of the final results of this review, for any importer–specific assessment rates calculated in the final results that are above *de minimis* (*i.e.*, at or above 0.50 percent), we will issue appraisement instructions directly to CBP to assess antidumping duties on appropriate entries by applying the assessment rate to the entered value of the merchandise. Pursuant to 19 CFR 356.8(a), the Department intends to issue assessment instructions to CBP 41 days after the date of publication of these final results of review.

The Department clarified its ''automatic assessment'' regulation on May 6, 2003. *See Notice of Policy Concerning Assessment of Antidumping Duties*, 68 FR 23954 (May 6, 2003). This clarification will apply to entries of subject merchandise during the POR produced by Mexinox for which Mexinox did not know the merchandise was destined for the United States. In such instances, we will instruct CBP to liquidate unreviewed entries at the 30.85 percent all–others rate if there is no company–specific rate for an intermediary involved in the transaction. *See id.* for a full discussion of this clarification.

Cash Deposit Requirements

The following cash deposit requirements will be effective upon publication of these final results for all shipments of the subject merchandise entered, or withdrawn from warehouse, for consumption on or after the publication date of these final results of administrative review, consistent with section 751(a)(1) of the Tariff Act: (1) the cash deposit rate for the reviewed company will be the rate listed above; (2) if the exporter is not a firm covered in this review, but was covered in a previous review or the original less than fair value (LTFV) investigation, the cash deposit rate will continue to be the company–specific rate published for the most recent period; (3) if the exporter is not a firm covered in this review, a prior review, or the original LTFV investigation, but the manufacturer is, the cash deposit rate will be the rate established for the most recent period for the manufacturer of the merchandise; and (4) the cash deposit rate for all other manufacturers or exporters will continue to be 30.85 percent, the all–others rate established in the LTFV investigation. *See Notice of Amended Final Determination of Sales at Less Than Fair Value: Stainless Steel Sheet and Strip in Coils from Mexico*, 64 FR 40560 (July 27, 1999). These deposit requirements, when imposed, shall remain in effect until publication of the final results of the next administrative review.

Notification to Interested Parties

This notice also serves as a final reminder to importers of their responsibility under 19 CFR 351.402(f)(2) to file a certificate regarding the reimbursement of antidumping duties prior to liquidation of the relevant entries during this review period. Failure to comply with this requirement could result in the Department's presumption that reimbursement of the antidumping duties occurred and the subsequent assessment of doubled antidumping duties.

This notice also serves as a reminder to parties subject to administrative protective orders (APOs) of their responsibility concerning the disposition of proprietary information disclosed under APO in accordance with 19 CFR 351.305, which continues to govern business proprietary information in this segment of the proceeding. Timely written notification of the return or destruction of APO materials or conversion to judicial protective order is hereby requested. Failure to comply with the regulations and the terms of an APO is a sanctionable violation.

This notice is issued and published in accordance with sections 751(a)(1) and 777(i)(1) of the Tariff Act.

Dated: February 4, 2008.

David M. Spooner,

Assistant Secretaryfor Import Administration.

Appendix – Issues in Decision Memorandum

General Issues

Comment 1: Revocation
Comment 2: Offsetting for U.S. Sales that Exceed Normal Value

Adjustments to United States Price

Comment 3: U.S. Indirect Selling Expenses

Comment 4: Temporary Import Bonds

Adjustments to Normal Value

Comment 5: Handling Expense
Comment 6: Circumstance–of-Sale Adjustment

Cost of Production

Comment 7: Major Input Rule
Comment 8: Employee Profit Sharing
Comment 9: Year–End Inflation Adjustment to G&A
Comment 10: Depreciation
Comment 11: Interest Expense
Comment 12: Packing Expense
Comment 13: G&A Expense

[FR Doc. E8–2464 Filed 2–8–08; 8:45 am]

BILLING CODE 3510–DS–S

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

Notice of Intent to Prepare a Joint Environmental Impact Statement / Environmental Impact Report for the Proposed Relocation of the National Oceanic and Atmospheric Administration's Southwest Fisheries Science Center located in La Jolla, California

AGENCY: National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice of Intent to prepare a joint National Environmental Policy Act (NEPA) Environmental Impact Statement (EIS) and California Environmental Quality Act (CEQA) Environmental Impact Report (EIR); request for comments.

SUMMARY: NOAA announces its intent to prepare a joint EIS/EIR to analyze the environmental impacts of relocating its Southwest Fisheries Science Center (SWFSC) near the Scripps Institution of Oceanography (SIO) within the University of California at San Diego (UCSD) campus in La Jolla, California.

Publication of this notice is to request public participation during preparation of the EIS/EIR to help determine the scope of environmental issues and range of alternatives to be addressed, and to provide information as to how to participate.

DATES: A public scoping meeting will held on the following date:Wednesday, February 20, 2008 – 5 p.m. tour of SWFSC and 6 p.m. meeting start time, SWFSC Lab, Building A, Large Conference Room, 8604 La Jolla Shores Drive, La Jolla, CA 92037.

FOR FURTHER INFORMATION CONTACT: Anne Elston, Environmental Research Analyst, SRI International, 333 Ravenswood Avenue, G 234, Menlo Park, CA 94025–3493; e-mai *anne.elston@sri.com*

SUPPLEMENTARY INFORMATION: The National Marine Fisheries Service (NMFS) is responsible for the management, conservation, and protection of living marine resources within the U.S. Exclusive Economic

Zone. The SWFSC in La Jolla, California, manages and conducts research involving Pacific fisheries and marine mammal research for the protection and management of these resources throughout the Western Pacific and the Antarctic. The existing SWFSC facility, built in 1964, is currently adjacent to a coastal bluff that is undergoing severe erosion and retreat. NOAA proposes to construct a new SWFSC building to replace its existing NMFS administrative and marine research facilities currently located in La Jolla, California. A minimum of two existing at risk SWFSC structures would be removed and the property currently used by NOAA would be returned to the UCSD for other appropriate uses.

NOAA is the lead Federal agency for implementation of the NEPA. The University of California is the lead agency under the CEQA. The existing and preferred sites for the SWFSC headquarters are at the UCSD campus. The NMFS, SIO and other marine research organizations conduct independent and joint research at the SWFSC and its salt water laboratory facilities.

The proposed project will require construction of a new facility to support SWFSC administrative and marine research operations. The preferred site will enable NMFS, SIO, and others to continue collaboration within a wide range of programmatic marine research disciplines. NOAA, in cooperation with UCSD, has decided to prepare a joint EIS/EIR to analyze the environmental impacts of relocating the SWFSC facilities at UCSD.

Other alternative actions considered are:

Use of other NOAA facility locations in California and other Pacific Coast states;

Use of alternative sites at or adjacent to SIO for collaborative research; and

Use of existing alternative NOAA facilities and properties away from UCSD.

This joint EIS/EIR will analyze environmental impacts that may result from construction and/or operation of the proposed facilities. These potential environmental issues to be addressed include: land use and coastal zone management; aesthetics; geology; hydrology and water resources; biological resources and protected species; utilities and public services; transportation and traffic circulation, recreational resources; air quality; noise and vibration; visual effects and aesthetics; cultural resources; and socioeconomics and land use; and cumulative effects.

The most salient and foreseeable environmental topics of greatest interest are expected to be aesthetics, transportation and traffic, hydrology, and short term noise effects.

Interested parties who wish to submit suggestions or comments regarding the scope or content on the proposed EIS/EIR are invited to attend the public scoping meeting.

Dated: February 6, 2008.

William F. Broglie,

Chief Administrative Officer, National Oceanic and Atmospheric Administration.

[FR Doc. E8–2457 Filed 2–8–08; 8:45 am]

BILLING CODE 3510–12–S

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

ENVIRONMENTAL PROTECTION AGENCY

Coastal Nonpoint Pollution Control Program: Approval Decision on Florida's and South Carolina's Coastal Nonpoint Pollution Control Programs

AGENCY: National Oceanic and Atmospheric Administration, U.S. Department of Commerce, and the U.S. Environmental Protection Agency.

ACTION: Notice of Intent to Approve the Florida and South Carolina Coastal Nonpoint Programs.

SUMMARY: Notice is hereby given of the intent to fully approve the Florida and South Carolina Coastal Nonpoint Pollution Control Programs (coastal nonpoint program) and of the availability of the draft decision documents fully approving the Florida and South Carolina coastal nonpoint programs. Section 6217 of the Coastal Zone Act Reauthorization Amendments (CZARA), 16 U.S.C. section 1455b, requires States and Territories with coastal zone management programs that have received approval under section 306 of the Coastal Zone Management Act, 16 U.S.C. section 1455, to develop and implement coastal nonpoint programs. Coastal States and Territories were required to submit their coastal nonpoint programs to the National Oceanic and Atmospheric Administration (NOAA) and the U.S. Environmental Protection Agency (EPA) for approval in July 1995. NOAA and EPA conditionally approved the Florida and South Carolina coastal nonpoint programs on November 18, 1997 and February 23, 1998, respectively. NOAA and EPA have drafted approval decisions describing how Florida and South Carolina have satisfied the conditions placed on their programs and therefore have a fully approved coastal nonpoint program.

NOAA and EPA are making the draft decisions for the Florida and South Carolina coastal nonpoint programs available for a 30-day public comment period. If comments are received, NOAA and EPA will consider whether such comments are significant enough to affect the decision to fully approve the programs.

Copies of the draft Approval Decisions can be found on the NOAA Web site at *http://coastalmanagement.noaa.gov/czm/6217/findings.html* or may be obtained upon request from: Allison Castellan, Coastal Programs Division (N/ORM3), Office of Ocean and Coastal Resource Management, NOS, NOAA, 1305 East-West Highway, Silver Spring, Maryland 20910, phone (301) 713–3155, x125, e-mail *Allison.Castellan@noaa.gov.*

DATES: Individuals or organizations wishing to submit comments on the draft Approval Decisions should do so by March 12, 2008.

ADDRESSES: Comments should be made to: John King, Chief, Coastal Programs Division (N/ORM3), Office of Ocean and Coastal Resource Management, NOS, NOAA, 1305 East-West Highway, Silver Spring, Maryland 20910, phone (301) 713–3155, x188, e-mail *John.King@noaa.gov.*

FOR FURTHER INFORMATION CONTACT: Allison Castellan, Coastal Programs Division, (N/ORM3), Office of Ocean and Coastal Resource Management, NOS, NOAA, 1305 East-West Highway, Silver Spring, Maryland 20910, phone (301) 713–3155, x125, e-mail *Allison.Castellan@noaa.gov.*

(Federal Domestic Assistance Catalog 11.419 Coastal Zone Management Program Administration)

Dated: February 5, 2008.

John H. Dunnigan,

Assistant Administrator for Ocean Services and Coastal Zone Management, National Oceanic and Atmospheric Administration.

Benjamin H. Grumbles,

Assistant Administrator, Office of Water, Environmental Protection Agency.

[FR Doc. 08–596 Filed 2–8–08; 8:45 am]

BILLING CODE 3510–08–M

PROOF OF PUBLICATION
(2015.5 C.C.P.)

STATE OF CALIFORNIA
County of San Diego

I am a citizen of the United States and a resident of the County aforesaid: I am over the age of eighteen years, and not a party to or interested in the above-entitled matter. I am the principal clerk of the printer of the

LA JOLLA LIGHT

a newspaper of general circulation, printed and published WEEKLY in the City of SAN DIEGO, County of SAN DIEGO, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of San Diego, State of California, under the date of APRIL 1, 1935, Case Number 80370; that the notice, of which the annexed is a printed copy (set in type not smaller than nonpareil), has been published in each regular and entire issue of the said newspaper and not in any supplement thereof on the following Dates, to-wit:

Feb. 14

all in the year 2008

I certify (or declare) under the penalty of perjury that the foregoing is true and correct.

Dated at EL CAJON, California

This 28th day of February

Signature

This space for the County Clerk's Filing Stamp

Notice of Preparation

Proof of Publication

NOTICE OF PREPARATION - ENVIRONMENTAL IMPACT REPORT

Project Title: National Oceanic and Atmospheric Administration (NOAA) Southwest Fisheries Science Center (SWFSC) Relocation
Sch. Number:
Lead Agency: NOAA
Project Location: La Jolla, CA
County: San Diego

In compliance with the California Environmental Quality Act, NOAA is issuing this Notice of Preparation (NOP) to inform you of the preparation of a joint Environmental Impact Statement/Environmental Impact Report (EIS/EIR). The proposed action is the relocation of the NOAA National Marine Fisheries Service's (NMFS) SWFSC at the University of California San Diego (UCSD) campus. The purpose of NOP is to obtain agency input as to the scope and content of the environmental data and analysis that should be included in the EIS/EIR.

The NMFS SWFSC manages NOAA's marine science research throughout the Southwest Region of the U.S. It provides researchers from NOAA, Scripps Institution of Oceanography (SIO) and others with wet and dry laboratory facilities, offices for research, management and administrative tasks, and other collaborative endeavours. The existing facility, built in 1964, is adjacent to a coastal bluff that is undergoing severe erosion and retreat. The proposed action is to construct a new SWFSC facility at a preferred site located across La Jolla Shores Drive from the existing NOAA facilities (see attached figure). A minimum of two existing at-risk SWFSC structures would be removed and the property currently occupied by NOAA returned to UCSD control for other appropriate uses. Relocation of the SWFSC will allow NMFS to continue its research collaboration with SIO and other researchers on Pacific fisheries and marine mammals.

The environmental issues to be addressed in the SWFSC Relocation EIS/EIR include: land use and coastal zone management; aesthetics; geology; hydrology and water resources; biological resources and protected species; utilities and public services; transportation and traffic circulation, recreational resources; air quality; noise and vibration; visual effects and aesthetics; cultural resources; socioeconomics and land use; and cumulative effects. The most salient and foreseeable environmental topics of greatest interest are expected to be aesthetics, transportation and traffic, hydrology and short-term noise effects.

Please send your comments on the alternatives to be analyzed in the EIS/EIR, environmental issues, and sources of environmental information to Anne Elston by March 20, 2008.

Attn: Anne Elston
Environmental Research Analyst
SRI International
333 Ravenswood Avenue, G-229
Menlo Park, California 94025-3493
anne.elston@sri.com

Scoping Meetings Agenda

NOAA is seeking public comments in these following areas. A public scoping meeting will be held on the following date, time and location:

Date: February 20, 2008
Time: 5 pm tour of SWFSC, 6 pm meeting start time
Location:
South West Fisheries Science Center Lab, Building A, Large Conference Room
8604 La Jolla Shores Drive
La Jolla, CA 92037-1508

Case #626030 Beach and Bay Press
Case #626031 The Beacon
Case #626032 La Jolla Village News

In the Superior Court of San Diego in and for the County of San Diego

CERTIFICATE OF PROOF OF PUBLICATION

In the Matter of : NOTICE OF PREPARATION ENVIRONMENTAL IMPACT REPORT

NOTICE OF PREPARATION-ENVIRONMENTAL IMPACT REPORT

Project Title: NatioÁnal Oceanic and Atmospheric Administration (NOAA) Southwest Fisheries Science Center (SWFSC) Relocation

Sch. Number:
Lead Agency: NOAA
Project Location: La Jolla, CA
County: San Diego

In compliance with the California Environmental Quality Act, NOAA is issuing this Notice of Preparation (NOP) to inform you of the preparation of a joint Environmental Impact Statement/ Environmental Impact Report (EIS/EIR). The proposed action is the relocation of the NOAA National Marine Fisheries Service's (NMFS) SWFSC at the University of California San Diego (UCSD) campus. The purpose of NOP is to obtain agency input as to the scope and content of the environmental data and analysis that should be included in the EIS/EIR. The NMFS SWFSC manages NOAA's marine science research throughout the Southwest Region of the U.S. It provides researchers from NOAA, Scripps Institution of Oceanography (SIO) and others with wet and dry laboratory facilities, offices for research, management and administrative t˜asks, and other collaborative endeavours. The existing facility, built in 1964, is adjacent to a coastal bluff that is undergoing severe erosion and retreat. The proposed action is to construct a new SWFSC facility at a preferred site located across La Jolla Shores Drive from the existing NOAA facilities (see attached figure). A minimum of two existing at-risk SWFSC structures would be removed and the property currently occupied by NOAA returned to UCSD control for other appropriate uses. Relocation of the SWFSC will allow NMFS to continue its research collaboration with SIO and other researchers on Pacific fisheries and marine mammals.

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Please send your comments on the alternatives to be analyzed in the EIS/EIR, environmental issues, and sources of environmental information to Anne Elston by March 20, 2008.

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333 Ravenswood Avenue, G-229
Menlo Park, California 94025-3493
anne.elston@sri.com

Scoping Meetings Agenda

NOAA is seeking public comments in these following areas. A public scoping meeting will be held on the following date, time and location:
Date: February 20, 2008
Time: 5 pm tour of SWFSC, 6 pm meeting start time

I am a citizen of the United States and a resident of the County aforesaid. I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the principal clerk of the printer of the Beach and Bay Press, Peninsula Beacon, and The La Jolla Village News, which are weekly newspapers of general circulation within the provisions of the Government Code of the State of California, printed and published in the County of San Diego, State of California; this proof of publication to which this certificate annexed is a true and correct copy published in said newspaper on: FEB 14, 2008

I certify under penalty of perjury that the foregoing is true and correct, this **FEB 14, 2008** at 4645 Cass Street, San Diego, CA 92109

Kim D. Donaldson Principal Clerk

Kim Donaldson

Affidavit of Publication

SRI INTERNATIONAL

333 RAVENSWOOD AVE. #G-226

MENLO PARK, CA 94025

STATE OF CALIFORNIA} ss.
County of San Diego}

The Undersigned, declares under penalty of perjury under the laws of the State of California: That....She is a resident of the County of San Diego. THAT....She is and at all times herein mentioned was a citizen of the United States, over the age of twenty-one years, and that .....She is not a party to, nor interested in the above entitled matter; that ....She is..... Chief Clerk for the publisher of .....

The San Diego Union-Tribune

a newspaper of general circulation, printed and published daily in the City of San Diego, County of San Diego, and which newspaper is published for the dissemination of local news and intelligence of a general character, and which newspaper at all the times herein mentioned had and still has a bona fide subscription list of paying subscribers, and which newspaper has been established, printed and published at regular intervals in the said City of San Diego, County of San Diego, for a period exceeding one year next preceding the date of publication of the notice hereinafter referred to, and which newspaper is not devoted to nor published for the interests, entertainment or instruction of a particular class, profession, trade, calling, race, or denomination, or any number of same; that the notice of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following date, to-wit:

FEBRUARY 16, 2008

Michelle A. Saner

Chief Clerk for the Publisher

Affidavit of Publication of

Legal Classified Advertisement

Ad # 2592708

Ordered by: LYNN PAZAR

NOTICE OF PREPARATION-ENVIRONMENTAL IMPACT REPORT

Project Title: National Oceanic and Atmospheric Administration (NOAA) Southwest Fisheries Science Center (SWFSC) Relocation

Sch. Number:
Lead Agency: NOAA
Project Location: La Jolla, CA
County: San Diego

In compliance with the California Environmental Quality Act, NOAA is issuing this Notice of Preparation (NOP) to inform you of the preparation of a joint Environmental Impact Statement/Environmental Impact Report (EIS/EIR). The proposed action is the relocation of the NOAA National Marine Fisheries Service's (NMFS) SWFSC at the University of California San Diego (UCSD) campus. The purpose of NOP is to obtain agency input as to the scope and content of the environmental data and analysis that should be included in the EIS/EIR.

The NMFS SWFSC manages NOAA's marine science research throughout the Southwest Region of the U.S. It provides researchers from NOAA, Scripps Institution of Oceanography (SIO) and others with wet and dry laboratory facilities, offices for research, management and administrative tasks, and other collaborative endeavours. The existing facility, built in 1964, is adjacent to a coastal bluff that is undergoing severe erosion and retreat. The proposed action is to construct a new SWFSC facility at a preferred site located across La Jolla Shores Drive from the existing NOAA facilities (see attached figure). A minimum of two existing at-risk SWFSC structures would be removed and the property currently occupied by NOAA returned to UCSD control for other appropriate uses. Relocation of the SWFSC will allow NMFS to continue its research collaboration with SIO and other researchers on Pacific fisheries and marine mammals.

The environmental issues to be addressed in the SWFSC Relocation EIS/EIR include: land use and coastal zone management; aesthetics; geology; hydrology and water resources; biological resources and protected species; utilities and public services; transportation and traffic circulation, recreational resources; air quality; noise and vibration; visual effects and aesthetics; cultural resources; socioeconomics and land use; and cumulative effects. The most salient and foreseeable environmental topics of greatest interest are expected to be aesthetics, transportation and traffic, hydrology and short-term noise effects.

Please send your comments on the alternatives to be analyzed in the EIS/EIR, environmental issues, and sources of environmental information to Anne Elston by March 20, 2008.

Attn: Anne Elston
Environmental Research Analyst
SRI International
333 Ravenswood Avenue, G-229
Menlo Park, California 94025-3493
anne.elston@sri.com

Scoping Meetings Agenda

NOAA is seeking public comments in these following areas. A public scoping meeting will be held on the following date, time and location:

Date: February 20, 2008
Time: 5 pm tour of SWFSC, 6 pm meeting start time
Location: South West Fisheries Science Center Lab, Building A, Large Conference Room. 8604 La Jolla Shores Drive, La Jolla, CA 92037-1508

Notice of Preparation

To: State Clearing House
1400 Tenth St
Sacramento CA 95814
(Address)

From: Anne Elston, Research Analyst
SRI International
333 Ravenswood Ave, G229
Menlo Park CA 94025
(Address)

Subject: Notice of Preparation of a Draft Environmental Impact Report

University of California, San Diego will be the Lead Agency and will prepare an environmental impact report for the project identified below. We need to know the views of your agency as to the scope and content of the environmental information which is germane to your agency's statutory responsibilities in connection with the proposed project. Your agency will need to use the EIR prepared by our agency when considering your permit or other approval for the project.

The project description, location, and the potential environmental effects are contained in the attached materials. A copy of the Initial Study (☐ is ☒ is not) attached.

Due to the time limits mandated by State law, your response must be sent at the earliest possible date but not later than 30 days after receipt of this notice.

Please send your response to Anne Elston (anne.elston@sri.com) at the address shown above. We will need the name for a contact person in your agency.

Project Title: Relocation of Southwest Fisheries Science Center

Project Applicant, if any: National Oceanic and Atmospheric Administration

Date February 8, 2008

Signature Catherine Presmyk

Title Asst. Director Environmental Planning

Telephone (858) 534-3860

Reference: California Code of Regulations, Title 14, (CEQA Guidelines) Sections 15082(a), 15103, 15375.

APPENDIX B
PRE-SCOPING MEETINGS

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Pre-Scoping Community Outreach Meeting
NOAA NMFS Southwest Fisheries Science Center (SWFSC)
La Jolla Lab Replacement Project

La Jolla Community Planning Association (LJCPA)
Thursday, January 3, 2008 @ 6:00 p.m.
La Jolla Recreation Center
615 Prospect Street, La Jolla
Chair: Tim Golba

Handouts:
NOAA La Jolla Lab Replacement (2-pg.) – final to be supplied by Dan Strandy by December 21; SRI to duplicate for meeting

Map of 1/30/08 Scoping Meeting location (location, parking, etc.); needs to be prepared for meetings; SRI

Display Board: Enlarged board (approx. 24" x 36") showing existing and proposed sites; photo from Strandy handout is perfect; SRI should secure and have prepared for meeting; UCSD will bring easel and poster board.

Talking Points:

- Introduce participants
- Brief information item to introduce you to a project that is in the planning process and about to enter the design and environmental review phase
- This project is a replacement facility for the Southwest Fisheries Sciences Center located at the north end of the Scripps Institution of Oceanography campus on La Jolla Shores Drive
- The Center is a unit of the National Marine Fisheries Service and part of NOAA – the National Oceanic and Atmospheric Administration
- The Center works in close collaboration with SIO but is a separate facility
- The Center conducts scientific research associated with fisheries development and management issues throughout the Pacific Ocean
- The existing Center was built in 1966 and consists of four buildings

- Two of the four buildings are now seriously impacted by natural cliff erosion and must be vacated and eventually demolished

- The remaining two buildings are structurally sound and maybe left in place

- In order to provide replacement space for all four buildings and maintain their close working relationship with SIO, it is planned to construct a new Southwest Fisheries Sciences Center to the east on the eastern side of La Jolla Shores Drive

- The new facility would be sited on a 3.305 acre site leased from UCSD

- The new facility would contain approximately 120,000 gross square feet and would be completed in early 2012 (following an approximately two-year construction period); it would house approximately 300 employees and provide substantially more off-street parking.

- At this point in time, the programming phase of the building project has been completed and design is being started

- Part of the design process is the environmental review process; because this is a joint Federal-State project, there will be both an Environmental Impact Statement and a State Environmental Impact Report completed

- The first step in that environmental review process is the issuance of a notice and the holding of a scoping meeting where comments from agencies and members of the public are solicited

- At the scoping meeting, a more detailed description of the proposed project will be presented and areas of potential environmental impact will be identified

- Participants will have the opportunity to recommend topics that they believe should be addressed in the environmental review process

- After the 30-day scoping period, the environmental documents will be prepared and ultimately circulated for another 30-day public review

- We expect that the public review period will occur in June of this year and that final project approval will occur in Fall 2008

- The approval process includes review of the project by the California Coastal Commission

- Formal announcement of and information about the scoping process will be distributed later this month, but we are here today to also give you that information

- The scoping meeting will be held on Wednesday, January 30 at 6:00 p.m. at the Southwest Fisheries Science Center on La Jolla Shores Drive; there will be a tour of the facility beginning at 5:00 p.m. for those who are interested

- We will continue to keep this group informed about the project and hope that many of you will be able to join in the tour and the scoping meeting

- We'd be pleased to take a few minutes now and answer any questions you may have.

I. Potential Questions/ Topic of Discussion:

1. Cost of building? Estimated Cost of Construction (ECC) is $84.0 million. Overall estimated project cost is $104.5 million.

2. Funding source(s)? Congressional Authority and Appropriations

3. Number of parking spaces? Where is parking located? Will it be adequate? A minimum of 154 parking spaces are anticipated to be constructed. Majority of parking to be located under proposed structure. Proposed parking provided will exceed UCSD/SIO required ratio of parking spaces per building occupant for Scripps Neighborhood.

4. How will this affect the traffic on La Jolla Shores Drive? Traffic Impact Study to be completed in early 2008.

5. What is fate of two remaining existing buildings? And the oceanfront site? The two buildings at most risk, buildings B & C are scheduled to be vacated in the summer of 2008. Building B & C are tentatively scheduled to be demolished no later than 2017. Upon completion of site restoration the existing property would be deeded back to UCSD/SIO.

6. What would be required to rehabilitate them (including costs) and who might want to use them? Costs are unknown at this time. UCSD/SIO has indicated interest in possible redevelopment of the existing site.

7. Is this project included in UCSD's Long Range Development Plan? The proposed site is designated as Academic Use in the 2004 Long Range Development Plan (LRDP), and the proposed NOAA use would be consistent with that designation.

8. How big and bulky will the new building be? The proposed design anticipates engaging the site by nesting the building into the steeply sloped site to minimize physical massing.

9. Why can't project be located somewhere else (alternative sites considered)? Others sites considered do not allow NOAA to continue to maintain its longstanding partnerships and co-location with SIO, the California Department of Fish and Game, and the Inter-America Tropical Tuna Commission (IATTC).

10. What other reviews and approvals are required? National Environmental Policy Act (NEPA); California Environmental Quality Act (CEQA); University of California San Diego – MSSPC; CCPC, Design Review Board Committees; The Regents of the University of California; and the Department of Commerce – National Oceanic and Atmospheric Administration.

11. How many employees at existing buildings? 283 employees are currently occupy the existing Southwest Fisheries Science Center Facility.

12. Any detailed questions re: traffic impacts, building design, etc. need to be deferred as subjects more appropriately raised at the scoping meeting and addressed in the environmental review process

II. Key site considerations:

- Visual Corridors
- Traffic Circulation
- Excavation on sloped terrain
- Biological and Hydrological conditions

LA JOLLA COMMUNITY PLANNING ASSOCIATION 2008 SIGN-IN SHEET

JANUARY 3rd MEETING

NAME (Please Print Legibly)	ADDRESS	E-MAIL OR PHONE #	SIGNATURE	Would you like your email added to our email list?
THOMAS SOMERS			[illegible]	THSOMERS@yahoo.com
Wendy Hunter Barker			[illegible]	no thanks
Paul Keljik			Paul Keljik	No thanks

LA JOLLA COMMUNITY PLANNING ASSOCIATION 2008 SIGN-IN SHEET

JANUARY 3rd MEETING

NAME (Please Print Legibly)	ADDRESS	E-MAIL OR PHONE #	SIGNATURE	Would you like your email added to our email list?
Tim GOLBA				NO !!!
Ed [illegible]				
DAVID VACCHIANO				
Joan Perry			Perry	yes
John Chamberlain				yes
Peggy Wiggins				
Debbie Beacham				already on it
Anne Elstn				
Shannon Mason				Please
Zephen Specht				

LA JOLLA COMMUNITY PLANNING ASSOCIATION 2008 SIGN-IN SHEET

JANUARY 3rd MEETING

NAME (Please Print Legibly)	ADDRESS	E-MAIL OR PHONE #	SIGNATURE	Would you like your email added to our email list?
John A. BEROL				
Richard Guarascio				
Jim Ridgway				
Donna Ayres				
Darry Ashby				
MARK LYON				
Meghan Donahue				yes
EDWARD DOHERTY			.com	Yes
STEVE HAYNES				
Doug Bennett				NO

LA JOLLA COMMUNITY PLANNING ASSOCIATION 2008 SIGN-IN SHEET

JANUARY 3rd MEETING

NAME (Please Print Legibly)	ADDRESS	E-MAIL OR PHONE #	SIGNATURE	Would you like your email added to our email list?
TED LANTON				
JOHN LEEK				
JOHN STEEL				

La Jolla Community Planning Association
President: Tim Golba Vice President: Lance Peto Secretary: Darcy Ashley

Regular Meeting- January 3, 2008
Draft Minutes

Present: Darcy Ashley, Orrin Gabsch, Tim Golba, Mark Lyon, Phil McConkey, Marty McGee, Phil Merten, Michael Morton, Lance Peto, Robert Thiele, Ray Weiss, Rob Whittemore

Absent: Dave Abrams, Lynne Hayes, Todd Lesser, Sherri Lightner, Paul Metcalf, Alice Perricone

Agenda items:

1. **Welcome and Call To Order:**
   The Chair, President Tim Golba called the meeting to order 6:05 pm.
   President Golba announces that Michael Morton has resigned as Secretary & Darcy Ashley has been appointed as the Secretary.

2. Request for Agenda modifications:

Motion to move item 12 to after 6.1 passes unanimously. (Ashley/Weiss 11-0-0)
Affirmative votes: Ashley, Gabsch, Lyon, McConkey, McGee, Merten, Morton, Peto, Thiele, Weiss, Whittemore

3. Approval of the December 6, 2007 Minutes.

Motion to defer approval to the February meeting passes unanimously.
(Ashley/Weiss 11-0-0)
Affirmative votes: Ashley, Gabsch, Lyon, McConkey, McGee, Merten, Morton, Peto, Thiele, Weiss, Whittemore

4. **President's Report**

   a. Election Committee- the election committee, an ad hoc committee, will be established. The committee with consisting of : Darcy Ashley, Michelle Fulks, Lance Peto, Cindy Thorsen, Rob Whittemore

Motion to establish the committee passes unanimously. (Golba/Gabsch 11-0-0)
Affirmative votes: Ashley, Gabsch, Lyon, McConkey, McGee, Merten, Morton, Peto, Thiele, Weiss, Whittemore

   b. Coastal Permit Exemption process
   c. Bylaws to City Council Timeline- Keely Sweeney reported that they will be scheduled at City Council in late January/ early February.

5. **Treasurer's Report**: Phil Merten made the report for Lynne Hayes
   Previous ending balance: $800.81. Collected at December meeting: $143.00.
   Expenses: $255.00 for ½ year rent including overtime. Ending balance: $688.81.

Motion to provide information to Promote La Jolla, who pledged $500 at the last meeting for LJCPA clerical services, that the office of the Secretary is being filled by a volunteer who will do the clerical work, thus making their generous donation not needed at this time. Motion approved unanimously. (Ashley/Thiele 11-0-0)
Affirmative votes: Ashley, Gabsch, Lyon, McConkey, McGee, Merten, Morton, Peto, Thiele, Weiss, Whittemore

6. **Public Comment:**
   a. **Robert Thiele**- presented a copy of the Torrey Pines Community Study to members of the community who worked on it. He presented a copy to La Jolla Town Council President Anne Cleveland.
   b. **Anne Cleveland**- the meeting time of the La Jolla Town Council has been changed to 5pm instead of 4pm.
   c. **Sheila Harden** (CCDC)- Announced the re-opening of the Balboa Theater on January 31st. She also brought free tickets, available to the public, for promotional shows at the theater.
   d. **Mary Coakley**- the groundbreaking on the Map at La Jolla Shores is likely to be the end of February.
   e. **Esther Viti**- refurbishing concrete trash containers in the Village area is her next project. The first event to do this is on January 27, 2008. Interested volunteers should meet her at the corner of Girard and Prospect at 7am.
   f. **Phil McConkey**- asked why there was a charge by the Rec. Center for meetings. Clarification to him that the charge was for overtime use of the room, since LJCPA meetings go past 8pm.
   g. **Rob Whittemore**- presented a letter to the Board signed by three trustees asking for a Special Members meeting to be held to vote on parking issues by the membership. The letter was withdrawn & a substitute motion was made.

Motion that when the La Jolla Parking Advisory Board brings to the La Jolla Community Planning Association a plan that is ready for a vote, there will be a special meeting scheduled for the membership to be heard & vote on the issue. **(Whittemore/ Gabsch 9-0-2)**
Affirmative votes: Ashley, Gabsch, Lyon, McConkey, McGee, Merten, Thiele, Weiss, Whittemore
Abstained: Morton, Peto

- **COMPACT-** Delegate: Gail Forbes
  The Escondido train will be operational this month.

- **Bird Rock Community Council**- Michelle Fulks
  2nd Annual Home Tour will take place Saturday, January 26th from 11 am to 3pm. Tickets are $25. There are six homes on the tour. Proceeds to benefit completion of the "Waverly Gate" project.

- **UCSD Campus Community Planner**: Milt Phegley for Anu Delouri who is on maternity leave.

Item #12 moved to this location- UCSD PROJECTS - Milt Phegley provided information about an upcoming project planning and environmental review effort that will occur later in January. The project is a replacement (new) facility for the Southwest Fisheries Science

Center (SWFSC) located at Scripps Institution of Oceanography (SIO). SWFSC is a unit of the National Oceanographic and Atmospheric Administration (NOAA) and works closely with SIO. Their existing facility at SIO is located on land owned by the Federal government and two of the existing buildings have significant structural/seismic problems. The proposed project would be a new building located on land leased from UCSD/SIO across La Jolla Shores Drive to the east. The proposed project will have a joint EIR/EIS prepared and the scoping meeting for that process is scheduled for January 30; notices of the hearing will be distributed in mid-January and there will be a public comment period extending into February. We want to introduce everyone to the proposed project, make them aware of the scoping meeting (and a preceding tour of the existing facility), and be available to answer any process-related questions.

In attendance for this presentation were Megan Donahue, Doug Bennet- SIO and John Chamberlain SRI Environmental Consulting.

Comments & Questions from the trustees & the public:

Melinda Merryweather inquired about the impact of the project on view corridors.

Presenters answered that the view corridors would be maintained from the roadways.

Mike Costello: asked if the project was federally funded.

Presenters answered that it was.

Jim Fitzgerald asked for the project to provide a virtual view of the project to show the visual impact.

Robert Thiele asked what the status of the existing buildings was.

Presenters answered that the 2 seaward buildings were to be removed.

Pat Granger asked about road access during construction.

Presenters answered that a traffic consultant had been hired.

Michelle Addington asked whether other locations had been considered.

Presenters answered that no other site was feasible.

Tim Lucas asked how large the project is.

Presenters discussed square footage of new project

Ed Ward inquired about off- street parking

John Berol inquired whether off street parking was to be free or for a fee

Michael Morton asked about plans for the old site

Presenters answered that it will return to UCSD for academic use.

Phil Merten asked that the presenters review the La Jolla Community Plan

Ed Ward asked that they provide parking for both the new facility and the old site.

Ray Weiss informed the group that UCSD requires that parking is to be paid, not free.

John Berol suggested that they provide 120 % parking spaces.

Orrin Gabsch- asked that the presenters have information about how many cubic yards of soil will be removed at the scoping meeting.

The Venter Institute will be heard at Coastal Commission in February.

7. **City of San Diego Planning Department**: Leslie Henegar present, no report.

8. **Representative for Council President and District 1** Councilman Scott Peters:

Keely Sweeney-

a. Announced Christmas tree recycling at Kate Sessions Park on January 23rd.
b. Coming up at City Council: Water supply, Oversize vehicle ordinance, funding for helicopters for fighting fires, Community Group bylaws.
c. Many street light outages have been fixed.

9. Representative for District 2 Councilman Kevin Faulconer – Thyme Curtis- not present.

10. COMMITTEE REPORTS & CONSENT ITEMS:

A.) **Planned District Ordinance** (PDO) **-** Chairperson: Joe LaCava

1. Dec 3 Minutes (*No mtg. Dec 17*) – *For CPA Information Only*

2. Recommendations to CDP Committee - *None*

3. Final Review – *For CPA Approval on Consent*

A. **Donna Marsh**, 7710 Fay Avenue, PDO Zone 3, Applicant's Representative: Keoni Rosa. MOTION**:** Design as presented meets the requirements of the PDO. (Collins/Cleveland: 9-0-0)

LJCPA Approved motion: To accept the recommendation of the PDO committee to approve item 10.A.3 Donna Marsh and forward the recommendation to the city. (Gabsch/Whittemore 11-0-0)
Affirmative votes: Ashley, Gabsch, Lyon, McConkey, McGee, Merten, Morton, Peto, Thiele, Weiss, Whittemore

B.) **Coastal Development Permit (CDP) Review Committee –**
Chairperson: C. A. MARENGO not present

1.) KORNFELD RESIDENCE APPROVED 7-2-0 (December 11th, 2007 action item) 9460 La Jolla Farms Road – new 13,994 square foot single family residence

2.) LIAGHAT RESIDENCE APPROVED 7-2-0 (December 11th, 2007 action item) 1700 Torrey Pines Road – new 13,994 square foot single family residence

3.) COPELAN RESIDENCE APPROVED 8-0-1 (December 11th, 2007 action item) 1320 Inspiration Drive – demolish 2,853 square foot garage

4.) KLEMM RESIDENCE Approved 5-1-0 (December 18th, 2007 action item) 1723 Castellana Road – new 5,280 square foot single family residence.

5.) FEENEY RESIDENCE Approved 5-0-2 **(**December 18th, 2007 action item)

6111 Camino de la Costa – new 2,115 square foot addition to a single family residence.

6.) GOMBOS RESIDENCE Approved 6-0-1(December 18th, 2007 action item) 1805 Amalfi Street – new 6,606 square foot single family residence.

7.) SEACLIFF RESIDENCE Approved 5-1-1**(**December 18th, 2007 action item) 1327 Coast Walk – CDP and Variance for conversion of Pavilion.

LJCPA Approved motion: To accept the recommendation of the CDP committee to approve items 10, B-1,2,3,5,6,7 and forward the recommendation to the city. (Lyon/Morton 11-0-0)

Affirmative votes: Ashley, Gabsch, Lyon, McConkey, McGee, Merten, Morton, Peto, Thiele, Weiss, Whittemore

LJCPA Approved motion: to accept the recommendation of the CDP committee to approve item 10, B-4 Klemm residence and forward the recommendation to the city. (Lyon/Morton 10-0-0-1)
Affirmative votes: Ashley, Gabsch, Lyon, McConkey, McGee, Morton, Peto, Thiele, Weiss, Whittemore
Recused: Merten

C.) **La Jolla Shores Permit Review Committee (LJPRC) -** Chairperson: Tony Espinoza

No items this month**.**

D.) **Traffic and Transportation (T&T) -** Chairperson: Joe LaCava for Mark Broido

1. **Donna Marsh:** Petition for permission to impact street traffic flow and parking for a private gala opening of a new store at 7712 Fay Avenue, on January 26th. Applicant's Rep: Berkman
   MOTION: Approve closing based on representation that merchant signatures reflect acceptance and there is no opposition and also based on the soft closing at 11am and hard closing at 5pm and all valet parking will be off-street. (Lesser/Heaton: 3-1-0-1)

2. **Fay Avenue Extension Vacation/Purchase**: The Methodist Church and other property owners are working with the City to have a street vacation and correction of map inconsistencies where the Fay Avenue Extension crosses La Jolla Hermosa and meets La Jolla Boulevard. Jim Anthony, Real Estate Assets, City of San Diego; several representatives from the Methodist Church.

   MOTION: At this time, the Board strongly opposes giving up this right-of-way and opposes vacating the Fay Avenue Extension. (Lesser/Heaton: 5-1)

3. **Via Capri (Via Capri at Hidden Valley Road):** Pop-out design presentation and review as part of a revised traffic calming measures proposed by the City for this block. Gary Pence, P.E., City of San Diego

   MOTION: Approve the curb bulb-outs on the east side of the intersection with a pilot program of restriping the intersection per Gary Pence's plan with the proviso that we continue to work with the City to get a more substantial intersection improvement. (Beaver/Heaton: 6-0-0)

The Fay Avenue Extension Vacation/Purchase was pulled for hearing by the LJCPA at the next meeting by Ashley/Lightner.

Via Capri (Via Capri at Hidden Valley Road) was pulled for hearing by the full Board of the LJCPA at the next meeting by Gabsch/ Whittemore.

LJCPA Approved motion: to accept the recommendation of the T & T committee to approve item 10, D-1- Donna Marsh and forward the recommendation to the city. (Lyon/Thiele 11-0-0)

Affirmative votes: Ashley, Gabsch, Lyon, McConkey, McGee, Merten, Morton, Peto, Thiele, Weiss, Whittemore

McGee and McConkey left the meeting.

11. **CHILDREN'S POOL ROPE BARIER** *Despite recent Court action, the City of San Diego is continuing to process a permit to place a rope barrier at the Children's Pool while the environmental impact process proceeds for returning the pool for the use specified in the Trust that gave the land to the City.*
There were no representatives from the City in attendance to make a presentation.
Public comment was made in opposition to the installation of a rope by: John Steele, Debbie Beacham, Melinda Merryweather, Jean Perry, Richard Garagio, John Lee, Granger.
Public comment in support of the rope made by: Donata Valley, Eileen Shively
For more detail on the public comment please see the recorded tape of the meeting.

LJCPA approved motion: The La Jolla Community Planning Association recommends the denial of the Coastal Development Permit for the Rope Barrier at the Children's Pool. Findings 1, 2 & 3 cannot be made. (Merten/Morton 7-2)
Affirmative votes: Ashley, Gabsch, Lyon, Merten, Morton, Peto, Thiele
No votes: Weiss, Whittemore

13. **ROSELAND DRIVE VACATION-** pulled for Full Trustee consideration –
Vacation of a portion of Roseland Drive – Portion before the CPA tonight will be for only the portion NOT in the Torrey Pines Road right of way.
Applicant Matt Peterson and Max Leguarti made a presentation of the proposal.
Edward Doheny representing neighbor Veronica Cushman stated his clients opposition to the Proposal, due to concerns about the public right of way & the lack of a public benefit as currently proposed.

Approved motion: Motion to endorse the full recommendation of the Traffic & Transportation committee, both of its parts: approve the Roseland vacation and deny the Torrey Pines vacation. This is conditioned upon the construction of an all-weather transit path and maintenance of the existing dirt path until the new path is constructed. (Weiss/Peto 8-0-1)
Affirmative votes: Ashley, Lyon, Merten, Morton, Peto, Thiele, Weiss, Whittemore
Abstained: Gabsch

14. **Meeting adjourned** to the next regular meeting, February 7th, 2008

Submitted by Darcy Ashley 1/29/08

Pre-Scoping Community Outreach Meeting
NOAA NMFS Southwest Fisheries Science Center (SWFSC)
La Jolla Lab Replacement Project

La Jolla Shores Association (LJSA)
Wednesday, January 9, 2008 @ 7:00 p.m.
Building T-29 at Scripps Institution of Oceanography
Chair: Jim Heaton

Talking Points:

- Introduce participants
- Brief information item to introduce you to a project that is in the planning process and about to enter the design and environmental review phase
- This project is a replacement facility for the Southwest Fisheries Sciences Center located at the north end of the Scripps Institution of Oceanography campus on La Jolla Shores Drive
- The Center is a unit of the National Marine Fisheries Service and part of NOAA – the National Oceanic and Atmospheric Administration
- The Center works in close collaboration with SIO but is a separate facility
- The Center conducts scientific research associated with fisheries development and management issues throughout the Pacific Ocean
- The existing Center was built in 1966 and consists of four buildings (all of which are nominally three stories in height)
- Two of the four buildings are now seriously impacted by natural cliff erosion and must be vacated and eventually demolished
- The remaining two buildings are structurally sound and may be left in place
- In order to provide replacement space for all four buildings and maintain their close working relationship with SIO, it is planned to construct a new

Southwest Fisheries Sciences Center to the east on the eastern side of La Jolla Shores Drive

- The new facility would be sited on a 3.3–acre site leased from UCSD

- The new facility would contain approximately 124,000 gross square feet and would be completed in early 2012 (following an approximately two-year construction period); it would house approximately 300 employees and provide substantially more off-street parking.

- The existing facility is approximately 100,000 sq. feet and there are approx. 280 employees.

- The proposed building would be about 25% larger than the existing complex (approx. 100,000 sq. ft.)

- Part of the new project will be a significant increase in the of-street pain for the NAA facility. Presently, there are 11 spaces on the SWFSC site. Additionally, approximately 40 Center employees purchase UCSD parking permit and park in UCSD lots. The remainder of the employees (roughly 230) either park on the street or use an alternative transportation method.

- The new facility will have at least 154 on-site spaces. Preliminary design studies indicate that approximately 200 spaces could be accommodated in the building – and that 200 is a design goal. Efforts to include as many spaces as feasible are part of the design process.

- Another integral part of the project that will be evaluated in the environmental process is the retention of two of the four existing buildings. These buildings (approximately 50,000 square feet total) may be used by UCSD/SIO for relocation of existing employees or for new employees. The parking demand that will occur as a result of these subsequent actions will also be evaluated.

- At this point in time, the programming phase of the building project has been completed and design is being started

- Part of the design process is the environmental review process; because this is a joint Federal-State project, there will be both an Environmental Impact Statement and a State Environmental Impact Report completed

- The first step in that environmental review process is the issuance of a notice and the holding of a scoping meeting where comments from agencies and members of the public are solicited

- At the scoping meeting, a more detailed description of the proposed project will be presented and areas of potential environmental impact will be identified

- Participants will have the opportunity to recommend topics that they believe should be addressed in the environmental review process

- After the 30-day scoping period, the environmental documents will be prepared and ultimately circulated for another 30-day public review

- We expect that the public review period will occur in June of this year and that final project approval will occur in Fall 2008

- The approval process includes review of the project by the California Coastal Commission

- Formal announcement of and information about the scoping process will be distributed later this month, but we are here today to also give you that information

- The scoping meeting will be held on Wednesday, January 30 at 6:00 p.m. at the Southwest Fisheries Science Center on La Jolla Shores Drive; there will be a tour of the facility beginning at 5:00 p.m. for those who are interested

- We will continue to keep this group informed about the project and hope that many of you will be able to join in the tour and the scoping meeting

- We'd be pleased to take a few minutes now and answer any questions you may have.

I. Potential Questions/ Topic of Discussion:

1. Cost of building At this time, the total project cost is estimated at about $105 million; the actual construction is estimated at $84 million.

2. Funding source(s)?All of the funding for the new facility will be Federal funds. Currently, funds have been approved by Congress for the continued design of the facility together with the environmental review. Actual construction funds would be dependent upon Congressional appropriations in future years.

3. Number of parking spaces? Preliminary planning for the project calls for a minimum of 154 off-street parking spaces for the exclusive use of the occupants and visitors of the proposed building. Preliminary site deisgn indicates that approximately 200 spaces may be able to be accommodated within the building.

   Where is parking located? All except a handful of spaces are proposed to be located in several levels of parking under the structure.

   Will it be adequate? Review of the adequacy of the proposed parking is certainly one of the more important environmental review issues. The proposed parking represents a many-fold increase over parking on the existing site (less than 40 spaces).

   How will this affect the traffic on La Jolla Shores Drive? Part of the project design and environmental review process will include detailed traffic circulation and safety studies. This work will be coordinated with and reviewed by the City of San Diego.

4. What is fate of two remaining existing buildings? And the oceanfront site? At present, the two remaining existing buildings (A and D)and the current site would be returned to UCSD. The two buildings that are most endangered (B and C) would be demolished by 2017 and the site restored in a manner that would not contribute to any additional erosion.

5. What would be required to rehabilitate them (including costs) and who might want to use them? The precise cost of rehabilitation of the buildings to remain is still being examined. However, UCSD and SIO believe that the space could be well used.

6. Is this project included in UCSD's Long Range Development Plan? The project site is designated in the UCSD LRDP as "academic" and the proposed use is consistent with that designation. Although the proposed project is not specifically identified in the LRDP (as is the case with all buildings), the building ahs been accounted for in the overall "development

envelope" for the campus. The specific impacts of the proposed project will be evaluated in the planned environmental review process.

7. How big and bulky will the new building be? Certainly there will be a change in the visual environment as a result of the construction of a new building on a vacant site. However, site design goals call for the height of the building being such that views across the site, especially from the upper reaches of La Jolla Shores Drive are not impacted. Portions of the proposed project will be three stories in height.

8. Why can't project be located somewhere else (alternative sites considered)? Other sites were evaluated both at SIO and at other UCSD campus locations. None of the other sites met either the physical or programmatic needs of the facility. The alternative site evaluation will be contained in the environmental document.

9. What other reviews and approvals are required? Following completion of the design aspects of the project, it will be reviewed by the UCSD Design Review Board. The EIR and EIS for the project will be completed and certified by the Department of Commerce and the UC Regents. The Regents will also review and approve the ground lease for the site and project. The California Coastal Commission will review the project under their Federal Consistency process.

   As the project moves through the design and review process, we will keep this and other groups and any other interested parties informed of the progress.

10. How many employees at existing buildings? The number of employees in the existing buildings will not be substantially increased in the new building. There are approximately 283 employees in the existing facilities.

11. Any detailed questions re: traffic impacts, building design, etc. need to be deferred as subjects more appropriately raised at the scoping meeting and addressed in the environmental review process

II. Key site considerations:

- Visual Corridors
- Traffic Circulation
- Excavation on sloped terrain
  Biological and Hydrological conditions.

January 9, 2008
La Jolla Shores Association Public Meeting
Building T-29 at Scripps Institution of Oceanography
Chair: Jim Heaton

Mailing List and comments associated with the proposed project.
Proposed Project: Relocation of NOAA Southwest Fisheries Science Center, La Jolla, California.

Name	Email	Comments
Jim Heaton	jamesjheaton@yahoo.com	
Dave Laney	dclaney@gmail.com	
Pat Nisson	pnisson1@san.rr.com	
Ed Furtek	efurtek@mac.com	
Greg Salmon	NOAASIO@GregSalmon.com	
MARY COAKLEY	coakleym@san.rr.com	Please notify for scoping meeting + tour etc.
Daira Paulson	daira@san.rr.com	

January 9, 2008
La Jolla Shores Association Public Meeting
Building T-29 at Scripps Institution of Oceanography
Chair: Jim Heaton

Name	Email	Comments
Dan Courtney	dfrex6excaliburre.com	
Bob Williams	Bob.Williams@NOAA.GOV	
Bob Bartu	SOLARBART@AOL.COM	
Charlie Williams	Charles.Williams@	williamsmimco.com
W H Barker	whbarker@ucsd.edu	
Doug Bennett	dbennett@ucsd.edu	
Camilla Ingram	cingram@ucsd.edu	
Meghan Donahue	Meghan.Donahue@noaa.gov	

LA JOLLA SHORES ASSOCIATION (LJSA) Meeting Minutes January 09, 2008

Next Meeting: LJSA Meeting Wednesday, February 13, 2008 pm at Martin-Johnson House (Bldg T-29) at Scripps Institute of Oceanography. Present: Alex Varon, Todd Lesser, Dave Laney, Jim Heaton, Mary Coakley, John Metzger, Sharon Luscomb, Greg Salmon, Tim Lucas, Izzy Tihayni, Sue Weissman, Ed Furtek, Joe Dicks, Pat Nissan. Absent: Sherri Lightner and Andrea Dahlberg, audience 10+.

1. **UCSD Representative**
   –Milt Phegley introduced the Southwest Fishery Science Center's new project for a replacement facility. Southwest Fishery has been working with UCSD on this site. Milt introduced project representatives from Scripps administration, Scripps Director of Finance, Capital planning and Research, Project, Planning, Design and Construction. SRI will be doing an environmental evaluation as well. This new location would be one of 6 centers in the National Fishery Services and is a Federal Facility that conducts scientific research throughout the Pacific Ocean. The project is currently in the planning process ready to enter the design and review stage. The replacement facility is proposed at the North end of Scripps Oceanography Institute which is on the east side of La Jolla Shores Drive. It would be leased from UCSD and is approximately 3.2 acres. The new structure would be 125,000 sqft. and could handle approximately 300 employees. Later this month the project will begin environmental scoping. After scoping, a statement will be published later in the year. Parking is also being reviewed closely. At the proposed new center there are 150-200 parking spaces which are an increase from 11 parking spaces in the previous location. The existing center, since 1966, consists of 4 buildings. 2 of the 4 buildings are being vacated and demolished already. The remaining 2 buildings may be used and left in place for SIO in the future. UCSD is requesting input from LJSA and provided handouts which will be posted on website for review. Milt will provide a monthly update on this project. Audience member brought up concerns on view corridors and parking issues. Traffic and Transportation study will be done as part of this project which will address parking issues
2. **Police Representative –**
   Lt. Brian Ahearn- reported the promotion of Captain Long. He also confirmed that 26 signs (signs previously approved by LJSA) have been put up throughout the community and primarily in the La Jolla Shores area.
3. **Approval of the Minutes** –approval of the December minutes is requested by email. Everyone needs to respond that they approve the minutes to jamesjheaton@yahoo.com
4. **Treasurer's Report**
   – Beginning and ending balance are reported the same due to no activity this month. $3,574.49.
5. **CD 1 Representative –**.
   Keely Sweeney reported recycling events last month at Kate Sessions, Swanson Pool Center, and Mission Bay. At the CPA last month, the committee asked that the Via Capri item come back next month for a vote meeting is 2/7 at 6 p.m. at the La Jolla Recreation Center. The issue that came up was related to risks of drivers that would loose their brakes and bikers maneuvering around "pop outs". These issues will be covered at next meeting. Kayak permitting meeting held on 1/9/08 with reported good attendance and feedback. Keely asked that interested parties should please route questions to Debbie Marcotte at City of San Diego Parks and Recreation dmarcotte@sandiego.gov. PD and CD1 have been talking about getting funding for the security camera project. Mary Coakley introduced the environmental staff to the Vendor regarding trash compactors for the location directly in front of Jeff's Burgers. A proposal has been written for the oversized vehicles ordinance. Audience member brought up issues with commercial trucks and vehicles using up neighborhood parking.
6. **Public Comment**
   -Molly from the Children's School talked about the positive experience the kindergarten class had during the annual visit to the merchants on Avenida de la Playa. She presented the LJSA Board with the Press Release and pictures. Mary Coakley shared the article from Southwest Airlines January "Spirit" Magazine about J.J., the baby gray whale. She said that Wyland has offered to donate his artwork and time to design a life-sized bronze replica to be included with "The Map" project. We will need to fund the Foundry costs. All donations are greatly appreciated.

A. Chair's Report – Jim Heaton

1. **Children's School committee-**
   Children's School is committed to mediate on 1/25/08. The neighbors are committed but requested to find another location closer to the area. Proposed mediation is scheduled to be at a downtown San Diego location. Joe Dicks requested a list of 6 items that they would like to resolve /mediate. Joe requested that both parties agree to cease all other efforts until mediation is over. Joe has also asked Todd Lesser to present at the Board of Trustees at the Children's School. This presentation will be to

provide input on how to work with the community on these types of issues and projects, etc. to help avoid conflict during these processes in the future and to work well with the neighbors.

2. **Site 653 Lawsuit Report**- appealing decision.
3. **Chabad Update**-no update.
4. **Ventor Institute**- no update.
5. **Community Parking Board** –Ken King will be transitioning off the parking board. LJSA is still waiting to figure out who should replace Ken on this Board. The City Attorney's office has required that the Parking Board do full disclosure. The next meeting is scheduled for 2/6 at 2 p.m. at the Rec. room but the only item to discuss will be conflict of interest code and no decisions can be made on substantive matters.

B. Kayak Permit Program Update-

John Metzger reported that the 1/9/08 kayak meeting with the City went well. The RFP process is currently being handled by the City of San Diego Real Estate & Assets department and they are in the process of gathering information from the current permit holders. It was mentioned that the RFP might be issued this year but at this point no decision will be made until after the season. Debbie Marcotte is assembling all comments from the kayak outfitters and others to provide input to the Real Estate & Assets department which will help construct the permit. It was suggested that the LJSA put together a letter to the City to highlight current issues such as storage, kayak paddles, and use of Lorreitte Park. It was suggested that the City send a questionnaire that kayak operators would fill out independently and send back to provide more input. It was also suggested that community members provide documentation of local outfitters with feedback. Another meeting will be held to go over feedback. It was suggested that next meeting will have an agenda item for kayak discussion for approx 30 minutes. Purpose of agenda topic is to collect thoughts and feedback so that the LJSA can put together this community feedback and provide to the City. Sharon Luscomb to provide Jim Heaton Debbie Marcotte's address for the letter. John Metzger to work with Tim Lucas on his questions regarding kayak outfitters, numbers, etc.

C. Summer Issues in Kellogg Park-

Charlie Williams did a detailed presentation of issues at Kellogg Park. Handouts of the Power Point presentation were provided. The presentation supports a request for Rangers and funding from the City to deal with the issues at Kellogg Park. Jim Heaton asked Keely Sweeney to provide input on what should be done next to raise this request to the City. Keely mentioned that the budget process is in the Spring. The Park and Recreation department handles the funding for this type of request. Charlie Williams and Mary Coakley will come back to LJSA next month with a prioritized list of what we need to do long and short term. Charlie also requested that people provide him feedback on they feel about the tents used at Kellogg Park. BBQ's and tents can be handled by making a municipal code change for La Jolla Shores. It was also suggested that Scuba permitting needs to be reviewed.

Due to the size and complexity of the issues the Board will dedicate the preponderance or our next two meeting to discussing the issues, developing recommendations and submitting a position statement to the City. An issue regarding the installation of the "teeth" at the La Jolla Shores parking lot came up. The money has been identified/approved for the teeth. **MOTION: Varon 12-0-0. Approved**: LJSA to present letter to support closing Kellogg Park by a company contracted by the City, which will re-install teeth and close and open gates as posted at the park. .

D. Committee Reports

1. **Land Use** – no meeting.
2. **Traffic & Transportation** – Todd Lesser reported that the committee agreed to close block on 1/22 for "local gala". Todd also mentioned the land vocation and land swaps with the Church and with property on Fay Avenue.
3. **Parks & Beaches** –. Mary Coakley-held trash compactor to next meeting.
4. **Cliffridge Park Progress**-Mary Coakley reported that there is a meeting on 1/14-will update at next meeting.
5. **Kellogg Park Security Update**-. Mary Coakley reported that Lt. Rick Wurtz expressed his support at the 1/9/08 kayak meeting regarding the security cameras. They would like to review some of the tapes for use of evaluating the kayak permit holders operating on the launch as well as the launch in general.
6. **Map Project Update** –the Map will break-ground on schedule. Still working with Wyland on whether he will provide the statue.
7. **Allen Field/Children's School** –no update.

Meeting Adjourned at 9:06pm, Minutes submitted by Sharon Luscomb

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APPENDIX C
OFFICIAL SCOPING MEETING

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SWFSC PUBLIC SCOPING MEETING

Southwest Fisheries Science Center (SWFSC), NOAA Fisheries Service
Wednesday February 20, 2008

Facility Tour and Research Poster Session

4:30-6:00pm **Sign in - Front Office**
Debi Pierson/Laura Tezer/Rosemary Troian

Tour of B Wing 2nd Floor – Ocean Views, Cliff Retreat, Mesonet, Partnerships
Various SWFSC employees

Aquarium
Russell Vetter, Leader, Aquarium and Larry Robertson curator

Autonomous Underwater Vehicle (AUV) Technology
David Demer, Leader, Advanced Survey Technologies Program (FRD) and Associate Researcher, Marine Physical Laboratory, Scripps Institution of Oceanography, UC San Diego

Conservation Genetics Laboratory
Barbara Taylor, Leader, Marine Mammal Genetics program, John Hyde (SWFSC post doctoral researcher), Aimee Lang and Nick Kellar (Scripps Institution of Oceangoraphy graduate students), Curator (Gabriella Serra Valente)

6:00pm **Large Conference Room**
Light refreshments, poster sessions, community mingle
Station 1. San Diego Bay Turtles (Robin LeRoux)
Station 2. Marine Mammal Ecosystem Research Cruises (Lisa Balance/Nacho Vilchis)
Station 3. Shark and billfish tagging and tracking (Suzy Kohin)
Station 4. CalCOFI and Vessels (Roger Hewitt and Tony Koslow)

Large Conference Room

6:15-6:30pm **SWFSC – Welcome and Overview of Research**
Sarah Mesnick - Science Liaison, SWFSC, and Co-founder, Center for Marine Biodiversity and Conservation, Scripps Institution of Oceanography, UC San Diego

6:30-6:45pm **Overview of Proposed Facility Project**
M ark Eberling, Project Manager, NOAA's Project Planning and Management Division

6:45-7:30pm **Environmental Impact Report Process**
Jim Manitakos, Environmental Program, SRI International

7:30- 9:00pm **Questions and Comments**
Community audience, NOAA, SRI, SIO, UCSD, etc…

SIGN-IN SHEET
February 20, 2008
Relocation of NOAA's SWFSC EIS/EIR Scoping Meeting

Name and mailing address	Email	Place me on official mailing list
TONY BOTTONE 9575 Paseo Montril San Diego CA 92129	tonybottone@sbcglobal.net	☑ Yes, Please ☐ No
Mingzhu Zhang	mingzhu99@yahoo.com	☒ Yes ☐ No
Hai Wang 11087 Ice Skate Place San Diego, CA 92126	hw9568@yahoo.com	☑ Yes ☐ No
ROBT. BARTO	SOLARBART@AOL.COM	☑ Yes ☐ No
Cathy Isom	sciencefun@hotmail.com	☑ Yes ☐ No
TIM LUCAS	HLUCAS@~~[illegible]~~abac.com	☒ Yes ☐ No
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RICH JULIAN	rjulian@sar.rr.com	☒ Yes ☐ No
Maria S. Rothschild	N/A	☒ Yes ☒ No
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SIGN-IN SHEET
February 20, 2008
Relocation of NOAA's SWFSC EIS/EIR Scoping Meeting

Name and mailing address	Email	Place me on official mailing list
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Miriam Ortiz	lachic_mo@hotmail.com	☑ Yes ☐ No
Garnet West	gwest1@san.rr.com	☒ Yes ☐ No
John BEROL	JBEROL@ COMPUSERVE.COM	☑ Yes ☐ No
Leslie Lucas	llucas@abac.com	☒ Yes ☐ No
Cathy Presmyk	cpresmyk@ucsd.edu	☒ Yes ☐ No
		☐ Yes ☐ No
		☐ Yes ☐ No
		☐ Yes ☐ No

SOUTHWEST FISHERIES SCIENCE CENTER RELOCATION

ENVIRONMENTAL REVIEW PROCESS

PUBLIC SCOPING MEETING

TRANSCRIPT OF MEETING

NOAA SOUTHWEST FISHERIES SCIENCE CENTER
8604 LA JOLLA SHORES DRIVE
LA JOLLA, CALIFORNIA 92037

WEDNESDAY
FEBRUARY 20, 2008

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LA JOLLA, CA WEDNESDAY, FEBRUARY 20, 2008 6:17 P.M.

--oOo--

MS. MESNICK: All right. Thank you all for coming. It's a pleasure to see so many people here on a cold and windy night. At least it's not raining. My name is Sarah Mesnick. I am a science liaison here at the Southwest Fisheries Science Center, and I'm also a scientist in our Protected Resources Division. It's my pleasure to welcome you to the public scoping.

What I'd like to do is take just a moment initially to let you know who is in the room with you and to introduce some of the folks here. I'll start by the people from the Southwest Fisheries Science Center. I'm going to start way in the back of the room. Meghan Donohue and Jessica Lipsky are in the director's office here and have worked hard to put this event together with folks from SRI and UC San Diego and the Scripps Director's Office. If all of those folks could raise their hands. These are the ones that are working together to ensure the continuation of joint partnerships here and working together for science in the marine realm.

I'd like to introduce some other people from the Southwest Fisheries Science Center. You're in the midst of a number of scientists. Lisa Ballance is the director of the Protected Resources Division. Roger Hewitt, who I saw a

moment ago, is the director of the Fisheries Resources Division. I'm just going to look around the room. Robin is in our Marine Turtle Program. Do we have some other scientists here? I think that's it.

The folks that went out on tours with a number of our staff, technicians in a number of the different labs. From -- let's see -- I want to introduce some of the scientists from Scripps. Tony Koslow is the head of the CalCOFI Program. I'll be talking about that in a moment. And it's a great honor to have Dick Rosenblatt here, who is a fisheries scientist, retired Scripps faculty, and knows more about the local fish than just about anybody on the planet. And it's a pleasure to have you here.

(Applause.)

MS. MESNICK: From a personal note, I did my Ph.D. on blenies, which are real small fish. Dick knows more about blenies than just about anybody.

I'd like to introduce -- oh, and Russ Davis, also from Scripps. What other scientists, just so I make sure I catch everybody -- other scientists from Scripps? Thank you. Thank you all.

We also have from the Inter-American Tropical Tuna Commission, we have Guillermo Compian. He's the director of the Tuna Commission -- Brian Hullman, Don Margules and -- anybody else from the Tuna Commission?

And then, and most importantly, we have a number of our neighbors. I want to thank you for coming. Give me just a raise of hands of who has come from the local community.

Great. We hope that by the end of the evening you know everything that you'd like to know about our building, what we do in it, and our relationship with Scripps. If anybody's lost this button, you can come and get it.

Okay. I wanted to take just a few moments in introduction about who the Southwest Fisheries Science Center is, why we are located where we're located, and what we do. I'm going to -- I'd like to stand over by my slides. Is that okay?

THE REPORTER: That's fine.

MS. MESNICK: Okay. It's a simple question, but the answer is not always so straightforward when you ask about a government agency because of the governmental hierarchy. We are -- NOAA is the National Oceanic and Atmospheric Administration. We're actually part of the U.S. Federal Government. We're part of the Department of Commerce.

The National Marine Fisheries Service and the acronym -- lots of acronyms always -- is NMFS -- is just one of the line offices of NOAA. Some of the other line offices you may be more aware of, like the National Weather

Service. They're also part of NOAA. They're the ones that brought the rain today.

(Laughter.)

MS. MESNICK: Our mission, that mission of NMFS, is to promote sustainable fishery and the recovery of protected species. And so we have sort of a dual function. We work on commercial and recreational fisheries, and we also work on species such as marine mammals and marine turtles and sea birds.

NMFS operates six fishery science centers around the country. We are one of those science centers. We are a research lab, and we are full of scientists. All of these science centers are located -- collocated on university campuses. So the Southwest Fisheries Science Center is here at Scripps Institution of Oceanography. The Northwest is on the University of Washington campus. The Northeast is at Woods Hole. Somebody way back when actually had a really good idea to collocate fisheries scientists with the academic science.

At this lab in particular, we are responsible for generating scientific information for the conservation and management of resources along the U.S. West Coast, but also we work all over the entire Pacific, and we work in Antarctica as well. So among these six science centers, we're rather unique. We do more international work than

just about any of the other science centers.

So what is our relationship with Scripps? And as I mentioned, all these science centers, as a rule, are collocated on university campuses. The answer of why they're collocated is very simple, and it's a benefit to all of us. That's how you get the best scientists. You put the best scientists together. You put a coffee shop in the middle. And you get interaction, and you get for the public the best possible answers to tough questions.

We, the Southwest Fisheries Science Center, and Scripps Institution of Oceanography are partners in research, in teaching, and we also share facilities, and we share ships. So it's a real -- also it's a benefit to the public because we're efficiently using resources.

Lastly, but perhaps not least importantly at all, is that we are very much involved in training the next generation of scientists. I did a quick count just yesterday of how many Scripps students are working either full-time or part-time in our labs, and it's 24. That is a quarter of the graduate students that are in the Departments of Biological Oceanography and Marine Biology. So a lot of the students at Scripps have a relationship up here and receive training from scientists here.

The relationship goes both ways. A number of our scientists here are adjunct professors at Scripps, who teach

at Scripps. Vice versa, a lot of those grad students grow up and get jobs here. So it's a really good way for both of the institutions to share knowledge and to grow together, to provide for the public the best possible science.

I'd like to speak for a moment now about what we do. It's really difficult. They gave me just two slides. I could talk on and on about the science here. I'm going to give you just a few examples, and I'm going to summarize it by saying we do biological, economic and oceanographic research. And unlike an academic institution that does basic research, most everything we do here is mandated through congressional legislation. So the Magnuson-Stevens Fisheries Conservation and Management Act, the Endangered Species Act, the Marine Mammal Protection Act -- we produce the best possible science so that those laws can be enacted with the best possible information.

I'm going to give you just a few examples of some of the work we do. I picked these to show the breadth of what we do. The longest research project we have here, as I mentioned when I introduced Tony Koslow, is this program called CalCOFI, which, again, is an acronym for California Cooperative Oceanic Fisheries Investigations. It's a 57-year collaboration between Scripps, the NOAA Fisheries Service and Cal Fish and Game. Many of you probably know how it started. It started with the collapse of the sardine

fishery that was chronicled in Cannery Row. People wanted to know why this fishery had collapsed. They realized that to understand why, they needed to have a long-term, large-scale study. That started CalCOFI. It continues to this day. It is the, or one of the, very largest, longest ecosystem approaches to management. Today, the sardine fishery is a well-managed fishery, and it has come back from collapse, and it's because of this understanding that we now have based on the interaction between climate change and fisheries. And so they manage the fisheries based on this information.

We do in our advanced surveys technology -- that's an umbrella term actually for a lot of R&D work. We use optical and acoustic technology to devise new ways of surveying fish in their habitat. Traditional methods would take a ship and a trawl and crawl along just like a commercial fishery would do and pull up the species to look at. What we're trying to do is find new non-lethal ways of surveying those resources. This is particularly important when those resources, such as rockfish, are depleted themselves, or abalone, which many of you may know is a -- it looks kind of like a rock itself. It's very hard to see. There's no way to survey it. So we take down video equipment or use acoustic equipment to survey fish species. We can do this in new ways.

These technologies are not only developed here, but they're implemented here, and they're applied to fisheries management.

Marine mammals. We work on a distribution and abundance of marine mammals all along the Pacific Coast and in the Eastern Tropical Pacific and at spots around the world. We have again one of the largest, longest ecosystem approaches to management in the Eastern Tropical Pacific. We do have -- I should point out, we do have posters on these things. That program is described right here. For instance, our humpback program is described on the poster there. At the end, please have a look around again at these.

Marine turtles. Some of you may not know that there's a population of marine turtles in San Diego Bay. Our turtle team there in the back works not only in San Diego Bay, but these turtles are -- to do conservation and management effectively of turtles, you must work on the nesting beaches, in the open ocean where they encounter fisheries, and in the foraging areas. Our turtle people work trans-Pacific. Many of you may know of a turtle that was tagged by this team in Indonesia, and was -- tagged on a nesting beach in Indonesia, and came out of the water and found -- the satellite tag let us know that it was in Oregon. It didn't come out of the water. But it went all

the way from Indonesia to Oregon. So our group, to do management and conservation of sea turtles, has to work across that whole expanse.

Here I wanted to point out that we have an Antarctic program. We have the U.S.'s only ecosystem based program for management of Antarctic resources that include fish -- you may know them -- they're imported here as Chilean sea bass as one of the species -- krill and krill predators, such as penguins and fur seals.

I personally work on sperm whales. Anyone that wants to know anything about any of these research projects is welcome to look around or chat with us later on.

I wanted to turn now to talk about the facilities. In this building, we have 285 people. We also -- the Southwest Fisheries Science Center has two other facilities, one in Santa Cruz collocated on the University of Santa Cruz campus, and one up in Pacific Grove, which is collocated with Naval Postgraduate Institute.

In this building, we have, as many of you saw, saltwater aquaria. These are unique in that we're able to alter the temperature of the water to do experiments with. So we're not just like Sea World or something. We actually are able to experimentally manipulate the input of the water. It's also why it'd be very hard for this building to be far away from the ocean with the salt water.

We have this lab for the advance technologies optical and acoustic R&D. We have a number of vessels, the largest of which is the David Starr Jordan, shown down there, and it is -- its homeport is San Diego at the marine facilities, which, as I mentioned before, is a shared facility with Scripps.

We have the world's largest or one of the largest collections of ichtyoplankton, which are larval fish, marine mammal and marine turtle genetic specimens. So actually in this building we're a research lab, we're a museum, we're aquarium, and we house scientists.

When I say "we" I do this actually very generally. As I mentioned, our partnership with Scripps is research and teaching. We also have the California Department of Fish and Game. A couple people in this building work for Cal Fish and Game. But the biggest partner we have in the building is the Inter-American Tropical Tuna Commission, of which Guillermo is director. There's 45 people from that commission in this building.

We also have partnerships with commercial and recreational fisheries. Us being collocated here enables easy access for our partners.

So I hope that gave you a quick overview. Any of the partners that wanted to say something, we'll have some time at the end for questions, and could fill you in a

little bit more about any of the things I mentioned.

MR. ROBERT BARTO: When you say located in this building, you mean Building A or the whole facility?

MS. MESNICK: We are very mixed up. So most of the Tuna Commission actually is in Building A, but people have offices all around. It's very nice. If there's an open office, people take that.

I'd like to turn this over now to Mark Eberling, who is from NOAA's Office of Facilities and Management up in Washington. He'll do anything to come down to the nice weather.

MR. EBERLING: You can't blame the rain on me today. Actually, I kind of had an interesting experience coming down today with your weather. Usually I'm used to flying into Alaska. And, yes, we'll have to take a couple of runs at the airport. But I didn't expect that in San Diego. Maybe count that to Alaska Airlines.

My name is Mark Eberling, and I'm NOAA's project manager based in Seattle. We're out of the Project Planning and Management Division, which is our Western Regional Office. So we basically kind of administer planning activities, design activities and construction activities up and down the coast from Alaska down the coast to California and Hawaii as well.

Basically, the existing Southwest Fisheries

Science Center facility existing site was deeded to NOAA in 19- -- in the early '90s -- or excuse me -- early 1960s. The facility we're currently in was constructed in 1964.

I'm just going to kind of give you a little history of the existing site. We're actually in Building A, but the site is actually comprised of four facilities, A, B, C and D. Existing Buildings B and C are currently threatened by the continued erosion of the coastal bluff that I'm sure many of you are aware of. Even though historically the rate of retreat is basically one-half foot per year over a hundred-year projection, that may not seem to be a large number. But currently our Buildings B and C are uncomfortably close for our NOAA leadership, which basically has provided us with essentially a mandate to begin evacuation of Buildings B and C.

Actually, in attendance today we actually have our geological consultant in the crowd. Certainly he feels comfortable occupying the site. So even though we feel comfortable with where we are, we are expecting to move out of Buildings B and C in the summer of this year. We actually have a temporary facility that the staff in those buildings will be moving to. Actually we have some restacking efforts that'll also take place, moving folks that remain in Building C into Buildings A and D. So we have a lot of activities going on this summer and into the

fall.

Our proposed project would basically build a new facility of approximately 125,000 square feet, 124,000 square feet. That's approximately 25 percent larger than the existing facility. It would still house approximately 285, 283 people that the current facility occupies. This facility, as you might have noticed, certainly wasn't built for staffing of 185, and certainly isn't as modern as we'd like it in our laboratories. With the advancement of science in the last 40-plus years, certainly we have a lot more equipment being placed in our laboratory. So certainly we need the added space to effectively complete the mission of the agency.

I'm just giving you a real brief history of the series of bluff failures that have occurred over, for instance, the last ten years. Basically, two major -- quote -- major -- minor -- major -- failures have occurred, which basically allowed NOAA to begin a series of mitigation measures. These measures included things such as water restrictions on-site, capping of a bluff-top area in the patio that you may have seen out there, cracked ceiling to prevent water migration into the subsurface, installation of inclinometers, which are actually a real-time device to sense any movement in the bluff, as well as placing tilt meters on a couple of buildings to sense any movement as

well. These are all essentially implemented and put into existence to provide NOAA leadership as well as the staff a sense of security.

Actually another method that we actually installed recently was installation of a dewatering well on site. This system is a vertical caisson with radial hydro-augers. We're typically not concerned with the slow natural erosion process. But we're certainly concerned with the upland water leak. As many of you know, the bluff failures are typically episodic. So you really have really no idea how large they could be. They could be very small; they could be somewhat larger.

So with that, NOAA has begun the process to plan and do the environmental scoping activities for a proposed new facilities. What is imagined -- or what is working -- we are working to is basically working with the university and SIO to lease land across the street, at which time the existing facility, which was initially deeded form the university, would return to the university. The two at-risk buildings, B and C, would actually be demolished at that time, sometime in the future, and tentatively at this point it would be before 2017. So that's still considerably out in the future.

I'm sure everybody's interested in what the potential design schedule and construction schedule may be

for the proposed new facility. A project design team has actually been selected. Gibbons, Drake & Scott was selected with executive architects Gould Evans, and San Diego-based architect Delawie, Wilkes, Rodrigues & Barker. Many of you might be familiar with their work on campus and in the area.

Design schedule -- schematic design documents are anticipated to be approved in July 2008, with the hope that construction documents, design documents would be completed in July of 2009. Currently NOAA has funding in hand to do work up through design development, which is typically 65 percent complete on the design documents. That would essentially take us through early December of 2008.

We're hopeful of receiving federal funding. And this project is 100 percent federal funded. We're hopeful of receiving the balance of our design funding in 2009, with the possibility of having some construction site work funding to begin early site work as early as the summer or fall of 2009. And all of this is predicated on actually receiving federally -- federal funds that we request.

So we all know typically how Congress works. Until the money actually shows up in our hands, there is some uncertainty there. But certainly this is a priority to NOAA. We look forward to moving throughout the process and constructing a new facility.

As I mentioned, construction could begin as early

as late summer of 2009 for the initial site work. Our preferred site is a fairly steep site, which would require a fairly large amount of earth to be removed from site. As we get into the environmental process, we'll talk a little bit more about individual studies that are ongoing to help address some of the initial concerns that we within NOAA have, as well as the university, as well as the public.

Construction is anticipated to take approximately two years. We're actually bringing on a construction manager, and there is a possibility that that could be done a little quicker, depending on how funding arrives and how our construction manager schedules his work and activities.

We anticipate selecting a construction manager early spring of this year. He's going to be able to help us with things like construction staging, as well as working with the university to potentially temporarily a lease area that we can stage off-site and potentially look at bussing in the employees from that location so we don't have to deal with localized parking issues.

One thing I didn't mention, existing facility, as many of you arrived, is pretty short on parking. You know, 44 years ago, parking may not have been a major concern, but certainly it is now. This existing site has approximately 30 parking spaces -- very small number. Our proposed facility would have underground parking, and the underground

parking would be approximately 202 spaces. So we believe that will alleviate certainly some of the NOAA staff parking in the adjacent community, as well as on La Jolla Shores Drive.

I think that was pretty much it. With that, I'll turn it over to Jim Manitakos, who is our environmental consultant. He can actually go through the environmental process.

MR. MANITAKOS: Thanks, Mark.

I'm Jim Manitakos from SRI International. We're contracted to NOAA. We're preparing the environmental impact statement/environmental impact report. Anne Elston here works also for SRI.

First, I want to talk about why is this project necessary. I think Mark talked a lot about this, but this picture shows you pretty clearly -- we're right here in Building A, and here's B, C and D. B and C are on the edge of this hard 80-foot bluff. It's a real hazard to be that close to an eroding bluff. But that's not the only reason. The buildings here were built in 1962 to 1964. I think they opened in '64, which makes 'em just a little bit younger than me, and I'm falling apart, so they probably are too.

There's very tight space that you can see here. This is about a two and a half acre piece of land we're on here bound by the cliff and private property to the north

and La Jolla Shores Drive to the east. It's a very tight space. So rebuilding on this property is not very practical.

Okay. So when NOAA looked at rebuilding this facility, there are a bunch of constraints that are very important. We talked about you need to be near the ocean because it's a constant seawater flow. You have to exchange the seawater to keep the tanks fresh so that the research can continue and the fish and the shellfish that are being raised can survive and thrive.

This really isn't a project to expand. The staff are projecting we'll go from about 283 now to about 300 in the next 20 years. So very modest increase. It's not really to enlarge it, but to provide modern, safe facilities for the research that's ongoing.

We talked about the parking problem. There is certainly a deficiency of parking that needs to be rectified.

There is a need to increase square footage to provide the researchers with the facilities and the space they need to do the most modern current research.

Maybe the most important thing is the ongoing collaboration with Scripps Institute of Oceanography. That's been going on for decades. We want to keep that going. We want to keep it close here so that the synergy

and the science is promoted well into the future.

Just to show you where we are now -- well, I guess we don't have a pointer. I'll use this. Here's just the Pacific Ocean. Up here you see La Jolla Shores Drive coming here. We're located -- I'm sorry -- this is La Jolla Shores Drive, and this is Torrey Pines. Here we are right here. This building shows up pretty well on this USGS map. Across the street right here is where the location of the new proposed facility is. Basically across the street's an undeveloped hillside within this horseshoe-shaped part of La Jolla Shores Drive.

We can show that in a little bit more detail. Here's a campus map for some of you who are familiar with the campus. We're right up here. These are the Scripps buildings. Scripps is over here. This site right here is where the undeveloped piece of property that is slightly larger. This is about two and a half acres here -- about three and a half acres there. That extra room will allow the facilities to be built that need to be built.

NOAA looked at a lot of different alternatives before coming to the preferred alternative. There was a number of studies done over several years to figure out what's the best way to go. We know we need to provide a modern, safe physical plant for the Fisheries Science Center. So we looked at different ways. One of them,

obviously, was could we stabilize the bluff and keep these buildings here? Well, it's possible. We had geological -- geologists and geological engineers look at it. There are different schemes that were looked at for doing that. But it's difficult to do. It is expensive, and it would require not only putting very large walls up to secure the bluff, but also putting some kind of rebuttment at the bottom on the beach to dissipate the wave action that's undercutting the bluff. None of that is a really very good idea. I suppose if you throw enough money at it, you could make it work. But it's probably not the best use of money. It's not the best thing for the beach or for the visual impact. So NOAA didn't think that was such a good idea, and I think most people would agree with that.

Second alternative was just rebuild right here. There's a couple problems with that. It's only two and a half acres. It's a very tight space. To rebuild on-site, you'd have to tear down what's here and move all the people out to another location during the construction period, and then move them back. The site is -- if you were to move back from the bluff, to be safe for the long-term future, you designed these facilities for 40 years, so you'd want to account for 40 years of bluff. You'd have to be move 40 to 60 feet away from the bluff, not build anything close. By the time you take that space out, the land that's left is

really just not adequate for what needs to be done.

Another alternative was, well, maybe we could take what's safe, the land that's already here that's safe, and some adjacent property. There's an adjacent about half acre that the university has that's designated park land right here next to La Jolla Shores Drive. Well, that would still be pretty tight, still not enough land really to do it, and also, yeah, that land's designated as park land. There's a path planned through it, and it's not really appropriate to be building on that.

Looking at leased office space, you could go somewhere in the area and try to lease office space. It's not really so readily available, and even if it's readily available, it's not on the ocean where we can get seawater. And it really wouldn't have the kind of specialized facilities that we need to do -- it's -- as you saw, if you took the tour, there's a lot of scientific facilities that occur here. It's not just offices. People work at computers, but the ocean aquaria, the seawater aquaria, the laboratories, all of that is very specialized. So it'd be very expensive to lease office space and modify it for that use, even if you could find a way to get seawater to available space.

Alternative five is just move the whole Fisheries Science Center to another NOAA facility. There are ones, as

we talked about, in Pacific Grove and Santa Cruz and Long Beach. A couple of problems with that. One, those facilities really don't have the space for that to build this. It would be difficult to build at any of those locations. They don't have large amounts of land available to build on that could support this. It would move the Fisheries Science Center here away from Scripps Institute of Oceanography and disrupt the ongoing collaboration and synergy there. It also would move it further away from any of the research areas that occur here in Southern California if we were to move it up to Central California. So it really is not feasible, though it was looked at.

Of course, the last alternative is just to take no action and let things go downhill -- well, literally, I guess. That's required by law, so we are looking at that, but it's really not a good option. It's not going to help.

Okay. So the environmental review process, this is required by law. There's the National Environmental Policy Act and the California Environmental Quality Act. They require that before a major federal or state action occurs, the government must look at the environmental consequences of it. That information must be available to the decision-makers so they understand the long-term consequences when they decide what to do. Both of these law apply. NOAA, as a federal agency, is certainly subject to

NEPA, and the University of California San Diego, Scripps Institute of Oceanography, as a state agency is subject to CEQA. While they're a little bit different, they both have pretty much the same intent. We're going to do one document that satisfies both laws.

And our point is public input. We're all here. We want to hear what the public has to say, what you think about the alternatives and the preferred alternative, what you'd like us to study as we go forward. We certainly want to give the public maximum opportunity to do that. We're here to listen. I'm going to be finishing real soon, so you can talk and not have to listen to me drone on.

I'm just going to go through -- we're at the very first step of this process. The very first part is public scoping, that is, we announce to the public that we're going to do a study. We want to hear feedback from the public as to what alternatives we should look at, what they think of the preferred alternative. What issues are you concerned about that need to be studied and addressed and mitigated? What kind of information you'd like to see in the document? So we want to hear about all that. It's required by law that we put out a notice. The notices have gone out in the newspapers, the Federal Register, and the State Clearing House. We'll be accepting the input -- the scoping input through March 20th. I'll talk to you a little bit about how

to do that.

After that, we'll go and we'll prepare a draft environmental impact statement, environmental impact report. That'll look at all these different alternatives and look at the environmental consequences of it, what kind of impacts will happen, and what kind of ways we have to mitigate those impacts and minimize the consequences of these different alternatives. There will be a public meeting, as required by law, on the draft EIS/EIR. The schedule of the draft EIS/EIR will be out in early summer, and we'll have a mandatory 45-day comment period on that. We will have at least one public meeting in which you can come and tell us what you think of our document, how well it's written, whether you agree or disagree with it. We want to hear.

We'll take all that input and we'll respond to it. You'll get a response. If you give us a question, if you give us your opinion, we will answer that in writing in the final EIS/EIR -- must respond to every relevant question. So nothing will get ignored.

And then we'll go through -- there's a cooling-off period required by NEPA then. And then there'll be a decision. This is under NEPA, and that's not CEQA, but there'll be a decision made, and it'll be in writing, and it'll say the government decided to proceed in this way, and

this is why we decided to proceed that way. That'll be clear to everyone who wishes to read that.

We're going to look at a number of issues. I won't go over these. You can read them yourself. But these are all issues that are of concern that we'll be looking at. I won't go -- obviously important, parking, and -- both during construction and during operation of the facility, traffic circulation, how it's going to affect that. We're going to study that. We have a traffic consultant that's working on a study right now with that. Visual aesthetics, how the building's going to affect both how it's going to look to the outside world and how it's going to affect any views from views-sheds along La Jolla Shores Drive or other parts of the area. These other issue areas we'll be studying and we'll be addressing them in the document.

Okay. One of the things we really want to do is get the public input, so I want to turn it over. But to do so, I want to do a couple things. We have these speaker forms that were at the back. We're having a stenographer make a transcript of this meeting, which is required. So we do like to ask that instead of having a free-for-all, so that we can get everyone down accurately, that you fill out one of these. We'll call you by name and you come up. This isn't a microphone here -- well, it's a microphone. It's not amplifying the sound. What it is doing is it's making

sure that he gets a clear recording of what's going on. So we'd ask you to come up. We'll turn this around for you. Come up and speak into this. We'll try to answer what we can, but everything you say we'll get on the record, and we'll make sure we address it as we move forward in the process.

Also, if you don't want to come up and speak, that's fine. We have some mailers here that you can put in -- you can write down your comments. You can add sheets to it. And it's preaddressed, so you can mail it back to us, and we'll get that in. And so that's good. That'll all go to Anne here, who's a point of contact, and she's collecting all that and making sure it all gets into the record.

MS. ANNE ELSTON: It's in your folder that you guys all have, in the blue folder.

MR. MANITAKOS: Yeah, you should have one of these. You can mail it. We just need it back. We would like to get it back by March 20th, approximately one month from now when the scoping period closes, so we can address those issues in the document as we're writing it.

So I don't know if you've received -- has anyone received any of these? If you want to fill them out --

MS. ANNE ELSTON: They're in the back.

MR. MANITAKOS: So if anyone wants to, if you could fill one out. We'll take a couple of minutes and hand

it up, and we'll call you up and allow you all to have a chance to speak.

(Pause.)

MR. MANITAKOS: While you're doing that, one last point is that, also, if you signed up in the sign-up, as she had put it, if you put your name in, and here's Anne's address and her e-mail. We'll get you on the list and make sure you get the draft environmental impact statement and environmental impact report. We'll make sure you get on the list of that. We'll have that available both in hard copy and electronically for people so that you can -- so you -- so you can make sure you get that, and you'll get on the list if you send our name to you -- if you send your name to us. We'll get it right. So did we get -- okay -- we have Tim Lucas. Just stand up and speak to the microphone.

MR. LUCAS: Okay. First of all, thank you for your presentation and for the earlier tour. That was very informative. I don't know where to begin. Basically, the bottom line to me on this project -- and you're going to find this from the local people that have to drive and park here -- the view corridors are going to be very essential to preserve. Driving down, it looked like this point you've chosen really -- I mean, it is bermed up pretty high, and probably won't be blocking much, so that's a good thing. But definitely need to look at that.

Landscaping -- how you landscape it -- because you're going to be getting rid of the more natural look, and it'll probably be a lot more -- have to be a lot more tailored. So that could be a feature and work in your favor.

The real gorilla in the room is the parking issue. Every space you go to having a complete complement for your staff is one step closer you'll get to approval from the community. Right now, I think you're short anywhere from 80 to 100 parking spaces -- 202 minus 300. So that -- the wildcard here is we don't know what Scripps -- or what -- pardon me -- what UCSD has planned for these buildings when you turn them over. If the two buildings remaining, which could house 150 people, you could have a situation in the future as bad as we've got now. If we can get some assurance from UCSD that they would not bring in uses that would require people to be parking, like if it's just students that are taking busses down, that's great, you know, holding conferences from Scripps Institute up there, something like that would be nice. But otherwise, it would really be nice to get the buildings gone so that we can't -- so that that just won't happen in the future.

Question: Are you going to be doing -- if I understand this, you're going to be doing a complete environmental impact study? Because currently UCSD is

pursuing the Venter Institute Project, and they basically did a -- I can't remember the exact term -- a negative mitigated declaration. You would not be doing that? You would be doing a full study?

MR. MANITAKOS: Yes, we're doing a full environmental impact report, which is the next step up from a negative declaration.

MR. LUCAS: Right. That's excellent. I think that would -- I look forward to that.

Do I have any other notes? So I guess presently you only have plans to demolish the two buildings.

MR. MANITAKOS: Tentatively the plan is, yeah, B and C would go, and A and D would be retained.

MR. LUCAS: Okay. I guess that's all my notes that I've got. Appreciate it.

MR. MANITAKOS: Just before you leave, one question. In terms of the view corridor -- I know La Jolla Shores Drive is key -- is there any specific locations you'd like our -- a part of the road, or anything -- any special view point you're interested in? -- because we can address that specifically.

MR. LUCAS: I'd love for you guys to exert some influence on UCSD and maybe cut down some of the view corridors that they've blocked with landscape and everything over the years. That might be a nice little tradeoff.

Also, as you're winding down the hill, La Jolla Shores Drive, it's really the view corridor from the bend up above it that is where you have the view of La Jolla, because once you drop down, you're behind basically the berm of where you're going to locate.

MR. MANITAKOS: Sure.

MR. LUCAS: So that's probably fairly safe. It's not a bad location. I would be in favor of it, and I do -- I guess it meets all your needs for pumping water and everything else.

MR. MANITAKOS: Yes, it does.

MR. LUCAS: All right. Thank you.

MR. MANITAKOS: Okay. John Berol.

MR. BEROL: Hi. It's very nice to be here. Thank you for all your work.

Is your EIR going to include UCSD's uses of Buildings A and D?

MR. MANITAKOS: Yes. It will address that. We're addressing that in -- and then the most -- I guess the most -- obviously that concerns the traffic and parking as to what's going to happen, and we are addressing those in the study that's being done by a traffic consultant, is looking at the net change that's going to happen when Scripps takes over from NOAA and how that's going to -- you know, what the difference is, so how that's going to affect traffic

generation and parking demand.

MR. BEROL: So presumably, although we haven't -- I don't know what the uses are going to be, you will need to know what the uses are going to be of Buildings A and D before you can do the EIR?

MR. MANITAKOS: That's correct. Yeah. We've been talking with Scripps. Is Cammie here? I saw her. I guess I -- and, yeah, we're talking to Scripps to get an idea, and we've been in discussion with them. We're going to get that input to look into it for our studies. So we're still working on exactly what they're going to do. What we've heard so far is it would be a -- you know, it'd be a much -- much less dense use. I mean, the number of employees is going to substantially drop. Exactly how much and exactly who's going to be here is still being worked out. But we're going to be finalizing that and getting that input from them in the next few weeks.

MR. BEROL: My concern for parking is for the existing parcel, which will be under UCSD use. Any parking that is put on that will have to be paid parking under California law, because the California law requires that UCSD charge for its parking. At least with respect to students that I've observed to a certain extent living nearby, that paid parking doesn't get used. The students prefer the free parking, and will go and spill over. So

looking at this as a project as a whole, to the extent that you're increasing the UCSD usage of these two parcels, no matter what UCSD does on its part, it's going to exasperate the parking problem, because people will choose to park off campus rather than on campus, no matter how many parking spaces are built on the existing where we are right now. So depending upon what you're going -- as a whole going to do on the existing parcel for UCSD use, it might be worthwhile, from my perspective as a member of the community affected by the spillover parking and noticing how other people are affected by it as well, to increase free parking in the new building on the east side, not only to cover all the employees from NOAA, but also to cover some of the usage that would be on the old parcels where we are now, because only NOAA can legally build a parking space that's not charged for. UCSD cannot do it by state law.

MR. MANITAKOS: Okay. We'll address that, the difference.

MR. BEROL: Thank you.

MR. MANITAKOS: Okay. Anyone else? Oh, here we are. Rich Julian.

MR. JULIAN: Yes. I'm a 36-year resident of San Diego. I wholeheartedly support your project and look forward to you going on with it. Yeah, there's some minor things that need to be addressed, but those are small

technicalities, by a long-shot. Over the years that I've lived here since 1972, I've enjoyed the relationship between SIO and Southwest Fisheries -- a fantastic pool of knowledge here. With the ocean and environment, it's great.

Also, I must admit that I do have two long-time friends who are former Southwest Fisheries employees, now retired, both Al Mirick and Lloyd Farrer -- so -- and not because they're my friends, but because of what Southwest Fisheries means to San Diego and also SIO. How could you go wrong, both with worldwide recognized institutions? So go for it. Let's get it on.

MR. MANITAKOS: Thank you. I appreciate that.

Okay. And Maria Rothschild. Oh, Marian.

MS. ROTHSCHILD: Marian. Yes.

We happen to have been in the same group, so he's heard what I was talking about. I basically just wanted to support what Mr. Berol had to say. As living also here since 1972, and being the parking lot on my street for the students and the staff and the people directly who park in front of me and tell me they will not pay the money when they can park on the street. So I hope you will definitely be able to do something about that.

Okay. Thank you.

MR. MANITAKOS: Okay. Thank you.

Okay. Sorry. Is it Robert Barto?

MR. BARTO: Robert Barto, your neighbor for quite a few years. I want to emphasize the issue of the parking, because with the amount of dirt you can take out of that space, you can double or triple the amount of parking that you're planning. If you want to increase the view corridor, you can remove some of the berm that's already up there, which I wouldn't mind. That would increase the view corridor.

As far as use of these buildings, I think it was mentioned that possibly 17 years or 2017 -- I'm not sure which was said -- that you're comfortable with this present erosion. I first toured this building in 1970, and I can't tell any difference in erosion then and now. The water that's irrigation, some of the local properties that have caused landslides doesn't occur here normally. With proper irrigation and runoff controls, you should be much better than it has been in the past.

If someone tried to build this close to the coast nowadays, they couldn't. In '64, it wasn't a problem. So I think these buildings should be used as long as possible. They should not be demolished until it's definitely sliding off the cliff.

Thank you. Robert Barto.

MR. MANITAKOS: Thank you.

Anyone else?

(No responses.)

MR. MANITAKOS: Last chance. Okay. I think we're -- many of the people are here, so if you want to talk some more to any of us, we're -- I -- I'm not going anywhere. I think most of the government folks here are going to stay here. If you want to talk more, especially if you want to talk to some of the scientists, we'd be happy to hear that.

(Meeting adjourned at 7:17 p.m.)

CERTIFICATE

I certify, under penalty of perjury, that the foregoing is a verbatim transcription prepared from the electronic sound recording produced at the proceedings in the above-entitled matter, and is a true and accurate transcript of said proceedings to the best of my ability and belief.

Michael J. Williamson, Transcriber

MAR 01 2008
Date

APPENDIX D
WRITTEN SCOPING RESPONSES

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STATE OF CALIFORNIA

GOVERNOR'S OFFICE *of* PLANNING AND RESEARCH

STATE CLEARINGHOUSE AND PLANNING UNIT

ARNOLD SCHWARZENEGGER
GOVERNOR

CYNTHIA BRYANT
DIRECTOR

Notice of Preparation

February 13, 2008

To: Reviewing Agencies

Re: National Oceanic and Atmospheric (NOAA) Southwest Fisheries Science Center (SWFSC) Relocation
SCH# 2008021053

Attached for your review and comment is the Notice of Preparation (NOP) for the National Oceanic and Atmospheric (NOAA) Southwest Fisheries Science Center (SWFSC) Relocation draft Environmental Impact Report (EIR).

Responsible agencies must transmit their comments on the scope and content of the NOP, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of the NOP from the Lead Agency. This is a courtesy notice provided by the State Clearinghouse with a reminder for you to comment in a timely manner. We encourage other agencies to also respond to this notice and express their concerns early in the environmental review process.

Please direct your comments to:

Anne Elston
University of California San Diego
SRI International
333 Ravenswood Avenue, G229
Menlo Park, CA 94025-3493

with a copy to the State Clearinghouse in the Office of Planning and Research. Please refer to the SCH number noted above in all correspondence concerning this project.

If you have any questions about the environmental document review process, please call the State Clearinghouse at (916) 445-0613.

Sincerely,

For. Scott Morgan
Project Analyst, State Clearinghouse

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via I/C

Attachments
cc: Lead Agency

1400 10th Street P.O. Box 3044 Sacramento, California 95812-3044
(916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

Document Details Report
State Clearinghouse Data Base

SCH# 2008021053
Project Title National Oceanic and Atmospheric (NOAA) Southwest Fisheries Science Center (SWFSC) Relocation
Lead Agency University of California, San Diego

Type **NOP** Notice of Preparation

Description The proposed action is the relocation of the NOAA National Marine Fisheries Service's (NMFS) SWFSC at the University of California San Diego (UCSD) campus. The existing facility, built in 1964, is adjacent to a coastal bluff that is undergoing severe erosion and retreat. The proposed action is to construct a new SWFSC facility at a preferred site located across La Jolla Shores Drive from the existing NOAA facilities. A minimum of two existing at-risk SWFSC structures would be removed and the property currently occupied by NOAA returned to UCSD control for other appropriate uses. Relocation of the SWFSC will allow NMFS to continue its research collaboration with SIO and other researchers on Pacific fisheries and marine mammals.

Lead Agency Contact

Name Anne Elston
Agency University of California San Diego
Phone 650-859-2693 **Fax**
email
Address SRI International
333 Ravenswood Avenue, G229
City Menlo Park **State** CA **Zip** 94025-3493

Project Location

County San Diego
City La Jolla
Region
Cross Streets La Jolla Shores Drive
Parcel No.
Township **Range** **Section** **Base**

Proximity to:

Highways
Airports
Railways
Waterways Pacific Ocean
Schools UCSD
Land Use

Project Issues

Reviewing Agencies Resources Agency; California Coastal Commission; Department of Parks and Recreation; Department of Water Resources; Department of Fish and Game, Region 5; Native American Heritage Commission; State Lands Commission; California Highway Patrol; Caltrans, District 11; Department of Toxic Substances Control; Regional Water Quality Control Board, Region 9

Date Received 02/13/2008 **Start of Review** 02/13/2008 **End of Review** 03/13/2008

Note: Blanks in data fields result from insufficient information provided by lead agency.

NOP Distribution List

County: San Diego

SCH# [illegible]

Resources Agency

- ■ **Resources Agency**
  Nadell Gayou
- ☐ **Dept. of Boating & Waterways**
  David Johnson
- ■ **California Coastal Commission**
  Elizabeth A. Fuchs
- ☐ **Colorado River Board**
  Gerald R. Zimmerman
- ☐ **Dept. of Conservation**
  Sharon Howell
- ☐ **California Energy Commission**
  Paul Richins
- ☐ **Cal Fire**
  Allen Robertson
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  Wayne Donaldson
- ■ **Dept of Parks & Recreation**
  Environmental Stewardship Section
- ☐ **Reclamation Board**
  Mark Herald
- ☐ **S.F. Bay Conservation & Dev't. Comm.**
  Steve McAdam
- ■ **Dept. of Water Resources**
  Resources Agency
  Nadell Gayou
- ☐ _____
  Conservancy

Fish and Game

- ☐ **Depart. of Fish & Game**
  Scott Flint
  Environmental Services Division
- ☐ **Fish & Game Region 1**
  Donald Koch
- ☐ **Fish & Game Region 1E**
  Laurie Harnsberger
- ☐ **Fish & Game Region 2**
  Jeff Drongesen
- ☐ **Fish & Game Region 3**
  Robert Floerke
- ☐ **Fish & Game Region 4**
  Julie Vance
- ■ **Fish & Game Region 5**
  Don Chadwick
  Habitat Conservation Program
- ☐ **Fish & Game Region 6**
  Gabrina Gatchel
  Habitat Conservation Program
- ☐ **Fish & Game Region 6 I/M**
  Gabrina Getchel
  Inyo/Mono, Habitat Conservation Program
- ☐ **Dept. of Fish & Game M**
  George Isaac
  Marine Region

Other Departments

- ☐ **Food & Agriculture**
  Steve Shaffer
  Dept. of Food and Agriculture
- ☐ **Depart. of General Services**
  Public School Construction
- ☐ **Dept. of General Services**
  Robert Sleppy
  Environmental Services Section
- ☐ **Dept. of Health Services**
  Veronica Malloy
  Dept. of Health/Drinking Water

Independent Commissions,Boards

- ☐ **Delta Protection Commission**
  Debby Eddy
- ☐ **Office of Emergency Services**
  Dennis Castrillo
- ☐ **Governor's Office of Planning & Research**
  State Clearinghouse
- ■ **Native American Heritage Comm.**
  Debbie Treadway
- ☐ **Public Utilities Commission**
  Ken Lewis
- ☐ **Santa Monica Bay Restoration**
  Guangyu Wang
- ■ **State Lands Commission**
  Marina Brand
- ☐ **Tahoe Regional Planning Agency (TRPA)**
  Cherry Jacques

Business, Trans & Housing

- ☐ **Caltrans - Division of Aeronautics**
  Sandy Hesnard
- ☐ **Caltrans - Planning**
  Terri Pencovic
- ■ **California Highway Patrol**
  Shirley Kelly
  Office of Special Projects
- ☐ **Housing & Community Development**
  Lisa Nichols
  Housing Policy Division

Dept. of Transportation

- ☐ **Caltrans, District 1**
  Rex Jackman
- ☐ **Caltrans, District 2**
  Marcelino Gonzalez
- ☐ **Caltrans, District 3**
  Jeff Pulverman
- ☐ **Caltrans, District 4**
  Tim Sable
- ☐ **Caltrans, District 5**
  David Murray
- ☐ **Caltrans, District 6**
  Moses Stites
- ☐ **Caltrans, District 7**
  Vin Kumar
- ☐ **Caltrans, District 8**
  Dan Kopulsky
- ☐ **Caltrans, District 9**
  Gayle Rosander
- ☐ **Caltrans, District 10**
  Tom Dumas
- ■ **Caltrans, District 11**
  Jacob Armstrong
- ☐ **Caltrans, District 12**
  Ryan P. Chamberlain

Cal EPA

Air Resources Board

- ☐ Airport Projects
  Jim Lerner
  - ☐ Transportation Projects
    Ravi Ramalingam
  - ☐ Industrial Projects
    Mike Tollstrup
- ☐ **California Integrated Waste Management Board**
  Sue O'Leary
- ☐ **State Water Resources Control Board**
  Regional Programs Unit
  Division of Financial Assistance
- ☐ **State Water Resources Control Board**
  Student Intern, 401 Water Quality Certification Unit
  Division of Water Quality
- ☐ **State Water Resouces Control Board**
  Steven Herrera
  Division of Water Rights
- ■ **Dept. of Toxic Substances Control**
  CEQA Tracking Center
- ☐ **Department of Pesticide Regulation**

Regional Water Quality Control Board (RWQCB)

- ☐ **RWQCB 1**
  Cathleen Hudson
  North Coast Region (1)
- ☐ **RWQCB 2**
  Environmental Document Coordinator
  San Francisco Bay Region (2)
- ☐ **RWQCB 3**
  Central Coast Region (3)
- ☐ **RWQCB 4**
  Teresa Rodgers
  Los Angeles Region (4)
- ☐ **RWQCB 5S**
  Central Valley Region (5)
  - ☐ **RWQCB 5F**
    Central Valley Region (5)
    Fresno Branch Office
  - ☐ **RWQCB 5R**
    Central Valley Region (5)
    Redding Branch Office
- ☐ **RWQCB 6**
  Lahontan Region (6)
  - ☐ **RWQCB 6V**
    Lahontan Region (6)
    Victorville Branch Office
- ☐ **RWQCB 7**
  Colorado River Basin Region (7)
- ☐ **RWQCB 8**
  Santa Ana Region (8)
- ■ **RWQCB 9**
  San Diego Region (9)

☐ **Other** _____

Last Updated on 01/14/2008

Subject: Fwd:public comment on federal register attached below in full - no new building no new taxes for this building
From: jean public <jeanpublic@yahoo.com>
Date: Mon, 11 Feb 2008 15:00:20 -0800 (PST)
To: answers@noaa.gov, anne.elston@sri.com, gpoaccess@gpo.gov, americanvoices@mail.house.gov
CC: media@cagw.org, info@taxpayer.net, comments@whitehouse.gov

use what you have. you are lucky you have a job with
the wasteful practices that go on at this agency. you
are also not working for the general american public
welfare, you are working for special interest
profiteers in the fish industry and i find that
offensive. i dont thank you should get one tax dollar
from general taxpaeyrs since you are letting their
children and grandchildren have all fish swiped from
their world. i do not approve any new buildings at
this time for any agency. use what you have.
b. sachau
15 elm st
florham park n j07932

[Federal Register: February 11, 2008 (Volume 73,
Number
28)][Notices] [Page 7713-7714]From the
Federal Register Online
via GPO Access
[wais.access.gpo.gov][DOCID:fr11fe08-31]

----------DEPARTMENT
OF COMMERCENational Oceanic and Atmospheric
AdministrationNotice of Intent
to Prepare a Joint Environmental Impact Statement /
Environmental Impact
Report for the Proposed Relocation of the National
Oceanic and Atmospheric
Administration's Southwest Fisheries Science Center
located in La Jolla,
CaliforniaAGENCY: National Oceanic and Atmospheric
Administration (NOAA),
Commerce.ACTION: Notice of Intent to prepare a joint
National Environmental
Policy Act (NEPA) Environmental Impact Statement
(EIS) and California
Environmental Quality Act (CEQA) Environmental
Impact Report (EIR); request
for

comments.----------SUMMARY:
NOAA announces its intent to prepare a joint EIS/EIR
to analyze the
environmental impacts of relocating its Southwest
Fisheries Science Center
(SWFSC) near the Scripps Institution of Oceanography
(SIO) within the
University of California at San Diego (UCSD) campus
in La Jolla,
California.Publication of this notice is to request
public participation
during preparation of the EIS/EIR to help determine
the scope of
environmental issues and range of alternatives to be
addressed, and to

Linda S. Adams
Secretary for
Environmental Protection

Department of Toxic Substances Control

Maureen F. Gorsen, Director
5796 Corporate Avenue
Cypress, California 90630

Arnold Schwarzenegger
Governor

March 11, 2008

Anne Elston
Research Analyst
University of California San Diego
SRI International
333 Ravenswood Avenue, G229
Menlo Park, California 94025-3493
E-mail: anne.elston@sri.com

NOTICE OF PREPARATION OF A DRAFT ENVIRONMENTAL IMPACT REPORT (EIR) FOR THE NATIONAL OCEANIC AND ATMOSPHERIC (NOAA) SOUTHWEST FISHERIES SCIENCE CENTER (SWFSC) RELOCATION PROJECT, LA JOLLA, SAN DIEGO COUNTY (SCH#2008021053)

Dear Ms. Elston:

The Department of Toxic Substances Control (DTSC) has received your submitted Notice of Preparation (NOP) for the above-mentioned project. The following project description is stated in your document: "The proposed action is the relocation of the NOAA National Marine Fisheries Service's (NMFS) SWFSC at the University of California San Diego (UCSD) campus. The existing facility, built in 1964, is adjacent to a coastal bluff that is undergoing severe erosion and retreat. The proposed action is to construct a new SWFSC facility at a preferred site located across La Jolla Shores Drive from the existing NOAA facilities. A minimum of two existing at-risk SWFSC structures would be removed and the property currently occupied by NOAA returned to UCSD control for other appropriate uses. Relocation of the SWFSC will allow NMFS to continue its research collaboration with SIO and other researchers on Pacific fisheries and marine mammals." DTSC has the following comments; please address if applicable.

1 The EIR should identify the current or historic uses at the project site that may have resulted in a release of hazardous wastes/substances, and any known or potentially contaminated sites within the proposed Project area. For all identified sites, the EIR should evaluate whether conditions at the site may pose a threat to human health or the environment. Following are the databases of some of the pertinent regulatory agencies:

National Priorities List (NPL): A list maintained by the United States Environmental Protection Agency (U.S.EPA).

Envirostor: A Database primarily used by the California Department of Toxic Substances Control, accessible through DTSC's website (see below).

Resource Conservation and Recovery Information System (RCRIS): A database of RCRA facilities that is maintained by U.S. EPA.

Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS): A database of CERCLA sites that is maintained by U.S.EPA.

Solid Waste Information System (SWIS): A database provided by the California Integrated Waste Management Board which consists of both open as well as closed and inactive solid waste disposal facilities and transfer stations.

Leaking Underground Storage Tanks (LUST) / Spills, Leaks, Investigations and Cleanups (SLIC): A list that is maintained by Regional Water Quality Control Boards.

Local Counties and Cities maintain lists for hazardous substances cleanup sites and leaking underground storage tanks.

The United States Army Corps of Engineers, 911 Wilshire Boulevard, Los Angeles, California, 90017, (213) 452-3908, maintains a list of Formerly Used Defense Sites (FUDS).

2) The EIR should identify the mechanism to initiate any required investigation and/or remediation for any site that may be contaminated, and the government agency to provide appropriate regulatory oversight. If necessary, DTSC would require an oversight agreement in order to review such documents. Please see comment No. 14 below for more information.

3) All environmental investigations, sampling and/or remediation for the site should be conducted under a Workplan approved and overseen by a regulatory agency that has jurisdiction to oversee hazardous substance cleanup. The findings of any investigations, including any Phase I or II Environmental Site Assessment Investigations should be summarized in the document. All sampling results in which hazardous substances were found should be clearly summarized in a table.

4) Proper investigation, sampling and remedial actions overseen by the respective regulatory agencies, if necessary, should be conducted at the site prior to the new development or any construction. All closure, certification or remediation approval reports by these agencies should be included in the EIR.

5) If any property adjacent to the project site is contaminated with hazardous chemicals, and if the proposed project is within 2,000 feet from a contaminated site, then the proposed development may fall within the "Border Zone of a Contaminated Property." Appropriate precautions should be taken prior to construction if the proposed project is within a Border Zone Property.

6) If buildings or other structures, asphalt or concrete-paved surface areas are being planned to be demolished, an investigation should be conducted for the presence of other related hazardous chemicals, lead-based paints or products, mercury, and asbestos containing materials (ACMs). If other hazardous chemicals, lead-based paints or products, mercury or ACMs are identified, proper precautions should be taken during demolition activities. Additionally, the contaminants should be remediated in compliance with California environmental regulations and policies.

7) Project construction may require soil excavation or filling in certain areas. Sampling may be required. If soil is contaminated, it must be properly disposed and not simply placed in another location onsite. Land Disposal Restrictions (LDRs) may be applicable to such soils. Also, if the project proposes to import soil to backfill the areas excavated, sampling should be conducted to ensure that the imported soil is free of contamination.

8) Human health and the environment of sensitive receptors should be protected during the construction or demolition activities. If it is found necessary, a study of the site and a health risk assessment overseen and approved by the appropriate government agency and a qualified health risk assessor should be conducted to determine if there are, have been, or will be, any releases of hazardous materials that may pose a risk to human health or the environment.

9) If it is determined that hazardous wastes are, or will be, generated by the proposed operations, the wastes must be managed in accordance with the California Hazardous Waste Control Law (California Health and Safety Code, Division 20, Chapter 6.5) and the Hazardous Waste Control Regulations (California Code of Regulations, Title 22, Division 4.5). If it is determined that hazardous wastes will be generated, the facility should also obtain a United

States Environmental Protection Agency Identification Number by contacting (800) 618-6942.

10) Certain hazardous waste treatment processes or hazardous materials, handling, storage or uses may require authorization from the local Certified Unified Program Agency (CUPA). Information about the requirement for authorization can be obtained by contacting your local CUPA.

11) If the project plans include discharging wastewater to a storm drain, you may be required to obtain an NPDES permit from the overseeing Regional Water Quality Control Board (RWQCB).

12) If during construction/demolition of the project, the soil and/or groundwater contamination is suspected, construction/demolition in the area should cease and appropriate health and safety procedures should be implemented.

13) If the site was used for agricultural, livestock or related activities, onsite soils and groundwater might contain pesticides, agricultural chemical, organic waste or other related residue. Proper investigation, and remedial actions, if necessary, should be conducted under the oversight of and approved by a government agency at the site prior to construction of the project.

14) EnviroStor is a database primarily used by the California Department of Toxic Substances Control, and is accessible through DTSC's website. DTSC can provide guidance for cleanup oversight through an Environmental Oversight Agreement (EOA) for government agencies, or a Voluntary Cleanup Agreement (VCA) for private parties. For additional information on the EOA or VCA, please see www.dtsc.ca.gov/SiteCleanup/Brownfields, or contact Maryam Tasnif-Abbasi, DTSC's Voluntary Cleanup Coordinator, at (714) 484-5489.

15) In future CEQA documents, if the project title changes, please provide historical project title(s).

If you have any questions regarding this letter, please contact Tong Qiao, Project Manager, at tqiao@dtsc.ca.gov or by phone at (714) 484-5470.

Sincerely,

Greg Holmes
Unit Chief
Southern California Cleanup Operations Branch - Cypress Office

cc: Governor's Office of Planning and Research
State Clearinghouse
P.O. Box 3044
Sacramento, California 95812-3044
state.clearinghouse@opr.ca.gov.

CEQA Tracking Center
Department of Toxic Substances Control
Office of Environmental Planning and Analysis
1001 I Street, 22nd Floor, M.S. 22-2
Sacramento, California 95814
gmoskat@dtsc.ca.gov

CEQA#2070

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

March 19, 2008

Anne Elston
SRI International
333 Ravenswood Ave. G-229
Menlo Park, CA 94025-3493

Subject: Scoping Comments for the Proposed Relocation of the National Oceanic and Atmospheric Administration (NOAA) Southwest Fisheries Science Center (SWFSC), La Jolla, California

Dear Ms. Elston:

The U.S. Environmental Protection Agency (EPA) has reviewed the Federal Register Notice published on February 11, 2008, requesting comments on NOAA's decision to prepare a joint Environmental Impact Statement/Environmental Impact Report for the SWFSC relocation. Our comments are provided pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508) and our NEPA review authority under Section 309 of the Clean Air Act.

The project proposes to construct a new SWFSC building to replace its existing administrative and research facilities because these existing facilities are located adjacent to an eroding/retreating coastal bluff. EPA requests consideration of the following issues in the Draft Environmental Impact Statement (DEIS):

LEED Certification. EPA strongly recommends that NOAA commit to facilities that are certified as "green buildings" per the Leadership in Energy and Environmental Design (LEED) green building rating system. LEED emphasizes state-of-the-art strategies for sustainable site development, water savings, energy efficiency, materials selection, and indoor air quality. NOAA should specify that the project will be constructed for certification by LEED. This specification will guide the building process and create a high-performance, sustainable facility. More information about the LEED green building rating system is available at http://www.usgbc.org/DisplayPage.aspx?CategoryID=19&.

Green Infrastructure. Since proposed construction and paving would increase the amount of impervious surface and subsequent stormwater runoff at the site, EPA recommends that NOAA provide onsite stormwater management features such as bioretention areas, vegetated swales, porous pavement, and filter strips. These features can serve as both stormwater treatment and visual enhancements. More detailed information on these forms of "green infrastructure" can be found at http://cfpub.epa.gov/npdes/home.cfm?program_id=298.

Energy Independence and Security Act of 2007. The Energy Independence and Security Act of 2007, which was signed into law in December 2007, contains requirements for federal buildings (Title IV, Subtitle C, *High-Performance Federal Buildings*), including that total energy use in federal buildings, relative to the 2005 level, be reduced 30% by 2015. The DEIS should demonstrate how the project will comply with all applicable sections of this Act.

The Energy Independence and Security Act of 2007 also addresses measures to reduce greenhouse gas emissions. In light of this recent federal legislation, as well as State of California efforts (Global Warming Solutions Act of 2006 and Executive Order S-3-05) to focus on potential climate change and impacts of increasing greenhouse gas emissions, EPA recommends that the DEIS identify the potential impacts to and from climate change and any specific mitigation measures needed to 1) protect the project from the effects of climate change, 2) reduce the project's adverse air quality effects, and 3) promote pollution prevention or environmental stewardship. The DEIS should analyze the impacts of the project in relation to compliance with the federal Energy Independence and Security Act of 2007, State of California Global Warming Solutions Act of 2006, and State of California Executive Order S-3-05.

Environmental Management System. An Environmental Management System (EMS) is a set of processes and practices that enable an organization to reduce its environmental impacts, reduce costs, and increase its operating efficiency. EPA recommends NOAA implement an EMS for this new facility and operations. More information on EMS can be found on EPA's EMS website at: http://www.epa.gov/ems/index.html.

Air Quality. The Draft Environmental Impact Statement (DEIS) should provide a detailed discussion of ambient air conditions (baseline or existing conditions), National Ambient Air Quality Standards (NAAQS), criteria pollutant nonattainment areas, and potential air quality impacts of the project (including cumulative and indirect impacts) for each fully evaluated alternative. San Diego County is designated as non-attainment for the 8-hour ozone NAAQS. Because of the air basin's nonattainment status, it is important to reduce emissions of ozone precursors from this project as much as practicable. The DEIS should discuss how ozone precursors can be reduced during the operational phase of the project.

The DEIS should also include a thorough analysis of construction-related impacts from the project alternatives including emission estimates of all criteria pollutants and diesel particulate matter (DPM). EPA also recommends that the DEIS disclose the available information about the health risks associated with vehicle emissions and mobile source air toxics (see http://www.epa.gov/otaq/toxics.htm). EPA recommends including a Construction Emissions Mitigation Plan (CEMP) for fugitive dust and DPM in the DEIS and adopting this plan in the Record of Decision. The DEIS should identify all appropriate mitigation measures and indicate what mechanism will ensure their implementation during the construction phase.

Invasive Species and Landscaping. Executive Order 13112 on Invasive Species calls for the restoration of native plant and tree species. If the proposed project will entail new landscaping, the DEIS should describe how the project will meet the requirements of Executive Order 13112.

EPA appreciates the opportunity to comment on preparation of the DEIS. Once the DEIS is released for public review, please send one hard copy and one electronic copy to me at the address above (mail code: CED-2). If you have any questions, please contact me at 415-947-4178 or vitulano.karen@epa.gov.

Sincerely,

Karen Vitulano

Karen Vitulano
Environmental Review Office

San Diego County Archaeological Society, Inc.

Environmental Review Committee

16 February 2008

To: Ms. Anne Elston
Environmental Research Analyst
SRI International
333 Ravenswood Avenue, G-229
Menlo Park, California 94025-3493

Subject: Notice of Preparation of a Draft Environmental Impact Statement and Environmental Impact Report
Southwest Fisheries Science Center Relocation

Dear Ms. Elston:

Thank you for the Notice of Preparation for the subject project, received by this Society last week.

We are pleased to note the inclusion of cultural resources in the list of subject areas to be addressed in the draft EIS/EIR, and look forward to reviewing it during the upcoming public comment period. To that end, please include us in the distribution of the draft EIS/EIR, and also provide us with a copy of the cultural resources technical report(s).

SDCAS appreciates being included in the environmental review process for this project.

Sincerely,

James W. Royle, Jr., Chairperson
Environmental Review Committee

cc: SDCAS President
File

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FEB 19 2008
via I/C

P.O. Box 81106 • San Diego, CA 92138-1106 • (858) 538-0935

STATE OF CALIFORNIA Arnold Schwarzenegger, Governor

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-6251
Fax (916) 657-5390
www.nahc.ca.gov
ds_nahc@pacbell.net

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FEB 20 2008
via 1st class

February 19, 2008

Ms. Anne Elston
University of California San Diego
SRI International
333 Ravenswood Avenue, G229
Menlo Park, CA 94025-3493

Re: SCH# 2008021053; CEQA Notice of Preparation (NOP) draft Environmental Impact Report (DEIR) for the National Oceanic and Atmospheric (NOAA) Southwest Fisheries Science Center (SWFSC) Relocation Project on the La Jolla Campus of the University of California San Diego; San Diego County, California

Dear Ms. Elston:

Thank you for the opportunity to comment on the above-referenced document. The Native American Heritage Commission is the state agency designated for the protection of California's Native American cultural resources. The California Environmental Quality Act (CEQA) requires that any project that causes a substantial adverse change in the significance of an historical resource, that includes archeological resources, is a 'significant effect' requiring the preparation of an Environmental Impact Report (EIR per the California Code of Regulations § 15064.5(b)(c) (CEQA Guidelines). This location, the La Jolla Community of the City of San Diego and the Campus of the University of California San Diego has yielded numerous Native American cultural resources and Native American human remains. Therefore, you should understand that the general area, if not the 'area of potential effect' (APE) is culturally sensitive. In order to comply with this provision, the lead agency is required to assess whether the project will have an adverse impact on these resources within the 'area of potential effect (APE),' and if so, to mitigate that effect. The Commission also recommends the following:

√ Contact the appropriate California Historic Resources Information Center (CHRIS). Therefore, the South Coast Information Center housed at San Diego State University. The record search will determine:

- If a part or the entire (APE) has been previously surveyed for cultural resources.
- If any known cultural resources have already been recorded in or adjacent to the APE.
- If the probability is low, moderate, or high that cultural resources are located in the APE.
- If a survey is required to determine whether previously unrecorded cultural resources are present.

√ If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.

- The final report containing site forms, site significance, and mitigation measurers should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for pubic disclosure.

√ Also, contact the Native American Heritage Commission (NAHC) for:

* A Sacred Lands File (SLF) search of the project area and information on tribal contacts in the project vicinity who may have information on cultural resources in or near the APE. Please provide us site identification as follows: USGS 7.5-minute quadrangle citation with name, township, range and section. This will assist us with the SLF.

- Furthermore, we recommend that you contact the Native American contacts on the attached list to get their input on the effect of potential project (e.g. APE) impact. In many cases a culturally-affiliated Native American tribe or person will be the only source of information about the existence of a cultural resource.

√ Lack of surface evidence of archeological resources does not preclude their subsurface existence.

- Lead agencies should include in their mitigation plan provisions for the identification and evaluation of accidentally discovered archeological resources, per California Environmental Quality Act (CEQA) §15064.5 (f)of the California Code of Regulations (CEQA Guidelines). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American, with knowledge in cultural resources, should monitor all ground-disturbing activities.
- Lead agencies should include in their mitigation plan provisions for the disposition of recovered artifacts, in consultation with culturally affiliated Native Americans.

√ Lead agencies should include provisions for discovery of Native American human remains or unmarked cemeteries in their mitigations plans.

- CEQA Guidelines §15064.5(d) requires the lead agency to work with the Native Americans identified by this Commission if the Initial Study identifies the presence or likely presence of Native American human remains within the APE. CEQA Guidelines provide for agreements with Native American groups, identified by the NAHE, to ensure the appropriate and dignified treatment of Native American human remains and any associated grave goods.
- Health and Safety Code §7050.5, Public Resources Code §5097.98 and CEQA Guidelines §15064.5(d) mandate procedures to be followed in the event of an accidental discovery of any human remains in a location other than a dedicated cemetery.

√ Lead agencies should consider avoidance, as defined in CEQA Guidelines §15370 when significant cultural resources are discovered during the course of project planning or execution.

Please feel free to contact me at (916) 653-6251 if you have any questions.

Sincerely,

Dave Singleton
Program Analyst

Attachment: Native American Contact List.

Cc: State Clearinghouse

Native American Contacts
San Diego County
February 19, 2008

La Posta Band of Mission Indians
Gwendolyn Parada, Chairperson
PO Box 1120 Diegueno
Boulevard , CA 91905
(619) 478-2113
619-478-2125

Kumeyaay Cultural Historic Committee
Ron Christman
56 Viejas Grade Road Diegueno/Kumeyaay
Alpine , CA 92001
(619) 445-0385

San Pasqual Band of Mission Indians
Allen E. Lawson, Chairperson
PO Box 365 Diegueno
Valley Center , CA 92082
(760) 749-3200
(760) 749-3876 Fax

Jamul Indian Village
William Mesa, Chairperson
P.O. Box 612 Diegueno/Kumeyaay
Jamul , CA 91935
jamulrez@sctdv.net
(619) 669-4785
(619) 669-48178 - Fax

Sycuan Band of the Kumeyaay Nation
Danny Tucker, Chairperson
5459 Sycuan Road Diegueno/Kumeyaay
El Cajon , CA 92021
ssilva@sycuan-nsn.gov
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This list is only applicable for contacting local Native American with regard to cultural resources for the proposed SCH#2008021053;; CEQA Notice of Preparation (NOP) and draft Environmental Impact Report (DEIR for the National Oceanic and Atmospheric (NOAA) Southwest Fisheries Science Center (SWFSC) located on the La Jolla Campus of the University of California San Diegounder the Management of SRI International; San Diego County, California.

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February 19, 2008

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Comments on Proposed Relocation of
NOAA's Southwest Fisheries Science Center (SWFSC)
Scoping Meeting
February 20, 2008

Name:	Russ Davis
Address:	13611 Mercado Dr. Del Mar CA 92014
Check here if you would like to receive a copy of the Draft EIS/EIR:	☑ Yes

Comments: While parking and views are important, safety on La Jolla Shores Drive is critical. The intersections to the present NMFS building and to UCSD parking lot P014 are today very dangerous. Downhill traffic frequently exceeds 50 mph, people nearly stop to enter NMFS and SIO west, and they stop in the middle of the road to enter P014, and stop in the same place going uphill to enter NMFS and SIO west. Another 200-300 cars will dramatically increase already too frequent incidents. The La Jolla Shores and Downwind tee intersection is similarly dangerous because downhill traffic frequently reaches 65 mph.

I hope the EIS will consider a way to bring La Jolla Shores traffic to a stop in front of NMFS. Consider making the sweeping bend a 90° turn with a stop sign / light.

Comments may be submitted at the Scoping Meeting or mailed (postmarked by March 20, 2008) to:

Anne Elston
Envirotechnical Program
SRI International
333 Ravenswood Ave, G-229
Menlo Park, CA 94025-3493

Form is self mailer (see reverse)

RECEIVED
FEB 28 2008
via 1st class mail

CALIFORNIA COASTAL COMMISSION
45 FREMONT, SUITE 2000
SAN FRANCISCO, CA 94105-2219
VOICE AND TDD (415) 904-5200
FAX (415) 904-5400

March 17, 2008

Anne Elston
Environmental Research Analyst
SRI International
333 Ravenswood Avenue, G-229
Menlo Park, CA 94025-3493

Subject: NOAA Southwest Fisheries Science Center Relocation, La Jolla, CA

Dear Ms. Elston:

The Coastal Commission staff has reviewed the notice published in the February 11, 2008, Federal Register announcing NOAA's Notice of Intent to prepare a joint Environmental Impact Statement and Environmental Impact Report for the above-referenced project at the University of California San Diego (UCSD) campus. Under 15 CFR § 930.36 of the federal Coastal Zone Management Act Federal Consistency Regulations, NOAA is required to prepare and submit to the Coastal Commission a consistency determination for its proposed relocation of the Southwest Fisheries Science Center at UCSD in La Jolla, San Diego County, CA. Please contact me at (415) 904-5288 or at lsimon@coastal.ca.gov should you have any questions on preparing and submitting a consistency determination. In addition, you can visit the Commission's website at www.coastal.ca.gov and access the federal consistency section for information on the federal consistency process.

Sincerely,

Larry Simon

Larry Simon
Federal Consistency Coordinator

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MAR 18 2008
via 1st class

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APPENDIX B
VOLUME I SUMMARY AND VALIDATION OF STUDIES IN SUPPORT OF NOAA SWFSC REPLACEMENT

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FINAL

SRI International

April 30, 2008

VOLUME I

SUMMARY AND VALIDATION OF STUDIES IN SUPPORT OF NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION SOUTHWEST FISHERIES SCIENCE CENTER REPLACEMENT

Prepared by

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Anne Elston, Research Analyst
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Prepared for

Department of Commerce
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Attention: Mark Eberling, Technical Monitor

Contract Number AB133A08NC0610
Government Prime Contract Number GS-10F-0420P

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EXECUTIVE SUMMARY

The National Marine Fisheries Service, a line office of National Ocean and Atmospheric Administration (NOAA), operates six regional fisheries science centers. The Southwest Fisheries Science Center (SWFSC) occupies a four-building complex on the campus of the University of California at San Diego (UCSD)/Scripps Institution of Oceanography (SIO) in La Jolla, California, and studies ground and pelagic fisheries of the California current, East tropical Pacific, and Antarctica. Since construction of the SWFSC buildings in the mid 1960s, the adjacent 180-foot coastal bluff has eroded significantly and ongoing bluff retreat represents a hazard to the existing SWSFC buildings; NOAA has vacated two of the buildings due to safety concerns. NOAA is investigating options for replacement of the SWFSC physical plant.

Under contract to NOAA, SRI International reviewed three previous government studies evaluating SWFSC replacement alternatives, updated the information contained in those studies, and performed an independent assessment of the cost and benefits of collocating SWFSC programs with seven existing NOAA activities on the West Coast of the United States or Hawaii. The following NOAA activities were evaluated to determine collocation cost and benefits:

- Federal Building, Long Beach, California
- Channel Islands National Marine Sanctuary (CINMS) Headquarters, Santa Barbara, California
- Pacific Fisheries Environmental Laboratory (PFEL), Pacific Grove, California
- Santa Cruz Laboratory, Santa Cruz, California
- Newport Research Station, Newport, Oregon
- Western Regional Center/Northwest Fisheries Science Center (NWFSC), Seattle, Washington, area
- Pacific Regional Center (PRC), Honolulu, Hawaii

This study also evaluated construction of a new SWFSC headquarters facility at a site on the SIO campus offered by UCSD to NOAA via no-cost lease. SWFSC and SIO collaborate extensively in performing scientific research and a number of staff are affiliated with both organizations. In addition, researchers benefit from access to NOAA and SIO research ships. The synergy between SWFSC and SIO results in improved quality of research and provides cost benefits (for example, SIO graduate students work on NOAA research projects).

None of the NOAA activities have existing building space available to accommodate programs relocated from La Jolla. All of the alternatives would require new construction. Relocation of SWFSC programs to either the Federal Building in Long Beach or CINMS is not considered feasible due to the lack of developable land. Additionally, the existing NOAA activities at Long Beach and Santa Barbara do not conduct basic fisheries science and little scientific synergy would result from movement of SWFSC programs to these locations; the move would be detrimental to existing scientific collaboration between SWFSC and SIO. Long Beach and Santa Barbara are 80 and 210 miles (mi), respectively, from the existing SWFSC site, which would result in costs to NOAA for employee relocation of $9.9 to $10.6 million.

The PFEL, Santa Cruz Laboratory, Newport Research Station, NWFSC, and Pacific Islands Fisheries Science Center (to be located at the PRC) perform basic fisheries research, which

would provide opportunities for synergistic collaboration with SWFSC programs. However, based on the types and geographic location of research performed at the SWFSC, the level of scientific synergy would be far less than the existing synergy between SWFSC and SIO. The PFEL and PRC lack developable land that could be used for new construction to house SWFSC programs. Potentially developable land is available in the vicinity of the Santa Cruz Laboratory, Newport Research Station, and NWFSC field stations. These three NOAA activities are located 395 to 1,200 mi from the existing SWFSC, which would result in costs to NOAA for employee relocation of $8.9 to $11.4 million. In contrast, NOAA's preferred site at the UCSD/SIO campus for relocation at the SWFSC is only about 200 feet from the existing SWFSC; NOAA would not incur employee relocation costs

Based on construction feasibility, scientific benefits, and employee relocation costs, the most advantageous alternative is federal construction of a new SWFSC physical plant on the UCSD/SIO campus.

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ABBREVIATIONS

CINMS	Channel Islands National Marine Sanctuary
ft	foot, feet
GSA	[United States] General Services Administration
GSF	gross square feet
IATTC	Inter-American Tropical Tuna Commission
IG	Inspector General
mi	miles
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOS	National Ocean Service
NPV	net present value
NWFSC	Northwest Fisheries Science Center
PFEL	Pacific Fisheries Environmental Laboratory
PIFSC	Pacific Islands Fisheries Science Center
PRC	Pacific Regional Center
SIO	Scripps Institution of Oceanography
sq ft	square feet
SWFSC	Southwest Fisheries Science Center
U.S.	United States
USAF	U.S. Air Force
UCSB	University of California, Santa Barbara
UCSC	University of California, Santa Cruz
UCSD	University of California, San Diego
WRC	Western Regional Center

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1 PREVIOUS STUDIES AND OBJECTIVES

This report is intended to summarize and update as necessary the information included in three previously prepared studies of the alternatives for replacement/relocation of the National Oceanic and Atmospheric Administration (NOAA) Southwest Fisheries Science Center (SWFSC), which is currently located on a 2.48-acre parcel acquired from the University of California, San Diego (UCSD) via a 99-year deed dated March 22, 1962. The current SWFSC physical plant contains approximately 100,381 gross square feet (GSF) of floor area within four buildings located on the campus of UCSD Scripps Institution of Oceanography (SIO) in La Jolla, California. This report is also intended to provide an independent assessment of NOAA's selection of construction of a new federally funded facility on the UCSD/SIO campus as the preferred alternative to replace the existing at-risk facility.

The three prior studies (reprinted in Volume II of this report) are summarized below.

Study 1: Initial Site Analysis Conducted by NOAA in Response to 1997 Department of Commerce Office of Inspector General (IG) Report

Study 1 investigated the potential for relocating programs at the SWFSC to collocate them with other existing NOAA facilities on the west coast of the continental United States (U.S.) or Hawaii (see Study 1 in Volume II). Specifically, the report addressed the following recommendations of the IG:

- Coast fisheries and ground fish programs should be moved and collocated with the existing NOAA laboratory in Newport, Oregon
- Genetic and protected species programs should be moved to the planned NOAA laboratory at Santa Cruz, California
- Large pelagic research should be moved to Honolulu, Hawaii
- Antarctic research programs should be moved to Seattle, Washington

NOAA carefully evaluated each of these recommended moves and determined that they would not be beneficial. Specifically, the coast fisheries and ground fish programs benefit from scientific collaboration with the California Department of Fish & Game, the Mexican *Instituto Nacional de Pesca*, and the San Diego Sportfishing Association. These collaborations would be adversely affected by moving the programs to a distant location.

The Santa Cruz Laboratory referenced in the 1997 study has since been built. The building is fully occupied and there is no space available to accommodate additional programs.

The Inter-American Tropical Tuna Commission (IATTC) is located at SWFSC pursuant to international agreements and an act of Congress. The large pelagic research program at SWFSC is closely linked to the IATTC and relocating it to Honolulu, Hawaii, would adversely affect the program.

SWFSC's Antarctic Research program works closely with SIO and relocation to Seattle, Washington, would severely degrade the effectiveness of scientific collaboration with SIO. Although the Alaska Fisheries Science Center formerly participated in Antarctic research, the center no longer does so and no synergy would be gained by relocating the program to the Northwestern U.S.

Study 2: *Southwest Fisheries Science Center National Oceanic and Atmospheric Administration Collocation Options*, prepared by SRI International under contract to NOAA in May 2004

Study 2 explored the potential for relocation of research programs currently at SWFSC to the following NOAA facilities (see Study 2 in Volume II):

- Glenn M. Anderson Federal Building, Long Beach, California
- Pacific Fisheries Environmental Laboratory (PFEL), Pacific Grove, California
- Santa Cruz Laboratory, University of California, Santa Cruz (UCSC)
- Marine Science Institute, University of California, Santa Barbara (UCSB)

Study 2 found that each of these locations lacked adequate building space to accommodate programs that would be relocated from the SWFSC. In addition, expansion of existing buildings or new construction was not feasible due to the lack of available land and/or development constraints. The Federal Building also lacks infrastructure to obtain seawater for necessary research aquaria and installing that infrastructure would be prohibitively expensive.

Study 3: Office of Management and Budget Exhibit 300—*Capital Asset Plan and Business Case for La Jolla Lab Replacement Project*, prepared by NOAA in April 2008

Study 3 is a business case prepared by NOAA of the proposed SWFSC replacement (see Study 3 in Volume II). The study summarizes the geologic hazards to the existing SWFSC and estimates budgetary resources required during 2008 through 2011 and beyond, assuming NOAA will enter a long-term no-cost ground lease with UCSD to obtain the preferred site and construct a federally owned building, and that two buildings (Buildings B and C) at the existing SWFSC will be removed. Buildings B and C are within 25 ft of the crest of an eroding 180-foot (ft) high coastal bluff and have been vacated due to the hazard posed by ongoing erosion of the bluff. The study states,

> Capacity at other NOAA facilities in California does not exist; and investments would be required to relocate/consolidate functions presently at La Jolla at other locations. There are business relationships supported at the La Jolla location that justify replacing the facility at the alternate UCSD site—including relationships with UCSD and SIO, and IATTC.

The study also describes the level of cooperation between SWFSC and UCSD/SIO:

> The 50 year old California Cooperative Oceanic Fisheries Investigation program uses both NOAA and SIO research ships, jointly staffed by SIO and SWFSC personnel, to conduct regular surveys.
>
> SWFSC greatly benefits from its access to SIO graduate students, numbering anywhere between 10 and 20, who work on SWFSC research projects critical to its mission. SWFSC staff capabilities are strengthened by the interaction and collaboration with SIO staff; opportunities for junior NMFS staff to pursue advanced degrees at SIO are exceptionally valuable. Several SWFSC senior staff accepts *[sic]* adjunct positions at SIO, keeping professional research skills and knowledge on the cutting edge.

2 SCOPE OF ANALYSIS AND METHODOLOGY

A. Scientific Collaboration and Synergy

As detailed in the prior studies, SWFSC performs detailed fisheries research in several areas, with a focus on fisheries and ecosystems of the California current and the eastern Pacific tropical tuna. Much of this research benefits from collaboration with SIO, which performs world-class scientific research into oceanography and the physical processes of the eastern Pacific Ocean. SWFSC/SIO collaboration extends to joint research programs; cooperative studies by scientists and graduate students who work at both organizations; and shared use of facilities, infrastructure, and marine vessels. The proximity of the two institutions promotes this collaboration. Benefits to science that may result from collocation of programs currently housed at SWFSC with other NOAA facilities were identified through consultation with NOAA management.

B. Land and Facility Availability

The prior studies examined the availability of existing NOAA facilities at each of the alternative sites (see Figure 1) to accommodate programs relocated from the SWFSC. They also considered the potential for expansion of the existing facilities through new construction at or adjacent to the existing NOAA sites. NOAA managers and administrative officers were contacted to reassess the prior findings with regard to opportunities for economical relocation of SWFSC programs to other existing NOAA facilities. Records of communications with NOAA staff are contained in Item 5 in Volume II of this report.

C. Relocation Costs

The cost to relocate the SWFSC to locations other than the UCSD/SIO campus is based on NOAA's *Estimated Relocation Expense Worksheet*, dated January 2008 (see sample worksheet, Item 4 in Volume II). If SWFSC is relocated more than 50 miles (mi) from the current location, employees would be entitled to reimbursement of relocation expenses for house hunting, travel en route to new destinations, cost of subsistence while occupying temporary quarters, transportation of household goods, and real estate transactions. All alternative NOAA facilities other than the preferred site at the UCSD/SIO campus in La Jolla are greater than 50 mi from the existing SWFSC site, thus, NOAA would be liable for payment of relocation expenses to employees who relocated to these alternative locations (if NOAA selects one of these alternatives). Potential NOAA liability for relocation costs are calculated for each site alternative (see Appendix A). The estimates of relocation costs in Section 6B and Appendix A of this report only cover NOAA costs for employee relocation. NOAA's cost for moving its equipment and materials to the new SWFSC would occur at all sites and would be programmed by NOAA as part of the project construction planning. SRI calculated employee relocation costs based on the following assumptions developed by SRI:

- Four out of five federal employees (i.e., 80%) at the SWFSC would relocate to the new SWFSC.
- The typical NOAA employee's family consists of one employee, a spouse, and one child over 12 years old. The average family owns two vehicles.

- NOAA employee and spouse would take a 10-day house hunting trip as allowed by government policy. Travel would be by car to sites inside California and by airplane outside California.
- Travel en route to a new work location would be via personal vehicles within the continental U.S. and via commercial air service to Hawaii. The average NOAA employee would transport two cars to Hawaii via marine freight service.
- Subsistence costs for house hunting, and travel en route, including the first 30 days after arrival, are based on 2008 U.S. government lodging, meals, and incidental expenditure rates by local area.
- NOAA would arrange for transport of furniture and household goods to the new location and would pay for temporary storage of those goods for 90 days.
- Three out of five relocated NOAA employees own their residences and would purchase new residences at the new location. Median house prices per metropolitan area are based on prices published by the National Association of Realtors.

3 DESCRIPTION OF ALTERNATIVE SITES INVESTIGATED

A. Glenn M. Anderson Federal Building, Long Beach, California

A number of NOAA line offices occupy the Glen M. Anderson Federal Building (see Figure 2), located in Long Beach, California, about 80 mi north-northwest of San Diego:

- National Weather Service
- NOAA Office of General Counsel
- National Marine Fisheries Service (NMFS) Southwest Region Headquarters (HQ)
- NMFS Restoration Center
- NMFS Office of Law Enforcement, Southwest Division
- National Ocean Service (NOS), Damages Assessment Center
- NMFS Western Seafood Inspection Service

NOAA leases this space from the U.S. General Services Administration (GSA), which owns the buildings. The NOAA staff at the building does not include researchers performing basic science. A total of 140 NOAA employees and contractors work at the building, and occupy 26,811 square feet (sq ft) of net useable space (excludes hallways, etc.) in the building. The entire building contains 172,395 useable sq ft of floor space. Major tenants besides NOAA include the Internal Revenue Service, U.S. Department of Agriculture, and Department of Homeland Security (Hornof, 2008).

The Federal Building is fully occupied and located in a densely developed area. There is no available space in the building to accommodate programs relocated from La Jolla and no adjacent land available for construction of new facilities. The facility does not contain seawater aquaria (Hornof, 2008).

B. Channel Islands National Marine Sanctuary Headquarters, UCSB

The Channel Islands National Marine Sanctuary (CINMS) is a unit of NOS, which is part of NOAA. CINMS Headquarters staff are based in 1,500 GSF of leased office space in a building located at Santa Barbara harbor, about 210 mi northwest of San Diego (see Figure 3). About 12 management, administrative, and law enforcement staff plus additional interns and boat crew are based at this office which NOAA leases from the City of Santa Barbara. Additionally, CINMS and NMFS staff occupy two other offices in Santa Barbara, leased from commercial landlords:

- Eight staff and contractors are based at a 1,200 GSF office at 735 State Street, Santa Barbara, California
- Five CINMS staff and contractors are based at a 1,000 GSF office at Channel Harbor, Oxnard, California

These offices lack room to accommodate programs relocated from La Jolla. NOAA tentatively plans to relocate staff currently posted to these three offices to the UCSB campus in Santa Barbara, California. Boat crews and support staff would remain at the harbor office. The CINMS staff conduct applied research for management of the CINMS, but are not involved in fisheries science research. The current office space is not considered suitable for fisheries research or laboratory use (Jacobs and Ostrom, 2008).

The Marine Science Institute at UCSB conducts research into coastal processes, marine biotechnology, ecological analysis, and ocean and coastal policy. UCSB recently constructed the Marine Science Research Building at its Isla Vista campus. A seawater intake and distribution system supplies aquaria located at several locations at the campus. No NOAA staff are currently based at the Marine Science Research Building, which is fully occupied and lacks available space for programs relocated from La Jolla.

C. Pacific Fisheries Environmental Laboratory (PFEL), Pacific Grove, California

The PFEL is a branch laboratory reporting to the SWFSC. The PFEL has 27 staff based at a 6,681 GSF laboratory located on a 4.2-acre parcel owned by NOAA in Pacific Grove, California, about 370 mi north-northwest of San Diego (see Figure 4). Staff includes 15 NOAA employees, 6 University of Hawaii researchers, 3 National Research Council post-doc fellows, and 3 retired NOAA Corps Officers. The PFEL studies the responses of fish populations to environmental changes, and models those effects. Both pelagic and ground fish populations of the California current are studied. The PFEL does not contain seawater aquaria. The existing building is fully occupied and a 320 sq ft temporary trailer on the grounds is used to supplement the space. There is no vacant space at the current facility (Snell, 2008).

The NOAA property is planned for open space-institutional uses by the City of Pacific Grove and adjacent properties are zoned for open space and low-density residential uses (City of Pacific Grove, 1994). While undeveloped land exists at the NOAA parcel and adjoining properties, substantial expansion of the physical plant is constrained by local land use plans and community concerns, and is not considered feasible.

D. Santa Cruz Laboratory, UCSC

SWFSC's Fisheries Ecology Division is based at the Santa Cruz Laboratory. The laboratory has 74 staff operating from a recently constructed 55,000 GSF building at the UCSC Marine Science

Campus at Terrace Point in Santa Cruz (see Figure 5). Both the building and the land are federally owned. The existing facility contains seawater aquaria with Pacific Ocean intakes and outfalls. The facility is located on a 2.5-acre parcel owned by NOAA in Santa Cruz, California, about 395 mi north-northwest of San Diego. The laboratory building was originally designed for an additional 10,000 GSF of space, but was not fully built due to funding constraints. The existing building is about 95% occupied and laboratory management foresees a need for additional space (Miller, 2008).

The laboratory conducts research into Pacific ground fish and Pacific salmon. There is no available space at the current laboratory to accommodate programs relocated from La Jolla. However, the Terrace Point campus of UCSC has an approved Master Plan that provides for substantial additional construction. Thus, there is potential for construction of new facilities at this location to accommodate relocated NOAA programs (Miller, 2008).

Laboratory scientists cooperate with SWFSC staff in performing research using NOAA's *David Starr Jordan* research vessel. The *David Starr Jordan* is based at Scripps pier in La Jolla. The laboratory also charters smaller ships based at Monterey or Moss Landing to perform ocean-going research and uses a boat ramp at Santa Cruz harbor to launch small research vessels (Miller, 2008).

E. National Marine Fisheries Service Newport Research Station, Newport, Oregon

The Northwest Fisheries Science Center (NWFSC), headquartered in Seattle, Washington, operates the Newport Research Station, located on the campus of the Mark O. Hatfield Marine Science Center of Oregon State University at Newport on the central Pacific coast of Oregon, about 900 mi north-northwest of San Diego (see Figure 6). The station is located on a 3.87 acre leased parcel and occupies three federally owned buildings (Buildings 950, 951, and 955), which have a total floor area of approximately 77,053 sq ft. Approximately 136 NOAA staff, contractors and cooperative researchers are employed at the station. The station contains seawater aquaria supplied by a Pacific Ocean intake; used seawater is discharged to the ocean (Lundeen, 2008 and Brown, 2008).

The Newport Research Station specializes in long-term monitoring of environmental conditions of the Pacific Ocean. The station coordinates ground fish studies of the U.S. Pacific Coast from the Canadian to the Mexican borders, including conducting ground fish surveys, habitat and ecosystem surveys, and stock assessments. The station also conducts research into sea floor volcanoes off the Northwest Coast of the U.S., behavior patterns and environmental effects on marine and anadromous fish, salmon aquaculture, and diseases affecting northwest fish populations. The station also includes NOAA law enforcement staff.

The station is fully occupied and does not have available space to house research programs relocated from La Jolla. Thus, new construction would be required to relocate SWFSC research programs to the Newport Research Station. There is no land available for new construction adjacent to the existing NOAA stations. However, undeveloped land that could potentially support new NOAA construction is available at the Hatfield Marine Science Center campus and is owned by Oregon State University (Lundeen, 2008).

F. NOAA Western Regional Center and NWFSC, Seattle, Washington

There are 1,011 NOAA employees and contractors who work at the Western Regional Center (WRC), located on the shoreline of Lake Washington in Seattle, approximately 1,200 mi north of San Diego. WRC contains several buildings with a combined total of approximately 618,000 GSF of floor space and a dock for research vessels (see Figures 7 (a) and (b)) (Eberling, 2008). NOAA owns the land and the buildings. The Center does not have seawater aquaria. Because Lake Washington is a freshwater lake, it is not a potential source of seawater for seawater aquaria. Construction of infrastructure to supply seawater from Puget Sound, and discharge used seawater, would be difficult and expensive at this location. The WRC is currently fully utilized with no available space to accommodate additional growth or programs. NOAA is considering expansion of the existing facilities at the WRC and has land available to do so (Petre, 2008).

The NWFSC headquarters is located in a 122,000 sq ft building located on a 7.3 acre parcel at Montlake in Seattle (see Figures 7 (a) and (c)). NOAA owns the building and land and leases 1.9 acres to the Seattle Yacht Club. NWFSC conducts research into anadromous and ground fisheries of the Pacific Northwest, including assessment of fishery stocks and ecological factors affecting populations. The Montlake facility is on Portage Bay, a freshwater connector between Lake Union and Lake Washington, and lacks access to seawater

NWFSC operates two remote research stations in the Puget Sound area. The Manchester Research Station studies salmon aquaculture and operates seawater pens for salmon in Clam Bay on the western shore of Puget Sound (see Figures 7 (a) and (d)). The Manchester field station contains 45,078 sq ft of floor space and is located on a 21-acre property. NOAA owns the land and the buildings. The existing station is fully occupied and has no unused floor space. The property has land that could be used to construct new facilities (Herkelrath, 2008).

The Mukilteo Research Station, located near Everett, Washington, on the eastern shore of Puget Sound, includes seawater aquaria. The Mukilteo facility contains a 13,000 sq ft building and is located on a 1.1 acre parcel leased from the U.S. Air Force (USAF) (see Figures 7 (a) and (e)). NOAA is in the process of acquiring the land from the USAF through the Base Realignment and Closure process. Future expansion is not considered feasible (Petre, 2008).

NWFSC cooperates with SWFSC and California, Oregon, and Washington state fisheries departments in providing information on ground fish to the Pacific Fishery Management Council. While there would be beneficial synergies in certain research areas from relocating SWFSC programs to the WRC, there would also be significant detriments. This location is distant from the ecosystems of the California current and tropical Eastern Pacific Ocean studied by SWFSC scientists, which would complicate and add to the costs of performing the research. The scientific synergy between SIO and SWFSC would also suffer.

G. Pacific Regional Center, Honolulu, Hawaii

Like the SWFSC, the Pacific Islands Fisheries Science Center (PIFSC) is one of six regional fisheries science centers operated by NOAA. PIFSC contains five research units: Coral Reef Ecosystems, Ecosystems and Oceanography, Fishery Biology and Stock Assessment, Fisheries Monitoring and Socioeconomics, and Protected Species. The scientific research being performed at the PIFSC is similar to the research performed at the SWFSC, but focuses on different fishery populations, species, and ecosystems. Scientists at PIFSC study coral reef ecosystems and north

central Pacific marine ecosystems as compared with SWFSC, which studies the ecosystems of the eastern tropical Pacific, California current, and Antarctica.

The PIFSC is currently located at the Manoa campus of the University of Hawaii. NOAA plans to relocate the PIFSC to the Pacific Regional Center (PRC), which is under construction at Ford Island in Pearl Harbor, Honolulu (see Figure 8). The PRC will have 370,000 GSF of floor space created through a combination of adaptive reuse of two existing U.S. Navy hangars and new construction. The PRC will house 11 NOAA line offices and is fully programmed to support current programs located in Hawaii. Seawater aquaria will be included (NOAA, March 2008). Occupancy of the PRC is scheduled for 2013 or later depending on appropriation of funds. All space in the PRC has been assigned to NOAA line offices relocated from existing facilities on the Island of Oahu and there is no unassigned space available to accommodate programs relocated from the SWFSC. It is not considered feasible to relocate SWFSC programs to the PRC.

H. Preferred Site at UCSD/SIO, La Jolla, California

NOAA cooperated with UCSD/SIO in identifying potential locations on the UCSD campus for construction of an SWFSC replacement facility. That investigation identified a 3.3-acre undeveloped parcel across La Jolla Shores Drive from the exiting SWFSC site as the preferred alternative (see Figure 9). This site is of sufficient size to accommodate the necessary 120,000 GSF building needed to house SWFSC. Because the preferred site is in proximity to the existing SWFSC and on the SIO portion of the UCSD campus, the cost to extend seawater pipes serving the existing SWFSC will not be prohibitive. Additionally, this site can be connected to the SIO seawater return system (currently under construction) at reasonable cost. Because of its proximity to the existing SWFSC site, there would be no employee relocation costs to NOAA.

SIO is the leading oceanographic research institution on the Pacific Coast of the U.S. SWFSC and SIO have collaborated in conducting scientific research for over 40 years by sharing laboratory space, research equipment, libraries, seawater, motor vehicles, and access to NOAA and SIO research ships and aircraft. Equally important, the proximity of SWFSC and SIO creates synergies. SIO focuses on oceanography and physical parameters of marine ecosystems, while SWFSC focuses on biology of marine ecosystems. Because the physical and biological conditions greatly influence one another, the expertise and research undertaken by the two are complementary.

Several senior SWFSC scientists have adjunct positions at SIO and between 10 and 20 SIO graduate students work on SWFSC research projects. These relationships benefit both organizations by promoting cutting edge research, leveraging combined research skills, and realizing efficiencies in performing studies. Equally important is the creation of an environment that promotes scientific collaboration, thereby enhancing the quality of fishery and oceanographic research.

The IATTC was established by a convention between Costa Rica and the U.S. in 1949. The 1949 convention was replaced by the Antigua Convention in 2003. The U.S. signed the Antigua Convention on November 11, 2003, and 11 other countries and the European Union have also signed the convention. Three additional countries (Mexico, El Salvador, and Taiwan) have agreed to abide by the convention. The Antigua Convention requires that the IATTC be located

in San Diego, California. The IATTC has 53 staff located at the SWFSC. SWFSC staff provide scientific support to the IATTC.

4 ANALYSIS OF LEASE OPTIONS

To mitigate the imminent bluff-retreat hazard to occupants of existing Buildings B and C at the SWFSC, NOAA is in the process of relocating those occupants to leased office space. NOAA signed a lease with the GSA for 53,197 sq ft of local office space in March 2007. The lease period is March 2008 through 2012. Occupants of Buildings B and C will be moved to the leased space by June 2008. This is a temporary measure to address the imminent hazard. The temporary leased office space is not suitable as a permanent facility to house SWFSC operations.

As detailed in Study 3 of the technical appendices (Volume II), NOAA performed a financial analysis of two lease alternatives to the preferred alternative (Alternative 1) of federal construction of an SWFSC replacement facility. Alternative 2 is the use of phased leases to provide the floor space necessary for SWFSC. This would involve two leases, one for 53,197 GSF of floor space to be occupied in 2008 and a second for 66,803 GSF to be occupied in 2009. Minor repair and alteration of existing Buildings A and D at the SWFSC would occur after operations move to the leased space. After Buildings A and D are rehabilitated, SWFSC staff would reoccupy them until 2028, at which time the site would be completely emptied and operations moved entirely to leased space. Lost productivity due to periodic moves is factored in at 1% of annual salary per move. The net present value (NPV) of Alternative 2 costs is estimated at $193.46 million.

Alternative 3 involves fully leasing the necessary floor space, without repair and re-occupancy of Buildings A and D. The leased floor space would have the same total area as Alternative 2. Lost productivity is factored as for Alternative 2, except that fewer moves would be required. The NPV of Alternative 3 costs is estimated at $243.11 million.

Based on the NPV costs of $117.07 million, NOAA selected construction of a 120,000 GSF federal facility as the preferred alternative. The NPV cost of Alternatives 2 and 3 would be 65% and 108%, respectively, more than the NPV cost of the preferred alternative.

5 VALIDATION OF PREVIOUS STUDIES

The three previous studies contained in Volume II describe the size, number of employees, areas of scientific research, and functions of the NOAA units considered as possible hosts for programs relocated from the existing SWFSC facility in La Jolla. This information was rechecked and found to remain substantially accurate with only a few minor changes in the size of facilities. Updated information is presented in the descriptions of each facility in Section 3 of this report.

6 SUMMARY OF FINDINGS AND CONCLUSION

A. Collocation with NOAA Activities Outside the San Diego Area

It would be technically feasible to relocate portions of the SWFSC operations and collocate them with existing NOAA activities at Santa Cruz, California; Newport, Oregon; or Seattle, Washington. The IATTC (comprising 53 of the 283 employees at the SWFSC) must remain in the San Diego area pursuant to international agreements. Relocation of the SWFSC's divisions (i.e., Antarctic Ecosystem Research, Fisheries Resource, Protected Species, and Management and Information Divisions) to alternative locales would require new construction. The construction cost would be similar to building a new SWFSC in La Jolla, California. NOAA has available land at the WRC in Seattle for construction of a new SWFSC physical plant, but providing seawater for necessary seawater aquaria would not be feasible at the WRC. The NWFSC performs seawater experiments at three remote research stations, but expansion of those stations to accommodate SWFSC research would be difficult due to lack of available land and infrastructure.

Due to the lack of available facilities or land for new construction, collocation of SWFSC programs with existing NOAA activities at Long Beach, California; Santa Barbara, California; Pacific Grove, California; or Honolulu, Hawaii, is not feasible.

While technically possible, consolidation of SWFSC programs (other than the IATTC) with existing NOAA activities in Santa Cruz, Newport, or Seattle would result in adverse effects on the scientific research performed by SWFSC. The SWFSC studies fisheries, sea turtles, marine mammals, and ecosystems of the California current, eastern tropical Pacific Ocean, and Antarctica. The oceanographic expertise of SIO in these geographic areas complements the fisheries expertise of SWFSC, resulting in a high level of scientific synergy. Cooperation between the SWFSC and UCSD/SIO includes cooperative research programs, staff maintaining relationships with both organizations, and shared usage of marine vessels for research purposes. Several SWFSC Scientists are also affiliated with SIO and a number of graduate students studying at UCSD/SIO participate in SWFSC research studies. SWFSC research programs depend on ocean data collected by research ships operated by both SIO and NOAA's Office of Marine and Aviation Operations, including the *David Starr Jordan* which is homeported at the Scripps pier in La Jolla. Relocation of SWFSC Programs away from SIO would sever convenient access to SIO and its world-class oceanographic expertise. SWFSC would likely lose access to SIO graduate students, who provide an invaluable and cost-effective resource promoting the quality of research at SWFSC. This synergy would suffer if the SWFSC were relocated to any of three locations listed above. Some beneficial synergy results in the study of Pacific coast ground fish ecology and fisheries from collocation at either Santa Cruz or Newport, but this would be outweighed by the detriments to synergy with SIO in other areas of research. Additionally, increased transit time and operational costs for researchers and vessels would result as both Santa Cruz and Newport are considerably farther from the ocean research areas than La Jolla.

UCSD/SIO has offered to lease to NOAA, at no cost, a 3.3-acre parcel on the UCSD campus that is suitable for federal construction of the new SWFSC—the preferred alternative. Two lease options for replacement of the SWFSC physical plant in the local La Jolla area were analyzed. Alternative 2 would consist of temporary lease of office space to allow rehabilitation of Buildings A and D at the current SWFSC facility, followed by reoccupation of these buildings by

SWFSC staff until 2028. After 2028, the entire SWFSC staff would move to leased space. Alternative 3 consists of NOAA permanently moving from the existing SWFSC facility to leased space in phases. The NPV cost of Alternatives 2 and 3 would be 65% and 108%, respectively, more than the NPV cost of the preferred alternative.

B. Employee Relocation Costs

NOAA would be liable for payment of employee relocation costs if the SWFSC programs were relocated greater than 50 mi from its current location in La Jolla, California. Alternative sites at Long Beach, California; Santa Barbara, California; Pacific Grove, California; Santa Cruz, California; Newport, Oregon; Seattle, Washington; and Honolulu, Hawaii are all greater than 50 mi from the existing site. Table 1 presents estimates in current dollars of employee relocation costs for all of these locations. Employee relocation costs would range from about $8.9 to $13.7 million, depending on the specific relocation area. NOAA will not incur employee relocation costs if a new SWFSC is constructed at the preferred site at the UCSD/SIO campus as the move distance would be far less than 50 mi.

Detailed calculations and assumptions on employee relocation costs are presented in a spreadsheet contained in Appendix A.

Table 1. Employee Relocation Costs

Relocation Site for SWFSC	Total Estimated Employee Relocation Cost
La Jolla, California	$ 0
Long Beach, California	$ 9,912,355
Santa Barbara, California	$ 10,586,227
Pacific Grove, California	$ 11,511,116
Santa Cruz, California	$ 11,418,284
Newport, Oregon	$ 8,941,918
Seattle, Washington	$ 10,278,326
Honolulu, Hawaii	$ 13,654,871

C. Conclusion

This study evaluated the benefits and costs of alternatives for relocation of fisheries science programs currently housed at the SWFSC headquarters in La Jolla, California. In addition to NOAA's preferred option of federal construction of a new SWFSC physical plant on the campus of UCSD/SIO in La Jolla, California, seven alternatives for collocation with existing NOAA facilities on the west coast of the continental U.S. and Hawaii were investigated. Table 2 presents the results of these investigations.

None of the NOAA activities has existing building space available to accommodate programs relocated from La Jolla. All of the alternatives would require new construction. The Santa Cruz Laboratory, Newport Research Station, NWFSC, and PIFSC perform basic fisheries research which would provide opportunities for synergistic collaboration with SWFSC programs. However, the greatest scientific benefits would result from maintaining the SWFSC programs on the SIO campus in La Jolla, California. Based on construction feasibility, scientific benefits and

relocation costs, the most advantageous alternative is federal construction of a new SWFSC physical plant on the UCSD/SIO campus.

Table 2. Results of Alternatives Evaluation

Alternative	Location	Scientific Synergy	Room for Expansion / If Yes, is Seawater Obtainable	Distance from Current Site (Miles)	NOAA Employee Relocation Cost ($ Million)
Federal Building	Long Beach, California	No	No / —	80	$ 9.9
CINMS	Santa Barbara, California	No	No / —	210	$10.6
PFEL	Pacific Grove, California	Yes, Minimal	No / —	370	$11.5
Santa Cruz Laboratory	Santa Cruz, California	Yes	Yes / Yes	395	$11.4
Newport Research Station	Newport, Oregon	Yes	Yes / Yes	900	$ 8.9
WRC and NWFSC	Seattle, Washington Area	Yes	Yes / Yes	1,200	$10.3
PRC and PIFSC	Honolulu, Hawaii	Yes	No / —	2,400	$13.7
UCSD/SIO Campus	La Jolla, California	Yes, Greatest	Yes / Yes	0.04	$ 0

7 REPORT PREPARERS

The Envirotechnical Program at SRI International prepared this report under contract to the NOAA Office of Chief Administrative Officer. During report preparation, a number of NOAA personnel were consulted. Citations listing the source of information are included in the report text where appropriate and the names, date of contact, and method of communication are provided in Section 8, References.

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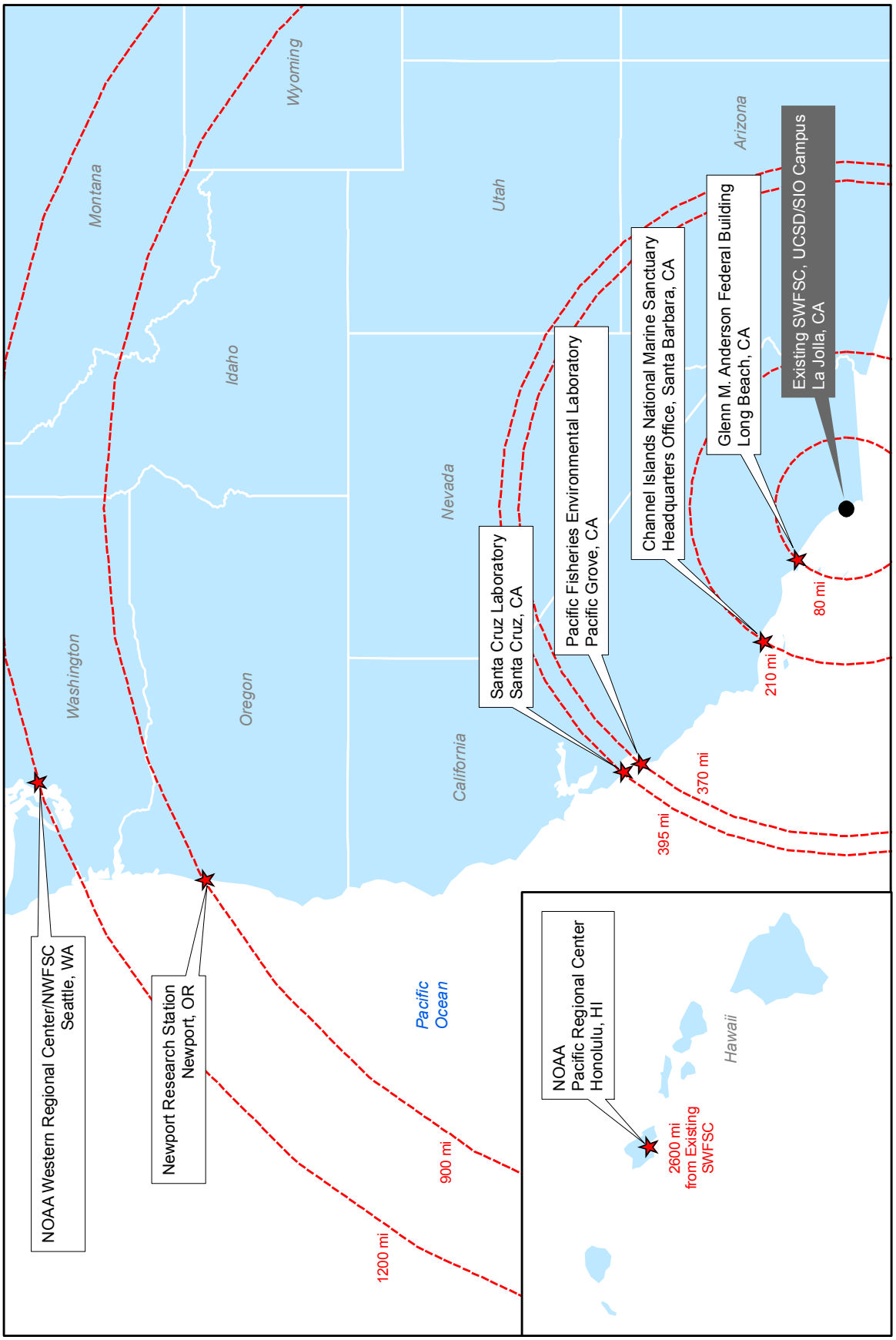
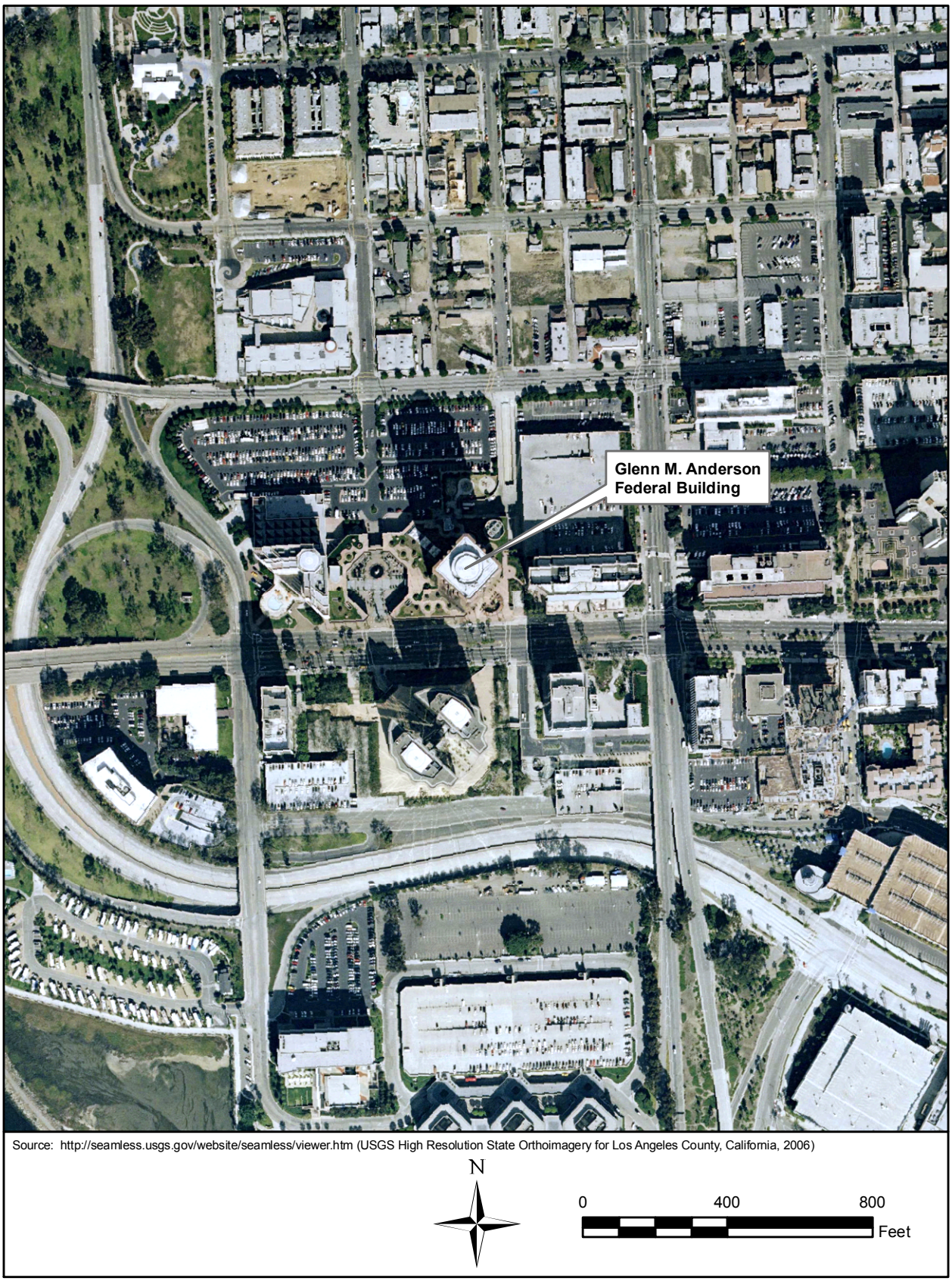


FIGURE 1 ALTERNATIVE NOAA SITES CONSIDERED FOR REPLACEMENT OF SWFSC, LA JOLLA, CALIFORNIA



Source: http://seamless.usgs.gov/website/seamless/viewer.htm (USGS High Resolution State Orthoimagery for Los Angeles County, California, 2006)

FIGURE 2 GLENN M. ANDERSON FEDERAL BUILDING, LONG BEACH, CALIFORNIA

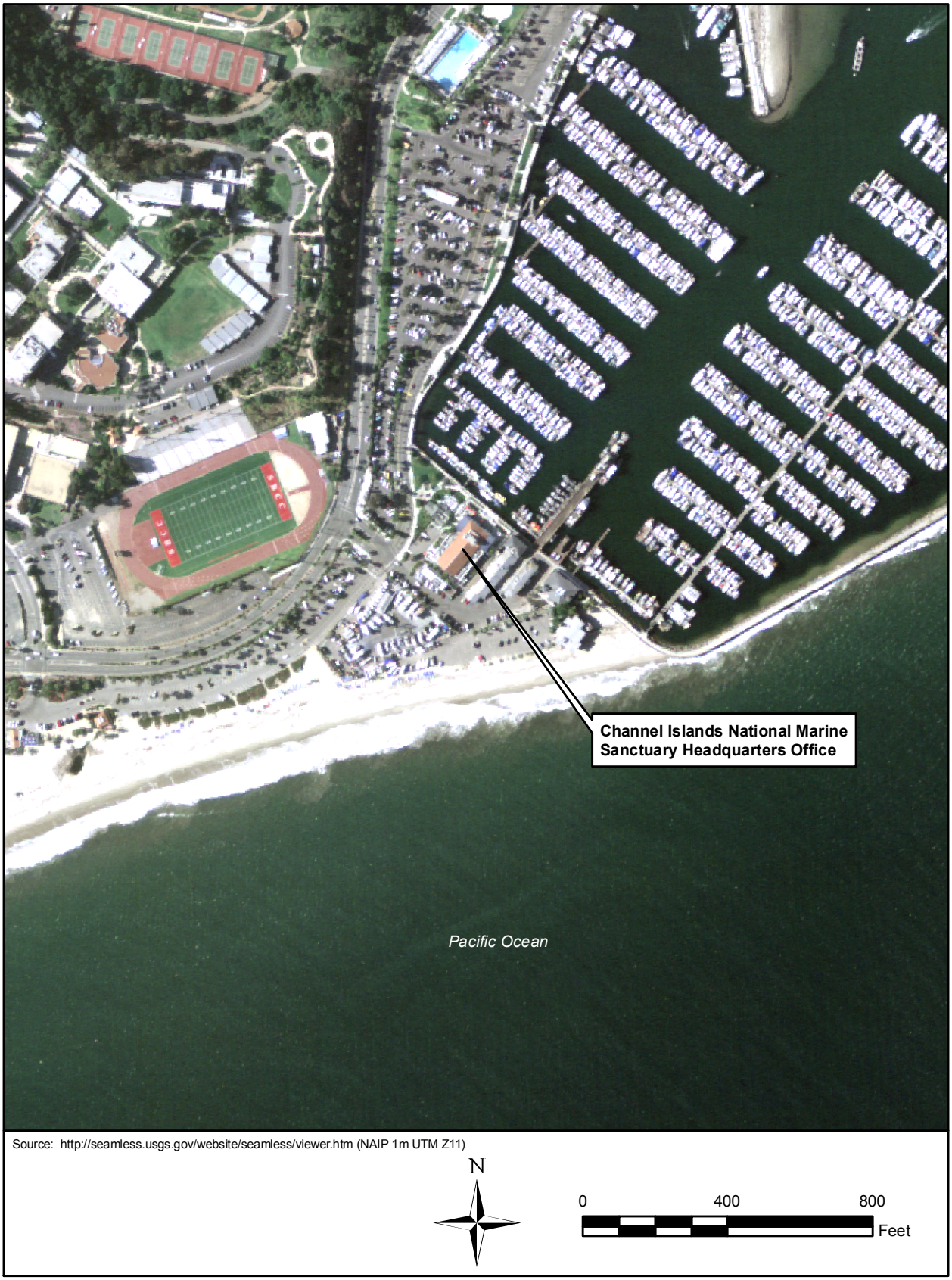


FIGURE 3 CHANNEL ISLANDS NATIONAL MARINE SANCTUARY HEADQUARTERS OFFICE, SANTA BARBARA, CALIFORNIA

FIGURE 4 PACIFIC FISHERIES ENVIRONMENTAL LABORATORY, PACIFIC GROVE, CALIFORNIA

FIGURE 5 SANTA CRUZ LABORATORY, SANTA CRUZ, CALIFORNIA

FIGURE 6 NEWPORT RESEARCH STATION, NEWPORT, OREGON

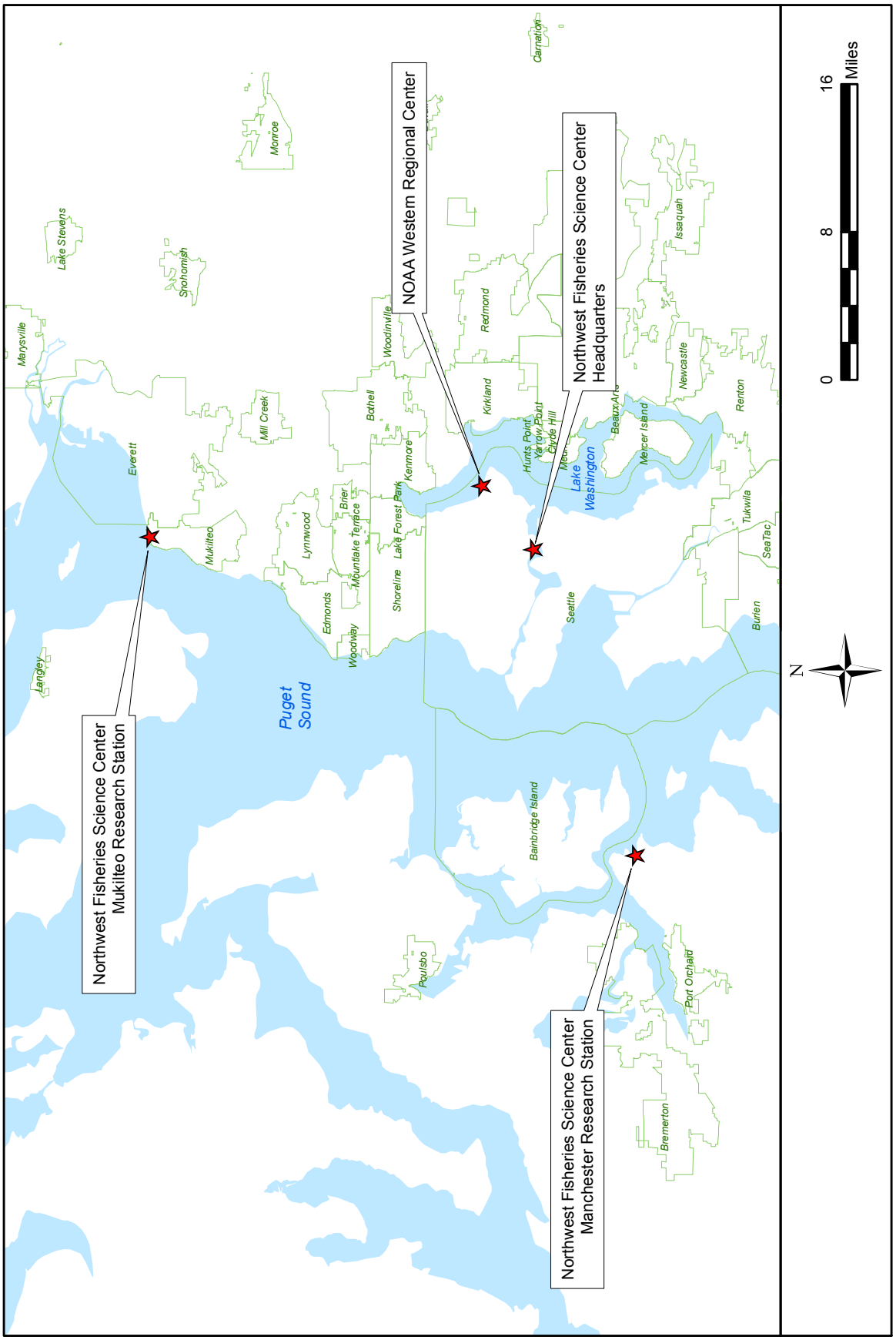


FIGURE 7(a) ALTERNATIVE NOAA SEATTLE AREA SITES CONSIDERED FOR REPLACEMENT OF SWFSC, LA JOLLA, CALIFORNIA

Source: http://seamless.usgs.gov/website/seamless/viewer.htm (USGS High Resolution Orthoimagery for the Seattle, Washington Urban Area, August 2005)

FIGURE 7(b) NOAA WESTERN REGIONAL CENTER, SEATTLE, WASHINGTON

Source: http://seamless.usgs.gov/website/seamless/viewer.htm (USGS High Resolution Orthoimagery for the Seattle, Washington Urban Area, August 2005)

N

0 400 800 Feet

FIGURE 7(c) NORTHWEST FISHERIES SCIENCE CENTER HEADQUARTERS, MONTLAKE, SEATTLE, WASHINGTON

FIGURE 7(d) MANCHESTER RESEARCH STATION, PORT ORCHARD, WASHINGTON

FIGURE 7(e) MUKILTEO RESEARCH STATION, MUKILTEO, WASHINGTON

Source: http://seamless.usgs.gov/website/seamless/viewer.htm (USGS High Resolution Orthoimagery for the Honolulu, HI Urban Area, 2005)

FIGURE 8 NOAA PACIFIC REGIONAL CENTER (UNDER CONSTRUCTION), HONOLULU, HAWAII

FIGURE 9 EXISTING AND PREFERRED SWFSC SITES AT UNIVERSITY OF CALIFORNIA, SAN DIEGO/SCRIPPS INSTITUTION OF OCEANOGRAPHY, LA JOLLA, CALIFORNIA

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APPENDIX A
SWFSC EMPLOYEE RELOCATION COSTS

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SWFSC EMPLOYEE RELOCATION COST ESTIMATES

COSTS PER RELOCATED EMPLOYEE

	Househunting Per Employee					
LOCATION	L+M+IE (a)	# Days (b)	Total L+M+IE	Transportation (c)	Miscellaneous (d)	Total
Long Beach, CA	$ 318.50	9.50	$ 3,025.75	$ 30.00	$ 302.58	$ 3,358.33
Santa Barbara, CA	$ 420.00	9.50	$ 3,990.00	$ 80.00	$ 399.00	$ 4,469.00
Pacific Grove, CA	$ 344.75	9.50	$ 3,275.13	$ 141.00	$ 327.51	$ 3,743.64
Santa Cruz, CA	$ 329.00	9.50	$ 3,125.50	$ 150.00	$ 312.55	$ 3,588.05
Newport, OR	$ 269.50	9.50	$ 2,560.25	$ 342.00	$ 256.03	$ 3,158.28
Seattle, WA	$ 378.00	9.50	$ 3,591.00	$ 1,000.00	$ 359.10	$ 4,950.10
Honolulu, HI	$ 505.75	9.50	$ 4,804.63	$ 2,000.00	$ 480.46	$ 7,285.09

a: employee and spouse = 1.75 x individual L+M+IE (Logding, Meals, and Incidental Expenses) per diem
b: 8 days + (2 x 0.75 days) = 9.5
c: POV roundtrip miles x $0.19, except Seattle airfare = $1,000; Honolulu airfare = $2,000
d: 10% of L+M+IE costs

	Travel En Route Per Employee					
LOCATION	L+M+IE (a)	# Days (b)	Total L+M+IE	Transportation (c)	Miscellaneous (d)	Total
Long Beach, CA	$ 318.50	0.75	$ 238.88	$ 30.00	$ 23.89	$ 292.76
Santa Barbara, CA	$ 420.00	0.75	$ 315.00	$ 80.00	$ 31.50	$ 426.50
Pacific Grove, CA	$ 344.75	1.50	$ 517.13	$ 141.00	$ 51.71	$ 709.84
Santa Cruz, CA	$ 329.00	1.50	$ 493.50	$ 150.00	$ 49.35	$ 692.85
Newport, OR	$ 269.50	2.50	$ 673.75	$ 342.00	$ 67.38	$ 1,083.13
Seattle, WA	$ 378.00	3.50	$ 1,323.00	$ 456.00	$ 132.30	$ 1,911.30
Honolulu, HI	$ 505.75	1.00	$ 505.75	$ 2,250.00	$ 3,225.58	$ 5,981.33

a: employee and spouse = 1.75 x individual L+M+IE per diem
b: distance/300 miles minus 0.25 day for first and last day
c: one-way miles x 2 cars x $0.19; except Honolulu airfare = $2,250 for employee, spouse, 1 child
d: 10% of lodging/per diem costs; plus $3,175 to ship 2 cars to Honolulu

	Subsistence Temp Quarters Per Employee		
LOCATION	L+M+IE (a)	# Days (b)	Total
Long Beach, CA	$ 455.00	29.50	$ 13,422.50
Santa Barbara, CA	$ 600.00	29.50	$ 17,700.00
Pacific Grove, CA	$ 492.50	29.50	$ 14,528.75
Santa Cruz, CA	$ 470.00	29.50	$ 13,865.00
Newport, OR	$ 385.00	29.50	$ 11,357.50
Seattle, WA	$ 540.00	29.50	$ 15,930.00
Honolulu, HI	$ 722.50	29.50	$ 21,313.75

a: employee, spouse, and one child over 12 = 2.5 x individual L+M+IE per diem
b: 28 days + (2 x 0.75 days) = 29.5 days

SWFSC EMPLOYEE RELOCATION COST ESTIMATES

COSTS PER RELOCATED EMPLOYEE (continued)

	Transport + Store Household Goods Per Employee (a,b)		
LOCATION	Transport	90-day Storage	Total
Long Beach, CA	$ 7,532.00	$ 10,775.00	$ 18,307.00
Santa Barbara, CA	$ 8,081.00	$ 10,775.00	$ 18,856.00
Pacific Grove, CA	$ 12,554.00	$ 10,775.00	$ 23,329.00
Santa Cruz, CA	$ 12,554.00	$ 10,775.00	$ 23,329.00
Newport, OR	$ 12,665.00	$ 8,925.00	$ 21,590.00
Seattle, WA	$ 13,365.00	$ 8,627.00	$ 21,992.00
Honolulu, HI	$ 26,132.00	$ 6,746.00	$ 32,878.00

a: estimate from Kevin Godfrey of NOAA

b: Long Beach transport estimated at 60% Santa Cruz; Santa Barbara at 75%

	Real Estate Per Employee					
LOCATION	Old House Value (a)	10% Value (b)	New House cost (c,d,e,f)	5% house price	Miscellaneous (g)	Total
Long Beach, CA	$ 588,700.00	$ 58,870.00	$ 589,200.00	$ 29,460.00	$ 1,000.00	$ 89,330.00
Santa Barbara, CA	$ 588,700.00	$ 58,870.00	$ 589,200.00	$ 29,460.00	$ 1,000.00	$ 89,330.00
Pacific Grove, CA	$ 588,700.00	$ 58,870.00	$ 836,800.00	$ 41,840.00	$ 1,000.00	$ 101,710.00
Santa Cruz, CA	$ 588,700.00	$ 58,870.00	$ 836,800.00	$ 41,840.00	$ 1,000.00	$ 101,710.00
Newport, OR	$ 588,700.00	$ 58,870.00	$ 239,600.00	$ 11,980.00	$ 1,000.00	$ 71,850.00
Seattle, WA	$ 588,700.00	$ 58,870.00	$ 386,900.00	$ 19,345.00	$ 1,000.00	$ 79,215.00
Honolulu, HI	$ 588,700.00	$ 58,870.00	$ 643,500.00	$ 32,175.00	$ 1,000.00	$ 92,045.00

a: median house sales price in San Diego-Carlsbad-San Marcos, CA reported by National Association of Realtors

b: direct sale method

c: median house price in metro area reported by National Association of Realtors

d: used Los Angeles-Long Beach-Santa Ana, CA median price for Santa Barbara, CA

e: used San Jose-Sunnyvale-Santa Clara, CA median price for Pacific Grove, CA and Santa Cruz, CA

f: used Eugene-Springfield, OR median price for Newport, OR

g: assumed to be $1,000 for family

TOTAL COSTS FOR ALL EMPLOYEES

LOCATION	Non-RE Cost/Empl (a)	No. Employees (b)	RE cost/employee	No. RE empl (c)	**Total Cost (d)**
Long Beach, CA	$ 35,380.59	111	$ 89,330.00	67	**$ 9,912,355.21**
Santa Barbara, CA	$ 41,451.50	111	$ 89,330.00	67	**$ 10,586,226.50**
Pacific Grove, CA	$ 42,311.23	111	$ 101,710.00	67	**$ 11,511,115.98**
Santa Cruz, CA	$ 41,474.90	111	$ 101,710.00	67	**$ 11,418,283.90**
Newport, OR	$ 37,188.90	111	$ 71,850.00	67	**$ 8,941,917.90**
Seattle, WA	$ 44,783.40	111	$ 79,215.00	67	**$ 10,278,362.40**
Honolulu, HI	$ 67,458.16	111	$ 92,045.00	67	**$ 13,654,871.04**

a: total = house hunting + travel en route + temp subsistence + transport household goods

b: assume 68% of 139 existing federal employees relocate

c: assumes 60% relocating employees are homeowners

d: total = (Non-RE per employee x # employees) + (RE cost per employee x # RE employees)

APPENDIX C
HYDROLOGY ANALYSIS REPORT FOR PROPOSED NOAA SWFSC RELOCATION, LA JOLLA, CALIFORNIA (PBS&J)

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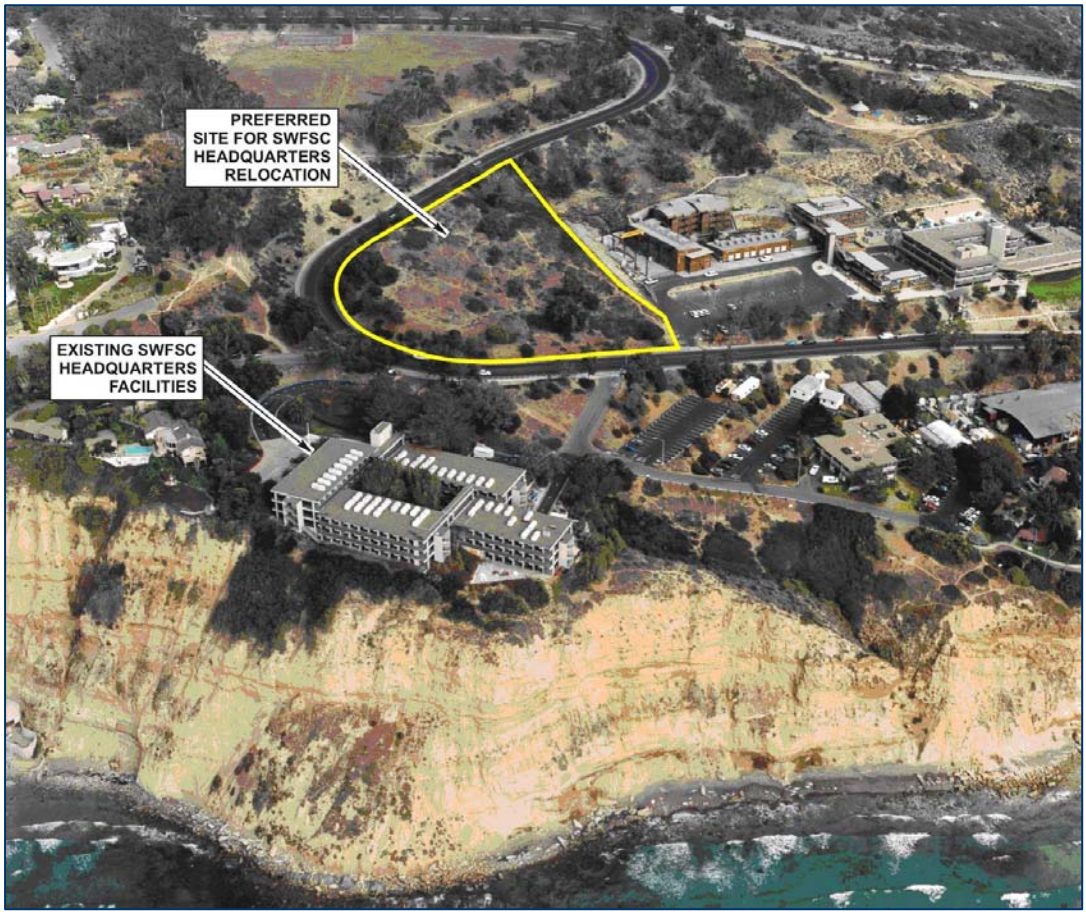
JANUARY 2007



Hydrology Analysis Report for Proposed National Oceanic and Atmospheric Administration (NOAA) Southwest Fisheries Science Center (SWFSC) Relocation, La Jolla, California

Submitted to

SRI International
333 Ravenswood Ave
Menlo Park, CA 94025

PBS&J

PBS&J Project No.: 491172.02 1000

Hydrology Analysis Report for Proposed National Oceanic and Atmospheric Administration (NOAA) Southwest Fisheries Science Center (SWFSC) Relocation, La Jolla, California

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January 2007

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Executive Summary

To support the National Oceanic and Atmospheric Administration in its facility and landscape design for the present and proposed relocation sites for the Southwest Fisheries Science Center (SWFSC) headquarters and to analyze project effects, this study assesses the affected environment and anticipated impacts on hydrologic resources.

Design and treatment measures are recommended in accordance with applicable mitigation measures per the 2004 final version of the University of California San Diego Long Range Development Plan Environmental Impact Report (UCSD LRDP EIR).

For the existing SWFSC site to be consistent with the UCSD LRDP EIR, it is recommended that coastal sage scrub be established within the demolition areas. Replacement of building structures with vegetation on the present SWFSC site would cause a decrease in the peak flow.

At the relocation site, an approximate two cubic feet per second increase in peak flows leaving the site is anticipated under the proposed condition scenario and will require detention to mitigate for the increase in peak flows. A conceptual layout with recommended Best Management Practices (BMP) to achieve detention is included herein. Additional BMP options for providing detention that are not included in the conceptual layout are listed.

Existing slopes that would be disturbed along the perimeter of the proposed relocation site fronting La Jolla Shores Drive are mainly protected by existing vegetation. In areas of sparse vegetation, additional native plantings would be established to prevent erosion on these slopes. Proposed cut slopes would be stabilized by using temporary woven mesh or netting restraints until plantings are well established.

This study provides recommendations to eliminate non-storm water runoff from the proposed SWFSC relocation into Area of Special Biological Significance 31 in accordance with the California Ocean Plan and National Pollutant Discharge Elimination System (NPDES) permit.

A conceptual layout of BMP providing water quality benefits is included herein as an option to address the California Ocean Plan.

The project must also comply with the UCSD Storm Water Management Plan (SWMP) which serves as the Water Quality Control Plan required under the California Ocean Plan. The SWMP includes measures to eliminate non-storm water runoff and an Action Plan addressing the monitoring activities to determine if non storm water runoff has been eliminated.

Water quality would also have the potential to be impacted during site construction. Under the NPDES permit program, a Storm Water Pollution Prevention Plan will be prepared by the contractor and BMP implemented for construction and demolition activities.

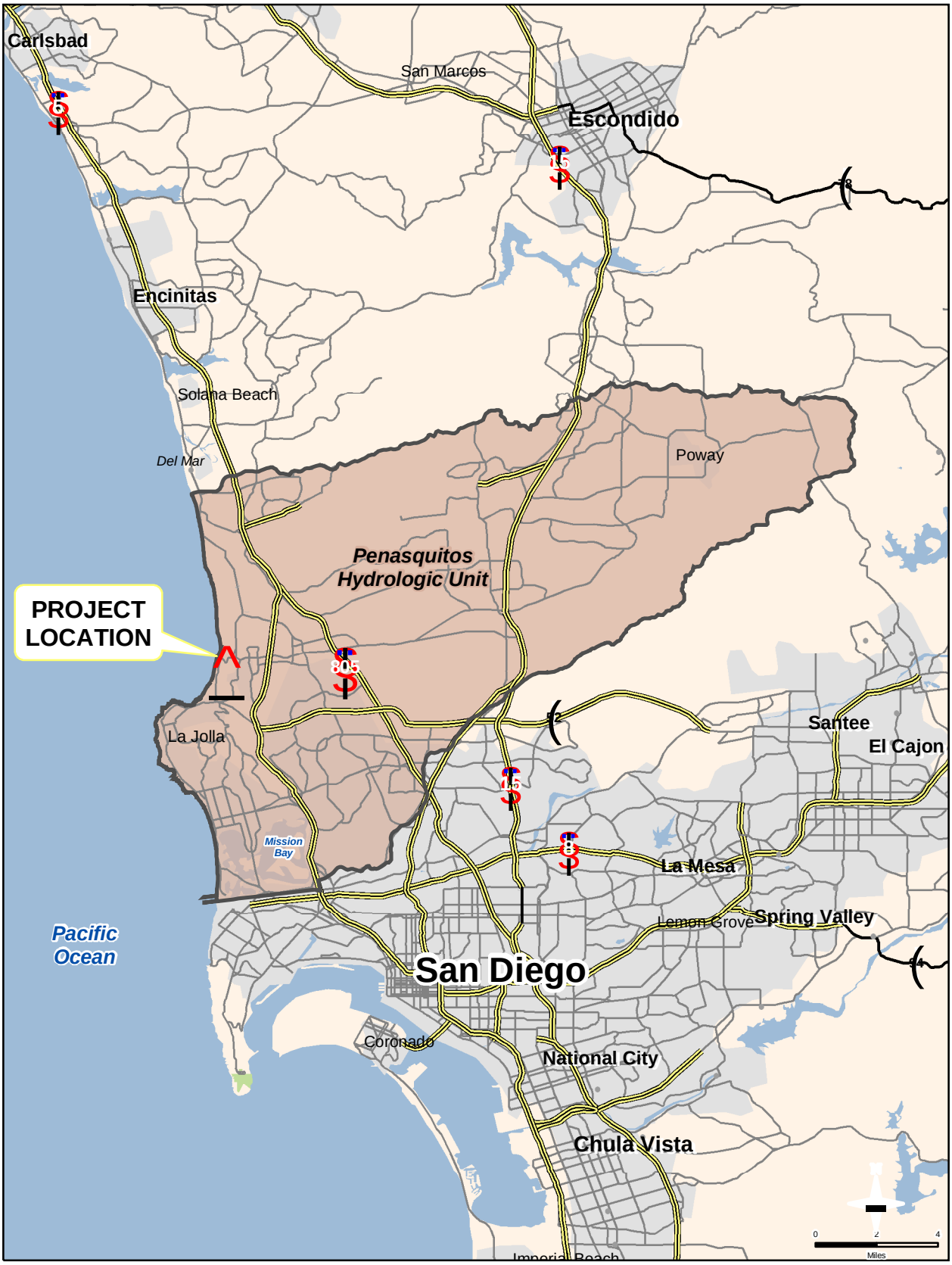
1.0 Background

The National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS), Southwest Region is one of six regional offices and six research centers throughout the United States. The Region's Southwest Fisheries Science Center (SWFSC) conducts scientific research on fisheries of the Pacific Ocean and provides scientific management advice on fishery resources.

NOAA has tentatively identified a proposed action that involves removal of some or all the existing SWFSC facilities, and constructing a single new structure on a preferred site. A regional map provides the general location of the study area, see Figure 1. The present site, existing facility, and the proposed relocation site, a 3.6-acre largely undeveloped parcel at the northernmost edge of Scripps Institution of Oceanography (SIO), are shown on the Vicinity Map, see Figure 2.

The SWFSC headquarters and La Jolla Laboratory are located adjacent to SIO on the University of California, San Diego (UCSD) campus in the community of La Jolla located within the City of San Diego, California. The headquarters facilities consist of structures threatened by coastal bluff erosion. For this reason, a prospective site for relocating the SWFSC to a new facility within the SIO property is being considered. Both the demolition of the SWFSC at the existing site and construction of the new facility at the proposed relocation site require an evaluation of hydrologic conditions for planning purposes and to assess project impacts under the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA).

Various applicable water quality standards apply to the present and proposed relocation sites. The project must demonstrate compliance with the National Pollutant Discharge Elimination System (NPDES) (Permit No. CA01017239); the California Ocean Plan (Order No. R9-2005-0008); the UCSD Storm Water Management Plan (SWMP) (UCSD, 2005); and applicable mitigation measures from the UCSD Long-Range Development Plan (LRDP) Environmental Impact Report (EIR) (PBS&J, 2004).



SOURCE: 2002 ESRI Streetmap dataset

PBSJ

REGIONAL LOCATION MAP

FIGURE 1

2/6/06 EC KM Z:\Projects\IS\SRI\Mxd\Fig1_RegionalLocation.mxd

SOURCE: Landiscor Aerial Photograph, 2003

PBSJ

VICINITY MAP

FIGURE 2

3/30/06 EC KM Z:\Projects\IS\SRI\Mxd\Fig2_VicinityMap.mxd

2.0 Objectives

To support NOAA in its facility and landscape design for the proposed project and to analyze project effects, this study assesses the affected environment, anticipated impacts on hydrologic resources, and recommends design and treatment measures that will reduce or eliminate on- and near-site erosion and impaired water quality. The design and treatment measures address erosion control methods, maintenance of peak runoff for the 10-year, 6-hour storm event, and applicable mitigation measures per the 2004 final version of the UCSD LRDP EIR.

The California Ocean Plan applies to drainage areas tributary to the San Diego Marine Life Refuge, identified by the State Water Resources Control Board (SWRCB) as an Area of Special Biological Significance 31 (ASBS 31). The NPDES Permit titled 'Waste Discharge Requirements for University of California, Scripps Institution of Oceanography, San Diego County' is effective until February 9, 2010 and provides an exception to the California Ocean Plan for non-storm water discharges at SIO. The exception is valid until January 1, 2007; thereafter, all non-storm water discharges are to be eliminated.

The proposed SWFSC relocation is tentatively scheduled for construction beginning in the year 2008. This study provides recommendations to eliminate non-storm water runoff from the proposed SWFSC relocation in accordance with the California Ocean Plan and NPDES Permit No. CA01017239.

The project must also comply with the UCSD SWMP which serves as the Water Quality Control Plan (WQMP) required under the California Ocean Plan. The SWMP includes measures to eliminate non-storm water runoff and an Action Plan addressing the monitoring activities to determine if non storm water runoff has been eliminated.

3.0 Methodology

The Modified Rational Method following the 1981 San Diego County Hydrology Manual was utilized to perform all hydrologic calculations within this study and was chosen to maintain consistency with the hydrology study performed as part of the UCSD LRDP EIR. A computerized version of the Modified Rational Method prepared with the HydroWIN 2005 Advanced Engineering Software (AES) program was utilized to help automate the process.

Nodes represent specific locations within each watershed, such as the upstream or downstream end of a pipe, a manhole or inlet location, or a given location on the surface, typically either the most upstream location within a watershed, or a point of concentration or point of interest for surface flows. Links represent the reaches between nodes. A complete node-link model for a watershed starts with a node at the upstream end, continues with a series of links and nodes in a downstream direction, and ends with a node at the downstream end linked together to form a hydrologic model of the entire watershed.

The AES program allows the user to develop a node-link model of the watershed. The nodes are placed as needed to depict the sub-basin topography, and are linked together to model conveyance mechanisms and confluence points of the watershed.

The AES program has the capability of performing calculations utilizing 15 functions. These functions are assigned code numbers, which appear in the printed results. The code numbers and their corresponding functions are included in Appendix A.

Existing and developed condition hydrology maps are presented in Figures 4 through 9. The hydrology maps depict hydrologic node numbers, drainage basin areas, major and minor drainage basin boundaries, land use boundaries and classifications. Drainage basin boundaries were determined from the UCSD LRDP EIR and SWMP for the SIO, field reconnaissance, and the proposed relocation site conceptual layout. Land use designations were based on the UCSD LRDP EIR for the existing condition and modified for the ultimate condition to reflect the proposed SWFSC at the relocation site and partial demolition at the existing SWFSC.

Hydrologic Criteria

The following criteria were utilized for hydrologic computations. Where multiple land uses occurred within the same drainage basin, a composite runoff coefficient was calculated.

Hydrologic Soil Type	Soil Type "D" (1)
Runoff Coefficients (based on land use)	
Turf / Open Space (TUR)	0.45
Single Family Residential (SFR)	0.55
Multi Family Residential / Dorms (MFR)	0.70
Commercial / Administrative (COM)	0.85
Paved (PAV)	0.95

Hydrologic Soil Type	Soil Type "D" [1]
Rainfall Intensity	Based on 1981 intensity-duration curves as presented in the 1981 *San Diego County Hydrology Manual*
Storm Event	10- and 100-year, 6-hour storm event

[1] Four hydrologic soil groups are used for estimating the runoff potential of soils. Group A has the lowest runoff potential, and Group D has the highest. Groupings are based on soil properties that influence runoff, such as water infiltration rate, texture, natural drainage or wetness, and the rock presence of a restrictive underlying layer or rock material. In comparison with Group A through C soil types, Group D soils have very slow infiltration rates when thoroughly wetted. They are chiefly clays that have a high shrink-swell potential, soils that have a high permanent water table, soils that have a claypan or clay layer at or near the surface, or soils that are shallow over nearly impervious material. Rate of water transmission is very slow (Soil Survey, San Diego Area, California 12/73).

3.1 Evaluation of Hydrology – Existing Conditions

The existing SWFSC and proposed relocation sites are located within the Penasquitos Hydrographic Unit (6.00) of the San Diego Region as defined in the San Diego Basin Water Quality Control Plan (1994), referred to as the Basin Plan. The Penasquitos Hydrographic Unit is a triangular shaped area encompassing approximately 170 square miles extending from Poway to La Jolla. The unit is comprised of five hydrologic areas; the SIO property is located within the Scripps Hydrologic Area. Annual precipitation levels with the Penasquitos Unit range from approximately 8 inches along the coast to over 18 inches at the inland reaches, with Scripps Hydrologic Area averaging approximately 10 inches per year. The SIO property drains directly to the Pacific Ocean via overland flow or within storm drain systems, see Figure 2.

The present SWFSC basin point of discharge is perched high on the cliff and flows first to a natural swale, then over the cliff, Node 103, and ultimately to ASBS 31, see Figure 4. Flows from the relocation site enter into a storm drain and are conveyed to the watershed outlet located to the southwest of Hubbs Hall, Node 207, within the SIO portion of the UCSD campus and ultimately to ASBS 31, see Figure 4.

Flood Insurance Rate Maps (FIRM) indicates that the existing SWFSC and proposed relocation sites are located in an area designated as Zone X (FEMA, June 19, 1997). Zone X is defined as an area determined to be outside the 100-year and the 500-year floodplains. The applicable FIRM panel is 06073C1582F and 06073C1601F.

3.2 Evaluation of Hydrology - Proposed Conditions

The proposed condition for the Scripps Hydrologic Area and the FIRM will remain unchanged from the existing hydrologic condition. The points of discharge will similarly remain unchanged; however, the land use and topography on both the existing and relocation sites will be altered with the proposed changes; therefore, an analysis reflecting the existing and proposed scenarios is provided below.

The present SWFSC site land use would be altered from the existing condition to include a greater share of open space (1.93 acres) and less commercial (0.76 acre) area following the demolition of buildings B and C shown on Figure 3. The topography, for hydrologic analysis purposes, remains unchanged.

The proposed relocation site land use would be altered from the existing condition to include a greater percentage of commercial space (1.71 acres) and less open space (0.89 acre). The topography of the site would be altered to allow for the proposed building structure, and the adjusted slopes are reflected in the analysis.

3.3 Natural Water Quality and Applicable Water Quality Standards

Runoff is a term used to describe any water that drains or runs off a defined land area into a waterway. Runoff can be the result of rain, in which case it is also sometimes referred to as storm water. Runoff can also result from various other sources or activities such as irrigation, hosing down of areas, errant wash water from cleaning, leaks in pipes, and air conditioner condensation. When runoff is not the result of natural precipitation, it is sometimes referred to as non-storm water. Non-storm water runoff is usually the result of land uses and activities that have potential to produce pollutants that could adversely affect water quality.

As previously stated, the SIO property is tributary to ASBS 31. Per the California Ocean Plan, a WQMP is required for the SIO. The UCSD SWMP satisfies SIO's WQMP requirement for the California Ocean Plan and is referenced in the analysis. The necessary measures to prohibit non-storm water urban runoff (discharges or urban runoff to a storm drain that are not entirely composed of storm water), except those discharges associated with fire fighting or other catastrophic events, and the necessary measures to be taken to reduce pollutants in the storm water discharges from the demolition and relocation sites. The inspection, monitoring, identification of pollutants, and implementation of Best Management Practices (BMPs) presented within the UCSD SWMP.

3.4 Monitoring Data

Pollutant monitoring data collected by UCSD Environmental, Health & Safety staff at "Outfall 001", corresponding to Node 207 on Figure 4, are provided in Appendix B. The Action Plan provisions presented in the UCSD SWMP (Section 4.4) should be adhered to meet monitoring and inspection guidelines. The Action Plan is included in Appendix C.

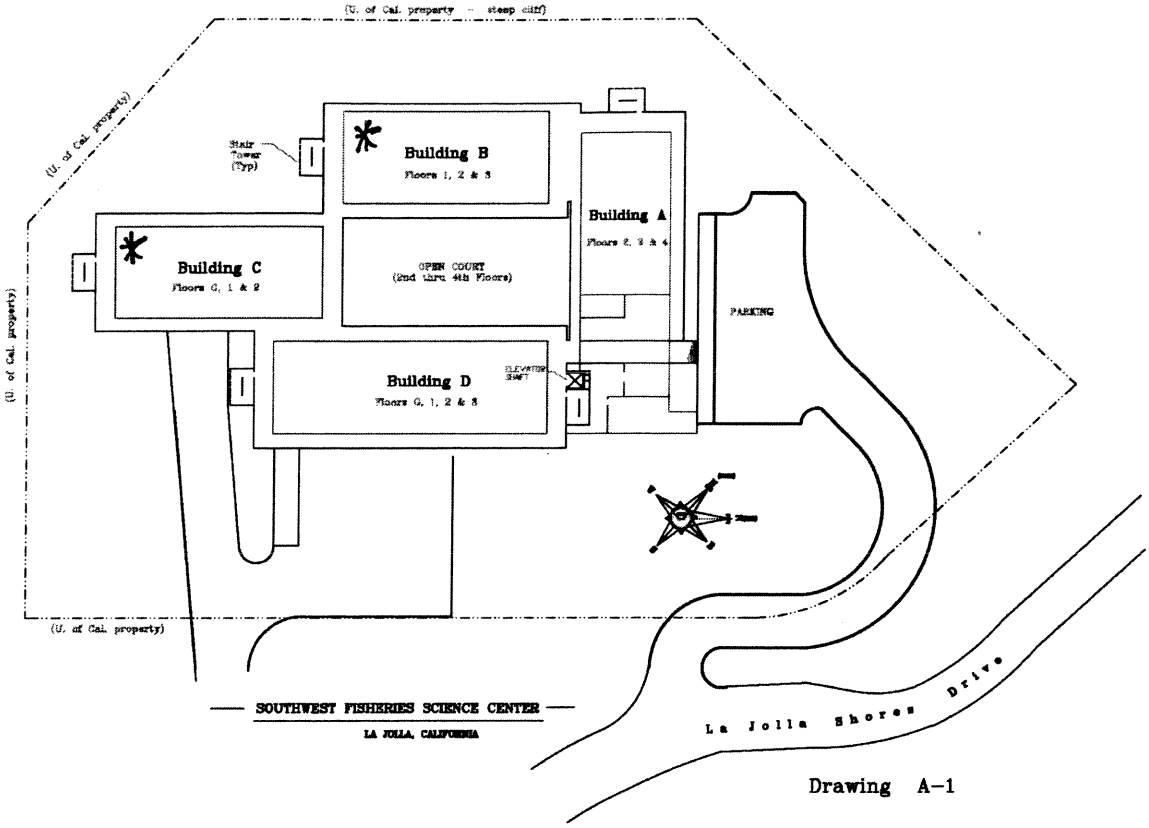


Figure 3 Existing SWFSC Facilities

*BUILDINGS B AND C TO BE DEMOLISHED.

4.0 Findings

4.1 General Hydrologic Analysis

The proposed relocation SWFSC watershed area for combined off-site and on-site hydrology consists of 80 acres. The on-site drainage basin at the proposed relocation site consists of 2.6 acres and is located centrally within a larger combined off-site and on-site watershed, see Figures 4 through 7. In general, flows for the watershed traverse east to west discharging at Node 207. Node 207 is the most downstream location in the watershed where runoff enters the Pacific Ocean, corresponding to “Outfall 001” as named in the UCSD SWMP.

The elevations of the combined watershed containing the proposed relocation site varies between 385 feet mean sea level (MSL) near the eastern boundary of the watershed to a low of approximately 18 feet MSL near the western boundary of the watershed. The drainage basins for the combined watershed are provided, see Figures 4 and 7.

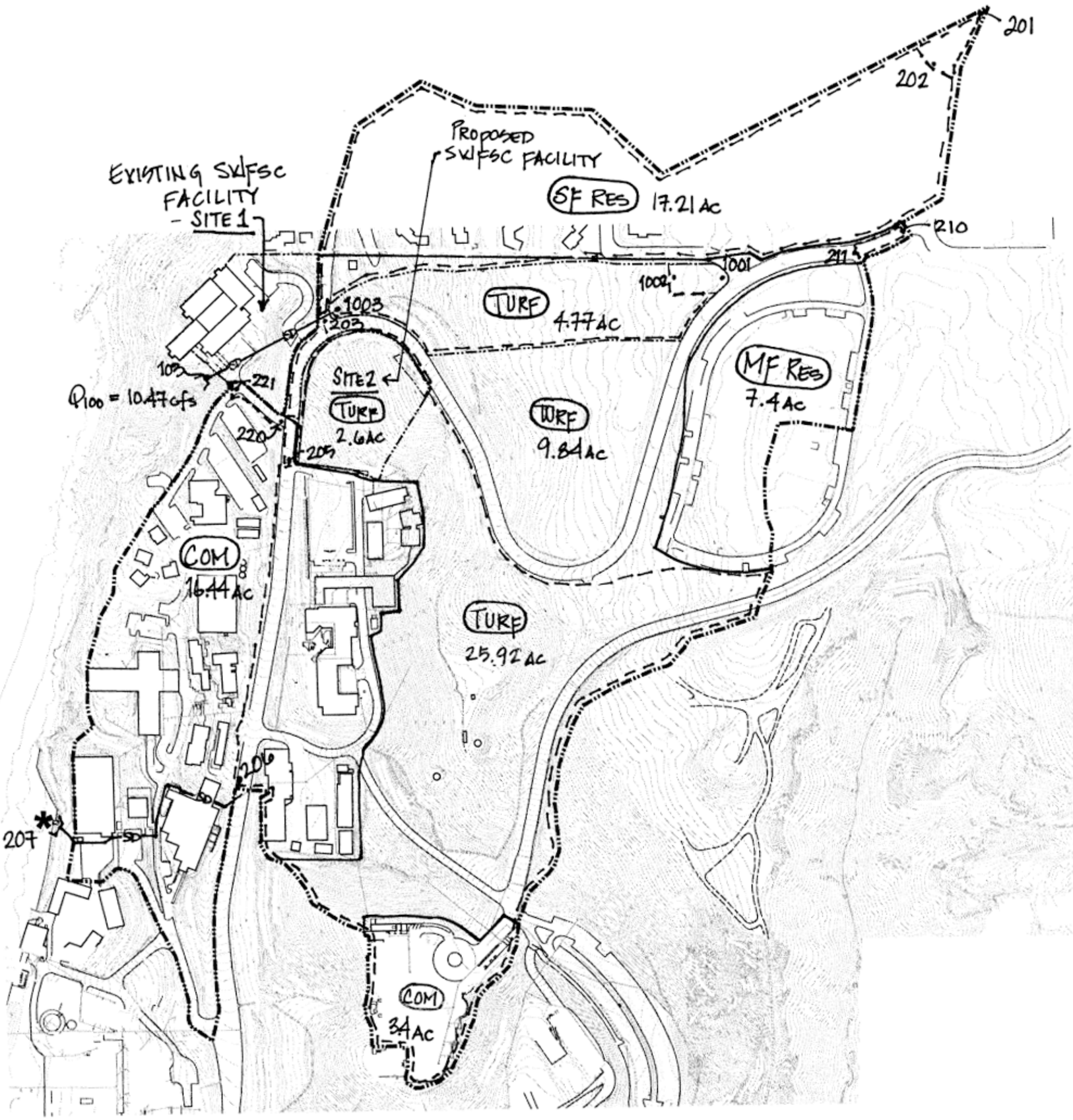
On site, the preferred site varies in elevations at the proposed relocation site vary between 293 feet MSL near the northeastern boundary to a low of approximately 213 feet MSL near the southwestern boundary. The on-site drainage basins are provided, see Figures 5 and 6.

The watershed area for the existing SWFSC combined off-site and on-site hydrology consists of 4.8 acres. The on-site drainage basin for the existing SWFSC site consists of 2.7 acres and is situated at the downstream end of a larger combined off-site and on-site watershed, see Figures 4 and 7 through 9. In general, flows for the watershed traverse east to west discharging to Node 203. Node 103 is the most downstream location in the watershed where runoff enters the Pacific Ocean, corresponding to “Outfall Fisheries” as named in the UCSD SWMP.

The elevations of the combined watershed containing the existing SWFSC site varies between 377 feet MSL near the eastern boundary of the watershed to a low of approximately 195 feet MSL near the western boundary of the watershed. The drainage basins for the combined watershed are provided, see Figures 4 and 7.

On-site elevations at the present SWFSC site vary between 290 feet MSL near the eastern boundary to a low of 195 feet MSL at the southern boundary. The on-site drainage basins are provided, see Figures 8 and 9.

For purposes of determining appropriate mitigation measures, the proposed hydrologic condition is performed under the assumption that all runoff leaves the relocation site. Per proposed BMPs presented in Section 4.4, a substantial portion of the flows would be contained within the relocation site to mitigate for an increase in peak flows and to eliminate the release of non-storm water discharges.



OFFSITE HYDROLOGY

EXISTING

1" = 300'

N

LEGEND

- BASIN BOUNDARY
- SUB-BASIN BOUNDARY
- LAND USE BOUNDARY
- —SD— STORM DRAIN

* TOTAL Q_{100} = 113.97 cfs AT NODE 207

FIGURE 4

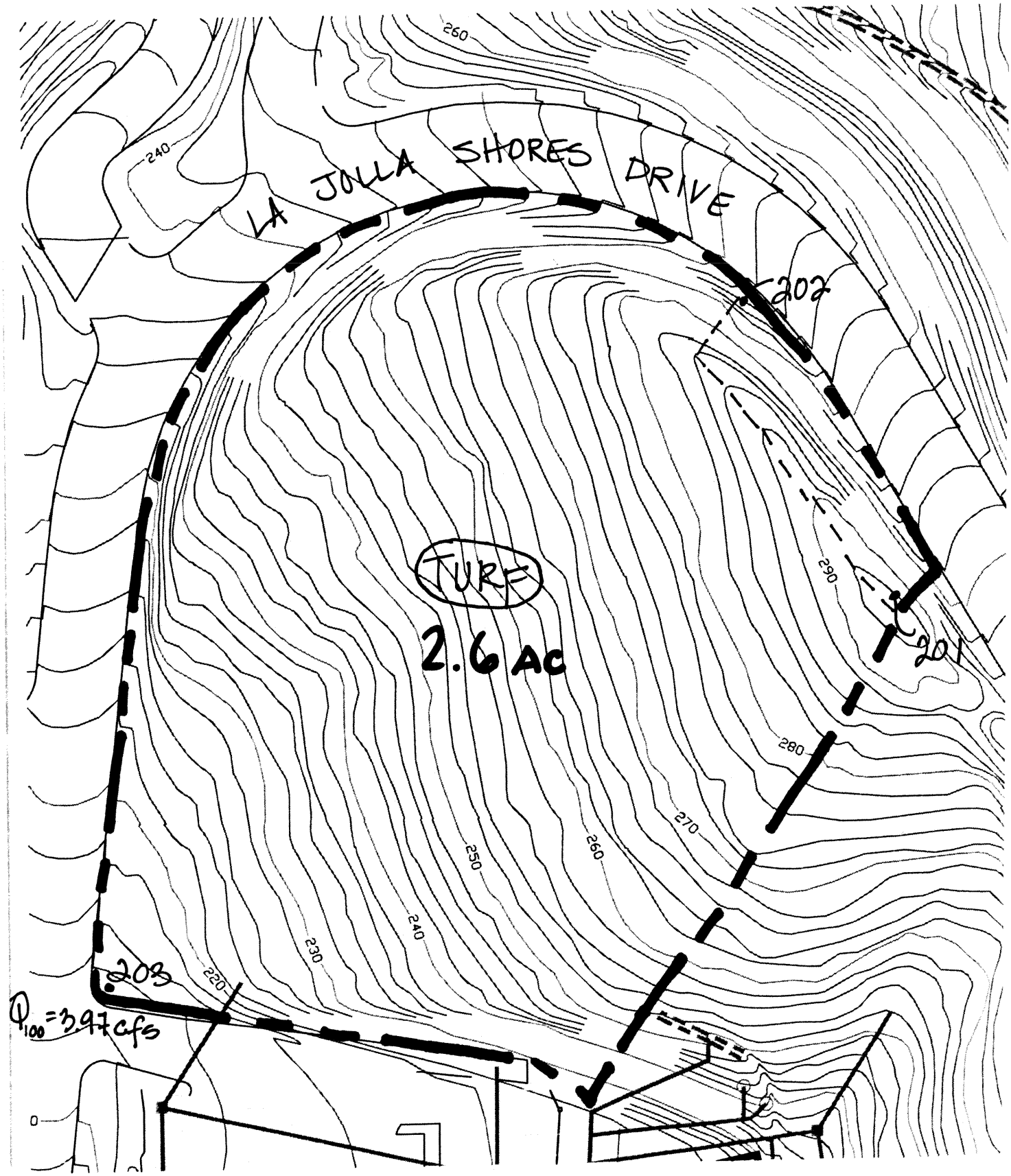
SITE 2 - PREFERRED SITE

1" = 60'

N

FIGURE 5

EXISTING HYDROLOGY



LEGEND

BASIN BOUNDARY

SUB-BASIN BOUNDARY

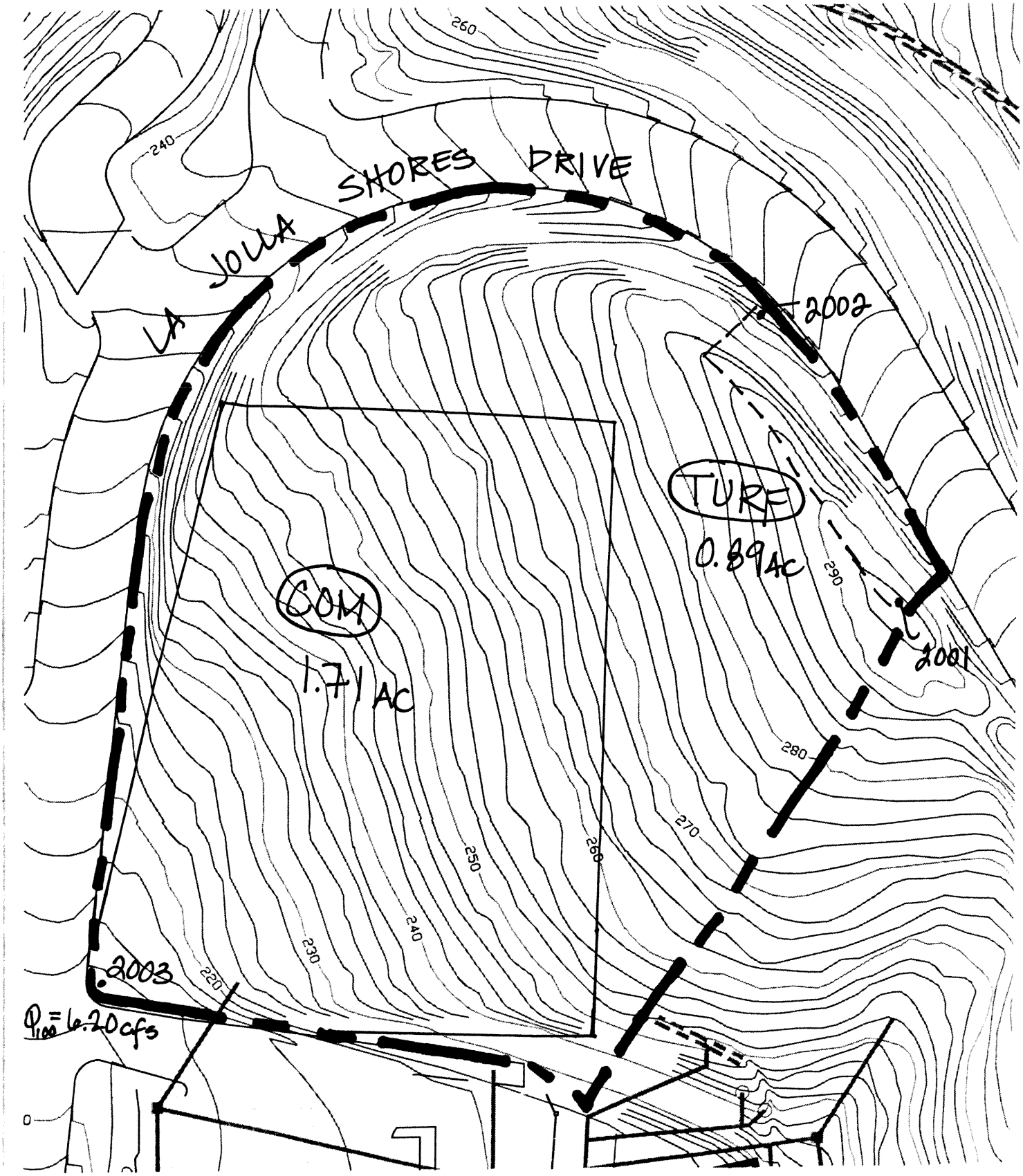
SITE 2 - PREFERRED SITE

1" = 60'

N

FIGURE 6

PROPOSED HYDROLOGY

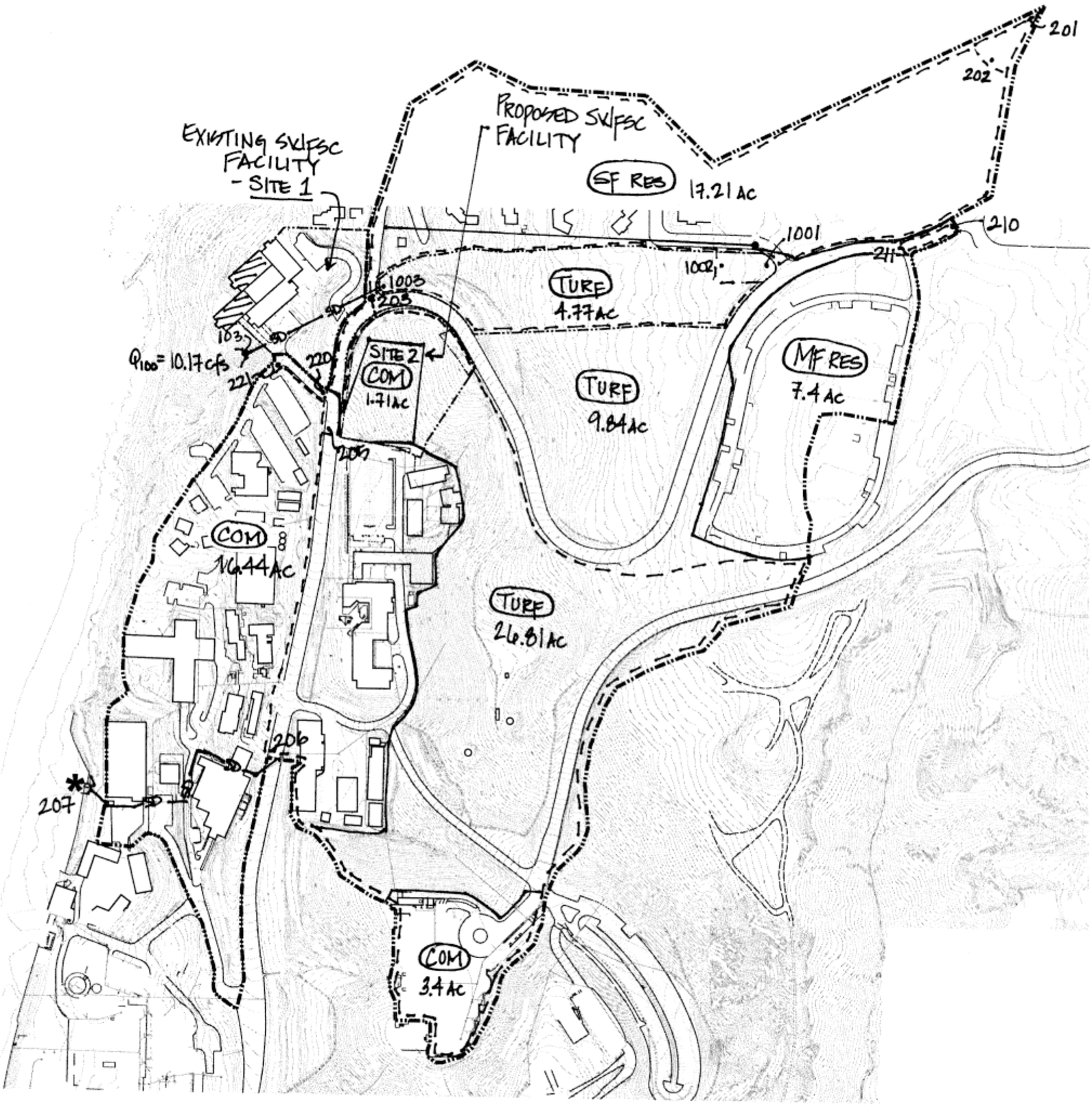


LEGEND

BASIN BOUNDARY

LAND USE BOUNDARY

SUB-BASIN BOUNDARY



OFFSITE HYDROLOGY
PROPOSED

1" = 300'

N

LEGEND

- BASIN BOUNDARY
- SUB-BASIN BOUNDARY
- LAND USE BOUNDARY
- —SD— STORM DRAIN

* TOTAL Q_{100} = 115.68 cfs AT NODE 207

FIGURE 7

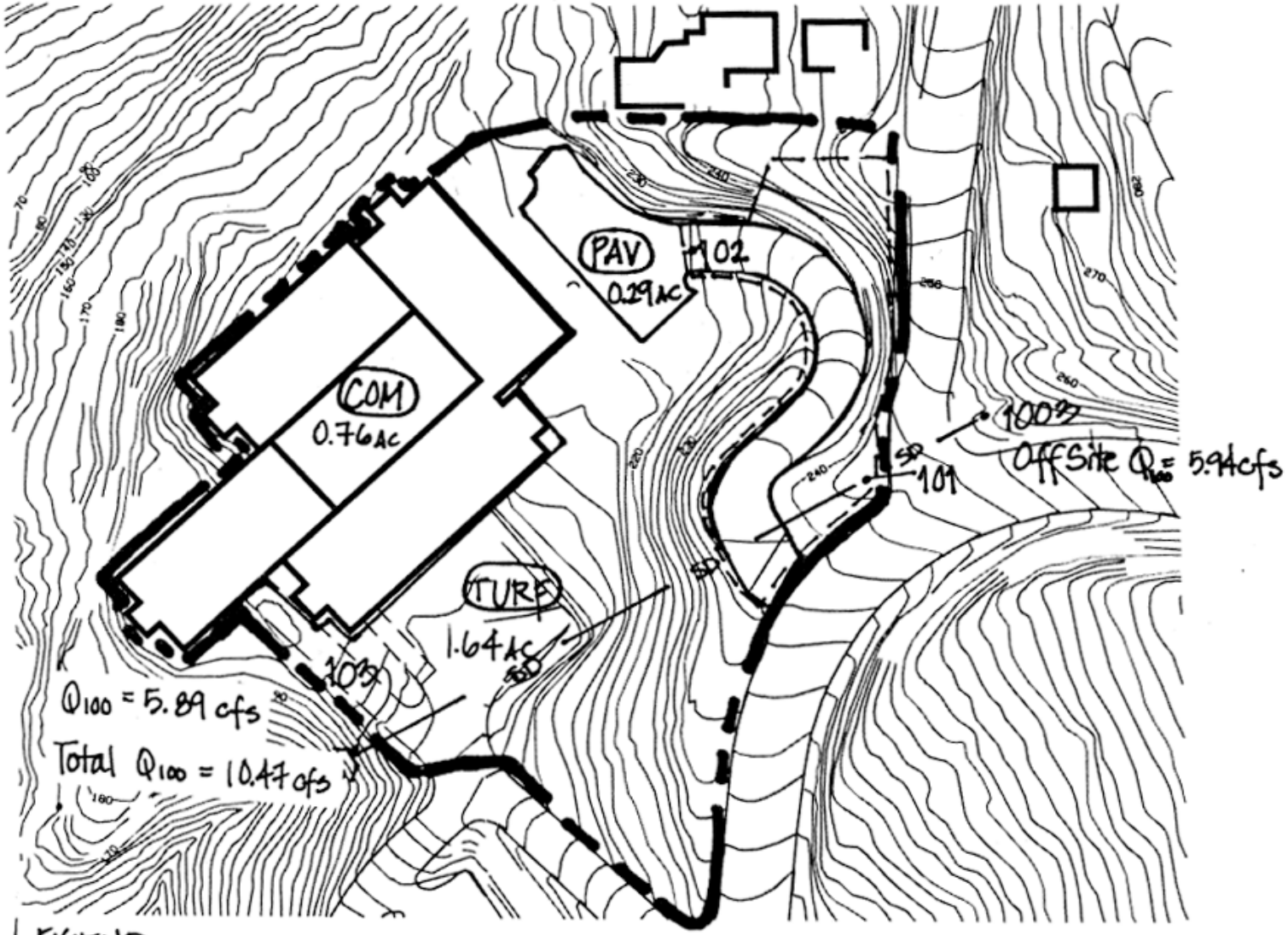
FIGURE 8

SITE 1: CURRENT SITE

EXISTING HYDROLOGY

1" = 80'

N



LEGEND

BASIN BOUNDARY

SD STORM DRAIN

LAND USE BOUNDARY

SUB-BASIN BOUNDARY

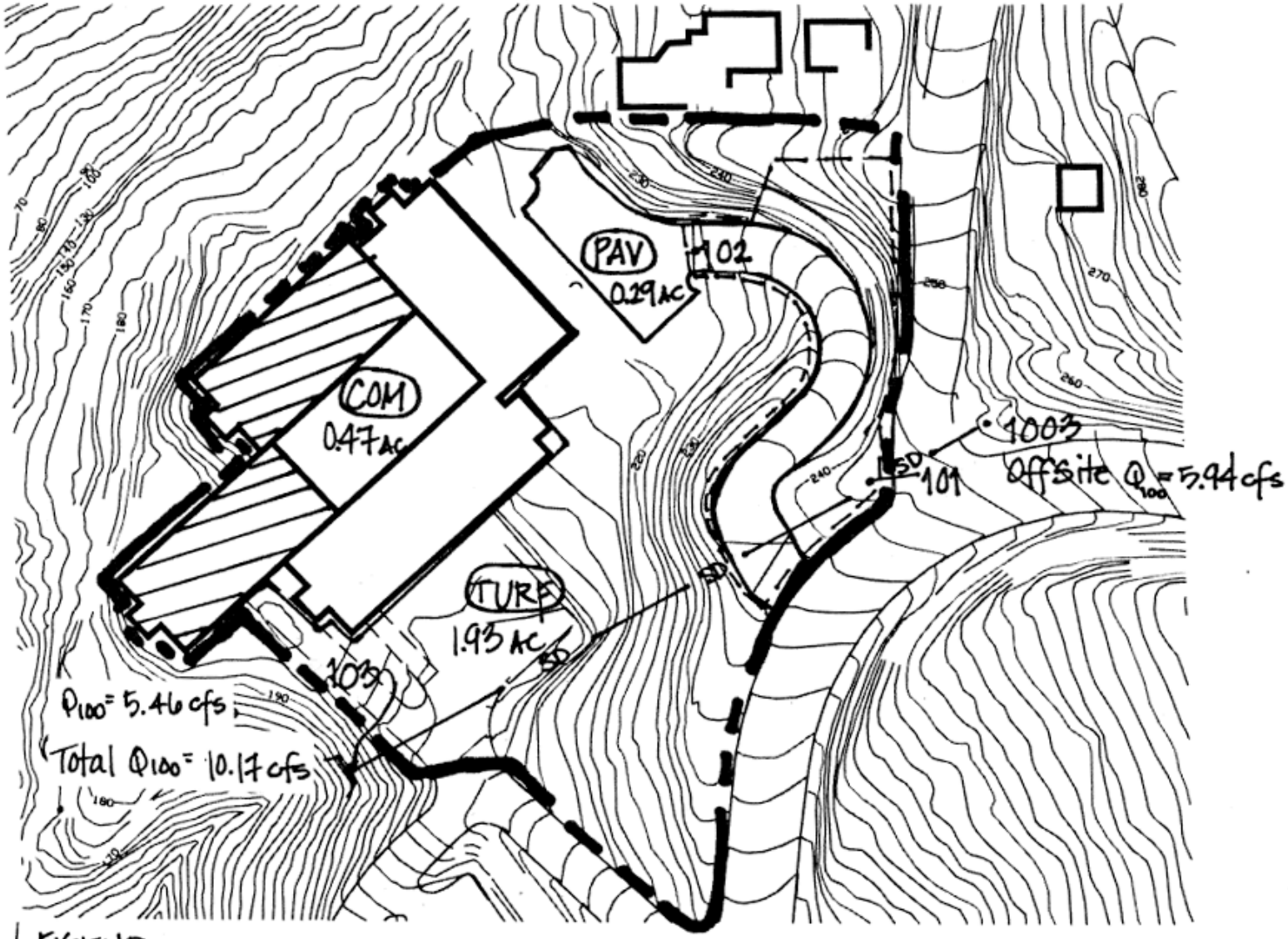
FIGURE 9

SITE 1: CURRENT SITE

PROPOSED HYDROLOGY

1" = 80'

N



LEGEND

BASIN BOUNDARY

DEMOLITION

LAND USE BOUNDARY

SUB-BASIN BOUNDARY

4.2 Existing and Proposed Condition Hydrologic Analysis Comparisons

Table 1 below summarizes the results of the hydrologic analysis for the proposed relocation site. Eight scenarios were modeled for the existing and developed conditions analyzing the 10-year and 100-year storm events for the combined on-site and off-site watershed as well as the on-site drainage basin. The table presents each scenario along with the most downstream node, the peak flow, tributary area, and the time of concentration.

Table 1. Proposed Relocation Site 10-Year and 100-Year Storm Event Peak Runoff Summary

Condition	Storm Event	Location	Figure	Node(s)	Q (cubic feet per second)	A (acres)	tc (minutes)
Existing	10-year, 6-hour	On-site Outlet	5	203	2.8	2.6	12.0
		Watershed Outlet	4	207	81.2	79.9	22.7
	100-year, 6-hour	On-site Outlet	5	203	4.0	2.6	11.2
		Watershed outlet	4	207	114.0	79.9	21.7
Developed	10-year, 6-hour	On-site Outlet	6	2003	4.4	2.6	12.2
		Watershed Outlet	7	207	82.4	79.9	22.7
	100-year, 6-hour	On-site Outlet	6	2003	6.2	2.6	11.4
		Watershed Outlet	7	207	115.7	79.9	21.7

Table 2 below summarizes the results of the hydrologic analysis for the present existing SWFSC site. Similar to the hydrologic analysis for the preferred proposed relocation site hydrologic analysis, the same eight scenarios were modeled. The table presents the each scenario along with the most downstream node, the peak flow, tributary area, and the time of concentration.

Table 2. Existing Site 10-Year and 100-Year Storm Event Peak Runoff Summary

Condition	Storm Event	Location	Figure	Node(s)	Q (cubic feet per second)	A (acres)	tc (minutes)
Existing	10-year, 6-hour	On-site Outlet	8	103	4.4	2.7	10.3
		Watershed Outlet	4	103	8.6	7.5	9.9
	100-year, 6-hour	On-site Outlet	8	103	5.9	2.7	9.9
		Watershed outlet	4	103	10.5	7.5	18.4
Developed	10-year, 6-hour	On-site Outlet	9	103	4.0	2.7	10.5
		Watershed Outlet	7	103	8.2	7.5	10.1
	100-year, 6-hour	On-site Outlet	9	103	6.0	2.7	17.9
		Watershed Outlet	7	103	10.2	7.5	18.4

Implementation of the proposed project would result in the demolition of two buildings at the existing SWFSC site, and construction of a new commercial building, landscaping, and other features at the relocation site. After demolition of the existing buildings, the general drainage patterns at the present SWFSC site would remain unchanged. Therefore, demolition is expected to result in a slight decrease in on-site runoff at the existing site due to a change in runoff coefficients from commercial, 0.85, to turf, 0.45. However, the project is expected to result in a slight increase in on-site runoff at the proposed relocation site due to a change in the runoff coefficients from turf, 0.45, to commercial, 0.85. The general drainage patterns of the proposed relocation site and the existing site would remain unchanged.

Table 3 provides a comparison of the peak runoff as modeled for changes in land use. Mitigation, as discussed in the next section, is required to detain increases in peak flows that exceed the existing flows at the watershed outlet.

Table 3. Change in Peak Runoff from Existing to Developed Condition Hydrology

Location	Q_{10} (cfs)			Q_{100} (cfs)		
	Existing	Proposed	dQ[(1)]	Existing	Proposed	dQ[(1)]
Present Site at Watershed Outlet - Node 203	8.6	8.2	-0.4	10.5	10.2	-0.3
Preferred Relocation Site at Watershed Outlet - Node 207	81.2	82.4	+1.2	114.0	115.7	+1.7

(1) dQ represents the change in peak runoff for a given storm event.
(2) An increase in peak runoff during the 10-year, 6-hour storm event must be mitigated by detention within each major drainage basin pursuant to the 2004 UCSD 2004 LRDP EIR.

At the existing SWFSC site, there would be a decrease in the peak flows leaving the site. At the relocation site, an increase in peak flows leaving the site is anticipated under the proposed condition scenario. The flows from the proposed relocation site converge with off-site drainage at Node 207. The determination point for the attenuation of peak flow rates is at Node 207, where the flows leave the USCD property limit; and, the hydrologic analysis required to satisfy mitigation measures is based on the 10-year, 6-hour storm event. At this node, the total basin area is 80 acres. The total existing Q_{10} storm flow is 81.2 cfs. The total proposed Q_{10} storm flow is 82.4 cfs, a 1.2 cfs increase in storm flows across UCSD property limits. Detention is to occur on site to mitigate for the increase in the peak flow at the site limits and is discussed in Section 4.3.1. The 1.2 cfs increase for mitigation is a conservative estimate that does not account for on-site detention. During subsequent design stages, the effect on peak flows due to detention on site should be included in the analysis.

Results of the rational method hydrologic calculations for the existing and developed condition 10- and 100-year storm events for the proposed relocation site are presented in Appendix D. The results of the existing and developed condition 10- and 100-year storm events for the existing SWFSC site are presented in Appendix E.

4.3 Criteria for Final Site Design

Applicable runoff mitigation measures from the Hydrology Technical Report prepared for the UCSD LRDP EIR include the following:

> "For each development or redevelopment project that would result in an increase of 5,000 square feet or more of impervious surface, the engineer of record shall perform a drainage study approved by the UCSD Facilities Design and Construction and Physical Planning departments that complies with the following conditions. BMPs and other recommendations used to comply with these conditions shall be incorporated into construction plans and other relevant project development plans. BMPs shall be consistent with UCSD adopted physical plans, shall be operational prior to project completion and occupancy, and shall be maintained by UCSD.
>
> Post-development peak storm water runoff discharge rates shall not exceed the estimated pre-development rate for developments where the increased peak storm water discharge rate will result in increased potential for downstream erosion. Therefore, all developments are required to maintain the peak runoff for the 10-year, 6-hour storm event. In cases where known or potential on or off-site erosion problems have been identified, the engineer of record in coordination with UCSD shall determine if maintenance of peak runoff for a larger storm event is necessary.
>
> Measures that protect slopes and channels such as energy dissipaters, vegetation, and slope/channel stabilizers shall be applied where appropriate."

The above requirements were restated in the following Mitigation Measures Hyd-1A (ii) and (iii) from the Mitigation Monitoring and Reporting Program of the UCSD LRDP EIR.

Hyd-1A (ii) "Measures that protect slopes and channels such as energy dissipaters, vegetation, and slope/channel stabilizers shall be applied where appropriate."

Hyd-1A (iii) "All developments that will increase impervious surfaces by 5,000 square feet or more are required to maintain the peak runoff for the 10-year, 6-hour storm event. In cases where known or potential on or off-site erosion problems have been identified, the engineer of record in coordination with UCSD shall determine if maintenance of peak runoff for a larger storm event is necessary.

"This standard shall be applied at the location where storm runoff from the drainage basin in which the project is located flows across UCSD property limits, either as overland flow or contained within a storm water conveyance system."

4.3.1 Proposed Relocation Site

Recommended site design BMPs were selected using the California Stormwater Management Practices Handbook prepared by California Stormwater Quality Association (CASQA) and previous experience.

A conceptual layout with recommended BMP options to address the detention of peak flows is provided, see Figure 10. This conceptual plan provides one option for detention. Different BMPs may become more suitable to the site as the design progresses. Within the conceptual plan, the proposed building is a four-level structure with an open area deck or roof on levels three and four. Planter boxes with native sedges are proposed on the roof tops to capture additional runoff

Roof runoff from levels three and four would be routed through drain pipes and collected in rain barrels situated at the ground floor along the north and east building perimeters. The collected rain runoff would flow through pipes into one of three rain gardens within the landscaped areas adjacent to the north and east sides of the building. The rain gardens would serve to retain flows collected from the impervious roof area. In addition to the rain gardens, foundation plantings are proposed within the landscaped areas to eliminate erosion around the base of the commercial building that could otherwise occur due to concentrated sheet flows during heavy rains. These areas promote infiltration of runoff and mitigate for base flows on site.

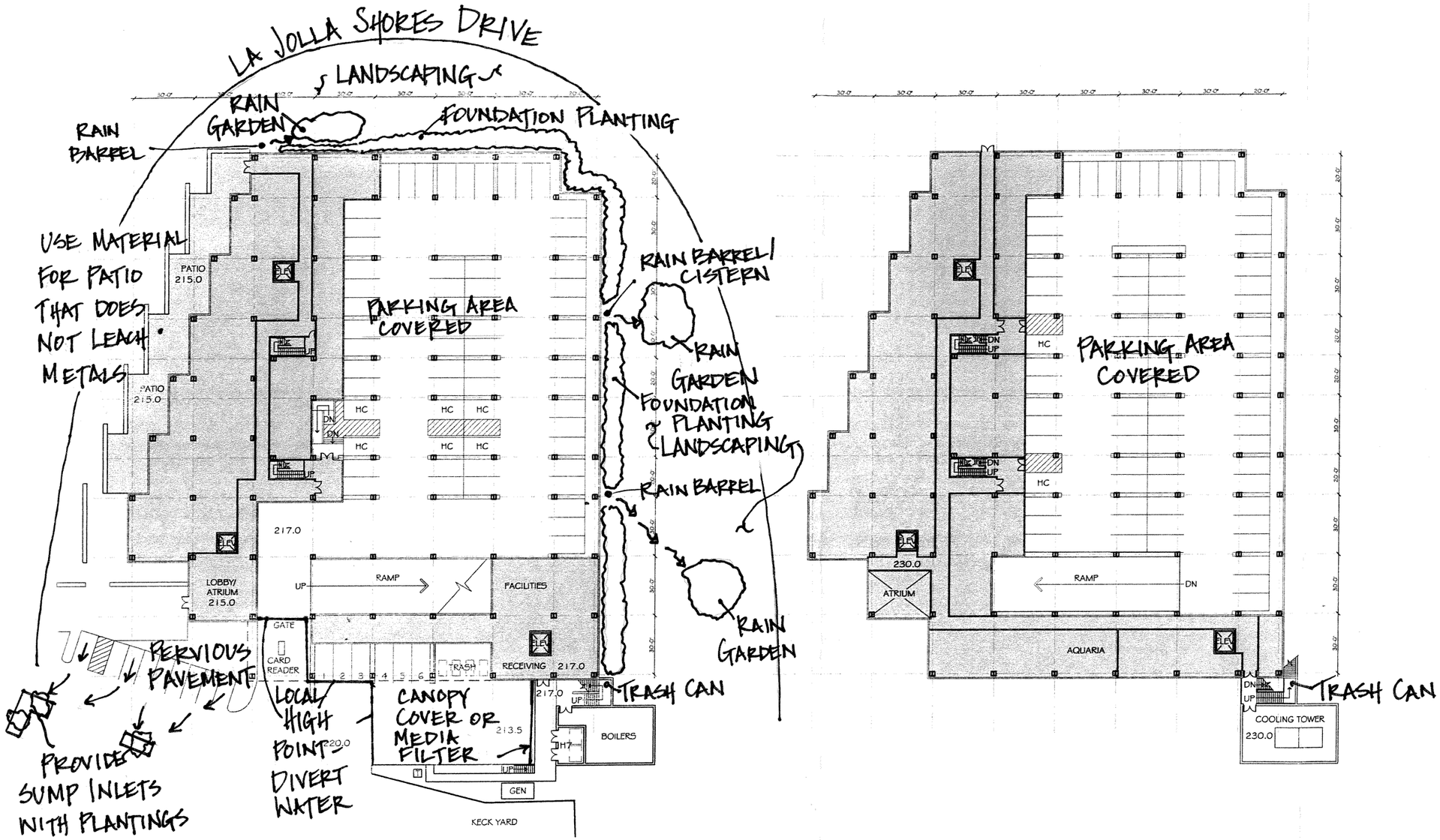
A short-term parking area is proposed adjacent to the southwest corner of the building to have permeable pavement to maximize infiltration, provide retention, slow runoff, and minimize impervious area. Runoff in the short-term parking area would flow to several planting islands without a curb and gutter to provide additional mini-retention basins (vegetated sumps).

Additional options to achieve mitigation not included in this conceptual plan may include infiltration trenches, vegetated swales, vegetated buffer strips, infiltration basins, or bio-retention amongst other available BMP providing protection.

The Urban Runoff Quality Management Approach is a method of sizing volume-based BMPs for planning level estimates and the methodology is described in detail in the American Society of Civil Engineers Manual of Practice No. 87. The Urban Runoff Quality Management Approach, corresponding to approximately an 85th percentile runoff event, estimates 3900 cubic feet of storage would be required on the project site for treatment control. The BMPs recommended in this conceptual layout would need to collectively provide the 3900 cubic feet of storage. The calculations to determine the required treatment volume are included in Appendix F.

Existing slopes that would not be disturbed along the perimeter of the proposed relocation site fronting La Jolla Shores Drive are mainly protected by existing vegetation. In areas of sparse existing vegetation, additional native plantings would be established to prevent erosion on these slopes. Proposed cut slopes would be stabilized by using temporary woven mesh or netting restraints until plantings are well established.

Proposed development flows leave the site in an existing storm drain infrastructure system. A non-erosive existing storm drain infrastructure system is in place and would convey the flows from the demolition and proposed relocation project off site. Velocities within the storm drain system are not anticipated to increase as a result of the project and energy dissipating measures at the outlet of the storm drain facilities are not recommended.



ELEVATION 215'-0"

ELEVATION 230'-0"

FIRST FLOOR PLAN			
08.31.04	PARKING SPACES	63	
PARKING COUNT MAY REDUCE 5% TO 8% TO FACILITATE STAIRS AND ELEVATORS	LEVEL 1 TOTAL	53,500	SQ.FT.
	USEABLE	20,800	SQ.FT.

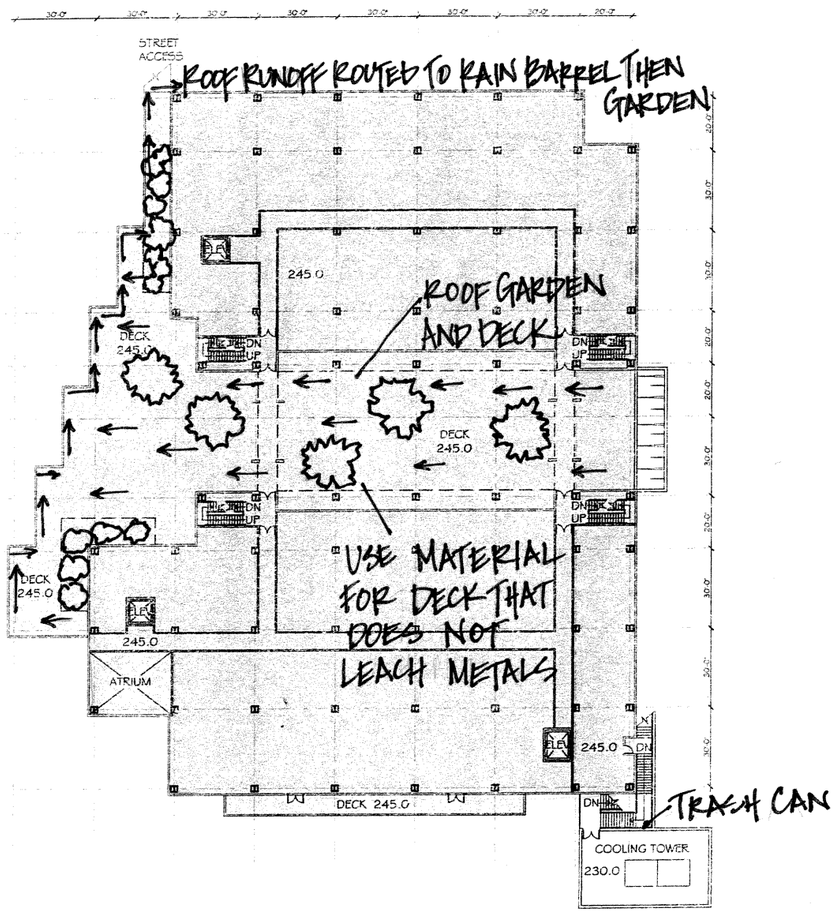
SECOND FLOOR PLAN			
08.31.04	PARKING SPACES	76	
PARKING COUNT MAY REDUCE 5% TO 8% TO FACILITATE STAIRS AND ELEVATORS	LEVEL 2 TOTAL	53,500	SQ.FT.
	USEABLE	23,300	SQ.FT.

CONCEPTUAL PLAN- FIGURE 10A

Delawie
Wilkes
Rodrigues
Barker

SCHEME ONE

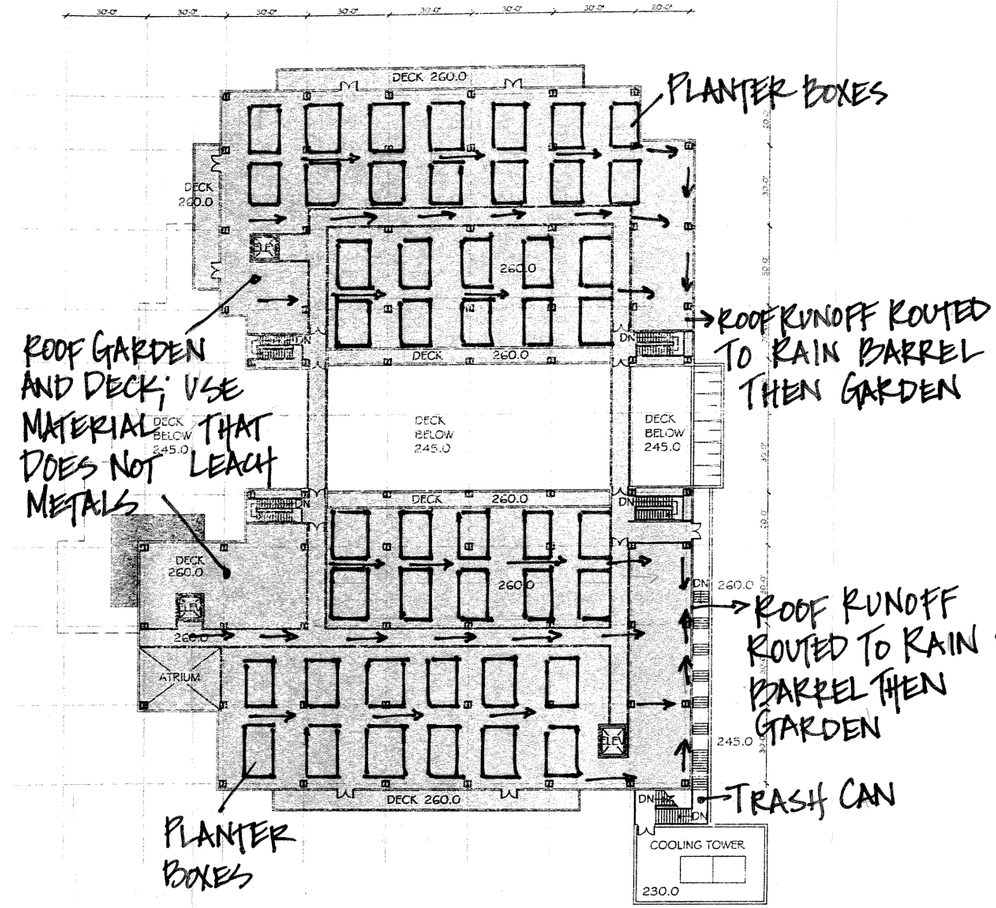
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
SOUTHWEST FISHERIES SCIENCE CENTER - LA JOLLA



ELEVATION 245'-0"

THIRD FLOOR PLAN

LEVEL 3 TOTAL	38,000 SQ.FT.
USEABLE	37,300 SQ.FT.



ELEVATION 260'-0"

FOURTH FLOOR PLAN

LEVEL 4 TOTAL	38,060 SQ.FT.
USEABLE	37,500 SQ.FT.

CONCEPTUAL PLAN - FIGURE 10B

Delawie
Wilkes
Rodrigues
Barker

SCHEME ONE

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
SOUTHWEST FISHERIES SCIENCE CENTER - LA JOLLA

In addition to providing detention in accordance with Mitigation Measures Hyd-1A (ii) and (iii) from the UCSD LRDP EIR, the BMPs recommended above would provide water quality benefits and capture non-storm water related discharges as conditioned in the California Ocean Plan. Runoff containing potential pollutants from the developed areas would pass through mini-retention features to capture both the storm water flows and potential discharges. As described as an option above, the mini-retention features would include rain barrels, rain gardens, vegetated sump islands in the short-term parking area, covered parking garage and loading dock and trash areas, landscaping, and the use of materials that serve to eliminate the leaching of metals. The building perimeter rain barrels or cisterns would direct roof runoff to rain gardens capturing and filtering associated storm water pollutants. Vegetated sump islands within the short-term parking area would collect potentially contaminated runoff and allow infiltration. Pervious pavement proposed in this parking area would also serve to maximize infiltration, provide retention, slow runoff, and minimize impervious land coverage. A canopy cover is recommended to protect the loading dock and trash areas. If the canopy cover interrupts the building design, then a media filter may alternatively be used. These BMPs function to eliminate non-storm water runoff discharges into ASBS 31 and to protect water quality. Other options to protect water quality may be considered in place of those BMPs included in this conceptual layout. Additional BMPs that may be considered on the site include bio-retention, vegetated swales, vegetated buffer strips, vortex separator, media filter, drain inserts, water quality inlets, infiltration trenches, and an infiltration basin amongst other BMPs that work effectively to treat water quality.

4.3.2 Existing SWFSC Demolition Site

For the existing SWFSC site to be consistent with Mitigation Measures Hyd-1A (ii) and (iii) from the UCSD LRDP EIR, it is recommended that coastal sage scrub be established within the demolition areas. Replacement of building structures with vegetation on the present SWFSC site would cause a decrease in the peak flow.

4.4 Sea Water Return System Waste Discharge Requirements

Although the California Ocean Plan prohibits waste discharges into ASBS 31, the SWRCB adopted Resolution No. 2004-0052 on July 22, 2004, which included a Mitigated Negative Declaration for a conditional exception to the prohibition against waste discharges. The exception establishes requirements and conditions applicable to the discharges into ASBS 31 from the seawater system at SIO. The exception is conditioned on compliance by UCSD/SIO with its NPDES Permit No.CA0107239, Waste Discharge Requirements (WDR).

Numerical effluent limits for seawater (solely seawater or seawater co-mingled with storm water) discharges into ASBS 31 by UCSD/SIO, were set forth in “Section C. Special Conditions, Item 1, Numerical Effluent Limitations for Outfalls #001,…” of the WDR. Numerical effluent limits for the dry weather seawater waste discharge from Outfall #001 became effective on February 9, 2005.

In order for UCSD/SIO to monitor its dry weather discharges separately and to address “Section C. Item5. Prohibition c,” which prohibits discharge of non-storm water to a storm

drain system, Southwest Fisheries/UCSD/SIO is required to separate the seawater return system from the storm water conveyance system, and install a designated seawater return system that will allow separate sampling of seawater discharge from the storm water.

4.5 Flooding On Site or Off Site

Flooding is not expected to occur at the existing SWFSC and proposed relocation sites as a result of the proposed changes in land use because site design mitigation to detain peak flows to their existing condition is recommended.

4.6 Water Quality Degradation and Water Quality Evaluation

Per the UCSD SWMP, pre-project water quality discharges would need to be monitored to establish baseline levels. Post-project water quality discharges shall not be worsened as a result of the project. Monitoring and inspection data guidelines will be adhered to, in accordance with Section 4.4 (Action Plan) of the SWMP.

4.7 Considerations During Construction

Water quality would also have the potential to be impacted during site construction. Land disturbing construction activities associated with implementation of the proposed project, such as grading and excavation, construction of new building foundations, roads, driveways, and trenches for utilities, could result in the localized alteration of drainage patterns. These alterations may temporarily exceed the capacity of storm water facilities if substantial drainage is rerouted. Temporary ponding and/or flooding could also result from temporary alterations of the drainage patterns or from the temporary creation of a sump condition due to grading. Land alterations may temporarily result in erosion and siltation if flows were substantially increased or routed to facilities or channels without capacity to carry the flow.

Under the NPDES permit program, a Storm Water Pollution Prevention Plan (SWPPP) will be prepared by the contractor and BMPs implemented for construction and demolition activities on both the existing SWFSC and proposed relocation sites. BMPs identified in the SWPPP shall accomplish the following:

Minimizing land disturbance. Clearing of land is limited to that which will be actively under construction; new land disturbance during the rainy season is minimized; and disturbance to areas that would not be affected by construction is avoided.

Stabilizing disturbed areas. Temporary stabilization of disturbed soils is provided via implementation of on-site erosion and sediment control BMPs whenever active construction is not occurring on graded portions of the site; and permanent stabilization is provided after finish grading via implementation of landscaping, irrigation and maintenance.

Protecting off-site slopes and channels. To avoid erosion of slopes and channels outside of the approved grading area, disturbance of natural channels is avoided, unvegetated off-site slopes are stabilized via implementation of erosion control BMPs, and

increases in runoff velocity caused by project construction is managed via implementation of on-site diversion or detention measures.

Controlling construction site perimeters. Upstream runoff is diverted around or safely conveyed through the construction sites and is kept free of excessive sediment and other constituents via implementation of filtration BMPs. Sediment-laden waters from disturbed or active construction areas within the existing SWFSC and proposed relocation sites are detained from discharging downstream via implementation of perimeter sediment control BMPs.

Implementation of appropriate BMPs as part of compliance with the General Construction Storm Water Permit would protect the quality of storm water runoff from the existing SWFSC and proposed relocation sites. In addition, the construction sites would be managed under the UCSD SWMP in compliance with the Phase II regulations and the 2004 UCSD LRDP EIR. Therefore, short-term water quality and hydrology impacts resulting from alterations of drainage patterns during construction would be less than significant.

5.0 Report Authors and Qualifications

Ann E. Redington, P.E., CFM, Project Engineer
B.S., Environmental Engineering, San Diego State University, 2002
B.S., Ornamental Horticulture, University of Illinois, 1998
California Professional Engineer, License Number 69329
Certified Floodplain Manager, Certificate No. US-03-00849
Association of State Floodplain Managers (ASFPM)
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Ann Redington provides engineering and technical support in the planning and design of stormwater infrastructure and flood control facilities. Representative projects include preparation of master drainage plans, hydrologic and hydraulic studies, floodplain studies, NPDES program compliance, plan checking, open channel design, and the design of a detention basin. Her experience also includes modeling using HEC-1, HEC-2, HEC-RAS, and AES; and she is proficient in GIS and AutoCAD.

Jennifer R. Bileck, P.E., Project Engineer
B.S., Environmental Engineering, Old Dominion University, 2001
M.E., Environmental Engineering, Old Dominion University, 2002
California Professional Engineer, License Number 69606
American Society of Civil Engineers - Young Member Forum
Haestad Methods WaterCAD and WaterGEMS - Certified Expert Modeler 2003

Jennifer Bileck is a Project Engineer in the PBS&J California Water Resources Program. She has experience in water, wastewater, and stormwater planning, and design and construction of utilities, including water mains, wastewater gravity and force mains for new, rehabilitation, and expansion projects.

6.0 References

California Stormwater Quality Association (CSQA), California Stormwater BMP Handbooks: New Development and Redevelopment, January 2003.

California Environmental Protection Agency, State Water Quality Control Board – San Diego Region, Order No. R9-2005-0008, NPDES Permit No. CA 0107239, Waste Discharge Requirements for University of California, Scripps Institution of Oceanography, San Diego County, February 9, 2005.

Environmental, Health & Safety at UCSD, UCSD/Scripps Monitoring Summary, February 11, 2005.

MACTEC Engineering and Consulting, Inc, Stormwater Management Plan for Scripps Institution of Oceanography, University of California, San Diego, August 2005.

PBS&J, UCSD Long Range Development Plan Environmental Impact Report: Hydrology Study for University of California, San Diego, La Jolla, California, May 2004.

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WEF Manual of Practice No. 23 / ASCE Manual of Practice No. 87, pages 175-178, 1998.

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Appendix A
AES Program Function Code Numbers

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AES Program Function Code Numbers

Sub-area Hydrologic Processes

Code 1:	confluence analysis at node
Code 2:	initial sub-area analysis
Code 3:	pipe travel time (computer-estimated pipe size)
Code 4:	pipe travel time (user-specified pipe size)
Code 5:	trapezoidal channel travel time
Code 6:	street-flow analysis
Code 7:	user-specified information at node
Code 8:	addition of sub-area runoff to mainline
Code 9:	v-gutter flow through sub-area
Code 10:	copy main stream data onto a memory bank
Code 11:	confluence a memory bank with the main stream memory
Code 12:	clear a memory bank
Code 13:	clear the main stream memory
Code 14:	copy a memory bank onto the main stream memory
Code 15:	hydrologic data bank storage functions

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Appendix B
Monitoring Data

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FEBRUARY 11, 2005, UCSD / SCRIPPS MONITORING SUMMARY

OUTFALL 1

Analyte	Sample Location	Date	Time	Result	Units	Calc. 30-Day Average	Calc. 6-Month Median	Wet or Dry Weather?	NPDES Permit Table	Method	Method Detection Limit	Reporting Limit	6-Mo. Median	Daily Maximum	Instant. Maximum	30-Day Average	7-Day Average	Instant Minimum	Potential Constituent of Concern?
Oil and Grease	Outfall001	02/11/05	1310	ND	mg/L	ND		Wet Weather	1	EPA 1664A	1	5			75	25	40		NO
Total Suspended Solids	Outfall001	02/11/05	1310	5.80	mg/L	4.900		Wet Weather	1	SM 2540D	0.5	0.5			120	60	n/a		NO
Total Settleable Solids	Outfall001	02/11/05	1310	ND	mL/L	ND		Wet Weather	1	SM 2540 F	0.1	0.1			3.0	1.0	1.5		NO
Turbidity	Outfall001	02/11/05	1310	6.12	NTU	4.465		Wet Weather	1	EPA 180.1	1	2			225	75	100		NO
pH (0-14)	Outfall001	02/11/05	1310	6.12	pH Units			Wet Weather	1	EPA 150.1	0.1	0.2			9.0			6.0	NO
Arsenic	Outfall001	02/11/05	1310	1.66	ug/L		NA	Wet Weather	2	EPA 1640	0.01	0.015	18	90	234				NO
Cadmium	Outfall001	02/11/05	1310	0.06	ug/L		NA	Wet Weather	2	EPA 1640	0.005	0.01	3	12	30				NO
Chromium VI (substitute total chromium value)	Outfall001	02/11/05	1310	1.28	ug/L		NA	Wet Weather	2	EPA 1640	0.005	0.01	6	24	60				NO
Copper	Outfall001	02/11/05	1310	13.00	ug/L		NA	Wet Weather	2	EPA 1640	0.005	0.01	5	32	86				NO
Lead	Outfall001	02/11/05	1310	5.01	ug/L		NA	Wet Weather	2	EPA 1640	0.005	0.01	6	24	60				NO
Mercury	Outfall001	02/11/05	1310	ND	ug/L		NA	Wet Weather	2	EPA 1640	0.005	0.01	0.239	0.959	2.399				NO
Nickel	Outfall001	02/11/05	1310	0.89	ug/L		NA	Wet Weather	2	EPA 1640	0.005	0.01	15	60	150				NO
Selenium	Outfall001	02/11/05	1310	0.014E (DNQ)	ug/L		NA	Wet Weather	2	EPA 1640	0.01	0.015	45	180	450				NO
Silver	Outfall001	02/11/05	1310	0.13	ug/L		NA	Wet Weather	2	EPA 1640	0.005	0.01	1.78	8.08	20.68				NO
Zinc	Outfall001	02/11/05	1310	16.60	ug/L		NA	Wet Weather	2	EPA 1640	0.005	0.01	44	224	584				NO
Cyanide	Outfall001	02/11/05	1310	ND	ug/L		NA	Wet Weather	2	SM 4500-CN	1	5	3	12	30				NO
Total Residual Chlorine	Outfall001	02/11/05	1310	20E (DNQ)	ug/L		NA	Wet Weather	2	SM 4500-Cl	10	50	6	24	180				NO
Ammonia as Nitrogen	Outfall001	02/11/05	1310	10E (DNQ)	ug/L		NA	Wet Weather	2	SM 4500-NH	10	50	1,800	7,200	18,000				NO(2)
Acute Toxicity (TUa)				Not Tested				Wet Weather	2		.	.	n/a	0.3	n/a				
Chronic Toxicity (TUa)				Not Tested				Wet Weather	2		.	.	n/a	3	n/a				
Non-Chlorinated Phenolic Compounds	Outfall001	02/11/05	1310	ND	ug/L		NA	Wet Weather	2	EPA 625	0.1	0	90	360	900				NO
Chlorinated Phenolic Compounds	Outfall001	02/11/05	1310	ND	ug/L		NA	Wet Weather	2	EPA 625	0.1	0.2	3	12	30				NO
Endosulfan	Outfall001	02/11/05	1310	ND	ug/L		NA	Wet Weather	2	EPA 625	0.001	0.005	0.027	0.054	0.081				NO
Endrin	Outfall001	02/11/05	1310	ND	ug/L		NA	Wet Weather	2	EPA 625	0.001	0.005	0.006	0.012	0.018				NO
HCH	Outfall001	02/11/05	1310	ND	ug/L		NA	Wet Weather	2	EPA 625	0.001	0.005	0.012	0.024	0.036				NO
Radioactivity Gross Alpha (pCi/L) Result ± Error	Outfall001	02/11/05	1310	1.96+2.21	pCi/L			Wet Weather	2	7110C	.	0.28							NA
Radioactivity Gross Beta (pCi/L) Result ± Error	Outfall001	02/11/05	1310	203+62.1	pCi/L			Wet Weather	2	900.0	.	4							NA
acrolein	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	3	EPA 8260B	4.3	20				660			NO
antimony	Outfall001	02/11/05	1310	0.24	ug/L	0.26		Wet Weather	3	EPA 1640	0.01	0.015				3,600			NO
bis(2-chloroethoxy)methane	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	3	EPA 625	0.05	0.1				13.2			NO
bis(2-chloroisopropyl)ether	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	3	EPA 625	0.05	0.1				3,600			NO
chlorobenzene	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	3	EPA 8260B	0.36	1.0				1,710			NO
Chromium III (substitute total chromium value)	Outfall001	02/11/05	1310	1.28	ug/L	1.05		Wet Weather	3	EPA 1640	0.005	0.01				570,000			NO
di-n-butyl phthalate	Outfall001	02/11/05	1310	0.036B	ug/L	ND		Wet Weather	3	EPA 625	0.005	0.01				10,500			NO
dichlorobenzenes	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	3	EPA 8260B	0.38	1.0				15,300			NO
diethyl phthalate	Outfall001	02/11/05	1310	0.152B	ug/L	ND		Wet Weather	3	EPA 625	0.005	0.01				99,000			NO
dimethyl phthalate	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	3	EPA 625	0.005	0.01				2,460,000			NO
4,6-dinitro-2-methylphenol	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	3	EPA 625	0.1	0.2				660			NO
2,4-dinitrophenol	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	3	EPA 625	0.1	0.2				12			NO
ethylbenzene	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	3	EPA 8260B	0.17	1.0				12,300			NO
fluoranthene	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	3	EPA 625	0.001	0.005				45			NO
hexachlorocyclopentadiene	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	3	EPA 625	0.05	0.1				174			NO
nitrobenzene	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	3	EPA 625	0.05	0.1				14.7			NO
thallium	Outfall001	02/11/05	1310	0.011	ug/L	0.011		Wet Weather	3	EPA 1640	0.005	0.01				6			NO
toluene	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	3	EPA 8260B	0.35	1.0				255,000			NO
tributyltin	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	3	Krone et a	0.001	0.003				0.0042			NO
1,1,1-trichloroethane	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	3	EPA 8260B	0.32	1.0				1,620,000			NO
acrylonitrile	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	4	EPA 8260B	3.6	20				0.3			NO(1)
aldrin	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	4	EPA 625	0.001	0.005				0.000066			NO(1)
benzene	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	4	EPA 8260B	0.26	0.50				17.7			NO
benzidine	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	4	EPA 625	0.05	0.1				0.000207			NO(1)
beryllium	Outfall001	02/11/05	1310	0.006E (DNQ)	ug/L	ND		Wet Weather	4	EPA 1640	0.005	0.01				0.099			NO(2)
bis(2-chloroethyl)ether	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	4	EPA 625	0.05	0.1				0.135			NO

ATTACHMENT F
FEBRUARY 11, 2005, UCSD / SCRIPPS MONITORING SUMMARY
OUTFALL 1

Analyte	Sample Location	Date	Time	Result	Units	Calc. 30-Day Average	Calc. 6-Month Median	Wet or Dry Weather?	NPDES Permit Table	Method	Method Detection Limit	Reporting Limit	6-Mo. Median	Daily Maximum	Instant Maximum	30-Day Average	7-Day Average	Instant Minimum	Potential Constituent of Concern?
bis(2-ethylhexyl)phthalate	Outfall001	02/11/05	1310	0.767B	ug/L	0.693B		Wet Weather	4	EPA 625	0.005	0.01				10.5			NO
carbon tetrachloride	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	4	EPA 8260B	0.42	0.50				2.7			NO
chlordane	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	4	EPA 625	0.001	0.005				0.000069			NO(1)
chlorodibromomethane	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	4	EPA 8260B	0.45	1.0				25.8			NO
chloroform	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	4	EPA 8260B	0.22	1.0				390			NO
DDT	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	4	EPA 625	0.001	0.005				0.00051			NO(1)
1,4-dichlorobenzene	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	4	EPA 625	0.01	0.05				54			NO
3-3'-dichlorobenzidine	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	4	EPA 625	0.05	0.1				0.0243			NO(1)
1,2-dichloroethane	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	4	EPA 8260B	0.22	0.50				84			NO
1,1-dichloroethylene	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	4	EPA 8260B	0.31	1.0				2.7			NO
dichlorobromomethane	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	4	EPA 8260B	0.27	1.0				18.6			NO
dichloromethane	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	4	EPA 8260B	2.6	10				1,350			NO
1,3-dichloropropane	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	4	EPA 8260B	0.3	1.0				26.700			NO
dieldrin	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	4	EPA 625	0.001	0.005				0.00012			NO(1)
2,4-dinitrotoluene	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	4	EPA 625	0.05	0.1				7.8			NO
1,2-diphenylhydrazine (measured by presence of atrazine)	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	4	EPA 625	0.005	0.01				0.48			NO
halomethanes	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	4	EPA 8260B	1.8	10				390			NO
heptachlor	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	4	EPA 625	0.001	0.005				0.00015			NO(1)
heptachlor epoxide	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	4	EPA 625	0.001	0.005				0.00006			NO(1)
hexachlorobenzene	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	4	EPA 625	0.001	0.005				0.00063			NO
hexachlorobutadiene	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	4	EPA 625	0.05	0.1				42			NO
hexachloroethane	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	4	EPA 625	0.05	0.1				7.5			NO
isophorone	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	4	EPA 625	0.05	0.1				2,190			NO
N-nitrosodimethylamine	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	4	EPA 625	0.05	0.1				21.9			NO
N-nitrosodi-N-propylamine	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	4	EPA 625	0.05	0.1				1.14			NO
N-nitrosodiphenylamine	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	4	EPA 625	0.05	0.1				7.5			NO
PAH's	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	4	EPA 625	0.001	0.005				0.0264			NO
PCB's	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	4	EPA 625	0.001	0.005				0.000057			NO(1)
TCDD equivalents	Outfall001	02/11/05	1310	8.97E-08	ug/L	7.25E-08		Wet Weather	4	EPA 1613	A	A				1.17E-08			YES
1,1,2,2-tetrachloroethane	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	4	EPA 8260B	0.37	1.00				6.9			NO
tetrachloroethylene	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	4	EPA 8260B	0.29	1.00				6			NO
toxaphene	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	4	EPA 625	0.01	0.05				0.00063			NO(1)
trichloroethylene (aka trichloroethene)	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	4	EPA 8260B	0.3	1.0				81			NO
1,1,2-trichloroethane	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	4	EPA 8260B	0.54	1.0				28.2			NO
2,4,6-trichlorophenol	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	4	EPA 625	0.05	0.1				0.87			NO
vinyl chloride	Outfall001	02/11/05	1310	ND	ug/L	ND		Wet Weather	4	EPA 8260B	0.33	0.50				108			NO

A = See Analytical Results for Detection Limit
B = Analyte detected in blank above reporting limit. Samples should be qualified and used for qualitative purpose only for those analytes.
ND = Not Detected at or Above Laboratory Method Detection Limits
E = Estimated Value below the reporting limit and above the method detection limit. DNQ = Detected, but Not Quantified
(1) Method Dectection Limit is greater than Permit Exceedence Limt
(2) = Result based on estimated values

Appendix C
UCSD SIO SWMP Action Plan

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4.3 SITE ASSESSMENTS

UCSD/SIO conducted multiple wet and dry weather site assessments to establish the location and physical condition of discharge points and the storm water conveyance system structures; the locations of run-on flows; and to gain a familiarity with the unique characteristics of the storm water conveyance system at SIO. The goals of the site assessments were to confirm the findings of the desktop assessment and to assist in the development of procedures, field forms, and maps needed for the non-storm water discharge elimination program. The basic elements of the site assessments were:

- Confirm the locations and physical features of points of discharge, the storm water conveyance system structures, and the delineation of the SIO basins (developed by BDS) for the development of procedures, forms and maps associated with the non-storm water discharge elimination program.
- Identify the potential areas, activities, and sources of non-storm water discharges determined during the desktop assessment, as well as the locations of run-on flows.

4.4 ACTION PLAN

The Non-Storm Water Discharge Elimination Program has provisions for identifying and correcting non-storm water discharges. The program provides for inspections and testing on a continuous basis to evaluate non-storm water discharges and to document their reoccurrence or elimination. The following subsections present procedures for performing inspections to assess the presence and sources of non-storm water discharges. The procedures, field forms, and maps to detect non-storm water discharges were developed to satisfy the unique characteristics of the storm water conveyance system, in particular, the combined seawater and storm water conveyance systems at SIO and are provided in Appendix B.

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Appendix D
10- and 100- year Storm Event, Offsite and Onsite, Hydrology for Preferred Relocation SWFSC Site

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                          Analysis prepared by:

                                PBS&J
                            9275 Sky Park Court
                                Suite 200
                            San Diego, CA 92123

  ************************** DESCRIPTION OF STUDY **************************
 * SITE 2 - ONSITE 10-YEAR STORM EVENT                                     *
 * EXISTING CONDITION                                                      *
 *                                                                         *
  ***************************************************************************

  FILE NAME: 2EXON10.DAT
  TIME/DATE OF STUDY: 09:55 02/06/2006
 ---------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
 ---------------------------------------------------------------------------
  1981 SAN DIEGO HYDROLOGY MANUAL RAINFALL INFORMATION USED

  USER SPECIFIED STORM EVENT(YEAR) =  10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 1.00
  RAINFALL-INTENSITY ADJUSTMENT FACTOR = 1.000
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: ONLY PEAK CONFLUENCE VALUES CONSIDERED
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  =====  ====  =====  =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE    201.00 TO NODE    202.00 IS CODE =  21
 ---------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 ===========================================================================
  GRASS GOOD COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  80
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   140.00
  UPSTREAM ELEVATION(FEET) =    293.00
  DOWNSTREAM ELEVATION(FEET) =    264.00
  ELEVATION DIFFERENCE(FEET) =     29.00
```

```
URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =     5.041
*CAUTION: SUBAREA SLOPE EXCEEDS COUNTY NOMOGRAPH
 DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
TIME OF CONCENTRATION ASSUMED AS 6-MIN.
  10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.160
SUBAREA RUNOFF(CFS) =       0.23
TOTAL AREA(ACRES) =       0.16   TOTAL RUNOFF(CFS) =       0.23

****************************************************************************
 FLOW PROCESS FROM NODE    202.00 TO NODE    203.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    264.00  DOWNSTREAM(FEET) =    213.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   575.00   CHANNEL SLOPE =  0.0887
 CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   2.000
 MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   1.00
  10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.380
 GRASS GOOD COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  80
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      1.56
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.60
 AVERAGE FLOW DEPTH(FEET) =   0.05   TRAVEL TIME(MIN.) =   6.00
 Tc(MIN.) =  12.00
 SUBAREA AREA(ACRES) =     2.44       SUBAREA RUNOFF(CFS) =    2.61
 TOTAL AREA(ACRES) =      2.60        PEAK FLOW RATE(CFS) =       2.84

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.07   FLOW VELOCITY(FEET/SEC.) =   2.14
 LONGEST FLOWPATH FROM NODE    201.00 TO NODE    203.00 =   715.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)      =      2.60  TC(MIN.) =     12.00
 PEAK FLOW RATE(CFS)    =      2.84
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************

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                          Analysis prepared by:

                                PBS&J
                            9275 Sky Park Court
                                Suite 200
                            San Diego, CA 92123

   *************************** DESCRIPTION OF STUDY **************************
  * SITE 2 - ONSITE 10-YEAR STORM EVENT
  * PROPOSED CONDITION                                                       *
  *                                                                          *
   ****************************************************************************

    FILE NAME: 2PON10.DAT
    TIME/DATE OF STUDY: 09:56 02/06/2006
  ----------------------------------------------------------------------------
    USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
  ----------------------------------------------------------------------------
    1981 SAN DIEGO HYDROLOGY MANUAL RAINFALL INFORMATION USED

    USER SPECIFIED STORM EVENT(YEAR) =  10.00
    SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
    SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 1.00
    RAINFALL-INTENSITY ADJUSTMENT FACTOR = 1.000
    SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
    NOTE: ONLY PEAK CONFLUENCE VALUES CONSIDERED
    *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
       HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
       WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
 NO.    (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
 ===   =====  =========  =================  ======  =====  ====  =====  =======
   1    30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

   GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
     1. Relative Flow-Depth =  0.00 FEET
        as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
     2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
   *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
    OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE   2001.00 TO NODE   2002.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  GRASS GOOD COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  80
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   140.00
  UPSTREAM ELEVATION(FEET) =    293.00
  DOWNSTREAM ELEVATION(FEET) =    284.00
  ELEVATION DIFFERENCE(FEET) =      9.00
```

```
  URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.446
  *CAUTION: SUBAREA SLOPE EXCEEDS COUNTY NOMOGRAPH
   DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.933
  SUBAREA RUNOFF(CFS) =       0.21
  TOTAL AREA(ACRES) =       0.16   TOTAL RUNOFF(CFS) =       0.21

****************************************************************************
  FLOW PROCESS FROM NODE   2002.00 TO NODE   2003.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    284.00  DOWNSTREAM(FEET) =    213.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   575.00   CHANNEL SLOPE =  0.1235
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   1.00
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.359
  *USER SPECIFIED(SUBAREA):
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .7300
  S.C.S. CURVE NUMBER (AMC II) =  80
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      2.28
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.01
  AVERAGE FLOW DEPTH(FEET) =   0.06   TRAVEL TIME(MIN.) =   4.76
  Tc(MIN.) =  12.21
  SUBAREA AREA(ACRES) =     2.44       SUBAREA RUNOFF(CFS) =    4.20
  TOTAL AREA(ACRES) =      2.60         PEAK FLOW RATE(CFS) =       4.41

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.08   FLOW VELOCITY(FEET/SEC.) =   2.77
  LONGEST FLOWPATH FROM NODE   2001.00 TO NODE   2003.00 =   715.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =      2.60  TC(MIN.) =     12.21
  PEAK FLOW RATE(CFS)    =      4.41
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************

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                          Analysis prepared by:

                                 PBS&J
                            9275 Sky Park Court
                                 Suite 200
                            San Diego, CA 92123

  ************************** DESCRIPTION OF STUDY **************************
 * SITE 2 - OFFSITE 10-YEAR STORM EVENT                                    *
 * EXISTING CONDITION                                                      *
 *                                                                         *
  ***************************************************************************

   FILE NAME: 2EXOFF10.DAT
   TIME/DATE OF STUDY: 09:57 02/06/2006
 ---------------------------------------------------------------------------
   USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
 ---------------------------------------------------------------------------
   1981 SAN DIEGO HYDROLOGY MANUAL RAINFALL INFORMATION USED

   USER SPECIFIED STORM EVENT(YEAR) =  10.00
   SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
   SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 1.00
   RAINFALL-INTENSITY ADJUSTMENT FACTOR = 1.000
   SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
   NOTE: ONLY PEAK CONFLUENCE VALUES CONSIDERED
   *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
      HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
      WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
 NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
 ===  =====  =========  ================  ======  =====  ======  =====  =======
   1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

   GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
     1. Relative Flow-Depth =  0.00 FEET
        as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
     2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
   *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
    OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE     201.00 TO NODE     202.00 IS CODE =  21
 ---------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 ===========================================================================
  SINGLE FAMILY DEVELOPMENT RUNOFF COEFFICIENT = .5500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  88
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   180.00
  UPSTREAM ELEVATION(FEET) =    385.00
  DOWNSTREAM ELEVATION(FEET) =    380.00
  ELEVATION DIFFERENCE(FEET) =      5.00
```

```
  URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =     9.449
  *CAUTION: SUBAREA SLOPE EXCEEDS COUNTY NOMOGRAPH
   DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.651
  SUBAREA RUNOFF(CFS) =       0.38
  TOTAL AREA(ACRES) =       0.26   TOTAL RUNOFF(CFS) =       0.38

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    203.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    380.00  DOWNSTREAM(FEET) =    244.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2240.00   CHANNEL SLOPE =  0.0607
  CHANNEL BASE(FEET) =   50.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.857
  SINGLE FAMILY DEVELOPMENT RUNOFF COEFFICIENT = .5500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  88
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.24
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.65
  AVERAGE FLOW DEPTH(FEET) =   0.05   TRAVEL TIME(MIN.) =  10.23
  Tc(MIN.) =  19.68
  SUBAREA AREA(ACRES) =    16.95       SUBAREA RUNOFF(CFS) =   17.31
  TOTAL AREA(ACRES) =     17.21         PEAK FLOW RATE(CFS) =      17.69

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.08   FLOW VELOCITY(FEET/SEC.) =   4.46
  LONGEST FLOWPATH FROM NODE    201.00 TO NODE    203.00 =  2420.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    203.00 TO NODE    203.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  19.68
  RAINFALL INTENSITY(INCH/HR) =   1.86
  TOTAL STREAM AREA(ACRES) =    17.21
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     17.69

****************************************************************************
  FLOW PROCESS FROM NODE    210.00 TO NODE    211.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  ROAD(HARD SURFACE) COVER RUNOFF COEFFICIENT = .9500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  92
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   150.00
  UPSTREAM ELEVATION(FEET) =    284.00
  DOWNSTREAM ELEVATION(FEET) =    283.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.785
  TIME OF CONCENTRATION ASSUMED AS 6-MIN.
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.160
  SUBAREA RUNOFF(CFS) =       0.42
  TOTAL AREA(ACRES) =       0.14   TOTAL RUNOFF(CFS) =       0.42
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     211.00 TO NODE     203.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     283.00  DOWNSTREAM(FEET) =     244.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2430.00   CHANNEL SLOPE =  0.0160
  CHANNEL BASE(FEET) =    50.00   "Z" FACTOR =    2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =    1.00
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.726
  *USER SPECIFIED(SUBAREA):
  GRASS GOOD COVER RUNOFF COEFFICIENT = .5600
  S.C.S. CURVE NUMBER (AMC II) =  92
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.92
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =    2.44
  AVERAGE FLOW DEPTH(FEET) =    0.08   TRAVEL TIME(MIN.) =  16.60
  Tc(MIN.) =  22.60
  SUBAREA AREA(ACRES) =     17.24        SUBAREA RUNOFF(CFS) =    16.66
  TOTAL AREA(ACRES) =      17.38         PEAK FLOW RATE(CFS) =       17.08

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.12   FLOW VELOCITY(FEET/SEC.) =    2.90
  LONGEST FLOWPATH FROM NODE     210.00 TO NODE     203.00 =  2580.00 FEET.
****************************************************************************
  FLOW PROCESS FROM NODE     203.00 TO NODE     203.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  22.60
  RAINFALL INTENSITY(INCH/HR) =   1.73
  TOTAL STREAM AREA(ACRES) =    17.38
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      17.08

  ** CONFLUENCE DATA **
  STREAM      RUNOFF       Tc       INTENSITY       AREA
  NUMBER       (CFS)     (MIN.)    (INCH/HOUR)     (ACRE)
     1         17.69     19.68        1.857         17.21
     2         17.08     22.60        1.726         17.38

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM      RUNOFF       Tc       INTENSITY
  NUMBER       (CFS)     (MIN.)    (INCH/HOUR)
     1         33.56     19.68        1.857
     2         33.52     22.60        1.726

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      33.56   Tc(MIN.) =    19.68
  TOTAL AREA(ACRES) =      34.59
  LONGEST FLOWPATH FROM NODE     210.00 TO NODE     203.00 =  2580.00 FEET.
****************************************************************************
  FLOW PROCESS FROM NODE     203.00 TO NODE     205.00 IS CODE =  61
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  244.00  DOWNSTREAM ELEVATION(FEET) =  221.00
  STREET LENGTH(FEET) =   400.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      33.89
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.43
    HALFSTREET FLOOD WIDTH(FEET) =   15.27
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.92
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.99
  STREET FLOW TRAVEL TIME(MIN.) =   0.96   Tc(MIN.) =  20.64
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.812
  ROAD(HARD SURFACE) COVER RUNOFF COEFFICIENT = .9500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  92
  SUBAREA AREA(ACRES) =    0.38      SUBAREA RUNOFF(CFS) =    0.65
  TOTAL AREA(ACRES) =     34.97        PEAK FLOW RATE(CFS) =      34.22

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.43   HALFSTREET FLOOD WIDTH(FEET) =  15.36
  FLOW VELOCITY(FEET/SEC.) =  6.91   DEPTH*VELOCITY(FT*FT/SEC.) =   2.99
  LONGEST FLOWPATH FROM NODE    210.00 TO NODE    205.00 =  2980.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    203.00 TO NODE    205.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.812
  GRASS GOOD COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  80
  SUBAREA AREA(ACRES) =    2.60   SUBAREA RUNOFF(CFS) =    2.12
  TOTAL AREA(ACRES) =     37.57   TOTAL RUNOFF(CFS) =   36.34
  TC(MIN.) =  20.64

****************************************************************************
  FLOW PROCESS FROM NODE    205.00 TO NODE    206.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  221.00  DOWNSTREAM ELEVATION(FEET) =  142.00
  STREET LENGTH(FEET) =   930.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
```

```
OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      55.38
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.47
  HALFSTREET FLOOD WIDTH(FEET) =   17.23
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    8.97
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.22
STREET FLOW TRAVEL TIME(MIN.) =   1.73   Tc(MIN.) =  22.37
  10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.736
*USER SPECIFIED(SUBAREA):
GRASS GOOD COVER RUNOFF COEFFICIENT = .5800
S.C.S. CURVE NUMBER (AMC II) =  80
SUBAREA AREA(ACRES) =   37.84      SUBAREA RUNOFF(CFS) =   38.10
TOTAL AREA(ACRES) =     75.41        PEAK FLOW RATE(CFS) =      74.43

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.51   HALFSTREET FLOOD WIDTH(FEET) =  19.91
FLOW VELOCITY(FEET/SEC.) =  9.68   DEPTH*VELOCITY(FT*FT/SEC.) =   4.96
LONGEST FLOWPATH FROM NODE    210.00 TO NODE    206.00 =  3910.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE    206.00 TO NODE    207.00 IS CODE =  31
----------------------------------------------------------------------------
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   142.00  DOWNSTREAM(FEET) =    18.00
FLOW LENGTH(FEET) =   705.00   MANNING'S N =  0.013
DEPTH OF FLOW IN  24.0 INCH PIPE IS  16.0 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =  33.43
ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
PIPE-FLOW(CFS) =     74.43
PIPE TRAVEL TIME(MIN.) =   0.35    Tc(MIN.) =  22.72
LONGEST FLOWPATH FROM NODE    210.00 TO NODE    207.00 =  4615.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE    207.00 TO NODE    207.00 IS CODE =   1
----------------------------------------------------------------------------
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
TOTAL NUMBER OF STREAMS =  2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
TIME OF CONCENTRATION(MIN.) =  22.72
RAINFALL INTENSITY(INCH/HR) =   1.72
TOTAL STREAM AREA(ACRES) =    75.41
PEAK FLOW RATE(CFS) AT CONFLUENCE =     74.43

****************************************************************************
FLOW PROCESS FROM NODE    220.00 TO NODE    221.00 IS CODE =  21
----------------------------------------------------------------------------
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
ROAD(HARD SURFACE) COVER RUNOFF COEFFICIENT = .9500
SOIL CLASSIFICATION IS "D"
S.C.S. CURVE NUMBER (AMC II) =  92
```

```
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   175.00
  UPSTREAM ELEVATION(FEET) =    221.00
  DOWNSTREAM ELEVATION(FEET) =    205.00
  ELEVATION DIFFERENCE(FEET) =     16.00
  URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.708
  *CAUTION: SUBAREA SLOPE EXCEEDS COUNTY NOMOGRAPH
   DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
  TIME OF CONCENTRATION ASSUMED AS 6-MIN.
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.160
  SUBAREA RUNOFF(CFS) =      0.33
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.33

****************************************************************************
  FLOW PROCESS FROM NODE    221.00 TO NODE    207.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    205.00  DOWNSTREAM(FEET) =     18.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1360.00   CHANNEL SLOPE =  0.1375
  CHANNEL BASE(FEET) =   50.00   "Z" FACTOR =  20.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   1.00
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.960
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  92
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      4.21
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.93
  AVERAGE FLOW DEPTH(FEET) =   0.04   TRAVEL TIME(MIN.) =  11.74
  Tc(MIN.) =  17.74
  SUBAREA AREA(ACRES) =     4.40       SUBAREA RUNOFF(CFS) =    7.33
  TOTAL AREA(ACRES) =      4.51         PEAK FLOW RATE(CFS) =       7.66

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.06   FLOW VELOCITY(FEET/SEC.) =   2.34
  LONGEST FLOWPATH FROM NODE    220.00 TO NODE    207.00 =  1535.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    207.00 TO NODE    207.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  17.74
  RAINFALL INTENSITY(INCH/HR) =   1.96
  TOTAL STREAM AREA(ACRES) =     4.51
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.66

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
     1       74.43    22.72        1.720        75.41
     2        7.66    17.74        1.960         4.51

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
```

NUMBER	(CFS)	(MIN.)	(INCH/HOUR)
1	72.98	17.74	1.960
2	81.16	22.72	1.720

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 81.16 Tc(MIN.) = 22.72
TOTAL AREA(ACRES) = 79.92
LONGEST FLOWPATH FROM NODE 210.00 TO NODE 207.00 = 4615.00 FEET.

==========

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 79.92 TC(MIN.) = 22.72
PEAK FLOW RATE(CFS) = 81.16

==========

==========

END OF RATIONAL METHOD ANALYSIS

```
****************************************************************************

              RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
              Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                           2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2005 Advanced Engineering Software (aes)
              Ver. 2.0 Release Date: 06/01/2005  License ID 1217

                          Analysis prepared by:

                                 PBS&J
                            9275 Sky Park Court
                                 Suite 200
                            San Diego, CA 92123

  ************************** DESCRIPTION OF STUDY **************************
 * SITE 2 - OFFSITE 10-YEAR STORM EVENT                                    *
 * PROPOSED CONDITION                                                      *
 *                                                                         *
  ***************************************************************************

   FILE NAME: 2POFF10.DAT
   TIME/DATE OF STUDY: 09:58 02/06/2006
 ---------------------------------------------------------------------------
   USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
 ---------------------------------------------------------------------------
   1981 SAN DIEGO HYDROLOGY MANUAL RAINFALL INFORMATION USED

   USER SPECIFIED STORM EVENT(YEAR) =  10.00
   SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
   SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 1.00
   RAINFALL-INTENSITY ADJUSTMENT FACTOR = 1.000
   SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
   NOTE: ONLY PEAK CONFLUENCE VALUES CONSIDERED
   *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
      HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
      WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
 NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
 ===  =====  =========  =================  ======  =====  ======  =====  =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00  0.0313  0.167  0.0150

   GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
     1. Relative Flow-Depth =  0.00 FEET
        as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
     2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
   *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
    OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE     201.00 TO NODE     202.00 IS CODE =  21
 ---------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 ===========================================================================
  SINGLE FAMILY DEVELOPMENT RUNOFF COEFFICIENT = .5500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  88
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   180.00
  UPSTREAM ELEVATION(FEET) =    385.00
  DOWNSTREAM ELEVATION(FEET) =    380.00
  ELEVATION DIFFERENCE(FEET) =      5.00
```

```
  URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    9.449
  *CAUTION: SUBAREA SLOPE EXCEEDS COUNTY NOMOGRAPH
   DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.651
  SUBAREA RUNOFF(CFS) =       0.38
  TOTAL AREA(ACRES) =       0.26   TOTAL RUNOFF(CFS) =       0.38

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    203.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    380.00  DOWNSTREAM(FEET) =    244.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2240.00   CHANNEL SLOPE =  0.0607
  CHANNEL BASE(FEET) =   50.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.857
  SINGLE FAMILY DEVELOPMENT RUNOFF COEFFICIENT = .5500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  88
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.24
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.65
  AVERAGE FLOW DEPTH(FEET) =   0.05   TRAVEL TIME(MIN.) =  10.23
  Tc(MIN.) =  19.68
  SUBAREA AREA(ACRES) =    16.95       SUBAREA RUNOFF(CFS) =   17.31
  TOTAL AREA(ACRES) =     17.21        PEAK FLOW RATE(CFS) =      17.69

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.08   FLOW VELOCITY(FEET/SEC.) =   4.46
  LONGEST FLOWPATH FROM NODE    201.00 TO NODE    203.00 =  2420.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    203.00 TO NODE    203.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  19.68
  RAINFALL INTENSITY(INCH/HR) =   1.86
  TOTAL STREAM AREA(ACRES) =    17.21
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     17.69

****************************************************************************
  FLOW PROCESS FROM NODE    210.00 TO NODE    211.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  ROAD(HARD SURFACE) COVER RUNOFF COEFFICIENT = .9500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  92
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   150.00
  UPSTREAM ELEVATION(FEET) =    284.00
  DOWNSTREAM ELEVATION(FEET) =    283.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.785
  TIME OF CONCENTRATION ASSUMED AS 6-MIN.
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.160
  SUBAREA RUNOFF(CFS) =       0.42
  TOTAL AREA(ACRES) =       0.14   TOTAL RUNOFF(CFS) =       0.42
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    211.00 TO NODE    203.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    283.00  DOWNSTREAM(FEET) =    244.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2430.00   CHANNEL SLOPE =  0.0160
  CHANNEL BASE(FEET) =   50.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.726
  *USER SPECIFIED(SUBAREA):
  GRASS GOOD COVER RUNOFF COEFFICIENT = .5600
  S.C.S. CURVE NUMBER (AMC II) =  92
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      9.92
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.44
  AVERAGE FLOW DEPTH(FEET) =   0.08   TRAVEL TIME(MIN.) =  16.60
  Tc(MIN.) =  22.60
  SUBAREA AREA(ACRES) =    17.24       SUBAREA RUNOFF(CFS) =   16.66
  TOTAL AREA(ACRES) =     17.38        PEAK FLOW RATE(CFS) =      17.08

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.12   FLOW VELOCITY(FEET/SEC.) =   2.90
  LONGEST FLOWPATH FROM NODE    210.00 TO NODE    203.00 =  2580.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    203.00 TO NODE    203.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  22.60
  RAINFALL INTENSITY(INCH/HR) =   1.73
  TOTAL STREAM AREA(ACRES) =    17.38
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     17.08

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
     1        17.69    19.68       1.857        17.21
     2        17.08    22.60       1.726        17.38

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1        33.56    19.68       1.857
     2        33.52    22.60       1.726

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     33.56   Tc(MIN.) =   19.68
  TOTAL AREA(ACRES) =     34.59
  LONGEST FLOWPATH FROM NODE    210.00 TO NODE    203.00 =  2580.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    203.00 TO NODE    205.00 IS CODE =  61
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  244.00  DOWNSTREAM ELEVATION(FEET) =  221.00
  STREET LENGTH(FEET) =   400.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      33.89
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.43
    HALFSTREET FLOOD WIDTH(FEET) =   15.27
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.92
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.99
  STREET FLOW TRAVEL TIME(MIN.) =   0.96   Tc(MIN.) =  20.64
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.812
  ROAD(HARD SURFACE) COVER RUNOFF COEFFICIENT = .9500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  92
  SUBAREA AREA(ACRES) =    0.38      SUBAREA RUNOFF(CFS) =    0.65
  TOTAL AREA(ACRES) =     34.97        PEAK FLOW RATE(CFS) =      34.22

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.43   HALFSTREET FLOOD WIDTH(FEET) =  15.36
  FLOW VELOCITY(FEET/SEC.) =  6.91   DEPTH*VELOCITY(FT*FT/SEC.) =   2.99
  LONGEST FLOWPATH FROM NODE    210.00 TO NODE    205.00 =  2980.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    203.00 TO NODE    205.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.812
  *USER SPECIFIED(SUBAREA):
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .7100
  S.C.S. CURVE NUMBER (AMC II) =  92
  SUBAREA AREA(ACRES) =    2.60   SUBAREA RUNOFF(CFS) =    3.34
  TOTAL AREA(ACRES) =     37.57   TOTAL RUNOFF(CFS) =   37.56
  TC(MIN.) =  20.64

****************************************************************************
  FLOW PROCESS FROM NODE    205.00 TO NODE    206.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  221.00  DOWNSTREAM ELEVATION(FEET) =  142.00
  STREET LENGTH(FEET) =   930.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
```

```
OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      56.62
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.47
  HALFSTREET FLOOD WIDTH(FEET) =   17.33
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    9.07
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.29
STREET FLOW TRAVEL TIME(MIN.) =   1.71   Tc(MIN.) =  22.35
  10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.737
*USER SPECIFIED(SUBAREA):
GRASS GOOD COVER RUNOFF COEFFICIENT = .5800
S.C.S. CURVE NUMBER (AMC II) =  92
SUBAREA AREA(ACRES) =    37.84      SUBAREA RUNOFF(CFS) =   38.12
TOTAL AREA(ACRES) =      75.41        PEAK FLOW RATE(CFS) =      75.68

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.52   HALFSTREET FLOOD WIDTH(FEET) =  20.28
FLOW VELOCITY(FEET/SEC.) =  9.65   DEPTH*VELOCITY(FT*FT/SEC.) =   4.98
LONGEST FLOWPATH FROM NODE    210.00 TO NODE    206.00 =  3910.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE    206.00 TO NODE    207.00 IS CODE =  31
----------------------------------------------------------------------------
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   142.00  DOWNSTREAM(FEET) =    18.00
FLOW LENGTH(FEET) =   705.00   MANNING'S N =  0.013
DEPTH OF FLOW IN  24.0 INCH PIPE IS  16.2 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =  33.53
ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
PIPE-FLOW(CFS) =     75.68
PIPE TRAVEL TIME(MIN.) =   0.35    Tc(MIN.) =  22.70
LONGEST FLOWPATH FROM NODE    210.00 TO NODE    207.00 =  4615.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE    207.00 TO NODE    207.00 IS CODE =   1
----------------------------------------------------------------------------
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
TOTAL NUMBER OF STREAMS =  2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
TIME OF CONCENTRATION(MIN.) =  22.70
RAINFALL INTENSITY(INCH/HR) =   1.72
TOTAL STREAM AREA(ACRES) =    75.41
PEAK FLOW RATE(CFS) AT CONFLUENCE =     75.68

****************************************************************************
FLOW PROCESS FROM NODE    220.00 TO NODE    221.00 IS CODE =  21
----------------------------------------------------------------------------
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
ROAD(HARD SURFACE) COVER RUNOFF COEFFICIENT = .9500
SOIL CLASSIFICATION IS "D"
S.C.S. CURVE NUMBER (AMC II) =  92
```

```
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   175.00
  UPSTREAM ELEVATION(FEET) =    221.00
  DOWNSTREAM ELEVATION(FEET) =    205.00
  ELEVATION DIFFERENCE(FEET) =     16.00
  URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.708
  *CAUTION: SUBAREA SLOPE EXCEEDS COUNTY NOMOGRAPH
   DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
  TIME OF CONCENTRATION ASSUMED AS 6-MIN.
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.160
  SUBAREA RUNOFF(CFS) =      0.33
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.33

****************************************************************************
  FLOW PROCESS FROM NODE    221.00 TO NODE    207.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    205.00  DOWNSTREAM(FEET) =     18.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1360.00   CHANNEL SLOPE =  0.1375
  CHANNEL BASE(FEET) =   50.00   "Z" FACTOR =  20.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   1.00
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.960
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  92
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      4.21
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.93
  AVERAGE FLOW DEPTH(FEET) =   0.04   TRAVEL TIME(MIN.) =  11.74
  Tc(MIN.) =  17.74
  SUBAREA AREA(ACRES) =     4.40       SUBAREA RUNOFF(CFS) =    7.33
  TOTAL AREA(ACRES) =      4.51         PEAK FLOW RATE(CFS) =       7.66

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.06   FLOW VELOCITY(FEET/SEC.) =   2.34
  LONGEST FLOWPATH FROM NODE    220.00 TO NODE    207.00 =  1535.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    207.00 TO NODE    207.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  17.74
  RAINFALL INTENSITY(INCH/HR) =   1.96
  TOTAL STREAM AREA(ACRES) =     4.51
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.66

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
     1       75.68    22.70        1.721        75.41
     2        7.66    17.74        1.960         4.51

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
```

NUMBER	(CFS)	(MIN.)	(INCH/HOUR)
1	74.11	17.74	1.960
2	82.40	22.70	1.721

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 82.40 Tc(MIN.) = 22.70
TOTAL AREA(ACRES) = 79.92
LONGEST FLOWPATH FROM NODE 210.00 TO NODE 207.00 = 4615.00 FEET.

==========

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 79.92 TC(MIN.) = 22.70
PEAK FLOW RATE(CFS) = 82.40

==========

==========

END OF RATIONAL METHOD ANALYSIS

```
****************************************************************************

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            Ver. 2.0 Release Date: 06/01/2005  License ID 1217

                          Analysis prepared by:

                                PBS&J
                           9275 Sky Park Court
                                Suite 200
                           San Diego, CA 92123

 ************************** DESCRIPTION OF STUDY **************************
* SITE 2 - ONSITE 100-YEAR STORM EVENT                                    *
* EXISTING CONDITION                                                      *
*                                                                         *
 ***************************************************************************

  FILE NAME: 2EXON.DAT
  TIME/DATE OF STUDY: 13:43 02/05/2006
---------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
---------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 1.00
  RAINFALL-INTENSITY ADJUSTMENT FACTOR = 1.000
  *USER SPECIFIED:
  NUMBER OF [TIME,INTENSITY] DATA PAIRS =  9
   1)   5.000;  4.400
   2)  10.000;  3.450
   3)  15.000;  3.000
   4)  20.000;  2.500
   5)  25.000;  2.200
   6)  30.000;  2.000
   7)  40.000;  1.720
   8)  50.000;  1.480
   9)  60.000;  1.310
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: ONLY PEAK CONFLUENCE VALUES CONSIDERED
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  =====  ====  ====  =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE    201.00 TO NODE    202.00 IS CODE =  21
---------------------------------------------------------------------------
```

```
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  GRASS GOOD COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  80
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   140.00
  UPSTREAM ELEVATION(FEET) =    293.00
  DOWNSTREAM ELEVATION(FEET) =    264.00
  ELEVATION DIFFERENCE(FEET) =     29.00
  URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.041
  *CAUTION: SUBAREA SLOPE EXCEEDS COUNTY NOMOGRAPH
   DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
  TIME OF CONCENTRATION ASSUMED AS 6-MIN.
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.210
  SUBAREA RUNOFF(CFS) =      0.30
  TOTAL AREA(ACRES) =      0.16   TOTAL RUNOFF(CFS) =      0.30

******************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    203.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    264.00  DOWNSTREAM(FEET) =    213.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   575.00   CHANNEL SLOPE =  0.0887
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.343
  GRASS GOOD COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  80
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      2.16
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.85
  AVERAGE FLOW DEPTH(FEET) =   0.06   TRAVEL TIME(MIN.) =   5.19
  Tc(MIN.) =  11.19
  SUBAREA AREA(ACRES) =     2.44       SUBAREA RUNOFF(CFS) =    3.67
  TOTAL AREA(ACRES) =      2.60         PEAK FLOW RATE(CFS) =       3.97

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.08   FLOW VELOCITY(FEET/SEC.) =   2.43
  LONGEST FLOWPATH FROM NODE    201.00 TO NODE    203.00 =   715.00 FEET.
==============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =      2.60  TC(MIN.) =     11.19
  PEAK FLOW RATE(CFS)    =      3.97
==============================================================================
==============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************

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                          Analysis prepared by:

                                 PBS&J
                            9275 Sky Park Court
                                 Suite 200
                            San Diego, CA 92123

 ************************** DESCRIPTION OF STUDY **************************
* SITE 2 - ONSITE 100-YEAR STORM EVENT                                    *
* PROPOSED CONDITION                                                      *
*                                                                         *
 ***************************************************************************

  FILE NAME: 2PROPON.DAT
  TIME/DATE OF STUDY: 12:30 02/05/2006
 ---------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
 ---------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 1.00
  RAINFALL-INTENSITY ADJUSTMENT FACTOR = 1.000
  *USER SPECIFIED:
  NUMBER OF [TIME,INTENSITY] DATA PAIRS =  9
   1)   5.000;  4.400
   2)  10.000;  3.450
   3)  15.000;  3.000
   4)  20.000;  2.500
   5)  25.000;  2.200
   6)  30.000;  2.000
   7)  40.000;  1.720
   8)  50.000;  1.480
   9)  60.000;  1.310
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: ONLY PEAK CONFLUENCE VALUES CONSIDERED
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  =====  ======  =====  =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE   2001.00 TO NODE   2002.00 IS CODE =  21
 ---------------------------------------------------------------------------
```

```
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  GRASS GOOD COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  80
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   140.00
  UPSTREAM ELEVATION(FEET) =    293.00
  DOWNSTREAM ELEVATION(FEET) =    284.00
  ELEVATION DIFFERENCE(FEET) =      9.00
  URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.446
  *CAUTION: SUBAREA SLOPE EXCEEDS COUNTY NOMOGRAPH
   DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.935
  SUBAREA RUNOFF(CFS) =      0.28
  TOTAL AREA(ACRES) =      0.16   TOTAL RUNOFF(CFS) =      0.28

******************************************************************************
  FLOW PROCESS FROM NODE   2002.00 TO NODE   2003.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    284.00  DOWNSTREAM(FEET) =    213.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   575.00   CHANNEL SLOPE =  0.1235
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.323
  *USER SPECIFIED(SUBAREA):
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .7300
  S.C.S. CURVE NUMBER (AMC II) =  80
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      3.20
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.42
  AVERAGE FLOW DEPTH(FEET) =   0.07   TRAVEL TIME(MIN.) =   3.96
  Tc(MIN.) =  11.41
  SUBAREA AREA(ACRES) =     2.44       SUBAREA RUNOFF(CFS) =    5.92
  TOTAL AREA(ACRES) =      2.60         PEAK FLOW RATE(CFS) =       6.20

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.10   FLOW VELOCITY(FEET/SEC.) =   3.19
  LONGEST FLOWPATH FROM NODE   2001.00 TO NODE   2003.00 =   715.00 FEET.
==============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =      2.60  TC(MIN.) =     11.41
  PEAK FLOW RATE(CFS)    =      6.20
==============================================================================
==============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************

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                          Analysis prepared by:

                                 PBS&J
                            9275 Sky Park Court
                                 Suite 200
                            San Diego, CA 92123

 ************************** DESCRIPTION OF STUDY **************************
* SITE 2 - OFFSITE 100-YEAR STORM EVENT                                   *
* EXISTING CONDITION                                                      *
*                                                                         *
 ***************************************************************************

  FILE NAME: 2EXOFF.DAT
  TIME/DATE OF STUDY: 13:46 02/05/2006
 ---------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
 ---------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 1.00
  RAINFALL-INTENSITY ADJUSTMENT FACTOR = 1.000
  *USER SPECIFIED:
  NUMBER OF [TIME,INTENSITY] DATA PAIRS =  9
   1)   5.000;  4.400
   2)  10.000;  3.450
   3)  15.000;  3.000
   4)  20.000;  2.500
   5)  25.000;  2.200
   6)  30.000;  2.000
   7)  40.000;  1.720
   8)  50.000;  1.480
   9)  60.000;  1.310
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: ONLY PEAK CONFLUENCE VALUES CONSIDERED
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  ========  ================  ======  =====  ====  ====  =======
  1   30.0     20.0   0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE    201.00 TO NODE    202.00 IS CODE =  21
 ---------------------------------------------------------------------------
```

```
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  SINGLE FAMILY DEVELOPMENT RUNOFF COEFFICIENT = .5500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  88
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   180.00
  UPSTREAM ELEVATION(FEET) =    385.00
  DOWNSTREAM ELEVATION(FEET) =    380.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    9.449
  *CAUTION: SUBAREA SLOPE EXCEEDS COUNTY NOMOGRAPH
   DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.555
  SUBAREA RUNOFF(CFS) =      0.51
  TOTAL AREA(ACRES) =      0.26   TOTAL RUNOFF(CFS) =      0.51

******************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    203.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    380.00  DOWNSTREAM(FEET) =    244.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2240.00   CHANNEL SLOPE =  0.0607
  CHANNEL BASE(FEET) =   50.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.610
  SINGLE FAMILY DEVELOPMENT RUNOFF COEFFICIENT = .5500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  88
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     13.03
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.95
  AVERAGE FLOW DEPTH(FEET) =   0.07   TRAVEL TIME(MIN.) =   9.45
  Tc(MIN.) =  18.90
  SUBAREA AREA(ACRES) =    16.95       SUBAREA RUNOFF(CFS) =   24.33
  TOTAL AREA(ACRES) =     17.21        PEAK FLOW RATE(CFS) =      24.84

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.10   FLOW VELOCITY(FEET/SEC.) =   5.14
  LONGEST FLOWPATH FROM NODE    201.00 TO NODE    203.00 =  2420.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE    203.00 TO NODE    203.00 IS CODE =   1
------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  18.90
  RAINFALL INTENSITY(INCH/HR) =   2.61
  TOTAL STREAM AREA(ACRES) =    17.21
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     24.84

******************************************************************************
  FLOW PROCESS FROM NODE    210.00 TO NODE    211.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  ROAD(HARD SURFACE) COVER RUNOFF COEFFICIENT = .9500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  92
```

```
INITIAL SUBAREA FLOW-LENGTH(FEET) =   150.00
UPSTREAM ELEVATION(FEET) =    284.00
DOWNSTREAM ELEVATION(FEET) =    283.00
ELEVATION DIFFERENCE(FEET) =      1.00
URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.785
TIME OF CONCENTRATION ASSUMED AS 6-MIN.
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.210
SUBAREA RUNOFF(CFS) =      0.56
TOTAL AREA(ACRES) =      0.14   TOTAL RUNOFF(CFS) =      0.56

****************************************************************************
 FLOW PROCESS FROM NODE    211.00 TO NODE    203.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    283.00  DOWNSTREAM(FEET) =    244.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2430.00   CHANNEL SLOPE =  0.0160
 CHANNEL BASE(FEET) =   50.00   "Z" FACTOR =   2.000
 MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.458
 *USER SPECIFIED(SUBAREA):
 GRASS GOOD COVER RUNOFF COEFFICIENT = .5600
 S.C.S. CURVE NUMBER (AMC II) =  92
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     14.37
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.75
 AVERAGE FLOW DEPTH(FEET) =   0.10   TRAVEL TIME(MIN.) =  14.70
 Tc(MIN.) =  20.70
 SUBAREA AREA(ACRES) =    17.24       SUBAREA RUNOFF(CFS) =   23.73
 TOTAL AREA(ACRES) =     17.38        PEAK FLOW RATE(CFS) =      24.29

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.14   FLOW VELOCITY(FEET/SEC.) =   3.40
 LONGEST FLOWPATH FROM NODE    210.00 TO NODE    203.00 =  2580.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    203.00 TO NODE    203.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =  20.70
 RAINFALL INTENSITY(INCH/HR) =   2.46
 TOTAL STREAM AREA(ACRES) =    17.38
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     24.29

 ** CONFLUENCE DATA **
 STREAM     RUNOFF      Tc       INTENSITY      AREA
 NUMBER      (CFS)    (MIN.)    (INCH/HOUR)    (ACRE)
    1        24.84    18.90        2.610        17.21
    2        24.29    20.70        2.458        17.38

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc       INTENSITY
 NUMBER      (CFS)    (MIN.)    (INCH/HOUR)
    1        47.71    18.90        2.610
```

```
    2        47.68     20.70        2.458

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      47.71   Tc(MIN.) =   18.90
  TOTAL AREA(ACRES) =      34.59
  LONGEST FLOWPATH FROM NODE    210.00 TO NODE    203.00 =  2580.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    203.00 TO NODE    205.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  244.00  DOWNSTREAM ELEVATION(FEET) =  221.00
  STREET LENGTH(FEET) =   400.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      48.17
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.48
    HALFSTREET FLOOD WIDTH(FEET) =   17.61
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.48
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.58
  STREET FLOW TRAVEL TIME(MIN.) =   0.89   Tc(MIN.) =  19.79
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.521
  ROAD(HARD SURFACE) COVER RUNOFF COEFFICIENT = .9500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  92
  SUBAREA AREA(ACRES) =    0.38      SUBAREA RUNOFF(CFS) =    0.91
  TOTAL AREA(ACRES) =     34.97        PEAK FLOW RATE(CFS) =      48.62

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.48   HALFSTREET FLOOD WIDTH(FEET) =  17.61
  FLOW VELOCITY(FEET/SEC.) =  7.55   DEPTH*VELOCITY(FT*FT/SEC.) =   3.61
  LONGEST FLOWPATH FROM NODE    210.00 TO NODE    205.00 =  2980.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    203.00 TO NODE    205.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.521
  GRASS GOOD COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  80
  SUBAREA AREA(ACRES) =    2.60   SUBAREA RUNOFF(CFS) =    2.95
  TOTAL AREA(ACRES) =     37.57   TOTAL RUNOFF(CFS) =   51.57
  TC(MIN.) =  19.79

****************************************************************************
  FLOW PROCESS FROM NODE    205.00 TO NODE    206.00 IS CODE =  61
----------------------------------------------------------------------------
```

```
>>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>(STANDARD CURB SECTION USED)<<<<<
==============================================================================
UPSTREAM ELEVATION(FEET) =  221.00  DOWNSTREAM ELEVATION(FEET) =  142.00
STREET LENGTH(FEET) =   930.00   CURB HEIGHT(INCHES) =  6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
INSIDE STREET CROSSFALL(DECIMAL) =  0.020
OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      78.10
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.52
  HALFSTREET FLOOD WIDTH(FEET) =   20.66
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    9.77
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.08
STREET FLOW TRAVEL TIME(MIN.) =   1.59   Tc(MIN.) =  21.38
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.417
*USER SPECIFIED(SUBAREA):
GRASS GOOD COVER RUNOFF COEFFICIENT = .5800
S.C.S. CURVE NUMBER (AMC II) =  80
SUBAREA AREA(ACRES) =   37.84      SUBAREA RUNOFF(CFS) =   53.06
TOTAL AREA(ACRES) =     75.41        PEAK FLOW RATE(CFS) =     104.63

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.56   HALFSTREET FLOOD WIDTH(FEET) =  22.93
FLOW VELOCITY(FEET/SEC.) = 10.78   DEPTH*VELOCITY(FT*FT/SEC.) =   6.02
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L =  930.0 FT WITH ELEVATION-DROP =  79.0 FT, IS   68.0 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    206.00
LONGEST FLOWPATH FROM NODE    210.00 TO NODE    206.00 =  3910.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE    206.00 TO NODE    207.00 IS CODE =  31
----------------------------------------------------------------------------
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   142.00  DOWNSTREAM(FEET) =    18.00
FLOW LENGTH(FEET) =   705.00   MANNING'S N =  0.013
DEPTH OF FLOW IN  27.0 INCH PIPE IS  18.4 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =  36.34
ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
PIPE-FLOW(CFS) =    104.63
PIPE TRAVEL TIME(MIN.) =   0.32    Tc(MIN.) =  21.70
LONGEST FLOWPATH FROM NODE    210.00 TO NODE    207.00 =  4615.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE    207.00 TO NODE    207.00 IS CODE =   1
----------------------------------------------------------------------------
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==============================================================================
TOTAL NUMBER OF STREAMS =  2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
TIME OF CONCENTRATION(MIN.) =  21.70
```

```
  RAINFALL INTENSITY(INCH/HR) =   2.40
  TOTAL STREAM AREA(ACRES) =    75.41
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    104.63

****************************************************************************
  FLOW PROCESS FROM NODE    220.00 TO NODE    221.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  ROAD(HARD SURFACE) COVER RUNOFF COEFFICIENT = .9500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  92
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   175.00
  UPSTREAM ELEVATION(FEET) =    221.00
  DOWNSTREAM ELEVATION(FEET) =    205.00
  ELEVATION DIFFERENCE(FEET) =     16.00
  URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.708
  *CAUTION: SUBAREA SLOPE EXCEEDS COUNTY NOMOGRAPH
   DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
  TIME OF CONCENTRATION ASSUMED AS 6-MIN.
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.210
  SUBAREA RUNOFF(CFS) =      0.44
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.44

****************************************************************************
  FLOW PROCESS FROM NODE    221.00 TO NODE    207.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    205.00  DOWNSTREAM(FEET) =     18.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1360.00   CHANNEL SLOPE =  0.1375
  CHANNEL BASE(FEET) =   50.00   "Z" FACTOR =  20.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.821
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  92
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      6.05
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.10
  AVERAGE FLOW DEPTH(FEET) =   0.06   TRAVEL TIME(MIN.) =  10.79
  Tc(MIN.) =  16.79
  SUBAREA AREA(ACRES) =     4.40       SUBAREA RUNOFF(CFS) =   10.55
  TOTAL AREA(ACRES) =      4.51         PEAK FLOW RATE(CFS) =      10.99

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.08   FLOW VELOCITY(FEET/SEC.) =   2.69
  LONGEST FLOWPATH FROM NODE    220.00 TO NODE    207.00 =  1535.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    207.00 TO NODE    207.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  16.79
  RAINFALL INTENSITY(INCH/HR) =   2.82
  TOTAL STREAM AREA(ACRES) =     4.51
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.99
```

** CONFLUENCE DATA **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)
1	104.63	21.70	2.398	75.41
2	10.99	16.79	2.821	4.51

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)
1	99.92	16.79	2.821
2	113.97	21.70	2.398

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 113.97 Tc(MIN.) = 21.70
TOTAL AREA(ACRES) = 79.92
LONGEST FLOWPATH FROM NODE 210.00 TO NODE 207.00 = 4615.00 FEET.

==========

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 79.92 TC(MIN.) = 21.70
PEAK FLOW RATE(CFS) = 113.97

==========
==========

END OF RATIONAL METHOD ANALYSIS

```
****************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                          2003,1985,1981 HYDROLOGY MANUAL
         (c) Copyright 1982-2005 Advanced Engineering Software (aes)
             Ver. 2.0 Release Date: 06/01/2005  License ID 1217

                          Analysis prepared by:

                                 PBS&J
                            9275 Sky Park Court
                                 Suite 200
                            San Diego, CA 92123

 ************************** DESCRIPTION OF STUDY **************************
* SITE 2 - OFFSITE 100-YEAR STORM EVENT                                   *
* PROPOSED CONDITION                                                      *
*                                                                         *
 ***************************************************************************

  FILE NAME: 2PROPOFF.DAT
  TIME/DATE OF STUDY: 13:47 02/05/2006
 ---------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
 ---------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 1.00
  RAINFALL-INTENSITY ADJUSTMENT FACTOR = 1.000
  *USER SPECIFIED:
  NUMBER OF [TIME,INTENSITY] DATA PAIRS =  9
   1)   5.000;  4.400
   2)  10.000;  3.450
   3)  15.000;  3.000
   4)  20.000;  2.500
   5)  25.000;  2.200
   6)  30.000;  2.000
   7)  40.000;  1.720
   8)  50.000;  1.480
   9)  60.000;  1.310
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: ONLY PEAK CONFLUENCE VALUES CONSIDERED
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  =====  ====  =====  =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE    201.00 TO NODE    202.00 IS CODE =  21
 ---------------------------------------------------------------------------
```

```
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  SINGLE FAMILY DEVELOPMENT RUNOFF COEFFICIENT = .5500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  88
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   180.00
  UPSTREAM ELEVATION(FEET) =    385.00
  DOWNSTREAM ELEVATION(FEET) =    380.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    9.449
  *CAUTION: SUBAREA SLOPE EXCEEDS COUNTY NOMOGRAPH
   DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.555
  SUBAREA RUNOFF(CFS) =      0.51
  TOTAL AREA(ACRES) =      0.26   TOTAL RUNOFF(CFS) =      0.51

******************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    203.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    380.00  DOWNSTREAM(FEET) =    244.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2240.00   CHANNEL SLOPE =  0.0607
  CHANNEL BASE(FEET) =   50.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.610
  SINGLE FAMILY DEVELOPMENT RUNOFF COEFFICIENT = .5500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  88
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     13.03
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.95
  AVERAGE FLOW DEPTH(FEET) =   0.07   TRAVEL TIME(MIN.) =   9.45
  Tc(MIN.) =  18.90
  SUBAREA AREA(ACRES) =    16.95       SUBAREA RUNOFF(CFS) =   24.33
  TOTAL AREA(ACRES) =     17.21        PEAK FLOW RATE(CFS) =      24.84

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.10   FLOW VELOCITY(FEET/SEC.) =   5.14
  LONGEST FLOWPATH FROM NODE    201.00 TO NODE    203.00 =  2420.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE    203.00 TO NODE    203.00 IS CODE =   1
------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  18.90
  RAINFALL INTENSITY(INCH/HR) =   2.61
  TOTAL STREAM AREA(ACRES) =    17.21
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     24.84

******************************************************************************
  FLOW PROCESS FROM NODE    210.00 TO NODE    211.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  ROAD(HARD SURFACE) COVER RUNOFF COEFFICIENT = .9500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  92
```

```
INITIAL SUBAREA FLOW-LENGTH(FEET) =   150.00
UPSTREAM ELEVATION(FEET) =    284.00
DOWNSTREAM ELEVATION(FEET) =    283.00
ELEVATION DIFFERENCE(FEET) =      1.00
URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.785
TIME OF CONCENTRATION ASSUMED AS 6-MIN.
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.210
SUBAREA RUNOFF(CFS) =      0.56
TOTAL AREA(ACRES) =      0.14   TOTAL RUNOFF(CFS) =      0.56

****************************************************************************
FLOW PROCESS FROM NODE    211.00 TO NODE    203.00 IS CODE =  51
----------------------------------------------------------------------------
>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =    283.00  DOWNSTREAM(FEET) =    244.00
CHANNEL LENGTH THRU SUBAREA(FEET) =  2430.00   CHANNEL SLOPE =  0.0160
CHANNEL BASE(FEET) =   50.00   "Z" FACTOR =   2.000
MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.458
*USER SPECIFIED(SUBAREA):
GRASS GOOD COVER RUNOFF COEFFICIENT = .5600
S.C.S. CURVE NUMBER (AMC II) =  92
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     14.37
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.75
AVERAGE FLOW DEPTH(FEET) =   0.10   TRAVEL TIME(MIN.) =  14.70
Tc(MIN.) =  20.70
SUBAREA AREA(ACRES) =    17.24       SUBAREA RUNOFF(CFS) =   23.73
TOTAL AREA(ACRES) =     17.38        PEAK FLOW RATE(CFS) =      24.29

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) =  0.14   FLOW VELOCITY(FEET/SEC.) =   3.40
LONGEST FLOWPATH FROM NODE    210.00 TO NODE    203.00 =  2580.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE    203.00 TO NODE    203.00 IS CODE =   1
----------------------------------------------------------------------------
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
TOTAL NUMBER OF STREAMS =  2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
TIME OF CONCENTRATION(MIN.) =  20.70
RAINFALL INTENSITY(INCH/HR) =   2.46
TOTAL STREAM AREA(ACRES) =    17.38
PEAK FLOW RATE(CFS) AT CONFLUENCE =     24.29

** CONFLUENCE DATA **
STREAM     RUNOFF      Tc      INTENSITY      AREA
NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
   1        24.84    18.90       2.610        17.21
   2        24.29    20.70       2.458        17.38

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR  2 STREAMS.

** PEAK FLOW RATE TABLE **
STREAM     RUNOFF      Tc      INTENSITY
NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
   1        47.71    18.90       2.610
```

```
    2        47.68     20.70        2.458

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      47.71   Tc(MIN.) =   18.90
  TOTAL AREA(ACRES) =      34.59
  LONGEST FLOWPATH FROM NODE    210.00 TO NODE    203.00 =  2580.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    203.00 TO NODE    205.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  244.00  DOWNSTREAM ELEVATION(FEET) =  221.00
  STREET LENGTH(FEET) =   400.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      48.17
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.48
    HALFSTREET FLOOD WIDTH(FEET) =   17.61
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.48
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.58
  STREET FLOW TRAVEL TIME(MIN.) =   0.89   Tc(MIN.) =  19.79
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.521
  ROAD(HARD SURFACE) COVER RUNOFF COEFFICIENT = .9500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  92
  SUBAREA AREA(ACRES) =    0.38      SUBAREA RUNOFF(CFS) =    0.91
  TOTAL AREA(ACRES) =     34.97        PEAK FLOW RATE(CFS) =      48.62

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.48   HALFSTREET FLOOD WIDTH(FEET) =  17.61
  FLOW VELOCITY(FEET/SEC.) =  7.55   DEPTH*VELOCITY(FT*FT/SEC.) =   3.61
  LONGEST FLOWPATH FROM NODE    210.00 TO NODE    205.00 =  2980.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    203.00 TO NODE    205.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.521
  *USER SPECIFIED(SUBAREA):
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .7100
  S.C.S. CURVE NUMBER (AMC II) =  92
  SUBAREA AREA(ACRES) =    2.60   SUBAREA RUNOFF(CFS) =    4.65
  TOTAL AREA(ACRES) =     37.57   TOTAL RUNOFF(CFS) =   53.28
  TC(MIN.) =  19.79

****************************************************************************
  FLOW PROCESS FROM NODE    205.00 TO NODE    206.00 IS CODE =  61
----------------------------------------------------------------------------
```

```
>>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
UPSTREAM ELEVATION(FEET) =  221.00  DOWNSTREAM ELEVATION(FEET) =  142.00
STREET LENGTH(FEET) =   930.00   CURB HEIGHT(INCHES) =  6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
INSIDE STREET CROSSFALL(DECIMAL) =  0.020
OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      79.81
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.52
  HALFSTREET FLOOD WIDTH(FEET) =   21.03
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    9.79
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.12
STREET FLOW TRAVEL TIME(MIN.) =   1.58   Tc(MIN.) =  21.37
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.418
*USER SPECIFIED(SUBAREA):
GRASS GOOD COVER RUNOFF COEFFICIENT = .5800
S.C.S. CURVE NUMBER (AMC II) =  92
SUBAREA AREA(ACRES) =   37.84      SUBAREA RUNOFF(CFS) =   53.06
TOTAL AREA(ACRES) =     75.41        PEAK FLOW RATE(CFS) =     106.34

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.56   HALFSTREET FLOOD WIDTH(FEET) =  23.05
FLOW VELOCITY(FEET/SEC.) = 10.83   DEPTH*VELOCITY(FT*FT/SEC.) =   6.08
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L =  930.0 FT WITH ELEVATION-DROP =  79.0 FT, IS   68.0 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    206.00
LONGEST FLOWPATH FROM NODE    210.00 TO NODE    206.00 =  3910.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE    206.00 TO NODE    207.00 IS CODE =  31
----------------------------------------------------------------------------
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   142.00  DOWNSTREAM(FEET) =    18.00
FLOW LENGTH(FEET) =   705.00   MANNING'S N =  0.013
DEPTH OF FLOW IN  27.0 INCH PIPE IS  18.6 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =  36.44
ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
PIPE-FLOW(CFS) =    106.34
PIPE TRAVEL TIME(MIN.) =   0.32    Tc(MIN.) =  21.69
LONGEST FLOWPATH FROM NODE    210.00 TO NODE    207.00 =  4615.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE    207.00 TO NODE    207.00 IS CODE =   1
----------------------------------------------------------------------------
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
TOTAL NUMBER OF STREAMS =  2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
TIME OF CONCENTRATION(MIN.) =  21.69
```

```
  RAINFALL INTENSITY(INCH/HR) =   2.40
  TOTAL STREAM AREA(ACRES) =    75.41
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    106.34

****************************************************************************
  FLOW PROCESS FROM NODE    220.00 TO NODE    221.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  ROAD(HARD SURFACE) COVER RUNOFF COEFFICIENT = .9500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  92
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   175.00
  UPSTREAM ELEVATION(FEET) =    221.00
  DOWNSTREAM ELEVATION(FEET) =    205.00
  ELEVATION DIFFERENCE(FEET) =     16.00
  URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.708
  *CAUTION: SUBAREA SLOPE EXCEEDS COUNTY NOMOGRAPH
   DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
  TIME OF CONCENTRATION ASSUMED AS 6-MIN.
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.210
  SUBAREA RUNOFF(CFS) =      0.44
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.44

****************************************************************************
  FLOW PROCESS FROM NODE    221.00 TO NODE    207.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    205.00  DOWNSTREAM(FEET) =     18.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1360.00   CHANNEL SLOPE =  0.1375
  CHANNEL BASE(FEET) =   50.00   "Z" FACTOR =  20.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.821
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  92
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      6.05
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.10
  AVERAGE FLOW DEPTH(FEET) =   0.06   TRAVEL TIME(MIN.) =  10.79
  Tc(MIN.) =  16.79
  SUBAREA AREA(ACRES) =     4.40       SUBAREA RUNOFF(CFS) =   10.55
  TOTAL AREA(ACRES) =      4.51         PEAK FLOW RATE(CFS) =      10.99

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.08   FLOW VELOCITY(FEET/SEC.) =   2.69
  LONGEST FLOWPATH FROM NODE    220.00 TO NODE    207.00 =  1535.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    207.00 TO NODE    207.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  16.79
  RAINFALL INTENSITY(INCH/HR) =   2.82
  TOTAL STREAM AREA(ACRES) =     4.51
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.99
```

** CONFLUENCE DATA **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)
1	106.34	21.69	2.398	75.41
2	10.99	16.79	2.821	4.51

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)
1	101.38	16.79	2.821
2	115.68	21.69	2.398

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 115.68 Tc(MIN.) = 21.69
TOTAL AREA(ACRES) = 79.92
LONGEST FLOWPATH FROM NODE 210.00 TO NODE 207.00 = 4615.00 FEET.

==========

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 79.92 TC(MIN.) = 21.69
PEAK FLOW RATE(CFS) = 115.68

==========

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END OF RATIONAL METHOD ANALYSIS

Appendix E
10- and 100- year Storm Event, Offsite and Onsite, Hydrology for Present SWFSC Site

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              RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
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              Ver. 2.0 Release Date: 06/01/2005  License ID 1217

                          Analysis prepared by:

                                PBS&J
                           9275 Sky Park Court
                                Suite 200
                           San Diego, CA 92123

   ************************** DESCRIPTION OF STUDY **************************
  * SITE 1 - ONSITE 10-YEAR STORM EVENT                                     *
  * EXISTING CONDITION                                                      *
  *                                                                         *
   ***************************************************************************

    FILE NAME: 1EXON10.DAT
    TIME/DATE OF STUDY: 09:50 02/06/2006
  ---------------------------------------------------------------------------
    USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
  ---------------------------------------------------------------------------
    1981 SAN DIEGO HYDROLOGY MANUAL RAINFALL INFORMATION USED

    USER SPECIFIED STORM EVENT(YEAR) =  10.00
    SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
    SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 1.00
    RAINFALL-INTENSITY ADJUSTMENT FACTOR = 1.000
    SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
    NOTE: ONLY PEAK CONFLUENCE VALUES CONSIDERED
    *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
       HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
       WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
 NO.    (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
 ===   =====  =========  ================  ======  =====  ====  =====  =======
  1    30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

   GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
     1. Relative Flow-Depth =  0.00 FEET
        as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
     2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
   *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
    OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  21
---------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===========================================================================
  *USER SPECIFIED(SUBAREA):
  GRASS GOOD COVER RUNOFF COEFFICIENT = .6900
  S.C.S. CURVE NUMBER (AMC II) =  0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =  290.00
  UPSTREAM ELEVATION(FEET) =  243.00
  DOWNSTREAM ELEVATION(FEET) =  222.00
  ELEVATION DIFFERENCE(FEET) =  21.00
```

```
URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.496
*CAUTION: SUBAREA SLOPE EXCEEDS COUNTY NOMOGRAPH
 DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
  10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.081
SUBAREA RUNOFF(CFS) =      0.83
TOTAL AREA(ACRES) =      0.39   TOTAL RUNOFF(CFS) =      0.83

****************************************************************************
FLOW PROCESS FROM NODE    102.00 TO NODE    103.00 IS CODE =  51
----------------------------------------------------------------------------
>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =    222.00  DOWNSTREAM(FEET) =    195.00
CHANNEL LENGTH THRU SUBAREA(FEET) =   335.00   CHANNEL SLOPE =  0.0806
CHANNEL BASE(FEET) =   50.00   "Z" FACTOR =   2.000
MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   1.00
  10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.559
*USER SPECIFIED(SUBAREA):
GRASS GOOD COVER RUNOFF COEFFICIENT = .6000
S.C.S. CURVE NUMBER (AMC II) =   0
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      2.60
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.47
AVERAGE FLOW DEPTH(FEET) =   0.04   TRAVEL TIME(MIN.) =   3.79
Tc(MIN.) =  10.29
SUBAREA AREA(ACRES) =     2.30       SUBAREA RUNOFF(CFS) =    3.53
TOTAL AREA(ACRES) =      2.69         PEAK FLOW RATE(CFS) =       4.36

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) =  0.05   FLOW VELOCITY(FEET/SEC.) =   1.72
LONGEST FLOWPATH FROM NODE    101.00 TO NODE    103.00 =   625.00 FEET.
============================================================================
END OF STUDY SUMMARY:
TOTAL AREA(ACRES)      =      2.69  TC(MIN.) =     10.29
PEAK FLOW RATE(CFS)    =      4.36
============================================================================
============================================================================
END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************

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                          Analysis prepared by:

                                PBS&J
                            9275 Sky Park Court
                                Suite 200
                            San Diego, CA 92123

  *************************** DESCRIPTION OF STUDY **************************
 * SITE 1 - ONSITE 10-YEAR STORM EVENT                                      *
 * PROPOSED CONDITION                                                       *
 *                                                                          *
  ****************************************************************************

  FILE NAME: 1PON10.DAT
  TIME/DATE OF STUDY: 09:51 02/06/2006
 ----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
 ----------------------------------------------------------------------------
  1981 SAN DIEGO HYDROLOGY MANUAL RAINFALL INFORMATION USED

  USER SPECIFIED STORM EVENT(YEAR) =  10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 1.00
  RAINFALL-INTENSITY ADJUSTMENT FACTOR = 1.000
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: ONLY PEAK CONFLUENCE VALUES CONSIDERED
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)    (FT)     SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  =====  ====  =====  =======
  1   30.0    20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  21
 ----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 ============================================================================
  *USER SPECIFIED(SUBAREA):
  GRASS GOOD COVER RUNOFF COEFFICIENT = .6900
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   290.00
  UPSTREAM ELEVATION(FEET) =    243.00
  DOWNSTREAM ELEVATION(FEET) =    222.00
  ELEVATION DIFFERENCE(FEET) =     21.00
```

```
  URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =     6.496
  *CAUTION: SUBAREA SLOPE EXCEEDS COUNTY NOMOGRAPH
   DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.081
  SUBAREA RUNOFF(CFS) =       0.83
  TOTAL AREA(ACRES) =       0.39   TOTAL RUNOFF(CFS) =       0.83

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    103.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    222.00  DOWNSTREAM(FEET) =    195.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   335.00   CHANNEL SLOPE =  0.0806
  CHANNEL BASE(FEET) =   50.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   1.00
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.534
  *USER SPECIFIED(SUBAREA):
  GRASS GOOD COVER RUNOFF COEFFICIENT = .5500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.46
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.39
  AVERAGE FLOW DEPTH(FEET) =   0.04   TRAVEL TIME(MIN.) =   4.02
  Tc(MIN.) =  10.51
  SUBAREA AREA(ACRES) =     2.30       SUBAREA RUNOFF(CFS) =    3.20
  TOTAL AREA(ACRES) =      2.69         PEAK FLOW RATE(CFS) =       4.03

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.05   FLOW VELOCITY(FEET/SEC.) =   1.66
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    103.00 =   625.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =      2.69  TC(MIN.) =     10.51
  PEAK FLOW RATE(CFS)    =      4.03
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************

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                          Analysis prepared by:

                                 PBS&J
                            9275 Sky Park Court
                                 Suite 200
                            San Diego, CA 92123

 ************************** DESCRIPTION OF STUDY **************************
 * SITE 1 - OFFSITE 10-YEAR STORM EVENT                                   *
 * EXISTING CONDITION                                                     *
 *                                                                        *
 **************************************************************************

  FILE NAME: 1EXOFF10.DAT
  TIME/DATE OF STUDY: 09:53 02/06/2006
 ----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
 ----------------------------------------------------------------------------
  1981 SAN DIEGO HYDROLOGY MANUAL RAINFALL INFORMATION USED

  USER SPECIFIED STORM EVENT(YEAR) =  10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 1.00
  RAINFALL-INTENSITY ADJUSTMENT FACTOR = 1.000
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: ONLY PEAK CONFLUENCE VALUES CONSIDERED
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  =====  ====  =====  =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE    201.00 TO NODE    202.00 IS CODE =  21
 ----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 ============================================================================
  GRASS GOOD COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  80
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   170.00
  UPSTREAM ELEVATION(FEET) =    377.00
  DOWNSTREAM ELEVATION(FEET) =    369.00
  ELEVATION DIFFERENCE(FEET) =      8.00
```

```
  URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    9.104
  *CAUTION: SUBAREA SLOPE EXCEEDS COUNTY NOMOGRAPH
   DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.689
  SUBAREA RUNOFF(CFS) =       0.35
  TOTAL AREA(ACRES) =       0.29   TOTAL RUNOFF(CFS) =       0.35

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    203.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    369.00  DOWNSTREAM(FEET) =    246.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   965.00   CHANNEL SLOPE =  0.1275
  CHANNEL BASE(FEET) =   50.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  1.00
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.804
  GRASS GOOD COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  80
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.29
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.37
  AVERAGE FLOW DEPTH(FEET) =   0.03   TRAVEL TIME(MIN.) =  11.73
  Tc(MIN.) =  20.83
  SUBAREA AREA(ACRES) =     4.48       SUBAREA RUNOFF(CFS) =    3.64
  TOTAL AREA(ACRES) =      4.77         PEAK FLOW RATE(CFS) =       3.99

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.04   FLOW VELOCITY(FEET/SEC.) =   1.85
  LONGEST FLOWPATH FROM NODE    201.00 TO NODE    203.00 =  1135.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1003.00 TO NODE    103.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   246.00  DOWNSTREAM(FEET) =   195.00
  FLOW LENGTH(FEET) =   450.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   4.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.24
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      3.99
  PIPE TRAVEL TIME(MIN.) =   0.57    Tc(MIN.) =  21.40
  LONGEST FLOWPATH FROM NODE    201.00 TO NODE    103.00 =  1585.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    103.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  21.40
  RAINFALL INTENSITY(INCH/HR) =   1.78
  TOTAL STREAM AREA(ACRES) =     4.77
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.99

****************************************************************************
```

```
  FLOW PROCESS FROM NODE     103.00 TO NODE     103.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =    9.90   RAIN INTENSITY(INCH/HOUR) =  2.60
  TOTAL AREA(ACRES) =      2.69   TOTAL RUNOFF(CFS) =      5.89

****************************************************************************
  FLOW PROCESS FROM NODE     103.00 TO NODE     103.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.90
  RAINFALL INTENSITY(INCH/HR) =    2.60
  TOTAL STREAM AREA(ACRES) =      2.69
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.89

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc       INTENSITY      AREA
  NUMBER     (CFS)     (MIN.)    (INCH/HOUR)    (ACRE)
     1        3.99     21.40        1.779         4.77
     2        5.89      9.90        2.601         2.69

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc       INTENSITY
  NUMBER     (CFS)     (MIN.)    (INCH/HOUR)
     1        8.62      9.90        2.601
     2        8.01     21.40        1.779

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      8.62   Tc(MIN.) =     9.90
  TOTAL AREA(ACRES) =      7.46
  LONGEST FLOWPATH FROM NODE     201.00 TO NODE     103.00 =  1585.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)       =      7.46  TC(MIN.) =      9.90
  PEAK FLOW RATE(CFS)     =      8.62
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************

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                          Analysis prepared by:

                                PBS&J
                          9275 Sky Park Court
                               Suite 200
                          San Diego, CA 92123

  ************************** DESCRIPTION OF STUDY **************************
 * SITE 1 - OFFSITE 10-YEAR STORM EVENT                                    *
 * PROPOSED CONDITION                                                      *
 *                                                                         *
  ***************************************************************************

  FILE NAME: 1POFF10.DAT
  TIME/DATE OF STUDY: 11:55 02/06/2006
 ---------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
 ---------------------------------------------------------------------------
  1981 SAN DIEGO HYDROLOGY MANUAL RAINFALL INFORMATION USED

  USER SPECIFIED STORM EVENT(YEAR) =  10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 1.00
  RAINFALL-INTENSITY ADJUSTMENT FACTOR = 1.000
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: ONLY PEAK CONFLUENCE VALUES CONSIDERED
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)    (FT)     SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  =====  ====  =====  =======
  1   30.0    20.0    0.018/0.018/0.020    0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE   1001.00 TO NODE   1002.00 IS CODE =  21
 ---------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 ===========================================================================
  GRASS GOOD COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  80
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   170.00
  UPSTREAM ELEVATION(FEET) =    377.00
  DOWNSTREAM ELEVATION(FEET) =    369.00
  ELEVATION DIFFERENCE(FEET) =      8.00
```

```
  URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    9.104
  *CAUTION: SUBAREA SLOPE EXCEEDS COUNTY NOMOGRAPH
   DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.689
  SUBAREA RUNOFF(CFS) =      0.35
  TOTAL AREA(ACRES) =      0.29   TOTAL RUNOFF(CFS) =      0.35

****************************************************************************
  FLOW PROCESS FROM NODE   1002.00 TO NODE   1003.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    369.00  DOWNSTREAM(FEET) =    246.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   965.00   CHANNEL SLOPE =  0.1275
  CHANNEL BASE(FEET) =   50.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   1.00
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.804
  GRASS GOOD COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  80
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      2.29
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.37
  AVERAGE FLOW DEPTH(FEET) =   0.03   TRAVEL TIME(MIN.) =  11.73
  Tc(MIN.) =  20.83
  SUBAREA AREA(ACRES) =     4.48       SUBAREA RUNOFF(CFS) =    3.64
  TOTAL AREA(ACRES) =      4.77         PEAK FLOW RATE(CFS) =       3.99

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.04   FLOW VELOCITY(FEET/SEC.) =   1.85
  LONGEST FLOWPATH FROM NODE   1001.00 TO NODE   1003.00 =  1135.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1003.00 TO NODE    103.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   246.00  DOWNSTREAM(FEET) =   195.00
  FLOW LENGTH(FEET) =   450.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   4.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.24
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      3.99
  PIPE TRAVEL TIME(MIN.) =   0.57    Tc(MIN.) =  21.40
  LONGEST FLOWPATH FROM NODE   1001.00 TO NODE    103.00 =  1585.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    103.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  21.40
  RAINFALL INTENSITY(INCH/HR) =   1.78
  TOTAL STREAM AREA(ACRES) =     4.77
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.99

****************************************************************************
```

```
  FLOW PROCESS FROM NODE     103.00 TO NODE     103.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =  10.11   RAIN INTENSITY(INCH/HOUR) =  2.58
  TOTAL AREA(ACRES) =      2.69   TOTAL RUNOFF(CFS) =      5.46

****************************************************************************
  FLOW PROCESS FROM NODE     103.00 TO NODE     103.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  10.11
  RAINFALL INTENSITY(INCH/HR) =   2.58
  TOTAL STREAM AREA(ACRES) =      2.69
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.46

  ** CONFLUENCE DATA **
  STREAM      RUNOFF      Tc       INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)    (INCH/HOUR)    (ACRE)
     1         3.99     21.40        1.779         4.77
     2         5.46     10.11        2.578         2.69

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM      RUNOFF      Tc       INTENSITY
  NUMBER      (CFS)     (MIN.)    (INCH/HOUR)
     1         8.21     10.11        2.578
     2         7.75     21.40        1.779

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      8.21   Tc(MIN.) =   10.11
  TOTAL AREA(ACRES) =      7.46
  LONGEST FLOWPATH FROM NODE   1001.00 TO NODE    103.00 =  1585.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =      7.46  TC(MIN.) =     10.11
  PEAK FLOW RATE(CFS)    =      8.21
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************

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                          Analysis prepared by:

                                PBS&J
                            9275 Sky Park Court
                                Suite 200
                            San Diego, CA 92123

 ************************** DESCRIPTION OF STUDY **************************
* SITE 1 - ONSITE 100-YEAR STORM EVENT                                     *
* EXISTING CONDITION                                                       *
*                                                                          *
 ****************************************************************************

  FILE NAME: 1EXISTON.DAT
  TIME/DATE OF STUDY: 08:09 02/06/2006
 ----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
 ----------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 1.00
  RAINFALL-INTENSITY ADJUSTMENT FACTOR = 1.000
  *USER SPECIFIED:
  NUMBER OF [TIME,INTENSITY] DATA PAIRS =  9
   1)   5.000;  4.400
   2)  10.000;  3.450
   3)  15.000;  3.000
   4)  20.000;  2.500
   5)  25.000;  2.200
   6)  30.000;  2.000
   7)  40.000;  1.720
   8)  50.000;  1.480
   9)  60.000;  1.310
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: ONLY PEAK CONFLUENCE VALUES CONSIDERED
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  =====  ====  ====  =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  21
 ----------------------------------------------------------------------------
```

```
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
 *USER SPECIFIED(SUBAREA):
 GRASS GOOD COVER RUNOFF COEFFICIENT = .6900
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   290.00
 UPSTREAM ELEVATION(FEET) =    243.00
 DOWNSTREAM ELEVATION(FEET) =    222.00
 ELEVATION DIFFERENCE(FEET) =     21.00
 URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.496
 *CAUTION: SUBAREA SLOPE EXCEEDS COUNTY NOMOGRAPH
  DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.116
 SUBAREA RUNOFF(CFS) =      1.11
 TOTAL AREA(ACRES) =      0.39   TOTAL RUNOFF(CFS) =      1.11

******************************************************************************
 FLOW PROCESS FROM NODE    102.00 TO NODE    103.00 IS CODE =  51
------------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    222.00  DOWNSTREAM(FEET) =    195.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   335.00   CHANNEL SLOPE =  0.0806
 CHANNEL BASE(FEET) =   50.00   "Z" FACTOR =   2.000
 MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   1.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.469
 *USER SPECIFIED(SUBAREA):
 GRASS GOOD COVER RUNOFF COEFFICIENT = .6000
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      3.52
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.64
 AVERAGE FLOW DEPTH(FEET) =   0.04   TRAVEL TIME(MIN.) =   3.41
 Tc(MIN.) =   9.90
 SUBAREA AREA(ACRES) =     2.30       SUBAREA RUNOFF(CFS) =    4.79
 TOTAL AREA(ACRES) =      2.69        PEAK FLOW RATE(CFS) =       5.89

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.06   FLOW VELOCITY(FEET/SEC.) =   1.84
 LONGEST FLOWPATH FROM NODE    101.00 TO NODE    103.00 =   625.00 FEET.
==============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)      =      2.69  TC(MIN.) =      9.90
 PEAK FLOW RATE(CFS)    =      5.89
==============================================================================
==============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************

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                          Analysis prepared by:

                                PBS&J
                            9275 Sky Park Court
                                Suite 200
                            San Diego, CA 92123

 ************************** DESCRIPTION OF STUDY **************************
* SITE 1 - ONSITE 100-YEAR STORM EVENT                                     *
* PROPOSED CONDITION                                                       *
*                                                                          *
 ****************************************************************************

  FILE NAME: 1PROPON.DAT
  TIME/DATE OF STUDY: 08:23 02/06/2006
 ----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
 ----------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 1.00
  RAINFALL-INTENSITY ADJUSTMENT FACTOR = 1.000
  *USER SPECIFIED:
  NUMBER OF [TIME,INTENSITY] DATA PAIRS =  9
   1)   5.000;  4.400
   2)  10.000;  3.450
   3)  15.000;  3.000
   4)  20.000;  2.500
   5)  25.000;  2.200
   6)  30.000;  2.000
   7)  40.000;  1.720
   8)  50.000;  1.480
   9)  60.000;  1.310
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: ONLY PEAK CONFLUENCE VALUES CONSIDERED
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)    (FT)     SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  =====  ====  ====  =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE     101.00 TO NODE     102.00 IS CODE =  21
 ----------------------------------------------------------------------------
```

```
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 ==============================================================================
  *USER SPECIFIED(SUBAREA):
  GRASS GOOD COVER RUNOFF COEFFICIENT = .6900
  S.C.S. CURVE NUMBER (AMC II) =  80
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   290.00
  UPSTREAM ELEVATION(FEET) =    243.00
  DOWNSTREAM ELEVATION(FEET) =    222.00
  ELEVATION DIFFERENCE(FEET) =     21.00
  URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.496
  *CAUTION: SUBAREA SLOPE EXCEEDS COUNTY NOMOGRAPH
   DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.116
  SUBAREA RUNOFF(CFS) =      1.11
  TOTAL AREA(ACRES) =      0.39   TOTAL RUNOFF(CFS) =      1.11

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    103.00 IS CODE =  51
 ----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
 ==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    222.00  DOWNSTREAM(FEET) =    195.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   335.00   CHANNEL SLOPE =  0.0806
  CHANNEL BASE(FEET) =   50.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.440
  *USER SPECIFIED(SUBAREA):
  GRASS GOOD COVER RUNOFF COEFFICIENT = .5500
  S.C.S. CURVE NUMBER (AMC II) =  80
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      3.32
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.55
  AVERAGE FLOW DEPTH(FEET) =   0.04   TRAVEL TIME(MIN.) =   3.61
  Tc(MIN.) =  10.11
  SUBAREA AREA(ACRES) =     2.30       SUBAREA RUNOFF(CFS) =    4.35
  TOTAL AREA(ACRES) =      2.69         PEAK FLOW RATE(CFS) =       5.46

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.06   FLOW VELOCITY(FEET/SEC.) =   1.87
  LONGEST FLOWPATH FROM NODE    101.00 TO NODE    103.00 =   625.00 FEET.
==============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =      2.69  TC(MIN.) =     10.11
  PEAK FLOW RATE(CFS)    =      5.46
==============================================================================
==============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************

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                              Analysis prepared by:

                                     PBS&J
                              9275 Sky Park Court
                                   Suite 200
                              San Diego, CA 92123

 ************************** DESCRIPTION OF STUDY **************************
 * SITE 1 - OFFSITE 100-YEAR STORM EVENT                                  *
 * EXISTING CONDITION                                                     *
 *                                                                        *
 **************************************************************************

  FILE NAME: 1EXOFF.DAT
  TIME/DATE OF STUDY: 08:16 02/06/2006
 ----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
 ----------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 1.00
  RAINFALL-INTENSITY ADJUSTMENT FACTOR = 1.000
  *USER SPECIFIED:
  NUMBER OF [TIME,INTENSITY] DATA PAIRS =  9
   1)   5.000;  4.400
   2)  10.000;  3.450
   3)  15.000;  3.000
   4)  20.000;  2.500
   5)  25.000;  2.200
   6)  30.000;  2.000
   7)  40.000;  1.720
   8)  50.000;  1.480
   9)  60.000;  1.310
 SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
 NOTE: ONLY PEAK CONFLUENCE VALUES CONSIDERED
 *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  =====  ====  ====  =======
  1   30.0     20.0    0.018/0.018/0.020  0.67    2.00 0.0313 0.167 0.0150

 GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
   1. Relative Flow-Depth =  0.00 FEET
      as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
   2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
 *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
  OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    201.00 TO NODE    202.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  GRASS GOOD COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  80
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   170.00
  UPSTREAM ELEVATION(FEET) =    377.00
  DOWNSTREAM ELEVATION(FEET) =    369.00
  ELEVATION DIFFERENCE(FEET) =      8.00
  URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    9.104
  *CAUTION: SUBAREA SLOPE EXCEEDS COUNTY NOMOGRAPH
   DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.620
  SUBAREA RUNOFF(CFS) =      0.47
  TOTAL AREA(ACRES) =      0.29   TOTAL RUNOFF(CFS) =      0.47

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    203.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    369.00  DOWNSTREAM(FEET) =    246.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   965.00   CHANNEL SLOPE =  0.1275
  CHANNEL BASE(FEET) =   50.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.714
  GRASS GOOD COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  80
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      3.25
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.84
  AVERAGE FLOW DEPTH(FEET) =   0.04   TRAVEL TIME(MIN.) =   8.76
  Tc(MIN.) =  17.86
  SUBAREA AREA(ACRES) =     4.48       SUBAREA RUNOFF(CFS) =    5.47
  TOTAL AREA(ACRES) =      4.77         PEAK FLOW RATE(CFS) =       5.94

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.06   FLOW VELOCITY(FEET/SEC.) =   2.11
  LONGEST FLOWPATH FROM NODE    201.00 TO NODE    203.00 =  1135.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1003.00 TO NODE    103.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   246.00  DOWNSTREAM(FEET) =   195.00
  FLOW LENGTH(FEET) =   450.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.86
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
```

```
PIPE-FLOW(CFS) =        5.94
PIPE TRAVEL TIME(MIN.) =    0.50     Tc(MIN.) =  18.36
LONGEST FLOWPATH FROM NODE     201.00 TO NODE     103.00 =  1585.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE     103.00 TO NODE     103.00 IS CODE =    1
----------------------------------------------------------------------------
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
TOTAL NUMBER OF STREAMS =  2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
TIME OF CONCENTRATION(MIN.) =  18.36
RAINFALL INTENSITY(INCH/HR) =   2.66
TOTAL STREAM AREA(ACRES) =      4.77
PEAK FLOW RATE(CFS) AT CONFLUENCE =       5.94

****************************************************************************
FLOW PROCESS FROM NODE     103.00 TO NODE     103.00 IS CODE =    7
----------------------------------------------------------------------------
>>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
USER-SPECIFIED VALUES ARE AS FOLLOWS:
TC(MIN) =    9.90    RAIN INTENSITY(INCH/HOUR) =  3.47
TOTAL AREA(ACRES) =      2.69    TOTAL RUNOFF(CFS) =       5.89

****************************************************************************
FLOW PROCESS FROM NODE     103.00 TO NODE     103.00 IS CODE =    1
----------------------------------------------------------------------------
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
TOTAL NUMBER OF STREAMS =  2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
TIME OF CONCENTRATION(MIN.) =    9.90
RAINFALL INTENSITY(INCH/HR) =    3.47
TOTAL STREAM AREA(ACRES) =      2.69
PEAK FLOW RATE(CFS) AT CONFLUENCE =       5.89

** CONFLUENCE DATA **
STREAM     RUNOFF      Tc      INTENSITY      AREA
NUMBER     (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
   1        5.94     18.36       2.664         4.77
   2        5.89      9.90       3.469         2.69

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR  2 STREAMS.

** PEAK FLOW RATE TABLE **
STREAM     RUNOFF      Tc      INTENSITY
NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
   1       10.45      9.90       3.469
   2       10.47     18.36       2.664

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =      10.47    Tc(MIN.) =    18.36
TOTAL AREA(ACRES) =       7.46
LONGEST FLOWPATH FROM NODE     201.00 TO NODE     103.00 =  1585.00 FEET.
```

```
==============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)        =       7.46  TC(MIN.) =      18.36
  PEAK FLOW RATE(CFS)      =      10.47
==============================================================================
==============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************
                RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
                Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                           2003,1985,1981 HYDROLOGY MANUAL
            (c) Copyright 1982-2005 Advanced Engineering Software (aes)
                Ver. 2.0 Release Date: 06/01/2005  License ID 1217

                              Analysis prepared by:

                                     PBS&J
                              9275 Sky Park Court
                                   Suite 200
                              San Diego, CA 92123

 ************************** DESCRIPTION OF STUDY **************************
 * SITE 1 - OFFSITE 100-YEAR STORM EVENT                                  *
 * PROPOSED CONDITION                                                     *
 *                                                                        *
 ************************************************************************

  FILE NAME: 1PROPOFF.DAT
  TIME/DATE OF STUDY: 08:27 02/06/2006
 ------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
 ------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 1.00
  RAINFALL-INTENSITY ADJUSTMENT FACTOR = 1.000
  *USER SPECIFIED:
  NUMBER OF [TIME,INTENSITY] DATA PAIRS =  9
   1)   5.000;  4.400
   2)  10.000;  3.450
   3)  15.000;  3.000
   4)  20.000;  2.500
   5)  25.000;  2.200
   6)  30.000;  2.000
   7)  40.000;  1.720
   8)  50.000;  1.480
   9)  60.000;  1.310
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: ONLY PEAK CONFLUENCE VALUES CONSIDERED
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE   FACTOR
NO.   (FT)    (FT)     SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  ========  ================  ======  =====  ====  =====  =======
  1   30.0    20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
 FLOW PROCESS FROM NODE     201.00 TO NODE     202.00 IS CODE =  21
----------------------------------------------------------------------------
```

```
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 ==============================================================================
  GRASS GOOD COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  80
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   170.00
  UPSTREAM ELEVATION(FEET) =    377.00
  DOWNSTREAM ELEVATION(FEET) =    369.00
  ELEVATION DIFFERENCE(FEET) =      8.00
  URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    9.104
  *CAUTION: SUBAREA SLOPE EXCEEDS COUNTY NOMOGRAPH
   DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.620
  SUBAREA RUNOFF(CFS) =      0.47
  TOTAL AREA(ACRES) =      0.29   TOTAL RUNOFF(CFS) =      0.47

 ******************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    203.00 IS CODE =  51
 ------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
 ==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    369.00  DOWNSTREAM(FEET) =    246.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   965.00   CHANNEL SLOPE =  0.1275
  CHANNEL BASE(FEET) =   50.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.714
  GRASS GOOD COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  80
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      3.25
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.84
  AVERAGE FLOW DEPTH(FEET) =   0.04   TRAVEL TIME(MIN.) =   8.76
  Tc(MIN.) =  17.86
  SUBAREA AREA(ACRES) =     4.48       SUBAREA RUNOFF(CFS) =    5.47
  TOTAL AREA(ACRES) =      4.77         PEAK FLOW RATE(CFS) =       5.94

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.06   FLOW VELOCITY(FEET/SEC.) =   2.11
  LONGEST FLOWPATH FROM NODE    201.00 TO NODE    203.00 =  1135.00 FEET.

 ******************************************************************************
  FLOW PROCESS FROM NODE   1003.00 TO NODE    103.00 IS CODE =  31
 ------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
 ==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   246.00  DOWNSTREAM(FEET) =   195.00
  FLOW LENGTH(FEET) =   450.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.86
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      5.94
  PIPE TRAVEL TIME(MIN.) =   0.50    Tc(MIN.) =  18.36
  LONGEST FLOWPATH FROM NODE    201.00 TO NODE    103.00 =  1585.00 FEET.

 ******************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    103.00 IS CODE =   1
 ------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
```

```
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  18.36
  RAINFALL INTENSITY(INCH/HR) =   2.66
  TOTAL STREAM AREA(ACRES) =     4.77
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.94

******************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    103.00 IS CODE =   7
------------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
==============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) =  10.11   RAIN INTENSITY(INCH/HOUR) =  3.44
  TOTAL AREA(ACRES) =     2.69   TOTAL RUNOFF(CFS) =      5.46

******************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    103.00 IS CODE =   1
------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =  10.11
  RAINFALL INTENSITY(INCH/HR) =   3.44
  TOTAL STREAM AREA(ACRES) =     2.69
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.46

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
     1         5.94    18.36       2.664         4.77
     2         5.46    10.11       3.440         2.69

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1        10.06    10.11       3.440
     2        10.17    18.36       2.664

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     10.17   Tc(MIN.) =   18.36
  TOTAL AREA(ACRES) =      7.46
  LONGEST FLOWPATH FROM NODE    201.00 TO NODE    103.00 =  1585.00 FEET.
==============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =      7.46  TC(MIN.) =     18.36
  PEAK FLOW RATE(CFS)    =     10.17
==============================================================================
==============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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Appendix F
BMP Fact Sheets

PBSJ	Subject: SOUTHWEST FISHERIES WATER QUALITY - STORMWATER VOLUME CALCS	
Comp by: / Check by:	Date: / Job Number:	Sheet Number:

URBAN RUNOFF QUALITY MANAGEMENT APPROACH

$C = 0.858i^3 - 0.78i^2 + 0.774i + 0.04$

$P_o = (a \times C) \times P_{10}$

where,

C = RUNOFF COEFFICIENT

i = WATERSHED IMPERVIOUS RATIO WHICH IS EQUAL TO THE TOTAL PERCENT IMPERVIOUSNESS DIVIDED BY 100

P_o = Maximized Detention Volume, in watershed inches

a = Regression Constant, a = 1.502 and a = 1.903 for 24 hour and 48 hour drawdown, respectively

P_{10} = mean annual runoff-producing rainfall depths, in watershed inches, Table #-1.

$i = \frac{\text{IMPERVIOUS AREA}}{\text{TOTAL AREA}} \quad \frac{1.71}{2.6} = .658$

$C = 0.858(0.658)^3 - 0.78(0.658)^2 + 0.774(0.658) + 0.04$

$= .244 - .338 + .509 + .04$

$C = 0.455$

$P_{10} = 0.57$ from Table 1, Appendix D, CA Stormwater BMP Handbook, New Development and Redevelopment

~~a = 1.502 for 24 hour drawdown~~

$P_o = (a \times C) \times P_{10}$

$= (1.502 \times 0.455)0.57$

$= 0.41$ in

$V_{BMP} = P_o \times A = 0.41 \text{ in} \times 2.6 \text{ ac} = 1.06 \text{ ac-in} \times \frac{43560 \text{ ft}^2}{1 \text{ ac}} \times \frac{1 \text{ ft}}{12 \text{ in}} = 3872 \text{ ft}^3$

OR approx. 4.3' deep by 30' x 30'

Roof Runoff Controls

SD-11

Rain Garden

Design Objectives

- ✓ Maximize Infiltration
- ✓ Provide Retention
- ✓ Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- ✓ Contain Pollutants
- Collect and Convey

Description

Various roof runoff controls are available to address stormwater that drains off rooftops. The objective is to reduce the total volume and rate of runoff from individual lots, and retain the pollutants on site that may be picked up from roofing materials and atmospheric deposition. Roof runoff controls consist of directing the roof runoff away from paved areas and mitigating flow to the storm drain system through one of several general approaches: cisterns or rain barrels; dry wells or infiltration trenches; pop-up emitters, and foundation planting. The first three approaches require the roof runoff to be contained in a gutter and downspout system. Foundation planting provides a vegetated strip under the drip line of the roof.

Approach

Design of individual lots for single-family homes as well as lots for higher density residential and commercial structures should consider site design provisions for containing and infiltrating roof runoff or directing roof runoff to vegetative swales or buffer areas. Retained water can be reused for watering gardens, lawns, and trees. Benefits to the environment include reduced demand for potable water used for irrigation, improved stormwater quality, increased groundwater recharge, decreased runoff volume and peak flows, and decreased flooding potential.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment.

Design Considerations

Designing New Installations

Cisterns or Rain Barrels

One method of addressing roof runoff is to direct roof downspouts to cisterns or rain barrels. A cistern is an above ground storage vessel with either a manually operated valve or a permanently open outlet. Roof runoff is temporarily stored and then released for irrigation or infiltration between storms. The number of rain

CASQA
California Stormwater Quality Association

barrels needed is a function of the rooftop area. Some low impact developers recommend that every house have at least 2 rain barrels, with a minimum storage capacity of 1000 liters. Roof barrels serve several purposes including mitigating the first flush from the roof which has a high volume, amount of contaminants, and thermal load. Several types of rain barrels are commercially available. Consideration must be given to selecting rain barrels that are vector proof and childproof. In addition, some barrels are designed with a bypass valve that filters out grit and other contaminants and routes overflow to a soak-away pit or rain garden.

If the cistern has an operable valve, the valve can be closed to store stormwater for irrigation or infiltration between storms. This system requires continual monitoring by the resident or grounds crews, but provides greater flexibility in water storage and metering. If a cistern is provided with an operable valve and water is stored inside for long periods, the cistern must be covered to prevent mosquitoes from breeding.

A cistern system with a permanently open outlet can also provide for metering stormwater runoff. If the cistern outlet is significantly smaller than the size of the downspout inlet (say ¼ to ½ inch diameter), runoff will build up inside the cistern during storms, and will empty out slowly after peak intensities subside. This is a feasible way to mitigate the peak flow increases caused by rooftop impervious land coverage, especially for the frequent, small storms.

Dry wells and Infiltration Trenches

Roof downspouts can be directed to dry wells or infiltration trenches. A dry well is constructed by excavating a hole in the ground and filling it with an open graded aggregate, and allowing the water to fill the dry well and infiltrate after the storm event. An underground connection from the downspout conveys water into the dry well, allowing it to be stored in the voids. To minimize sedimentation from lateral soil movement, the sides and top of the stone storage matrix can be wrapped in a permeable filter fabric, though the bottom may remain open. A perforated observation pipe can be inserted vertically into the dry well to allow for inspection and maintenance.

In practice, dry wells receiving runoff from single roof downspouts have been successful over long periods because they contain very little sediment. They must be sized according to the amount of rooftop runoff received, but are typically 4 to 5 feet square, and 2 to 3 feet deep, with a minimum of 1-foot soil cover over the top (maximum depth of 10 feet).

To protect the foundation, dry wells must be set away from the building at least 10 feet. They must be installed in solids that accommodate infiltration. In poorly drained soils, dry wells have very limited feasibility.

Infiltration trenches function in a similar manner and would be particularly effective for larger roof areas. An infiltration trench is a long, narrow, rock-filled trench with no outlet that receives stormwater runoff. These are described under Treatment Controls.

Pop-up Drainage Emitter

Roof downspouts can be directed to an underground pipe that daylights some distance from the building foundation, releasing the roof runoff through a pop-up emitter. Similar to a pop-up irrigation head, the emitter only opens when there is flow from the roof. The emitter remains flush to the ground during dry periods, for ease of lawn or landscape maintenance.

Foundation Planting

Landscape planting can be provided around the base to allow increased opportunities for stormwater infiltration and protect the soil from erosion caused by concentrated sheet flow coming off the roof. Foundation plantings can reduce the physical impact of water on the soil and provide a subsurface matrix of roots that encourage infiltration. These plantings must be sturdy enough to tolerate the heavy runoff sheet flows, and periodic soil saturation.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Supplemental Information

Examples

- City of Ottawa's Water Links Surface –Water Quality Protection Program
- City of Toronto Downspout Disconnection Program
- City of Boston, MA, Rain Barrel Demonstration Program

Other Resources

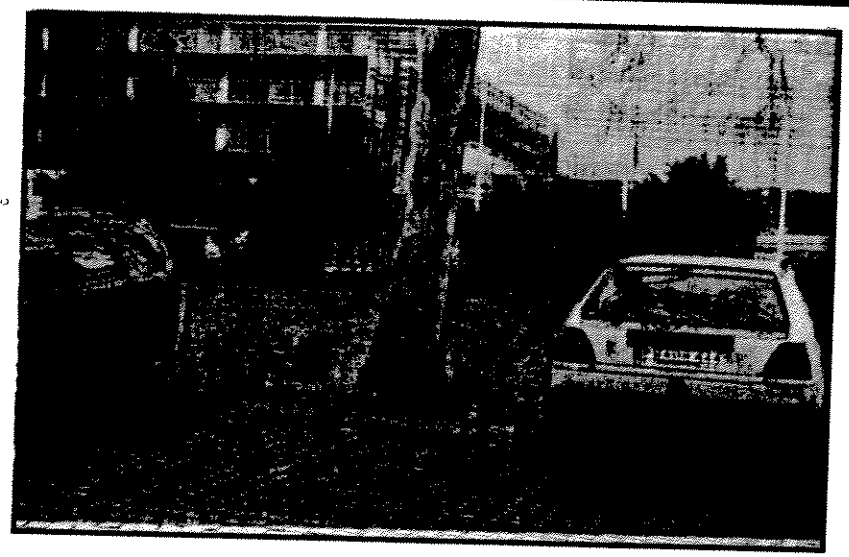
Hager, Marty Catherine, Stormwater, "Low-Impact Development", January/February 2003. www.stormh2o.com

Low Impact Urban Design Tools, Low Impact Development Design Center, Beltsville, MD. www.lid-stormwater.net

Start at the Source, Bay Area Stormwater Management Agencies Association, 1999 Edition

Pervious Pavements

SD-20



Design Objectives

- ✓ Maximize Infiltration
- ✓ Provide Retention
- ✓ Slow Runoff
- ✓ Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Pervious paving is used for light vehicle loading in parking areas. The term describes a system comprising a load-bearing, durable surface together with an underlying layered structure that temporarily stores water prior to infiltration or drainage to a controlled outlet. The surface can itself be porous such that water infiltrates across the entire surface of the material (e.g., grass and gravel surfaces, porous concrete and porous asphalt), or can be built up of impermeable blocks separated by spaces and joints, through which the water can drain. This latter system is termed 'permeable' paving. Advantages of pervious pavements is that they reduce runoff volume while providing treatment, and are unobtrusive resulting in a high level of acceptability.

Approach

Attenuation of flow is provided by the storage within the underlying structure or sub base, together with appropriate flow controls. An underlying geotextile may permit groundwater recharge, thus contributing to the restoration of the natural water cycle. Alternatively, where infiltration is inappropriate (e.g., if the groundwater vulnerability is high, or the soil type is unsuitable), the surface can be constructed above an impermeable membrane. The system offers a valuable solution for drainage of spatially constrained urban areas.

Significant attenuation and improvement in water quality can be achieved by permeable pavements, whichever method is used. The surface and subsurface infrastructure can remove both the soluble and fine particulate pollutants that occur within urban runoff. Roof water can be piped into the storage area directly, adding areas from which the flow can be attenuated. Also, within lined systems, there is the opportunity for stored runoff to be piped out for reuse.

Suitable Applications

Residential, commercial and industrial applications are possible. The use of permeable pavement may be restricted in cold regions, arid regions or regions with high wind erosion. There are some specific disadvantages associated with permeable pavement, which are as follows:

- Permeable pavement can become clogged if improperly installed or maintained. However, this is countered by the ease with which small areas of paving can be cleaned or replaced when blocked or damaged.

- Their application should be limited to highways with low traffic volumes, axle loads and speeds (less than 30 mph limit), car · ·ing areas and other lightly trafficked or non-trafficked areas. Permeable surfaces currently not considered suitable for adoptable roads due to the risks associated with ıailure on high speed roads, the safety implications of ponding, and disruption arising from reconstruction.

- When using un-lined, infiltration systems, there is some risk of contaminating groundwater, depending on soil conditions and aquifer susceptibility. However, this risk is likely to be small because the areas drained tend to have inherently low pollutant loadings.

- The use of permeable pavement is restricted to gentle slopes.

- Porous block paving has a higher risk of abrasion and damage than solid blocks.

Design Considerations

Designing New Installations

If the grades, subsoils, drainage characteristics, and groundwater conditions are suitable, permeable paving may be substituted for conventional pavement on parking areas, cul de sacs and other areas with light traffic. Slopes should be flat or very gentle. Scottish experience has shown that permeable paving systems can be installed in a wide range of ground conditions, and the flow attenuation performance is excellent even when the systems are lined.

The suitability of a pervious system at a particular pavement site will, however, depend on the loading criteria required of the pavement.

Where the system is to be used for infiltrating drainage waters into the ground, the vulnerability of local groundwater sources to pollution from the site should be low, and the seasonal high water table should be at least 4 feet below the surface.

Ideally, the pervious surface should be horizontal in order to intercept local rainfall at source. On sloping sites, pervious surfaces may be terraced to accommodate differences in levels.

Design Guidelines

The design of each layer of the pavement must be determined by the likely traffic loadings and their required operational life. To provide satisfactory performance, the following criteria should be considered:

- The subgrade should be able to sustain traffic loading without excessive deformation.

- The granular capping and sub-base layers should give sufficient load-bearing to provide an adequate construction platform and base for the overlying pavement layers.

- The pavement materials should not crack of suffer excessive rutting under the influence of traffic. This is controlled by the horizontal tensile stress at the base of these layers.

There is no current structural design method specifically for pervious pavements. Allowances should be considered the following factors in the design and specification of materials:

- Pervious pavements use materials with high permeability and void space. All the current UK pavement design methods are based on the use of conventional materials that are dense and relatively impermeable. The stiffness of the materials must therefore be assessed.
- Water is present within the construction and can soften and weaken materials, and this must be allowed for.
- Existing design methods assume full friction between layers. Any geotextiles or geomembranes must be carefully specified to minimize loss of friction between layers.
- Porous asphalt loses adhesion and becomes brittle as air passes through the voids. Its durability is therefore lower than conventional materials.

The single sized grading of materials used means that care should be taken to ensure that loss of finer particles between unbound layers does not occur.

Positioning a geotextile near the surface of the pervious construction should enable pollutants to be trapped and retained close to the surface of the construction. This has both advantages and disadvantages. The main disadvantage is that the filtering of sediments and their associated pollutants at this level may hamper percolation of waters and can eventually lead to surface ponding. One advantage is that even if eventual maintenance is required to reinstate infiltration, only a limited amount of the construction needs to be disturbed, since the sub-base below the geotextile is protected. In addition, the pollutant concentration at a high level in the structure allows for its release over time. It is slowly transported in the stormwater to lower levels where chemical and biological processes may be operating to retain or degrade pollutants.

The design should ensure that sufficient void space exists for the storage of sediments to limit the period between remedial works.

- Pervious pavements require a single size grading to give open voids. The choice of materials is therefore a compromise between stiffness, permeability and storage capacity.
- Because the sub-base and capping will be in contact with water for a large part of the time, the strength and durability of the aggregate particles when saturated and subjected to wetting and drying should be assessed.
- A uniformly graded single size material cannot be compacted and is liable to move when construction traffic passes over it. This effect can be reduced by the use of angular crushed rock material with a high surface friction.

In pollution control terms, these layers represent the site of long term chemical and biological pollutant retention and degradation processes. The construction materials should be selected, in addition to their structural strength properties, for their ability to sustain such processes. In general, this means that materials should create neutral or slightly alkaline conditions and they should provide favorable sites for colonization by microbial populations.

Construction/Inspection Considerations

- Permeable surfaces can be laid without cross-falls or longitudinal gradients.
- The blocks should be lain level

- They should not be used for storage of site materials, unless the surface is well protected from deposition of silt and other spillages.
- The pavement should be constructed in a single operation, as one of the last items to be built, on a development site. Landscape development should be completed before pavement construction to avoid contamination by silt or soil from this source.
- Surfaces draining to the pavement should be stabilized before construction of the pavement.
- Inappropriate construction equipment should be kept away from the pavement to prevent damage to the surface, sub-base or sub-grade.

Maintenance Requirements

The maintenance requirements of a pervious surface should be reviewed at the time of design and should be clearly specified. Maintenance is required to prevent clogging of the pervious surface. The factors to be considered when defining maintenance requirements must include:

- Type of use
- Ownership
- Level of trafficking
- The local environment and any contributing catchments

Studies in the UK have shown satisfactory operation of porous pavement systems without maintenance for over 10 years and recent work by Imbe et al. at 9th ICUD, Portland, 2002 describes systems operating for over 20 years without maintenance. However, performance under such regimes could not be guaranteed, Table 1 shows typical recommended maintenance regimes:

Table 1 Typical Recommended Maintenance Regimes

Activity	Schedule
■ Minimize use of salt or grit for de-icing ■ Keep landscaped areas well maintained ■ Prevent soil being washed onto pavement	Ongoing
■ Vacuum clean surface using commercially available sweeping machines at the following times: - End of winter (April) - Mid-summer (July / August) - After Autumn leaf-fall (November)	2/3 x per year
■ Inspect outlets	Annual
■ If routine cleaning does not restore infiltration rates, then reconstruction of part of the whole of a pervious surface may be required. ■ The surface area affected by hydraulic failure should be lifted for inspection of the internal materials to identify the location and extent of the blockage. ■ Surface materials should be lifted and replaced after brush cleaning. Geotextiles may need complete replacement. ■ Sub-surface layers may need cleaning and replacing. ■ Removed silts may need to be disposed of as controlled waste.	As needed (infrequent) Maximum 15-20 years

Permeable pavements are up to 25 % cheaper (or at least no more expensive than the traditional forms of pavement construction), when all construction and drainage costs are taken into account. (Accepting that the porous asphalt itself is a more expensive surfacing, the extra cost of which is offset by the savings in underground pipework etc.) (Niemczynowicz, et al., 1987)

Table 1 gives US cost estimates for capital and maintenance costs of porous pavements (Landphair et al., 2000)

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Additional Information

Cost Considerations

Permeable pavements are up to 25 % cheaper (or at least no more expensive than the traditional forms of pavement construction), when all construction and drainage costs are taken into account. (Accepting that the porous asphalt itself is a more expensive surfacing, the extra cost of which is offset by the savings in underground pipework etc.) (Niemczynowicz, et al., 1987)

Table 2 gives US cost estimates for capital and maintenance costs of porous pavements (Landphair et al., 2000)

Table 2 **Engineer's Estimate for Porous Pavement**

Porous Pavement													
Item	Units	Price	Cycles/ Year	Quant. 1 Acre WS	Total	Quant. 2 Acre WS	Total	Quant. 3 Acre WS	Total	Quant. 4 Acre WS	Total	Quant. 5 Acre WS	Total
Grading	SY	$2.00		604	$1,208	1209	$2,418	1812	$3,624	2419	$4,838	3020	$6,040
Paving	SY	$19.00		212	$4,028	424	$8,056	636	$12,084	848	$16,112	1060	$20,140
Excavation	CY	$3.60		201	$724	403	$1,451	604	$2,174	806	$2,902	1008	$3,629
Filter Fabric	SY	$1.15		700	$805	1400	$1,610	2000	$2,300	2800	$3,220	3600	$4,140
Stone Fill	CY	$16.00		201	$3,216	403	$6,448	604	$9,664	806	$12,896	1008	$16,128
Sand	CY	$7.00		100	$700	200	$1,400	300	$2,100	400	$2,800	500	$3,500
Sight Well	EA	$300.00		2	$600	3	$900	4	$1,200	7	$2,100	7	$2,100
Seeding	LF	$0.05		644	$32	1288	$64	1932	$97	2576	$129	3220	$161
Check Dam	CY	$35.00		0	$0	0	$0	0	$0	0	$0	0	$0
Total Construction Costs					$10,105		$19,929		$29,619		$40,158		$48,798
Construction Costs Amortized for 20 Years					$505		$996		$1,481		$2,008		$2,440

Annual Maintenance Expense													
Item	Units	Price	Cycles/ Year	Quant. 1 Acre WS	Total	Quant. 2 Acre WS	Total	Quant. 3 Acre WS	Total	Quant. 4 Acre WS	Total	Quant. 5 Acre WS	Total
Sweeping	AC	$250.00	6	1	$1,500	2	$3,000	3	$4,500	4	$6,000	5	$7,500
Washing	AC	$250.00	6	1	$1,500	2	$3,000	3	$4,500	4	$6,000	5	$7,500
Inspection	MH	$20.00	5	5	$100	5	$100	5	$100	5	$100	5	$100
Deep Clean	AC	$450.00	0.5	1	$225	2	$450	3	$675	3.9	$878	5	$1,125
Total Annual Maintenance Expense					$3,960		$7,792		$11,651		$15,483		$18,370

Supplemental Information

■

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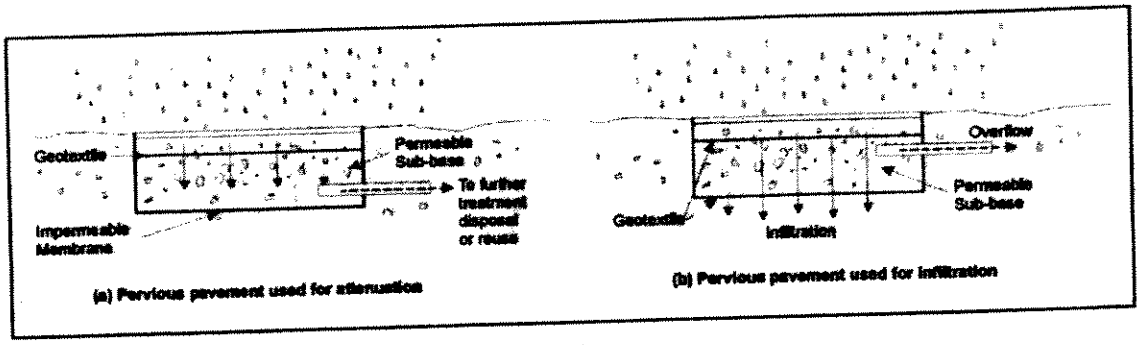
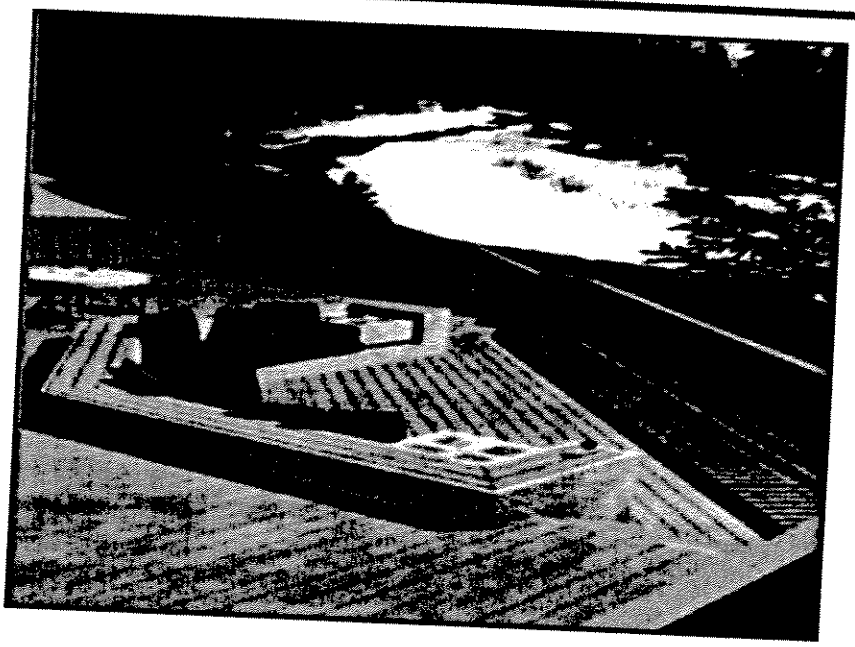


Schematics of a Pervious Pavement System

Alternative Building Materials SD-21



Design Objectives

- ✓ Maximize Infiltration
- ✓ Provide Retention
- ✓ Source Control
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- Contain Pollutant
- Collect and Convey

Description

Alternative building materials are selected instead of conventional materials for new construction and renovation. These materials reduce potential sources of pollutants in stormwater runoff by eliminating compounds that can leach into runoff, reducing the need for pesticide application, reducing the need for painting and other maintenance, or by reducing the volume of runoff.

Approach

Alternative building materials are available for use as lumber for decking, roofing materials, home siding, and paving for driveways, decks, and sidewalks.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment.

Design Considerations

Designing New Installations

Decking

One of the most common materials for construction of decks and other outdoor construction has traditionally been pressure treated wood, which is now being phased out. The standard treatment is called CCA, for chromated copper arsenate. The key ingredients are arsenic (which kills termites, carpenter ants and other insects), copper (which kills the fungi that cause wood to rot) and chromium (which reacts with the other ingredients to bind them to the wood). The amount of arsenic is far from trivial. A deck just 8 feet x 10 feet contains more than 1 1/3 pounds of this highly potent poison. Replacement materials include a new type of pressure treated wood, plastic and composite lumber.

There are currently over 20 products in the market consisting of plastic or plastic-wood composites. Plastic lumber is made from 100% recycled plastic, # 2 HDPE and polyethylene plastic milk jugs

CASQA California Stormwater Quality Association

and soap bottles. Plastic-wood composites are a combination of plastic and wood fibers or sawdust. These materials are a long last' xterior weather, insect, and chemical resistant wood lumber replacement for non structural ı cations. Use it for decks, docks, raised garden beds and planter boxes, pallets, hand railings, outdoor furniture, animal pens, boat decks, etc.

New pressure treated wood uses a much safer recipe, ACQ, which stands for ammoniacal copper quartenary. It contains no arsenic and no chromium. Yet the American Wood Preservers Association has found it to be just as effective as the standard formula. ACQ is common in Japan and Europe.

Roofing

Several studies have indicated that metal used as roofing material, flashing, or gutters can leach metals into the environment. The leaching occurs because rainfall is slightly acidic and slowly dissolved the exposed metals. Common traditional applications include copper sheathing and galvanized (zinc) gutters.

Coated metal products are available for both roofing and gutter applications. These products eliminate contact of bare metal with rainfall, eliminating one source of metals in runoff. There are also roofing materials made of recycled rubber and plastic that resemble traditional materials.

A less traditional approach is the use of green roofs. These roofs are not just green, they're alive. Planted with grasses and succulents, low- profile green roofs reduce the urban heat island effect, stormwater runoff, and cooling costs, while providing wildlife habitat and a connection to nature for building occupants. These roofs are widely used on industrial facilities in Europe and have been established as experimental installations in several locations in the US, including Portland, Oregon. Their feasibility is questionable in areas of California with prolonged, dry, hot weather.

Paved Areas

Traditionally, concrete is used for construction of patios, sidewalks, and driveways. Although it is non-toxic, these paved areas reduce stormwater infiltration and increase the volume and rate of runoff. This increase in the amount of runoff is the leading cause of stream channel degradation in urban areas.

There are a number of alternative materials that can be used in these applications, including porous concrete and asphalt, modular blocks, and crushed granite. These materials, especially modular paving blocks, are widely available and a well established method to reduce stormwater runoff.

Building Siding

Wood siding is commonly used on the exterior of residential construction. This material weathers fairly rapidly and requires repeated painting to prevent rotting. Alternative "new" products for this application include cement-fiber and vinyl. Cement-fiber siding is a masonry product made from Portland cement, sand, and cellulose and will not burn, cup, swell, or shrink.

Pesticide Reduction

A common use of powerful pesticides is for the control of termites. Chlordane was used for many years for this purpose and is now found in urban streams and lakes nationwide. There are a

number of physical barriers that can be installed during construction to help reduce the use of pesticides.

Sand barriers for subterranean termites are a physical deterrent because the termites cannot tunnel through it. Sand barriers can be applied in crawl spaces under pier and beam foundations, under slab foundations, and between the foundation and concrete porches, terraces, patios and steps. Other possible locations include under fence posts, underground electrical cables, water and gas lines, telephone and electrical poles, inside hollow tile cells and against retaining walls.

Metal termite shields are physical barriers to termites which prevent them from building invisible tunnels. In reality, metal shields function as a helpful termite detection device, forcing them to build tunnels on the outside of the shields which are easily seen. Metal termite shields also help prevent dampness from wicking to adjoining wood members which can result in rot, thus making the material more attractive to termites and other pests. Metal flashing and metal plates can also be used as a barrier between piers and beams of structures such as decks, which are particularly vulnerable to termite attack.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of "redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Other Resources

There are no good, independent, comprehensive sources of information on alternative building materials for use in minimizing the impacts of stormwater runoff. Most websites or other references to "green" or "alternative" building materials focus on indoor applications, such as formaldehyde free plywood and low VOC paints, carpets, and pads. Some supplemental information on alternative materials is available from the manufacturers.

Fires are a source of concern in many areas of California. Information on the flammability of alternative decking materials is available from the University of California Forest Product Laboratory (UCFPL) website at: http://www.ucfpl.ucop.edu/WDDeckIntro.htm

APPENDIX D
BIOLOGICAL TECHNICAL REPORT FOR THE SOUTHWEST FISHERIES SCIENCE CENTER AT UC SAN DIEGO

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Biological Technical Report
for Relocation of the
National Oceanic and Atmospheric Administration (NOAA)
Southwest Fisheries Science Center (SWFSC)

Prepared for:

SRI International
333 Ravenswood Avenue, G-134
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May 13, 2008

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1.0 BACKGROUND

The National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS), Southwest Region conducts scientific research on fisheries of the Pacific Ocean and provides scientific management advice on fishery resources. The Region's Southwest Fisheries Science Center (SWFSC) is the headquarters for six regional headquarters in the United States.

The SWFSC headquarters is located on the campus of the Scripps Institution of Oceanography (SIO), a portion of the University of California, San Diego (UCSD) campus in La Jolla, California. The headquarter facilities consist of structures which are being threatened by coastal bluff erosion. For this reason, NOAA NMFS is considering relocating the SWFSC headquarters. The preferred site for the new SWFSC facility is largely undeveloped and impacts resulting from the proposed project will be assessed under the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA).

The existing facility is located on a 2.48-acre parcel on the UCSD campus. The 3.3-acre relocation site is currently undeveloped and is located east of the existing facility just south of La Jolla Shores Drive, as shown in Figure 1 (Vicinity Map).

2.0 OBJECTIVES

This biological technical report was prepared to provide SRI International with current biological data to satisfy the review of the proposed project under CEQA, NEPA, and other federal, state, and local regulations. The report describes vegetation communities as well as sensitive resources observed or detected on the preferred site that could be potentially affected upon implementation of the proposed project. In addition, this report includes analyses of impacts to vegetation communities and sensitive resources. Mitigation measures are proposed to offset the proposed project's potentially significant impacts to sensitive vegetation communities and sensitive plant and animal species.

3.0 METHODOLOGY

3.1 Literature Review

Existing information pertaining to the project region was reviewed prior to the initiation of the field surveys. Such information included an aerial photograph of the project area; the Biological Resources section of the 2004 UCSD Long Range Development Plan (LRDP) Final Program EIR; the *Biological Resources Technical Report* (2004) prepared by Helix Environmental Planning, Inc. for the 2004 LRDP EIR; California Department of Fish and Game (CDFG) California Natural Diversity Database (CNDDB); and the previous vegetation map and biological technical report prepared for the preferred site in 2006.

3.2 Reconnaissance Survey

A reconnaissance survey of the preferred site was conducted by foot on February 19, 2008 by Jim Rocks of Rocks Biological Consulting and Kate Gentles from PBS&J. An aerial photograph was used as a base layer to create a vegetation map. Vegetation communities/land uses were identified and delineated in the field and then digitized by using a Geographic Information System (GIS). A U.S. Fish and Wildlife Service (USFWS) protocol level survey for the coastal California gnatcatcher *(Polioptila californica californica)* was also conducted and is described below. No other focused surveys for rare, threatened, or endangered species were conducted, but the locations of sensitive species, if observed, were recorded on the aerial photograph. No formal jurisdictional wetland delineations were conducted because hydric soils are not present and no evidence of wetland hydrology or vegetation was observed.

3.3 Protocol-level Coastal California Gnatcatcher Surveys

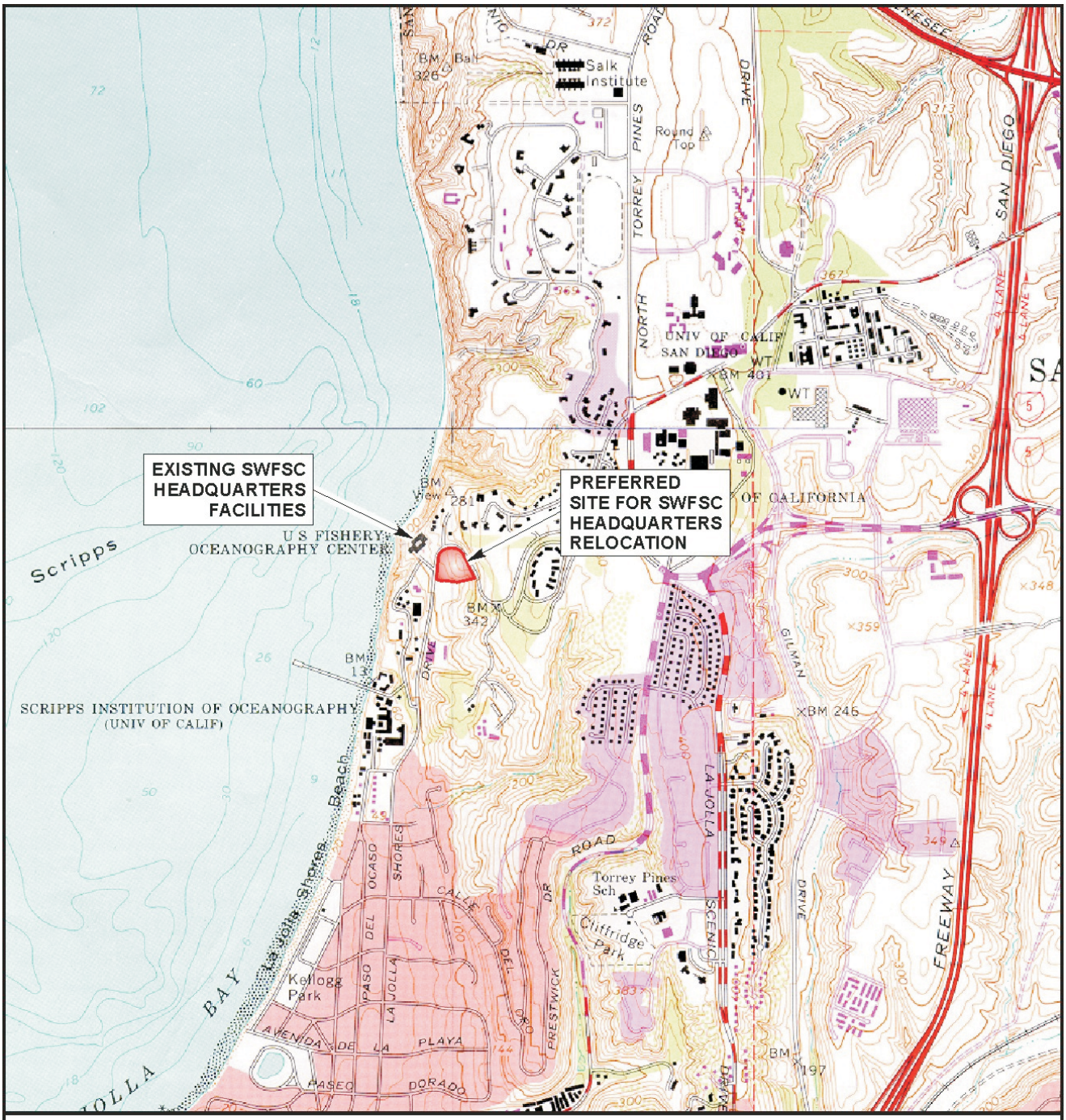
All potentially appropriate California gnatcatcher habitat (all coastal sage scrub habitat) within the preferred site was surveyed. A total of three surveys, at least 7 days apart, were conducted within the appropriate habitat areas between February 19, 2008 and March 3, 2008. Surveys were conducted on foot, and all bird and other wildlife species were identified and recorded (see attached species list in Appendix B). A taped California gnatcatcher vocalization was played at regular intervals throughout each survey to increase the chances of locating California gnatcatchers. Following the protocol, taped vocalizations were discontinued if a response ensued. All surveys were conducted during times of appropriate weather conditions and are detailed in Table 1, below. The survey letter report is available in Appendix C.

Table 1. Summary of Weather Conditions during Coastal California Gnatcatcher Surveys

Date	Surveyor	Time	Temp (ºF)	Wind (mph)	% Clouds	Precip.
2/19/2008	Jim Rocks	0940-1200	58-65	1-4	100-60	0
2/25/2008	Jim Rocks	0900-1005	61-66	1-4	5-0	0
3/3/2008	Jim Rocks	0930-1040	65-68	1-6	0-0	0

3.4 Scientific Nomenclature

Scientific nomenclature used in this report is from Holland (1986) and Oberbauer (1996) for vegetation communities; Simpson and Rebman (2006), Lightner (2006), and CNPS (2007) for flora; and Laudenslayer (1991) for animals.



SOURCE: USGS DEL MAR, CALIF. (1967, PHOTOREVISED 1975); LA JOLLA, CALIF. (1967, PHOTOREVISED 1975) T. 15 S., R. 4 W.

N

0 0.25 0.50 0.75 1.0 NAUTICAL MILES (nmi)

0 0.46 0.93 1.39 1.85 KILOMETERS (km)

VICINITY MAP **FIGURE 1**

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4.0 BIOLOGICAL SETTING

The preferred site is surrounded by developed areas on the UCSD campus. As shown in Figure 2 (Preferred Relocation Site), existing land uses surrounding the preferred site include residential, academic, and park lands within the UCSD/SIO campus, and single-family residences and open space off campus to the north. The elevation of the preferred site is approximately 213 to 304 feet above mean sea level. The preferred site is generally disturbed and supports coastal sage scrub habitat and ornamental vegetation. Figure 3 (Preferred Site Vegetation Map) shows the distribution of vegetation communities within the preferred site.

5.0 RESULTS OF INVESTIGATION

5.1 Vegetation Communities

Several vegetation types were identified within the preferred site. Table 2 lists the vegetation communities and land uses that occur within the preferred site and the approximate acreages of each. Figure 3 (Preferred Site Vegetation Map) shows the distribution of vegetation communities within the preferred site. This section provides a general description of the vegetation observed within the preferred site. A compendium of plant species observed during field surveys is provided in Appendix A.

Table 2. Vegetation Communities and Land Uses within the Preferred Site

Vegetation Community or Land Use[1]	Total Acreage Within Project Area
Diegan Coastal Sage Scrub	*1.63*
Diegan Coastal Sage Scrub - disturbed	*0.08*
Disturbed Habitat	0.73
Eucalyptus Woodland	0.37
Urbanized	0.49
TOTAL	**3.30**

[1] Vegetation community names in *italics* are considered sensitive.

Diegan Coastal Sage Scrub (including disturbed)
The Diegan coastal sage scrub is comprised of low, soft-woody subshrubs, which grow up to about one meter (three feet) high. Many of plants in this community are facultatively drought-deciduous. This association is typically found on dry sites, such as steep, south-facing slopes or clay-rich soils that are slow to release stored water. Diegan coastal sage scrub within the preferred site is mostly degraded vegetation, with only a few intact patches, probably caused by minor clearing or other disturbance to the vegetation. The dominant native plant species present

in this community include California sagebrush (*Artemisia californica*), California box-thorn (*Lycium californicum*), lemonadeberry (*Rhus integrifolia*), wild cucumber (*Marah macrocarpus*), bush sunflower (*Encelia californica*), and coast prickly-pear (*Opuntia littoralis*). The dominant non-native species include Bermuda buttercup (*Oxalis pes-caprae*) and black mustard (*Brassica nigra*). Diegan coastal sage scrub is considered a sensitive habitat by the resource agencies. Therefore, impacts on Diegan coastal sage scrub within the preferred site would be considered significant.

Disturbed Habitat

Disturbed habitat is any land on which the native vegetation has been significantly altered by construction or other land-clearing activities, and the species composition and site conditions are not characteristic of the disturbed phase of a plant association. Disturbed habitat is typically found in vacant lots, roadsides, construction staging areas, or abandoned fields, and is dominated by non-native annual species and perennial broadleaf species. The dominant on-site plant species in this community include Bermuda buttercup, black mustard, peppergrass (*Lepidium nitidum*), iceplant (*Carpobrotus chilensis*), eucalyptus (*Eucalyptus* spp.), red-eye acacia (*Acacia cyclops*), and myoporum (*Myoporum laetum*). Disturbed habitat occurs within the preferred site; however, impacts on this community would not be considered significant.

Eucalyptus Woodland

Stands of eucalyptus trees (*Eucalyptus* sp.) occur across the preferred site and occur in areas in the vicinity of the preferred site. Plants in this genus, imported primarily from Australia, were originally planted in groves throughout many regions of coastal California as a potential source of lumber and building materials, for their use as windbreaks, and for their horticultural novelty. They have increased their cover through natural regeneration, particularly in moist areas sheltered from strong coastal winds. Gum trees naturalize readily in the state and, where they form dense stands, tend to completely supplant native vegetation, greatly altering community structure and dynamics. Very few native plants are compatible with eucalyptus. Impacts on eucalyptus trees would not be considered significant.

Urbanized

Urbanized land includes areas of development and redevelopment (locations of existing man-made structures), roadways, parking lots, pedestrian paths, horticultural open spaces, landscape buffers and courtyards, plazas, gardens, and recreation fields. Urbanized land is not considered sensitive, nor is it regulated by any resource agency.

SOURCE: Landiscor Aerial Photograph, 2004

PREFERRED RELOCATION SITE **FIGURE 2**

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SOURCE: Google, 2008 and PBS&J, 2008

PREFERRED SITE VEGETATION MAP **FIGURE 3**

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5.2 Plant and Animal Species

A total of 37 plant species were observed during the reconnaissance survey, including nine patches of California box thorn (*Lycium californicum*), a California Native Plant Society (CNPS) List 4 species. List 4 species are "watch list" plants that are still relatively common, are not considered sensitive by UCSD, and, therefore, do not impose a significant biological constraint on the proposed project. A complete list of plants observed is included in Appendix A.

A total of 18 animal species were observed or detected during the reconnaissance survey and the coastal California gnatcatcher surveys. A complete list of animals observed or detected is included in Appendix B. All of the animal species were identified by direct observation or vocalizations, the presence of scat and/or tracks, or other signs.

5.3 Sensitive Resources

Sensitive resources are those defined as the following: (1) habitat areas or vegetation communities that are unique, are of relatively limited distribution, or are of particular value to wildlife; and (2) species that have been given recognition by federal, state, or local government agencies and organizations due to limited, declining, or threatened populations.

A review of the CNDDB, the LRDP *Biological Resources Technical Report,* and the 2004 LRDP Final EIR was conducted prior to the field survey. With the aid of those documents and local knowledge of biological resources, Tables 3 and 4 were created. The tables list sensitive species and their habitat requirements and assess their potential to occur within the 3.3-acre preferred site. Significant biological impacts typically involve USFWS listed species or sensitive habitats; however, the less sensitive species listed below, such as Species of Concern, must be considered in the planning and CEQA process, as well. The following discussion is focused on sensitive vegetation communities, plants, and wildlife species that occur or have the potential to occur within the 3.3-acre preferred site.

One sensitive vegetation community occurs within the preferred site: Diegan coastal sage scrub. Both intact and disturbed areas of this vegetation community are considered sensitive by the CDFG and USFWS because this vegetation community is known to support sensitive plant and wildlife species.

Table 3 lists the sensitive plant species that could potentially occur within the preferred site. As shown in Table 3, one sensitive plant species, San Diego sea dahlia (*Coreopsis maritima*), which is a CNPS List 2.2 species, was found to occur just to the southeast of the preferred site (i.e., off-site). List 2 species are defined as those species which are rare, threatened, or endangered in California, but are more common elsewhere. Because this species does not occur within the preferred site, this species does not pose a significant biological constraint on the proposed project.

Table 3. Sensitive Plant Species Potentially Occurring within the Preferred Site

Species	Status[1]	Potential to Occur within the Preferred Site
San Diego thorn-mint *(Acanthomintha ilicifolia)*	FT / SE / 1B.1	Very Low. Occurs on clay lenses in open areas. Habitat not observed on-site.
California adolphia (*Adolphia californica*)	2.1	None. Occurs in canyons and washes in coastal sage scrub. Would have been observed if present.
Shaw's agave (*Agave shawii*)	2.1	None. Occurs in coastal sage scrub and coastal bluff scrub. Would have been observed if present.
San Diego ambrosia *(Ambrosia pumila)*	FE / 1B.1	None. Found in open grassland areas and coastal sage scrub, often on historic river floodplains. Habitat not observed on-site.
Aphanisma *(Aphanisma blitoides)*	1B.2	Low. Occurs in sandy soils in coastal bluff scrub, coastal dunes, and coastal sage scrub. Habitat not observed on-site.
Del Mar Manzanita (*Arctostaphylos glandulosa* ssp. *crassifolia*)	FE / 1B.1	None. Occurs in southern maritime chaparral. Would have been observed if present.
Coastal dunes milk vetch (*Astragalus tener* var. *titi*)	FE / SE / 1B.1	None. Occurs in coastal dunes and sandy places along the coast.
Encinitas baccharis (*Baccharis vanessae*)	FT / SE / 1B.1	None. Occurs in southern maritime and southern mixed chaparral. Would have been observed if present.
White coast ceanothus (*Ceanothus verrucosus*)	FSC / 2.2	None. Occurs in chaparral. Would have been observed if present.
Orcutt's spineflower *(Chorizanthe orcuttiana)*	FE / SE / 1B.1	None. Occurs in coastal chaparral openings in chamise, in loose sandy substrate.
Long-spined spineflower *(Chorizanthe polygonoides* var. *longispina)*	1B.2	Very Low. Occurs in chaparral and coastal sage scrub.
Summer holly *(Comarostaphylis diversifolia* ssp. *diversifolia)*	1B.1	None. Occurs in chaparral. Would have been observed if present.
San Diego sea dahlia *(Coreopsis maritima)*	2.2	Observed, to the southeast of the preferred site.
San Diego sand aster (*Corethrogyne filaginifolia* var. *incana*)	1B.1	None. Occurs in coastal bluff scrub, chaparral, and coastal scrub. Would have been observed if present.
Del Mar Mesa sand aster (*Corethrogyne filaginfolia* var. *linifolia*)	1B.1	None. Typically occurs in sandy and disturbed areas of southern maritime chaparral. Would have been observed if present.
Short-leaved dudleya (*Dudleya brevifolia*)	SE / 1B.1	Very Low. Occurs in dry, sandstone bluffs in chaparral. Habitat not observed on-site.
Variegated dudleya (*Dudleya variegata*)	1B.2	Very Low. Occurs on clay soils on dry hillside and mesas.
Sticky dudleya *(Dudleya viscida)*	1B.2	Very Low. Occurs in coastal bluff scrub, chaparral, coastal scrub with rocky soils
San Diego button celery *(Eryngium aristulatum* var. *parishii)*	FE / SE / 1B.1	None. Occurs in vernal pools. Habitat not observed on-site.
San Diego barrel cactus (*Ferocactus viridescens*)	FSC / 2.1	None. Occurs in dry slopes in coastal sage scrub. Would have been observed if present.
Robinson's pepper-grass *(Lepidium virginicum* var. *robinsonii)*	1B.2	None. Occurs in chaparral and coastal scrub. Would have been observed if present.

Species	Status[1]	Potential to Occur within the Preferred Site
Willowy monardella *(Monardella viminea)*	FE / SE / 1B.1	None. Occurs on terraces of alluvial ephemeral washes. Habitat not observed on-site.
San Diego goldenstar (*Muilla clevelandii*)	1B.1	Very Low. Perennial herb occurring in chaparral, coastal sage scrub, valley and foothill grasslands, and vernal pools.
Spreading navarretia *(Navarretia fossalis)*	FT / 1B.1	None. Occurs in vernal pools. Habitat not observed on-site.
California Orcutt grass *(Orcuttia californica)*	FE / SE / 1B.1	None. Occurs in vernal pools. Habitat not observed on-site.
Brand's star phacelia *(Phacelia stellaris)*	FC / 1B.1	None. Occurs in coastal dunes. Habitat not observed on-site.
Torrey pine (*Pinus torreyana* ssp. *torreyana*)	1B.1	Ornamental plantings of species observed within the project site.
San Diego mesa mint *(Pogogyne abramsii)*	FE / SE / 1B.1	None. Occurs in vernal pools. Habitat not observed on-site.
Otay Mesa mint *(Pogogyne nudiuscula)*	FE / SE / 1B.1	None. Occurs in vernal pools. Habitat not observed on-site.
Nuttall's scrub oak (*Quercus dumosa*)	FSC / 1B.1	None. Occurs in chaparral, coastal scrub with sandy or clay loam soils. Would have been observed if present.
Parry's tetracoccus (*Tetracoccus dioicus*)	1B.2	None. Occurs in coastal sage scrub. Would have been observed if present.

[1] **Federal Candidates and Listed Plants**
FE = Federally listed, endangered; FT = Federally listed, threatened; FC = Candidate for federal listing;
FSC = Federally special concern species
State Listed Plants
SE = State listed, endangered
California Native Plant Society Lists
1A = Species presumed extinct; 1B = Species, rare, threatened, or endangered in California and elsewhere. These species are eligible for state listing.
2 = Species rare, threatened, or endangered in California but which are more common elsewhere. These species are eligible for state listing.
3 = Species for which more information is needed. Distribution, endangerment, and/or taxonomic information is needed.
4 = A watch list of species of limited distribution. These species need to be monitored for changes in the status of their populations.
0.1 = Seriously endangered in California.
0.2 = Fairly endangered in California.

Table 4 lists the sensitive animal species that could potentially occur within the preferred site based on a review of the CNDDB, the LRDP Biological Resources Technical Report, and the 2004 LRDP Final EIR. The site supports habitat for the coastal California gnatcatcher. Protocol surveys for the preferred site were conducted in August through October 2001 by Helix Environmental Planning, Inc; in May and June 2005 by PBS&J; and in February and March 2008 by Rocks Biological Consulting. In 2001, there were four California gnatcatcher observations within SIO. The surveys conducted in 2005 and 2008 both yielded negative results.

Table 4. Sensitive Animal Species Potentially Occurring within the Preferred Site

Species	Status[1] Federal / State / Other	Potential to Occur within the Preferred Site
Amphibians		
Western spadefoot *(Spea (=Scaphiopus) hammondii)*	None / CSC	Low. Most common in grasslands, coastal sage scrub near rain pools or vernal pools, riparian habitats. Habitat not observed on-site.
Reptiles		
Belding's orange-throated whiptail *(Aspidoscelis hyperythra beldingi)*	None / CSC	Low. Occurs in coastal sage scrub and chaparral. Also found in weedy, disturbed areas adjacent to these habitats. Important habitat requirements include open, sunny areas, shaded areas, and abundant invertebrate prey base, particularly native ants and termites.
Rosy boa (*Charina trivirgata*)	FSC / None	Very Low. Prefers rocky areas in coastal sage scrub, chaparral, and desert habitats
Northern red-diamond rattlesnake (*Crotalus exsul*)	FSC / CSC	Very Low. Favors rocky outcrops in coastal sage scrub, chaparral, creosote bush scrub and areas dominated by cactus.
Coronado Island skink (*Eumeces skiltonianus interparietalis*)	FSC / CSC	Low. Prefers grassland, coastal sage scrub, and open chaparral habitat where there is abundant leaf litter or low, herbaceous growth.
Coast (San Diego) horned lizard *(Phrynosoma coronatum (blainvillii* population*))*	FSC / CSC	Very Low. Prefers coastal sage scrub and chaparral habitat.
Coast patch-nosed snake (*Salvadora hexalepis virgultea*)	FSC / CSC	Very Low. Primarily found in chaparral but also inhabits coastal sage scrub and areas of grassland mixed with scrub.
Birds		
Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*)	None / CSC	None. Prefers Coastal sage scrub where it occurs on rocky hillsides and in canyons. Would have been observed if present.
Coastal California gnatcatcher *(Polioptila californica californica)*	FT, USBC / CSC	Low. Prefers coastal sage scrub, coastal sage scrub-chaparral mix, and coastal sage scrub-grassland ecotone habitats. However, none were observed during focused surveys.
Mammals		
Northwestern San Diego pocket mouse (*Chaetodipus fallax fallax*)	FSC / CSC	Low. Can occur in coastal sage scrub and ruderal areas, often in sandy washes.
San Diego black-tailed jackrabbit (*Lepus californicus bennettii*)	FSC / CSC	Low. Occurs primarily in open habitats including coastal sage scrub, chaparral, grasslands, croplands, and open, disturbed areas if there is at least some shrub cover present.
San Diego desert woodrat *Neotoma lepida intermedia*	FSC / CSC	Low. Prefers coastal sage scrub habitat and other xeric habitats.

[1] **Federal Designations**
FE = Federally endangered; FSC = Federal Species of Concern; FT = Federally threatened;
USBC = U.S. Bird Conservation watch list
State Designations
CSC = California Species of Concern; SE = State-listed as endangered

6.0 PROJECT IMPACTS AND MITIGATION MEASURES

Impacts addressed in this section are considered either direct or indirect. A direct impact occurs when the primary effects of the project replace the existing habitat with graded or developed areas. An indirect impact consists of secondary effects of a project such as decreased water quality (e.g., through sedimentation, urban contaminants, or fuel release), colonization of non-native plant species, edge effects, human activity, animal behavioral changes, night lighting, and roadkill. The magnitude of an indirect impact can be the same as a direct impact; however, the effect usually takes longer to become apparent.

6.1 Sensitive Plant Species

No sensitive plant species that would constrain the proposed project were detected within the preferred site. As shown in Table 3, some other sensitive plant species have some potential to occur within the preferred site, albeit a low or very low potential. Because these species have a low potential of occurring within the preferred site, any potential impacts to such species would be less than significant.

6.2 Sensitive Animal Species

No sensitive animal species were observed within the preferred site. However, there are two species which could be directly impacted by construction of the proposed project: coastal California gnatcatcher and raptors. A direct impact could occur to coastal California gnatcatcher as a result of habitat loss due to project grading and construction. If on-site habitat clearing occurs prior to March 2009, impacts to coastal California gnatcatcher would be less than significant, because the recent 2008 surveys were negative. However, because, coastal California gnatcatcher surveys are valid for only one calendar year, if on-site habitat clearing occurs after March 2009, the direct impact to coastal California gnatcatcher could be significant.

Additional direct impacts to roosting and nesting habitat for raptor species could occur as a result of removing tall trees, such as eucalyptus trees, with active nests. The direct loss of suitable habitat for coastal California gnatcatcher and raptors would result in a significant impact to sensitive animal species.

However, the eucalyptus trees can provide nest sites for raptor species and, if trees will be removed during the raptor breeding season (approximately February 1 through August 31), a survey for nests should be conducted prior to clearing the trees. If an active nest(s) is present, impacts on the trees must be avoided until the nest is no longer active.

As shown in Table 4, several other sensitive animal species have some potential to occur within the preferred site, albeit a low potential. Because these species have a low potential of occurring within the preferred site, any potential impacts to such species would be less than significant.

Implementation of following mitigation measures will reduce impacts to coastal California gnatcatcher, if construction were begin after March 2009, and raptors to a less than significant level.

MM-1 If habitat clearing should occur after March 2009, three surveys at least seven to 10 days apart shall be conducted to determine the presence or absence of the coastal California gnatcatcher, as required by 2004 LRDP EIR mitigation measure Bio-2A. The permittee shall submit the 10-day pre-survey notification to the USFWS Carlsbad Permits Division, including an explanation that three surveys will be conducted and that UCSD will mitigate all impacts to Diegan coastal sage scrub at a 2:1 ratio (MM-3), regardless of whether or not it is occupied, through on-site preservation in the UCSD Park. Documentation of the survey results shall be provided to USFWS.

If habitat located within the preferred site is determined to be occupied by coastal California gnatcatcher, the following measures shall be implemented.

i. Diegan coastal sage scrub habitat shall not be removed during the gnatcatcher breeding season (February 15 through August 30). If gnatcatchers are not present, then only mitigation for the habitat loss shall be required (MM-3) and habitat clearing can occur at any time in the year following the survey.

ii. If construction activities are proposed during the gnatcatcher breeding season or operational noise would exceed noise thresholds suggested by the USFWS and gnatcatchers are found within 500 feet of the grading limits based on the survey to determine presence/absence, an acoustical technician shall be consulted to identify appropriate measures for reducing construction or operational noise levels to 60 dB(A) hourly Leq during the part of the breeding season when active nests are most likely. If ambient noise levels currently exceed this level, then noise attenuation measures shall be implemented to prevent construction or operational noise from exceeding ambient levels during this period. If noise reduction measures are determined to be necessary, the acoustical technician shall confirm, through noise measurements, that noise attenuation measures are effective at maintaining noise at or below the specified threshold.

iii. Impacts to Diegan coastal sage scrub (regardless of occupancy) shall be mitigated at a 2:1 ratio by preserving areas in the Park (MM-3).

MM-2 Prior to initiation of project construction, during the raptor nesting season (generally February 1 through August 31) where suitable trees for raptor nesting occur within the preferred site or within 500 feet of the preferred site, pre-construction surveys for raptor nests shall be performed by a qualified biologist. These surveys shall be conducted no more than ten days before construction. Construction activities within 500 feet of active nests shall not be allowed to resume during the breeding season until a qualified biologist determines that the nest is no longer active.

6.3 Sensitive Vegetation Communities

Approximately 1.71 acres of Diegan coastal sage scrub was identified within the preferred site, as shown in Table 2. Both intact and disturbed areas of this vegetation community are considered sensitive by the CDFG and USFWS because this vegetation community is known to support sensitive plant and wildlife species. Therefore, implementation of the proposed project would directly impact this sensitive vegetation community and would result in a significant impact to Diegan coastal sage scrub.

Implementation of following mitigation measure, which is based on Mitigation Measure Bio-3B from the 2004 LRDP EIR, will reduce impacts to Diegan coastal sage scrub to a less than significant level.

MM-3 In accordance with the 2004 UCSD LRDP EIR Mitigation Measure Bio-3B, prior to project construction, all direct impacts to Diegan coastal sage scrub greater than 0.1 acre shall be mitigated at a ratio of 2 to 1.

Mitigation for Diegan coastal sage scrub impacts shall consist of preservation of habitat on campus combined with habitat creation and/or enhancement on-campus lands. All on-campus mitigation shall occur in the Park, particularly in the Ecological Reserve. This may require reclassifying at least some Restoration Lands and/or Grove Reserve as Ecological Reserve if they contain appropriate habitat to satisfy the mitigation requirement(s). Restoration activities could occur within portions of the Park that are currently disturbed, or in areas disturbed by project impacts, if they occur adjacent to other habitat in the Park. Mitigation credit should be given only where the habitat would be considered to be viable in the long-term, given the other surrounding uses planned by the 2004 LRDP.

The Applicant shall coordinate the preservation of habitat with UCSD's Department of Physical Planning. The process of preserving habitat is an administrative process where UCSD will quantify the impacts and bank suitable habitat near the preferred relocation site, most likely in Skeleton Canyon on the SIO Campus.

6.4 Wetlands and Jurisdictional Waterways

Waters of the United States is a broad category of water bodies which encompasses both wetland and non-wetland aquatic habitats, such as streams, creeks, rivers, lakes, ponds, bays, and oceans. These non-wetland waters are referred to as "Other Waters of the U.S." No wetlands or jurisdictional waterways were detected within the preferred site. Therefore, the proposed project would result in no impacts to wetlands or jurisdictional waterways.

6.5 Wildlife Movement Corridors

A wildlife movement corridor is defined as a patch of wildlife habitat which joins two or more larger areas of wildlife habitat. The preferred site is located adjacent to a small area of open space habitat, but in general, the preferred site is located within an urbanized area. Because there are no larger areas of habitat in the vicinity of the preferred, the project area would not be used as a wildlife movement corridor. Therefore, implementation of the proposed project would not result in a significant impact on wildlife movement corridors.

7.0 PLANT PALETTE

The following is a list of recommended native plants that would be desirable for landscaping the preferred relocation site.

Shrubs

California sagebrush (*Artemisia californica*)
Coast cholla (*Cylindropuntia prolifera*)
California encelia (*Encelia californica*)
Coast California buckwheat (*Eriogonum fasciculatum*)
California box-thorn (*Lycium californicum*)
Lemonadeberry (*Rhus integrifolia*)
Coastal deerweed (*Lotus scoparius* var. *scoparius*)
Laurel sumac (*Malosma laurina*)
Coast monkey flower (*Mimulus aurantiacus* var. *puniceus*)
Coast prickly-pear (*Opuntia littoralis*)
White sage (*Salvia apiana*)

Herbaceous Perennial and Annuals

Morning glory (*Calystegia macrostegia*)
Fascicled tarweed (*Deinandra fasciculate*)
Dudleya (*Dudleya* spp.)
Golden yarrow (*Eriophyllum confertiflorum*)
California poppy (*Eschscholzia californica*)
California everlasting (*Gnaphalium californicum*)
California goldfields (*Lasthenia californica*)
Southern goldfields (*Lasthenia coronaria*)
Tidy tips (*Layia platyglossa*)
Ground pink (*Linanthus dianthiflorus*)
California wishbone (*Mirabilis laevis*)
Purple needlegrass (*Nassella pulchra*)
Blue-eyed grass (*Sisyrinchium bellum*)

8.0 REPORT AUTHORS AND QUALIFICATIONS

Kate Gentles conducted the literature review prior to the field survey, assisted with the field survey, prepared the Biological Technical report, and assisted with presence/absence survey reports for the threatened California gnatcatcher. Ms. Gentles has a Bachelor of Arts degree in Biology from the University of San Diego and a Master of Environmental Science and Management degree from the University of California, Santa Barbara. She has over three years of experience in environmental studies in which she has served as Project Manager and Assistant Project Manager in the preparation of documents for compliance with CEQA, NEPA, and other applicable environmental and planning-related laws and regulations. Over the past two years, she has conducted general biological surveys and wetland delineations and has prepared biological technical reports, jurisdictional delineations, and Natural Environment Studies. Ms. Gentles has participated in the environmental documentation for a variety of projects including multi-use development, environmental restoration, coastal development, redevelopment, and bridge replacement projects.

Jim Rocks served as the lead biologist for this project. As such, he conducted the field surveys, conducted the presence/absence surveys for the coastal California gnatcatcher, and reviewed the Biological Technical report and focused survey reports. Mr. Rocks has a Master of Science degree in Biological Sciences from Southern Illinois University; and over nine years of biological experience in southern California, primarily in San Diego County. His expertise includes vegetation mapping, rare plant surveys, habitat assessment, wetland delineation, and native plant revegetation. Mr. Rocks has permits to conduct presence/absence surveys for the coastal California gnatcatcher, quino checkerspot butterfly, and all California fairy shrimp. He has conducted surveys for quino checkerspot butterfly, coastal California gnatcatcher, fairy shrimps, arroyo toad, least Bell's vireo, desert tortoise, southwestern willow flycatcher, and other sensitive wildlife species.

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APPENDIX A
Plant Species Observed within Preferred Relocation Site

APPENDIX A
Plant Species Observed Within Preferred Relocation Site

Species Name	Common Name
GYMNOSPERMS	
PINACEAE – Pine Family	
Pinus torreyana	Torrey Pine
ANGIOSPERMS - MONOCOTYLEDONS	
IRIDACEAE – Iris Family	
**Chasmanthe floribunda*	African Cornflag
**Iris* sp.	Iris (ornamental)
POACEAE - Grass Family	
**Avena barbata*	Wild Oat
**Bromus diandrus*	Ripgut Brome
*Cynodon dactylon	Bermuda Grass
Nassella sp. (not flowering)	Needlegrass
THEMIDACEAE – Brodiaea Family	
Dichelostemma capitatum	Blue Dicks
ANGIONSPERMS - DICOTYLEDONS	
AMARANTHACEAE - Amaranth Family	
Atriplex lentiformis	Quailbush
**Salsola tragus*	Russian Thistle
ANACARDIACEAE - Sumac Family	
Rhus integrifolia	Lemonadeberry
ASTERACEAE - Sunflower Family	
Artemisia californica	California Sagebrush
Coreopsis maritima	San Diego Sea Dahlia
**Cynara cardunculus*	Artichoke Thistle (Cardoon)
Encelia californica	Bush Sunflower
Grindelia camporum var. *bracteosum*	Gumplant
AZIOACEAE – Fig-Marigold Family	
**Carpobrotus chilensis*	Iceplant
BRASSICACEAE - Mustard Family	
**Brassica nigra*	Black Mustard
**Lepidium nitidum*	Peppergrass

Species Name	Common Name
CACTACEAE – Cactus Family	
Cylindropuntia prolifera	Coast Cholla
Opuntia littoralis	Coast Prickly-pear
CONVOLVULACEAE - Morning-Glory Family	
Calystegia macrostegia	Morning-Glory
CRASSULACEAE – Stonecrop Family	
Dudleya pulverulenta	Chalk Dudleya
CUCURBITACEAE - Gourd Family	
Marah macrocarpus	Wild Cucumber
EUPHORBIACEAE - Spurge Family	
**Ricinus communis*	Castor Bean
FABACEAE – Pea Family	
**Acacia cyclops*	Red-eye Acacia
Astragalus trichopodus var.*lonchus*	Milkvetch
Lupinus succulentus	Arroyo Lupine
**Medicago polymorpha*	Bur-clover
GERANIACEAE – Geranium Family	
**Erodium cicutarium*	Filaree
MYRTACEAE – Myrtle Family	
**Eucalytus* sp.	Gum Tree
NYCTAGINACEAE – Four O'Clock Family	
Mirabilis laevis var. *crassilfolia*	Wishbone Bush
OXALIDACEAE – Oxalis Family	
**Oxalis pes-carpe*	Bermuda Buttercup
SCROPHULARIACEAE – Figwort Family	
**Myporum laetum*	Myporum
SOLANACEAE - Nightshade Family	
Lycium californicum	California Box-thorn
TROPAEOLACEAE – Nasturtium Family	
**Tropaeolum majus.*	Garden Nasturtium

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APPENDIX B
Animal Species Detected within Preferred Relocation Site

APPENDIX B
Animal Species Detected Within Preferred Relocation Site

Common Name	Species Name
Birds	
American Crow	*Corvus brachyrhyncos*
Anna's Hummingbird	*Calypte anna*
Bewick's Wren	*Thryomanes bewickii*
Black Phoebe	*Sayornis nigricans*
Bushtit	*Psaltriparus minimus*
California Towhee	*Pipilo crissalis*
Cassin's Kingbird	*Tyrannus vociferus*
Common Raven	*Corvus corax*
House Finch	*Carpodacus mexicanus*
Mourning Dove	*Zenaida macroura*
Red-tailed Hawk	*Buteo jamaicensis*
Scrub Jay	*Aphelocoma coerulescens*
Spotted Towhee	*Piplio erythrophthalmus*
White-crowned Sparrow	*Zonotrichia leucophtys*
Wrentit	*Chamaea fasciata*
Yellow-rumped Warbler	*Dendroica coronata*
Mammals	
Rabbit (scat)	*Sylvilagus* sp.
Arthropods	
California trapdoor spider	*Bothriocyrtum californicum*

APPENDIX C
Protocol Survey for Coastal California Gnatcatcher Letter Report

ROCKS BIOLOGICAL CONSULTING

May 12, 2008

Ms. Sandra Marquez
Recovery Permit Coordinator
Carlsbad Fish and Wildlife Office
6010 Hidden Valley Road
Carlsbad, California 92011

RE: 45-day Summary Report of Focused, Protocol-Level Coastal California Gnatcatcher (*Polioptila californica californica*) Surveys for the Proposed National Oceanic and Atmospheric Administration (NOAA) Southwest Fisheries Science Center (SWFSC) Relocation Project in La Jolla, San Diego County, California

Ms. Marquez:

In compliance with the Special Terms and Conditions for Endangered and Threatened Wildlife Species Permit TE 063230-3, I am submitting this report, which presents the results of focused, protocol-level surveys I conducted to determine the presence/ absence of the coastal California gnatcatcher (*Polioptila californica californica*) within and adjacent to the proposed National Oceanic and Atmospheric Administration (NOAA) Southwest Fisheries Science Center (SWFSC) Relocation Site in La Jolla, San Diego County, California (Figure 1).

PROJECT DESCRIPTION

The existing SWFSC headquarters facility is located on the campus of the Scripps Institution of Oceanography (SIO) a portion of the University of California, San Diego (UCSD) campus in La Jolla, California. The headquarters facility consists of structures which are being threatened by coastal bluff erosion. For this reason, NOAA National Marine Fisheries Service proposes relocating the SWFSC headquarters facility to an undeveloped site located east of the existing facility. The proposed relocation site is a 3.3-acre site located just south of La Jolla Shores Drive, as shown in Figures 1 and 2.

SURVEY AREA DESCRIPTION

The survey area consisted of the 3.3-acre preferred relocation site. The survey area was characterized by a steep, sloping hill dominated by Diegan coastal sage scrub, disturbed Diegan coastal sage scrub, eucalyptus woodland, disturbed habitat, and urbanized areas, including ornamental landscaping, as shown in Figure 3.

SURVEY METHODOLOGY

Focused surveys for the coastal California gnatcatcher occurred three (3) times from February 19 to March 3, 2008 and were conducted under my permit number TE-063230-3. I followed the current UCSD protocol, which requires that three surveys separated by a minimum of seven days be conducted within all habitat that has a potential to support the coastal California gnatcatcher. Although UCSD is not an enrolled jurisdiction under the NCCP, this protocol was developed during previous meetings and

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arrangements with Sandy Marquez at the U.S. Fish and Wildlife Service (pers. comm. PBS&J). Ms. Marquez agreed that the UCSD protocol would be sufficient to determine presence or absence of the coastal California gnatcatcher within and adjacent to the preferred relocation site because: 1) nine coastal California gnatcatcher surveys were conducted for the entire UCSD campus in 2001; 2) no gnatcatchers have been observed previously within 500 feet of the preferred relocation site, and 3) UCSD agrees to mitigate for all gnatcatcher habitat impacts at a ratio of 2:1.

I surveyed all suitable habitats within the preferred relocation site for the presence of the coastal California gnatcatcher by walking meandering transects through appropriate habitat for the species, including Diegan coastal sage scrub and adjacent habitats that may support gnatcatcher foraging or nesting activities. I surveyed passively by listening and looking for the coastal California gnatcatcher. When no observations of the species were made after approximately 5 to 10 minutes of passive survey activity, played a taped vocalization of the coastal California gnatcatcher for approximately 5 to 10 seconds and then listened and looked for the species again. This technique was repeated throughout the survey area.

A list of all wildlife species detected during the surveys was compiled and is included as Attachment A to this report.

RESULTS

All surveys were conducted according to the schedule presented in Table 1, below. Weather conditions during the surveys were mild with no precipitation. See Table 1 for a summary of weather conditions for each survey date.

Table 1. Summary of Weather Conditions during Coastal California Gnatcatcher Surveys

Date	Surveyor	Time	Temp (ºF)	Wind (mph)	% Clouds
2/19/2008	Jim Rocks	0940-1200	58-65	1-4	100-60
2/25/2008	Jim Rocks	0900-1005	61-66	1-4	5-0
3/3/2008	Jim Rocks	0930-1040	65-68	1-6	0-0

No coastal California gnatcatchers were observed within or adjacent to the preferred relocation site.

If you have any questions or comments about this summary report, please feel free to contact me at (619) 843-6640.

By signing this report, I certify that the information in this survey report and attached exhibits fully and accurately represent my work.

Sincerely,

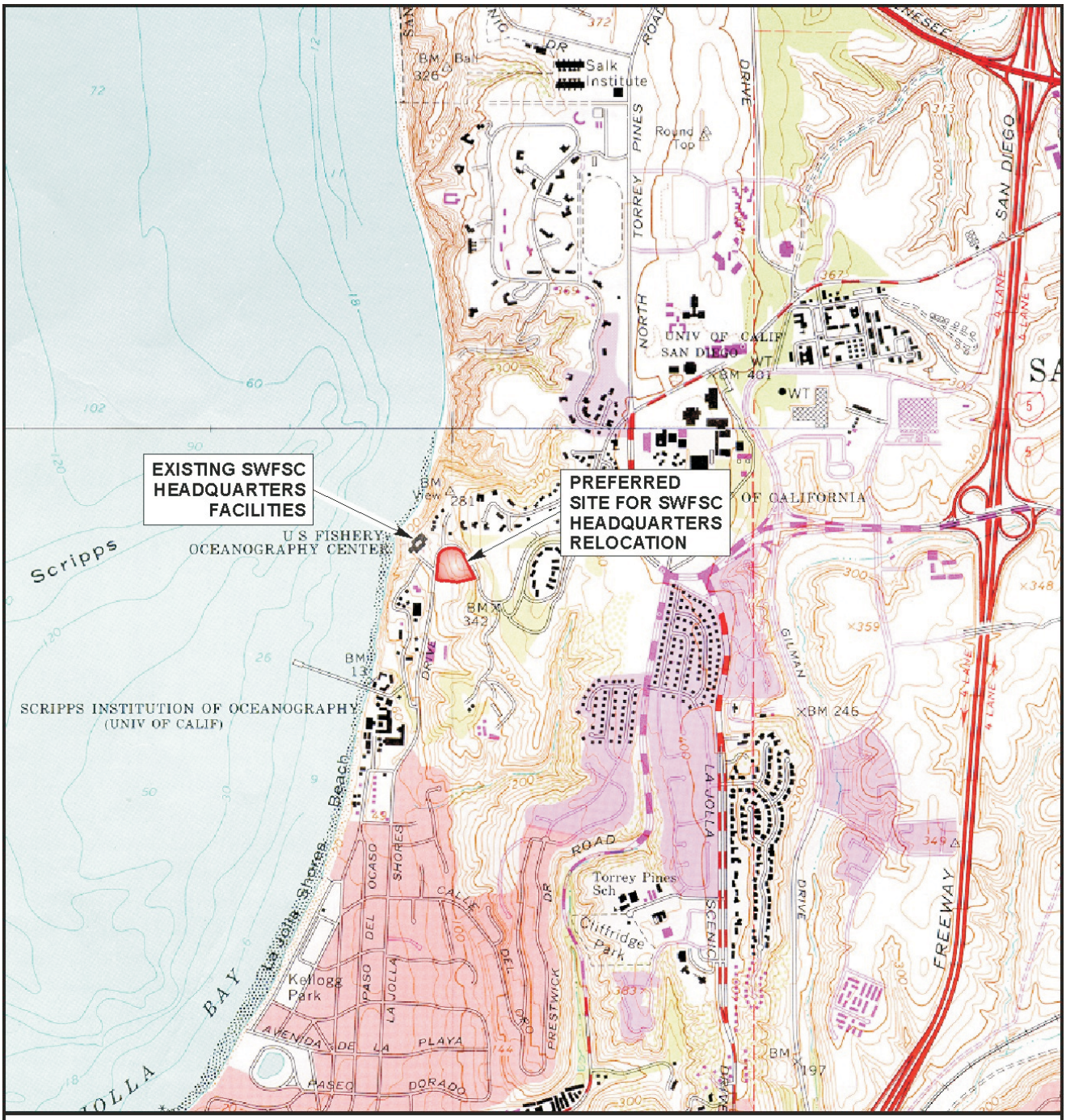
Jim Rocks
Principal, Rocks Biological Consulting

Attachments

ATTACHMENT A

Wildlife Species Observed or Detected During Coastal California Gnatcatcher Surveys for the NOAA Southwest Fisheries Science Center (SWFSC) Relocation Project

Common Name	***Scientific Name***
Birds	
American Crow	*Corvus brachyrhyncos*
Anna's Hummingbird	*Calypte anna*
Bewick's Wren	*Thryomanes bewickii*
Black Phoebe	*Sayornis nigricans*
Bushtit	*Psaltriparus minimus*
California Towhee	*Pipilo crissalis*
Cassin's Kingbird	*Tyrannus vociferus*
Common Raven	*Corvus corax*
House Finch	*Carpodacus mexicanus*
Mourning Dove	*Zenaida macroura*
Red-tailed Hawk	*Buteo jamaicensis*
Scrub Jay	*Aphelocoma coerulescens*
Spotted Towhee	*Piplio erythrophthalmus*
White-crowned Sparrow	*Zonotrichia leucophtys*
Wrentit	*Chamaea fasciata*
Yellow-rumped Warbler	*Dendroica coronata*
Mammals	
Rabbit (scat)	*Sylvilagus* sp.
Arthropods	
California trapdoor spider	*Bothriocyrtum californicum*



SOURCE: USGS DEL MAR, CALIF. (1967, PHOTOREVISED 1975); LA JOLLA, CALIF. (1967, PHOTOREVISED 1975) T. 15 S., R. 4 W.

N

0 0.25 0.50 0.75 1.0 NAUTICAL MILES (nmi)

0 0.46 0.93 1.39 1.85 KILOMETERS (km)

VICINITY MAP **FIGURE 1**

SOURCE: Landiscor Aerial Photograph, 2004

PREFERRED RELOCATION SITE **FIGURE 2**

SOURCE: Google, 2008 and PBS&J, 2008

PREFERRED SITE VEGETATION MAP **FIGURE 3**

APPENDIX E
TRAFFIC IMPACT ANALYSIS FOR THE SOUTHWEST FISHERIES SCIENCE CENTER PROJECT

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LINSCOTT
LAW &
GREENSPAN
engineers

TRAFFIC IMPACT ANALYSIS

SOUTHWEST FISHERIES SCIENCE CENTER

San Diego, California
November 14, 2008

Prepared for:

SRI International
333 Ravenswood Avenue, MS G134
Menlo Park CA 94025

LLG Ref. 3-07-1794

Prepared by:
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EXECUTIVE SUMMARY

Linscott, Law & Greenspan Engineers (LLG) has been retained to assess the traffic impacts associated with the Partial demolition of the existing Southwest Fisheries Science Center and the construction of a new Science Center on the other side of the La Jolla Shores Drive. The project site is bound by La Jolla Shores Drive on the west, north, and east side and Shellback Way on the south, within the University of San Diego at California (UCSD) in the City of San Diego.

The project proposes to demolish two (approximately 40,000 sf) of the four existing structures on the west side of La Jolla Shores Drive and replace them with a new 124,000 square foot (sf) research and development building on the east side of La Jolla Shores Drive, a net increase of 84,000 sf. As part of the proposed action, existing staff will be transferred between the existing and the new building. In the long run, staffing may increase by 17 people, from 283 to 300. Once NOAA turns over Buildings A and D to UCSD/SIO, these buildings will contain up to 44 staff relocated from other SIO buildings and up to 22 new hires, resulting in a maximum occupancy of 66 SIO staff.

Existing daily and peak hour traffic volumes were conducted during the week of August 25, 2008 for peak hour and street segment analysis in the study area. The data was collected during the summer months because of reported and documented higher traffic volumes during the summer. Two trip generation calculations were conducted for this project with one being the "Net" trips that would be assigned on a regional level and the second calculation would be for the ultimate 124,000 sf, gross project to be assigned to both the existing and proposed project driveways. The "net" project is calculated to generate 672 ADT with 97 inbound / 11 outbound trips during the AM peak hour and 9 inbound / 85 outbound trips during the PM peak hour. The "gross" project would generate approximately 992 ADT with 145 inbound / 15 outbound trips during the AM peak hour and 15 inbound / 125 outbound trips during the PM peak hour.

The following scenarios were evaluated:

- Existing Conditions;
- Existing + Cumulative Projects;
- Existing + Cumulative Projects + Project;
- Year 2030;
- Year 2030 + Project.

The intersection and street segment analysis were conducted for the near term scenarios and a segment analysis were conducted for Year 2030. Intersection analysis was conducted using the Highway Capacity Manual 2000 methodology. Street segments utilized the City of San Diego's *Roadway Classification, Level of Service (LOS), and ADT Table* to determine Level of Service (LOS) operations.

LLG reviewed and utilized cumulative projects from the "*UTC Revitalization Project*" submitted by LLG to the City of San Diego in March 2008. In addition, the UTC project itself was included. Therefore, a total of thirteen projects were identified for inclusion in the analysis.

LLG determined the projects regional distribution based on existing traffic volumes, the future circulation system, discussions with NOAA/SWFSC staff, and the project's proximity to I-5 and SR 52.

Year 2030 street segment traffic volumes were forecasted for the study area based on the *SANDAG Series 10* Model. The traffic model presents weekday buildout traffic volumes in ADTs. To produce the 2030 peak hour intersection volumes, LLG compared existing to future ADTs. Then, using existing peak hour volumes and cross multiplication weighted by approach ADTs, LLG estimated future peak hour turn volumes.

Based on the significance criteria, no near–term or Year 2030 impacts were calculated. However, based on a site plan review, several recommendations are provided to improve on and off-site circulation.

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TRAFFIC IMPACT ANALYSIS

SOUTHWEST FISHERIES SCIENCE CENTER

San Diego, California
November 14, 2008

1.0 INTRODUCTION

Linscott, Law & Greenspan Engineers (LLG) has been retained to assess the traffic impacts associated with the partial demolition of the existing 100,000 square foot (sf) Southwest Fisheries Science Center (SWFSC) and the construction of a new SWFSC at a preferred site across La Jolla Shores Drive. The existing and preferred site are located on the campus of the University of California at San Diego, Scripps Institute of Oceanography (UCSD/SIO) in the community of La Jolla, which is part of the City of San Diego, CA. The project proposes to demolish two (approximately 40,000 sf) of the four existing structures and replace them with a new 124,000 sf research and development building, a net increase of 84,000 sf. The proposed new SWFSC building would be located across La Jolla Shores Drive from the existing facility. As part of the proposed action, existing staff will be transferred from the existing SWFSC to the newly constructed SWFSC. In the long-run, staffing at the SWFSC is expected to increase from the current 283 to 300 staff working on site. After NOAA turns over existing buildings A and D to UCSD/SIO, those buildings will contain up to 44 staff relocated from other SIO buildings and up to 22 new hires, resulting in a maximum occupancy of 66 SIO staff.

The project site is bound by La Jolla Shores Drive on the west, north, and east side and Shellback Way on the south, within the University of San Diego at California (UCSD) campus in the City of San Diego. ***Figure 1-1*** shows the general vicinity of the project. ***Figure 1-2*** shows the project's study area including each study area intersection to be analyzed as part of this study. ***Figure 1-3*** provides a focused area map of the proposed National Oceanographic and Atmospheric Administration (NOAA) site and other SIO facilities. This traffic study analyzes existing and near-term and cumulative (i.e. Year 2030) scenarios and will determine potential impacts of the project on the study area roadway network.

The following sections are included in this report:

- Project Description
- Existing Conditions
- Analysis Approach & Methodology
- Significance Criteria
- Analysis of Existing Conditions
- Cumulative Projects
- Trip Generation/Distribution/Assignment
- Analysis of Near-term Scenarios
- Year 2030 Analysis

- Construction Traffic
- Local Circulation Assessment
- Significance of Impacts and Recommended Mitigation Measures

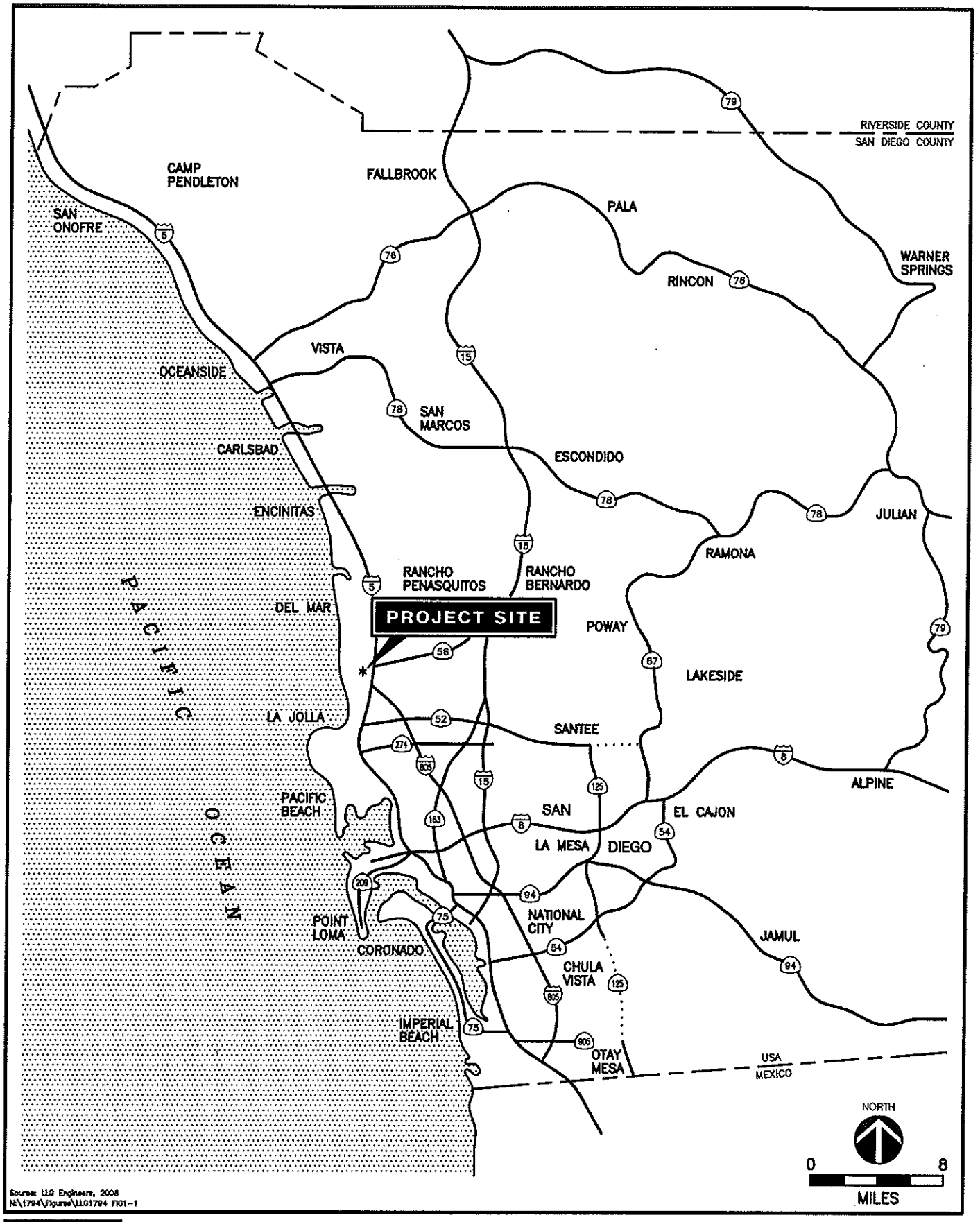
Several major assumptions were utilized throughout the traffic study:

a) Two separate project traffic assignments were completed. First, for the project access points along Shellback Way and Downwind Way, the entire 124,000 sf (gross project) of the new building was assumed in this assignment, even though the net increase in square footage is 84,000 sf (124,000 sf – 40,000 sf demolished). However, the population at the existing SWFSC buildings is expected to decrease from the current 283 people to 66 people, to be conservative no reductions in traffic on La Jolla Shores Drive were taken. This assumption is justified because all trips generated by the new SWFSC would be new to the preferred site area east of La Jolla Shores Drive.

   The second project traffic assignment utilized the "net" 84,000 sf for the near–term regional analysis of roadways beyond the immediate project site, since these would be considered new trips on the circulation system.

b) SANDAG's 2030 Regional Model was used in the long-term analysis. This model includes the land uses in the 2004 Long Range Development Plan Environmental Impact Report (UCSD 2004 LRDP EIR), which has a horizon year of 2020.

c) All analyses assumed that the westbound left-turn from Shellback Way to La Jolla Shores Drive is permitted and project traffic was assigned to this movement.



Source: LLG Engineers, 2008
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Figure 1-1

Vicinity Map

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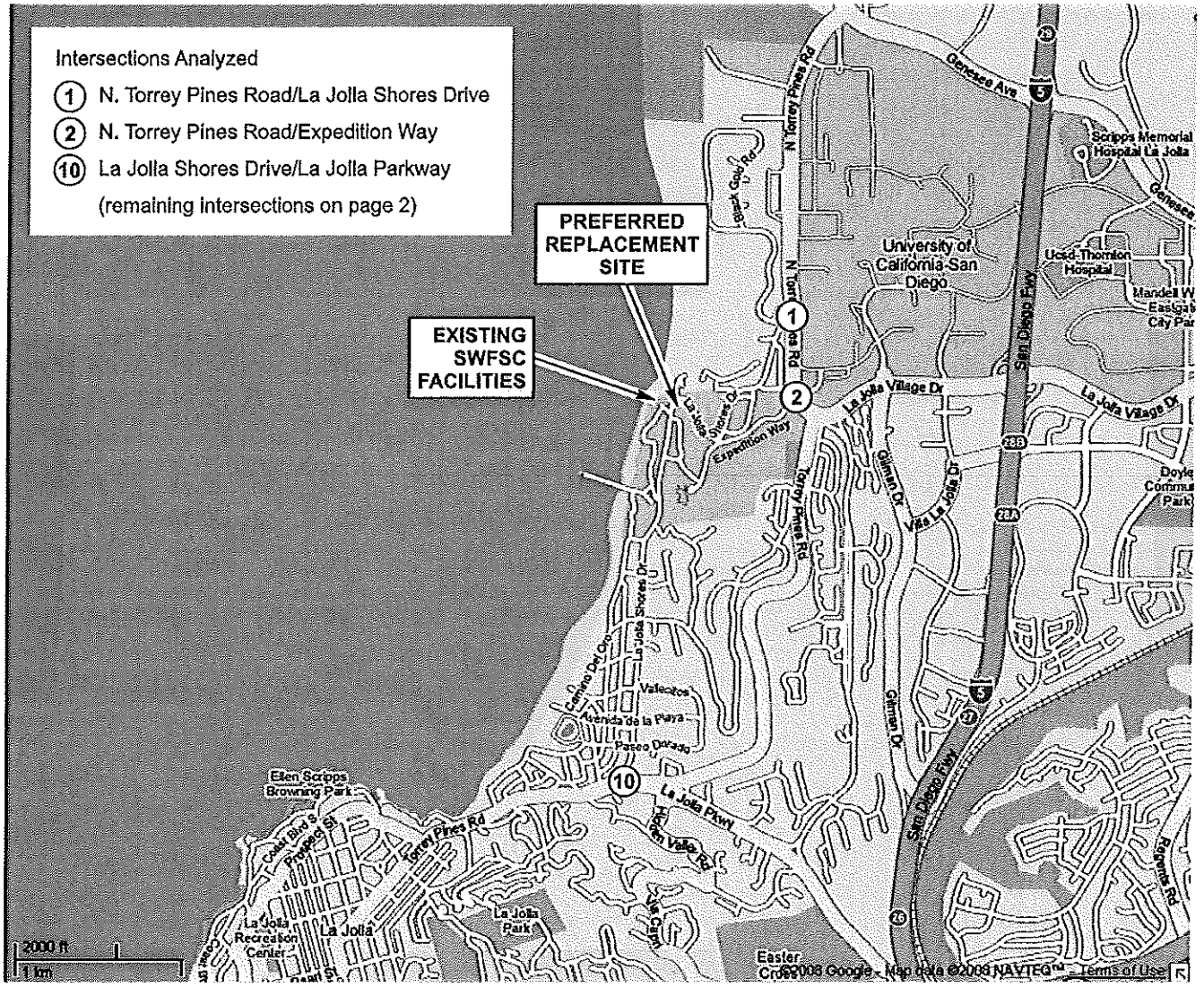

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Figure 1-2

Project Study Area

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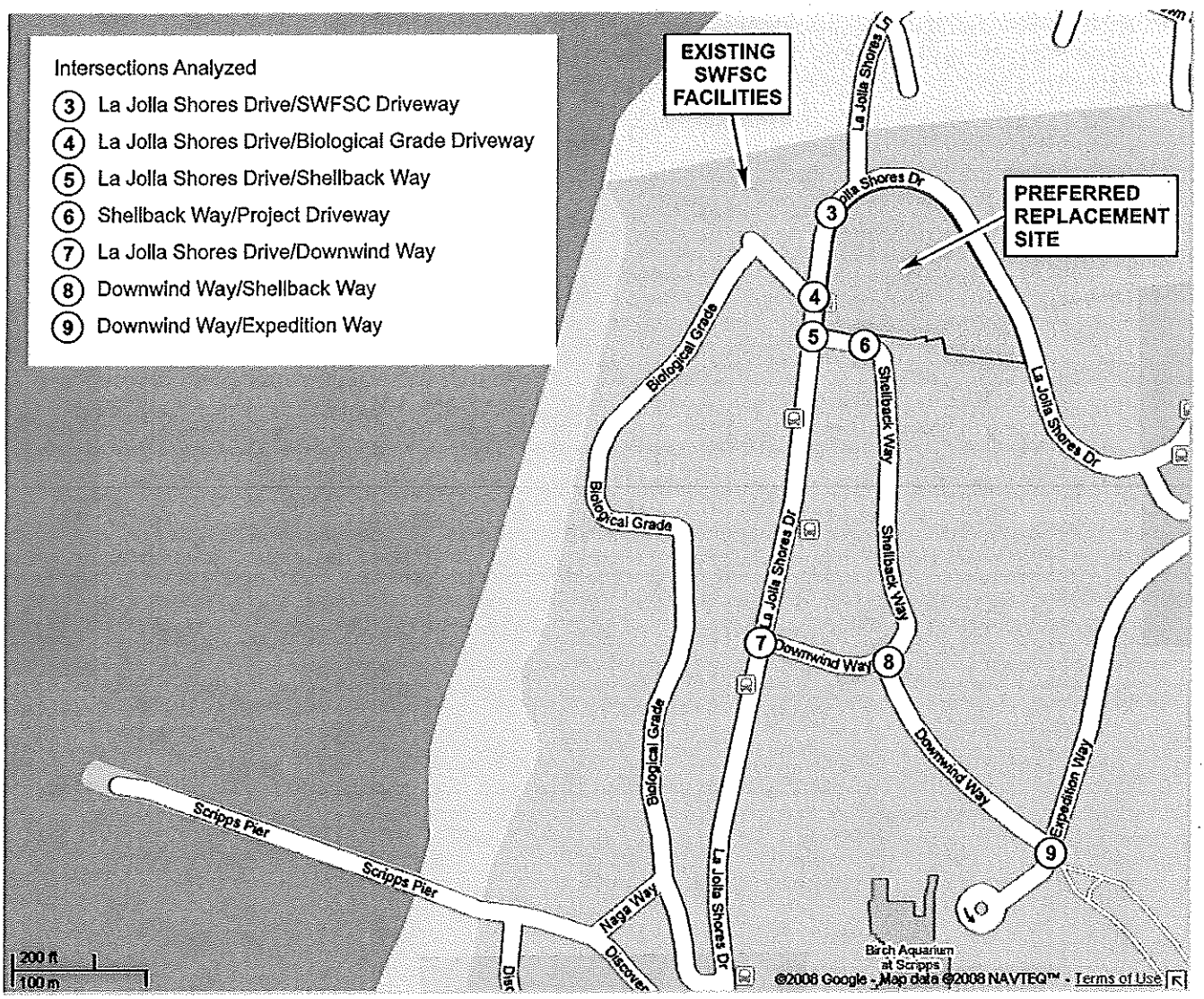

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Figure 1-2

Project Study Area (Continued)

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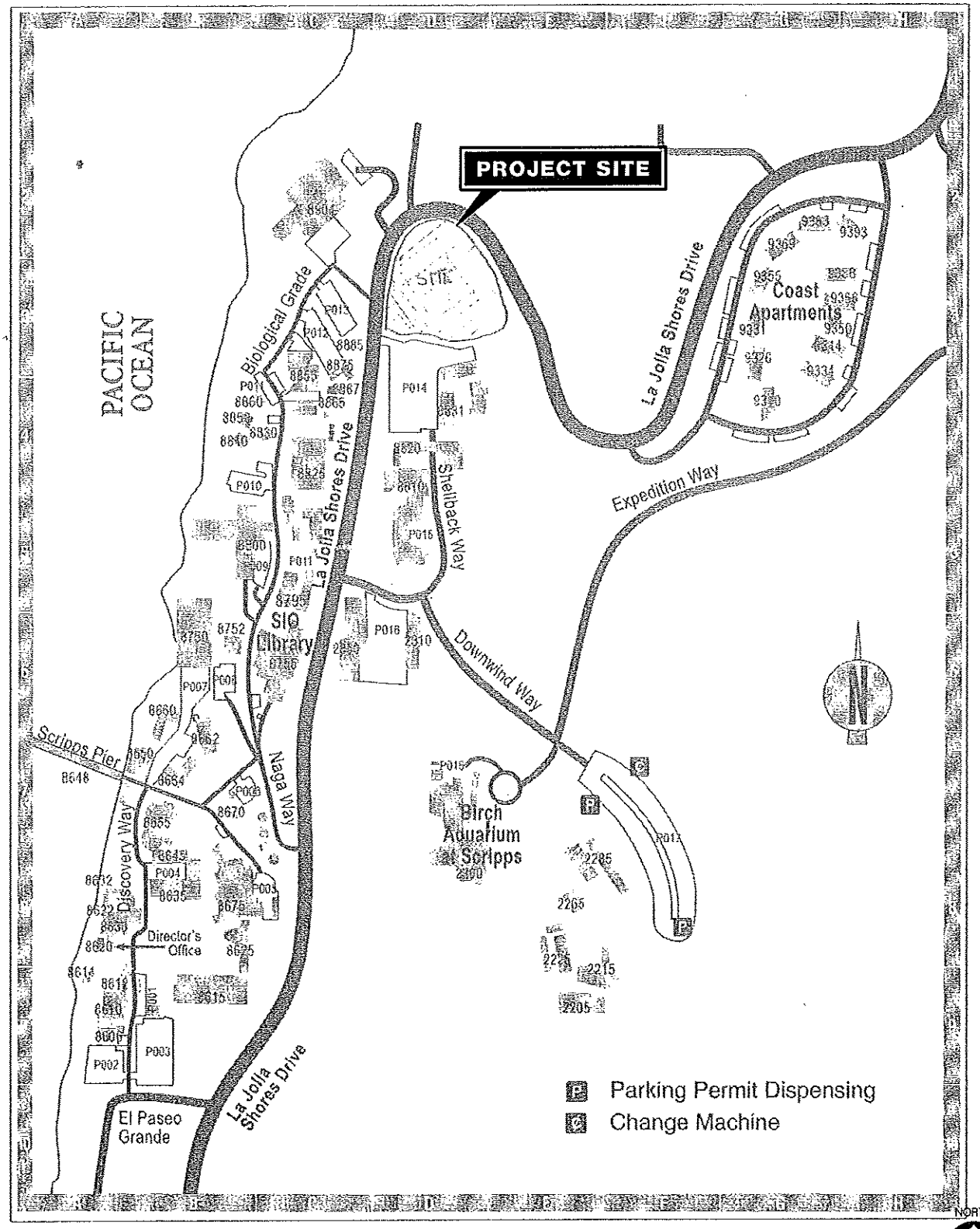

Source: UCSD, 2008
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Figure 1-3

Focused Project Area Map

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2.0 PROJECT DESCRIPTION

2.1 Project Location

The proposed project site is bound by La Jolla Shores Drive on the west, north, and east sides and Shellback Way on the south, within the UCSD/SIO campus in the City of San Diego. The existing site lies along the west side of La Jolla Shores Drive and just north of the Biological Grade Driveway.

2.2 Project Description

The NOAA project proposes demolishing two (approximately 40,000 sf) of the four existing buildings situated along the west side of La Jolla Shores Drive due to their close location with unstable bluffs. As part of the project, NOAA would construct a new 124,000 sf building east of La Jolla Shores Drive directly across the road from the existing SWFSC. Existing SWFSC employees will be relocated into the new building along with up to 17 new staff positions that may be created in the long–term. This would yield a long–term population of 300 people. In addition, it is proposed NOAA will turn over buildings A and D to UCSD/SIO, the buildings will contain up to 44 staff relocated from other SIO buildings and up to 22 new hires, resulting in a maximum occupancy of 66 SIO staff.

2.3 Project Access / Parking

Site access will be provided via Shellback Way. In addition, La Jolla Shores Drive provides direct access to Shellback Way. Other travel routes are available via Downwind Way and Expedition Way. It should be noted that as part of the project, westbound left-turns at the La Jolla Shores Drive/Shellback Way driveway would be permitted (currently prohibited). Therefore, the analyses were conducted with the assumption that left–turns are permitted.

The La Jolla Shores Drive/Shellback Way driveway is currently shown on the site plan to be 52 feet wide, two 20–foot lanes separated by a 12–foot median. Since westbound, left–turn's will be permitted, the exit portion of the driveway should be at least 22–feet wide. The median could be reduced to 10 feet in width.

Staffing at the new SWFSC has the potential to increase from the current 283 to 300 in the long-term. Parking supply will increase from 30 stalls at the existing center to a proposed 202 underground stalls at the new SWFSC. The underground parking will also accommodate 6 government vehicles.

Figure 2-1 shows the projects proposed site plan.

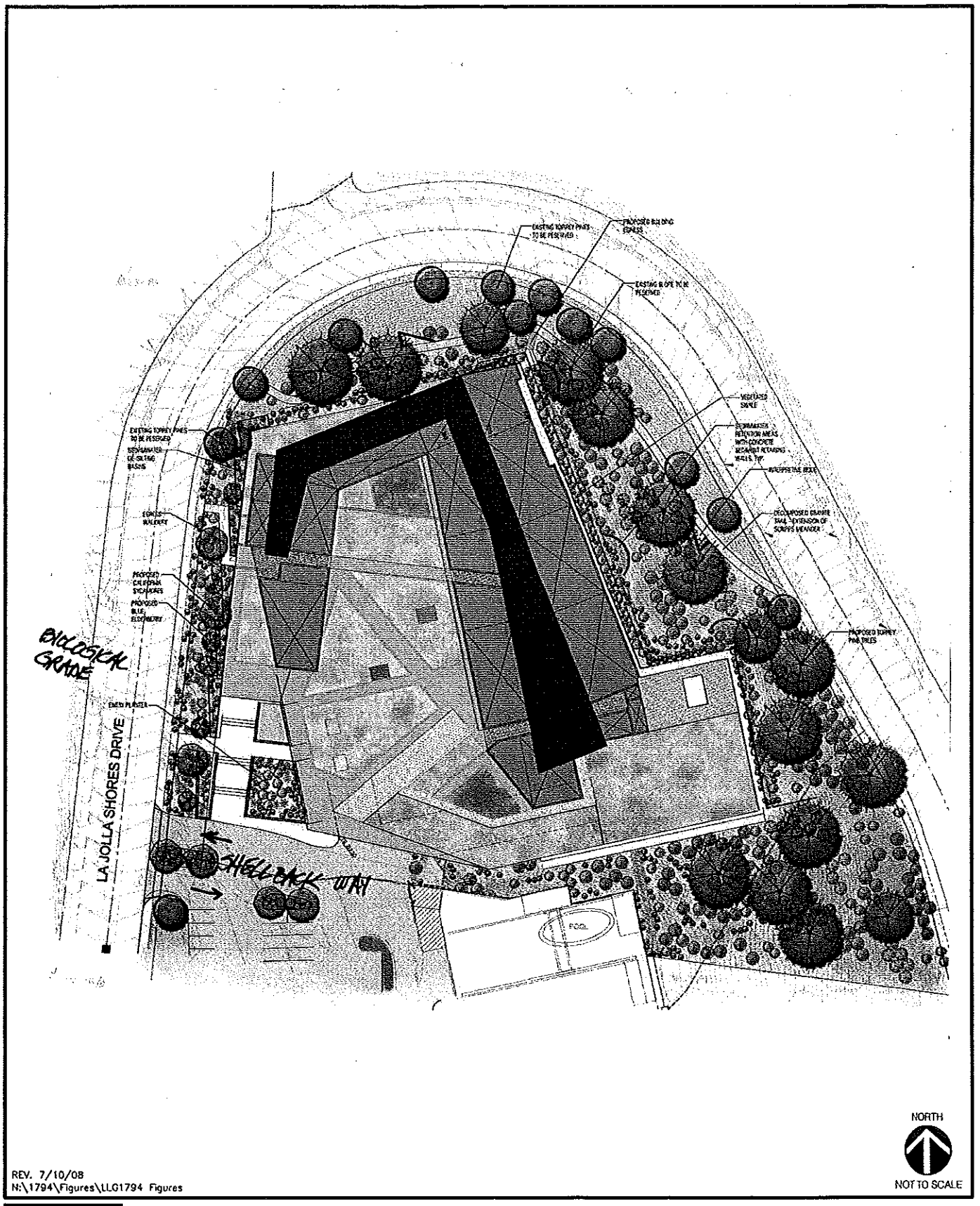

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Figure 2-1

Site Plan

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3.0 EXISTING CONDITIONS

The study area intersections and street segments are based on the regional standards of practice and are listed below. These locations were identified based on the City of San Diego's fifty-peak hour trip threshold. These identified locations receive approximately 50 peak hour trips or are in close proximity to the site and were therefore included in the analysis.

Intersections

- N. Torrey Pines Road/ La Jolla Shores Drive (Signalized)
- N. Torrey Pines Road / Expedition Way (Signalized)
- La Jolla Shores Drive / Existing SWFSC Driveway (Unsignalized)
- La Jolla Shores Drive / Biological Grade Driveway (Unsignalized)
- La Jolla Shores Drive / Shellback Way (Unsignalized)
- Shellback Way / Proposed SWFSC Driveway (Unsignalized)
- La Jolla Shores Drive / Downwind Way (Unsignalized)
- Downwind Way / Shellback Way (Unsignalized)
- Downwind Way / Expedition Way (Unsignalized)
- La Jolla Shores Drive / La Jolla Parkway (Signalized)

Segments

- N. Torrey Pines Road: between Expedition Way and Torrey Pines Road
- La Jolla Shores Drive: between N. Torrey Pines Road and Existing SWFSC Driveway
- La Jolla Shores Drive: between Existing SWFSC Driveway and Biological Grade Driveway
- La Jolla Shores Drive: between Shellback Way and Downwind Way
- La Jolla Shores Drive: between Downwind Way and La Jolla Parkway
- Expedition Way: between N. Torrey Pines Road and Downwind Way
- Downwind Way: east of La Jolla Shores Drive
- Downwind Way: west of Expedition Way
- Shellback Way: east of La Jolla Shores Drive
- Shellback Way: north of Downwind Way

3.1 Existing Street Network

Effective evaluation of the traffic impacts associated with the proposed project requires an understanding of the existing transportation system within the project area.

The following is a brief description of the study area roadway segments. ***Figure 3-1*** depicts the study area segments and intersections graphically.

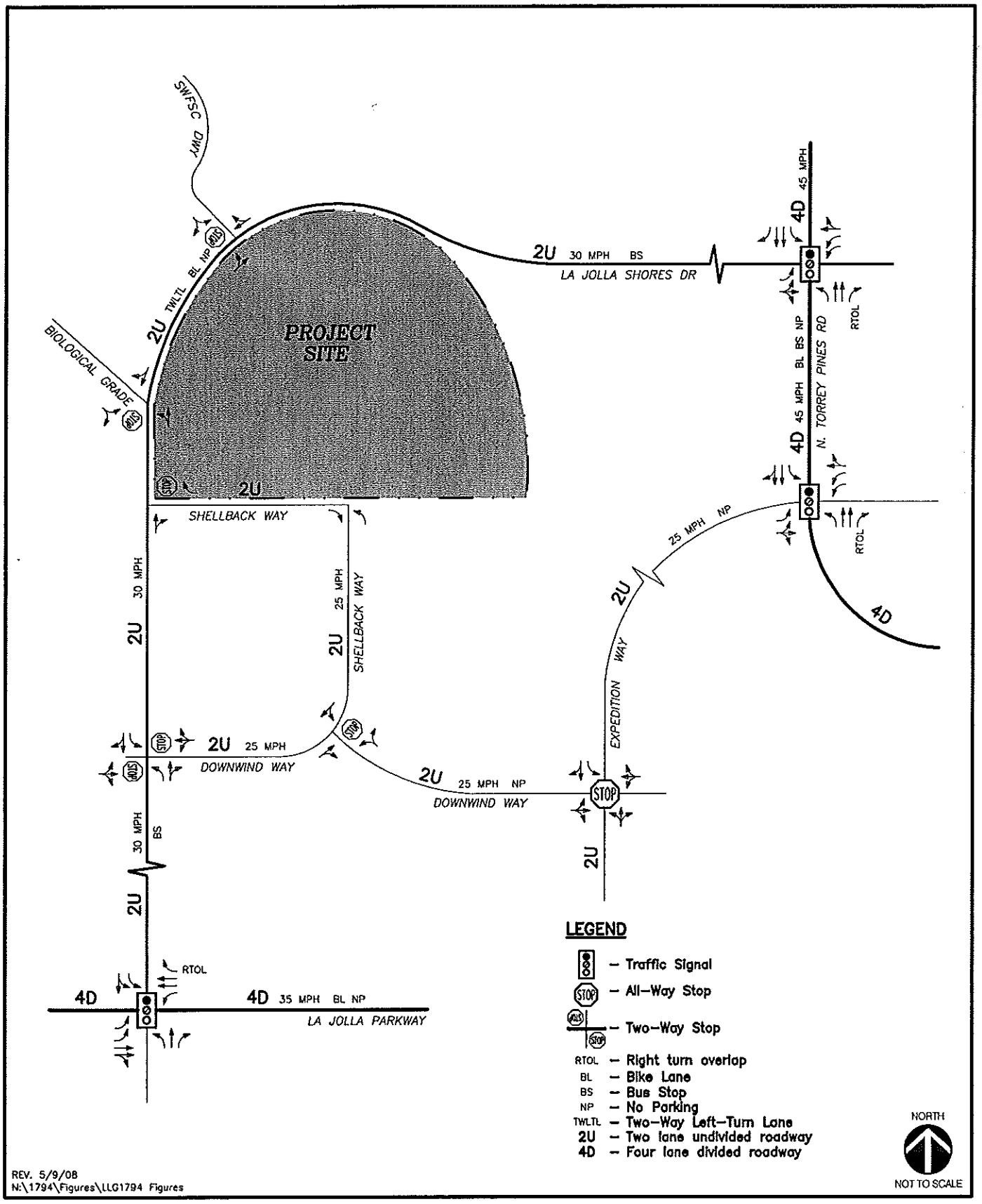

Figure 3-1

Existing Conditions Diagram

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SOUTHWEST FISHERIES SCIENCE CENTER

N. Torrey Pines Road is classified as a Four Lane Major Street on the *University Community Plan Circulation Element*. N. Torrey Pines Road is currently constructed as a four-lane divided road within the project area. The posted speed limit is 45 mph, and bike lanes are provided in both directions. Curbside parking is prohibited. Key traffic signals are provided at La Jolla Shores Drive and Expedition Way.

La Jolla Shores Drive is classified as a Two Lane Modified Collector on the *University Community Plan Circulation Element*. La Jolla Shores Drive is currently constructed as a two-lane road providing a Two–Way Left–Turn Lane (TWLTL) between La Jolla Shores Lane and Biological Grade. The posted speed limit is 30 mph, and bike lanes are provided in both directions. Curbside parking is permitted intermittently along both sides of the road. Key traffic signals are provided at N. Torrey Pines Road and La Jolla Parkway.

Expedition Way is an unclassified local roadway within the project area. Expedition Way is constructed as a two-lane undivided roadway that runs east to west terminating at the Birch Aquarium at Scripps Institution of Oceanography. No bike lanes or bus stops are provided and curbside parking is prohibited. The posted speed limit is 25 mph. A traffic signal is provided at N. Torrey Pines Road.

Downwind Way is an unclassified local roadway within the project area. Downwind Way is constructed as a two-lane undivided roadway that runs east to west between La Jolla Shores Drive and Expedition Way. It makes a 90–degree corner at Shellback Way, where the straight movement leads to Shellback Way. Drivers must make a turn to remain on Downwind Way. No bike lanes or bus stops are provided and curbside parking is prohibited. The posted speed limit is 25 mph.

Shellback Way is an unclassified local roadway within the project area. Shellback Way is constructed as a two-lane undivided roadway that runs east to west between La Jolla Shores Drive and the proposed project site. Shellback Way then turns south east of the project site and connects to Downwind Way. At this point, Shellback Way makes a 90–degree corner and heads southerly where it terminates at Downwind Way. No bike lanes or city bus stops are provided and curbside parking is prohibited. The posted speed limit is 25 mph.

3.2 Existing Traffic Volumes

Peak hour intersection turning movement traffic counts within the project area were commissioned by LLG for two different times of the year, April 2008 and August 2008. The April counts reflect the "academic year" and the August counts reflect the "summertime". The counts were conducted during the AM/PM commuter peak hours at the study intersections and for a 24-hour period on the street segments. All counts were conducted mid-week, Tuesday thru Thursday.

The August counts were consistently 10-15% higher than the April counts. Therefore to be conservative, only the August counts were used in this traffic study. ***Figure 3-2*** depicts the peak hour intersection turning movement volumes and daily segment volumes at the study area intersections and segments respectively.

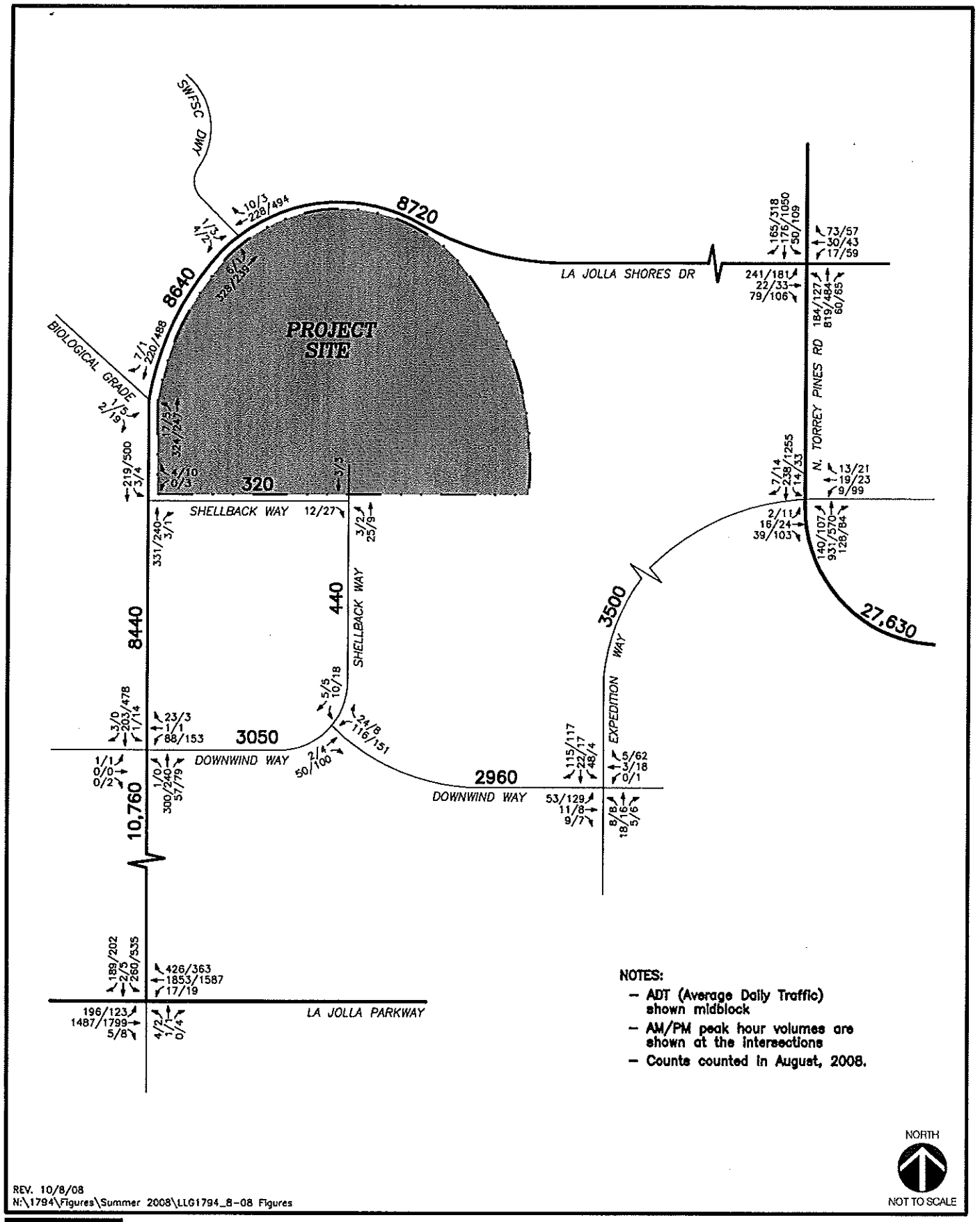

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Figure 3-2

Existing "Summer" Traffic Volumes AM/PM Peak Hours & ADT

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Table 3–1 is a summary of the average daily traffic volumes (ADTs) commissioned by LLG the week of August 25th, 2008. The multiple day counts were averaged as presented in the table.

Appendix A contains the peak hour intersection and segment count sheets.

TABLE 3–1
EXISTING TRAFFIC VOLUMES

Street Segment	ADT[a]	Month	Source[b]
N. Torrey Pines Road			
Expedition Way to Torrey Pines Road	27,630	August, 2008	LLG
La Jolla Shores Drive			
N. Torrey Pines Road to Existing SWFSC Driveway	8,720	August, 2008	LLG
Existing SWFSC Driveway to Biological Grade Driveway	8,640	August, 2008	LLG
Shellback Way to Downwind Way	8,440	August, 2008	LLG
Downwind Way to La Jolla Parkway	10,760	August, 2008	LLG
Expedition Way			
N. Torrey Pines Road to Downwind Way	3,500	August, 2008	LLG
Downwind Way			
East of La Jolla Shores Drive	2,960	August, 2008	LLG
West of Expedition Way	3,050	August, 2008	LLG
Shellback Way			
East of La Jolla Shores Drive	320	August, 2008	LLG
North of Downwind Way	440	August, 2008	LLG

Footnotes:

a. Average Daily Traffic Volumes.

b. LLG Engineers commissioned counts in August 2008.

3.3 Existing Public Transportation

The only public transportation available in the area is a Metropolitan Transit System (MTS) bus route on La Jolla Shores Drive. Bus Route 30 serves the project site as it traverses between UTC and Old Town with 30–minute headways. A stop for Bus 30 is located on northbound La Jolla Shores Drive adjacent to the project site. There is also a campus shuttle available to assist with midday trips. The shuttle is not seen as a commute option. Currently about 11% of the SWFSC employee's carpool and 7% receive subsidiaries for public transportation use. These rates are expected to continue into the future. Additionally, some SWFSC employees are expected to use alternative transportation modes (walking, bicycling, etc).

4.0 ANALYSIS APPROACH AND METHODOLOGY

Level of Service (LOS) is the term used to denote the different operating conditions which occur on a given roadway segment under various traffic volume loads. It is a qualitative measure used to describe a quantitative analysis taking into account factors such as roadway geometries, signal phasing, speed, travel delay, freedom to maneuver, and safety. Level of service provides an index to the operational qualities of a roadway segment or an intersection. Level of service designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions. Level of service designation is reported differently for signalized and unsignalized intersections, as well as for roadway segments.

4.1 Intersections

Signalized intersections were analyzed under AM and PM peak hour conditions. Average vehicle delay was determined utilizing the methodology found in Chapter 16 of the *2000 Highway Capacity Manual (HCM),* with the assistance of the *Synchro* (version 6) computer software. The delay values (represented in seconds) were qualified with a corresponding intersection LOS. Signalized intersection calculation worksheets and an LOS definition graphic (*Figure 1*) are attached in ***Appendix B***.

Unsignalized intersections were analyzed under AM and PM peak hour conditions. Average vehicle delay and LOS was determined based upon the procedures found in Chapter 17 of the *2000 Highway Capacity Manual (HCM),* with the assistance of the *Synchro* (version 6) computer software. Unsignalized intersection calculation worksheets and a more detailed explanation of the methodology are attached in *Appendix B.*

4.2 Street Segments

Street segment analysis is based upon the comparison of daily traffic volumes (ADTs) to the City of San Diego's *Roadway Classification, Level of Service, and ADT Table.* This table provides segment capacities for different street classifications, based on traffic volumes and roadway characteristics. The City of San Diego's *Roadway Classification, Level of Service, and ADT Table* is attached in ***Appendix C***.

5.0 SIGNIFICANCE CRITERIA

According to the City of San Diego's *Significance Determination Thresholds* report dated January 2007, a project is considered to have a significant impact if the new project traffic has decreased the operations of surrounding roadways by a City defined threshold. For projects deemed complete on or after January 1, 2007, the City defined threshold by roadway type or intersection is shown in ***Table 5–1.***

The impact is designated either a "direct" or "cumulative" impact. According to the City's *Significance Determination Thresholds* report,

> "*Direct* traffic impacts are those projected to occur at the time a proposed development becomes operational, including other developments not presently operational but which are anticipated to be operational at that time (near term)."
>
> "*Cumulative* traffic impacts are those projected to occur at some point after a proposed development becomes operational, such as during subsequent phases of a project and when additional proposed developments in the area become operational (short-term cumulative) or when affected community plan area reaches full planned buildout (long-term cumulative)."
>
> It is possible that a project's near term (direct) impacts may be reduced in the long term, as future projects develop and provide additional roadway improvements (for instance, through implementation of traffic phasing plans). In such a case, the project may have direct impacts but not contribute considerably to a cumulative impact."
>
> For intersections and roadway segments affected by a project, level of service (LOS) D or better is considered acceptable under both direct and cumulative conditions."

If the project exceeds the thresholds in *Table 5–1*, then the project may be considered to have a significant "direct" or "cumulative" project impact. A significant impact can also occur if a project causes the Level of Service to degrade from D to E, even if the allowable increases in *Table 5–1* are not exceeded. A feasible mitigation measure will need to be identified to return the impact within the City thresholds, or the impact will be considered significant and unmitigated.

TABLE 5–1
CITY OF SAN DIEGO
TRAFFIC IMPACT SIGNIFICANT THRESHOLDS

Level of Service with Project[b]	Allowable Increase Due to Project Impacts[a]					
	Freeways		Roadway Segments		Signalized Intersections	Ramp Metering
	V/C	Speed (mph)	V/C	Speed (mph)	Delay (sec.)	Delay (min.)
E	0.010	1.0	0.02	1.0	2.0	2.0[c]
F	0.005	0.5	0.01	0.5	1.0	1.0[c]

Footnotes:

a. If a proposed project's traffic causes the values shown in the table to be exceeded, the impacts are determined to be significant. The project applicant shall then identify feasible improvements (within the Traffic Impact Study) that will restore/and maintain the traffic facility at an acceptable LOS. If the LOS with the proposed project becomes unacceptable (see note b), or if the project adds a significant amount of peak-hour trips to cause any traffic queues to exceed on- or off-ramp storage capacities, the project applicant shall be responsible for mitigating the project's direct significant and/or cumulatively considerable traffic impacts.

b. All LOS measurements are based upon Highway Capacity Manual procedures for peak-hour conditions. However, V/C ratios for roadway segments are estimated on an ADT/24-hour traffic volume basis (using Table 2 of the City's Traffic Impact Study Manual). The acceptable LOS for freeways, roadways, and intersections is generally "D" ("C" for undeveloped locations). For metered freeway ramps, LOS does not apply. However, ramp meter delays above 15 minutes are considered excessive.

c. The impact is only considered significant if the total delay exceeds 15 minutes.

General Notes:

1. Delay = Average control delay per vehicle measured in seconds for intersections, or minutes for ramp meters.
2. LOS = Level of Service
3. V/C = Volume to Capacity Ratio (capacity at LOS E should be used)
4. Speed = Arterial speed measured in miles per hour for Congestion Management Program (CMP) analyses

Also, according to the City of San Diego's *Significance Determination Thresholds* report, other possible significant impacts that are not accounted for in *Table 5–1* include the following:

- If a project would increase traffic hazards to motor vehicles, bicyclists or pedestrians due to proposed non-standard design features (e.g., poor sight distance, proposed driveway onto an access-restricted roadway), the impact would be significant.

- If a project would result in the construction of a roadway which is inconsistent with the General Plan and/or a community plan, the impact would be significant if the proposed SWFSC driveway would not properly align with other existing or planned roadways.

- If a project would result in a substantial restriction in access to publicly or privately owned land, the impact would be significant.

6.0 ANALYSIS OF EXISTING CONDITIONS

This section discusses the existing intersection and street segment operations. *Appendix B* contains the peak hour analysis worksheets.

6.1 Peak Hour Intersection Levels of Service

Table 6–1 shows the existing intersection operations in the project vicinity. As shown on *Table 6-1*, all study area intersections are calculated to currently operate at LOS D or better during both the AM and PM peak hours. It should be noted than when looking at individual movements instead of the whole intersection, the westbound left–turn from Downwind Way to La Jolla Shores Drive is calculated at LOS E. This implies that drivers may experience delay while waiting for gaps in La Jolla Shores Drive traffic to make a left–turn, which was observed to be true. The sidewalk crossing La Jolla Shores Drive is located on the south side of the intersection, creating potential conflicts between pedestrians and westbound vehicles turning left. Relocation of the sidewalk to the north side of the intersection would eliminate these conflicts.

TABLE 6–1
EXISTING INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Existing	
			Delay[a]	LOS[b]
1. N. Torrey Pines Road / La Jolla Shores Drive	Signal	AM PM	23.6 29.0	C C
2. N. Torrey Pines Road / Expedition Way	Signal	AM PM	16.8 25.6	B C
3. La Jolla Shores Drive/ Existing SWFSC Driveway	OWSC[c]	AM PM	10.3 13.9	B B
4. La Jolla Shores Drive/ Biological Grade Driveway	OWSC	AM PM	10.8 12.8	B B
5. La Jolla Shores Drive/ Shellback Way	OWSC	AM PM	10.3 10.3	B B
6. Shellback Way/ Proposed SWFSC Driveway	OWSC	AM PM	7.4 7.3	A A
7. La Jolla Shores Drive/ Downwind Way	TWSC[d]	AM *WB L*[f] PM *WB L*[f]	2.6 *15.7* 5.9 *36.7*	A *B* A *E*
8. Downwind Way / Shellback Way	OWSC	AM PM	9.5 10.0	A A
9. Downwind Way / Expedition Way	AWSC[e]	AM PM	7.3 8.1	A A
10. La Jolla Shores Drive / La Jolla Parkway	Signal	AM PM	33.6 46.7	C D

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. OWSC– One-Way Stop Controlled intersection. Minor street delay is reported.
d. TWSC – Two-Way Stop Controlled intersection.
e. AWSC – All-Way Stop Controlled intersection.
f. Delay reported is for the westbound minor street movement.

SIGNALIZED		UNSIGNALIZED	
DELAY/LOS THRESHOLDS		DELAY/LOS THRESHOLDS	
Delay	LOS	Delay	LOS
0.0 < 10.0	A	0.0 < 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
> 80.1	F	> 50.1	F

6.2 Daily Street Segment Levels of Service

Table 6–2 shows the existing street segment operations in the project study area. *Appendix C* contains the *City of San Diego's Roadway Classification* table, which outlines capacities for various roadway classifications. As shown on *Table 6-2*, all segments are calculated to operate at LOS D or better on a daily basis. These are acceptable levels of service.

TABLE 6–2
EXISTING STREET SEGMENT OPERATIONS

Street Segment	Classification	Capacity (LOS E) [a]	ADT [b]	LOS [c]	V/C [d]
N. Torrey Pines Road					
Expedition Way to Torrey Pines Road	4-lane Major Street	40,000	27,630	C	0.691
La Jolla Shores Drive					
N. Torrey Pines Road to Existing SWFSC Dwy.	2-lane Modified Collector	15,000	8,720	C	0.581
Existing SWFSC Dwy. to Biological Grade	2-lane Modified Collector	15,000	8,640	C	0.576
Shellback Way to Downwind Way	2-lane Modified Collector	15,000	8,440	C	0.563
Downwind Way to La Jolla Parkway	2-lane Modified Collector	15,000	10,760	D	0.717
Expedition Way					
N. Torrey Pines Road to Downwind Way	Unclassified	8,000	3,500	B	0.438
Downwind Way					
East of La Jolla Shores Drive	Unclassified	8,000	2,960	B	0.370
West of Expedition Way	Unclassified	8,000	3,050	B	0.381
Shellback Way					
East of La Jolla Shores Drive	Unclassified	2,200[e]	320	C	0.145
North of Downwind Way	Unclassified	2,200[e]	440	C	0.200

Footnotes:

a. Capacities based on City of San Diego's Roadway Classification Table.
b. Average Daily Traffic Volumes.
c. Level of Service.
d. Volume to Capacity.
e. Capacity at LOS C.

7.0 CUMULATIVE PROJECTS

Cumulative Projects are other development projects that are either planned or ongoing in the vicinity of the project study area that will add traffic to the adjacent roadways. To identify potential cumulative projects, LLG reviewed and utilized cumulative projects from the "*UTC Revitalization Project*" submitted by LLG to the City of San Diego in March 2008. In addition, the UTC project itself was included. ***Table 7-1*** details each project. A total of thirteen projects were identified for inclusion in the analysis. ***Figure 7-1*** shows the traffic volumes for the cumulative projects. ***Figure 7-2*** shows the existing + cumulative projects traffic volumes.

It should be noted that none of the traffic studies for the 13 cumulative projects showed any traffic on La Jolla Shores Drive, Expedition Way, Downwind Way, etc. It is reasonable to expect that there would be some nominal amount of cumulative projects trips on these streets, but it would be speculative to estimate the amount of trips. However, a more detailed assessment of the cumulative projects trips is contained in the 2030 analysis.

TABLE 7–1
CUMULATIVE PROJECTS LIST

Project Name	Type of Development	Project Size
1. Nobel Research Park / IDEC	R&D/ Corporate Office	766,000 SF
2. La Jolla Commons	R&D/Office/Residential Commercial (Hotel)	490,000 SF/120 multi-dwelling units 325 rooms
3. La Jolla Crossroads	R&D/Office/Residential	162,000 SF/1,500 multi-dwelling units
4. Qualcomm / Campus Point	R&D/Office	330,000 SF
5. UCSD	Medical/R&D/Office	700 staff/500,000 SF
6. Eastgate Tech Park	Industrial/Business Park	225,842 SF
7. Congregation Beth Israel	Religious (Temple) Educational (School)	500 seat Temple/75 preschool and 180 k-8 students
8. Nexus Center	R&D/Office	67,000 SF
9. Towne Centre Science Park	R&D/Office	190,000 SF
10. La Jolla Centre III & IV	Commercial Office	547,228 SF
11. Costa Verde Specific Plan[a]	Retail/Residential Hotel	16.5 acres/2,931 dwelling units 400 rooms
12. Regency Centre[b]	Retail	75,000 SF
13. UTC Revitalization Project	Commercial/Residential	750,000 SF/250 multi-family dwelling units

a. A portion of the Costa Verde Specific Plan was built and occupied at the time existing counts were conducted; however, to be conservative, the entire project was incorporated into the Model. The Monte Verde project (within the Costa Verde Specific Plan) involves the conversion (based on trip generation equivalency) of 400 hotel rooms to approximately 1,084 residential dwellings units.

b. The Regency Centre expansion project, though located within the Costa Verde Specific Plan, was not originally taken into account and therefore included as background cumulative traffic.

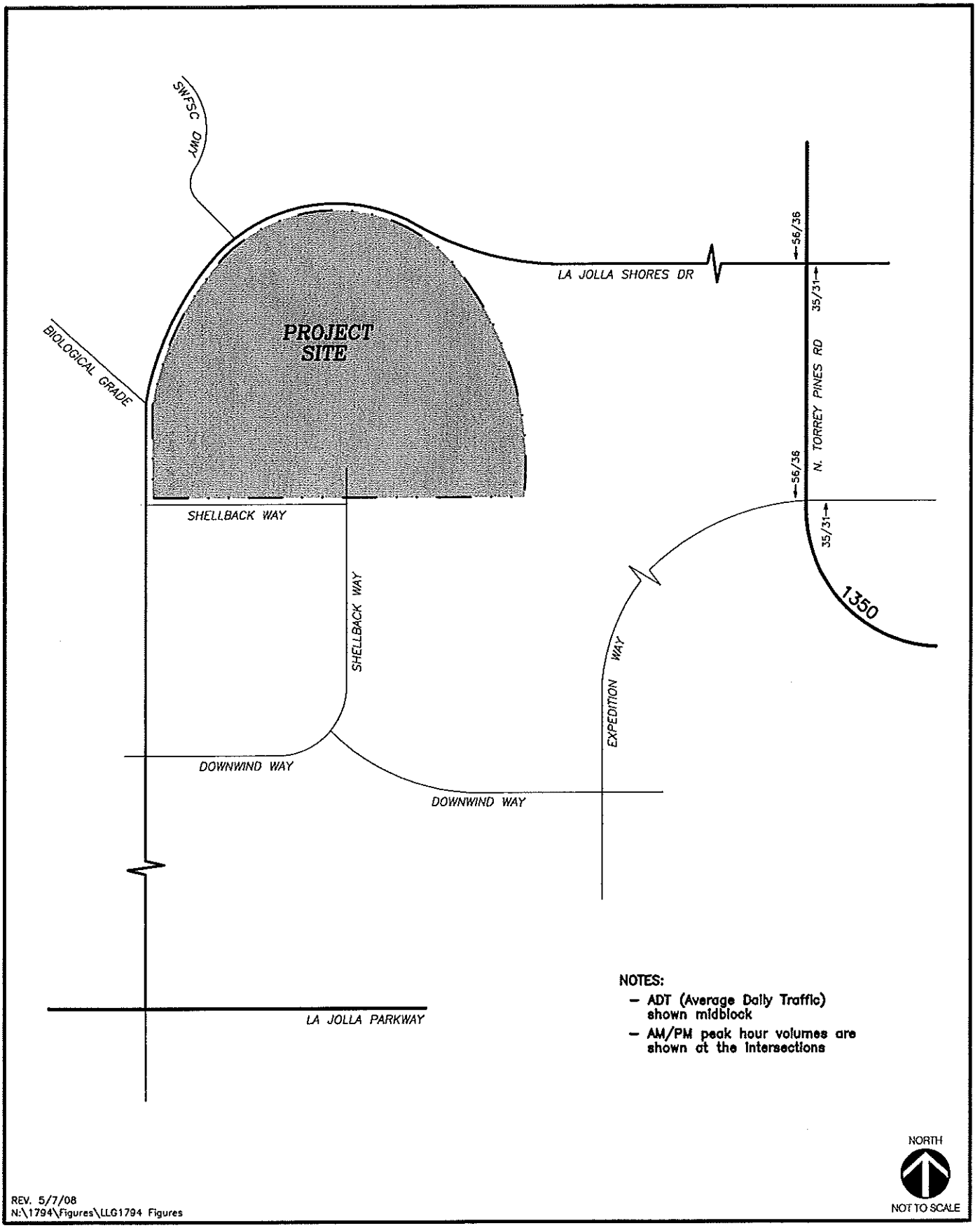

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Figure 7-1

Cumulative Projects Traffic Volumes AM/PM Peak Hours & ADT

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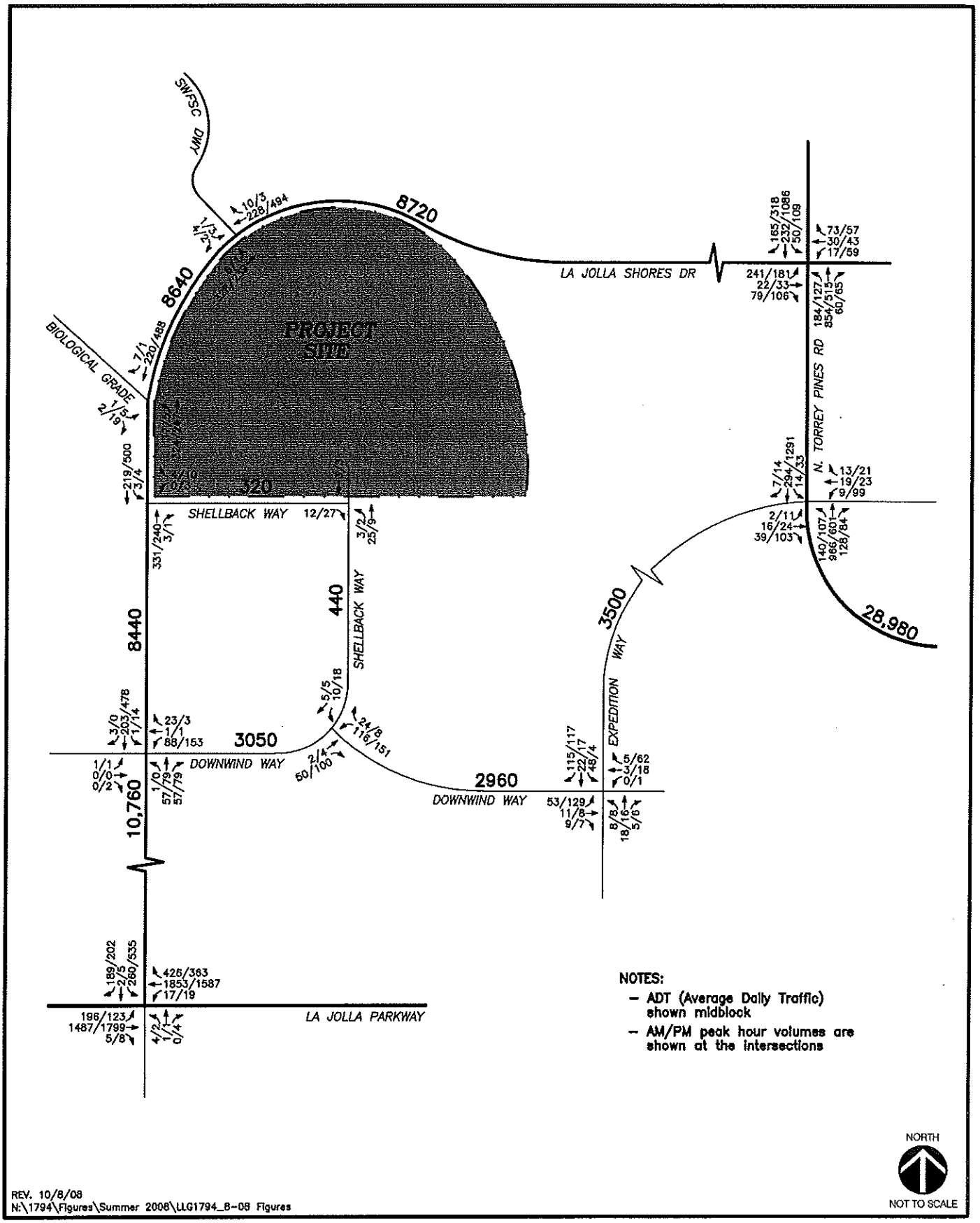

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Figure 7-2

Existing + Cumulative Projects Traffic Volumes AM/PM Peak Hours & ADT

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8.0 TRIP GENERATION/DISTRIBUTION/ASSIGNMENT

8.1 Trip Generation

As detailed in Section 2.0, the existing SWFSC is located on the northwest side of La Jolla Shores Drive and is comprised of four buildings containing about 100,000 sf of research space. As part of the project, two (approximately 40,000 sf) of the four existing research and development buildings will be demolished and a new 124,000 sf research center building will be constructed across La Jolla Shores Drive from the existing buildings. Based on the square footages above, the new building will have a "net" increase of 84,000 sf (124,000 sq. ft. minus 40,000 sq ft).

Given the unique nature of this project, two separate trip generation forecasts were completed utilizing both the "net" and "gross" square footages. To be conservative, the standard City trip rate for "Office Space – R&D" was utilized from the *City of San Diego's Trip Generation Rate Summary Table (May 2003)*. This trip rate of 8.0/ksf is consistent with trip generation rate for research uses included in the UCSD 2004 LRDP EIR. To be extra conservative, reductions for transit and trips to sea were not taken. A brief discussion on each trip generation forecast is provided below.

8.1.1 Net Trip Generation

Since the majority of the employees will be relocating from the existing buildings to across the street to the new proposed building, the trip generation is based on the number of new trips generated by the additional 84,000 sf, since current employees are already part of the existing street system and only future (17) employees would be considered new trips added to the circulation system. After the relocation of SWFSC staff to the new building, UCSD/SIO will take possession of Buildings A and D and may backfill these buildings with up to 66 staff, composed two–thirds of staff relocated from other SIO buildings and one–third of new hires. ***Table 8-1*** shows that the "net" project trip generation is calculated to generate approximately 672 ADT with 97 inbound and 11 outbound trips during the AM peak hour and 9 inbound and 85 outbound trips during the PM peak hour. It should be noted that the net trip generation was utilized for the regional analysis for roadways beyond the immediate project site. The City sometimes calls these "cumulative trips".

8.1.2 Gross Trip Generation

To be conservative, the gross trip generation assumed that the project was a plan–to–ground and LLG utilized the total 124,000 sf gross project in determining the number of trips generated. *Table 8–1* shows that based on the 124,000 sf, the gross project is calculated to generate approximately 992 ADT with 145 inbound and 15 outbound trips during the AM peak hour and 15 inbound and 125 outbound trips during the PM peak hour. This is appropriate as all trips generated by SWFSC would be new to the area east of La Jolla Shores Drive. It should be noted that the gross trip generation was utilized for the local analysis for roadways such as Shellback Way and Downwind Way. The City sometimes calls these "driveway trips".

TABLE 8–1
PROJECT TRIP GENERATION

Land Use	Size	Daily Trip Ends (ADTs)		AM Peak Hour				PM Peak Hour			
		Rate[a]	Volume	% of ADT	In:Out Split	Volume In	Volume Out	% of ADT	In:Out Split	Volume In	Volume Out
Net New Office Space (R&D)	84 KSF	8.0/KSF	672	16%	90:10	97	11	14%	10:90	9	85
OR											
Gross Office Space (R&D)	124 KSF	8.0/KSF	992	16%	90:10	145	15	14%	10:90	15	125

Footnotes:
a. Rate is based on City of San Diego's Trip Generation Rate Summary Table, May 2003.
KSF – 1,000 square feet

8.2 Trip Distribution

LLG determined the projects regional distribution based on existing traffic volumes, the future circulation system, discussions with NOAA/SWFSC and UCSD/SIO staff, and the project's proximity to I-5 and SR 52. A March 3, 2008 letter from the SWFSC indicates that 60% of the staff lives north of the laboratory and 40% live to the east & south. ***Figure 8–1*** shows the regional traffic distribution.

8.3 Trip Assignment

Two separate trip assignments were completed for each net and gross trip generation. Each assignment is discussed below.

Net Trip Assignment

The assignment of net trips to the circulation system was applied to roadways that are out of the project's immediate area. The affected study area intersections and roadways are listed below:

- N. Torrey Pines Road / La Jolla Shores Drive intersection
- La Jolla Shores Drive / Existing SWFSC Driveway intersection
- La Jolla Shores Drive / Biological Grade Driveway intersection
- La Jolla Shores Drive / Downwind Way intersection
- La Jolla Shores Drive / La Jolla Parkway intersection
- N. Torrey Pines Road: Expedition Way to Torrey Pines Road
- La Jolla Shores Drive: between Existing SWFSC Driveway and Biological Grade Driveway
- La Jolla Shores Drive: between Shellback Way and Downwind Way

- La Jolla Shores Drive: south of Downwind Way
- Downwind Way: east of La Jolla Shores Drive

Since these trips are new trips and not relocated trips, these trips were assigned to the circulation element roadways such as N. Torrey Pines Road, La Jolla Parkway, and portions of La Jolla Shores Drive between Downwind Way and La Jolla Parkway. It should be noted that no net trips were assigned to the internal roadways (Shellback Way & Downwind Way) since these trips would be assigned as gross trips due to the relocation of existing employees. ***Figure 8-2a*** shows the project trip assignment for the net trips.

Gross Trip Assignment

Gross trips or driveway trips were assigned to the immediate local street system. The affected study area intersections and roadways are listed below:

- La Jolla Shores Drive / Shellback Way intersection
- Shellback Way / Proposed SWFSC Driveway intersection
- Downwind Way / Shellback Way intersection
- Downwind Way / Expedition Way intersection
- N. Torrey Pines Road / Expedition Way intersection
- Shellback Way: East of La Jolla Shores Drive
- Shellback Way: North of Downwind Way
- Downwind Way: West of Expedition Way
- Expedition Way: between N. Torrey Pines Road and Downwind Way

The assignment of these trips only applies to immediate project access roadways. Portions of Downwind Way, Expedition Way, Shellback Way and the proposed SWFSC driveway were all assigned gross trips. These trips are not considered regional trips since they are basically moving across the street or have altered their internal travel patterns and are not are changing their existing travel route outside of these internal roadways. ***Figure 8-2b*** shows the project trip assignment for the gross trips.

Figure 8–2c shows the assignment of the total project traffic, based on the individual net and gross assignments shown on *Figures 8–2a* and *8–2b*. ***Figure 8–3*** shows existing + cumulative projects + project traffic volumes.

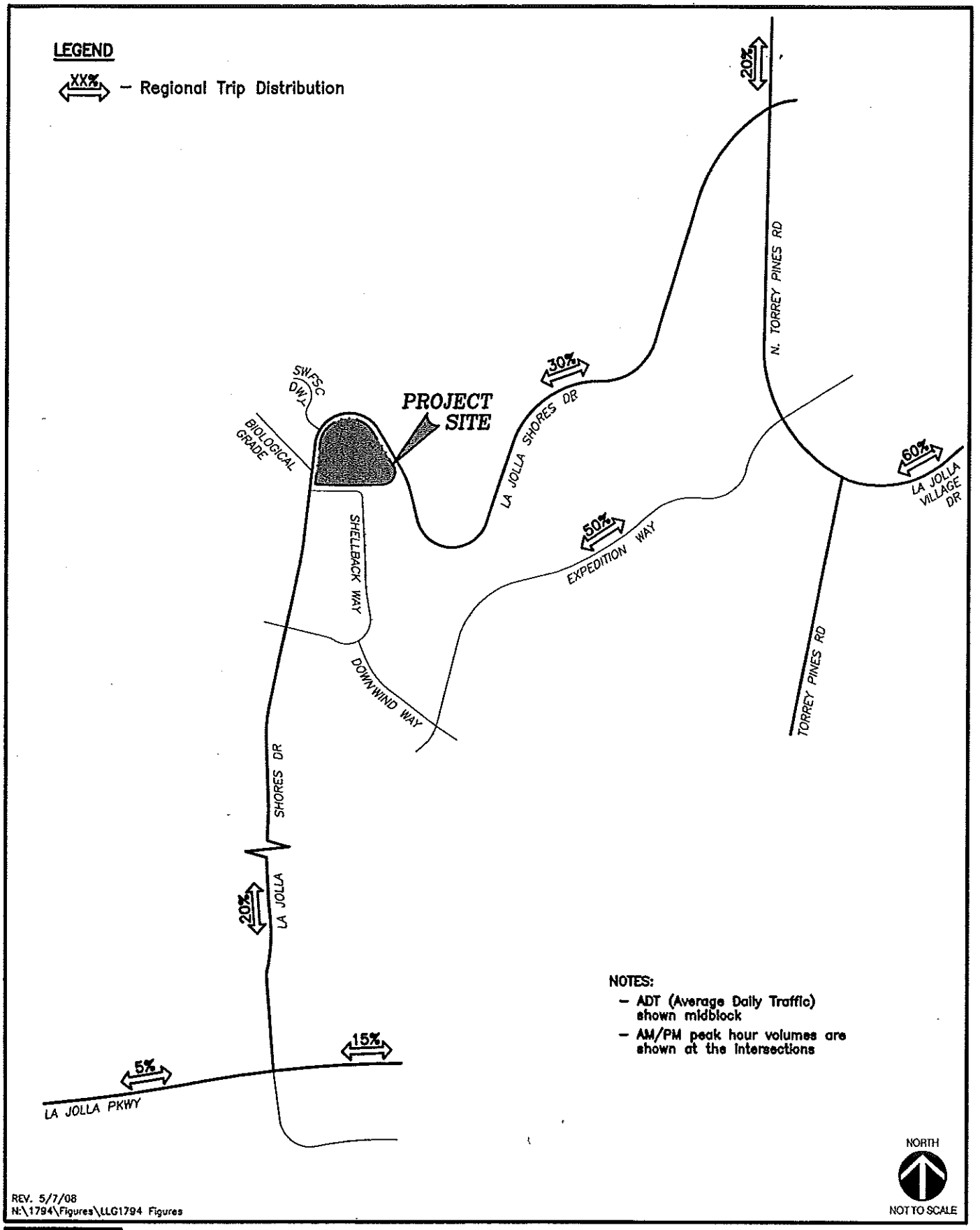

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Figure 8-1

Regional Traffic Distribution

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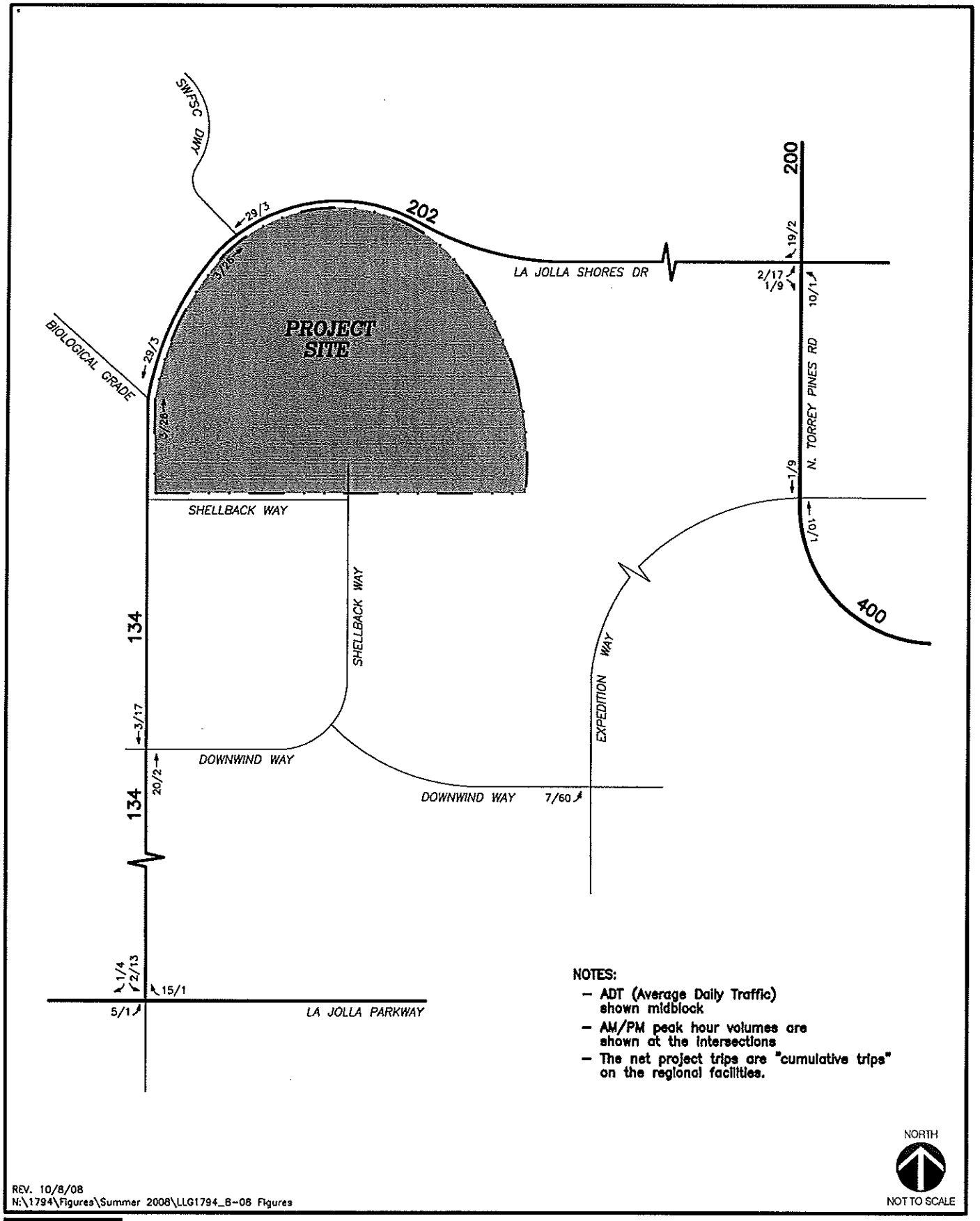

NOTES:
- ADT (Average Daily Traffic) shown midblock
- AM/PM peak hour volumes are shown at the intersections
- The net project trips are "cumulative trips" on the regional facilities.

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Figure 8-2a

Net Project Traffic Volumes AM/PM Peak Hours & ADT

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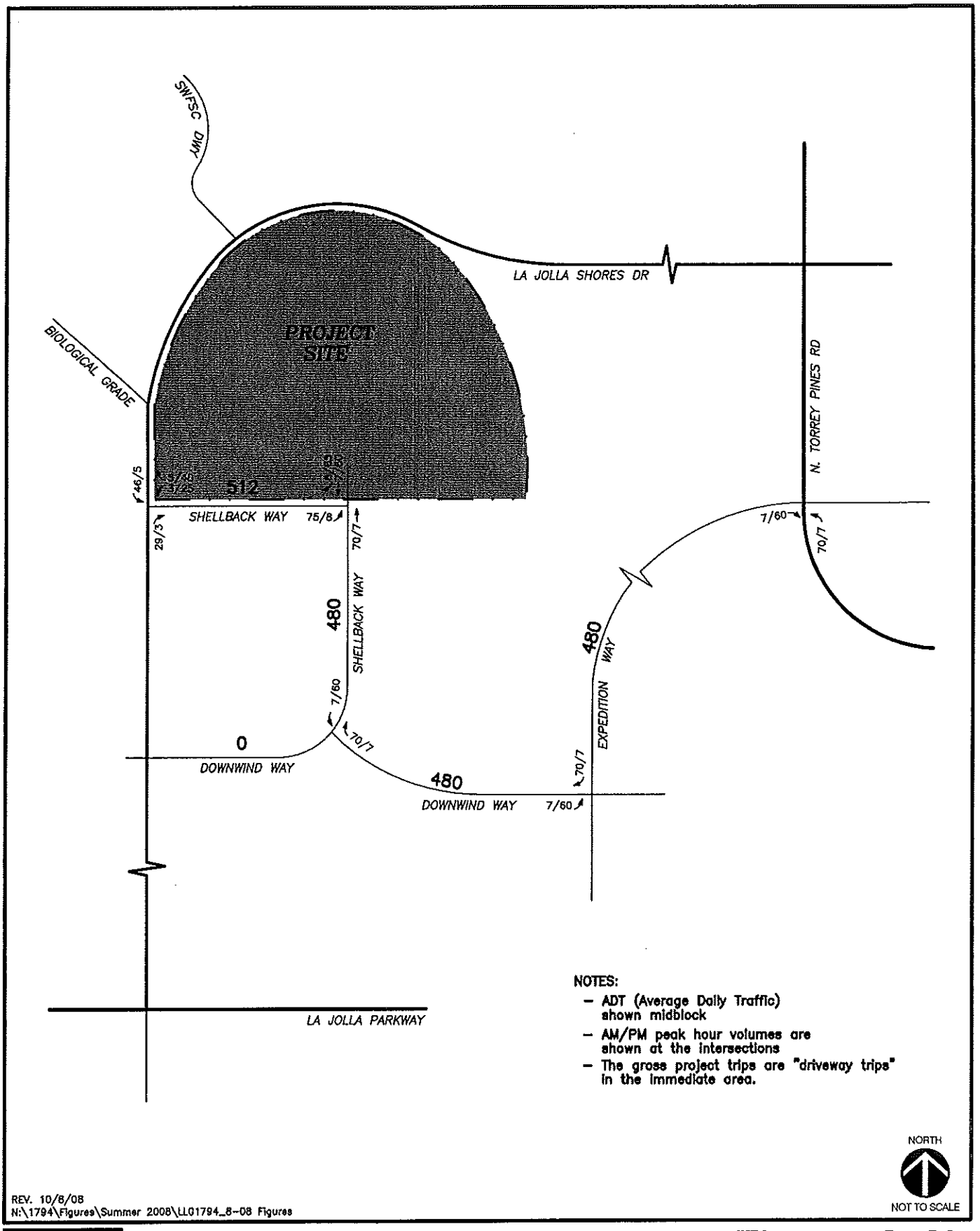

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Figure 8-2b

Gross Project Traffic Volumes AM/PM Peak Hours & ADT

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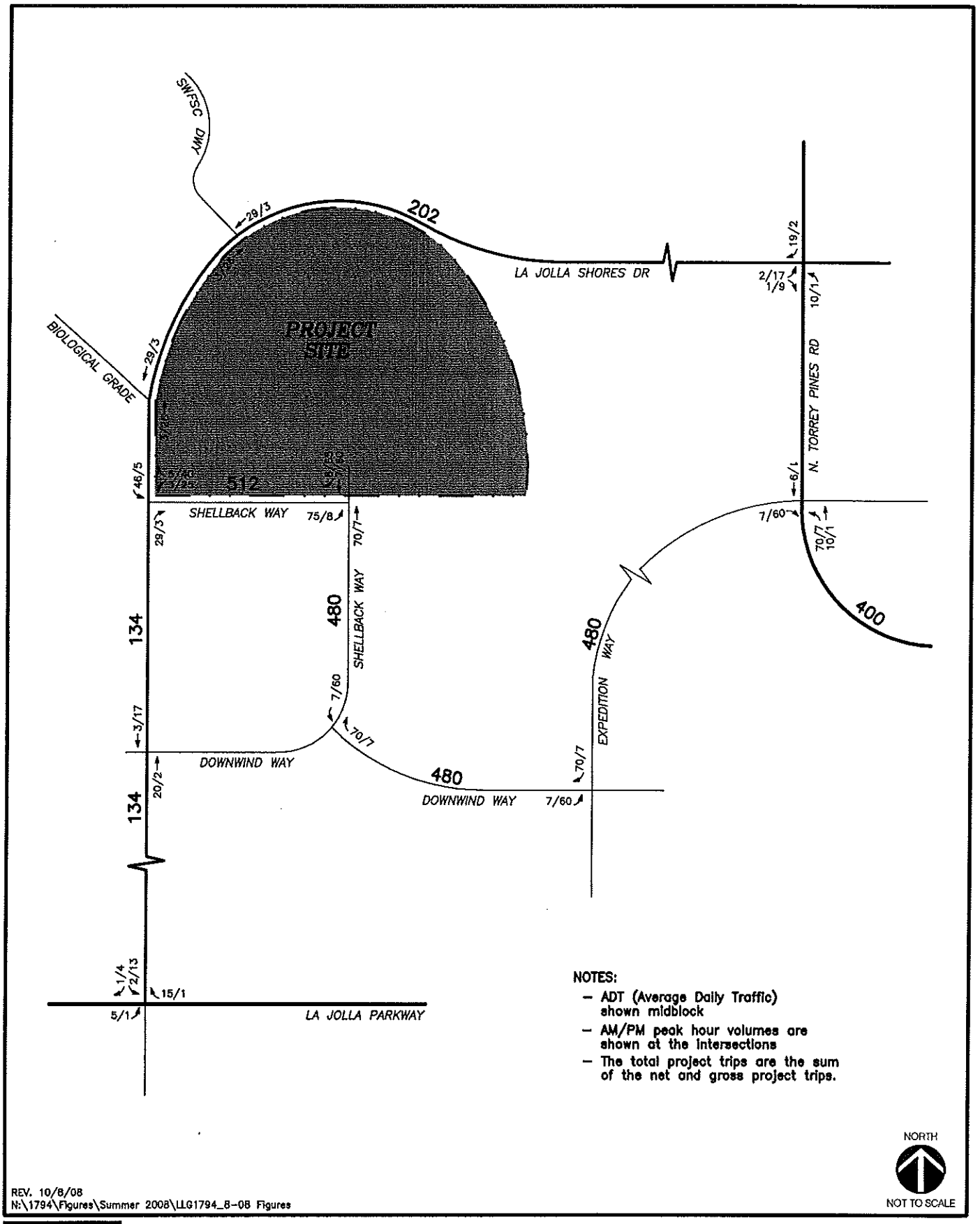

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Figure 8-2c

Total Project Traffic Volumes AM/PM Peak Hours & ADT

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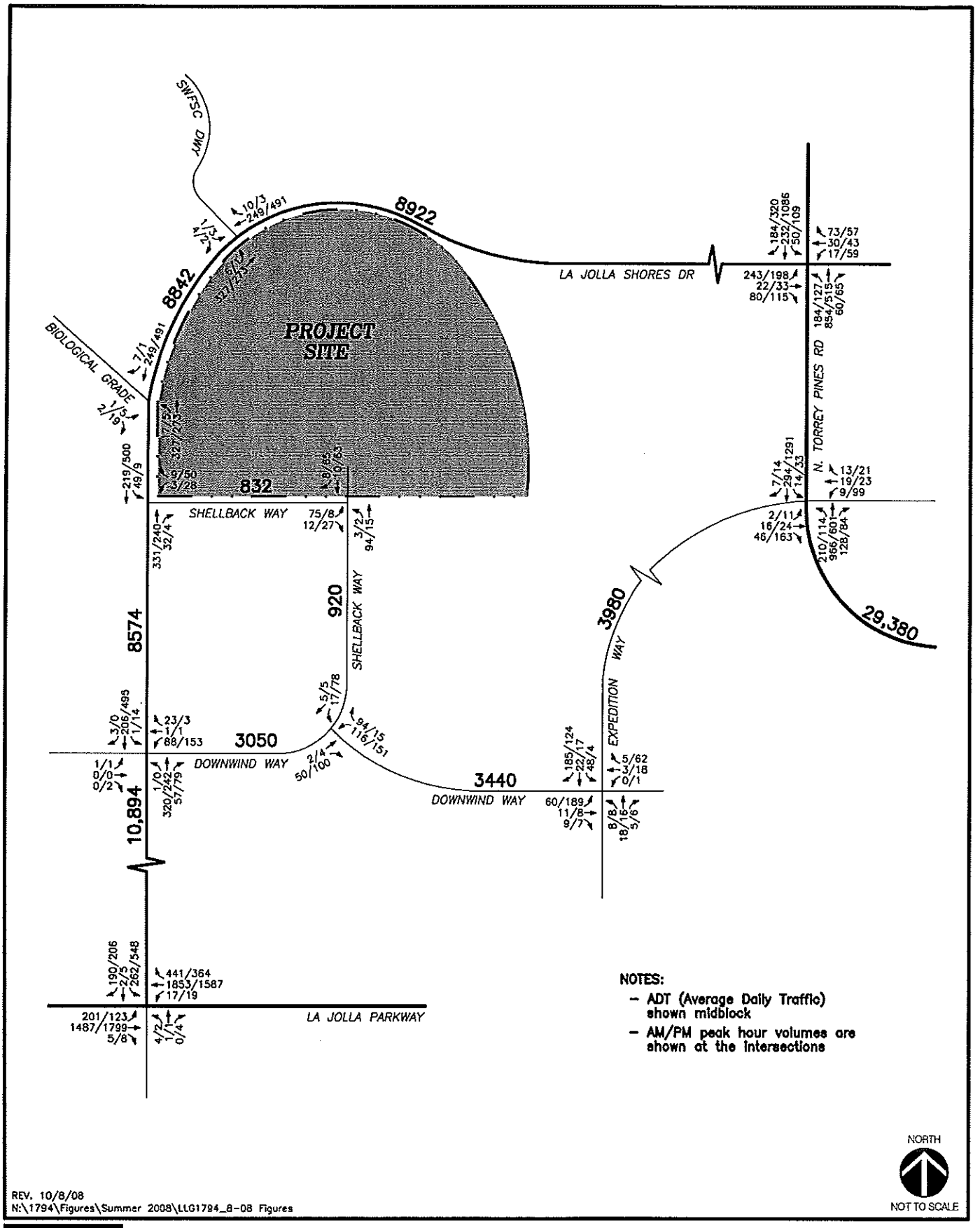

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Figure 8-3

Existing + Cumulative + Project Traffic Volumes AM/PM Peak Hours & ADT

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9.0 ANALYSIS OF NEAR-TERM SCENARIOS

This section discusses the near-term operations of intersections and street segments in the project study area.

9.1 Existing + Cumulative Projects

The section below discusses the "Existing + Cumulative Projects" scenario operations.

9.1.1 Intersection Analysis

Table 9–1 shows the intersection operations in the project vicinity for "Existing + Cumulative Project" scenario. As shown on *Table 9–1*, all key intersections are calculated to continue to operate at LOS D or better with the addition of cumulative projects traffic.

It should be noted that although the westbound left–turn at the La Jolla Shores Drive/Downwind Way unsignalized intersection operates at LOS E during the PM peak hour, the intersection as a whole is calculated to operate at an acceptable LOS A condition for all scenarios. The left–turn from Downwind Way to La Jolla Shores Drive will continue to be difficult during the peak hours.

9.1.2 Segment Operations

Table 9–2 shows the street segment operations for "Existing + Cumulative Projects" scenario. With the addition of cumulative projects traffic, all segments are calculated to operate at LOS D or better on a daily basis.

9.2 Existing + Cumulative Projects + Project

The section below discusses the "Existing + Cumulative Projects + Project" scenario operations.

9.2.1 Intersection Analysis

Table 9–1 shows the intersection operations in the project vicinity for "Existing + Cumulative Projects + Project" scenario. As shown on Table *9–1*, all key intersections are calculated to continue to operate at LOS D or better with the addition of project traffic. **No significant impacts are calculated.**

It should be noted that although the westbound left–turn at the La Jolla Shores Drive/Downwind Way unsignalized intersection operates at LOS E during the PM peak hour, the intersection as a whole is calculated to operate at an acceptable LOS A condition for all scenarios. The left–turn from Downwind Way to La Jolla Shores Drive will continue to be difficult during the peak hours.

9.2.2 Segment Operations

Table 9–2 shows the street segment operations for "Existing + Cumulative Project + Project" scenario. With the addition of project traffic all segments are calculated to continue to operate at LOS D or better on a daily basis. **No significant impacts are calculated.**

TABLE 9–1
NEAR-TERM INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Existing		Existing + Cumulative Projects		Existing + Cumulative Projects + Project		Δ[c]	Impact Type
			Delay[a]	LOS[b]	Delay	LOS	Delay	LOS		
1. N. Torrey Pines Road / La Jolla Shores Drive	Signal	AM	23.6	C	23.8	C	24.2	C	0.4	None
		PM	29.0	C	29.0	C	30.1	C	1.1	
2. N. Torrey Pines Road / Expedition Way	Signal	AM	16.8	B	16.8	B	20.4	C	3.6	None
		PM	25.6	C	25.8	C	26.5	C	0.7	
3. La Jolla Shores Drive/ Existing SWFSC Driveway	OWSC[d]	AM	10.3	B	10.3	B	10.6	B	0.3	None
		PM	13.9	B	13.9	B	14.2	B	0.3	
4. La Jolla Shores Drive/ Biological Grade Dwy	OWSC	AM	10.8	B	10.8	B	11.1	B	0.3	None
		PM	12.8	B	12.8	B	12.9	B	0.1	
5. La Jolla Shores Drive/ Shellback Way	OWSC	AM	10.3	B	10.3	B	11.6	B	1.3	None
		PM	11.1	B	11.1	B	13.1	B	2.8	
6. Shellback Way/ Proposed SWFSC Driveway	OWSC	AM	7.4	A	7.4	A	7.8	A	0.4	None
		PM	7.3	A	7.3	A	7.4	A	0.1	
7. La Jolla Shores Drive/ Downwind Way	TWSC[e]	AM	2.6	A	2.6	A	2.6	A	0.0	None
		WB L[g]	*15.7*	*B*	*15.7*	*B*	*16.2*	*C*	0.5	
		PM	6.0	A	6.0	A	6.4	A	0.5	
		WB L[g]	*36.1*	*E*	*36.1*	*E*	*39.1*	*E*	2.4	
8. Downwind Way/ Shellback Way	OWSC	AM	9.5	A	9.5	A	9.8	A	0.3	None
		PM	10.0	A	10.0	A	11.5	B	1.5	
9. Downwind Way/ Expedition Way	AWSC[f]	AM	7.3	A	7.3	A	7.7	A	0.4	None
		PM	8.1	A	8.1	A	8.8	A	0.7	
10. La Jolla Shores Drive/ La Jolla Parkway	Signal	AM	33.6	C	33.6	C	34.0	C	0.4	None
		PM	46.5	D	46.5	D	47.5	D	0.5	

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. Δ denotes an increase in delay due to project.
d. OWSC – One-Way Stop Controlled intersection. Minor street delay is reported.
e. TWSC – Two-Way Stop Controlled intersection. Minor street delay is reported.
f. AWSC – All-Way Stop Controlled intersection.
g. Delay reported is for the westbound minor street movement.

SIGNALIZED DELAY/LOS THRESHOLDS		UNSIGNALIZED DELAY/LOS THRESHOLDS	
Delay	LOS	Delay	LOS
0.0 < 10.0	A	0.0 < 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
> 80.1	F	> 50.1	F

TABLE 9–2
NEAR-TERM STREET SEGMENT OPERATIONS

Street Segment	Existing Capacity (LOS E)[a]	Existing			Existing + Cumulative Projects			Existing + Cumulative Projects + Project			Δ[e]	Impact Type
		ADT[b]	V/C[c]	LOS[d]	ADT	V/C	LOS	ADT	V/C	LOS		
N. Torrey Pines Road												
Expedition Way to Torrey Pines Road	40,000	27,630	0.691	C	28,980	0.725	C	29,380	0.735	C	0.010	None
La Jolla Shores Drive												
N. Torrey Pines Road to Existing SWFSC Driveway	15,000	8,720	0.581	C	8,720	0.581	C	8,922	0.595	C	0.014	None
Existing SWFSC Driveway to Biological Grade Dwy.	15,000	8,640	0.576	C	8,640	0.576	C	8,842	0.589	C	0.013	None
Shellback Way to Downwind Way	15,000	8,440	0.563	C	8,440	0.563	C	8,574	0.572	C	0.009	None
Downwind Way to La Jolla Parkway	15,000	10,760	0.717	D	10,760	0.717	D	10,894	0.726	D	0.009	None
Expedition Way												
N. Torrey Pines Road to Downwind Way	8,000	3,500	0.438	B	3,500	0.438	B	3,980	0.498	C	0.060	None
Downwind Way												
East of La Jolla Shores Drive	8,000	2,960	0.370	B	2,960	0.370	B	3,440	0.430	B	0.006	None
West of Expedition Way	8,000	3,050	0.381	B	3,050	0.381	B	3,050	0.381	B	0.000	None
Shellback Way												
East of La Jolla Shores Drive	2,200[f]	320	0.145	C	320	0.145	C	832	0.378	C	0.233	None
North of Downwind Way	2,200[f]	440	0.200	C	440	0.200	C	920	0.418	C	0.218	None

Footnotes:

a. Capacities based on City of San Diego's Roadway Classification & LOS table (See *Appendix C*).

b. Average Daily Traffic

c. Volume to Capacity ratio

d. Level of Service

e. Δ – Increase in Volume to Capacity ratio due to the project.

f. Capacity at LOS C.

10.0 YEAR 2030 ANALYSIS

This section discusses Year 2030 operations of the intersection and street segments in the project study area. ***Figure 10–1*** illustrates the forecasted Year 2030 without project traffic volumes with ***Figure 10-2*** illustrating Year 2030 with project traffic volumes.

10.1 Year 2030 Volumes Forecasting

A long-term analysis was conducted for Year 2030 and Year 2030 + project. Year 2030 traffic volumes in the local project area were obtained from the most recent SANDAG Series 10 2030 traffic model.

The traffic model presents weekday buildout traffic volumes in ADTs. To produce the 2030 peak hour intersection volumes, LLG compared existing to future ADTs. Then, using existing peak hour volumes and cross multiplication weighted by approach ADTs, LLG estimated future peak hour turn volumes. It should be noted that for the unclassified roadways such as Expedition Way and Downwind Way, the traffic model does not provide ADT volumes. Therefore, LLG added a growth factor of 25% to existing ADTs to represent Year 2030 conditions. *Appendix B* contains a copy of the Year 2030 and Year 2030 + project peak hour intersection analysis worksheets.

The UCSD 2004 LRDP EIR is included in this long-term cumulative traffic analysis. SANDAG's 2030 regional model was used in the long-term analysis. This model includes the land uses in the LRDP.

10.2 Year 2030 Operations

10.2.1 Intersection Operations

Table 10–1 shows the intersection operations in the project vicinity for "Year 2030" scenario. As shown on *Table 10–1*, the majority of the key intersections are calculated to operate at LOS D or better during both the AM and PM peak hours except the following intersections, which are calculated to operate at LOS E or F conditions.

- N. Torrey Pines Road / La Jolla Shores Drive (LOS E – PM peak hour)
- La Jolla Shores Drive / Downwind Way (LOS E/F – AM/PM peak hours)
- La Jolla Shores Drive / La Jolla Parkway (LOS F – AM & PM peak hours)

10.2.2 Segment Operations

Table 10–2 shows the street segment operations for "Year 2030" without project scenario. *Table 10-2* shows that the majority of the segments are calculated to operate at LOS D or better on a daily basis. The segments on La Jolla Shores Drive are calculated to operate at LOS E or F conditions.

10.3 Year 2030 + Project

10.3.1 Intersection Operations

Table 10–1 shows the intersection operations in the project vicinity with the addition of project traffic. As shown on *Table 10–1*, the majority of the key intersections are calculated to operate at

LOS D or better during both the AM and PM peak hours except the following intersections, which are calculated to continue to operate at LOS E or F conditions.

- N. Torrey Pines Road / La Jolla Shores Drive (LOS E – PM peak hour)
- La Jolla Shores Drive / Downwind Way (LOS E/F – AM/PM peak hours)
- La Jolla Shores Drive / La Jolla Parkway (LOS F – AM & PM peak hours)

Based on City of San Diego significance criteria, the overall increase in delay at the intersection of La Jolla Shores Drive and Downwind Way during the PM peak hour due to the project is less than 2.0 seconds. Therefore, **no significant impact are calculated**.

10.3.2 Segment Operations

Table 10–2 shows the street segment operations for "Year 2030" with project scenario. *Table 10-2* shows that the majority of the segments are calculated to continue to operate at LOS D or better on a daily basis. The segments on La Jolla Shores Drive continue to operate at LOS E or F conditions. Based on City of San Diego significance criteria, the increase in v/c due to the project is less than 0.02. Therefore, **no significant impacts are calculated**.

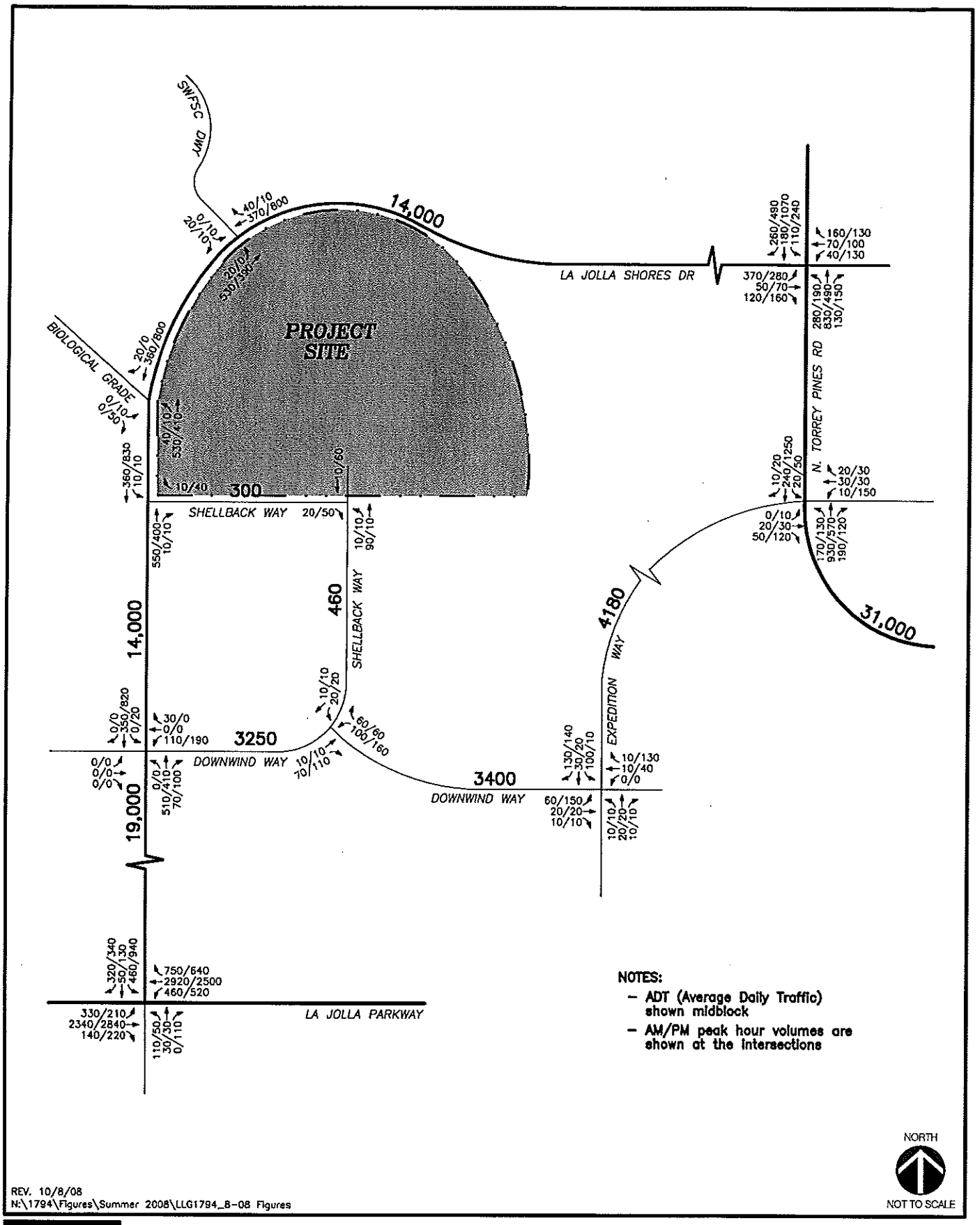

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Figure 10-1

Year 2030 Traffic Volumes AM/PM Peak Hours & ADT

SOUTHWEST FISHERIES SCIENCE CENTER

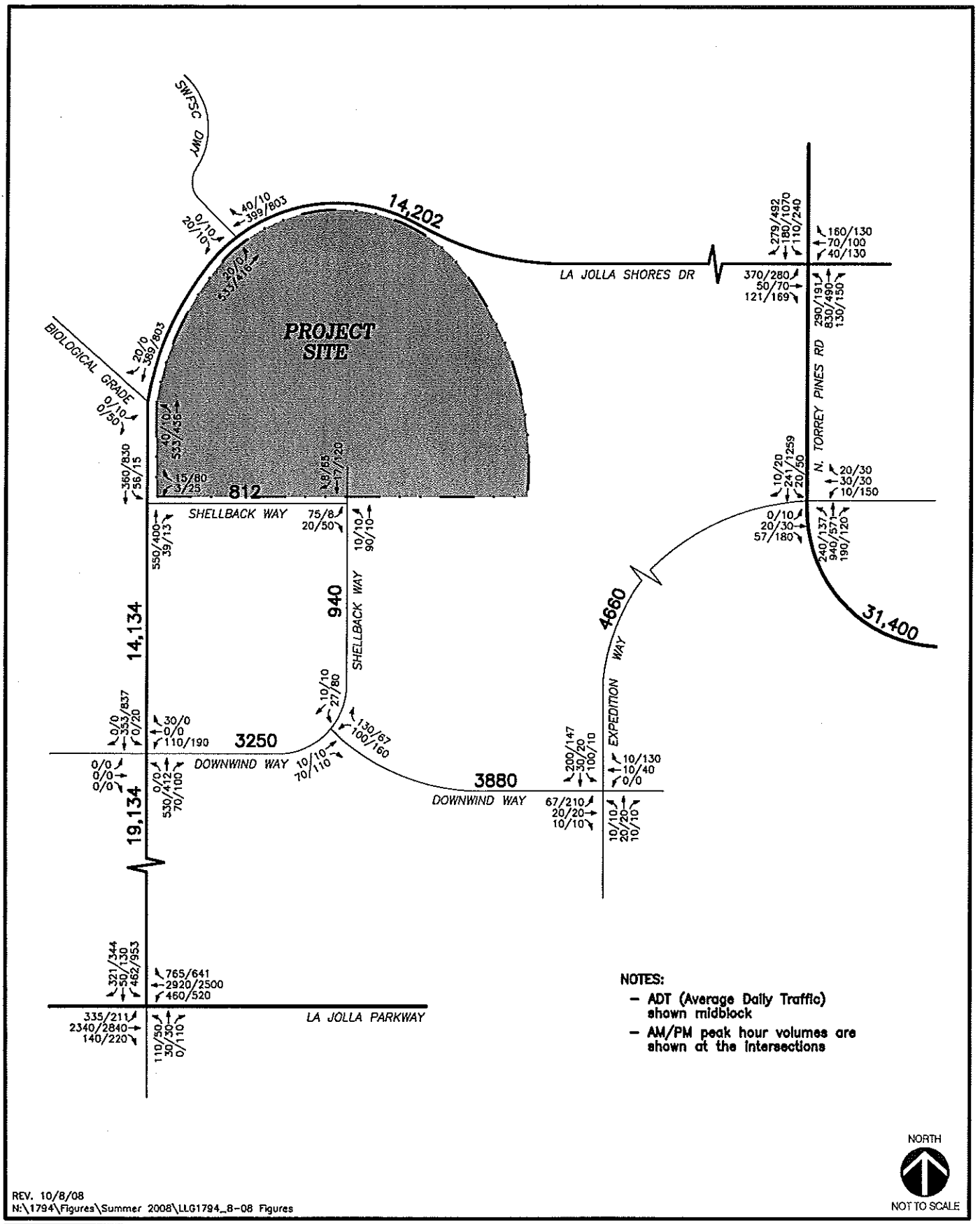

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Figure 10-2

Year 2030 + Project Traffic Volumes AM/PM Peak Hours & ADT

SOUTHWEST FISHERIES SCIENCE CENTER

TABLE 10–1
YEAR 2030 INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	2030		Year 2030 + Project		Δ[c]	Impact Type
			Delay[a]	LOS[b]	Delay	LOS		
1. N. Torrey Pines Road / La Jolla Shores Drive	Signal	AM	40.7	D	41.1	D	0.4	None
		PM	56.1	E	57.6	E	1.5	
2. N. Torrey Pines Road / Expedition Way	Signal	AM	19.2	B	23.4	C	4.2	None
		PM	30.5	C	31.3	C	0.8	
3. La Jolla Shores Drive/ Existing SWFSC Driveway	OWSC[d]	AM	14.4	B	14.9	B	0.5	None
		PM	21.8	C	22.4	C	0.6	
4. La Jolla Shores Drive/ Biological Grade Dwy	OWSC	AM	16.1	C	16.7	C	0.6	None
		PM	20.5	C	20.9	C	0.4	
5. La Jolla Shores Drive/ Shellback Way	OWSC	AM	12.4	B	16.9	C	4.5	None
		PM	11.3	B	19.4	C	8.1	
6. Shellback Way/ Proposed Project Driveway	OWSC	AM	7.3	A	8.8	A	1.5	None
		PM	7.7	A	8.0	A	0.3	
7. La Jolla Shores Drive/ Downwind Way	TWSC[e]	AM	6.5	A	7.0	A	0.5	None
		WB L[g]	*46.0*	*E*	*50.2*	*F*	4.2	
		PM	65.3	F	66.5	F	1.2	
		WB L[g]	*> 100.0*	*F*	*> 100.0*	*F*	> 5.0	
8. Downwind Way/ Shellback Way	OWSC	AM	9.8	A	10.2	A	0.4	None
		PM	10.5	B	12.0	B	1.5	
9. Downwind Way/ Expedition Way	AWSC[f]	AM	7.8	A	8.1	A	0.3	None
		PM	8.8	A	9.6	A	0.8	
10. La Jolla Shores Drive/ La Jolla Parkway	Signal	AM	> 100.0	F	> 100.0	F	1.3	None
		PM	> 100.0	F	> 100.0	F	1.0	

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. Δ denotes an increase in delay due to project.
d. OWSC – One-Way Stop Controlled intersection. Minor street delay is reported.
e. TWSC – Two-Way Stop Controlled intersection. Minor street delay is reported.
f. AWSC – All-Way Stop Controlled intersection.
g. Delay reported is for the westbound minor street movement.

SIGNALIZED DELAY/LOS THRESHOLDS		UNSIGNALIZED DELAY/LOS THRESHOLDS	
Delay	LOS	Delay	LOS
0.0 < 10.0	A	0.0 < 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
> 80.1	F	> 50.1	F

TABLE 10–2
LONG-TERM STREET SEGMENT OPERATIONS

Street Segment	Capacity (LOS E) [a]	Year 2030			Year 2030 + Project			Δ[e]	Sig? [f]
		ADT[b]	LOS [c]	V/C [d]	ADT	LOS	V/C		
N. Torrey Pines Road									
Expedition Way to Torrey Pines Road	40,000	31,000	D	0.775	31,400	D	0.785	0.010	No
La Jolla Shores Drive									
N. Torrey Pines Road to Existing SWFSC Driveway	15,000	14,000	E	0.933	14,202	E	0.947	0.014	No
Existing SWFSC Driveway to Downwind Way	15,000	14,000	E	0.933	14,134	F	0.942	0.009	No
Downwind Way to La Jolla Parkway	15,000	19,000	F	1.267	19,134	F	1.275	0.008	No
Expedition Way									
N. Torrey Pines Road to Downwind Way	8,000	4,180	C	0.523	4,660	C	0.583	0.060	No
Downwind Way									
East of La Jolla Shores Drive	8,000	3,250	B	0.406	3,250	B	0.406	0.000	No
West of Expedition Way	8,000	3,400	B	0.425	3,880	C	0.485	0.060	No
Shellback Way									
East of La Jolla Shores Drive	2,200[g]	300	C	0.136	812	C	0.370	0.234	No
North of Downwind Way	2,200[g]	460	C	0.209	940	C	0.427	0.218	No

Footnotes

a. Capacity based on roadway classification operating at LOS E.
b. Average Daily Traffic.
c. Level of Service.
d. Volume to Capacity.
e. Δ denotes a project-induced increase in the Volume to Capacity (V/C) ratio.
f. Sig = Indicates a potentially significant project impact. See Section 10.2.1 for detailed explanation.
g. Capacity at LOS C.

11.0 CONSTRUCTION AND DEMOLITION TRAFFIC

11.1 NOAA Building Construction

Construction of the *Southwest Fisheries Science Center* project will generate construction traffic in the surrounding area on a temporary basis. Construction traffic relates to the traffic generated from construction vehicles, which consist primarily of heavy trucks, smaller construction trucks, and worker vehicles.

Construction of the project is expected to occur over a two–year time frame. Three major construction phases are anticipated. These phases are expected to include site grading, concrete pours, and the building of structures.

For the *Southwest Fisheries Science Center* project, a number of techniques could be implemented to minimize construction trips. For example, the project could implement a construction debris-recycling program with the intent to reuse as much material on-site as possible, reducing trips to the local landfill. This would include the recycling of concrete for base material for landscaping and erosion control.

For the construction activity that will occur, off-site trips will be generated. These trips may impact the community for an extended period of time. Each phase of construction will have its own traffic intensity and duration. The calculations outlined below are for each phase of construction and include the best estimate of the amount of construction and worker vehicles that would occur. A passenger car equivalence (PCE) of 4.0 was applied to large construction trucks due to the steep grades in the area. The export of dirt associated with the grading will generate the highest amount of truck trips, while the building of structures will generate the highest amount of worker trips. It is estimated that 127,000 cubic yards of dirt will be exported in trucks that have a capacity of 10 cubic yards. Given a five–month schedule and 6–day work weeks (120 working days), there would be about 106 loaded trucks per day leaving the site (127,000/10/120). This would equate to a truck leaving about every 5 minutes. If tandem haul trucks are used, the number of loaded haul trucks leaving the site could be reduced to as little as 53 per day and the interval between haul trucks would increase up to 10 minutes. The calculations below show the highest activity among the grading, concrete pours, and the building of structures. Table 11–1 shows an AM and PM peak hour comparison. Table 11–1 provides a comparison between the most construction/truck intensive phase of the project (Phase 1) and the "net" trips that would be distributed and assigned to the regional roadways such as N. Torrey Pines Road and La Jolla Parkway. This traffic impact analysis is based on single haul trucks as they would result in greater traffic generation and potential effects.

Phase 1 (Grading, 5 months)

– 106 trucks/day * 2 trips/truck * 4 PCE	=	848 ADT
– 40 workers/day * 2 trips/worker	=	80 ADT
Total	=	***928 ADT***

Phase 2 (Concrete Pours, 2 months)

- 32 trucks/day * 2 trips/truck * 4 PCE = 256 ADT
- 20 workers/day * 2 trips/worker = 40 ADT

Total = ***296 ADT***

Phase 3 (Building Structures, 18 months)

- 20 trucks/day * 2 trips/truck * 4 PCE = 160 ADT
- 100 workers/day * 2 trips/worker = 200 ADT

Total = **360 ADT**

TABLE 11–1
CONSTRUCTION TRAFFIC TRIP GENERATION COMPARISON

Use	Size	ADTs	AM Peak Hour				PM Peak Hour			
			% of ADT	In:Out Split	Volume In	Volume Out	% of ADT	In:Out Split	Volume In	Volume Out
Daily Truck Traffic	106 truck trips[a]	848[b]	–	50:50	24	24	–	50:50	24	24
Construction Workers	40 trips	80	–	90:10	25	5	–	10:90	5	25
Construction Traffic Totals	–	***928***	–	–	***49***	***29***	–	–	***29***	***49***
Net Office Space (R&D)[c]	84 ksf	***672***	16%	90:10	**97**	**11**	14%	10:90	**9**	**85**
Difference in Construction vs. Office trips:		**256**	–	–	**(48)**	**18**	–	–	**20**	**(36)**

Footnotes:

a. Projected haul truck traffic is estimated at 53 to 106 per day, 106 is used as worst case for this analysis.
b. Project ADT includes PCE- Passenger Car Equivalent of 4.0
c. Based on SANDAG published rates, April 2002

As shown in *Table 11–1*, Phase 1 of construction is calculated to generate more daily trips than the net NOAA office, but fewer peak hour trips. Project impacts are based on peak hour trips, more than ADT's. Truck trips would ingress/egress the site throughout the day, having a less intensive peak hour impact to the circulation system as opposed to the NOAA office project. Therefore, based on the above data, construction traffic is not expected to cause any significant traffic impacts.

Construction traffic is expected to utilize Circulation Element roads to access the site, such as La Jolla Shores Drive, North Torrey Pines Road, La Jolla Village Drive, I-5, SR 56, and SR 52. Construction traffic (heavy trucks) should be discouraged, if not prohibited, from using Downwind Way and Expedition Way. This is primarily because of the potential disruption to the existing "Keck buildings" on Shellback Way and to the Birch Aquarium patrons. All heavy construction trucks should be directed to use the Shellback Way driveway to and from the north on La Jolla Shores

Drive. Construction traffic does not need to use, and should be conditioned not to use any residential streets.

Finally, construction traffic control plans must be prepared to identify the routes for heavy construction vehicles and the hours of construction activity. This will reduce the potential impacts and avoid the commuter peak hours. The traffic control plans will detail the work zones and lane closures/transitions. The traffic control plans may utilize "flaggers" at the intersection La Jolla Shores Drive/Shellback Way to facilitate truck movements into and out of the site. They will conform to the technical requirements of the City of San Diego Regional Standard Drawings & California Department of Transportation (Caltrans) standards prior to the commencement of work.

11.2 Demolition of Existing Buildings B & C

As part of the project, the demolition of Buildings B & C will commence upon completion and occupancy of the new NOAA building. Staff from existing Buildings B & C will be relocated to the new building or transfer to one of the two remaining buildings (A & D). This section details the activity that will occur as a result of the demolition and the number of off-site trips that will be generated. These trips may impact the community for a short period of time (30–60 days). The calculations outlined below are the best estimate of the amount of construction and worker vehicles that would occur. It is anticipated that the demolition will need approximately 7–9 trucks a day along with 20 construction workers. A passenger car equivalence (PCE) of 4.0 was applied to large construction trucks due to the steep grades in the area. It is estimated that 4,454 cubic yards of demolition material will be exported in trucks that have a capacity of 10 cubic yards. Given a 30–60 day period schedule, there would be a total of about 445 loaded trucks or approximately 8 trucks per day leaving the site (4,454/10/60). The calculations below show the anticipated number of trips generated as a result of the demolition.

Demolition (30–60 days)

– 8 trucks/day * 2 trips/truck * 4 PCE	=	65 ADT
– 20 workers/day * 2 trips/worker	=	40 ADT
Total	=	**105 ADT**

Demolition traffic is expected to utilize Circulation Element roads to access the existing SWFSC driveway, such as La Jolla Shores Drive, North Torrey Pines Road, La Jolla Village Drive, I-5, SR 56, and SR 52. Demolition traffic (heavy trucks) should be discouraged, if not prohibited, from using Downwind Way and Expedition Way. All heavy trucks used during demolition should be directed to use the La Jolla Shores Drive to and from the north. Demolition traffic does not need to use, and should be conditioned not to use any residential streets.

Finally, traffic control plans must be prepared to identify the routes for heavy construction vehicles and the hours of demolition activity. This will reduce the potential impacts and avoid the commuter peak hours. The traffic control plans will detail the work zones. The traffic control plans may utilize "flaggers" at the intersection La Jolla Shores Drive/Existing SWFSC driveway to facilitate truck

movements into and out of the site. The traffic control plans will conform to the requirements of the City of San Diego Regional Standard Drawings & Caltran's standards prior to the commencement of work.

12.0 LOCAL CIRCULATION ASSESSMENT

As part of this traffic report, LLG conducted a preliminary access review. The following are issues that have been identified based on our review:

- Driveway access
- La Jolla Shores Drive Vehicle Speeds
- Traffic Signal Warrants
- On-site circulation
- Site Access

12.1 Access

Vehicle access to the new SWFSC facility would be via a driveway connecting to the east–west oriented segment of Shellback Way. Within the immediate project area, there are several alternative routes that could be utilized to reach Shellback Way. Shellback Way "Tees" into La Jolla Shores Drive to the west and Shellback Way forms a "tee" intersection with Downwind Way to the south.

The intersection of La Jolla Shores Drive and Shellback Way has been a subject of concern with the tenants of the Keck Buildings. Construction of the new SWFSC facility will add traffic to this intersection. Southbound left–turns from La Jolla Shores Drive to Shellback Way are accommodated by a two–way left–turn lane that extends northerly into the curve, ending at La Jolla Shores Lane. The length of this two-way left–turn lane is believed to be long enough to accommodate project traffic in addition to existing traffic. If an unexpected queuing problem develops, then the southbound left–turn into Shellback Way should be prohibited. For traffic making a westbound right-turn from Shellback Way to La Jolla Shores Drive, the sight distance can be improved by implementing an additional 50 to 100 feet of red curb along the eastside of La Jolla Shores Drive south of Shellback Way. This would eliminate 2 to 4 parking spaces.

Current westbound left–turns from Shellback Way onto La Jolla Shores Drive are prohibited. This prohibition was reportedly implemented by UCSD in response to a past construction project. It is believed this prohibition is no longer required. Westbound left–turns from Shellback Way to La Jolla Shores Drive should be allowed into the existing two-way left–turn lane.

An analysis of this intersection (*Appendix B*) with the westbound left–turn allowed shows that acceptable Levels of Service are calculated for all scenarios analyzed. For the existing + cumulative project + project, the westbound left–turn movement is calculated to operate at LOS B operations for both the AM and PM peak hours.

The proposed SWFSC driveway will be constructed as the north leg (Tee) to Shellback Way. The proposed SWFSC driveway will have unrestricted access into the existing parking lot (P014). Several alternatives were considered but rejected to segregate the NOAA project and the east-west portion of Shellback Way (functionally the project driveway) from the existing parking lot.

Appendix D shows site access circulation at the La Jolla Shores Drive and Shellback Way intersection. Fire department and occasional truck circulation would be the only vehicles allowed to traverse between the two sites.

Based on the intersection analysis results found on Table 9-1, and the projected thru traffic volumes on the north-south portion of Shellback Way, no capacity related issues are expected. Even though the 580 ADT that is estimated to use the north-south portion of Shellback Way (between the Keck Buildings) does not constitute a significant traffic impact, it will be a measurable increase in traffic. It might affect the current activities that occur along this street and it will be a change to the current environment. The proposed SWFSC driveway can physically handle this volume and the current speed bumps will be effective in regulating speeds in this area.

Bollard seats would be placed at the curve of Shellback Way and on Shellback Way south of the Keck Center. This would allow temporary placement of bollards to control traffic when Keck Center occupants use this road segment to stage large equipment, expected to be an infrequent occurrence.

12.2 La Jolla Shores Drive Speed Survey

As part of the analysis, two speed surveys were conducted along La Jolla Shores Drive during the week of April 7th. The two locations are detailed below:

- La Jolla Shores Drive: between the La Jolla Shores Lane and Biological Grade
- La Jolla Shores Drive: between Downwind Way and Naga Way

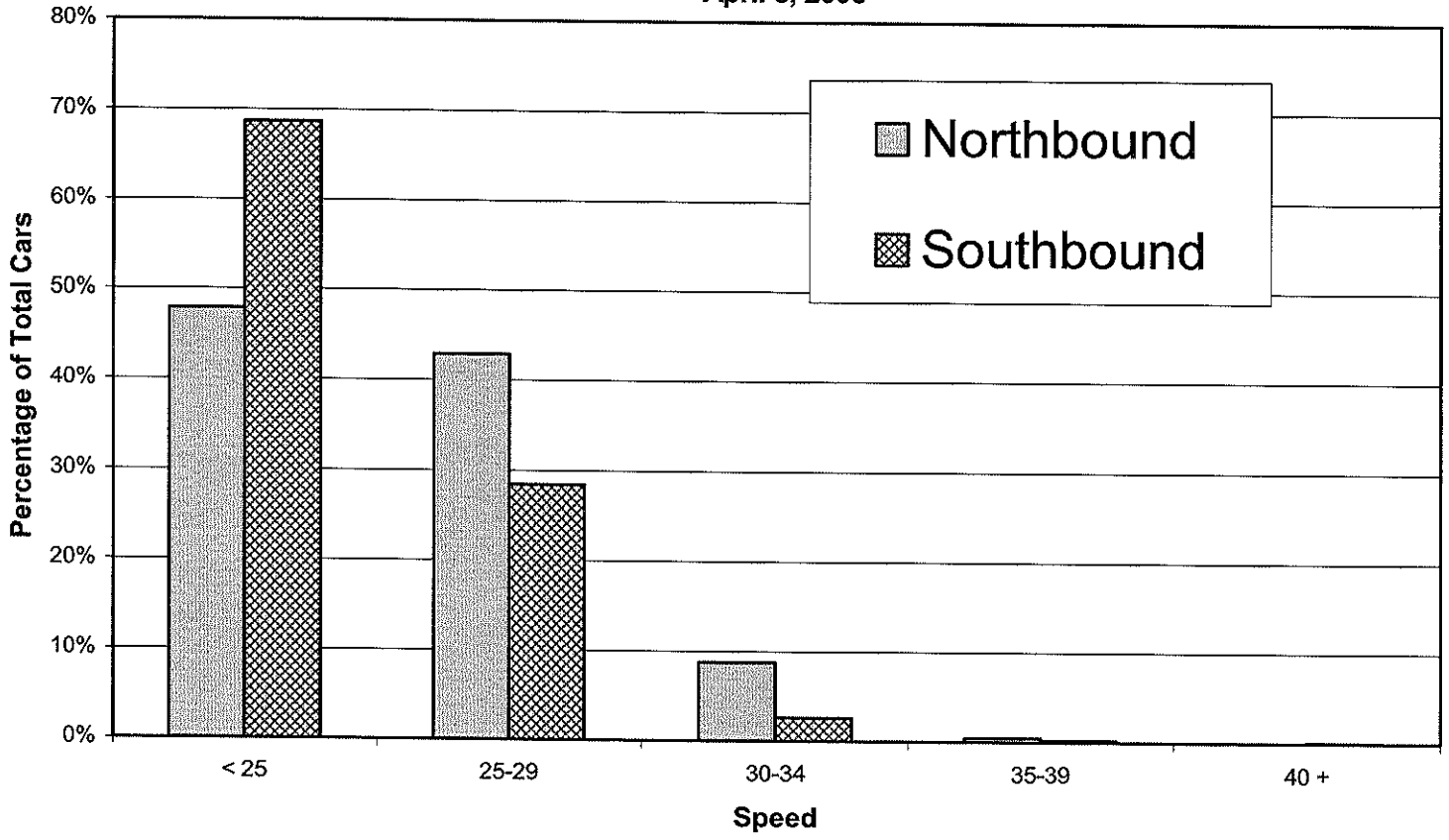
The speed surveys were conducted to provide a snapshot of current vehicle speeds along La Jolla Shores Drive at the project site, given La Jolla Shores Drive steep grade.

Results from the speed surveys are shown on Graphs 1 and 2. ***Graph 1*** shows the results of the speed survey for La Jolla Shores Drive between La Jolla Shores Lane and Biological Grade. ***Graph 2*** shows the results of the speed survey for La Jolla Shores Drive between Downwind Way and Naga Way. Based on the two surveys, speeds along the Downwind to Naga Way stretch were higher than the stretch between La Jolla Shores Lane and Biological Way. Between Downwind Way and Naga Way, the majority of the vehicles were traveling at or below 29 mph. However, numerous vehicles were traveling well over 30 mph in both directions. This is likely the result of the long straight nature of La Jolla Shores Drive coupled with its steep grade, giving the driver of the vehicle more confidence to speed.

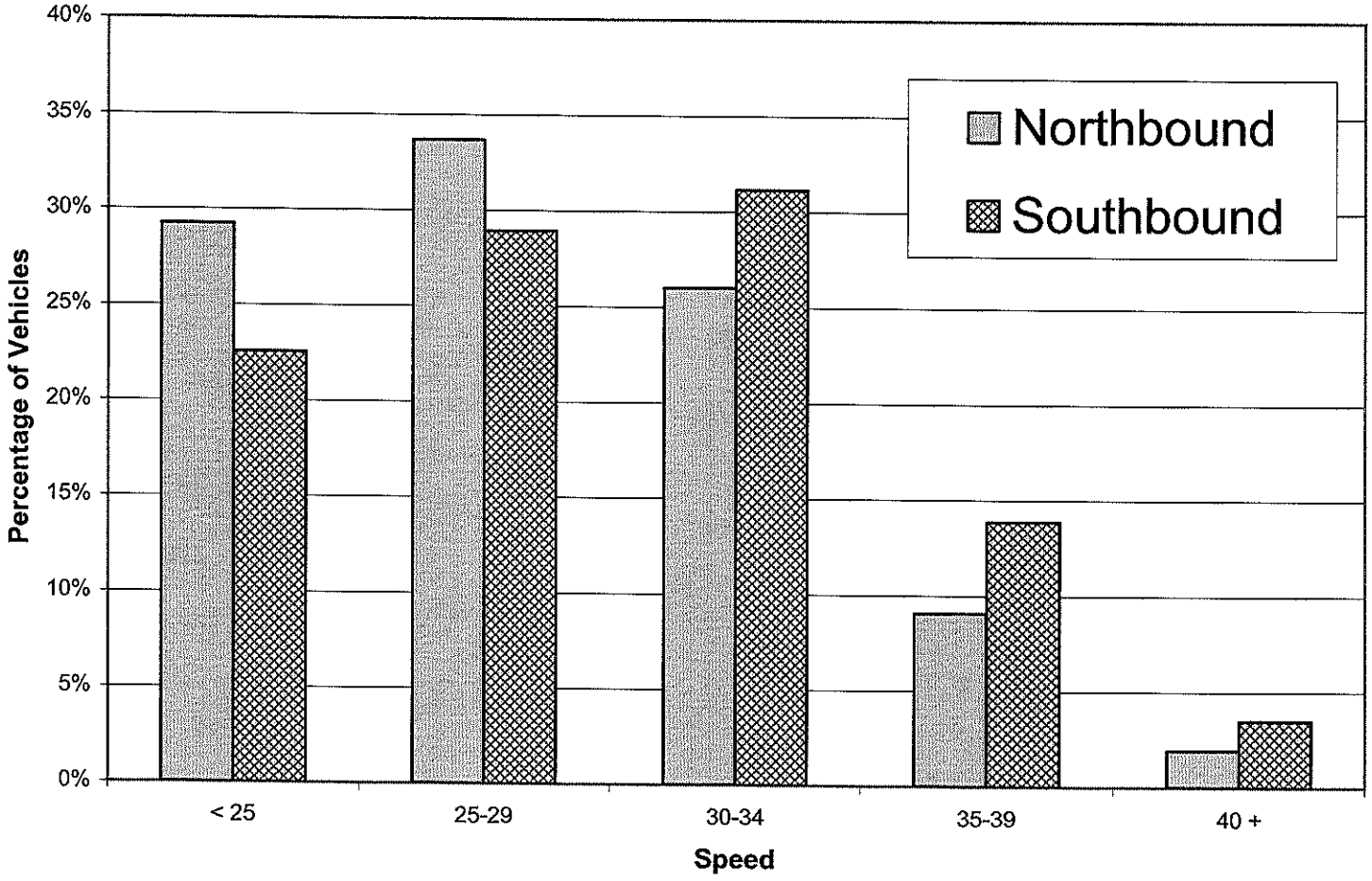
The La Jolla Shores Drive stretch between La Jolla Shores Lane and Biological Grade to the north, averaged speeds in the 20 and 25 mph range. Given these speeds, the westbound egress movement (left–turn) movement at the La Jolla Shores Driveway and Shellback Way intersection should operate adequately. This is partially due to the lower speeds of La Jolla Shores Drive traffic at

Shellback Way as compared to Downwind Way. Vehicles making the southbound left onto Shellback Way will have adequate sight distance and will be in a striped left–turn lane. ***Appendix E*** contains a copy of the La Jolla Shores Drive speed surveys.

Graph 1
La Jolla Shores Drive Speed Survey
La Jolla Shores Lane to Biological Grade
April 8, 2008



Graph 2
La Jolla Shores Drive Speed Survey
Downwind Way to Naga Way
April 8, 2008



12.3 La Jolla Shores Drive Accident History

An accident assessment was conducted for La Jolla Shores Drive (between Biological Grade and Downwind Way). Accident data used in this analysis was obtained from the City of San Diego Traffic Engineering Department and UCSD Police Department for the five full calendar years where data is available, 1–1–2003 to 12–31–2008.

12.3.1 La Jolla Shores Drive segment:

A review of the accident data for this segment of La Jolla Shores Drive revealed that during the five-year period, La Jolla Shores Drive had a total of five traffic-related accidents. LLG utilized the Accident Rate formula found in the *"2004 Collision Data on California State Highways"* publication to determine the accident rate for the identified segment. ***Table 2*** summarizes the findings over the five-year period.

The formula for calculating the accident rate on segments found in *"2004 Collision Data on California State Highways"* is as follows:

$$\text{Segment Accident Rate} = \frac{(\text{\# of Accidents/Year})*(1{,}000{,}000)}{\text{Vehicle Miles of Travel}}$$

TABLE 12–1
SEGMENT ACCIDENT ASSESSMENT (YEARS 2003-2008)

Segment	# of Accidents[a]	Calculated Accident Rate[b]	Rate Group[c]	Expected Rate[d]
La Jolla Shores Drive	5	0.65	H10	3.05

Notes:

a. Obtained from City of San Diego and UCSD Police Department.
b. Calculated using the formula found in *"2004 Collision Data on California State Highways"*
c. Rate group (H10) selected based on speed limit (less than 45 mph) in an urban area.
d. Expected Rate is the statewide rate for similar roadways obtained from Caltrans *"2004 Collision Data on California State Highways"*.

As seen in *Table 12–1*, the La Jolla Shores Drive segment has a lower collision rate when compared to the national average for a two-lane urban roadway.

12.3 Traffic Signal Warrants

Traffic signal warrants were conducted for the intersection of La Jolla Shores Drive and Downwind Way. This is the most likely intersection to be signalized given the current high speeds on La Jolla Shores Drive and delays to Downwind Way traffic during peak hours. The following traffic signal warrants were conducted for the Existing + Cumulative Project + Project scenario. There are twelve different warrants for signalizing intersections. Only one of these warrants has to be met for the intersection to justify signalization. However, meeting a warrant doesn't necessarily mean it automatically qualifies an intersection for signalization, engineering judgment and other factors should be considered. For this report, Warrants 1, 2, and 3 (the most important ones) were evaluated. It should be noted that the minor street peak hour was selected for the warrant calculations since the westbound left–turn movement experiences long delays due to small gaps in traffic along La Jolla Shores Drive.

Appendix F contains the warrant results calculation sheets.

> ***Warrant 1: Eight-Hour Vehicular Volume***—The Minimum Vehicular Volume, Condition A, is intended for application at locations where a large volume of intersecting traffic is the principal reason for installing a traffic signal. The Interruption of Continuous Traffic, Condition B, is intended for application at locations where volume on a major street is so heavy that traffic on a minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.
>
> ***Warrant 2: Four-Hour Vehicular Volume***—The Four-Hour Vehicular Volume signal Warrant conditions are intended to be applied where the volume of intersecting traffic is the principal reason to consider installing a traffic signal.
>
> ***Warrant 3: Peak-Hour Vehicular Volume***—The Peak-Hour Vehicular Volume signal Warrant is intended for use at a location where traffic conditions are such that for a minimum one hour of an average day, the minor-street traffic suffers undue delay when entering or crossing the major street.

Warrant Results

Warrant 1: Eight-Hour Vehicular Volume

The relevant information to the Warrant analyses include the peak hour, four-hour and eight-hour traffic volumes, the number of approach lanes, as well as the speed on the La Jolla Shores Drive. ***Table 12-2*** shows the minimum vehicular volumes and ***Table 12-3*** shows the eight-hour volumes at the La Jolla Shores Drive and Downwind Way approaches. The eight hours selected were the highest for Downwind Way.

TABLE 12-2
CONDITION A FOR WARRANT 1—MINIMUM VEHICULAR VOLUMES

Number of Lanes for Moving Traffic on each Approach		**Vehicles per Hour on** La Jolla Shores Drive **Street** *(Total of Both Approaches)*		**Vehicles per Hour on Higher Volume** Downwind Way *(One Direction Only)*	
La Jolla Shores Drive	Downwind Way	**Urban**	**Rural**	**Urban**	**Rural**
1	1	**500**	350	**150**	105
2 or more	1	600	420	150	105
2 or more	2 or more	600	420	200	140
1	2 or more	500	350	200	140

TABLE 12-3
VOLUMES FOR THE EIGHT HIGHEST HOURS ENTERING THE INTERSECTION
WARRANT 1, CONDITION A

Approach	**Warrant Volume**	**6:00 pm to 7:00 pm**	**5:00 pm to 6:00 pm**	**4:00 pm to 5:00 pm**	**1:00 pm to 2:00 pm**	**12:00 pm to 1:00pm**	**2:00 pm to 3:00pm**	**3:00 pm to 4:00 pm**	**11:00 am to 12:00 pm**
High volume Downwind Way approach	**150**	212	190	181	141	127	126	124	124
Both La Jolla Shores Drive approaches	**500**	933	1,124	869	780	714	745	796	696
Hourly Warrant Met?		**Yes**	**Yes**	**Yes**	**No**	**No**	**No**	**No**	**No**

Based on the eight-hour volumes in *Table 12-2*, ***Condition A of Warrant 1 is not met.***

As explained in the MUTCD (*Attachment B*), since Condition A was not warranted, Condition B was analyzed. ***Table 12-4*** highlights the criteria necessary to complete the analysis for Condition B.

TABLE 12-4
CONDITION B FOR WARRANT 1 – INTERRUPTION OF CONTINUOUS TRAFFIC

Number of Lanes for Moving Traffic on each Approach		**Vehicles per Hour on** La Jolla Shores Drive *(Total of Both Approaches)*	**Vehicles per Hour on Higher Volume** Downwind Way *(One Direction Only)*
La Jolla Shores Drive	Downwind Way	**Urban**	**Urban**
1	**1**	750	75

Existing eight-hour volumes do not exceed the 100% parameters for Condition B for the La Jolla Shores Drive and Downwind Way. Only six of the eight hours of the La Jolla Shores Drive volumes exceeds the threshold of 750. Therefore, ***Condition B of Warrant 1 is not met.***

Based on the eight-hour volumes, *Table 12-3* and *12-4* show that both Conditions A and B of Warrant 1 are not met.

Warrant 2: Four-Hour Volume Warrant

Table 12-5 shows the highest four-hour volume for the Downwind Way and La Jolla Shores Drive approaches. Warrant 2 requires that the four-hour volumes shown in *Table 12-5* fall above the 80 vehicles per hour minimum threshold curve shown on graph on *Figure 4C-1* (Appendix F). The four-hour traffic volumes do not exceed the 80 vehicles per hour minimum curve for a Downwind Way approach with one lane. ***Warrant 2 is not met.***

TABLE 12-5
WARRANT 2—FOUR-HOUR VOLUMES

Approach	**Lanes**	**Warrant Volume**	**6:00 pm to 7:00 pm**	**5:00 pm to 6:00 pm**	**4:00 pm to 5:00 pm**	**1:00 pm to 2:00 pm**
Downwind Way approach	1	See Graph	212	190	181	141
Both La Jolla Shores Drive approaches	1	See Graph	933	1,124	869	780
Hourly Warrant Met?			**Yes**	**Yes**	**Yes**	**No**

Warrant 3: Peak Hour Volume Warrant

Existing peak hour volumes were conducted at La Jolla Shores Drive and Downwind Way on August 26, 2008 (Tuesday). Either Category A or B (detailed below) of the Peak Hour Warrant must be met in order to warrant a signal. The delay analysis was completed using the Synchro 6 software package. Appendix F shows the peak hour intersection delay worksheets.

Category A requires the following in order for a signal to be warranted:

1. The total delay experienced by traffic, on the Downwind Way approach controlled by a STOP sign, exceeds four vehicle-hours. ***This requirement is not met for the AM and PM peak hours.***

2. The volume on the Downwind Way approach exceeds 100 vehicles per hour (vph) for one moving lane of traffic. ***This requirement is met for the AM and PM peak hours.***

3. The total entering volume serviced during the hour is greater than 650 vph (for intersections ***with three approaches). This requirement is met for the AM and PM peak hours.***

Category B of the Warrant necessitates the use of a graph, also found in Appendix E. The co-ordinates plotted are shown in the ***Table 12-6*** below. The resulting point for the AM and PM peak hours clearly shows that the peak hour volumes at this intersection are below the 80 vehicles per hour minimum volume for a Downwind Way approach with one lane. ***Category B is therefore not met for the AM and PM peak hours.***

TABLE 12-6
WARRANT 3—PEAK HOUR VOLUMES

Approach	Lanes	Warrant Volume	Peak Hour Volume AM/PM
Downwind Way approach	1	See Graph	212
Both La Jolla Shores Drive approaches	1	See Graph	933
Peak Hour Warrant Met?		**No/No**	

12.4 All-Way Stop Warrants

Additional warrant analysis was conducted for the intersection of La Jolla Shores Drive and Downwind Way based on the traffic signal warrants not being satisfied. The criteria for Multi–way Stop warrants are detailed below:

- Multi–way stop control can be useful as a safety measure at an intersection if certain traffic conditions exist.

- Multi–way stop control is not effective where the volume of traffic on the intersecting roads is approximately equal.
- The decision to install multi–way stop control should be based on an engineering study.
- A crash problem, as indicated by 5 or more reported crashes in a 12-month period that are susceptible to correction by a multi–way stop installation.
- Minimum volumes averaging 300 vehicles per hour total of both major street approaches for any 8 hours of an average day, and 200 (vehicles, pedestrian, bicycles) units per hour for the same 8 hours on the minor street approach.
- The need to control left–turn conflicts.

The volume criteria for an all-way stop is 300 vehicles per hour for the La Jolla Shores Drive and 200 vehicles per hour for the Downwind Way for each of 8 hours. La Jolla Shores Drive exceeds the threshold for the major street by a factor of 2. However, Downwind Way does not meet the criteria for the minor street. The actual volume is approximately half (122 peak trips/hour) the volume required to satisfy this criteria. In addition to low minor street approach volumes, other factors such as speed, the steep grade of La Jolla Shores Drive, and minimal pedestrian traffic indicate that a multi–way stop would not be the best solution at this location.

12.5 Access Summary

Based on the findings detailed in Sections 12.1 thru 12.4, it is believed that to best serve the NOAA project and the existing users, access at the intersections of La Jolla Shores Drive with Shellback Way and Downwind Way are integrated. What happen at one affects the other.

The intersection of La Jolla Shores Drive and Downwind Way is a difficult problem. It does not meet signal warrants or multi–way stop warrants under existing conditions. It comes close to meeting warrants after adding project traffic. There are delays to Downwind Way traffic waiting to enter La Jolla Shores Drive. This puts "pressure" on drivers to occasionally accept short gaps than desirable. It is also a precarious place for pedestrians to cross. Also, traffic volumes have seasonal variation, with volumes noticeably higher in the summer. The 2030 regional forecast indicates that the traffic volumes on La Jolla Shores Drive are expected to double from about 7,000 ADT to 14,000 ADT.

The combination of these factors suggests that the NOAA project is the correct opportunity to get this intersection all–way stop controlled or signalized. Enhanced intersection control will benefit the current Keck tenants, the Birch Aquarium visitors, and the greater SIO community.

If the City of San Diego and UCSD/SIO will allow on all-way stop or a traffic signal at Downwind Way/La Jolla Shores Drive, then the Shellback Way/La Jolla Shores Drive intersection should be restricted to right-turn's by installing a triangular median on Shellback Way and appropriate No left–turn signs (see Figure 12–1). If La Jolla Shores Drive remains uncontrolled at Downwind Way, then westbound left–turn's should be allowed from Shellback Way to La Jolla Shores Drive, due to lower speeds on La Jolla Shores Drive and lower volumes than at Downwind Way.

Section 13.0 details the projects traffic recommendations based on the site plan review.

13.0 SIGNIFICANCE OF IMPACTS AND MITIGATION MEASURES

13.1 Significance of Impacts

Based on the established Significance Criteria, no significant project or cumulative impacts were calculated at the study area intersections or street segments. Therefore, no mitigation measures are required. In addition, there were no significant construction impacts calculated. However, based on a site plan review, LLG has the following access–related recommendations.

13.2 Recommendations

Since no significant traffic impacts were calculated for the proposed NOAA project, no mitigation measures are required. However, the following operational improvements are suggested.

1) Install an additional 50 to 100 feet of red curb on the east side of La Jolla Shores Drive south of Shellback Way.

2) Widen Shellback Way from its proposed width to 52–feet wide. The inbound lane (eastbound) shall be at least 20–feet wide and the outbound lane (westbound) shall be at least 22–feet wide and striped for two approach lanes. This leaves a 10–foot wide median.

3) If an unexpected queuing problem occurs on a regular basis, prohibit the southbound left–turn from La Jolla Shores Drive to Shellback Way. This traffic would be redirected to the La Jolla Shores Drive/Downwind Way intersection.

4) Require trucks use La Jolla Shores Drive during construction. Prohibit truck traffic from using Shellback Way in front of the Keck Center. Prepare construction traffic control plans for a courtesy review by the City of San Diego.

5) To eliminate potential conflicts between pedestrians and vehicles turning left from westbound Downwind Way to La Jolla Shores Drive, relocate the existing sidewalk crossing La Jolla Shores Drive from the south to the north side of the intersection.

APPENDIX A

INTERSECTION AND SEGMENT MANUAL COUNT SHEETS

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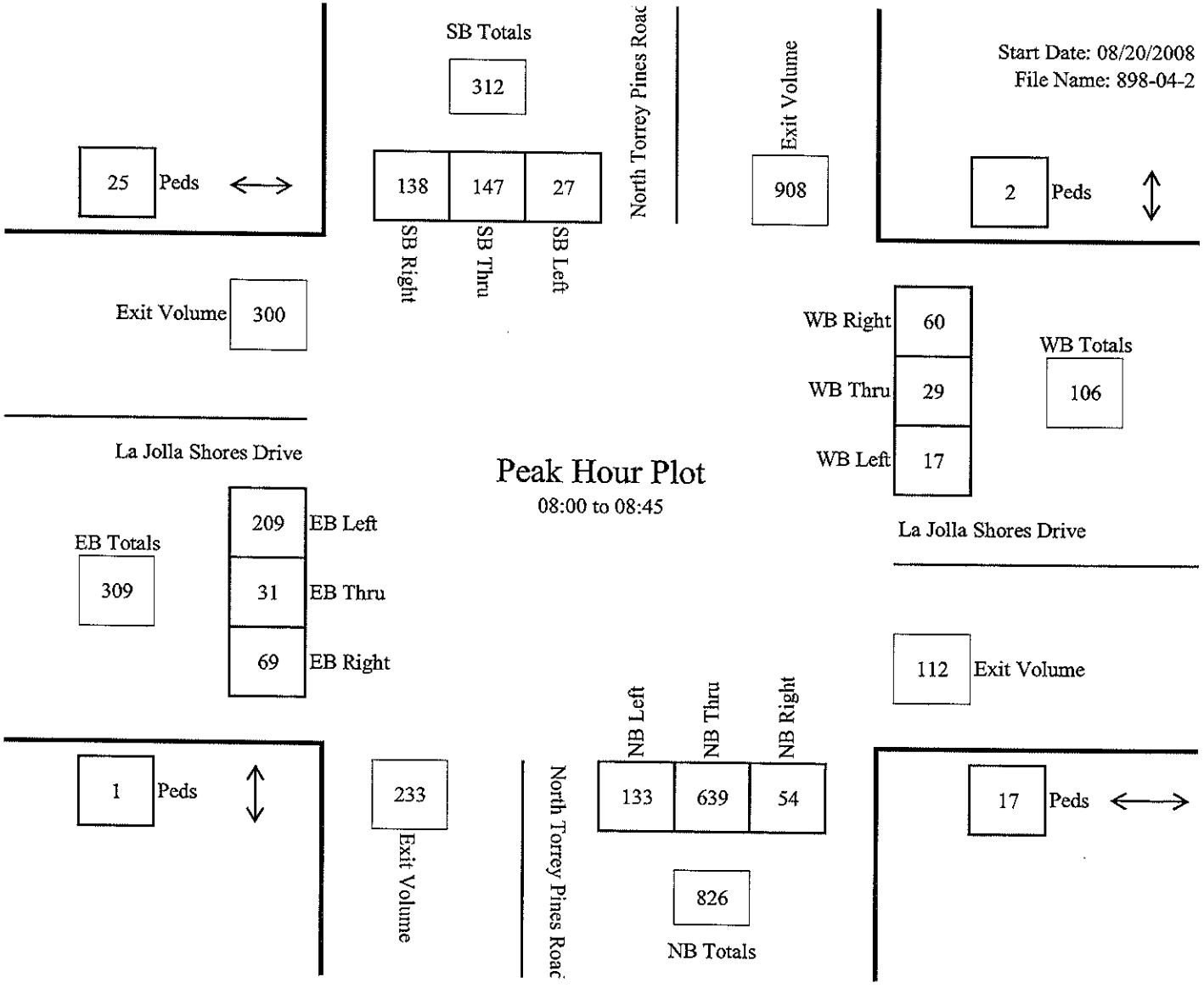
4542 Ruffner Street, Suite 100, San Diego, CA 92111

Start Date: 08/20/2008
File Name: 898-04-2

Peak Hour Plot

08:00 to 08:45



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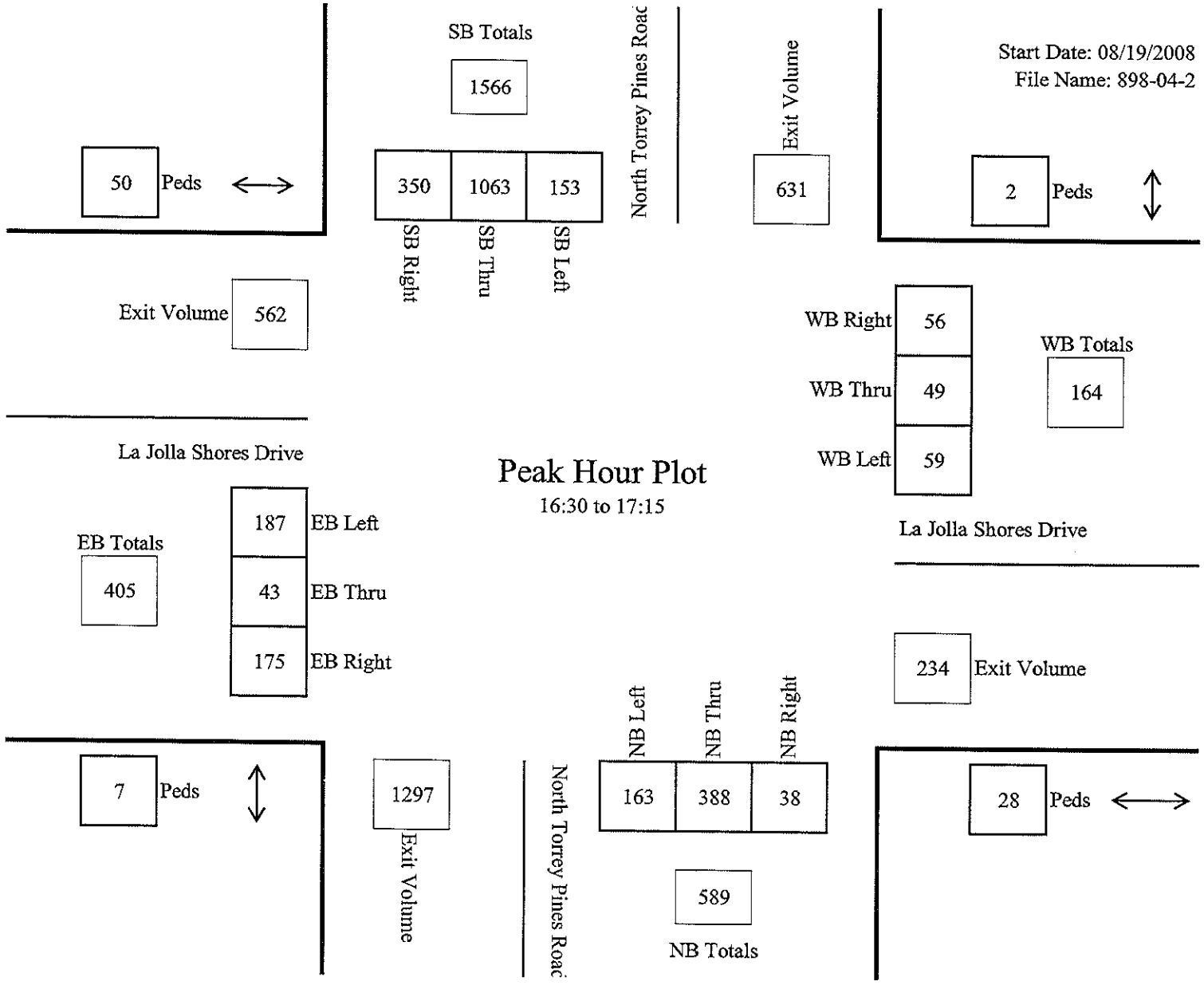
Start Date: 08/19/2008
File Name: 898-04-2

Peak Hour Plot

16:30 to 17:15



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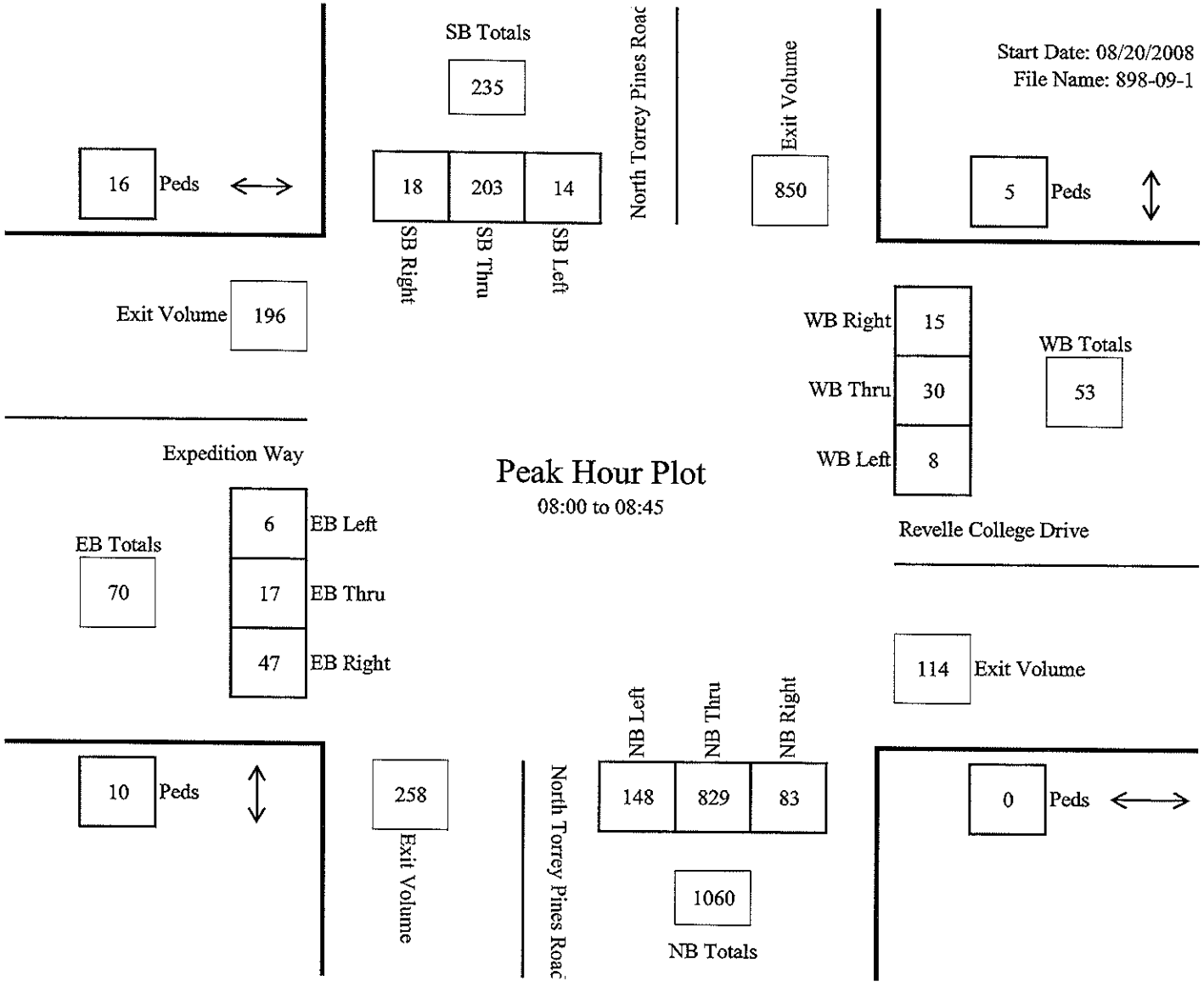
Start Date: 08/20/2008
File Name: 898-09-1

Peak Hour Plot

08:00 to 08:45



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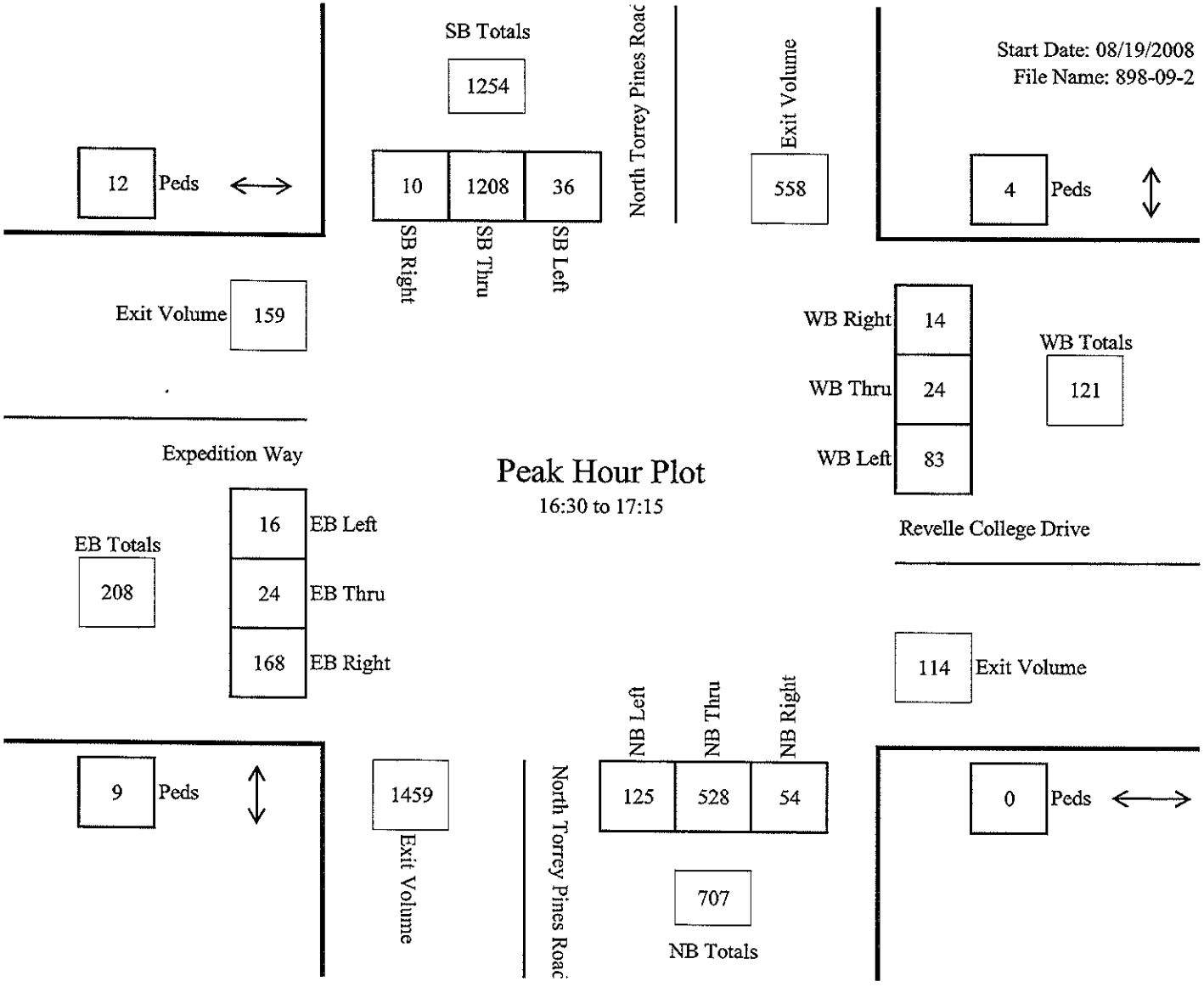
Start Date: 08/19/2008
File Name: 898-09-2

Peak Hour Plot

16:30 to 17:15



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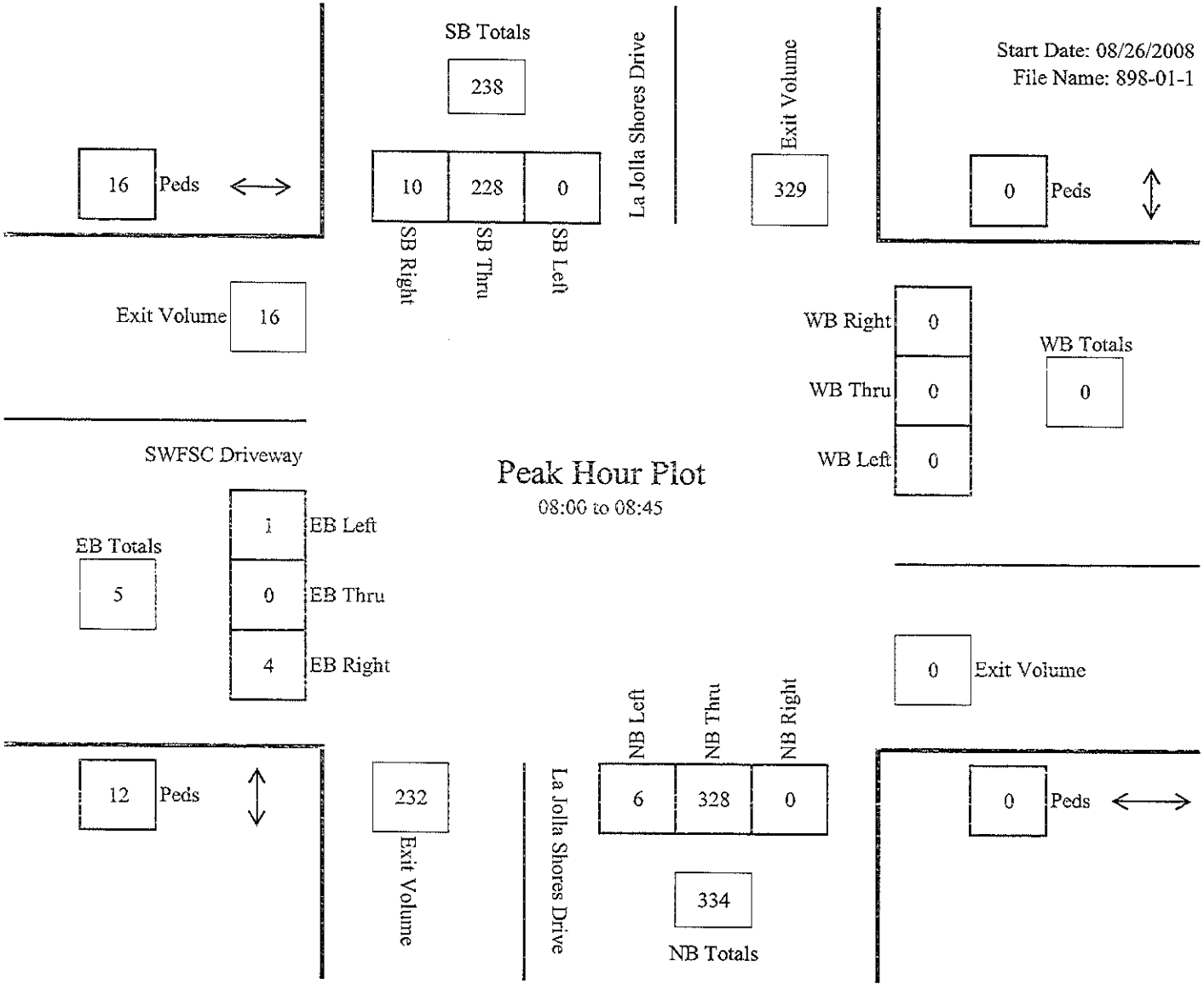

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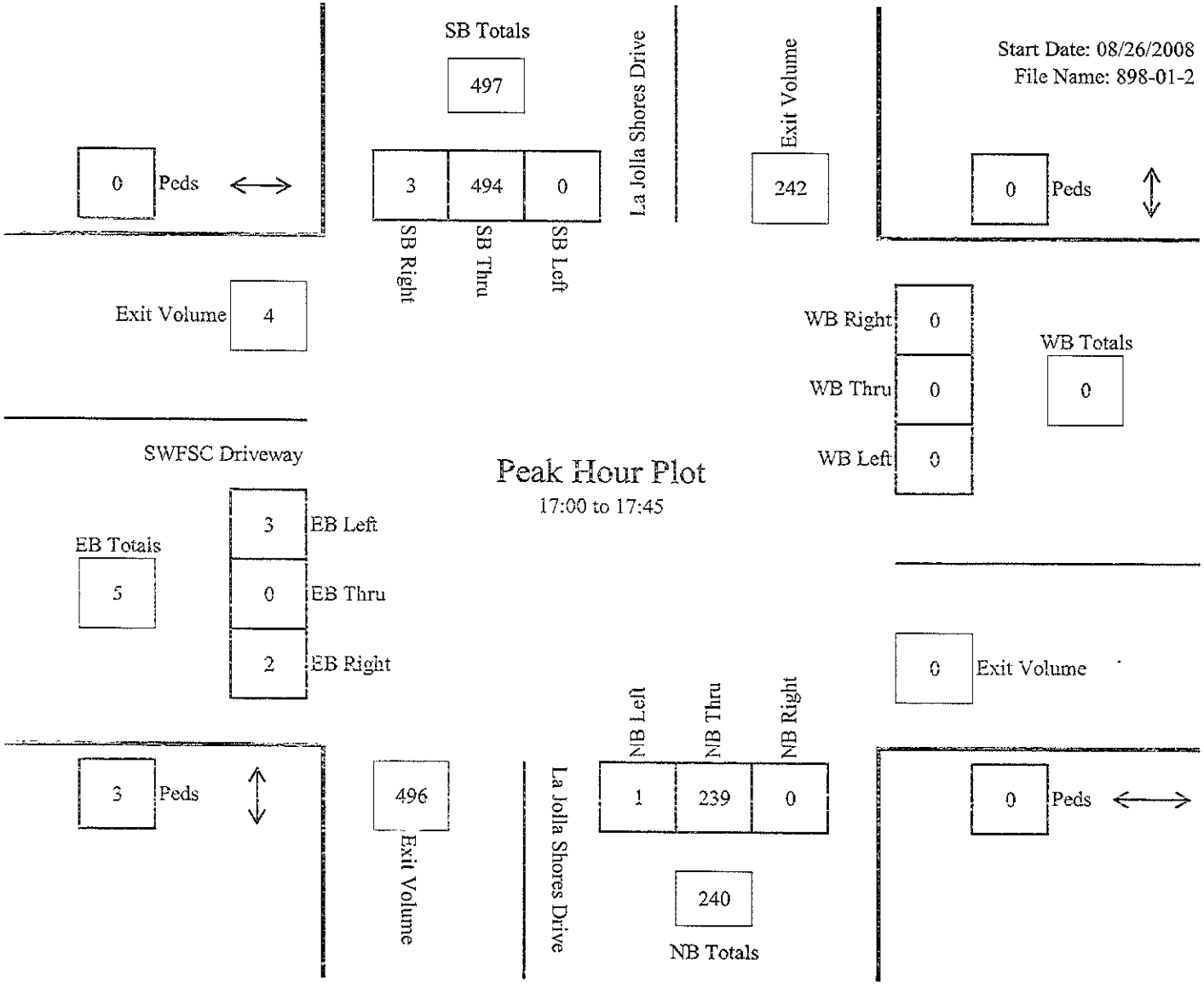

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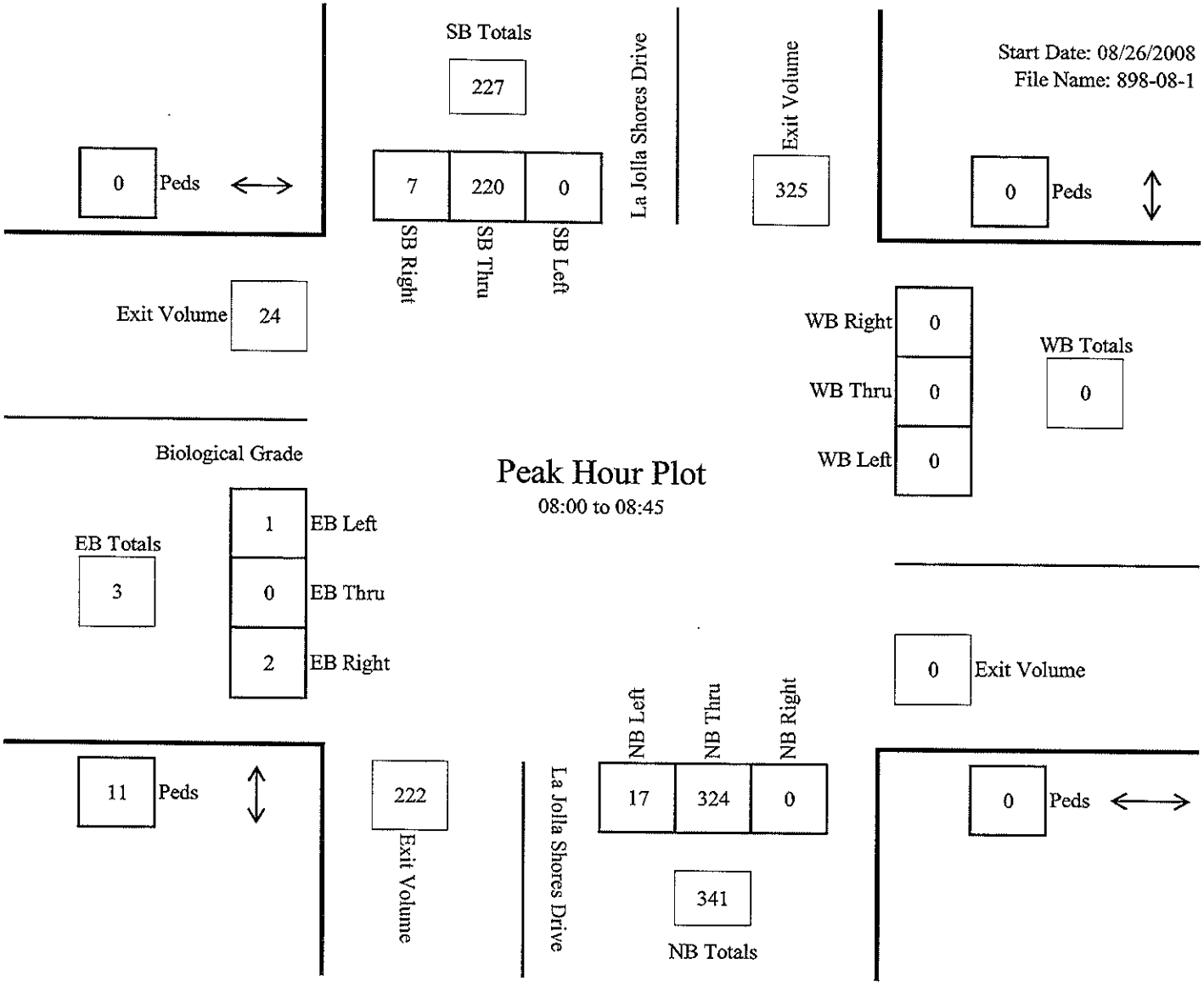
Start Date: 08/26/2008
File Name: 898-08-1

Peak Hour Plot

08:00 to 08:45



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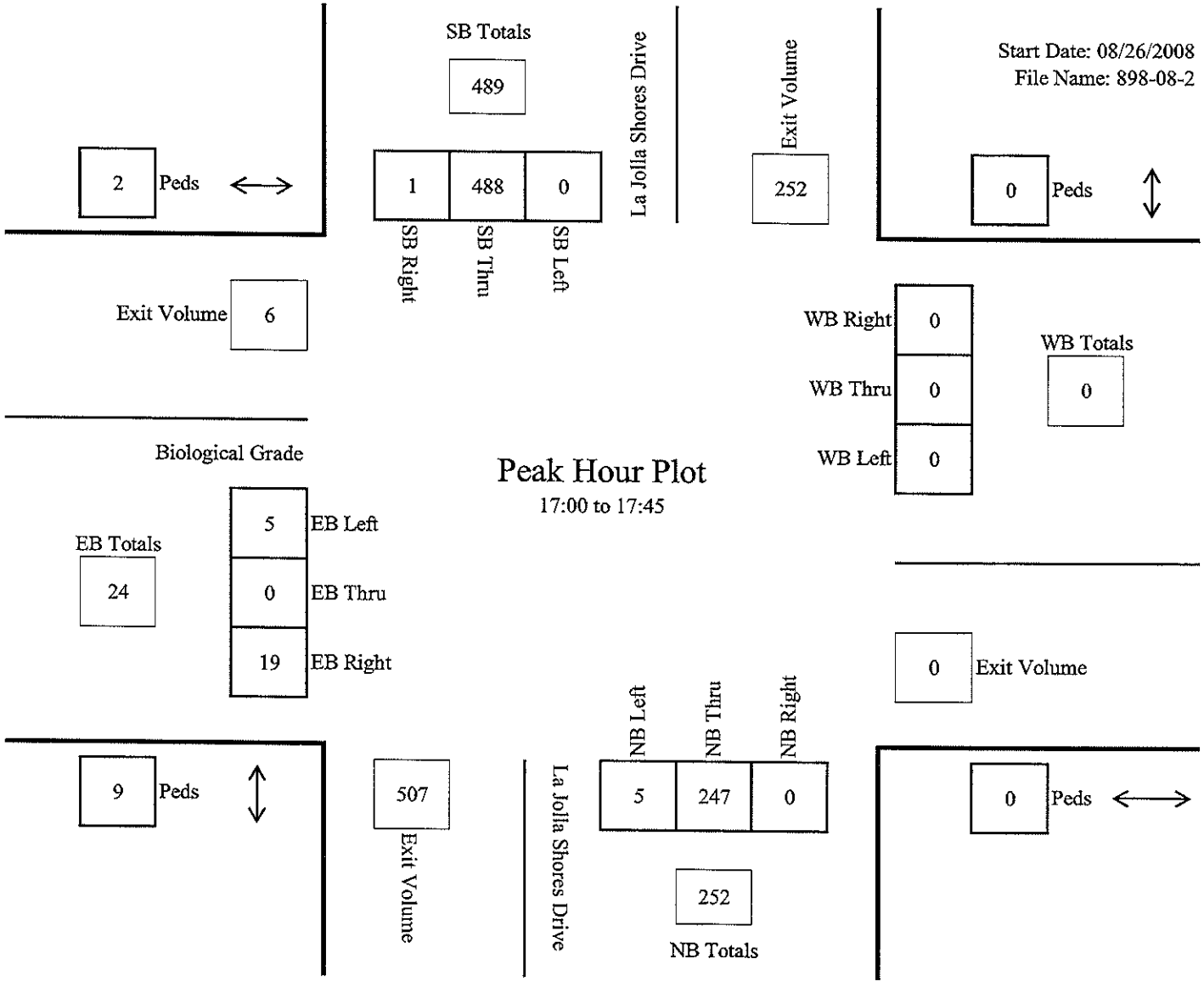
4542 Ruffner Street, Suite 100, San Diego, CA 92111

Start Date: 08/26/2008
File Name: 898-08-2

Peak Hour Plot

17:00 to 17:45



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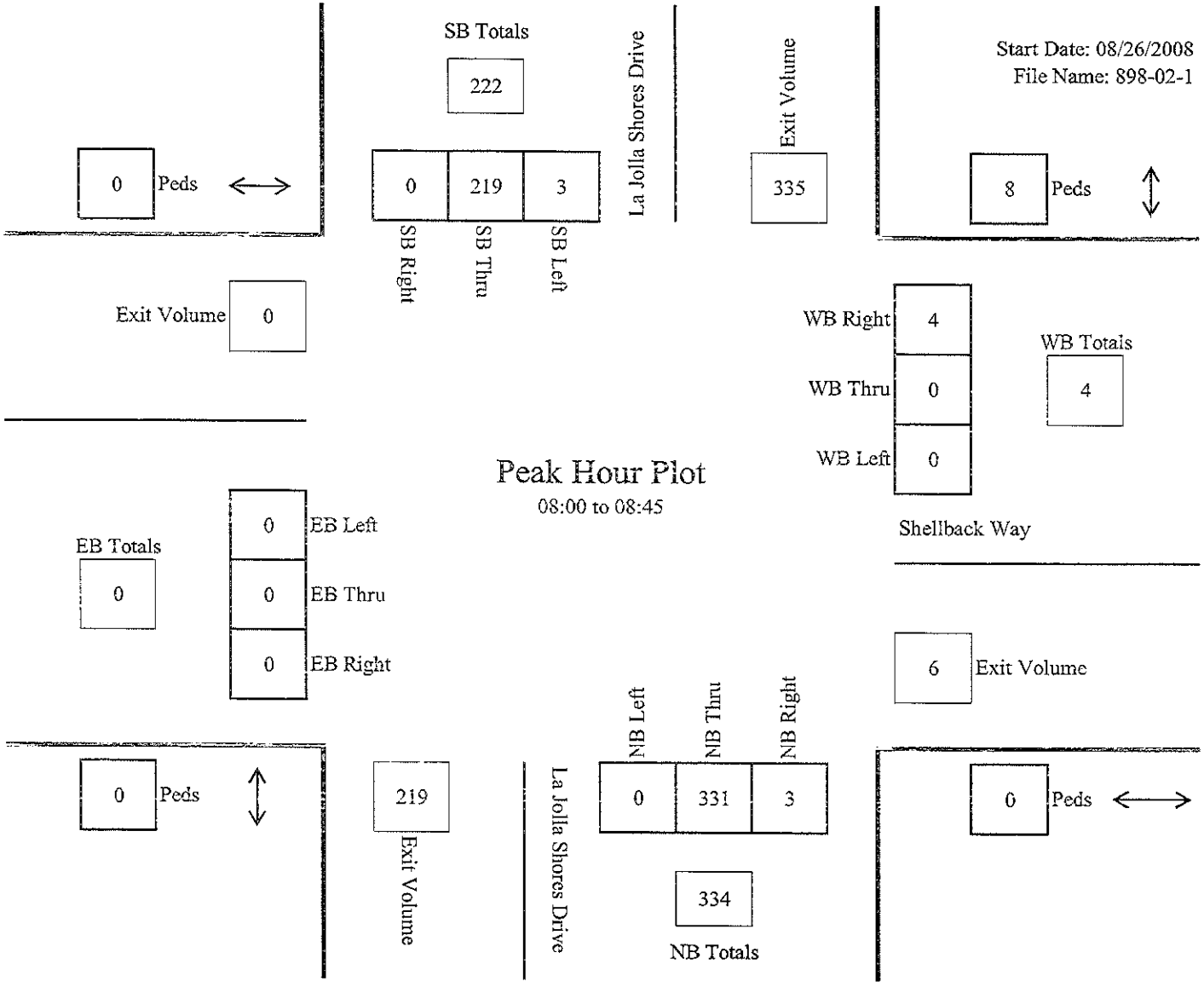
Start Date: 08/26/2008
File Name: 898-02-1

Peak Hour Plot

08:00 to 08:45



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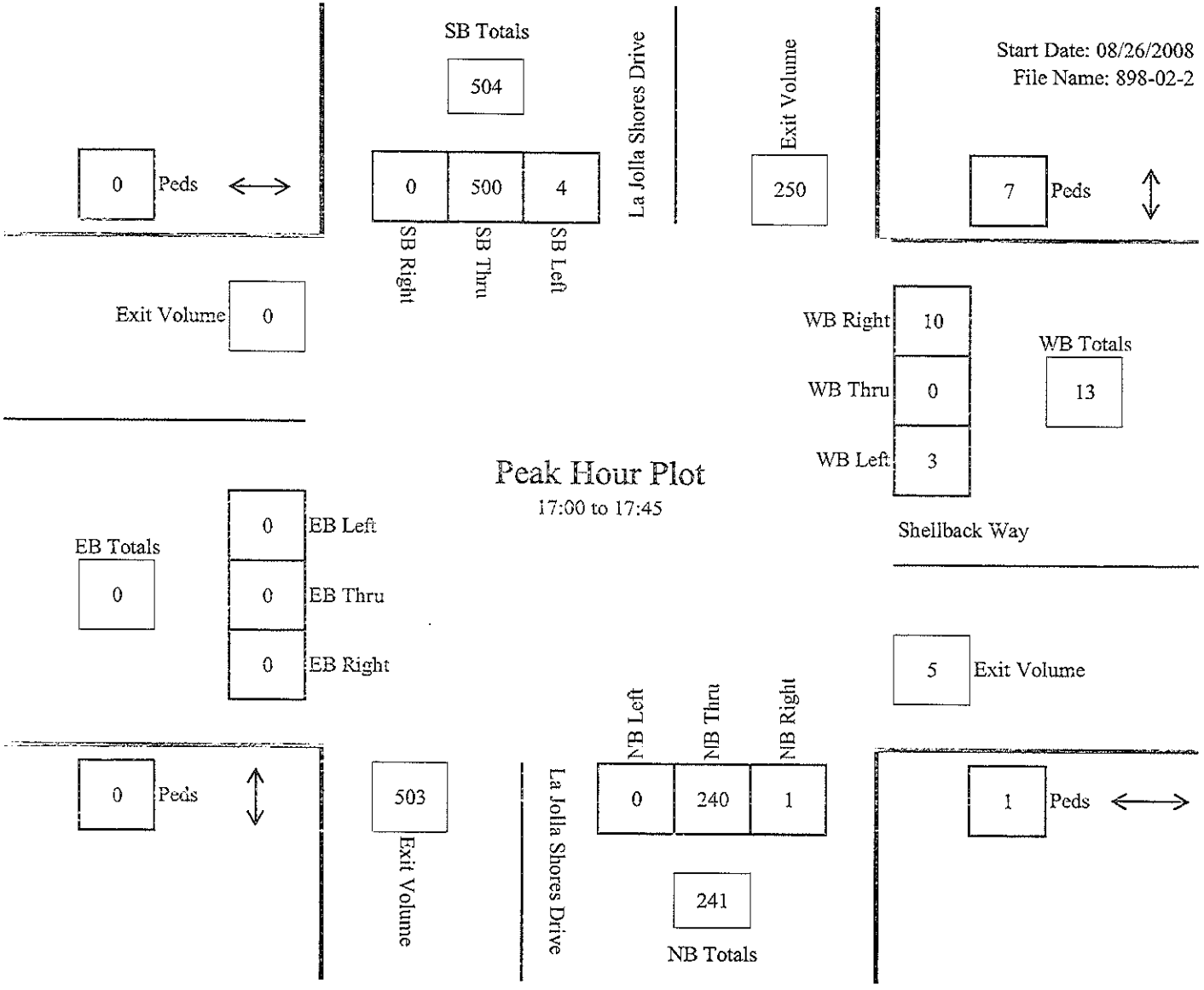
Start Date: 08/26/2008
File Name: 898-02-2

Peak Hour Plot

17:00 to 17:45



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4542 Ruffner Street, Suite 100, San Diego, CA 92111

Counted By: Emp. #00
Location: Shellback Way & Keck Parking Lot Driveway

Start Date: 08/26/2008
File Name: 898-03-1

	Keck Parking Lot Driveway Southbound				Westbound				Shellback Way Northbound				Service Driveway Eastbound				
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
7:00	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
7:15	0	1	0	0	0	0	0	0	0	4	0	0	0	0	0	0	5
7:30	0	3	0	0	0	0	0	0	0	5	0	0	1	0	0	0	9
7:45	0	4	0	0	0	0	0	0	2	9	0	0	1	0	2	0	18
Total	0	8	0	0	0	0	0	0	2	19	0	0	2	0	2	0	33
8:00	0	4	0	0	0	0	0	0	0	6	0	0	0	0	0	0	10
8:15	0	1	0	1	0	0	0	0	0	3	0	0	0	0	0	2	7
8:30	0	3	0	1	0	0	0	0	1	7	0	0	0	0	1	1	14
8:45	0	1	0	3	0	0	0	0	3	1	0	0	1	0	0	1	10
Total	0	9	0	5	0	0	0	0	4	17	0	0	1	0	1	4	41
Grand Total	0	17	0	5	0	0	0	0	6	36	0	0	3	0	3	4	74
Approach%	-	77.3	-	22.7	-	-	-	-	14.3	85.7	-	-	30.0	-	30.0	40.0	
Total%	-	23.0	-	6.8	-	-	-	-	8.1	48.6	-	-	4.1	-	4.1	5.4	

Peak hour analysis for the period 07:45 to 08:30

Volume	-	12	-	2	-	-	-	-	3	25	-	-	1	-	3	3	49
Approach%	-	85.7	-	14.3	-	-	-	-	10.7	89.3	-	-	14.3	-	42.9	42.9	
Total%	-	24.5	-	4.1	-	-	-	-	6.1	51.0	-	-	2.0	-	6.1	6.1	
PHF				0.88				######				0.64				0.58	

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4542 Ruffner Street, Suite 100, San Diego, CA 92111

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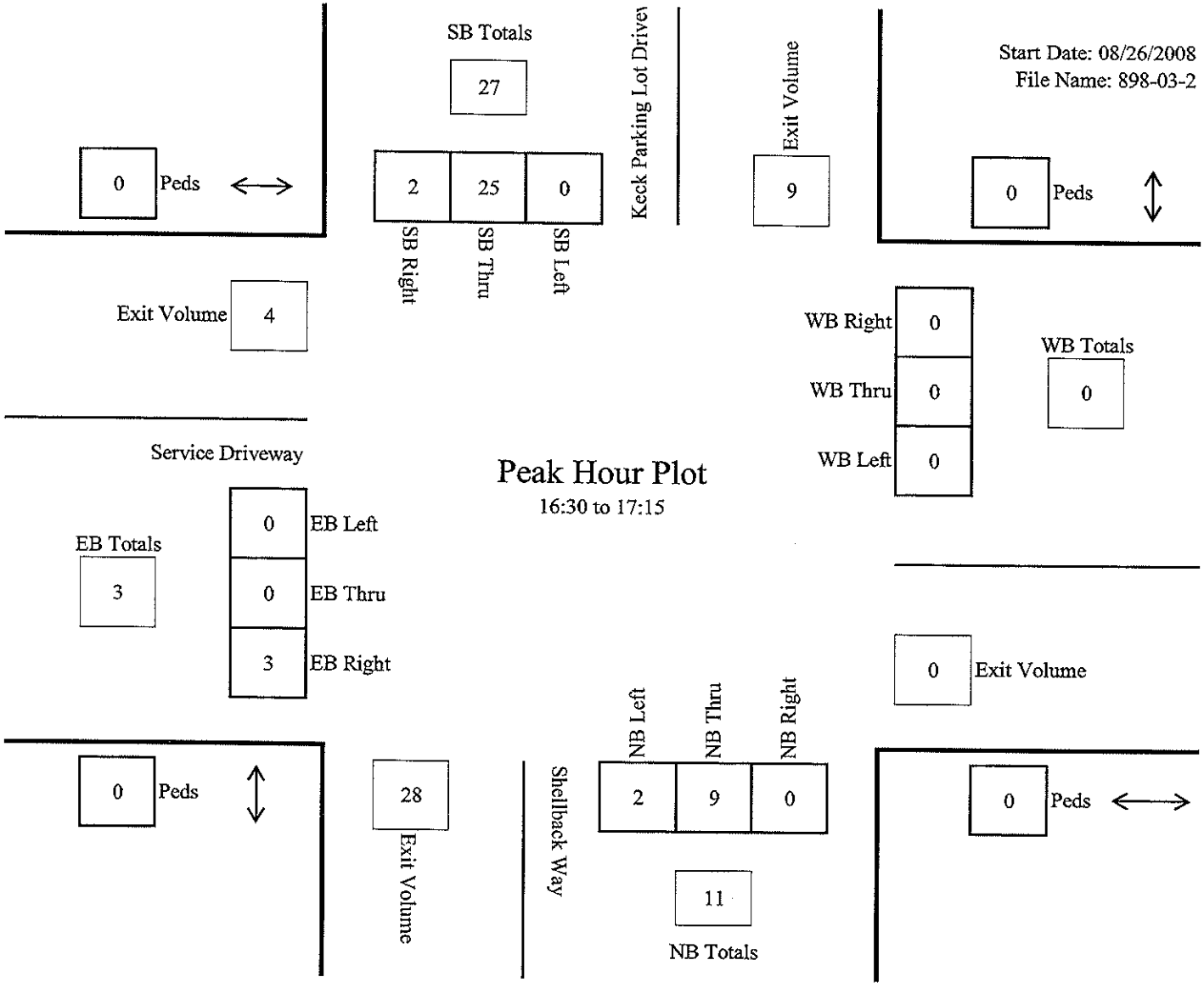
File Name: 898-03-2



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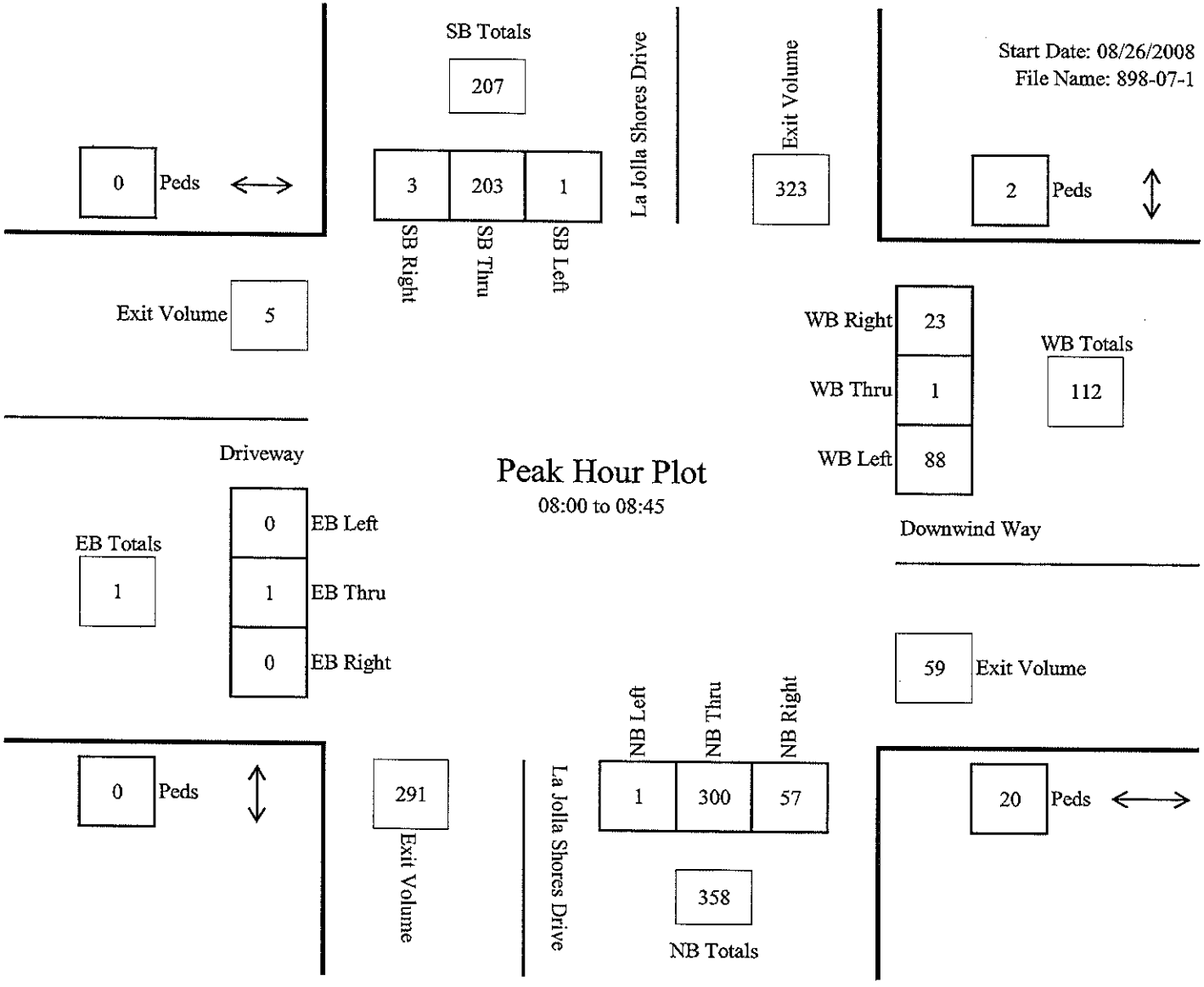
Start Date: 08/26/2008
File Name: 898-07-1

Peak Hour Plot

08:00 to 08:45



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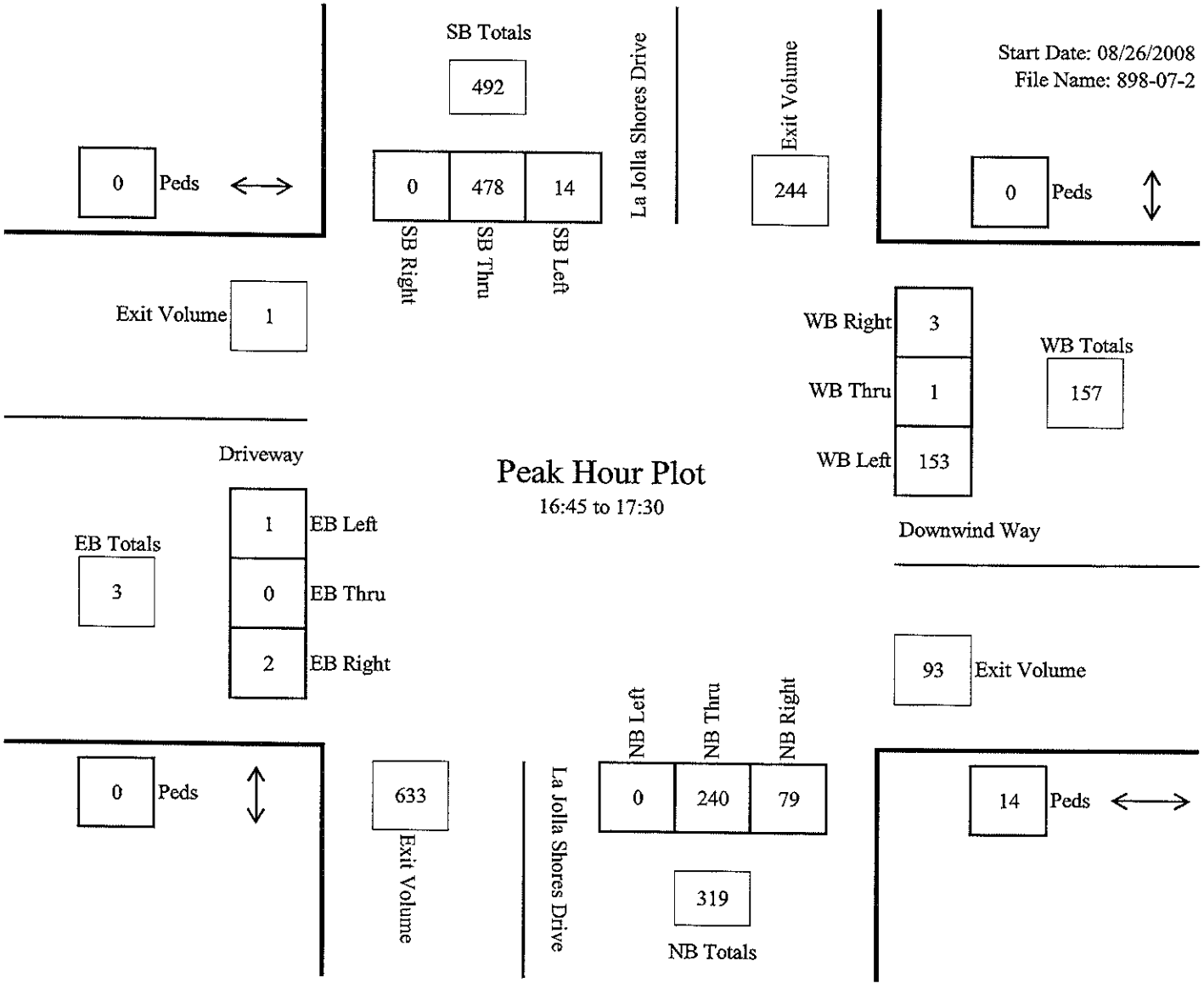

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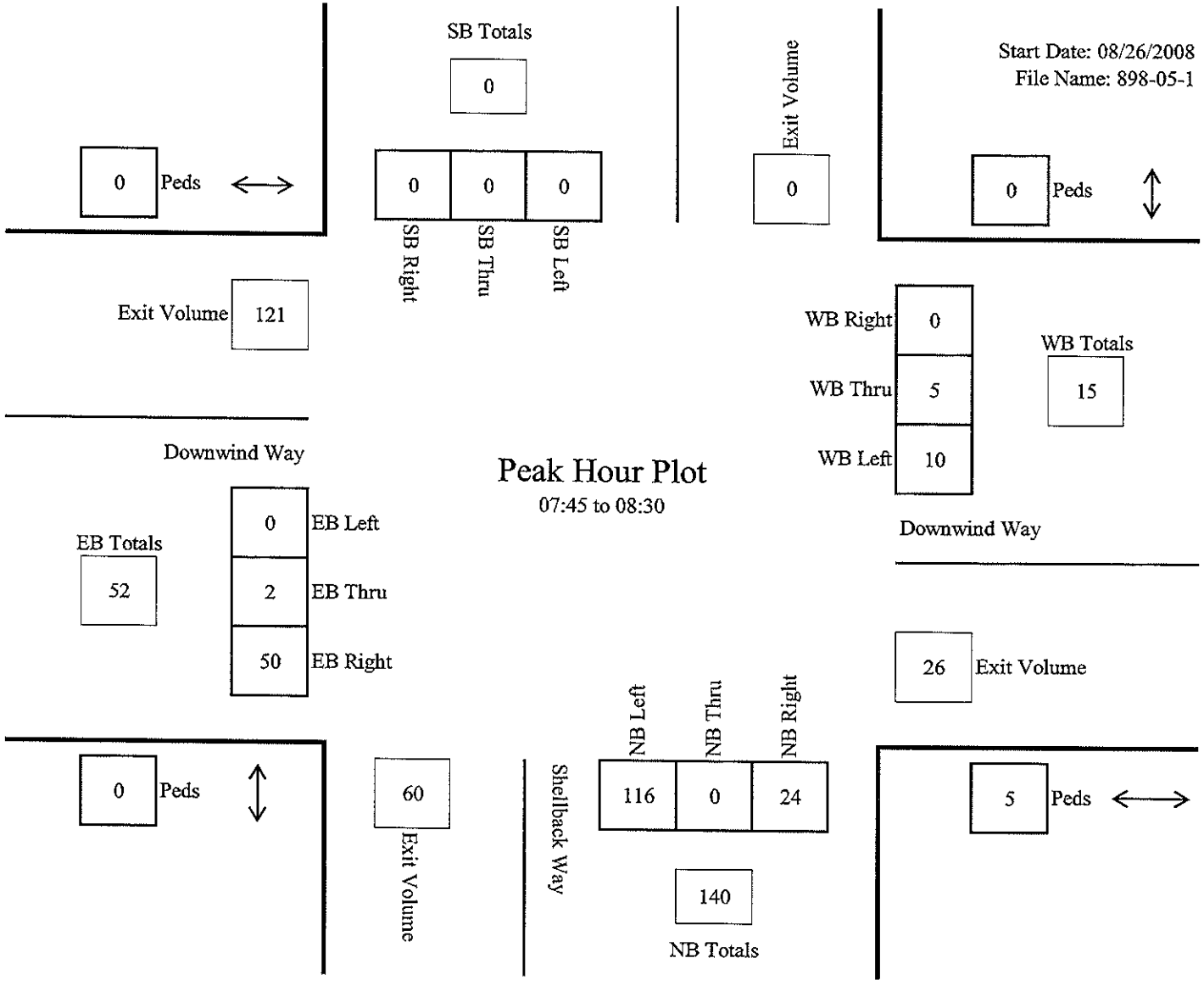
Start Date: 08/26/2008
File Name: 898-05-1

Peak Hour Plot

07:45 to 08:30



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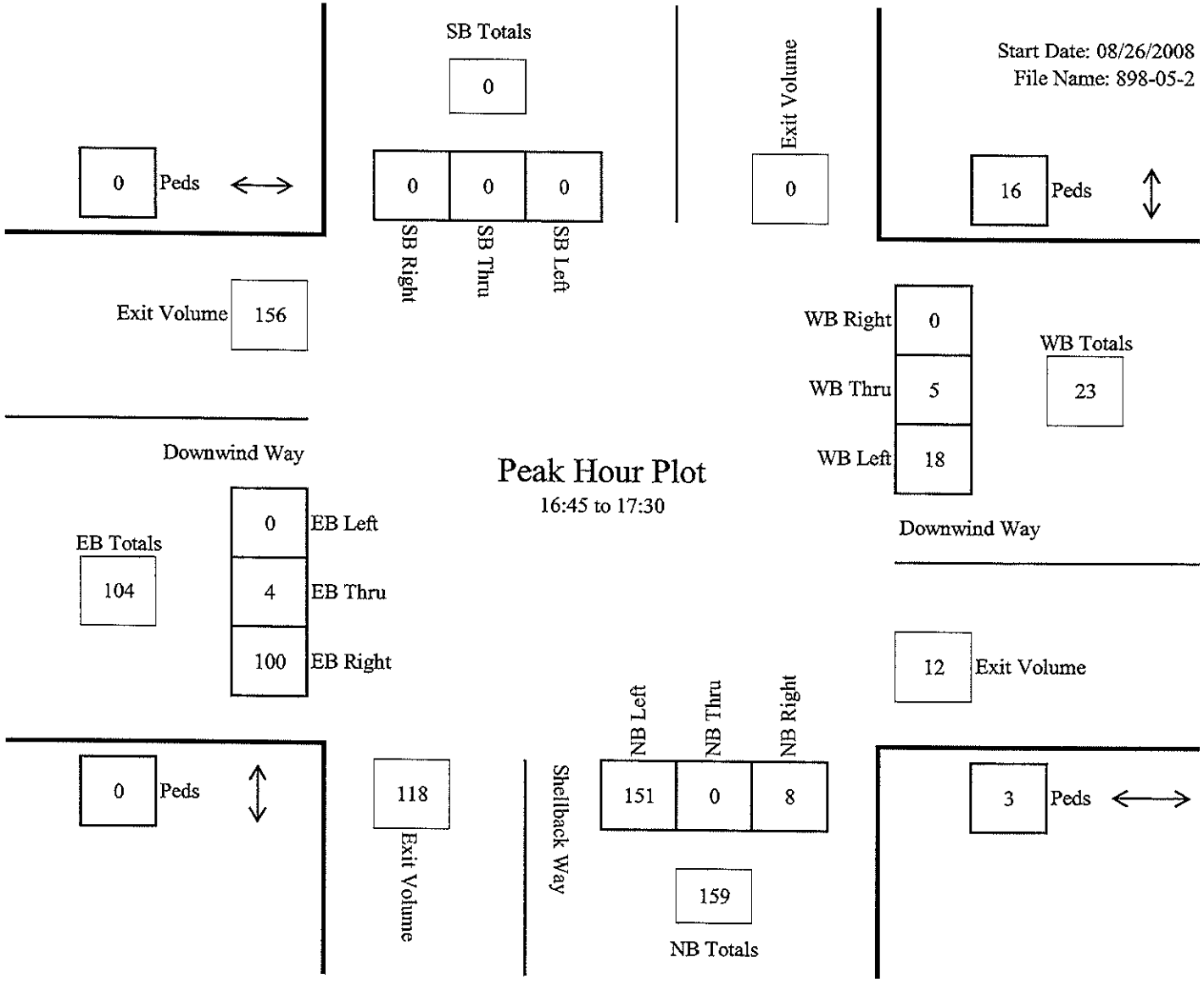
Start Date: 08/26/2008
File Name: 898-05-2

Peak Hour Plot

16:45 to 17:30



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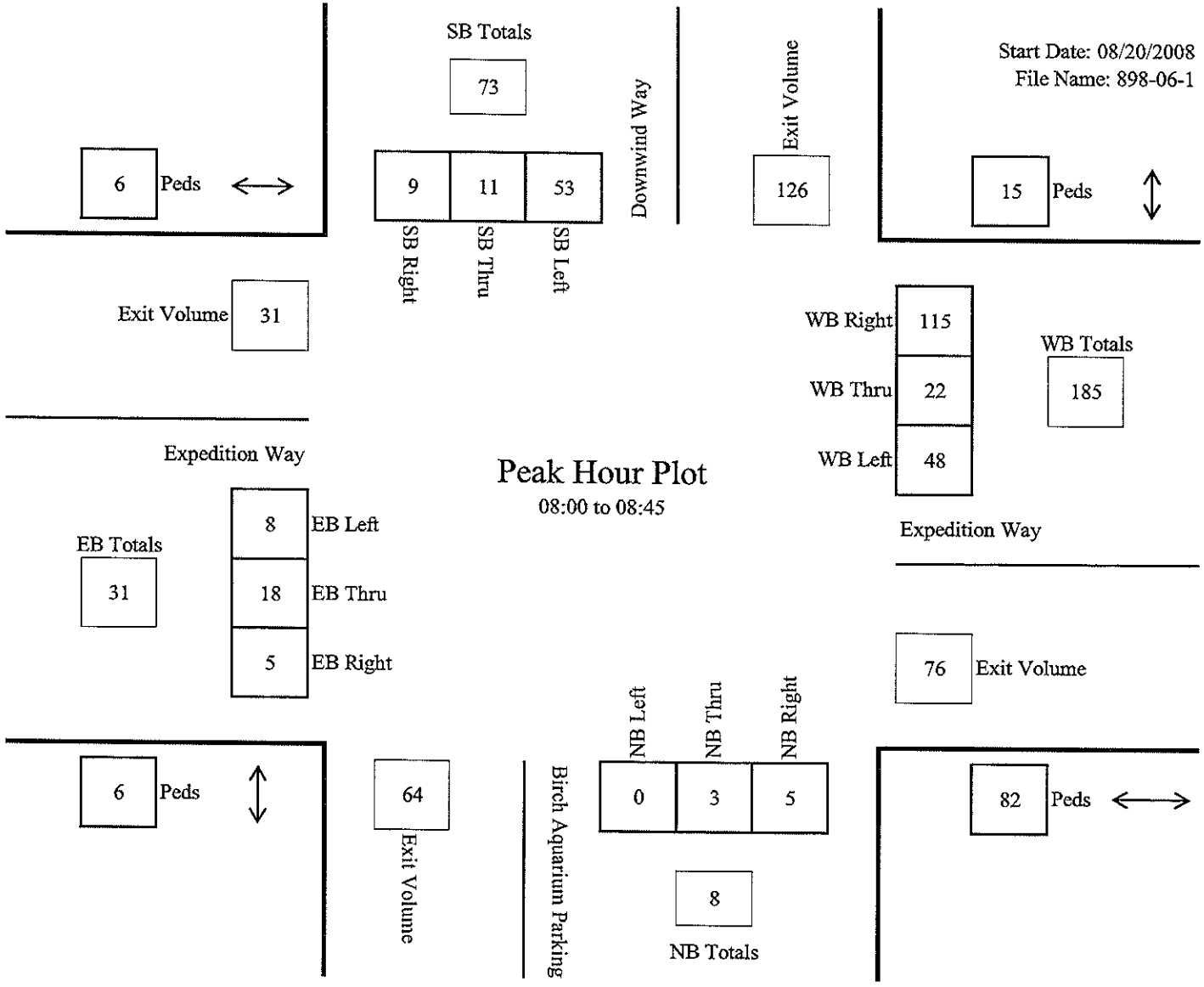
Linscott Law & Greenspan

4542 Ruffner Street, Suite 100, San Diego, CA 92111

Start Date: 08/20/2008
File Name: 898-06-1

Peak Hour Plot

08:00 to 08:45



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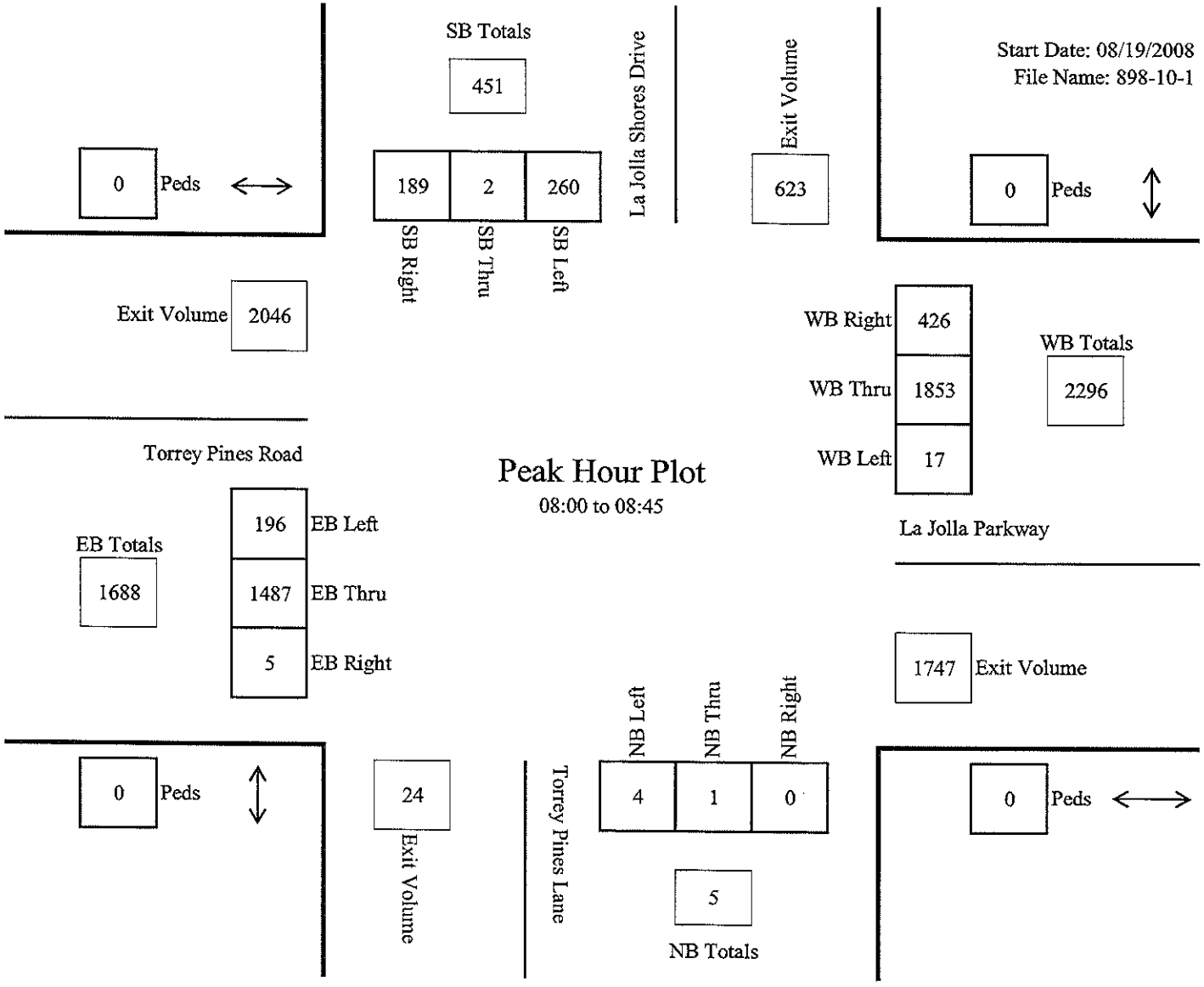
Linscott Law & Greenspan

4542 Ruffner Street, Suite 100, San Diego, CA 92111

Start Date: 08/19/2008
File Name: 898-10-1

Peak Hour Plot

08:00 to 08:45



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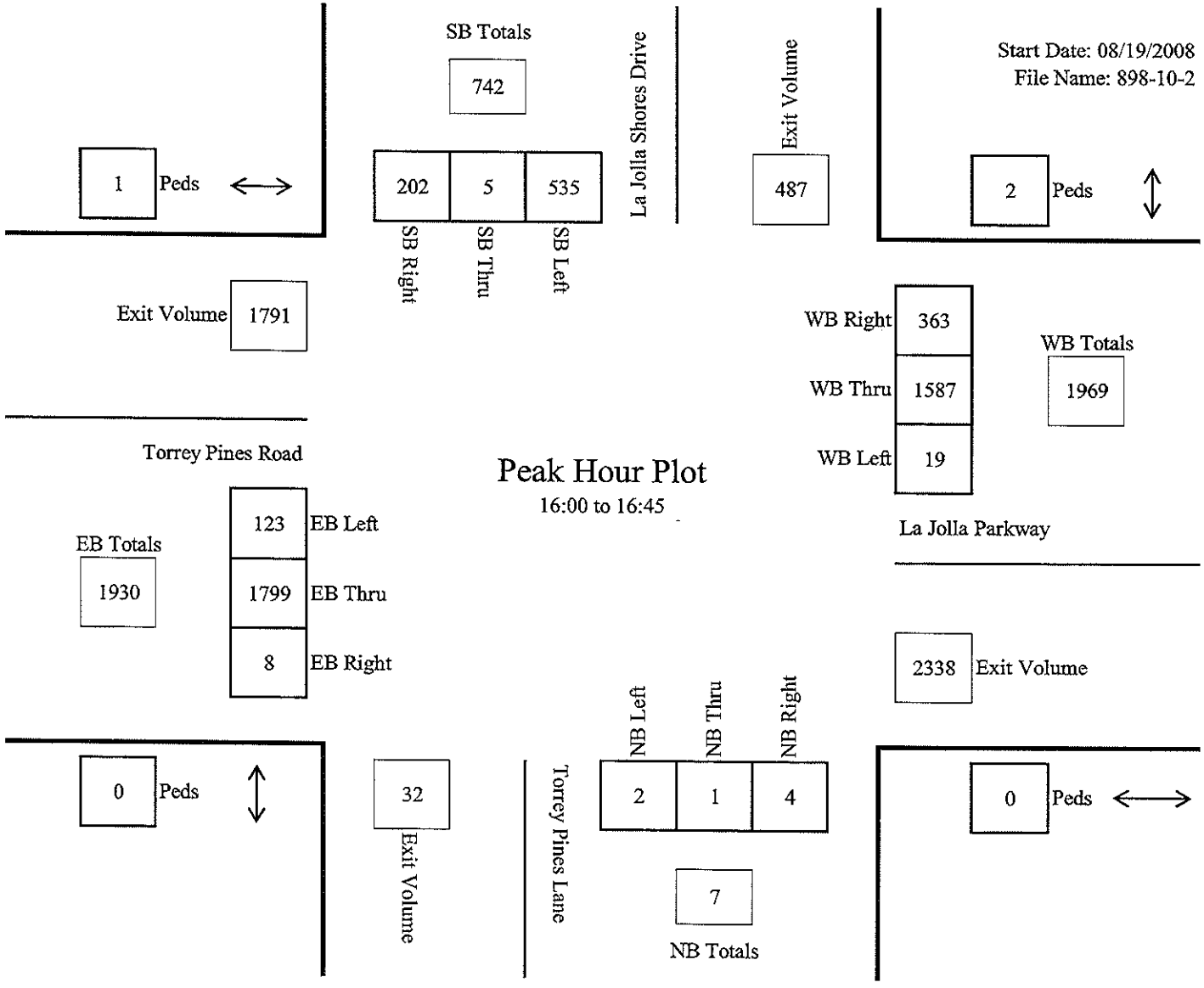
4542 Ruffner Street, Suite 100, San Diego, CA 92111

Start Date: 08/19/2008
File Name: 898-10-2

Peak Hour Plot

16:00 to 16:45



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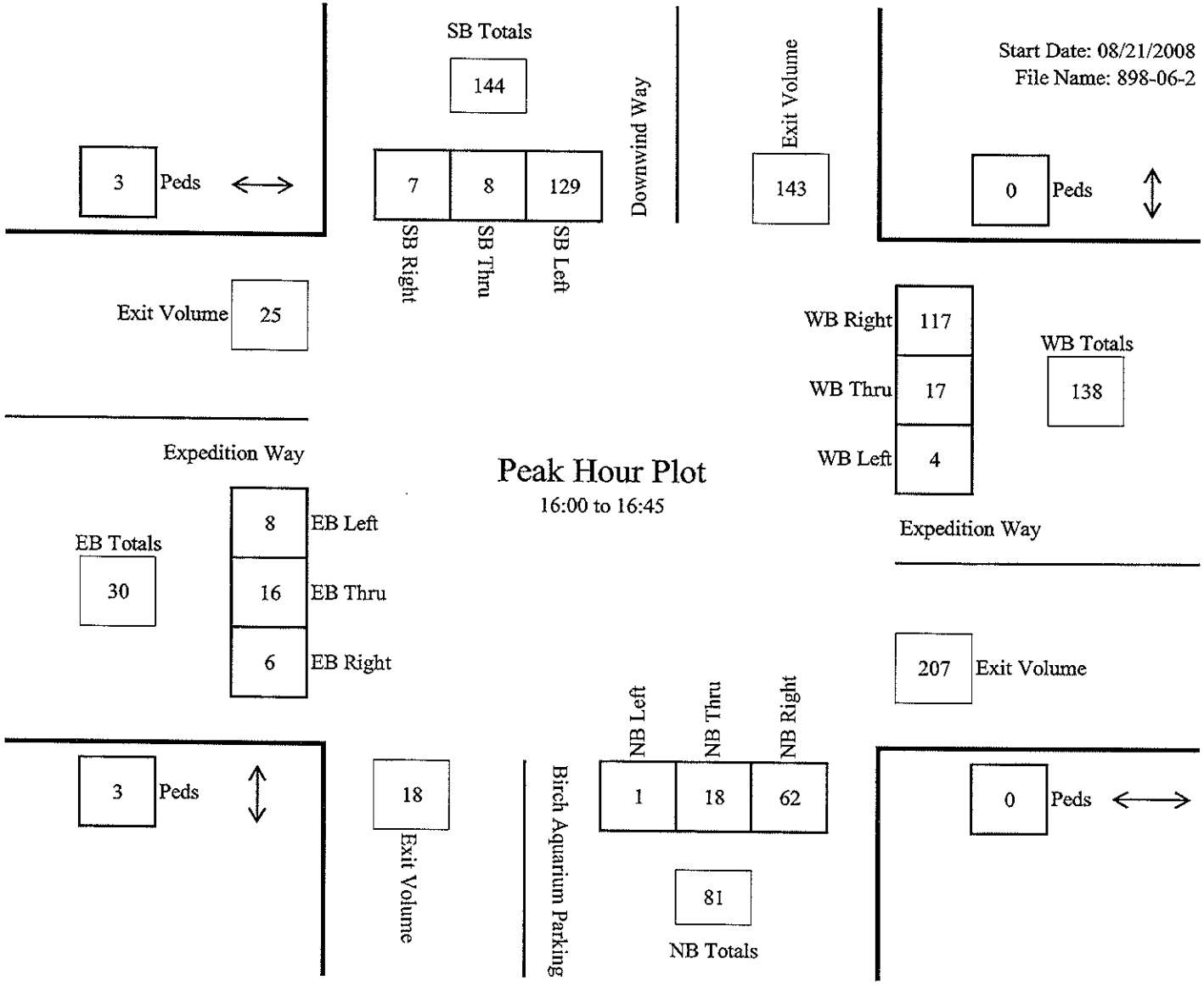
Linscott Law & Greenspan

4542 Ruffner Street, Suite 100, San Diego, CA 92111

Start Date: 08/21/2008
File Name: 898-06-2

Peak Hour Plot

16:00 to 16:45



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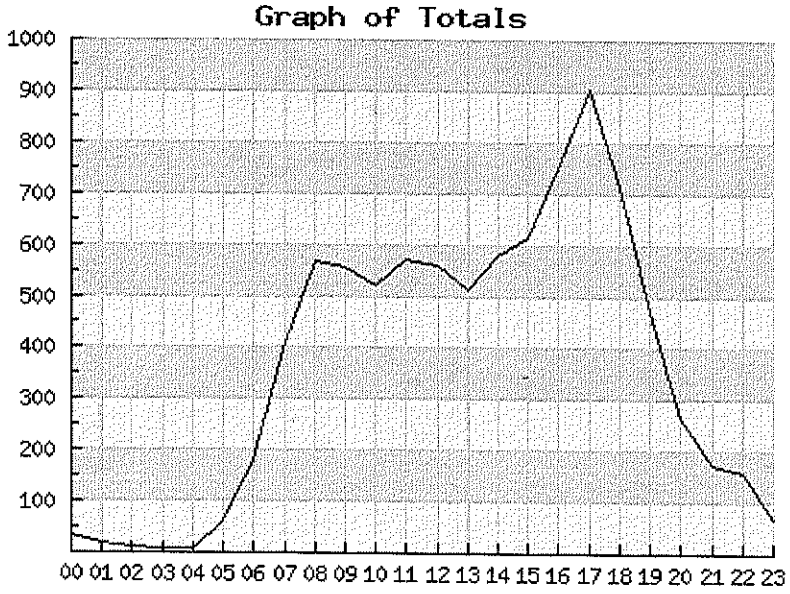
Daily Vehicle Volume Report

Location:
La Jolla Shores Drive east of SWFSC Drive
File Number: 89811-2
Counter ID: 107
Report Duration:
Thursday Aug 21, 2008 - 14:00 to
Friday Aug 22, 2008 - 13:59
Other Notes:
None at this time.



Time	East Bound Volume	West Bound Volume	Total Volume
00:00 - 00:59	23	11	34
01:00 - 01:59	8	10	18
02:00 - 02:59	7	4	11
03:00 - 03:59	4	4	8
04:00 - 04:59	1	6	7
05:00 - 05:59	32	29	61
06:00 - 06:59	74	106	180
07:00 - 07:59	209	202	411
08:00 - 08:59	318	250	568
09:00 - 09:59	271	286	557
10:00 - 10:59	238	282	520
11:00 - 11:59	259	311	570
12:00 - 12:59	256	303	559
13:00 - 13:59	248	266	514
14:00 - 14:59	284	295	579
15:00 - 15:59	300	314	614
16:00 - 16:59	340	410	750
17:00 - 17:59	280	624	904
18:00 - 18:59	274	439	713
19:00 - 19:59	271	201	472
20:00 - 20:59	155	112	267
21:00 - 21:59	101	72	173
22:00 - 22:59	80	78	158
23:00 - 23:59	35	34	69
Total	**4068**	**4649**	**8717**
AM Peak Hour	8:00 8:59	11:00 11:59	8:15 9:14
Volume	318	311	577
PM Peak Hour	16:00 16:59	17:15 18:14	17:15 18:14
Volume	340	652	938

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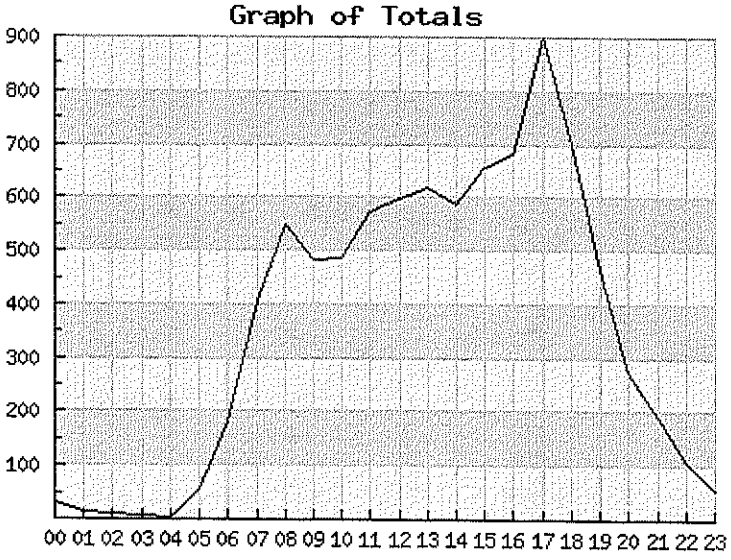
Daily Vehicle Volume Report

Location:
La Jolla Shores Dr btwn SFWSC Drwy & Biological Grade
File Number: 89812-1
Counter ID: 202
Report Duration:
Wednesday Aug 20, 2008 - 15:45 to
Thursday Aug 21, 2008 - 15:44
Other Notes:
None at this time.



Time	North Bound Volume	South Bound Volume	Total Volume
00:00 - 00:59	22	10	32
01:00 - 01:59	9	6	15
02:00 - 02:59	5	4	9
03:00 - 03:59	3	3	6
04:00 - 04:59	2	3	5
05:00 - 05:59	30	24	54
06:00 - 06:59	87	92	179
07:00 - 07:59	266	142	408
08:00 - 08:59	365	184	549
09:00 - 09:59	263	221	484
10:00 - 10:59	255	233	488
11:00 - 11:59	290	282	572
12:00 - 12:59	309	290	599
13:00 - 13:59	354	263	617
14:00 - 14:59	321	267	588
15:00 - 15:59	360	296	656
16:00 - 16:59	362	318	680
17:00 - 17:59	392	507	899
18:00 - 18:59	260	442	702
19:00 - 19:59	262	205	467
20:00 - 20:59	170	106	276
21:00 - 21:59	125	67	192
22:00 - 22:59	68	38	106
23:00 - 23:59	33	22	55
Total	**4613**	**4025**	**8638**
AM Peak Hour	7:45 8:44	11:00 11:59	11:00 11:59
Volume	377	282	572
PM Peak Hour	16:45 17:44	17:15 18:14	17:15 18:14
Volume	395	542	911

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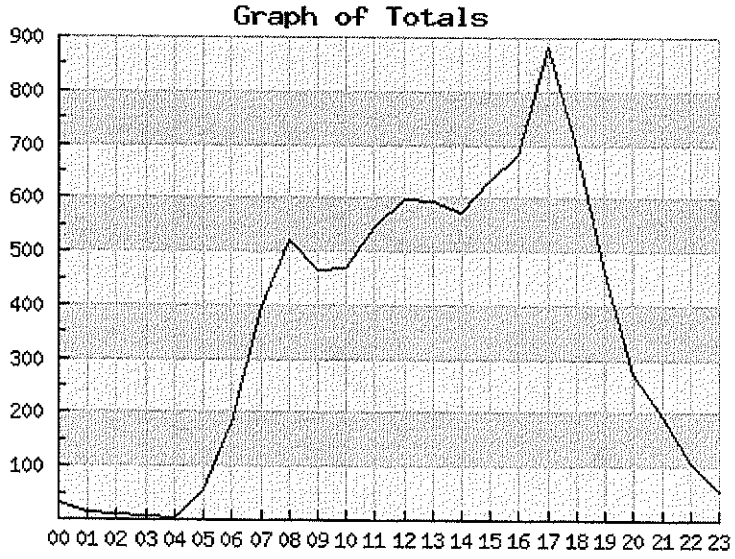
Daily Vehicle Volume Report

Location:
La Jolla Shores Dr btwn Shellback Wy & Downwind Wy
File Number: 89813-1
Counter ID: 108
Report Duration:
Wednesday Aug 20, 2008 - 16:30 to
Thursday Aug 21, 2008 - 16:29
Other Notes:
None at this time.



Time	North Bound Volume	South Bound Volume	Total Volume
00:00 - 00:59	20	12	32
01:00 - 01:59	9	6	15
02:00 - 02:59	4	5	9
03:00 - 03:59	3	3	6
04:00 - 04:59	2	3	5
05:00 - 05:59	27	28	55
06:00 - 06:59	78	101	179
07:00 - 07:59	248	147	395
08:00 - 08:59	322	198	520
09:00 - 09:59	246	219	465
10:00 - 10:59	226	243	469
11:00 - 11:59	237	308	545
12:00 - 12:59	289	308	597
13:00 - 13:59	330	263	593
14:00 - 14:59	291	282	573
15:00 - 15:59	311	320	631
16:00 - 16:59	307	374	681
17:00 - 17:59	320	561	881
18:00 - 18:59	209	486	695
19:00 - 19:59	237	225	462
20:00 - 20:59	159	115	274
21:00 - 21:59	119	74	193
22:00 - 22:59	67	41	108
23:00 - 23:59	29	26	55
Total	**4090**	**4348**	**8438**
AM Peak	7:45	11:00	11:00
Hour	8:44	11:59	11:59
Volume	330	308	545
PM Peak	13:00	17:15	17:15
Hour	13:59	18:14	18:14
Volume	330	595	897

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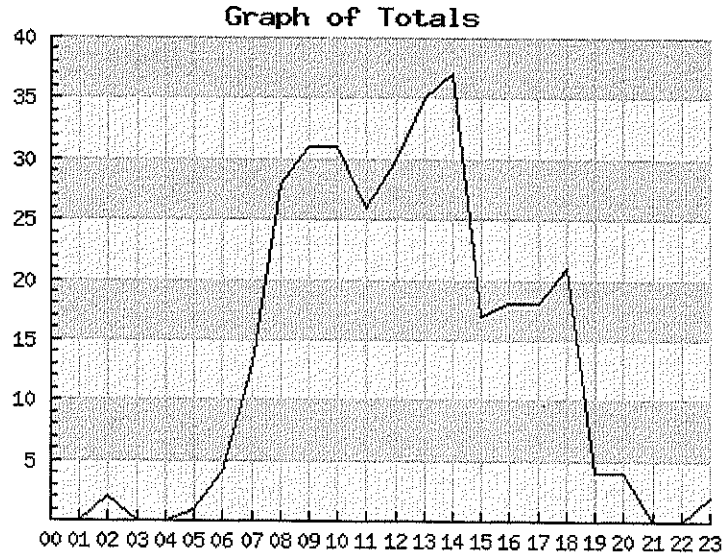
Daily Vehicle Volume Report

Location:
Shellback Way east of La Jolla Shores Drive
File Number: 89815-1
Counter ID: 103
Report Duration:
Wednesday Aug 20, 2008 - 00:00 to
Wednesday Aug 20, 2008 - 23:59
Other Notes:
None at this time



Time	East Bound Volume	West Bound Volume	Total Volume
00:00 - 00:59	0	0	0
01:00 - 01:59	0	0	0
02:00 - 02:59	0	2	2
03:00 - 03:59	0	0	0
04:00 - 04:59	0	0	0
05:00 - 05:59	0	1	1
06:00 - 06:59	2	2	4
07:00 - 07:59	10	3	13
08:00 - 08:59	20	8	28
09:00 - 09:59	21	10	31
10:00 - 10:59	24	7	31
11:00 - 11:59	19	7	26
12:00 - 12:59	21	9	30
13:00 - 13:59	16	19	35
14:00 - 14:59	26	11	37
15:00 - 15:59	12	5	17
16:00 - 16:59	11	7	18
17:00 - 17:59	9	9	18
18:00 - 18:59	15	6	21
19:00 - 19:59	3	1	4
20:00 - 20:59	3	1	4
21:00 - 21:59	0	0	0
22:00 - 22:59	0	0	0
23:00 - 23:59	1	1	2
Total	**213**	**109**	**322**
AM Peak Hour Volume	8:30 9:29 27	8:45 9:44 12	8:45 9:44 39
PM Peak Hour Volume	13:45 14:44 26	13:00 13:59 19	13:30 14:29 43

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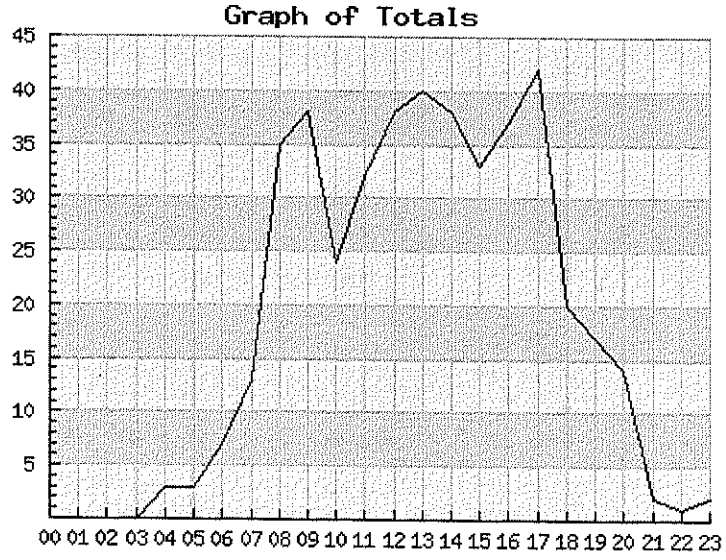
Daily Vehicle Volume Report

Location:
Shellback Way north of Downwind Way
File Number: 89816-2
Counter ID: 106
Report Duration:
Thursday Aug 21, 2008 - 00:00 to
Thursday Aug 21, 2008 - 23:59
Other Notes:
None at this time.



Time	North Bound Volume	South Bound Volume	Total Volume
00:00 - 00:59	0	0	0
01:00 - 01:59	0	0	0
02:00 - 02:59	0	0	0
03:00 - 03:59	0	0	0
04:00 - 04:59	3	0	3
05:00 - 05:59	1	2	3
06:00 - 06:59	3	4	7
07:00 - 07:59	8	5	13
08:00 - 08:59	24	11	35
09:00 - 09:59	26	12	38
10:00 - 10:59	13	11	24
11:00 - 11:59	11	21	32
12:00 - 12:59	19	19	38
13:00 - 13:59	19	21	40
14:00 - 14:59	18	20	38
15:00 - 15:59	16	17	33
16:00 - 16:59	15	22	37
17:00 - 17:59	11	31	42
18:00 - 18:59	5	15	20
19:00 - 19:59	5	12	17
20:00 - 20:59	6	8	14
21:00 - 21:59	1	1	2
22:00 - 22:59	0	1	1
23:00 - 23:59	2	0	2
Total	**206**	**233**	**439**
AM Peak Hour	8:45 9:44	11:00 11:59	8:45 9:44
Volume	32	21	46
PM Peak Hour	13:30 14:29	16:45 17:44	16:45 17:44
Volume	21	31	48

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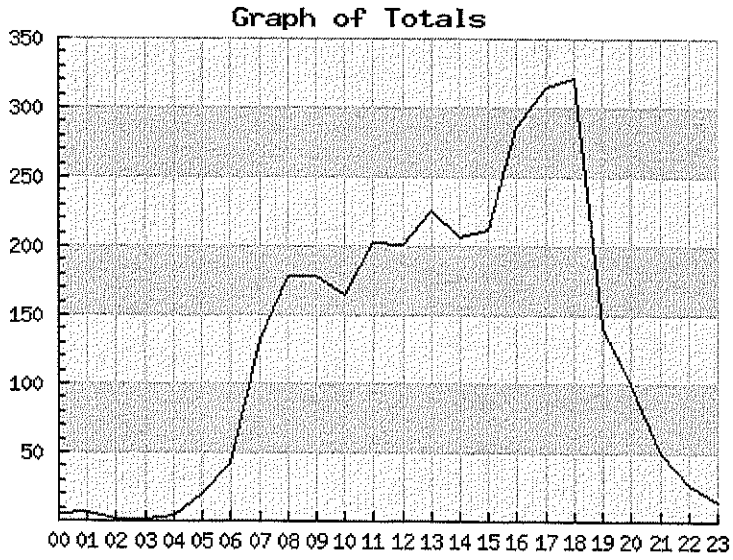
Daily Vehicle Volume Report

Location:
Downwind Wy btwn La Jolla Shores Dr & Shellback Wy
File Number: 89817-1
Counter ID: 114
Report Duration:
Wednesday Aug 20, 2008 - 13:45 to
Thursday Aug 21, 2008 - 13:44
Other Notes:
None at this time.



Time	West Bound Volume	East Bound Volume	Total Volume
00:00 - 00:59	4	2	6
01:00 - 01:59	5	2	7
02:00 - 02:59	2	0	2
03:00 - 03:59	2	0	2
04:00 - 04:59	3	1	4
05:00 - 05:59	19	1	20
06:00 - 06:59	29	13	42
07:00 - 07:59	96	37	133
08:00 - 08:59	118	61	179
09:00 - 09:59	126	53	179
10:00 - 10:59	116	49	165
11:00 - 11:59	124	79	203
12:00 - 12:59	127	75	202
13:00 - 13:59	141	85	226
14:00 - 14:59	126	81	207
15:00 - 15:59	124	88	212
16:00 - 16:59	181	105	286
17:00 - 17:59	190	125	315
18:00 - 18:59	212	109	321
19:00 - 19:59	76	66	142
20:00 - 20:59	54	46	100
21:00 - 21:59	36	14	50
22:00 - 22:59	18	9	27
23:00 - 23:59	11	4	15
Total	**1940**	**1105**	**3045**
AM Peak Hour	8:30 9:29	11:00 11:59	8:30 9:29
Volume	147	79	212
PM Peak Hour	17:45 18:44	17:15 18:14	17:45 18:44
Volume	222	128	344

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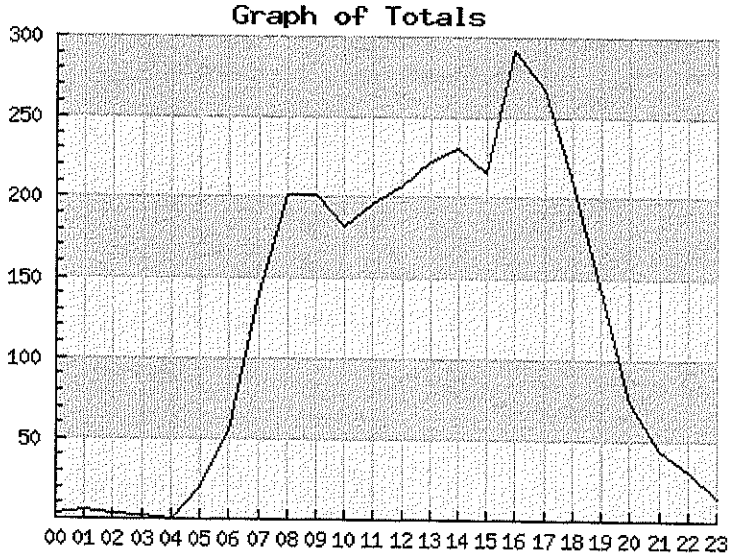
Daily Vehicle Volume Report

Location:
Downwind Wy bwn Shellback Wy & Expedition Wy
File Number: 89818-2
Counter ID: 113
Report Duration:
Thursday Aug 21, 2008 - 00:00 to
Thursday Aug 21, 2008 - 23:59
Other Notes:
None at this time.



Time	South Bound Volume	North Bound Volume	Total Volume
00:00 - 00:59	1	3	4
01:00 - 01:59	3	3	6
02:00 - 02:59	1	2	3
03:00 - 03:59	0	2	2
04:00 - 04:59	0	0	0
05:00 - 05:59	3	17	20
06:00 - 06:59	19	36	55
07:00 - 07:59	46	94	140
08:00 - 08:59	73	128	201
09:00 - 09:59	66	135	201
10:00 - 10:59	67	115	182
11:00 - 11:59	99	97	196
12:00 - 12:59	97	110	207
13:00 - 13:59	109	113	222
14:00 - 14:59	108	123	231
15:00 - 15:59	107	109	216
16:00 - 16:59	143	149	292
17:00 - 17:59	111	157	268
18:00 - 18:59	98	112	210
19:00 - 19:59	88	54	142
20:00 - 20:59	48	26	74
21:00 - 21:59	19	25	44
22:00 - 22:59	13	18	31
23:00 - 23:59	9	6	15
Total	**1328**	**1634**	**2962**
AM Peak Hour	11:00 11:59	8:30 9:29	8:30 9:29
Volume	99	154	231
PM Peak Hour	16:15 17:14	16:15 17:14	16:15 17:14
Volume	147	160	307

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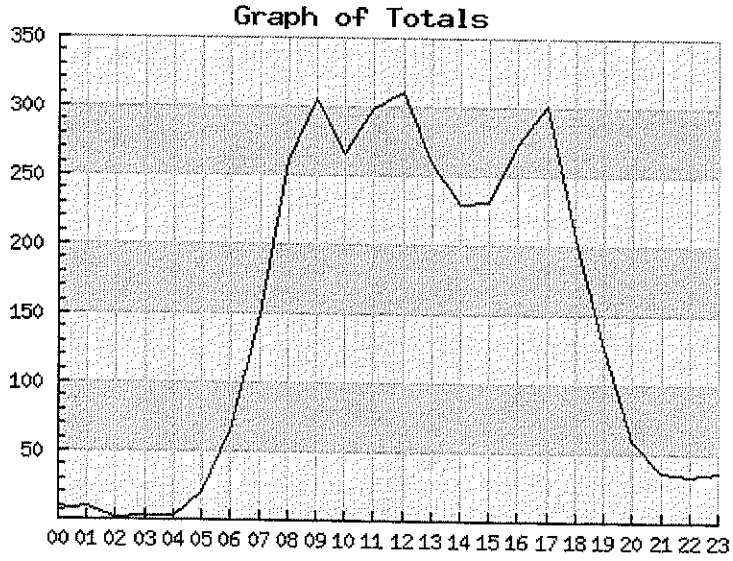
Daily Vehicle Volume Report

Location:
Expedition Wy btwn Downwind Wy & Torrey Pines Rd
File Number: 89819-1
Counter ID: 101
Report Duration:
Wednesday Aug 27, 2008 - 00:00 to
Wednesday Aug 27, 2008 - 23:59
Other Notes:
None at this time



Time	East Bound Volume	West Bound Volume	Total Volume
00:00 - 00:59	6	1	7
01:00 - 01:59	5	5	10
02:00 - 02:59	0	2	2
03:00 - 03:59	1	2	3
04:00 - 04:59	1	2	3
05:00 - 05:59	4	16	20
06:00 - 06:59	14	51	65
07:00 - 07:59	39	110	149
08:00 - 08:59	64	197	261
09:00 - 09:59	105	201	306
10:00 - 10:59	78	188	266
11:00 - 11:59	121	178	299
12:00 - 12:59	158	153	311
13:00 - 13:59	126	134	260
14:00 - 14:59	115	115	230
15:00 - 15:59	128	103	231
16:00 - 16:59	150	123	273
17:00 - 17:59	147	154	301
18:00 - 18:59	96	109	205
19:00 - 19:59	92	35	127
20:00 - 20:59	32	28	60
21:00 - 21:59	17	20	37
22:00 - 22:59	11	23	34
23:00 - 23:59	18	18	36
Total	**1528**	**1968**	**3496**
AM Peak Hour	11:00 11:59	8:30 9:29	8:30 9:29
Volume	121	227	325
PM Peak Hour	12:00 12:59	17:00 17:59	12:00 12:59
Volume	158	154	311

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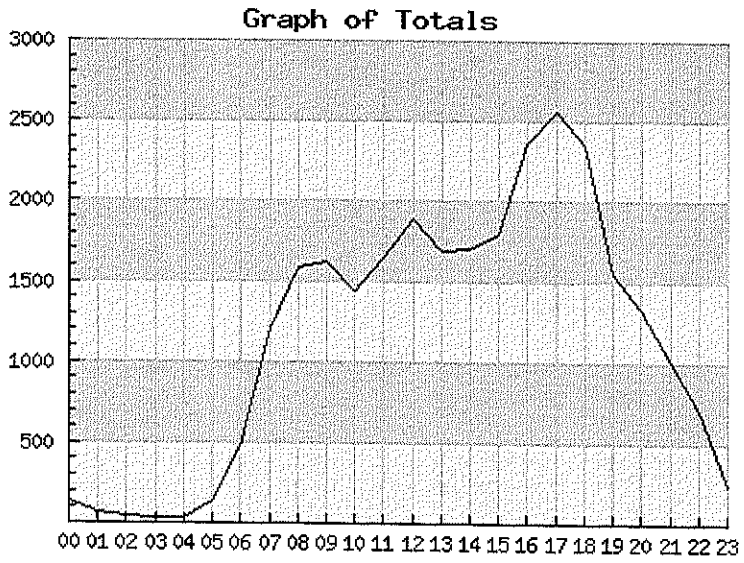
Daily Vehicle Volume Report

Location:
N Torrey Pines Rd btwn Expedition Wy & Torrey Pines Rd
File Number: 89820-1
Counter ID: 212
Report Duration:
Wednesday Aug 20, 2008 - 13:15 to
Thursday Aug 21, 2008 - 13:14
Other Notes:
None at this time.



Time	North Bound Volume	South Bound Volume	Total Volume
00:00 - 00:59	45	97	142
01:00 - 01:59	28	46	74
02:00 - 02:59	24	25	49
03:00 - 03:59	11	20	31
04:00 - 04:59	25	11	36
05:00 - 05:59	122	21	143
06:00 - 06:59	360	117	477
07:00 - 07:59	942	260	1202
08:00 - 08:59	1184	400	1584
09:00 - 09:59	1130	491	1621
10:00 - 10:59	872	564	1436
11:00 - 11:59	842	807	1649
12:00 - 12:59	931	958	1889
13:00 - 13:59	857	832	1689
14:00 - 14:59	735	972	1707
15:00 - 15:59	712	1081	1793
16:00 - 16:59	763	1599	2362
17:00 - 17:59	987	1573	2560
18:00 - 18:59	1099	1255	2354
19:00 - 19:59	568	980	1548
20:00 - 20:59	283	1045	1328
21:00 - 21:59	228	777	1005
22:00 - 22:59	151	559	710
23:00 - 23:59	95	144	239
Total	**12994**	**14634**	**27628**
AM Peak Hour	8:30 9:29	10:45 11:44	8:30 9:29
Volume	1267	812	1731
PM Peak Hour	17:30 18:29	16:30 17:29	17:30 18:29
Volume	1208	1702	2666

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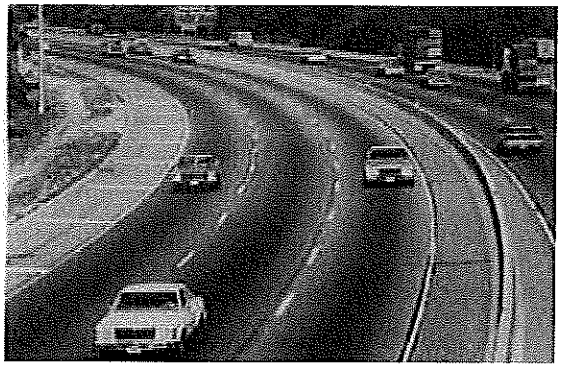
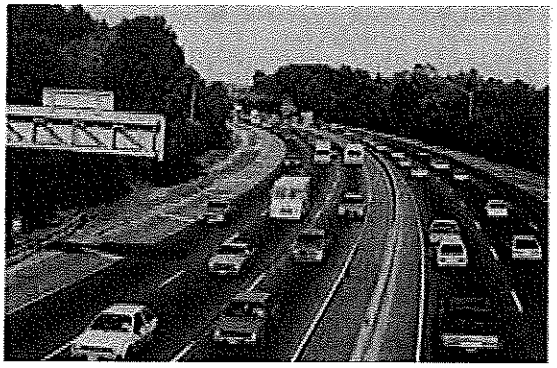
APPENDIX B

LOS DEFINITIONS AND INTERSECTION ANALYSIS SHEETS

FIGURE 1. LEVEL OF SERVICE (LOS) DEFINITIONS



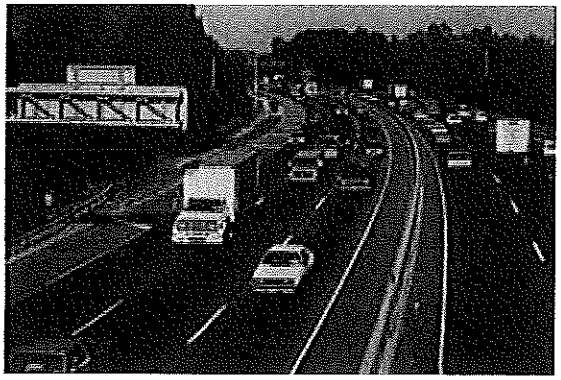
Level of Service A: Free-flow traffic with individual users virtually unaffected by the presence of others in the traffic stream.



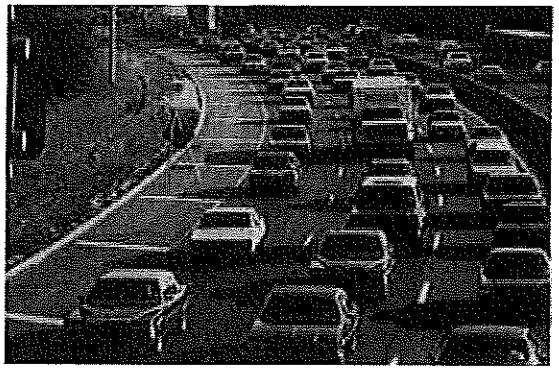
Level of Service D: High-density flow in which speed and freedom to maneuver are severely restricted and comfort and convenience have declined even though flow remains stable.

Level of Service B: Stable traffic flow with a high degree of freedom to select speed and operating conditions but with some influence from other users.

Level of Service E: Unstable flow at or near capacity levels with poor levels of comfort and convenience.



Level of Service C: Restricted flow that remains stable but with significant interactions with others in the traffic stream. The general level of comfort and convenience declines noticeably at this level.



Level of Service F: Forced traffic flow in which the amount of traffic approaching a point exceeds the amount that can be served. LOS F is characterized by stop-and-go waves, poor travel times, low comfort and convenience, and increased accident exposure.

EXISTING ANALYSIS

AM ANALYSIS

1: La Jolla Shores Rd & N. Torrey Pines Rd

10/24/2008
Existing AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	0.95		0.97	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.93		1.00	0.89		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.98		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1681	1614		3433	1666		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	0.98		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1681	1614		3433	1666		1770	3539	1583	1770	3539	1583
Volume (vph)	241	22	79	17	30	73	184	819	60	50	176	165
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	262	24	86	18	33	79	200	890	65	54	191	179
RTOR Reduction (vph)	0	28	0	0	73	0	0	0	27	0	0	106
Lane Group Flow (vph)	186	158	0	18	39	0	200	890	38	54	191	73
Turn Type	Split			Split			Prot		pm+ov	Prot		Perm
Protected Phases	4	4		8	8		5	2	8	1	6	
Permitted Phases									2			6
Actuated Green, G (s)	14.4	14.4		6.3	6.3		14.6	45.1	51.4	5.1	35.6	35.6
Effective Green, g (s)	14.4	14.4		6.3	6.3		14.6	45.1	51.4	5.1	35.6	35.6
Actuated g/C Ratio	0.17	0.17		0.07	0.07		0.17	0.52	0.59	0.06	0.41	0.41
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	279	267		249	121		297	1837	936	104	1450	649
v/s Ratio Prot	c0.11	0.10		0.01	c0.02		c0.11	c0.25	0.00	0.03	0.05	
v/s Ratio Perm									0.02			0.05
v/c Ratio	0.67	0.59		0.07	0.32		0.67	0.48	0.04	0.52	0.13	0.11
Uniform Delay, d1	34.0	33.5		37.6	38.3		33.9	13.4	7.4	39.7	16.0	15.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.9	3.5		0.1	1.5		5.9	0.9	0.0	4.3	0.2	0.4
Delay (s)	39.9	37.1		37.7	39.8		39.8	14.3	7.4	44.0	16.2	16.2
Level of Service	D	D		D	D		D	B	A	D	B	B
Approach Delay (s)		38.5			39.5			18.4			19.8	
Approach LOS		D			D			B			B	

Intersection Summary

HCM Average Control Delay	23.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	86.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	52.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

2: Expedition Way & N. Torrey Pines Rd

10/24/2008
Existing AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.95	0.95		0.97	1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.89		1.00	0.94		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1581		3433	1751		1770	3539	1583	1770	3523	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1581		3433	1751		1770	3539	1583	1770	3523	
Volume (vph)	2	16	39	9	19	13	140	931	128	14	238	7
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	17	42	10	21	14	152	1012	139	15	259	8
RTOR Reduction (vph)	0	36	0	0	12	0	0	0	42	0	1	0
Lane Group Flow (vph)	2	23	0	10	23	0	152	1012	97	15	266	0
Turn Type	Prot			Prot			Prot		pm+ov	Prot		
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases									2			
Actuated Green, G (s)	0.9	15.6		5.9	19.7		13.6	71.7	77.6	2.7	60.8	
Effective Green, g (s)	0.9	15.6		5.9	19.7		13.6	71.7	77.6	2.7	60.8	
Actuated g/C Ratio	0.01	0.14		0.05	0.18		0.12	0.65	0.70	0.02	0.55	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	14	222		182	311		217	2286	1164	43	1930	
v/s Ratio Prot	0.00	c0.00		0.00	0.01		c0.09	c0.29	c0.00	0.01	0.08	
v/s Ratio Perm		0.01							0.06			
v/c Ratio	0.14	0.10		0.05	0.08		0.70	0.44	0.08	0.35	0.14	
Uniform Delay, d1	54.7	41.6		49.9	38.1		46.7	9.7	5.3	53.3	12.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.7	0.2		0.1	0.1		9.8	0.6	0.0	4.9	0.1	
Delay (s)	59.3	41.8		50.0	38.2		56.5	10.4	5.4	58.1	12.4	
Level of Service	E	D		D	D		E	B	A	E	B	
Approach Delay (s)		42.4			40.8			15.2			14.9	
Approach LOS		D			D			B			B	

Intersection Summary

HCM Average Control Delay	16.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	111.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	42.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	1	4	6	328	228	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	4	7	357	248	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	623	253	259			
vC1, stage 1 conf vol			0			
vC2, stage 2 conf vol			0			
vCu, unblocked vol	623	253	259			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)			3.1			
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	99			
cM capacity (veh/h)	447	785	996			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	5	7	357	259
Volume Left	1	7	0	0
Volume Right	4	0	0	11
cSH	682	996	1700	1700
Volume to Capacity	0.01	0.01	0.21	0.15
Queue Length 95th (ft)	1	0	0	0
Control Delay (s)	10.3	8.6	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	10.3	0.2		0.0
Approach LOS	B			

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	27.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	1	2	17	324	220	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	2	18	352	239	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	632	243	247			
vC1, stage 1 conf vol			0			
vC2, stage 2 conf vol			0			
vCu, unblocked vol	632	243	247			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)			3.1			
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	98			
cM capacity (veh/h)	436	796	1000			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	3	18	352	247
Volume Left	1	18	0	0
Volume Right	2	0	0	8
cSH	624	1000	1700	1700
Volume to Capacity	0.01	0.02	0.21	0.15
Queue Length 95th (ft)	0	1	0	0
Control Delay (s)	10.8	8.7	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	10.8	0.4		0.0
Approach LOS	B			

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	27.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	4	331	3	3	219
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	4	360	3	3	238
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	606	361			363	
vC1, stage 1 conf vol					0	
vC2, stage 2 conf vol					0	
vCu, unblocked vol	606	361			363	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)					3.1	
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			100	
cM capacity (veh/h)	459	683			958	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	4	363	3	238
Volume Left	0	0	3	0
Volume Right	4	3	0	0
cSH	683	1700	958	1700
Volume to Capacity	0.01	0.21	0.00	0.14
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	10.3	0.0	8.8	0.0
Lane LOS	B		A	
Approach Delay (s)	10.3	0.0	0.1	
Approach LOS	B			

Intersection Summary

Average Delay	0.1		
Intersection Capacity Utilization	27.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0	
Lane Util. Factor		1.00		1.00	1.00	
Frt		0.86		1.00	1.00	
Flt Protected		1.00		1.00	1.00	
Satd. Flow (prot)		1611		1853	1863	
Flt Permitted		1.00		0.99	1.00	
Satd. Flow (perm)		1611		1839	1863	
Volume (vph)	0	12	3	25	3	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	13	3	27	3	0
RTOR Reduction (vph)	0	8	0	0	0	0
Lane Group Flow (vph)	0	5	0	30	3	0
Turn Type		custom	Perm			
Protected Phases				2	6	
Permitted Phases		4	2			
Actuated Green, G (s)		16.0		16.0	16.0	
Effective Green, g (s)		16.0		16.0	16.0	
Actuated g/C Ratio		0.40		0.40	0.40	
Clearance Time (s)		4.0		4.0	4.0	
Lane Grp Cap (vph)		644		736	745	
v/s Ratio Prot					0.00	
v/s Ratio Perm		c0.00		c0.02		
v/c Ratio		0.01		0.04	0.00	
Uniform Delay, d1		7.2		7.3	7.2	
Progression Factor		1.00		1.00	1.00	
Incremental Delay, d2		0.0		0.1	0.0	
Delay (s)		7.2		7.4	7.2	
Level of Service		A		A	A	
Approach Delay (s)	7.2			7.4	7.2	
Approach LOS	A			A	A	

Intersection Summary

HCM Average Control Delay	7.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.02		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	1	0	88	1	23	1	300	57	1	203	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1	0	96	1	25	1	326	62	1	221	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	578	615	222	583	585	357	224			388		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	578	615	222	583	585	357	224			388		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	77	100	96	100			100		
cM capacity (veh/h)	410	406	817	423	422	687	1345			1170		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	1	122	1	388	1	224
Volume Left	0	96	1	0	1	0
Volume Right	0	25	0	62	0	3
cSH	406	459	1345	1700	1170	1700
Volume to Capacity	0.00	0.27	0.00	0.23	0.00	0.13
Queue Length 95th (ft)	0	26	0	0	0	0
Control Delay (s)	13.9	15.7	7.7	0.0	8.1	0.0
Lane LOS	B	C	A		A	
Approach Delay (s)	13.9	15.7	0.0		0.0	
Approach LOS	B	C				

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	38.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	2	50	10	5	116	24
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	54	11	5	126	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			57		57	29
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			57		57	29
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		87	98
cM capacity (veh/h)			1548		944	1045

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	57	16	152
Volume Left	0	11	126
Volume Right	54	0	26
cSH	1700	1548	960
Volume to Capacity	0.03	0.01	0.16
Queue Length 95th (ft)	0	1	14
Control Delay (s)	0.0	4.9	9.5
Lane LOS		A	A
Approach Delay (s)	0.0	4.9	9.5
Approach LOS			A

Intersection Summary			
Average Delay	6.7		
Intersection Capacity Utilization	22.0%	ICU Level of Service	A
Analysis Period (min)	15		

9: Downwind Way & Expedition Way

10/24/2008

10/24/2008 Existing AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	53	11	9	0	3	5	8	18	5	48	22	115
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	58	12	10	0	3	5	9	20	5	52	24	125

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	79	9	34	52	149
Volume Left (vph)	58	0	9	52	0
Volume Right (vph)	10	5	5	0	125
Hadj (s)	0.11	-0.34	-0.01	0.53	-0.55
Departure Headway (s)	4.5	4.2	4.4	5.3	4.2
Degree Utilization, x	0.10	0.01	0.04	0.08	0.17
Capacity (veh/h)	759	814	787	662	837
Control Delay (s)	8.0	7.2	7.6	7.5	6.9
Approach Delay (s)	8.0	7.2	7.6	7.0	
Approach LOS	A	A	A	A	

Intersection Summary			
Delay	7.3		
HCM Level of Service	A		
Intersection Capacity Utilization	25.8%	ICU Level of Service	A
Analysis Period (min)	15		

10: La Jolla Shores Pkwy & La Jolla Shores Drive

10/24/2008

10/24/2008 Existing AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.95	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	
Satd. Flow (prot)	3433	3539		1770	3539	1583	1770	1863	1583	1681	1686	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	
Satd. Flow (perm)	3433	3539		1770	3539	1583	1770	1863	1583	1681	1686	
Volume (vph)	228	1453	2	13	1811	282	1	1	1	251	1	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	248	1579	2	14	1968	307	1	1	1	273	1	0
RTOR Reduction (vph)	0	0	0	0	0	76	0	0	1	0	0	0
Lane Group Flow (vph)	248	1581	0	14	1968	231	1	1	0	137	137	0
Turn Type	Prot			Prot		pm+ov	Split		Perm	Split		
Protected Phases	7	4		3	8	6	2	2		6	6	
Permitted Phases						8			2			
Actuated Green, G (s)	13.3	102.4		1.9	91.0	106.2	17.2	17.2	17.2	15.2	15.2	
Effective Green, g (s)	13.3	102.4		1.9	91.0	106.2	17.2	17.2	17.2	15.2	15.2	
Actuated g/C Ratio	0.09	0.67		0.01	0.60	0.70	0.11	0.11	0.11	0.10	0.10	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	299	2373		22	2109	1101	199	210	178	167	168	
v/s Ratio Prot	c0.07	0.45		0.01	c0.56	0.02	c0.00	0.00		c0.08	0.08	
v/s Ratio Perm						0.12			0.00			
v/c Ratio	0.83	0.67		0.64	0.93	0.21	0.01	0.00	0.00	0.82	0.82	
Uniform Delay, d1	68.6	15.0		75.1	28.1	8.3	60.2	60.2	60.1	67.4	67.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	17.1	0.7		47.5	8.3	0.1	0.0	0.0	0.0	26.4	25.3	
Delay (s)	85.6	15.7		122.6	36.4	8.4	60.2	60.2	60.1	93.8	92.6	
Level of Service	F	B		F	D	A	E	E	E	F	F	
Approach Delay (s)		25.2			33.1			60.2			93.2	
Approach LOS		C			C			E			F	

Intersection Summary			
HCM Average Control Delay	33.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	152.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	80.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

PM ANALYSIS

1: La Jolla Shores Rd & N. Torrey Pines Rd

10/24/2008
Existing PM

10/24/2008

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	0.95		0.97	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.90		1.00	0.91		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.99		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1681	1586		3433	1704		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	0.99		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1681	1586		3433	1704		1770	3539	1583	1770	3539	1583
Volume (vph)	181	33	106	59	43	57	127	484	65	109	1050	318
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	197	36	115	64	47	62	138	526	71	118	1141	346
RTOR Reduction (vph)	0	47	0	0	32	0	0	0	28	0	0	95
Lane Group Flow (vph)	171	130	0	64	77	0	138	526	43	118	1141	251
Turn Type	Split			Split			Prot		pm+ov	Prot		Perm
Protected Phases	4	4		8	8		5	2	8	1	6	
Permitted Phases									2			6
Actuated Green, G (s)	17.0	17.0		10.5	10.5		14.3	60.9	71.4	13.0	59.6	59.6
Effective Green, g (s)	17.0	17.0		10.5	10.5		14.3	60.9	71.4	13.0	59.6	59.6
Actuated g/C Ratio	0.14	0.14		0.09	0.09		0.12	0.52	0.61	0.11	0.51	0.51
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	243	230		307	152		216	1836	963	196	1797	804
v/s Ratio Prot	c0.10	0.08		0.02	c0.05		c0.08	0.15	0.00	0.07	c0.32	
v/s Ratio Perm									0.02			0.16
v/c Ratio	0.70	0.57		0.21	0.51		0.64	0.29	0.04	0.60	0.63	0.31
Uniform Delay, d1	47.8	46.8		49.6	51.0		49.1	16.0	9.3	49.7	21.0	16.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.9	3.2		0.3	2.7		6.1	0.4	0.0	5.1	1.7	1.0
Delay (s)	56.7	49.9		49.9	53.6		55.2	16.4	9.3	54.9	22.7	17.9
Level of Service	E	D		D	D		E	B	A	D	C	B
Approach Delay (s)		53.3			52.3			23.0			24.0	
Approach LOS		D			D			C			C	

Intersection Summary

HCM Average Control Delay	29.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	117.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	64.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

2: Expedition Way & N. Torrey Pines Rd

10/24/2008
Existing PM

10/24/2008

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.95	0.95		0.97	1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.88		1.00	0.93		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1554		3433	1729		1770	3539	1583	1770	3533	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1554		3433	1729		1770	3539	1583	1770	3533	
Volume (vph)	11	24	103	99	23	21	107	570	84	33	1255	14
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	26	112	108	25	23	116	620	91	36	1364	15
RTOR Reduction (vph)	0	93	0	0	18	0	0	0	30	0	0	0
Lane Group Flow (vph)	12	45	0	108	30	0	116	620	61	36	1379	0
Turn Type	Prot			Prot			Prot		pm+ov	Prot		
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases									2			
Actuated Green, G (s)	1.5	19.9		8.9	25.8		12.0	69.8	78.7	3.5	61.3	
Effective Green, g (s)	1.5	19.9		8.9	25.8		12.0	69.8	78.7	3.5	61.3	
Actuated g/C Ratio	0.01	0.17		0.08	0.22		0.10	0.60	0.67	0.03	0.53	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	22	265		262	383		182	2119	1123	53	1857	
v/s Ratio Prot	0.01	c0.00		c0.03	0.02		c0.07	0.18	0.00	0.02	c0.39	
v/s Ratio Perm		0.03							0.03			
v/c Ratio	0.55	0.17		0.41	0.08		0.64	0.29	0.05	0.68	0.74	
Uniform Delay, d1	57.2	41.3		51.4	36.0		50.2	11.4	6.4	56.0	21.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	24.9	0.3		1.1	0.1		7.1	0.4	0.0	29.4	2.7	
Delay (s)	82.1	41.6		52.4	36.1		57.3	11.7	6.4	85.4	24.2	
Level of Service	F	D		D	D		E	B	A	F	C	
Approach Delay (s)		44.8			47.4			17.5			25.8	
Approach LOS		D			D			B			C	

Intersection Summary

HCM Average Control Delay	25.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	116.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	61.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	3	2	1	239	494	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	2	1	260	537	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	801	539	540			
vC1, stage 1 conf vol			0			
vC2, stage 2 conf vol			0			
vCu, unblocked vol	801	539	540			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)			3.1			
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	100	100			
cM capacity (veh/h)	353	543	901			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	5	1	260	540
Volume Left	3	1	0	0
Volume Right	2	0	0	3
cSH	411	901	1700	1700
Volume to Capacity	0.01	0.00	0.15	0.32
Queue Length 95th (ft)	1	0	0	0
Control Delay (s)	13.9	9.0	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	13.9	0.0		0.0
Approach LOS	B			

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	36.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	5	19	5	247	488	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	21	5	268	530	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	810	531	532			
vC1, stage 1 conf vol			0			
vC2, stage 2 conf vol			0			
vCu, unblocked vol	810	531	532			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)			3.1			
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	96	99			
cM capacity (veh/h)	347	548	904			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	26	5	268	532
Volume Left	5	5	0	0
Volume Right	21	0	0	1
cSH	489	904	1700	1700
Volume to Capacity	0.05	0.01	0.16	0.31
Queue Length 95th (ft)	4	0	0	0
Control Delay (s)	12.8	9.0	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	12.8	0.2		0.0
Approach LOS	B			

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	35.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	3	10	240	1	4	500
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	11	261	1	4	543
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	814	261			262	
vC1, stage 1 conf vol					0	
vC2, stage 2 conf vol					0	
vCu, unblocked vol	814	261			262	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)					3.1	
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			100	
cM capacity (veh/h)	346	777			995	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	14	262	4	543
Volume Left	3	0	4	0
Volume Right	11	1	0	0
cSH	604	1700	995	1700
Volume to Capacity	0.02	0.15	0.00	0.32
Queue Length 95th (ft)	2	0	0	0
Control Delay (s)	11.1	0.0	8.6	0.0
Lane LOS	B		A	
Approach Delay (s)	11.1	0.0	0.1	
Approach LOS	B			

Intersection Summary

Average Delay	0.2		
Intersection Capacity Utilization	36.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00	
Frt		0.86	1.00	1.00	1.00	
Flt Protected		1.00	0.95	1.00	1.00	
Satd. Flow (prot)		1611	1770	1863	1863	
Flt Permitted		1.00	0.76	1.00	1.00	
Satd. Flow (perm)		1611	1408	1863	1863	
Volume (vph)	0	27	2	9	3	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	29	2	10	3	0
RTOR Reduction (vph)	0	17	0	0	0	0
Lane Group Flow (vph)	0	12	2	10	3	0
Turn Type		custom	Perm			
Protected Phases				2	6	
Permitted Phases		4	2			
Actuated Green, G (s)		16.0	16.0	16.0	16.0	
Effective Green, g (s)		16.0	16.0	16.0	16.0	
Actuated g/C Ratio		0.40	0.40	0.40	0.40	
Clearance Time (s)		4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)		644	563	745	745	
v/s Ratio Prot				c0.01	0.00	
v/s Ratio Perm		c0.01	0.00			
v/c Ratio		0.02	0.00	0.01	0.00	
Uniform Delay, d1		7.3	7.2	7.2	7.2	
Progression Factor		1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.1	0.0	0.0	0.0	
Delay (s)		7.3	7.2	7.3	7.2	
Level of Service		A	A	A	A	
Approach Delay (s)	7.3			7.3	7.2	
Approach LOS	A			A	A	

Intersection Summary

HCM Average Control Delay	7.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.02		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	0	2	153	1	3	0	240	79	14	478	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	0	2	166	1	3	0	261	86	15	520	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	815	897	520	856	854	304	520			347		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	815	897	520	856	854	304	520			347		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	40	100	100	100			99		
cM capacity (veh/h)	294	278	560	276	295	741	1057			1223		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	3	171	0	347	15	520
Volume Left	1	166	0	0	15	0
Volume Right	2	3	0	86	0	0
cSH	430	280	1700	1700	1223	1700
Volume to Capacity	0.01	0.61	0.00	0.20	0.01	0.31
Queue Length 95th (ft)	1	92	0	0	1	0
Control Delay (s)	13.4	36.1	0.0	0.0	8.0	0.0
Lane LOS	B	E			A	
Approach Delay (s)	13.4	36.1	0.0		0.2	
Approach LOS	B	E				

Intersection Summary				
Average Delay		6.0		
Intersection Capacity Utilization		47.2%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	4	100	18	5	151	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	109	20	5	164	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			113		103	59
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			113		103	59
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		81	99
cM capacity (veh/h)			1476		883	1007

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	113	25	173
Volume Left	0	20	164
Volume Right	109	0	9
cSH	1700	1476	889
Volume to Capacity	0.07	0.01	0.19
Queue Length 95th (ft)	0	1	18
Control Delay (s)	0.0	5.9	10.0
Lane LOS		A	B
Approach Delay (s)	0.0	5.9	10.0
Approach LOS			B

Intersection Summary				
Average Delay		6.0		
Intersection Capacity Utilization		23.4%	ICU Level of Service	A
Analysis Period (min)		15		

9: Downwind Way & Expedition Way

10/24/2008
Existing PM

10/24/2008

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	129	8	7	1	18	62	8	16	6	4	17	117
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	140	9	8	1	20	67	9	17	7	4	18	127

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total (vph)	140	16	88	33	150
Volume Left (vph)	140	0	1	9	4
Volume Right (vph)	0	8	67	7	127
Hadj (s)	0.53	-0.29	-0.42	-0.03	-0.47
Departure Headway (s)	5.5	4.7	4.2	4.6	4.1
Degree Utilization, x	0.21	0.02	0.10	0.04	0.17
Capacity (veh/h)	623	734	807	722	825
Control Delay (s)	8.8	6.6	7.7	7.9	7.9
Approach Delay (s)	8.6		7.7	7.9	7.9
Approach LOS	A		A	A	A

Intersection Summary

Delay	8.1		
HCM Level of Service	A		
Intersection Capacity Utilization	29.0%	ICU Level of Service	A
Analysis Period (min)	15		

10: La Jolla Shores Pkwy & La Jolla Shores Drive

10/24/2008
Existing PM

10/24/2008

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.95	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	
Satd. Flow (prot)	3433	3537		1770	3539	1583	1770	1863	1583	1681	1686	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	
Satd. Flow (perm)	3433	3537		1770	3539	1583	1770	1863	1583	1681	1686	
Volume (vph)	178	1697	8	28	1596	214	3	4	6	415	1	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	193	1845	9	30	1735	233	3	4	7	451	1	0
RTOR Reduction (vph)	0	0	0	0	0	62	0	0	6	0	0	0
Lane Group Flow (vph)	193	1854	0	30	1735	171	3	4	1	226	226	0
Turn Type	Prot			Prot		pm+ov	Split		Perm	Split		
Protected Phases	7	4		3	8	6	2	2		6	6	
Permitted Phases						8			2			
Actuated Green, G (s)	10.8	90.8		3.1	83.1	117.2	16.0	16.0	16.0	34.1	34.1	
Effective Green, g (s)	10.8	90.8		3.1	83.1	117.2	16.0	16.0	16.0	34.1	34.1	
Actuated g/C Ratio	0.07	0.57		0.02	0.52	0.73	0.10	0.10	0.10	0.21	0.21	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	232	2007		34	1838	1160	177	186	158	358	359	
v/s Ratio Prot	c0.06	c0.52		0.02	0.49	0.03	0.00	c0.00		c0.13	0.13	
v/s Ratio Perm						0.08			0.00			
v/c Ratio	0.83	0.92		0.88	0.94	0.15	0.02	0.02	0.00	0.63	0.63	
Uniform Delay, d1	73.7	31.4		78.3	36.3	6.4	64.9	64.9	64.8	57.2	57.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	21.7	7.7		106.5	10.5	0.1	0.2	0.2	0.1	8.2	8.1	
Delay (s)	95.4	39.2		184.8	46.8	6.5	65.1	65.2	64.9	65.4	65.3	
Level of Service	F	D		F	D	A	E	E	E	E	E	
Approach Delay (s)		44.5			44.1			65.0			65.4	
Approach LOS		D			D			E			E	

Intersection Summary

HCM Average Control Delay	46.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	78.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

EXISTING + CUMULATIVE PROJECTS ANALYSIS

AM ANALYSIS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	0.95		0.97	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.93		1.00	0.89		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.98		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1681	1614		3433	1666		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	0.98		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1681	1614		3433	1666		1770	3539	1583	1770	3539	1583
Volume (vph)	241	22	79	17	30	73	184	854	60	50	232	165
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	262	24	86	18	33	79	200	928	65	54	252	179
RTOR Reduction (vph)	0	28	0	0	73	0	0	0	26	0	0	104
Lane Group Flow (vph)	186	158	0	18	39	0	200	928	39	54	252	75
Turn Type	Split			Split			Prot		pm+ov	Prot		Perm
Protected Phases	4	4		8	8		5	2	8	1	6	
Permitted Phases									2			6
Actuated Green, G (s)	14.6	14.6		6.4	6.4		14.9	47.4	53.8	5.2	37.7	37.7
Effective Green, g (s)	14.6	14.6		6.4	6.4		14.9	47.4	53.8	5.2	37.7	37.7
Actuated g/C Ratio	0.16	0.16		0.07	0.07		0.17	0.53	0.60	0.06	0.42	0.42
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	274	263		245	119		294	1872	951	103	1489	666
v/s Ratio Prot	c0.11	0.10		0.01	c0.02		c0.11	c0.26	0.00	0.03	0.07	
v/s Ratio Perm									0.02			0.05
v/c Ratio	0.68	0.60		0.07	0.32		0.68	0.50	0.04	0.52	0.17	0.11
Uniform Delay, d1	35.3	34.8		38.8	39.5		35.1	13.5	7.3	41.0	16.2	15.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.5	3.9		0.1	1.6		6.3	0.9	0.0	4.7	0.2	0.3
Delay (s)	41.8	38.7		39.0	41.1		41.4	14.4	7.4	45.7	16.4	16.1
Level of Service	D	D		D	D		D	B	A	D	B	B
Approach Delay (s)		40.2			40.8			18.6			19.6	
Approach LOS		D			D			B			B	

Intersection Summary

HCM Average Control Delay	23.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	89.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.95	0.95		0.97	1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.89		1.00	0.94		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1581		3433	1751		1770	3539	1583	1770	3526	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1581		3433	1751		1770	3539	1583	1770	3526	
Volume (vph)	2	16	39	9	19	13	140	966	128	14	294	7
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	17	42	10	21	14	152	1050	139	15	320	8
RTOR Reduction (vph)	0	36	0	0	12	0	0	0	42	0	1	0
Lane Group Flow (vph)	2	23	0	10	23	0	152	1050	97	15	327	0
Turn Type	Prot			Prot			Prot		pm+ov	Prot		
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases									2			
Actuated Green, G (s)	0.9	15.6		5.9	19.7		13.6	71.2	77.1	2.9	60.5	
Effective Green, g (s)	0.9	15.6		5.9	19.7		13.6	71.2	77.1	2.9	60.5	
Actuated g/C Ratio	0.01	0.14		0.05	0.18		0.12	0.64	0.70	0.03	0.55	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	14	223		183	312		217	2276	1160	46	1927	
v/s Ratio Prot	0.00	c0.00		0.00	0.01		c0.09	c0.30	c0.00	0.01	0.09	
v/s Ratio Perm		0.01							0.06			
v/c Ratio	0.14	0.10		0.05	0.08		0.70	0.46	0.08	0.33	0.17	
Uniform Delay, d1	54.5	41.4		49.8	37.9		46.6	10.0	5.4	52.9	12.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.7	0.2		0.1	0.1		9.8	0.7	0.0	4.1	0.2	
Delay (s)	59.2	41.7		49.9	38.0		56.4	10.7	5.4	57.1	12.7	
Level of Service	E	D		D	D		E	B	A	E	B	
Approach Delay (s)		42.2			40.7			15.3			14.7	
Approach LOS		D			D			B			B	

Intersection Summary

HCM Average Control Delay	16.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	110.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	43.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	1	4	6	328	228	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	4	7	357	248	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	623	253	259			
vC1, stage 1 conf vol			0			
vC2, stage 2 conf vol			0			
vCu, unblocked vol	623	253	259			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)			3.1			
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	99			
cM capacity (veh/h)	447	785	996			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	5	7	357	259
Volume Left	1	7	0	0
Volume Right	4	0	0	11
cSH	682	996	1700	1700
Volume to Capacity	0.01	0.01	0.21	0.15
Queue Length 95th (ft)	1	0	0	0
Control Delay (s)	10.3	8.6	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	10.3	0.2		0.0
Approach LOS	B			

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	27.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	1	2	17	324	220	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	2	18	352	239	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	632	243	247			
vC1, stage 1 conf vol			0			
vC2, stage 2 conf vol			0			
vCu, unblocked vol	632	243	247			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)			3.1			
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	98			
cM capacity (veh/h)	436	796	1000			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	3	18	352	247
Volume Left	1	18	0	0
Volume Right	2	0	0	8
cSH	624	1000	1700	1700
Volume to Capacity	0.01	0.02	0.21	0.15
Queue Length 95th (ft)	0	1	0	0
Control Delay (s)	10.8	8.7	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	10.8	0.4		0.0
Approach LOS	B			

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	27.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	4	331	3	3	219
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	4	360	3	3	238
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	606	361			363	
vC1, stage 1 conf vol					0	
vC2, stage 2 conf vol					0	
vCu, unblocked vol	606	361			363	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)					3.1	
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			100	
cM capacity (veh/h)	459	683			958	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	4	363	3	238
Volume Left	0	0	3	0
Volume Right	4	3	0	0
cSH	683	1700	958	1700
Volume to Capacity	0.01	0.21	0.00	0.14
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	10.3	0.0	8.8	0.0
Lane LOS	B		A	
Approach Delay (s)	10.3	0.0	0.1	
Approach LOS	B			

Intersection Summary

Average Delay	0.1		
Intersection Capacity Utilization	27.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0	
Lane Util. Factor		1.00		1.00	1.00	
Frt		0.86		1.00	1.00	
Flt Protected		1.00		1.00	1.00	
Satd. Flow (prot)		1611		1853	1863	
Flt Permitted		1.00		0.99	1.00	
Satd. Flow (perm)		1611		1839	1863	
Volume (vph)	0	12	3	25	3	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	13	3	27	3	0
RTOR Reduction (vph)	0	8	0	0	0	0
Lane Group Flow (vph)	0	5	0	30	3	0
Turn Type		custom	Perm			
Protected Phases				2	6	
Permitted Phases		4	2			
Actuated Green, G (s)		16.0		16.0	16.0	
Effective Green, g (s)		16.0		16.0	16.0	
Actuated g/C Ratio		0.40		0.40	0.40	
Clearance Time (s)		4.0		4.0	4.0	
Lane Grp Cap (vph)		644		736	745	
v/s Ratio Prot					0.00	
v/s Ratio Perm		c0.00		c0.02		
v/c Ratio		0.01		0.04	0.00	
Uniform Delay, d1		7.2		7.3	7.2	
Progression Factor		1.00		1.00	1.00	
Incremental Delay, d2		0.0		0.1	0.0	
Delay (s)		7.2		7.4	7.2	
Level of Service		A		A	A	
Approach Delay (s)	7.2			7.4	7.2	
Approach LOS	A			A	A	

Intersection Summary

HCM Average Control Delay	7.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.02		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	88	0	23	0	300	57	1	203	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	96	0	25	0	326	62	1	221	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	574	611	221	580	580	357	221			388		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	574	611	221	580	580	357	221			388		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	78	100	96	100			100		
cM capacity (veh/h)	414	408	819	425	425	687	1349			1170		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	0	121	0	388	1	221
Volume Left	0	96	0	0	1	0
Volume Right	0	25	0	62	0	0
cSH	1700	462	1700	1700	1170	1700
Volume to Capacity	0.00	0.26	0.00	0.23	0.00	0.13
Queue Length 95th (ft)	0	26	0	0	0	0
Control Delay (s)	0.0	15.5	0.0	0.0	8.1	0.0
Lane LOS	A	C			A	
Approach Delay (s)	0.0	15.5	0.0		0.0	
Approach LOS	A	C				

Intersection Summary				
Average Delay	2.6			
Intersection Capacity Utilization	32.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	2	50	10	5	116	24
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	54	11	5	126	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			57		57	29
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			57		57	29
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		87	98
cM capacity (veh/h)			1548		944	1045

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	57	16	152
Volume Left	0	11	126
Volume Right	54	0	26
cSH	1700	1548	960
Volume to Capacity	0.03	0.01	0.16
Queue Length 95th (ft)	0	1	14
Control Delay (s)	0.0	4.9	9.5
Lane LOS		A	A
Approach Delay (s)	0.0	4.9	9.5
Approach LOS			A

Intersection Summary				
Average Delay	6.7			
Intersection Capacity Utilization	22.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	57	12	6	0	3	1	8	5	2	29	11	138
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	62	13	7	0	3	1	9	5	2	32	12	150

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	82	4	16	32	162
Volume Left (vph)	62	0	9	32	0
Volume Right (vph)	7	1	2	0	150
Hadj (s)	0.14	-0.12	0.06	0.53	-0.61
Departure Headway (s)	4.5	4.3	4.5	5.3	4.1
Degree Utilization, x	0.10	0.01	0.02	0.05	0.18
Capacity (veh/h)	768	788	778	664	853
Control Delay (s)	8.0	7.4	7.5	7.3	6.8
Approach Delay (s)	8.0	7.4	7.5	6.9	
Approach LOS	A	A	A	A	

Intersection Summary

Delay	7.3		
HCM Level of Service	A		
Intersection Capacity Utilization	26.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	1.00		0.95	0.95	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.95	
Satd. Flow (prot)	3433	3538		1770	3539	1583	1770	1863		1681	1686	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.95	
Satd. Flow (perm)	3433	3538		1770	3539	1583	1770	1863		1681	1686	
Volume (vph)	196	1487	5	17	1853	426	4	1	0	260	2	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	213	1616	5	18	2014	463	4	1	0	283	2	0
RTOR Reduction (vph)	0	0	0	0	0	110	0	0	0	0	0	0
Lane Group Flow (vph)	213	1621	0	18	2014	353	4	1	0	142	143	0
Turn Type	Prot			Prot		pm+ov	Split		Perm	Split		
Protected Phases	7	4		3	8	6	2	2		6	6	
Permitted Phases						8			2			
Actuated Green, G (s)	12.9	102.5		2.9	92.5	108.1	17.2	17.2		15.6	15.6	
Effective Green, g (s)	12.9	102.5		2.9	92.5	108.1	17.2	17.2		15.6	15.6	
Actuated g/C Ratio	0.08	0.66		0.02	0.60	0.70	0.11	0.11		0.10	0.10	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	287	2352		33	2123	1110	197	208		170	171	
v/s Ratio Prot	c0.06	0.46		0.01	c0.57	0.03	c0.00	0.00		0.08	c0.08	
v/s Ratio Perm						0.19						
v/c Ratio	0.74	0.69		0.55	0.95	0.32	0.02	0.00		0.84	0.84	
Uniform Delay, d1	69.0	16.0		75.0	28.6	8.9	61.0	60.9		68.0	68.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.9	0.9		17.2	9.9	0.2	0.2	0.0		28.3	28.3	
Delay (s)	78.9	16.9		92.1	38.6	9.0	61.2	60.9		96.3	96.3	
Level of Service	E	B		F	D	A	E	E		F	F	
Approach Delay (s)		24.1			33.5			61.1			96.3	
Approach LOS		C			C			E			F	

Intersection Summary

HCM Average Control Delay	33.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	154.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	80.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

PM ANALYSIS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	0.95		0.97	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.90		1.00	0.91		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.99		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1681	1586		3433	1704		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	0.99		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1681	1586		3433	1704		1770	3539	1583	1770	3539	1583
Volume (vph)	181	33	106	59	43	57	127	515	65	109	1081	318
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	197	36	115	64	47	62	138	560	71	118	1175	346
RTOR Reduction (vph)	0	47	0	0	32	0	0	0	28	0	0	93
Lane Group Flow (vph)	171	130	0	64	77	0	138	560	43	118	1175	253
Turn Type	Split			Split			Prot		pm+ov	Prot		Perm
Protected Phases	4	4		8	8		5	2	8	1	6	
Permitted Phases									2			6
Actuated Green, G (s)	17.0	17.0		10.5	10.5		14.3	60.9	71.4	13.0	59.6	59.6
Effective Green, g (s)	17.0	17.0		10.5	10.5		14.3	60.9	71.4	13.0	59.6	59.6
Actuated g/C Ratio	0.14	0.14		0.09	0.09		0.12	0.52	0.61	0.11	0.51	0.51
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	243	230		307	152		216	1836	963	196	1797	804
v/s Ratio Prot	c0.10	0.08		0.02	c0.05		c0.08	0.16	0.00	0.07	c0.33	
v/s Ratio Perm									0.02			0.16
v/c Ratio	0.70	0.57		0.21	0.51		0.64	0.31	0.04	0.60	0.65	0.32
Uniform Delay, d1	47.8	46.8		49.6	51.0		49.1	16.2	9.3	49.7	21.3	16.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.9	3.2		0.3	2.7		6.1	0.4	0.0	5.1	1.9	1.0
Delay (s)	56.7	49.9		49.9	53.6		55.2	16.6	9.3	54.9	23.2	18.0
Level of Service	E	D		D	D		E	B	A	D	C	B
Approach Delay (s)		53.3			52.3			22.8			24.4	
Approach LOS		D			D			C			C	

Intersection Summary

HCM Average Control Delay	29.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	117.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	65.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.95	0.95		0.97	1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.88		1.00	0.93		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1554		3433	1729		1770	3539	1583	1770	3534	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1554		3433	1729		1770	3539	1583	1770	3534	
Volume (vph)	11	24	103	99	23	21	107	601	84	33	1291	14
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	26	112	108	25	23	116	653	91	36	1403	15
RTOR Reduction (vph)	0	93	0	0	18	0	0	0	30	0	0	0
Lane Group Flow (vph)	12	45	0	108	30	0	116	653	61	36	1418	0
Turn Type	Prot			Prot			Prot		pm+ov	Prot		
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases									2			
Actuated Green, G (s)	1.5	19.9		8.9	25.8		12.0	69.8	78.7	3.5	61.3	
Effective Green, g (s)	1.5	19.9		8.9	25.8		12.0	69.8	78.7	3.5	61.3	
Actuated g/C Ratio	0.01	0.17		0.08	0.22		0.10	0.60	0.67	0.03	0.53	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	22	265		262	383		182	2119	1123	53	1858	
v/s Ratio Prot	0.01	c0.00		c0.03	0.02		c0.07	0.18	0.00	0.02	c0.40	
v/s Ratio Perm		0.03							0.03			
v/c Ratio	0.55	0.17		0.41	0.08		0.64	0.31	0.05	0.68	0.76	
Uniform Delay, d1	57.2	41.3		51.4	36.0		50.2	11.5	6.4	56.0	21.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	24.9	0.3		1.1	0.1		7.1	0.4	0.0	29.4	3.0	
Delay (s)	82.1	41.6		52.4	36.1		57.3	11.9	6.4	85.4	24.9	
Level of Service	F	D		D	D		E	B	A	F	C	
Approach Delay (s)		44.8			47.4			17.4			26.4	
Approach LOS		D			D			B			C	

Intersection Summary

HCM Average Control Delay	25.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	116.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	62.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	3	2	1	239	494	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	2	1	260	537	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	801	539	540			
vC1, stage 1 conf vol			0			
vC2, stage 2 conf vol			0			
vCu, unblocked vol	801	539	540			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)			3.1			
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	100	100			
cM capacity (veh/h)	353	543	901			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	5	1	260	540
Volume Left	3	1	0	0
Volume Right	2	0	0	3
cSH	411	901	1700	1700
Volume to Capacity	0.01	0.00	0.15	0.32
Queue Length 95th (ft)	1	0	0	0
Control Delay (s)	13.9	9.0	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	13.9	0.0		0.0
Approach LOS	B			

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	36.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	5	19	5	247	488	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	21	5	268	530	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	810	531	532			
vC1, stage 1 conf vol			0			
vC2, stage 2 conf vol			0			
vCu, unblocked vol	810	531	532			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)			3.1			
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	96	99			
cM capacity (veh/h)	347	548	904			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	26	5	268	532
Volume Left	5	5	0	0
Volume Right	21	0	0	1
cSH	489	904	1700	1700
Volume to Capacity	0.05	0.01	0.16	0.31
Queue Length 95th (ft)	4	0	0	0
Control Delay (s)	12.8	9.0	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	12.8	0.2		0.0
Approach LOS	B			

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	35.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	3	10	240	1	4	500
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	11	261	1	4	543
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	814	261			262	
vC1, stage 1 conf vol					0	
vC2, stage 2 conf vol					0	
vCu, unblocked vol	814	261			262	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)					3.1	
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			100	
cM capacity (veh/h)	346	777			995	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	14	262	4	543
Volume Left	3	0	4	0
Volume Right	11	1	0	0
cSH	604	1700	995	1700
Volume to Capacity	0.02	0.15	0.00	0.32
Queue Length 95th (ft)	2	0	0	0
Control Delay (s)	11.1	0.0	8.6	0.0
Lane LOS	B		A	
Approach Delay (s)	11.1	0.0	0.1	
Approach LOS	B			

Intersection Summary

Average Delay	0.2		
Intersection Capacity Utilization	36.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00	
Frt		0.86	1.00	1.00	1.00	
Flt Protected		1.00	0.95	1.00	1.00	
Satd. Flow (prot)		1611	1770	1863	1863	
Flt Permitted		1.00	0.76	1.00	1.00	
Satd. Flow (perm)		1611	1408	1863	1863	
Volume (vph)	0	27	2	9	3	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	29	2	10	3	0
RTOR Reduction (vph)	0	17	0	0	0	0
Lane Group Flow (vph)	0	12	2	10	3	0
Turn Type		custom	Perm			
Protected Phases				2	6	
Permitted Phases		4	2			
Actuated Green, G (s)		16.0	16.0	16.0	16.0	
Effective Green, g (s)		16.0	16.0	16.0	16.0	
Actuated g/C Ratio		0.40	0.40	0.40	0.40	
Clearance Time (s)		4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)		644	563	745	745	
v/s Ratio Prot				c0.01	0.00	
v/s Ratio Perm		c0.01	0.00			
v/c Ratio		0.02	0.00	0.01	0.00	
Uniform Delay, d1		7.3	7.2	7.2	7.2	
Progression Factor		1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.1	0.0	0.0	0.0	
Delay (s)		7.3	7.2	7.3	7.2	
Level of Service		A	A	A	A	
Approach Delay (s)	7.3			7.3	7.2	
Approach LOS	A			A	A	

Intersection Summary

HCM Average Control Delay	7.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.02		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	0	2	153	1	3	0	240	79	14	478	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	0	2	166	1	3	0	261	86	15	520	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	815	897	520	856	854	304	520			347		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	815	897	520	856	854	304	520			347		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	40	100	100	100			99		
cM capacity (veh/h)	294	278	560	276	295	741	1057			1223		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	3	171	0	347	15	520
Volume Left	1	166	0	0	15	0
Volume Right	2	3	0	86	0	0
cSH	430	280	1700	1700	1223	1700
Volume to Capacity	0.01	0.61	0.00	0.20	0.01	0.31
Queue Length 95th (ft)	1	92	0	0	1	0
Control Delay (s)	13.4	36.1	0.0	0.0	8.0	0.0
Lane LOS	B	E			A	
Approach Delay (s)	13.4	36.1	0.0		0.2	
Approach LOS	B	E				

Intersection Summary				
Average Delay	6.0			
Intersection Capacity Utilization	47.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	4	100	18	5	151	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	109	20	5	164	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			113		103	59
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			113		103	59
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		81	99
cM capacity (veh/h)			1476		883	1007

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	113	25	173
Volume Left	0	20	164
Volume Right	109	0	9
cSH	1700	1476	889
Volume to Capacity	0.07	0.01	0.19
Queue Length 95th (ft)	0	1	18
Control Delay (s)	0.0	5.9	10.0
Lane LOS		A	B
Approach Delay (s)	0.0	5.9	10.0
Approach LOS			B

Intersection Summary				
Average Delay	6.0			
Intersection Capacity Utilization	23.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	97	3	7	4	25	61	10	15	0	3	12	91
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	105	3	8	4	27	66	11	16	0	3	13	99
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1							
Volume Total (vph)	105	11	98	27	115							
Volume Left (vph)	105	0	4	11	3							
Volume Right (vph)	0	8	66	0	99							
Hadj (s)	0.53	-0.46	-0.36	0.11	-0.48							
Departure Headway (s)	5.4	4.4	4.1	4.7	4.0							
Degree Utilization, x	0.16	0.01	0.11	0.04	0.13							
Capacity (veh/h)	635	779	844	727	860							
Control Delay (s)	8.2	6.3	7.6	7.8	7.6							
Approach Delay (s)	8.1		7.6	7.8	7.6							
Approach LOS	A		A	A	A							

Intersection Summary			
Delay	7.8		
HCM Level of Service	A		
Intersection Capacity Utilization	25.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.95	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	
Satd. Flow (prot)	3433	3537		1770	3539	1583	1770	1863	1583	1681	1687	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	
Satd. Flow (perm)	3433	3537		1770	3539	1583	1770	1863	1583	1681	1687	
Volume (vph)	123	1799	8	19	1587	363	2	1	4	535	5	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	134	1955	9	21	1725	395	2	1	4	582	5	0
RTOR Reduction (vph)	0	0	0	0	0	108	0	0	4	0	0	0
Lane Group Flow (vph)	134	1964	0	21	1725	287	2	1	0	291	296	0
Turn Type	Prot			Prot		pm+ov	Split		Perm	Split		
Protected Phases	7	4		3	8	6	2	2		6	6	
Permitted Phases						8			2			
Actuated Green, G (s)	10.8	89.0		2.8	81.0	108.2	17.1	17.1	17.1	27.2	27.2	
Effective Green, g (s)	10.8	89.0		2.8	81.0	108.2	17.1	17.1	17.1	27.2	27.2	
Actuated g/C Ratio	0.07	0.59		0.02	0.53	0.71	0.11	0.11	0.11	0.18	0.18	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	244	2070		33	1885	1126	199	209	178	301	302	
v/s Ratio Prot	c0.04	c0.56		0.01	0.49	0.05	c0.00	0.00		0.17	c0.18	
v/s Ratio Perm						0.14			0.00			
v/c Ratio	0.55	0.95		0.64	0.92	0.25	0.01	0.00	0.00	0.97	0.98	
Uniform Delay, d1	68.3	29.4		74.1	32.4	7.7	60.0	59.9	59.9	62.0	62.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.5	10.1		33.9	7.4	0.1	0.1	0.0	0.0	44.1	47.0	
Delay (s)	70.8	39.5		108.0	39.8	7.9	60.1	60.0	60.0	106.1	109.2	
Level of Service	E	D		F	D	A	E	E	E	F	F	
Approach Delay (s)		41.5			34.6			60.0			107.6	
Approach LOS		D			C			E			F	

Intersection Summary			
HCM Average Control Delay	46.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	152.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	80.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

EXISTING + CUMULATIVE PROJECTS + PROJECT ANALYSIS

AM ANALYSIS

1: La Jolla Shores Rd & N. Torrey Pines Rd

10/24/2008

10/24/2008

Existing + Cumulative + Project AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	0.95		0.97	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.93		1.00	0.89		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.98		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1681	1613		3433	1666		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	0.98		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1681	1613		3433	1666		1770	3539	1583	1770	3539	1583
Volume (vph)	243	22	80	17	30	73	194	854	60	50	232	184
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	264	24	87	18	33	79	211	928	65	54	252	200
RTOR Reduction (vph)	0	28	0	0	73	0	0	0	26	0	0	116
Lane Group Flow (vph)	188	159	0	18	39	0	211	928	39	54	252	84
Turn Type	Split			Split			Prot		pm+ov	Prot		Perm
Protected Phases	4	4		8	8		5	2	8	1	6	
Permitted Phases									2			6
Actuated Green, G (s)	14.9	14.9		6.4	6.4		15.5	48.3	54.7	5.2	38.0	38.0
Effective Green, g (s)	14.9	14.9		6.4	6.4		15.5	48.3	54.7	5.2	38.0	38.0
Actuated g/C Ratio	0.16	0.16		0.07	0.07		0.17	0.53	0.60	0.06	0.42	0.42
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	276	265		242	117		302	1883	954	101	1481	662
v/s Ratio Prot	c0.11	0.10		0.01	c0.02		c0.12	c0.26	0.00	0.03	0.07	
v/s Ratio Perm									0.02			0.05
v/c Ratio	0.68	0.60		0.07	0.33		0.70	0.49	0.04	0.53	0.17	0.13
Uniform Delay, d1	35.7	35.2		39.4	40.2		35.5	13.5	7.4	41.6	16.5	16.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.8	3.8		0.1	1.7		6.9	0.9	0.0	5.4	0.2	0.4
Delay (s)	42.5	39.0		39.6	41.8		42.3	14.4	7.4	47.0	16.8	16.6
Level of Service	D	D		D	D		D	B	A	D	B	B
Approach Delay (s)		40.7			41.5			18.9			19.9	
Approach LOS		D			D			B			B	

Intersection Summary

HCM Average Control Delay	24.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	90.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	53.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

2: Expedition Way & N. Torrey Pines Rd

10/24/2008

10/24/2008

Existing + Cumulative + Project AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.95	0.95		0.97	1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.89		1.00	0.94		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1572		3433	1751		1770	3539	1583	1770	3526	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1572		3433	1751		1770	3539	1583	1770	3526	
Volume (vph)	2	16	46	9	19	13	210	966	128	14	294	7
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	17	50	10	21	14	228	1050	139	15	320	8
RTOR Reduction (vph)	0	43	0	0	12	0	0	0	42	0	1	0
Lane Group Flow (vph)	2	24	0	10	23	0	228	1050	97	15	327	0
Turn Type	Prot			Prot			Prot		pm+ov	Prot		
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases									2			
Actuated Green, G (s)	1.0	15.6		5.9	19.5		16.7	72.4	78.3	2.9	58.6	
Effective Green, g (s)	1.0	15.6		5.9	19.5		16.7	72.4	78.3	2.9	58.6	
Actuated g/C Ratio	0.01	0.14		0.05	0.17		0.15	0.65	0.70	0.03	0.52	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	15	219		181	305		264	2292	1165	46	1848	
v/s Ratio Prot	0.00	c0.00		0.00	0.01		c0.13	c0.30	c0.00	0.01	0.09	
v/s Ratio Perm		0.01							0.06			
v/c Ratio	0.13	0.11		0.06	0.08		0.86	0.46	0.08	0.33	0.18	
Uniform Delay, d1	55.0	42.0		50.3	38.6		46.4	9.9	5.3	53.5	13.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.0	0.2		0.1	0.1		24.1	0.7	0.0	4.1	0.2	
Delay (s)	59.0	42.3		50.4	38.7		70.5	10.5	5.4	57.6	14.2	
Level of Service	E	D		D	D		E	B	A	E	B	
Approach Delay (s)		42.7			41.3			19.7			16.1	
Approach LOS		D			D			B			B	

Intersection Summary

HCM Average Control Delay	20.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	111.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	43.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	1	4	6	331	257	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	4	7	360	279	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	658	285	290			
vC1, stage 1 conf vol			0			
vC2, stage 2 conf vol			0			
vCu, unblocked vol	658	285	290			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)			3.1			
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	99			
cM capacity (veh/h)	426	754	984			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	5	7	360	290
Volume Left	1	7	0	0
Volume Right	4	0	0	11
cSH	654	984	1700	1700
Volume to Capacity	0.01	0.01	0.21	0.17
Queue Length 95th (ft)	1	1	0	0
Control Delay (s)	10.6	8.7	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	10.6	0.2		0.0
Approach LOS	B			

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	27.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	1	2	17	327	249	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	2	18	355	271	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	667	274	278			
vC1, stage 1 conf vol			0			
vC2, stage 2 conf vol			0			
vCu, unblocked vol	667	274	278			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)			3.1			
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	98			
cM capacity (veh/h)	416	764	989			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	3	18	355	278
Volume Left	1	18	0	0
Volume Right	2	0	0	8
cSH	598	989	1700	1700
Volume to Capacity	0.01	0.02	0.21	0.16
Queue Length 95th (ft)	0	1	0	0
Control Delay (s)	11.1	8.7	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	11.1	0.4		0.0
Approach LOS	B			

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	27.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	3	9	331	32	49	219
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	10	360	35	53	238
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	722	377			395	
vC1, stage 1 conf vol					0	
vC2, stage 2 conf vol					0	
vCu, unblocked vol	722	377			395	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)					3.1	
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			94	
cM capacity (veh/h)	372	669			948	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	13	395	53	238
Volume Left	3	0	53	0
Volume Right	10	35	0	0
cSH	558	1700	948	1700
Volume to Capacity	0.02	0.23	0.06	0.14
Queue Length 95th (ft)	2	0	4	0
Control Delay (s)	11.6	0.0	9.0	0.0
Lane LOS	B		A	
Approach Delay (s)	11.6	0.0	1.7	
Approach LOS	B			

Intersection Summary

Average Delay	0.9		
Intersection Capacity Utilization	36.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.94	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	1770	1583		1860	1750	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	1770	1583		1855	1750	
Volume (vph)	75	12	3	94	10	8
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	82	13	3	102	11	9
RTOR Reduction (vph)	0	8	0	0	5	0
Lane Group Flow (vph)	82	5	0	105	15	0
Turn Type		Perm	Perm			
Protected Phases	4			2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	16.0	16.0		16.0	16.0	
Effective Green, g (s)	16.0	16.0		16.0	16.0	
Actuated g/C Ratio	0.40	0.40		0.40	0.40	
Clearance Time (s)	4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	708	633		742	700	
v/s Ratio Prot	c0.05				0.01	
v/s Ratio Perm		0.00		c0.06		
v/c Ratio	0.12	0.01		0.14	0.02	
Uniform Delay, d1	7.5	7.2		7.6	7.3	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.0		0.4	0.1	
Delay (s)	7.9	7.2		8.0	7.3	
Level of Service	A	A		A	A	
Approach Delay (s)	7.8			8.0	7.3	
Approach LOS	A			A	A	

Intersection Summary

HCM Average Control Delay	7.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.13		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	18.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

7: Downwind Way & La Jolla Shores Drive

10/24/2008

10/24/2008 — Existing + Cumulative + Project AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	0	0	88	1	23	1	320	57	1	206	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	0	0	96	1	25	1	348	62	1	224	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	603	640	226	607	610	379	227			410		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	603	640	226	607	610	379	227			410		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	77	100	96	100			100		
cM capacity (veh/h)	394	393	814	408	408	668	1341			1149		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	1	122	1	410	1	227
Volume Left	1	96	1	0	1	0
Volume Right	0	25	0	62	0	3
cSH	394	443	1341	1700	1149	1700
Volume to Capacity	0.00	0.27	0.00	0.24	0.00	0.13
Queue Length 95th (ft)	0	28	0	0	0	0
Control Delay (s)	14.2	16.2	7.7	0.0	8.1	0.0
Lane LOS	B	C	A		A	
Approach Delay (s)	14.2	16.2	0.0		0.0	
Approach LOS	B	C				

Intersection Summary

Average Delay	2.6		
Intersection Capacity Utilization	32.8%	ICU Level of Service	A
Analysis Period (min)	15		

8: Downwind Way & Shellback Way

10/24/2008

10/24/2008 — Existing + Cumulative + Project AM

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	2	50	17	8	116	94
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	54	18	9	126	102
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			57		75	29
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			57		75	29
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		86	90
cM capacity (veh/h)			1548		917	1045

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	57	27	228
Volume Left	0	18	126
Volume Right	54	0	102
cSH	1700	1548	971
Volume to Capacity	0.03	0.01	0.24
Queue Length 95th (ft)	0	1	23
Control Delay (s)	0.0	5.0	9.8
Lane LOS		A	A
Approach Delay (s)	0.0	5.0	9.8
Approach LOS			A

Intersection Summary

Average Delay	7.6		
Intersection Capacity Utilization	26.9%	ICU Level of Service	A
Analysis Period (min)	15		

6: Downwind Way & La Jolla Shores Drive

10/24/2008

10/24/2008

Existing + Cumulative + Project AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	1	0	88	1	23	1	300	57	1	203	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1	0	96	1	25	1	326	62	1	221	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								1091			920	
pX, platoon unblocked												
vC, conflicting volume	578	615	222	583	585	357	224			388		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	578	615	222	583	585	357	224			388		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	77	100	96	100			100		
cM capacity (veh/h)	410	406	817	423	422	687	1345			1170		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	1	122	1	338	1	224
Volume Left	0	96	1	0	1	0
Volume Right	0	25	0	62	0	3
cSH	406	459	1345	1700	1170	1700
Volume to Capacity	0.00	0.27	0.00	0.23	0.00	0.13
Queue Length 95th (ft)	0	26	0	0	0	0
Control Delay (s)	13.9	15.7	7.7	0.0	8.1	0.0
Lane LOS	B	C	A		A	
Approach Delay (s)	13.9	15.7	0.0		0.0	
Approach LOS	B	C				

Intersection Summary

Average Delay	2.6		
Intersection Capacity Utilization	38.9%	ICU Level of Service	A
Analysis Period (min)	15		

10: La Jolla Shores Pkwy & La Jolla Shores Drive

10/24/2008

10/24/2008

Existing + Cumulative + Project AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.95	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	
Satd. Flow (prot)	3433	3539		1770	3539	1583	1770	1863	1583	1681	1686	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	
Satd. Flow (perm)	3433	3539		1770	3539	1583	1770	1863	1583	1681	1686	
Volume (vph)	233	1453	2	13	1811	297	1	1	1	253	1	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	253	1579	2	14	1968	323	1	1	1	275	1	0
RTOR Reduction (vph)	0	0	0	0	0	80	0	0	1	0	0	0
Lane Group Flow (vph)	253	1581	0	14	1968	243	1	1	0	138	138	0
Turn Type	Prot			Prot		pm+ov	Split		Perm	Split		
Protected Phases	7	4		3	8	6	2	2		6	6	
Permitted Phases						8			2			
Actuated Green, G (s)	13.4	102.9		1.5	91.0	106.2	17.2	17.2	17.2	15.2	15.2	
Effective Green, g (s)	13.4	102.9		1.5	91.0	106.2	17.2	17.2	17.2	15.2	15.2	
Actuated g/C Ratio	0.09	0.67		0.01	0.60	0.70	0.11	0.11	0.11	0.10	0.10	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	301	2383		17	2108	1100	199	210	178	167	168	
v/s Ratio Prot	c0.07	0.45		0.01	c0.56	0.02	c0.00	0.00		c0.08	0.08	
v/s Ratio Perm						0.13			0.00			
v/c Ratio	0.84	0.66		0.82	0.93	0.22	0.01	0.00	0.00	0.83	0.82	
Uniform Delay, d1	68.6	14.7		75.5	28.1	8.4	60.2	60.2	60.2	67.5	67.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	18.6	0.7		132.1	8.3	0.1	0.0	0.0	0.0	27.1	26.4	
Delay (s)	87.3	15.4		207.6	36.5	8.5	60.2	60.2	60.2	94.6	93.9	
Level of Service	F	B		F	D	A	E	E	E	F	F	
Approach Delay (s)		25.3			33.6			60.2			94.2	
Approach LOS		C			C			E			F	

Intersection Summary

HCM Average Control Delay	34.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	152.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	80.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

PM ANALYSIS

1: La Jolla Shores Rd & N. Torrey Pines Rd

10/24/2008

10/24/2008 — Existing + Cumulative · Project PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	0.95		0.97	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.90		1.00	0.91		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.99		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1681	1583		3433	1704		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	0.99		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1681	1583		3433	1704		1770	3539	1583	1770	3539	1583
Volume (vph)	198	33	115	59	43	57	129	515	65	109	1086	321
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	215	36	125	64	47	62	140	560	71	118	1180	349
RTOR Reduction (vph)	0	47	0	0	32	0	0	0	28	0	0	94
Lane Group Flow (vph)	185	144	0	64	77	0	140	560	43	118	1180	255
Turn Type	Split			Split			Prot		pm+ov	Prot		Perm
Protected Phases	4	4		8	8		5	2	8	1	6	
Permitted Phases									2			6
Actuated Green, G (s)	18.1	18.1		10.6	10.6		14.5	60.9	71.5	13.1	59.5	59.5
Effective Green, g (s)	18.1	18.1		10.6	10.6		14.5	60.9	71.5	13.1	59.5	59.5
Actuated g/C Ratio	0.15	0.15		0.09	0.09		0.12	0.51	0.60	0.11	0.50	0.50
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	256	241		307	152		216	1816	954	195	1774	794
v/s Ratio Prot	c0.11	0.09		0.02	c0.05		c0.08	0.16	0.00	0.07	c0.33	
v/s Ratio Perm									0.02			0.16
v/c Ratio	0.72	0.60		0.21	0.51		0.65	0.31	0.04	0.61	0.67	0.32
Uniform Delay, d1	47.9	46.9		50.2	51.6		49.7	16.7	9.6	50.3	22.1	17.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.7	3.9		0.3	2.7		6.5	0.4	0.0	5.2	2.0	1.1
Delay (s)	57.6	50.8		50.5	54.2		56.2	17.2	9.7	55.6	24.1	18.7
Level of Service	E	D		D	D		E	B	A	E	C	B
Approach Delay (s)		54.1			52.8			23.6			25.2	
Approach LOS		D			D			C			C	

Intersection Summary

HCM Average Control Delay	30.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	118.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

2: Expedition Way & N. Torrey Pines Rd

10/24/2008

10/24/2008 — Existing + Cumulative + Project PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.95	0.95		0.97	1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.87		1.00	0.93		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1538		3433	1729		1770	3539	1583	1770	3534	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1538		3433	1729		1770	3539	1583	1770	3534	
Volume (vph)	11	24	163	99	23	21	114	601	84	33	1291	14
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	26	177	108	25	23	124	653	91	36	1403	15
RTOR Reduction (vph)	0	147	0	0	18	0	0	0	30	0	0	0
Lane Group Flow (vph)	12	56	0	108	30	0	124	653	61	36	1418	0
Turn Type	Prot			Prot			Prot		pm+ov	Prot		
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases									2			
Actuated Green, G (s)	1.5	19.9		8.9	25.8		12.3	69.9	78.8	3.5	61.1	
Effective Green, g (s)	1.5	19.9		8.9	25.8		12.3	69.9	78.8	3.5	61.1	
Actuated g/C Ratio	0.01	0.17		0.08	0.22		0.11	0.60	0.68	0.03	0.52	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	22	262		262	382		187	2120	1123	53	1850	
v/s Ratio Prot	0.01	c0.00		c0.03	0.02		c0.07	0.18	0.00	0.02	c0.40	
v/s Ratio Perm		0.03							0.03			
v/c Ratio	0.55	0.21		0.41	0.08		0.66	0.31	0.05	0.68	0.77	
Uniform Delay, d1	57.3	41.7		51.4	36.0		50.2	11.5	6.4	56.0	22.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	24.9	0.4		1.1	0.1		8.5	0.4	0.0	29.4	3.1	
Delay (s)	82.1	42.1		52.5	36.1		58.7	11.9	6.4	85.4	25.2	
Level of Service	F	D		D	D		E	B	A	F	C	
Approach Delay (s)		44.3			47.4			18.0			26.7	
Approach LOS		D			D			B			C	

Intersection Summary

HCM Average Control Delay	26.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	116.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	65.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	3	2	1	265	497	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	2	1	288	540	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	832	542	543			
vC1, stage 1 conf vol			0			
vC2, stage 2 conf vol			0			
vCu, unblocked vol	832	542	543			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)			3.1			
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	100	100			
cM capacity (veh/h)	339	540	900			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	5	1	288	543
Volume Left	3	1	0	0
Volume Right	2	0	0	3
cSH	398	900	1700	1700
Volume to Capacity	0.01	0.00	0.17	0.32
Queue Length 95th (ft)	1	0	0	0
Control Delay (s)	14.2	9.0	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	14.2	0.0		0.0
Approach LOS	B			

Intersection Summary

Average Delay	0.1		
Intersection Capacity Utilization	36.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	5	19	5	273	491	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	21	5	297	534	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	842	534	535			
vC1, stage 1 conf vol			0			
vC2, stage 2 conf vol			0			
vCu, unblocked vol	842	534	535			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)			3.1			
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	96	99			
cM capacity (veh/h)	333	546	903			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	26	5	297	535
Volume Left	5	5	0	0
Volume Right	21	0	0	1
cSH	482	903	1700	1700
Volume to Capacity	0.05	0.01	0.17	0.31
Queue Length 95th (ft)	4	0	0	0
Control Delay (s)	12.9	9.0	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	12.9	0.2		0.0
Approach LOS	B			

Intersection Summary

Average Delay	0.4		
Intersection Capacity Utilization	35.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	28	50	240	4	9	500
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	30	54	261	4	10	543
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	826	263			265	
vC1, stage 1 conf vol					0	
vC2, stage 2 conf vol					0	
vCu, unblocked vol	826	263			265	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)					3.1	
tF (s)	3.5	3.3			2.2	
p0 queue free %	91	93			99	
cM capacity (veh/h)	338	776			993	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	85	265	10	543
Volume Left	30	0	10	0
Volume Right	54	4	0	0
cSH	530	1700	993	1700
Volume to Capacity	0.16	0.16	0.01	0.32
Queue Length 95th (ft)	14	0	1	0
Control Delay (s)	13.1	0.0	8.7	0.0
Lane LOS	B		A	
Approach Delay (s)	13.1	0.0	0.2	
Approach LOS	B			

Intersection Summary

Average Delay	1.3		
Intersection Capacity Utilization	37.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.90		1.00	1.00	0.93	
Flt Protected	0.99		0.95	1.00	1.00	
Satd. Flow (prot)	1651		1770	1863	1734	
Flt Permitted	0.99		0.67	1.00	1.00	
Satd. Flow (perm)	1651		1245	1863	1734	
Volume (vph)	8	27	2	15	63	65
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	29	2	16	68	71
RTOR Reduction (vph)	17	0	0	0	43	0
Lane Group Flow (vph)	21	0	2	16	96	0
Turn Type			Perm			
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	16.0		16.0	16.0	16.0	
Effective Green, g (s)	16.0		16.0	16.0	16.0	
Actuated g/C Ratio	0.40		0.40	0.40	0.40	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Lane Grp Cap (vph)	660		498	745	694	
v/s Ratio Prot	c0.01			0.01	c0.06	
v/s Ratio Perm			0.00			
v/c Ratio	0.03		0.00	0.02	0.14	
Uniform Delay, d1	7.3		7.2	7.3	7.6	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.1		0.0	0.1	0.4	
Delay (s)	7.4		7.2	7.3	8.0	
Level of Service	A		A	A	A	
Approach Delay (s)	7.4			7.3	8.0	
Approach LOS	A			A	A	

Intersection Summary

HCM Average Control Delay	7.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.09		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	17.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

7: Downwind Way & La Jolla Shores Drive

10/24/2008

10/24/2008

Existing + Cumulative + Project PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	0	2	153	1	3	0	242	79	14	495	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	0	2	166	1	3	0	263	86	15	538	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	835	917	538	877	874	306	538			349		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	835	917	538	877	874	306	538			349		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	37	100	100	100			99		
cM capacity (veh/h)	282	268	543	265	284	734	1030			1210		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	3	171	0	349	15	538
Volume Left	1	166	0	0	15	0
Volume Right	2	3	0	86	0	0
cSH	415	269	1700	1700	1210	1700
Volume to Capacity	0.01	0.63	0.00	0.21	0.01	0.32
Queue Length 95th (ft)	1	99	0	0	1	0
Control Delay (s)	13.7	39.1	0.0	0.0	8.0	0.0
Lane LOS	B	E			A	
Approach Delay (s)	13.7	39.1	0.0		0.2	
Approach LOS	B	E				

Intersection Summary

Average Delay	6.4		
Intersection Capacity Utilization	48.1%	ICU Level of Service	A
Analysis Period (min)	15		

8: Downwind Way & Shellback Way

10/24/2008

10/24/2008

Existing + Cumulative + Project PM

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	4	100	78	5	151	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	109	85	5	164	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			113		234	59
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			113		234	59
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			94		77	98
cM capacity (veh/h)			1476		711	1007

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	113	90	180
Volume Left	0	85	164
Volume Right	109	0	16
cSH	1700	1476	731
Volume to Capacity	0.07	0.06	0.25
Queue Length 95th (ft)	0	5	24
Control Delay (s)	0.0	7.2	11.5
Lane LOS		A	B
Approach Delay (s)	0.0	7.2	11.5
Approach LOS			B

Intersection Summary

Average Delay	7.1		
Intersection Capacity Utilization	27.2%	ICU Level of Service	A
Analysis Period (min)	15		

9: Downwind Way & Expedition Way

10/24/2008

Existing + Cumulative + Project PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	189	8	7	1	18	62	8	16	6	4	17	124
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	205	9	8	1	20	67	9	17	7	4	18	135

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total (vph)	205	16	88	33	158
Volume Left (vph)	205	0	1	9	4
Volume Right (vph)	0	8	67	7	135
Hadj (s)	0.53	-0.29	-0.42	-0.03	-0.47
Departure Headway (s)	5.6	4.7	4.3	4.9	4.3
Degree Utilization, x	0.32	0.02	0.11	0.04	0.19
Capacity (veh/h)	622	730	782	683	784
Control Delay (s)	9.9	6.6	7.8	8.1	8.2
Approach Delay (s)	9.7		7.8	8.1	8.2
Approach LOS	A		A	A	A

Intersection Summary

Delay	8.8		
HCM Level of Service	A		
Intersection Capacity Utilization	32.7%	ICU Level of Service	A
Analysis Period (min)	15		

10: La Jolla Shores Pkwy & La Jolla Shores Drive

10/24/2008

Existing + Cumulative + Project PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.95	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	
Satd. Flow (prot)	3433	3537		1770	3539	1583	1770	1863	1583	1681	1687	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	
Satd. Flow (perm)	3433	3537		1770	3539	1583	1770	1863	1583	1681	1687	
Volume (vph)	123	1799	8	19	1587	364	2	1	4	548	5	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	134	1955	9	21	1725	396	2	1	4	596	5	0
RTOR Reduction (vph)	0	0	0	0	0	109	0	0	4	0	0	0
Lane Group Flow (vph)	134	1964	0	21	1725	287	2	1	0	298	303	0
Turn Type	Prot			Prot		pm+ov	Split		Perm	Split		
Protected Phases	7	4		3	8	6	2	2		6	6	
Permitted Phases						8			2			
Actuated Green, G (s)	10.5	88.8		2.8	81.1	109.3	17.1	17.1	17.1	28.2	28.2	
Effective Green, g (s)	10.5	88.8		2.8	81.1	109.3	17.1	17.1	17.1	28.2	28.2	
Actuated g/C Ratio	0.07	0.58		0.02	0.53	0.71	0.11	0.11	0.11	0.18	0.18	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	236	2054		32	1877	1132	198	208	177	310	311	
v/s Ratio Prot	c0.04	c0.56		0.01	0.49	0.05	c0.00	0.00		0.18	c0.18	
v/s Ratio Perm						0.13			0.00			
v/c Ratio	0.57	0.96		0.66	0.92	0.25	0.01	0.00	0.00	0.96	0.97	
Uniform Delay, d1	69.0	30.2		74.6	32.9	7.6	60.4	60.3	60.3	61.8	62.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.1	11.2		39.4	7.7	0.1	0.1	0.0	0.0	42.2	44.9	
Delay (s)	72.1	41.4		113.9	40.6	7.7	60.5	60.4	60.3	104.0	106.9	
Level of Service	E	D		F	D	A	E	E	E	F	F	
Approach Delay (s)		43.4			35.2			60.4			105.4	
Approach LOS		D			D			E			F	

Intersection Summary

HCM Average Control Delay	47.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	152.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	81.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

YEAR 2030 ANALYSIS

AM ANALYSIS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	0.95		0.97	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.93		1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.98		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1681	1622		3433	1668		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	0.98		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1681	1622		3433	1668		1770	3539	1583	1770	3539	1583
Volume (vph)	370	50	120	40	70	160	280	830	130	110	180	260
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	402	54	130	43	76	174	304	902	141	120	196	283
RTOR Reduction (vph)	0	24	0	0	71	0	0	0	63	0	0	196
Lane Group Flow (vph)	292	270	0	43	179	0	304	902	78	120	196	87
Turn Type	Split			Split			Prot		pm+ov	Prot		Perm
Protected Phases	4	4		8	8		5	2	8	1	6	
Permitted Phases									2			6
Actuated Green, G (s)	22.0	22.0		15.2	15.2		22.0	44.9	60.1	10.3	33.2	33.2
Effective Green, g (s)	22.0	22.0		15.2	15.2		22.0	44.9	60.1	10.3	33.2	33.2
Actuated g/C Ratio	0.20	0.20		0.14	0.14		0.20	0.41	0.55	0.10	0.31	0.31
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	341	329		481	234		359	1466	878	168	1084	485
v/s Ratio Prot	c0.17	0.17		0.01	c0.11		c0.17	c0.25	0.01	0.07	0.06	
v/s Ratio Perm									0.04			0.05
v/c Ratio	0.86	0.82		0.09	0.77		0.85	0.62	0.09	0.71	0.18	0.18
Uniform Delay, d1	41.7	41.3		40.6	44.9		41.6	25.0	11.3	47.6	27.6	27.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	18.6	15.0		0.1	14.0		16.6	1.9	0.0	13.4	0.4	0.8
Delay (s)	60.2	56.4		40.7	58.8		58.2	26.9	11.4	61.1	28.0	28.4
Level of Service	E	E		D	E		E	C	B	E	C	C
Approach Delay (s)		58.3			56.2			32.3			34.8	
Approach LOS		E			E			C			C	

Intersection Summary

HCM Average Control Delay	40.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	108.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	71.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.95	0.95		0.97	1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.89		1.00	0.94		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1581		3433	1751		1770	3539	1583	1770	3518	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1581		3433	1751		1770	3539	1583	1770	3518	
Volume (vph)	10	20	50	10	30	20	170	930	190	20	240	10
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	22	54	11	33	22	185	1011	207	22	261	11
RTOR Reduction (vph)	0	46	0	0	18	0	0	0	62	0	2	0
Lane Group Flow (vph)	11	30	0	11	37	0	185	1011	145	22	270	0
Turn Type	Prot			Prot			Prot		pm+ov	Prot		
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases									2			
Actuated Green, G (s)	0.9	15.3		6.0	19.5		14.9	70.7	76.7	2.6	58.4	
Effective Green, g (s)	0.9	15.3		6.0	19.5		14.9	70.7	76.7	2.6	58.4	
Actuated g/C Ratio	0.01	0.14		0.05	0.18		0.14	0.64	0.70	0.02	0.53	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	14	221		188	311		240	2281	1165	42	1873	
v/s Ratio Prot	c0.01	0.00		0.00	c0.02		c0.10	c0.29	c0.01	0.01	0.08	
v/s Ratio Perm		0.02							0.08			
v/c Ratio	0.79	0.13		0.06	0.12		0.77	0.44	0.12	0.52	0.14	
Uniform Delay, d1	54.3	41.4		49.2	37.9		45.8	9.7	5.4	52.9	13.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	130.6	0.3		0.1	0.2		14.2	0.6	0.0	11.3	0.2	
Delay (s)	184.9	41.7		49.3	38.1		59.9	10.3	5.5	64.2	13.2	
Level of Service	F	D		D	D		E	B	A	E	B	
Approach Delay (s)		59.8			39.9			16.2			17.0	
Approach LOS		E			D			B			B	

Intersection Summary

HCM Average Control Delay	19.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	109.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	45.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	10	20	20	530	370	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	22	22	576	402	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1043	424	446			
vC1, stage 1 conf vol			0			
vC2, stage 2 conf vol			0			
vCu, unblocked vol	1043	424	446			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)			3.1			
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	97	98			
cM capacity (veh/h)	248	630	931			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	33	22	576	446
Volume Left	11	22	0	0
Volume Right	22	0	0	43
cSH	416	931	1700	1700
Volume to Capacity	0.08	0.02	0.34	0.26
Queue Length 95th (ft)	6	2	0	0
Control Delay (s)	14.4	9.0	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	14.4	0.3		0.0
Approach LOS	B			

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	37.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	10	10	40	530	360	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	11	43	576	391	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1065	402	413			
vC1, stage 1 conf vol			0			
vC2, stage 2 conf vol			0			
vCu, unblocked vol	1065	402	413			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)			3.1			
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	98	95			
cM capacity (veh/h)	235	648	941			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	22	43	576	413
Volume Left	11	43	0	0
Volume Right	11	0	0	22
cSH	345	941	1700	1700
Volume to Capacity	0.06	0.05	0.34	0.24
Queue Length 95th (ft)	5	4	0	0
Control Delay (s)	16.1	9.0	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	16.1	0.6		0.0
Approach LOS	C			

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	37.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	10	550	10	10	360
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	11	598	11	11	391
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1016	603			609	
vC1, stage 1 conf vol					0	
vC2, stage 2 conf vol					0	
vCu, unblocked vol	1016	603			609	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)					3.1	
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	98			99	
cM capacity (veh/h)	260	499			882	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	11	609	11	391
Volume Left	0	0	11	0
Volume Right	11	11	0	0
cSH	499	1700	882	1700
Volume to Capacity	0.02	0.36	0.01	0.23
Queue Length 95th (ft)	2	0	1	0
Control Delay (s)	12.4	0.0	9.1	0.0
Lane LOS	B		A	
Approach Delay (s)	12.4	0.0	0.2	
Approach LOS	B			

Intersection Summary

Average Delay	0.2		
Intersection Capacity Utilization	39.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0	
Lane Util. Factor		1.00		1.00	1.00	
Frt		0.86		1.00	1.00	
Flt Protected		1.00		0.99	1.00	
Satd. Flow (prot)		1611		1853	1863	
Flt Permitted		1.00		0.98	1.00	
Satd. Flow (perm)		1611		1831	1863	
Volume (vph)	0	20	10	90	10	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	22	11	98	11	0
RTOR Reduction (vph)	0	13	0	0	0	0
Lane Group Flow (vph)	0	9	0	109	11	0
Turn Type		custom	Perm			
Protected Phases				2	6	
Permitted Phases		4	2			
Actuated Green, G (s)		16.0		16.0	16.0	
Effective Green, g (s)		16.0		16.0	16.0	
Actuated g/C Ratio		0.40		0.40	0.40	
Clearance Time (s)		4.0		4.0	4.0	
Lane Grp Cap (vph)		644		732	745	
v/s Ratio Prot					0.01	
v/s Ratio Perm		c0.01		c0.06		
v/c Ratio		0.01		0.15	0.01	
Uniform Delay, d1		7.2		7.7	7.2	
Progression Factor		1.00		1.00	1.00	
Incremental Delay, d2		0.0		0.4	0.0	
Delay (s)		7.3		8.1	7.3	
Level of Service		A		A	A	
Approach Delay (s)	7.3			8.1	7.3	
Approach LOS	A			A	A	

Intersection Summary

HCM Average Control Delay	7.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.08		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	15.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	10	0	110	10	30	0	510	70	10	350	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	11	0	120	11	33	0	554	76	11	380	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1000	1038	386	1000	1005	592	391			630		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1000	1038	386	1000	1005	592	391			630		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	95	100	44	95	94	100			99		
cM capacity (veh/h)	199	228	662	212	239	506	1167			952		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	11	163	0	630	11	391
Volume Left	0	120	0	0	11	0
Volume Right	0	33	0	76	0	11
cSH	228	242	1700	1700	952	1700
Volume to Capacity	0.05	0.67	0.00	0.37	0.01	0.23
Queue Length 95th (ft)	4	108	0	0	1	0
Control Delay (s)	21.6	46.0	0.0	0.0	8.8	0.0
Lane LOS	C	E			A	
Approach Delay (s)	21.6	46.0	0.0		0.2	
Approach LOS	C	E				

Intersection Summary				
Average Delay		6.5		
Intersection Capacity Utilization		52.9%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	10	70	20	10	100	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	76	22	11	109	65
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			87		103	49
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			87		103	49
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		88	94
cM capacity (veh/h)			1509		882	1020

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	87	33	174
Volume Left	0	22	109
Volume Right	76	0	65
cSH	1700	1509	929
Volume to Capacity	0.05	0.01	0.19
Queue Length 95th (ft)	0	1	17
Control Delay (s)	0.0	5.0	9.8
Lane LOS		A	A
Approach Delay (s)	0.0	5.0	9.8
Approach LOS			A

Intersection Summary				
Average Delay		6.3		
Intersection Capacity Utilization		24.2%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	60	20	10	0	10	10	10	20	10	100	30	130
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	65	22	11	0	11	11	11	22	11	109	33	141

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	98	22	43	109	174
Volume Left (vph)	65	0	11	109	0
Volume Right (vph)	11	11	11	0	141
Hadj (s)	0.10	-0.27	-0.07	0.53	-0.53
Departure Headway (s)	4.7	4.5	4.5	5.4	4.3
Degree Utilization, x	0.13	0.03	0.05	0.16	0.21
Capacity (veh/h)	710	740	760	649	813
Control Delay (s)	8.5	7.6	7.8	8.2	7.2
Approach Delay (s)	8.5	7.6	7.8	7.6	
Approach LOS	A	A	A	A	

Intersection Summary			
Delay	7.8		
HCM Level of Service	A		
Intersection Capacity Utilization	30.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	1.00		0.95	0.95	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.99	
Satd. Flow (prot)	3433	3509		1770	3539	1583	1770	1863		1681	1565	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.99	
Satd. Flow (perm)	3433	3509		1770	3539	1583	1770	1863		1681	1565	
Volume (vph)	330	2340	140	460	2920	750	110	30	0	460	50	320
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	359	2543	152	500	3174	815	120	33	0	500	54	348
RTOR Reduction (vph)	0	3	0	0	0	121	0	0	0	0	58	0
Lane Group Flow (vph)	359	2692	0	500	3174	694	120	33	0	419	425	0
Turn Type	Prot			Prot		pm+ov	Split		Perm	Split		
Protected Phases	7	4		3	8	6	2	2		6	6	
Permitted Phases						8			2			
Actuated Green, G (s)	14.0	105.0		5.0	96.0	113.0	17.0	17.0		17.0	17.0	
Effective Green, g (s)	14.0	105.0		5.0	96.0	113.0	17.0	17.0		17.0	17.0	
Actuated g/C Ratio	0.09	0.66		0.03	0.60	0.71	0.11	0.11		0.11	0.11	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	300	2303		55	2123	1116	188	198		179	166	
v/s Ratio Prot	c0.10	0.77		c0.28	c0.90	0.07	c0.07	0.02		0.25	c0.27	
v/s Ratio Perm						0.37						
v/c Ratio	1.20	1.17		9.09	1.50	0.62	0.64	0.17		2.34	2.56	
Uniform Delay, d1	73.0	27.5		77.5	32.0	12.3	68.6	65.1		71.5	71.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	116.3	81.1		3677.3	225.3	1.1	15.4	1.8		620.4	719.2	
Delay (s)	189.3	108.6		3754.8	257.3	13.4	84.0	66.9		691.9	790.7	
Level of Service	F	F		F	F	B	F	E		F	F	
Approach Delay (s)		118.1			602.6			80.3			744.8	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	436.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.75		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	137.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

PM ANALYSIS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	0.95		0.97	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.91		1.00	0.92		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.99		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1681	1597		3433	1705		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	0.99		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1681	1597		3433	1705		1770	3539	1583	1770	3539	1583
Volume (vph)	280	70	160	130	100	130	190	490	150	240	1070	490
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	304	76	174	141	109	141	207	533	163	261	1163	533
RTOR Reduction (vph)	0	39	0	0	30	0	0	0	71	0	0	176
Lane Group Flow (vph)	272	243	0	141	220	0	207	533	92	261	1163	357
Turn Type	Split			Split			Prot		pm+ov	Prot		Perm
Protected Phases	4	4		8	8		5	2	8	1	6	
Permitted Phases									2			6
Actuated Green, G (s)	28.4	28.4		22.3	22.3		22.0	60.4	82.7	20.1	58.5	58.5
Effective Green, g (s)	28.4	28.4		22.3	22.3		22.0	60.4	82.7	20.1	58.5	58.5
Actuated g/C Ratio	0.19	0.19		0.15	0.15		0.15	0.41	0.56	0.14	0.40	0.40
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	324	308		520	258		265	1452	889	242	1406	629
v/s Ratio Prot	c0.16	0.15		0.04	c0.13		0.12	0.15	0.02	c0.15	c0.33	
v/s Ratio Perm									0.04			0.23
v/c Ratio	0.84	0.79		0.27	0.85		0.78	0.37	0.10	1.08	0.83	0.57
Uniform Delay, d1	57.2	56.6		55.3	60.9		60.3	30.1	15.0	63.6	39.8	34.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	17.1	12.6		0.3	23.0		13.9	0.7	0.1	80.3	5.7	3.7
Delay (s)	74.3	69.2		55.5	83.8		74.1	30.8	15.1	143.8	45.5	38.2
Level of Service	E	E		E	F		E	C	B	F	D	D
Approach Delay (s)		71.7			73.6			37.9			56.6	
Approach LOS		E			E			D			E	

Intersection Summary

HCM Average Control Delay	56.1	HCM Level of Service	E
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	147.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	81.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.95	0.95		0.97	1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.88		1.00	0.92		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1558		3433	1723		1770	3539	1583	1770	3531	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1558		3433	1723		1770	3539	1583	1770	3531	
Volume (vph)	10	30	120	150	30	30	130	570	120	50	1250	20
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	33	130	163	33	33	141	620	130	54	1359	22
RTOR Reduction (vph)	0	102	0	0	25	0	0	0	43	0	1	0
Lane Group Flow (vph)	11	61	0	163	41	0	141	620	87	54	1380	0
Turn Type	Prot			Prot			Prot		pm+ov	Prot		
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases									2			
Actuated Green, G (s)	0.8	20.1		10.8	29.3		13.0	68.9	79.7	4.7	60.6	
Effective Green, g (s)	0.8	20.1		10.8	29.3		13.0	68.9	79.7	4.7	60.6	
Actuated g/C Ratio	0.01	0.17		0.09	0.24		0.11	0.58	0.67	0.04	0.51	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	11	262		310	422		192	2037	1107	69	1788	
v/s Ratio Prot	0.01	c0.00		c0.05	0.02		c0.08	0.18	0.01	0.03	c0.39	
v/s Ratio Perm		0.04							0.05			
v/c Ratio	1.00	0.23		0.53	0.10		0.73	0.30	0.08	0.78	0.77	
Uniform Delay, d1	59.4	43.1		52.0	35.0		51.7	13.1	7.1	57.0	23.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	271.4	0.5		1.6	0.1		13.5	0.4	0.0	42.6	3.3	
Delay (s)	330.8	43.6		53.6	35.1		65.2	13.5	7.1	99.6	27.2	
Level of Service	F	D		D	D		E	B	A	F	C	
Approach Delay (s)		61.8			48.3			20.7			30.0	
Approach LOS		E			D			C			C	

Intersection Summary

HCM Average Control Delay	30.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	119.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	64.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	10	10	0	390	800	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	11	0	424	870	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1299	875	880			
vC1, stage 1 conf vol			0			
vC2, stage 2 conf vol			0			
vCu, unblocked vol	1299	875	880			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)			3.1			
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	97	100			
cM capacity (veh/h)	178	349	813			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	22	0	424	880
Volume Left	11	0	0	0
Volume Right	11	0	0	11
cSH	236	1700	1700	1700
Volume to Capacity	0.09	0.00	0.25	0.52
Queue Length 95th (ft)	8	0	0	0
Control Delay (s)	21.8	0.0	0.0	0.0
Lane LOS	C			
Approach Delay (s)	21.8	0.0		0.0
Approach LOS	C			

Intersection Summary

Average Delay	0.4		
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	10	50	10	410	800	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	54	11	446	870	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1337	870	870			
vC1, stage 1 conf vol			0			
vC2, stage 2 conf vol			0			
vCu, unblocked vol	1337	870	870			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)			3.1			
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	85	99			
cM capacity (veh/h)	167	351	815			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	65	11	446	870
Volume Left	11	11	0	0
Volume Right	54	0	0	0
cSH	296	815	1700	1700
Volume to Capacity	0.22	0.01	0.26	0.51
Queue Length 95th (ft)	21	1	0	0
Control Delay (s)	20.5	9.5	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	20.5	0.2		0.0
Approach LOS	C			

Intersection Summary

Average Delay	1.0		
Intersection Capacity Utilization	52.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	40	400	10	10	830
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	43	435	11	11	902
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1364	440			446	
vC1, stage 1 conf vol					0	
vC2, stage 2 conf vol					0	
vCu, unblocked vol	1364	440			446	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)					3.1	
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	93			99	
cM capacity (veh/h)	161	617			931	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	43	446	11	902
Volume Left	0	0	11	0
Volume Right	43	11	0	0
cSH	617	1700	931	1700
Volume to Capacity	0.07	0.26	0.01	0.53
Queue Length 95th (ft)	6	0	1	0
Control Delay (s)	11.3	0.0	8.9	0.0
Lane LOS	B		A	
Approach Delay (s)	11.3	0.0	0.1	
Approach LOS	B			

Intersection Summary

Average Delay	0.4		
Intersection Capacity Utilization	53.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00	
Frt		0.86	1.00	1.00	1.00	
Flt Protected		1.00	0.95	1.00	1.00	
Satd. Flow (prot)		1611	1770	1863	1863	
Flt Permitted		1.00	0.71	1.00	1.00	
Satd. Flow (perm)		1611	1331	1863	1863	
Volume (vph)	0	50	10	10	60	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	54	11	11	65	0
RTOR Reduction (vph)	0	32	0	0	0	0
Lane Group Flow (vph)	0	22	11	11	65	0
Turn Type		custom	Perm			
Protected Phases				2	6	
Permitted Phases		4	2			
Actuated Green, G (s)		16.0	16.0	16.0	16.0	
Effective Green, g (s)		16.0	16.0	16.0	16.0	
Actuated g/C Ratio		0.40	0.40	0.40	0.40	
Clearance Time (s)		4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)		644	532	745	745	
v/s Ratio Prot				0.01	c0.03	
v/s Ratio Perm		c0.01	0.01			
v/c Ratio		0.03	0.02	0.01	0.09	
Uniform Delay, d1		7.3	7.3	7.2	7.5	
Progression Factor		1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.1	0.1	0.0	0.2	
Delay (s)		7.4	7.3	7.3	7.7	
Level of Service		A	A	A	A	
Approach Delay (s)	7.4			7.3	7.7	
Approach LOS	A			A	A	

Intersection Summary

HCM Average Control Delay	7.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.06		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

7: Downwind Way & La Jolla Shores Drive

10/24/2008

10/24/2008
Year 2030 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	190	0	10	0	410	100	20	820	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	207	0	11	0	446	109	22	891	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1391	1489	891	1435	1435	500	891			554		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1391	1489	891	1435	1435	500	891			554		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	0	100	98	100			98		
cM capacity (veh/h)	116	122	344	109	132	575	769			1026		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	0	217	0	554	22	891
Volume Left	0	207	0	0	22	0
Volume Right	0	11	0	109	0	0
cSH	1700	114	1700	1700	1026	1700
Volume to Capacity	0.00	1.91	0.00	0.33	0.02	0.52
Queue Length 95th (ft)	0	440	0	0	2	0
Control Delay (s)	0.0	505.3	0.0	0.0	8.6	0.0
Lane LOS	A	F			A	
Approach Delay (s)	0.0	505.3	0.0		0.2	
Approach LOS	A	F				

Intersection Summary

Average Delay	65.3		
Intersection Capacity Utilization	61.0%	ICU Level of Service	B
Analysis Period (min)	15		

8: Downwind Way & Shellback Way

10/24/2008

10/24/2008
Year 2030 PM

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	10	110	20	10	160	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	120	22	11	174	65
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			130		125	71
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			130		125	71
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		80	93
cM capacity (veh/h)			1455		857	992

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	130	33	239
Volume Left	0	22	174
Volume Right	120	0	65
cSH	1700	1455	890
Volume to Capacity	0.08	0.01	0.27
Queue Length 95th (ft)	0	1	27
Control Delay (s)	0.0	5.0	10.5
Lane LOS		A	B
Approach Delay (s)	0.0	5.0	10.5
Approach LOS			B

Intersection Summary

Average Delay	6.7		
Intersection Capacity Utilization	27.5%	ICU Level of Service	A
Analysis Period (min)	15		

9: Downwind Way & Expedition Way

10/24/2008

10/24/2008
Year 2030 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	150	20	10	0	40	130	10	20	10	10	20	140
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	163	22	11	0	43	141	11	22	11	11	22	152

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total (vph)	163	33	185	43	185
Volume Left (vph)	163	0	0	11	11
Volume Right (vph)	0	11	141	11	152
Hadj (s)	0.53	-0.20	-0.42	-0.07	-0.45
Departure Headway (s)	5.8	5.0	4.4	5.0	4.4
Degree Utilization, x	0.26	0.05	0.23	0.06	0.23
Capacity (veh/h)	594	681	769	648	747
Control Delay (s)	9.6	7.1	8.7	8.3	8.8
Approach Delay (s)	9.1		8.7	8.3	8.8
Approach LOS	A		A	A	A

Intersection Summary

Delay	8.8		
HCM Level of Service	A		
Intersection Capacity Utilization	39.2%	ICU Level of Service	A
Analysis Period (min)	15		

10: La Jolla Shores Pkwy & La Jolla Shores Drive

10/24/2008

10/24/2008
Year 2030 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.95	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.98	
Satd. Flow (prot)	3433	3501		1770	3539	1583	1770	1863	1583	1681	1615	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.98	
Satd. Flow (perm)	3433	3501		1770	3539	1583	1770	1863	1583	1681	1615	
Volume (vph)	210	2840	220	520	2500	640	50	30	110	940	130	340
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	228	3087	239	565	2717	696	54	33	120	1022	141	370
RTOR Reduction (vph)	0	4	0	0	0	120	0	0	40	0	21	0
Lane Group Flow (vph)	228	3322	0	565	2717	576	54	33	80	763	749	0
Turn Type	Prot			Prot		pm+ov	Split		Perm	Split		
Protected Phases	7	4		3	8	6	2	2		6	6	
Permitted Phases						8			2			
Actuated Green, G (s)	12.0	94.0		5.0	87.0	115.0	17.0	17.0	17.0	28.0	28.0	
Effective Green, g (s)	12.0	94.0		5.0	87.0	115.0	17.0	17.0	17.0	28.0	28.0	
Actuated g/C Ratio	0.08	0.59		0.03	0.54	0.72	0.11	0.11	0.11	0.18	0.18	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	257	2057		55	1924	1138	188	198	168	294	283	
v/s Ratio Prot	0.07	c0.95		c0.32	0.77	0.09	0.03	0.02		0.45	c0.46	
v/s Ratio Perm						0.28			c0.05			
v/c Ratio	0.89	1.62		10.27	1.41	0.51	0.29	0.17	0.47	2.60	2.65	
Uniform Delay, d1	73.3	33.0		77.5	36.5	9.9	65.9	65.1	67.3	66.0	66.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	28.5	279.1		4208.7	188.6	0.4	3.8	1.8	9.3	727.7	751.7	
Delay (s)	101.8	312.1		4286.2	225.1	10.3	69.7	66.9	76.6	793.7	817.7	
Level of Service	F	F		F	F	B	E	E	E	F	F	
Approach Delay (s)		298.6			764.3			73.3			805.7	
Approach LOS		F			F			E			F	

Intersection Summary

HCM Average Control Delay	577.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.98		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	170.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

YEAR 2030 + PROJECT ANALYSIS

AM ANALYSIS

1: La Jolla Shores Rd & N. Torrey Pines Rd

10/24/2008

10/24/2008

Year 2030 + Project AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	0.95		0.97	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.93		1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.98		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1681	1621		3433	1668		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	0.98		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1681	1621		3433	1668		1770	3539	1583	1770	3539	1583
Volume (vph)	372	50	121	40	70	160	290	830	130	110	180	279
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	404	54	132	43	76	174	315	902	141	120	196	303
RTOR Reduction (vph)	0	25	0	0	71	0	0	0	63	0	0	211
Lane Group Flow (vph)	294	271	0	43	179	0	315	902	78	120	196	92
Turn Type	Split			Split			Prot		pm+ov	Prot		Perm
Protected Phases	4	4		8	8		5	2	8	1	6	
Permitted Phases									2			6
Actuated Green, G (s)	22.1	22.1		15.2	15.2		22.6	45.2	60.4	10.3	32.9	32.9
Effective Green, g (s)	22.1	22.1		15.2	15.2		22.6	45.2	60.4	10.3	32.9	32.9
Actuated g/C Ratio	0.20	0.20		0.14	0.14		0.21	0.42	0.56	0.09	0.30	0.30
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	341	329		480	233		368	1470	879	168	1070	479
v/s Ratio Prot	c0.17	0.17		0.01	c0.11		c0.18	c0.25	0.01	0.07	0.06	
v/s Ratio Perm									0.04			0.06
v/c Ratio	0.86	0.82		0.09	0.77		0.86	0.61	0.09	0.71	0.18	0.19
Uniform Delay, d1	41.9	41.5		40.8	45.1		41.5	24.9	11.3	47.8	28.0	28.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	19.5	15.3		0.1	14.5		17.4	1.9	0.0	13.4	0.4	0.9
Delay (s)	61.4	56.8		40.9	59.6		58.9	26.9	11.4	61.3	28.4	29.0
Level of Service	E	E		D	E		E	C	B	E	C	C
Approach Delay (s)		59.1			56.9			32.7			35.1	
Approach LOS		E			E			C			D	

Intersection Summary

HCM Average Control Delay	41.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	108.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	71.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

2: Expedition Way & N. Torrey Pines Rd

10/24/2008

10/24/2008

Year 2030 + Project AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.95	0.95		0.97	1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.89		1.00	0.94		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1574		3433	1751		1770	3539	1583	1770	3518	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1574		3433	1751		1770	3539	1583	1770	3518	
Volume (vph)	10	20	57	10	30	20	240	940	190	20	241	10
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	22	62	11	33	22	261	1022	207	22	262	11
RTOR Reduction (vph)	0	53	0	0	18	0	0	0	61	0	2	0
Lane Group Flow (vph)	11	31	0	11	37	0	261	1022	146	22	271	0
Turn Type	Prot			Prot			Prot		pm+ov	Prot		
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases									2			
Actuated Green, G (s)	1.0	15.7		5.9	19.6		18.1	73.3	79.2	2.7	57.9	
Effective Green, g (s)	1.0	15.7		5.9	19.6		18.1	73.3	79.2	2.7	57.9	
Actuated g/C Ratio	0.01	0.14		0.05	0.17		0.16	0.65	0.70	0.02	0.51	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	15	219		180	305		285	2304	1170	42	1809	
v/s Ratio Prot	c0.01	0.00		0.00	c0.02		c0.15	c0.29	c0.01	0.01	0.08	
v/s Ratio Perm		0.02							0.09			
v/c Ratio	0.73	0.14		0.06	0.12		0.92	0.44	0.12	0.52	0.15	
Uniform Delay, d1	55.7	42.5		50.7	39.2		46.5	9.6	5.4	54.3	14.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	103.2	0.3		0.1	0.2		31.9	0.6	0.0	11.3	0.2	
Delay (s)	158.9	42.8		50.9	39.4		78.4	10.3	5.5	65.6	14.6	
Level of Service	F	D		D	D		E	B	A	E	B	
Approach Delay (s)		56.3			41.3			21.5			18.4	
Approach LOS		E			D			C			B	

Intersection Summary

HCM Average Control Delay	23.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	112.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	46.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	10	20	20	533	399	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	22	22	579	434	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1078	455	477			
vC1, stage 1 conf vol			0			
vC2, stage 2 conf vol			0			
vCu, unblocked vol	1078	455	477			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)			3.1			
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	96	98			
cM capacity (veh/h)	236	605	921			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	33	22	579	477
Volume Left	11	22	0	0
Volume Right	22	0	0	43
cSH	398	921	1700	1700
Volume to Capacity	0.08	0.02	0.34	0.28
Queue Length 95th (ft)	7	2	0	0
Control Delay (s)	14.9	9.0	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	14.9	0.3		0.0
Approach LOS	B			

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	38.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	10	10	40	533	389	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	11	43	579	423	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1100	434	445			
vC1, stage 1 conf vol			0			
vC2, stage 2 conf vol			0			
vCu, unblocked vol	1100	434	445			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)			3.1			
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	98	95			
cM capacity (veh/h)	224	622	931			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	22	43	579	445
Volume Left	11	43	0	0
Volume Right	11	0	0	22
cSH	329	931	1700	1700
Volume to Capacity	0.07	0.05	0.34	0.26
Queue Length 95th (ft)	5	4	0	0
Control Delay (s)	16.7	9.1	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	16.7	0.6		0.0
Approach LOS	C			

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	38.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	13	10	550	39	15	360
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	11	598	42	16	391
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1043	619			640	
vC1, stage 1 conf vol					0	
vC2, stage 2 conf vol					0	
vCu, unblocked vol	1043	619			640	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)					3.1	
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	98			98	
cM capacity (veh/h)	249	489			873	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	14	11	640	16	391
Volume Left	14	0	0	16	0
Volume Right	0	11	42	0	0
cSH	249	489	1700	873	1700
Volume to Capacity	0.06	0.02	0.38	0.02	0.23
Queue Length 95th (ft)	4	2	0	1	0
Control Delay (s)	20.3	12.5	0.0	9.2	0.0
Lane LOS	C	B		A	
Approach Delay (s)	16.9		0.0	0.4	
Approach LOS	C				

Intersection Summary

Average Delay	0.5		
Intersection Capacity Utilization	41.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.96	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	1770	1583		1857	1779	
Flt Permitted	0.95	1.00		0.99	1.00	
Satd. Flow (perm)	1770	1583		1842	1779	
Volume (vph)	75	20	10	160	17	8
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	82	22	11	174	18	9
RTOR Reduction (vph)	0	13	0	0	5	0
Lane Group Flow (vph)	82	9	0	185	22	0
Turn Type		Perm	Perm			
Protected Phases	4			2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	16.0	16.0		16.0	16.0	
Effective Green, g (s)	16.0	16.0		16.0	16.0	
Actuated g/C Ratio	0.40	0.40		0.40	0.40	
Clearance Time (s)	4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	708	633		737	712	
v/s Ratio Prot	c0.05				0.01	
v/s Ratio Perm		0.01		c0.10		
v/c Ratio	0.12	0.01		0.25	0.03	
Uniform Delay, d1	7.5	7.2		8.0	7.3	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.0		0.8	0.1	
Delay (s)	7.9	7.3		8.8	7.4	
Level of Service	A	A		A	A	
Approach Delay (s)	7.8			8.8	7.4	
Approach LOS	A			A	A	

Intersection Summary

HCM Average Control Delay	8.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.18		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	26.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	10	0	110	10	30	0	530	70	10	353	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	11	0	120	11	33	0	576	76	11	384	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1025	1063	389	1025	1030	614	395			652		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1025	1063	389	1025	1030	614	395			652		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	95	100	41	95	93	100			99		
cM capacity (veh/h)	190	221	659	204	231	492	1164			934		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	11	163	0	652	11	395
Volume Left	0	120	0	0	11	0
Volume Right	0	33	0	76	0	11
cSH	221	233	1700	1700	934	1700
Volume to Capacity	0.05	0.70	0.00	0.38	0.01	0.23
Queue Length 95th (ft)	4	115	0	0	1	0
Control Delay (s)	22.2	50.2	0.0	0.0	8.9	0.0
Lane LOS	C	F			A	
Approach Delay (s)	22.2	50.2	0.0		0.2	
Approach LOS	C	F				

Intersection Summary

Average Delay	6.9		
Intersection Capacity Utilization	53.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	10	70	20	27	100	130
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	76	22	29	109	141
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			87		122	49
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			87		122	49
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		87	86
cM capacity (veh/h)			1509		861	1020

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	87	51	250
Volume Left	0	22	109
Volume Right	76	0	141
cSH	1700	1509	944
Volume to Capacity	0.05	0.01	0.26
Queue Length 95th (ft)	0	1	27
Control Delay (s)	0.0	3.2	10.2
Lane LOS		A	B
Approach Delay (s)	0.0	3.2	10.2
Approach LOS			B

Intersection Summary

Average Delay	7.0		
Intersection Capacity Utilization	29.4%	ICU Level of Service	A
Analysis Period (min)	15		

9: Downwind Way & Expedition Way

10/24/2008

10/24/2008

Year 2030 + Project AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	67	20	10	0	10	10	10	20	10	100	30	200
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	73	22	11	0	11	11	11	22	11	109	33	217

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	105	22	43	109	250
Volume Left (vph)	73	0	11	109	0
Volume Right (vph)	11	11	11	0	217
Hadj (s)	0.11	-0.27	-0.07	0.53	-0.57
Departure Headway (s)	4.9	4.6	4.6	5.4	4.3
Degree Utilization, x	0.14	0.03	0.06	0.16	0.30
Capacity (veh/h)	685	709	741	646	817
Control Delay (s)	8.7	7.8	7.9	8.3	7.9
Approach Delay (s)	8.7	7.8	7.9	8.0	
Approach LOS	A	A	A	A	

Intersection Summary			
Delay	8.1		
HCM Level of Service	A		
Intersection Capacity Utilization	32.6%	ICU Level of Service	A
Analysis Period (min)	15		

10: La Jolla Shores Pkwy & La Jolla Shores Drive

10/24/2008

10/24/2008

Year 2030 + Project AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	1.00		0.95	0.95	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.96	
Satd. Flow (prot)	3433	3509		1770	3539	1583	1770	1863		1681	1701	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.96	
Satd. Flow (perm)	3433	3509		1770	3539	1583	1770	1863		1681	1701	
Volume (vph)	335	2340	140	460	2920	785	110	30	0	462	50	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	364	2543	152	500	3174	853	120	33	0	502	54	0
RTOR Reduction (vph)	0	3	0	0	0	126	0	0	0	0	0	0
Lane Group Flow (vph)	364	2692	0	500	3174	727	120	33	0	271	285	0
Turn Type	Prot			Prot		pm+ov	Split		Perm	Split		
Protected Phases	7	4		3	8	6	2	2		6	6	
Permitted Phases						8			2			
Actuated Green, G (s)	14.0	105.0		5.0	96.0	113.0	17.0	17.0		17.0	17.0	
Effective Green, g (s)	14.0	105.0		5.0	96.0	113.0	17.0	17.0		17.0	17.0	
Actuated g/C Ratio	0.09	0.66		0.03	0.60	0.71	0.11	0.11		0.11	0.11	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	300	2303		55	2123	1118	188	198		179	181	
v/s Ratio Prot	c0.11	0.77		c0.28	c0.90	0.07	c0.07	0.02		0.16	c0.17	
v/s Ratio Perm						0.39						
v/c Ratio	1.21	1.17		9.09	1.50	0.65	0.64	0.17		1.51	1.57	
Uniform Delay, d1	73.0	27.5		77.5	32.0	12.8	68.6	65.1		71.5	71.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	122.7	81.1		3677.3	225.3	1.3	15.4	1.8		257.9	283.4	
Delay (s)	195.7	108.6		3754.8	257.3	14.1	84.0	66.9		329.4	354.9	
Level of Service	F	F		F	F	B	F	E		F	F	
Approach Delay (s)		119.0			597.8			80.3			342.5	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	394.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.63		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	125.4%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

PM ANALYSIS

1: La Jolla Shores Rd & N. Torrey Pines Rd

10/24/2008

10/24/2008

Year 2030 + Project PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	0.95		0.97	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.91		1.00	0.92		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.99		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1681	1595		3433	1705		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	0.99		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1681	1595		3433	1705		1770	3539	1583	1770	3539	1583
Volume (vph)	297	70	169	130	100	130	191	490	150	240	1070	490
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	323	76	184	141	109	141	208	533	163	261	1163	533
RTOR Reduction (vph)	0	38	0	0	30	0	0	0	72	0	0	178
Lane Group Flow (vph)	287	258	0	141	220	0	208	533	91	261	1163	355
Turn Type	Split			Split			Prot		pm+ov	Prot		Perm
Protected Phases	4	4		8	8		5	2	8	1	6	
Permitted Phases									2			6
Actuated Green, G (s)	29.6	29.6		22.4	22.4		22.3	60.4	82.8	20.1	58.2	58.2
Effective Green, g (s)	29.6	29.6		22.4	22.4		22.3	60.4	82.8	20.1	58.2	58.2
Actuated g/C Ratio	0.20	0.20		0.15	0.15		0.15	0.41	0.56	0.14	0.39	0.39
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	335	318		518	257		266	1439	883	240	1387	620
v/s Ratio Prot	c0.17	0.16		0.04	c0.13		0.12	0.15	0.02	c0.15	c0.33	
v/s Ratio Perm									0.04			0.22
v/c Ratio	0.86	0.81		0.27	0.86		0.78	0.37	0.10	1.09	0.84	0.57
Uniform Delay, d1	57.4	56.8		55.8	61.5		60.8	30.8	15.4	64.2	40.9	35.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	18.9	14.1		0.3	23.4		13.9	0.7	0.1	83.4	6.2	3.8
Delay (s)	76.3	70.8		56.1	84.9		74.6	31.5	15.5	147.6	47.1	39.2
Level of Service	E	E		E	F		E	C	B	F	D	D
Approach Delay (s)		73.5			74.5			38.5			58.4	
Approach LOS		E			E			D			E	

Intersection Summary

HCM Average Control Delay	57.6	HCM Level of Service	E
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	148.5	Sum of lost time (s)	16.0
Intersection Capacity Utilization	81.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

2: Expedition Way & N. Torrey Pines Rd

10/24/2008

10/24/2008

Year 2030 + Project PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.95	0.95		0.97	1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.87		1.00	0.92		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1542		3433	1723		1770	3539	1583	1770	3531	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1681	1542		3433	1723		1770	3539	1583	1770	3531	
Volume (vph)	10	30	180	150	30	30	137	571	120	50	1259	20
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	33	196	163	33	33	149	621	130	54	1368	22
RTOR Reduction (vph)	0	153	0	0	25	0	0	0	43	0	1	0
Lane Group Flow (vph)	11	76	0	163	41	0	149	621	87	54	1389	0
Turn Type	Prot			Prot			Prot		pm+ov	Prot		
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases									2			
Actuated Green, G (s)	0.8	20.1		10.8	29.3		13.4	69.0	79.8	4.7	60.3	
Effective Green, g (s)	0.8	20.1		10.8	29.3		13.4	69.0	79.8	4.7	60.3	
Actuated g/C Ratio	0.01	0.17		0.09	0.24		0.11	0.58	0.67	0.04	0.50	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	11	259		309	421		198	2038	1107	69	1777	
v/s Ratio Prot	0.01	c0.00		c0.05	0.02		c0.08	0.18	0.01	0.03	c0.39	
v/s Ratio Perm		0.05							0.05			
v/c Ratio	1.00	0.29		0.53	0.10		0.75	0.30	0.08	0.78	0.78	
Uniform Delay, d1	59.5	43.6		52.1	35.0		51.6	13.1	7.0	57.0	24.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	271.4	0.6		1.6	0.1		14.9	0.4	0.0	42.6	3.5	
Delay (s)	330.9	44.3		53.7	35.1		66.5	13.4	7.1	99.7	27.9	
Level of Service	F	D		D	D		E	B	A	F	C	
Approach Delay (s)		57.4			48.3			21.3			30.5	
Approach LOS		E			D			C			C	

Intersection Summary

HCM Average Control Delay	31.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	119.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	67.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	10	10	0	416	803	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	11	0	452	873	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1330	878	884			
vC1, stage 1 conf vol			0			
vC2, stage 2 conf vol			0			
vCu, unblocked vol	1330	878	884			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)			3.1			
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	97	100			
cM capacity (veh/h)	171	347	812			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	22	0	452	884
Volume Left	11	0	0	0
Volume Right	11	0	0	11
cSH	229	1700	1700	1700
Volume to Capacity	0.10	0.00	0.27	0.52
Queue Length 95th (ft)	8	0	0	0
Control Delay (s)	22.4	0.0	0.0	0.0
Lane LOS	C			
Approach Delay (s)	22.4	0.0		0.0
Approach LOS	C			

Intersection Summary

Average Delay	0.4		
Intersection Capacity Utilization	52.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	10	50	10	436	803	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	54	11	474	873	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1368	873	873			
vC1, stage 1 conf vol			0			
vC2, stage 2 conf vol			0			
vCu, unblocked vol	1368	873	873			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)			3.1			
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	84	99			
cM capacity (veh/h)	160	350	815			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	65	11	474	873
Volume Left	11	11	0	0
Volume Right	54	0	0	0
cSH	292	815	1700	1700
Volume to Capacity	0.22	0.01	0.28	0.51
Queue Length 95th (ft)	21	1	0	0
Control Delay (s)	20.9	9.5	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	20.9	0.2		0.0
Approach LOS	C			

Intersection Summary

Average Delay	1.0		
Intersection Capacity Utilization	52.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	25	80	400	13	15	830
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	87	435	14	16	902
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1377	442			449	
vC1, stage 1 conf vol					0	
vC2, stage 2 conf vol					0	
vCu, unblocked vol	1377	442			449	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)					3.1	
tF (s)	3.5	3.3			2.2	
p0 queue free %	83	86			98	
cM capacity (veh/h)	157	616			930	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	114	449	16	902
Volume Left	27	0	16	0
Volume Right	87	14	0	0
cSH	363	1700	930	1700
Volume to Capacity	0.31	0.26	0.02	0.53
Queue Length 95th (ft)	33	0	1	0
Control Delay (s)	19.4	0.0	8.9	0.0
Lane LOS	C		A	
Approach Delay (s)	19.4	0.0	0.2	
Approach LOS	C			

Intersection Summary

Average Delay	1.6		
Intersection Capacity Utilization	56.7%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.93	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1583	1770	1863	1731	
Flt Permitted	0.95	1.00	0.67	1.00	1.00	
Satd. Flow (perm)	1770	1583	1248	1863	1731	
Volume (vph)	8	50	10	17	60	65
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	54	11	18	65	71
RTOR Reduction (vph)	0	32	0	0	43	0
Lane Group Flow (vph)	9	22	11	18	93	0
Turn Type		Perm	Perm			
Protected Phases	4			2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	16.0	16.0	16.0	16.0	16.0	
Effective Green, g (s)	16.0	16.0	16.0	16.0	16.0	
Actuated g/C Ratio	0.40	0.40	0.40	0.40	0.40	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	708	633	499	745	692	
v/s Ratio Prot	0.01			0.01	c0.05	
v/s Ratio Perm		c0.01	0.01			
v/c Ratio	0.01	0.03	0.02	0.02	0.13	
Uniform Delay, d1	7.2	7.3	7.3	7.3	7.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.0	0.1	0.1	0.1	0.4	
Delay (s)	7.3	7.4	7.3	7.3	8.0	
Level of Service	A	A	A	A	A	
Approach Delay (s)	7.4			7.3	8.0	
Approach LOS	A			A	A	

Intersection Summary

HCM Average Control Delay	7.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.08		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	18.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	190	0	10	0	412	100	20	837	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	207	0	11	0	448	109	22	910	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1412	1510	910	1455	1455	502	910			557		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1412	1510	910	1455	1455	502	910			557		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	0	100	98	100			98		
cM capacity (veh/h)	113	119	336	107	128	573	757			1024		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	0	217	0	557	22	910
Volume Left	0	207	0	0	22	0
Volume Right	0	11	0	109	0	0
cSH	1700	112	1700	1700	1024	1700
Volume to Capacity	0.00	1.95	0.00	0.33	0.02	0.54
Queue Length 95th (ft)	0	445	0	0	2	0
Control Delay (s)	0.0	521.1	0.0	0.0	8.6	0.0
Lane LOS	A	F			A	
Approach Delay (s)	0.0	521.1	0.0		0.2	
Approach LOS	A	F				

Intersection Summary

Average Delay	66.5		
Intersection Capacity Utilization	61.9%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	10	110	80	10	160	67
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	120	87	11	174	73
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			130		255	71
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			130		255	71
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			94		75	93
cM capacity (veh/h)			1455		689	992

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	130	98	247
Volume Left	0	87	174
Volume Right	120	0	73
cSH	1700	1455	758
Volume to Capacity	0.08	0.06	0.33
Queue Length 95th (ft)	0	5	35
Control Delay (s)	0.0	6.8	12.0
Lane LOS		A	B
Approach Delay (s)	0.0	6.8	12.0
Approach LOS			B

Intersection Summary

Average Delay	7.7		
Intersection Capacity Utilization	31.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	210	20	10	0	40	130	10	20	10	10	20	147
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	228	22	11	0	43	141	11	22	11	11	22	160
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1							
Volume Total (vph)	228	33	185	43	192							
Volume Left (vph)	228	0	0	11	11							
Volume Right (vph)	0	11	141	11	160							
Hadj (s)	0.53	-0.20	-0.42	-0.07	-0.45							
Departure Headway (s)	5.8	5.1	4.5	5.2	4.6							
Degree Utilization, x	0.37	0.05	0.23	0.06	0.25							
Capacity (veh/h)	592	677	744	612	711							
Control Delay (s)	10.9	7.1	8.9	8.6	9.2							
Approach Delay (s)	10.5		8.9	8.6	9.2							
Approach LOS	B		A	A	A							

Intersection Summary

Delay	9.6			
HCM Level of Service	A			
Intersection Capacity Utilization	43.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.95	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	
Satd. Flow (prot)	3433	3501		1770	3539	1583	1770	1863	1583	1681	1704	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	
Satd. Flow (perm)	3433	3501		1770	3539	1583	1770	1863	1583	1681	1704	
Volume (vph)	211	2840	220	520	2500	641	50	30	110	953	130	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	229	3087	239	565	2717	697	54	33	120	1036	141	0
RTOR Reduction (vph)	0	4	0	0	0	121	0	0	40	0	0	0
Lane Group Flow (vph)	229	3322	0	565	2717	576	54	33	80	573	604	0
Turn Type	Prot			Prot		pm+ov	Split		Perm	Split		
Protected Phases	7	4		3	8	6	2	2		6	6	
Permitted Phases						8			2			
Actuated Green, G (s)	12.0	94.0		5.0	87.0	115.0	17.0	17.0	17.0	28.0	28.0	
Effective Green, g (s)	12.0	94.0		5.0	87.0	115.0	17.0	17.0	17.0	28.0	28.0	
Actuated g/C Ratio	0.08	0.59		0.03	0.54	0.72	0.11	0.11	0.11	0.18	0.18	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	257	2057		55	1924	1138	188	198	168	294	298	
v/s Ratio Prot	0.07	c0.95		c0.32	0.77	0.09	0.03	0.02		0.34	c0.35	
v/s Ratio Perm						0.28			c0.05			
v/c Ratio	0.89	1.62		10.27	1.41	0.51	0.29	0.17	0.47	1.95	2.03	
Uniform Delay, d1	73.4	33.0		77.5	36.5	10.0	65.9	65.1	67.3	66.0	66.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	29.5	279.1		4208.7	188.6	0.4	3.8	1.8	9.3	439.3	473.7	
Delay (s)	102.8	312.1		4286.2	225.1	10.3	69.7	66.9	76.6	505.3	539.7	
Level of Service	F	F		F	F	B	E	E	E	F	F	
Approach Delay (s)		298.6			764.1			73.3			522.9	
Approach LOS		F			F			E			F	

Intersection Summary

HCM Average Control Delay	530.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.86		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	160.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

APPENDIX C

CITY OF SAN DIEGO ROADWAY CLASSIFICATION TABLE

TABLE 2
ROADWAY CLASSIFICATIONS, LEVELS OF SERVICE (LOS) AND AVERAGE DAILY TRAFFIC (ADT)

			LEVEL OF SERVICE				
STREET CLASSIFICATION	LANES	CROSS SECTIONS	A	B	C	D	E
Freeway	8 lanes		60,000	84,000	120,000	140,000	150,000
Freeway	6 lanes		45,000	63,000	90,000	110,000	120,000
Freeway	4 lanes		30,000	42,000	60,000	70,000	80,000
Expressway	6 lanes	102/122	30,000	42,000	60,000	70,000	80,000
Prime Arterial	6 lanes	102/122	25,000	35,000	50,000	55,000	60,000
Major Arterial	6 lanes	102/122	20,000	28,000	40,000	45,000	50,000
Major Arterial	4 lanes	78/98	15,000	21,000	30,000	35,000	40,000
Collector	4 lanes	72/92	10,000	14,000	20,000	25,000	30,000
Collector (no Center lane) (continuous left-turn lane)	4 lanes 2 lanes	64/84 50/70	5,000	7,000	10,000	13,000	15,000
Collector (no fronting property)	2 lanes	40/60	4,000	5,500	7,500	9,000	10,000
Collector (commercial-industrial fronting)	2 lanes	50/70	2,500	3,500	5,000	6,500	8,000
Collector (multi-family)	2 lanes	40/60	2,500	3,500	5,000	6,500	8,000
Sub-Collector (single-family)	2 lanes	36/56	—	—	2,200	—	—

LEGEND

XXX/XXX = Curb to curb width (feet)/right of way (feet): based on the City of San Diego Street Design Manual.

XX,XXX = Approximate recommended ADT based on City of San Diego Street Design Manual

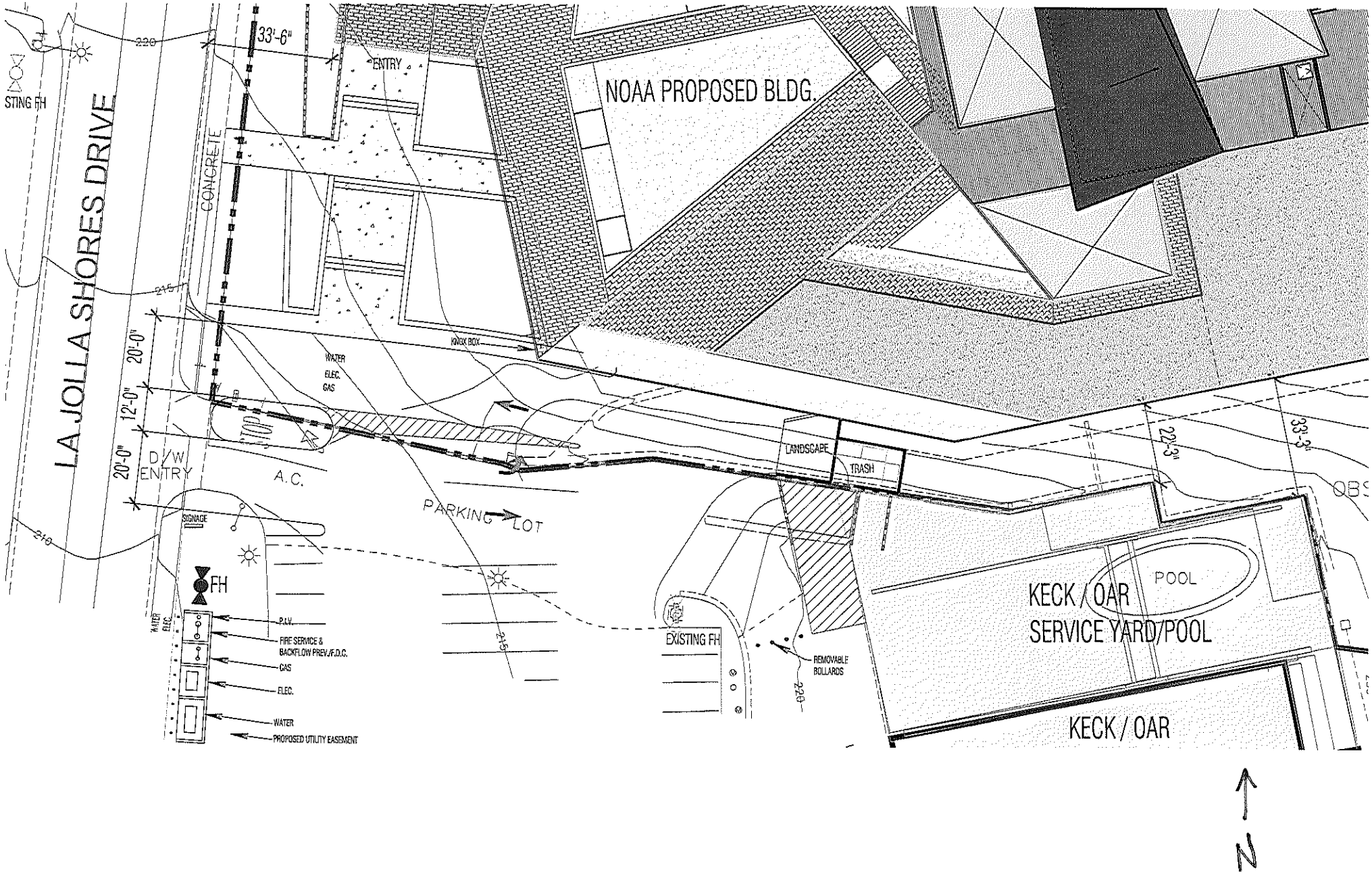
Notes:

1. The volumes and the average daily level of service listed above are only intended as a general planning guideline.

2. Levels of service are not applied to residential streets since their primary purpose is to serve abutting lots, not carry through traffic. Levels of service normally apply to roads carrying through traffic between major trip generators and attractors.

APPENDIX D

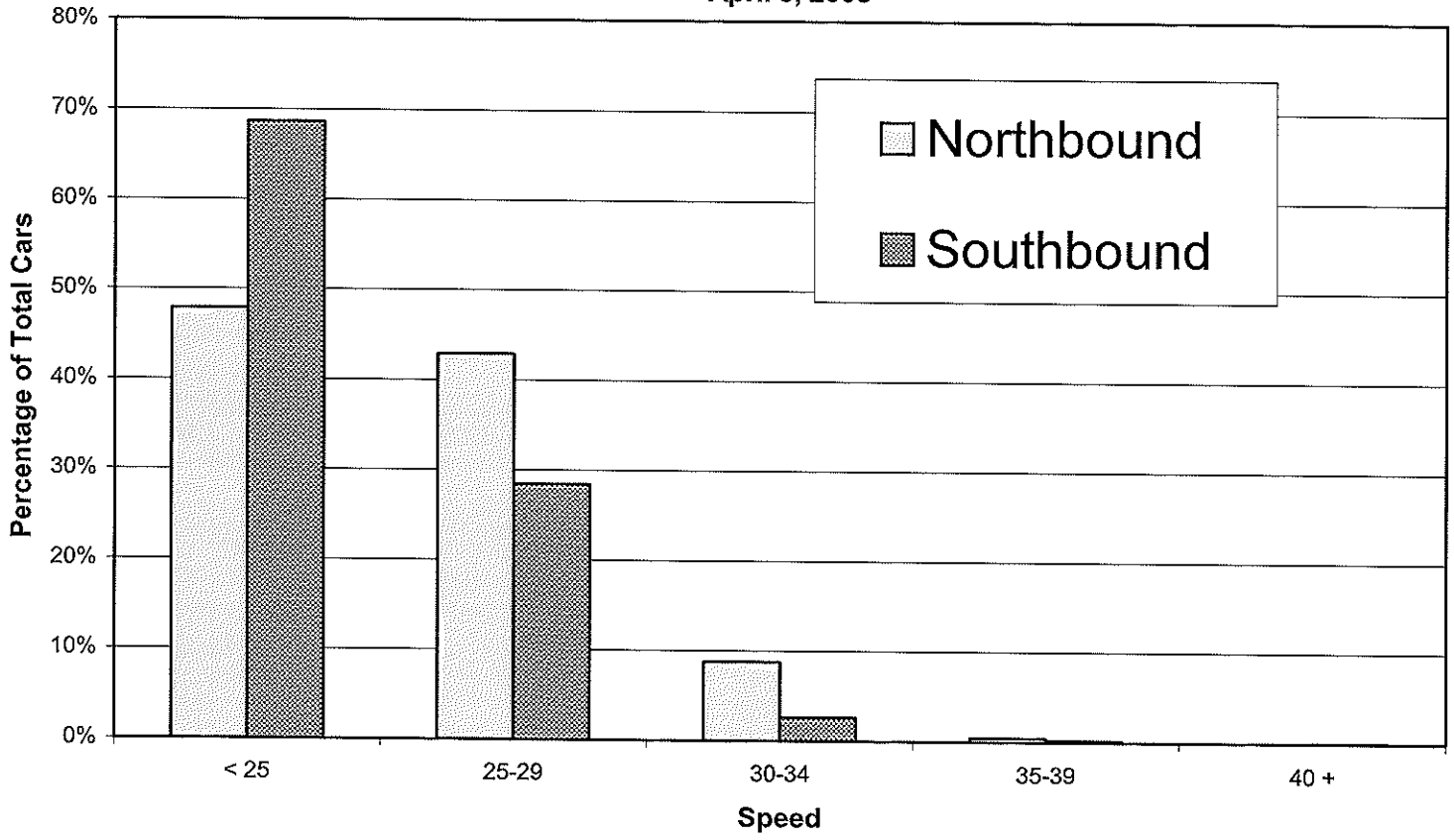
LA JOLLA SHORES DRIVE / SHELLBACK WAY SITE ACCESS CIRCULATION


LA JOLLA SHORES DRIVE
STING FH
220
215
210
33'-6"
CONCRETE
ENTRY
NOAA PROPOSED BLDG.
KNOX BOX
WATER
ELEC.
GAS
20'-0"
12'-0"
20'-0"
D/W
ENTRY
STOP
A.C.
PARKING LOT
SIGNAGE
FH
P.I.V.
FIRE SERVICE &
BACKFLOW PREV./F.D.C.
GAS
ELEC.
WATER
PROPOSED UTILITY EASEMENT
EXISTING FH
REMOVABLE
BOLLARDS
LANDSCAPE
TRASH
22'-3"
33'-3"
KECK / OAR
SERVICE YARD/POOL
POOL
KECK / OAR
N

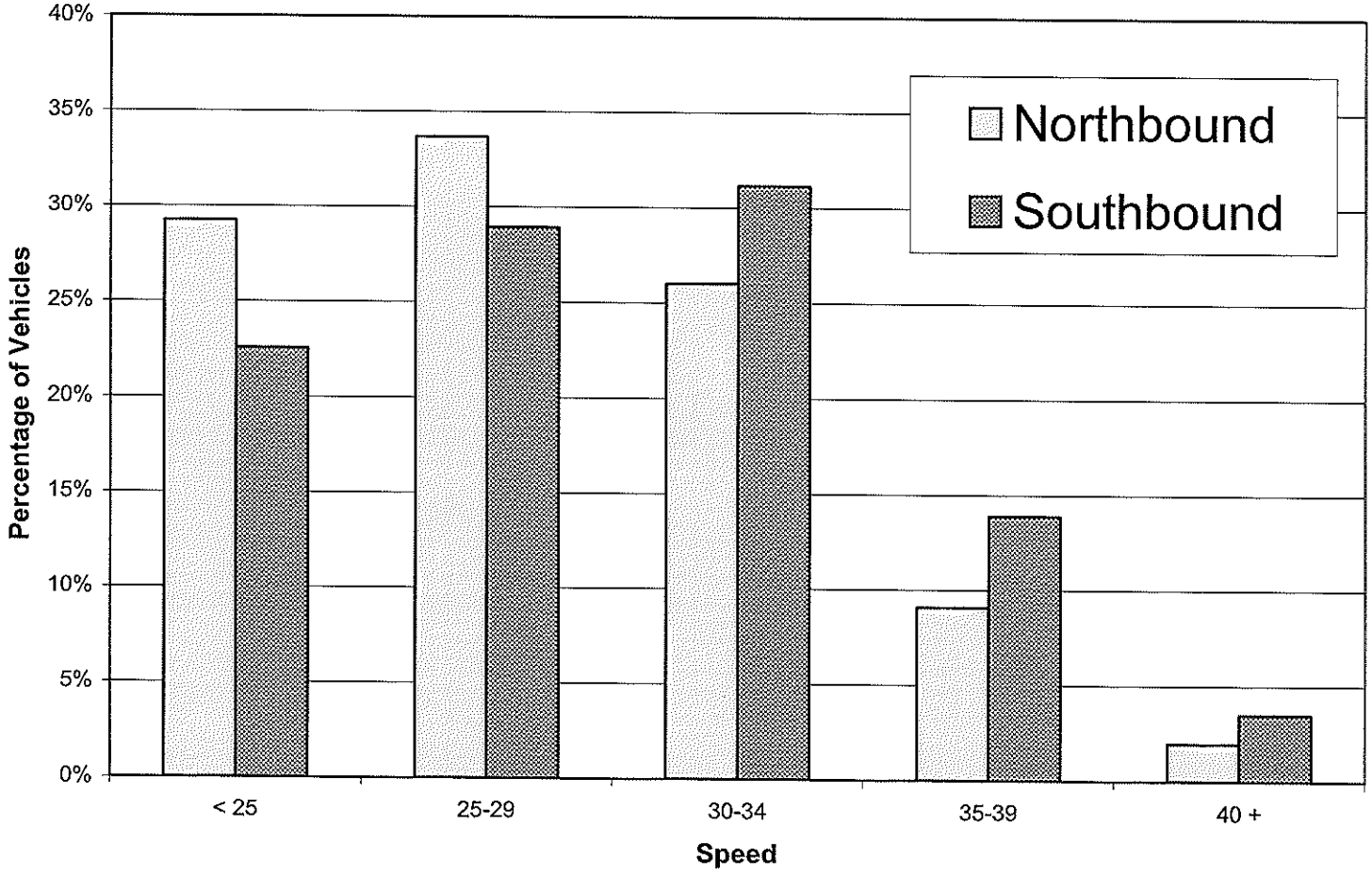
APPENDIX E

LA JOLLA SHORES DRIVE SPEED SURVEYS

Graph 1
La Jolla Shores Drive Speed Survey
La Jolla Shores Lane to Biological Grade
April 8, 2008



Graph 2
La Jolla Shores Drive Speed Survey
Downwind Way to Naga Way
April 8, 2008



APPENDIX F

LA JOLLA SHORES DRIVE AND DOWNWIND WAY WARRANT CALCULATION SHEETS

SWFSC Project (3-02-1157-2)
August 26, 2008
Signal "Warrant 1: Eight Hour "Analysis

TIME	Major Street (both approaches) (veh/hr)	Minor Street (N-Leg) (highest approach) (veh/hr)	Signal Warrant Met?	
			Condition A	Condition B
12:00 AM	41	4	NO	NO
1:00 AM	22	5	NO	NO
2:00 AM	10	2	NO	NO
3:00 AM	18	2	NO	NO
4:00 AM	11	3	NO	NO
5:00 AM	72	19	NO	NO
6:00 AM	218	29	NO	NO
7:00 AM	509	96	NO	NO
8:00 AM	649	118	NO	NO
9:00 AM	610	126	NO	NO
10:00 AM	587	116	NO	NO
11:00 AM	**696**	**124** 8	**NO**	**NO**
12:00 PM	**714**	**127** 5	**NO**	**NO**
1:00 PM	**780**	**141** 4	**NO**	**YES**
2:00 PM	**745**	**126** 6	**NO**	**NO**
3:00 PM	**796**	**124** 7	**NO**	**YES**
4:00 PM	**869**	**181** 3	**YES**	**YES**
5:00 PM	**1124**	**190** 2	**YES**	**YES**
6:00 PM	**933**	**212** 1	**YES**	**YES**
7:00 PM	572	76	NO	NO
8:00 PM	363	54	NO	NO
9:00 PM	224	36	NO	NO
10:00 PM	131	18	NO	NO
11:00 PM	68	11	NO	NO

Notes:

1. Counts conducted on Thursday, August 21, 2008

2. Condition A represents "Minimum Vehicular Volume".
At 100%, Major threshold is 500 and Minor threshold is 150.

3. Condition B represents "Interruption of Continuous Traffic".
At 100%, Major threshold is 750 and Minor threshold is 75.

Existing + Cumulative Project + Project

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 1 of 4)

COUNT DATE _____
CALC JN DATE 9/9/08
CHK JPK DATE 9/9/08

DIST ____ CO ____ RTE ____ PM ____

Major St: La Jolla Shores Drive
Minor St: Downwind Way

Critical Approach Speed _____ mph
Critical Approach Speed _____ mph

Speed limit or critical speed on major street traffic > 64 km/h (40 mph)..... ☐ or
In built up area of isolated community of < 10,000 population..... ☐ } RURAL (R)
■ URBAN (U)

WARRANT 1 - Eight Hour Vehicular Volume SATISFIED YES ■ NO ☐
(Condition A or Condition B or combination of A and B must be satisfied)

Condition A - Minimum Vehicle Volume 100% SATISFIED YES ☐ NO ■
80% SATISFIED YES ■ NO ☐

APPROACH LANES	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS) U	R	U	R	PK-HR			4TH HR				8TH HR Hour
	1		2 or More									
Both Approaches Major Street	500 (400)	350 (280)	600 (480)	420 (336)	933	1124	869	780	714	745	796	696
Highest Approach Minor Street	150 (120)	105 (84)	200 (160)	140 (112)	212	190	181	141	127	126	124	124

Condition B - Interruption of Continuous Traffic 100% SATISFIED YES ☐ NO ■
80% SATISFIED YES ■ NO ☐

APPROACH LANES	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS) U	R	U	R	PK-HR			4TH HR				8TH HR Hour
	1		2 or More									
Both Approaches Major Street	750 (600)	525 (420)	900 (720)	630 (504)	933	1124	869	780	714	745	796	696
Highest Approach Minor Street	75 (60)	53 (42)	100 (80)	70 (56)	212	190	181	141	127	126	124	124

Combination of Conditions A & B SATISFIED YES ☐ NO ☐

REQUIREMENT	CONDITION	✓	FULFILLED
TWO CONDITIONS SATISFIED 80%	A. MINIMUM VEHICULAR VOLUME	✓	Yes ■ No ☐
	AND, B. INTERRUPTION OF CONTINUOUS TRAFFIC	✓	
AND, AN ADEQUATE TRIAL OF OTHER ALTERNATIVES THAT COULD CAUSE LESS DELAY AND INCONVENIENCE TO TRAFFIC HAS FAILED TO SOLVE THE TRAFFIC PROBLEMS			Yes ☐ No ☐

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Ex + C.P. + P

8/08

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 2 of 4)

WARRANT 2 - Four Hour Vehicular Volume **SATISFIED* YES ☐ NO ■**

Record hourly vehicular volumes for any four hours of an average day.

APPROACH LANES	One	2 or More	6PM	5PM	4PM	1PM Hour
Both Approaches - Major Street	X		933	1124	869	780
Higher Approach - Minor Street	X		212	190	181	141

*All plotted points fall above the curves in Figure 4C-1. (URBAN AREAS)		Yes ☐ No ■
OR, All plotted points fall above the curves in Figure 4C-2. (RURAL AREAS)	N/A	Yes ☐ No ☐

WARRANT 3 - Peak Hour **SATISFIED YES ☐ NO ■**
(Part A or Part B must be satisfied)

PART A **SATISFIED YES ☐ NO ■**
(All parts 1, 2, and 3 below must be satisfied for the same one hour, for any four consecutive 15-minute periods)

1. The total delay experienced for traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach, or five vehicle-hours for a two-lane approach; AND	Yes ☐ No ■
2. The volume on the same minor street approach (one direction only) equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND	Yes ■ No ☐
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches.	Yes ■ No ☐

PART B **SATISFIED YES ☐ NO ■**

APPROACH LANES	One	2 or More	Hour
Both Approaches - Major Street	X		933
Higher Approach - Minor Street	X		212

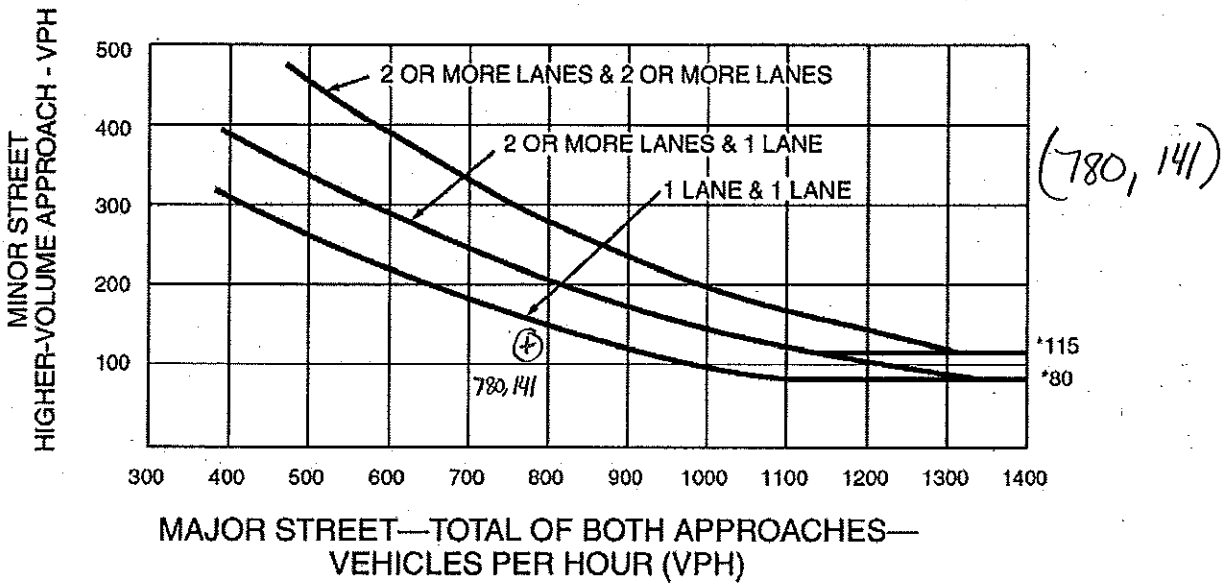
The plotted point falls above the curve in Figure 4C-3.		Yes ☐ No ■
OR, The plotted point falls above the curve in Figure 4C-4.	N/A	Yes ☐ No ☐

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Ex+ C.P. + P 8/08

Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume

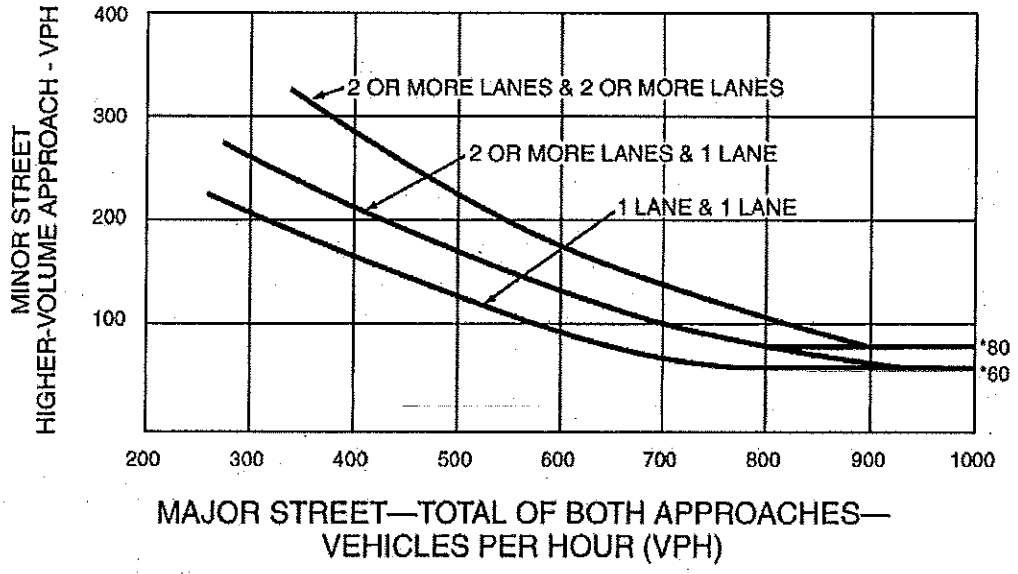
Does not meet



*Note: 115 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE ~~70~~ 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

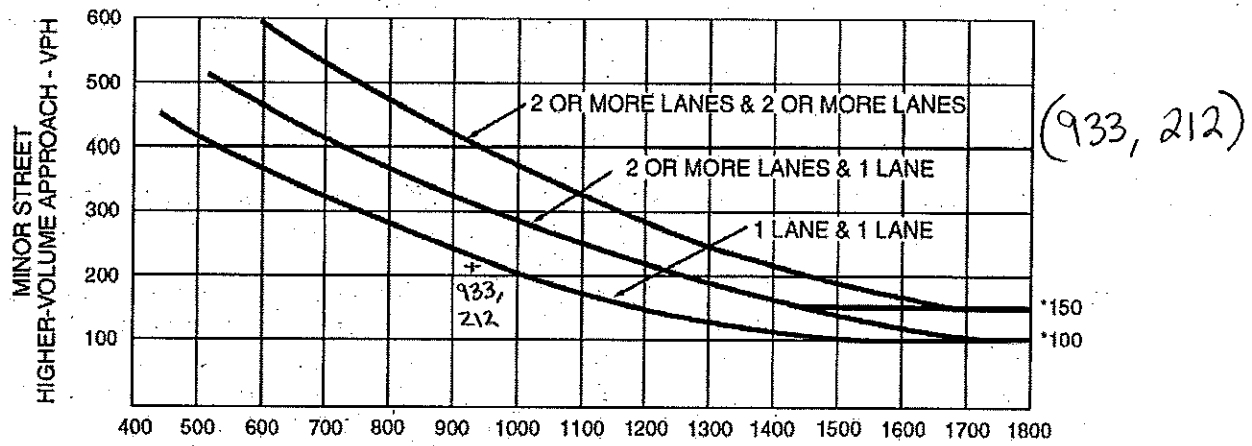


*Note: 80 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 60 vph applies as the lower threshold volume for a minor-street approach with one lane.

Ext C.P.+P 8/08

Figure 4C-3. Warrant 3, Peak Hour

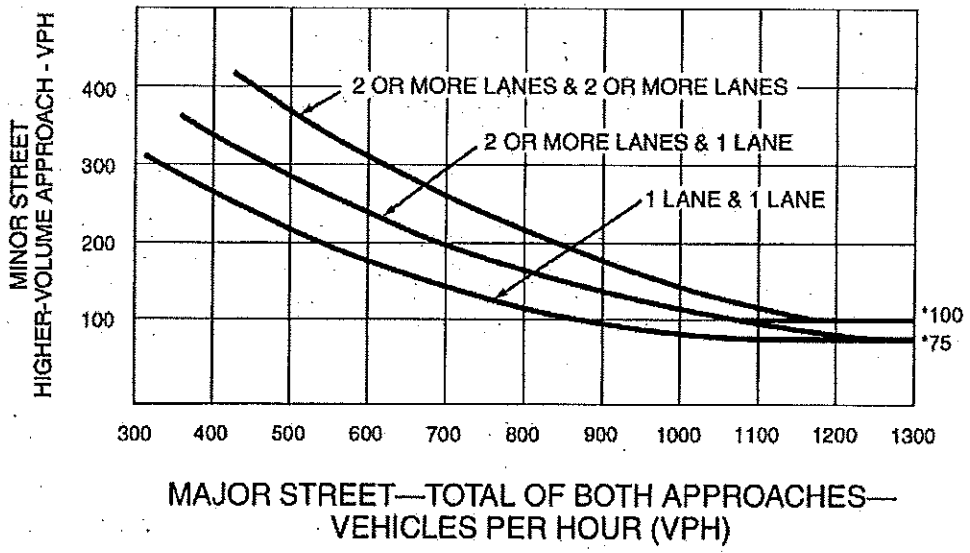
Does not meet.



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE ~~70~~ 64 km/h OR ABOVE 40 mph ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

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APPENDIX F
AIR EMISSIONS CALCULATIONS

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Estimated $PM_{2.5}$ Emissions During SWFSC Construction Period

Year	Vehicle Type	Emission Type	Duration (days)	VMT/day	$PM_{2.5}$ (pounds [lbs]/ Vehicle Mile Traveled [VMT])	$PM_{2.5}$ (lbs/day)	$PM_{2.5}$ (tons/day)	$PM_{2.5}$ (lbs/project)	$PM_{2.5}$ (tons/project)	$PM_{2.5}$ (tons/year) in 2010	$PM_{2.5}$ (tons/year) in 2011 and 2012	Description of Emissions
2010	Passenger cars to Heavy duty trucks[1]	Vehicle Exhaust Construction Phase I	125	_	_	_	0.0400000000	_	5.00	5.00		Personal vehicles to get to job site and construction vehicle emissions
2010	Passenger cars to Heavy duty trucks[1]	Vehicle Exhaust Construction Phase II Concrete Pours	50	_	_	_	0.0200000000	_	1.00	1.00		Personal vehicles to get to job site and construction vehicle emissions
2010	Bulldozing[2]	Fugitive Dust	60	10	_	0.52	0.0002586347	31.04	0.02	0.02		Dirt/Debris Pushing Operations
2010	Scraping[3]	Fugitive Dust	125	5	1.186962482	5.93481241	0.002967406	741.85	0.37	0.37		Earthmoving (cut and fill operations, and pan scraper operations)
2010	Grading[4]	Fugitive Dust	125	_	_	0.027556019	1.3778E-05	3.44	0.00	0.00		Graded Surface
2010	Wind Erosion[5]	Fugitive Dust	125	3.3	85.600	282.48	0.14	35,310.00	17.66	17.66		Open Storage Piles
2010	Material Handling[6]	Fugitive Dust	100	_	_	1.426917068	0.000713459	445.1828618	0.07	0.07		Storage Pile Filling or Truck Dumping
2010-2012	Unpaved Roads	Fugitive Dust	450	10	0.367707	3.677067269	0.001838534	165.4680271	0.83	0.20	0.48	Dirt Debris fugitive dust emissions at nonpaved construction staging areas
2010-2012	Passenger cars to Heavy duty trucks[1,7]	Vehicle Exhaust Construction Phase III Building Structure	450	_	_	_	0.0400000000	_	18.00	4.35	10.43	Personal vehicles to get to job site and construction vehicle emissions
Total $PM_{2.5}$ Emissions										**28.66**	**10.91**	

Notes:

1 - Exhaust Emissions using CARB's EMFAC2007.
2 - U.S. EPA AB-42 Chapter 11, Tables 11.9-3, 11.9-5
3 - U.S. EPA AB-42, Chapter 13, Tables 13.2.2-1 to 5 & SCAQMD Sample Construction Scenario Projects less than 5 acres
4 - U.S. EPA AB-42, Chapter 11, Tables 11.9-5 & SCAQMD Sample Construction Scenario Projects less than 5 acres
5 - Emission factor is from South Coast Air Quality Management District (SCAQMD) California Environmental Quality Act (CEQA) Air Quality Handbook 1993, Table A9-9 (default values). Emission factors is expressed in lbs/day/acre; therefore, VMT/day is expressed in acre/day.
6 - U.S. EPA AB-42, Ch 13.2.4
7 - The scenario assumes a greater ratio of Heavy duty trucks to passenger cars and a 30 VMT per vehicle per trip.

Estimated $PM_{2.5}$ Emissions During SWFSC Demolition Period

Vehicle Type	Emission Type	Duration (days)	$PM_{2.5}$ (lbs/day)	$PM_{2.5}$ (tons/day)	$PM_{2.5}$ (tons/project)	$PM_{2.5}$ (tons/year)	Description of Emissions
Waste Tonnage from Demolition[1]	Fugitive Dust	75	0.03414	0.00002	0.00128	_	Fugitive Dust from Blasting or Wrecking a Building
Passenger cars to Heavy duty trucks[2]	Vehicle Exhaust	75	_	0.02000	1.50000	_	Vehicle Exhaust from Personal vehicles to get to job site and Demolition vehicle emissions
Total $PM_{2.5}$ Emissions					**0.02002**	**0.02002**	

Notes: 1 - U.S. EPA Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, 11-19-92: 2-14

2 - Exhaust Emissions using CARB's EMFAC2007. The scenario assumes a greater ratio of Heavy duty trucks to passenger cars and a 30 VMT per vehicle per trip.

Estimated PM_{10} Emissions During SWFSC Construction Period

Year	Vehicle Type	Emission Type	Duration (days)	VMT/day	PM_{10} ([lbs]/ Vehicle Mile Traveled [VMT])	PM_{10} (lbs/day)	PM_{10} (tons/day)	PM_{10} (lbs/project)	PM_{10} (tons/project)	PM_{10} (tons/year) in 2010	PM_{10} (tons/year) for each year: 2011 and 2012	Description of Emissions
2010	Passenger cars to Heavy duty trucks[1]	Vehicle Exhaust Construction Phase I	125	_	_	_	0.04000	_	5.00	5.00	_	Personal vehicles to get to job site and construction vehicle emissions
2010	Passenger cars to Heavy duty trucks[1]	Vehicle Exhaust Construction Phase II Concrete Pours	50	_	_	_	0.02000	_	1.00	1.00	_	Personal vehicles to get to job site and construction vehicle emissions
2010	Bulldozing[2]	Fugitive Dust	60	10	_	6.73	0.00336	403.54	0.20	0.20	_	Dirt/Debris Pushing Operations
2010	Scraping[3]	Fugitive Dust	125	5	11.87275482	59.3637741	0.02968	7,420.47	3.71	3.71	_	Earthmoving (cut and fill operations, and pan scraper operations)
2010	Grading[4]	Fugitive Dust	50	_	_	0.560863981	0.00028	28.04	0.01	0.01	_	Graded Surface
2010	Wind Erosion[5]	Fugitive Dust	125	3.3	85.600	282.48	0.14124	35,310.00	17.66	17.66	_	Open Storage Piles
2010	Material Handling[6]	Fugitive Dust	100	_	_	9.423037242	0.09423	942.30372	0.47	0.47	_	Storage Pile Filling or Truck Dumping
2010-2012	Unpaved Roads	Fugitive Dust	450	10	3.677067	36.77067269	0.018385336	1654.680271	8.27	2.00	4.79	Dirt Debris fugitive dust emissions at nonpaved construction staging areas
2010-2012	Passenger cars to Heavy duty trucks[1,7]	Vehicle Exhaust Construction Phase III Building Structure	450	_	_	_	0.04000	_	18.00	4.35	10.43	Personal vehicles to get to job site and construction vehicle emissions
Total PM_{10} Emissions						**358.55**	**0.27**	**44,104.35**	**28.05**	**34.39**	**15.22**	

Notes:

1 - Exhaust Emissions using CARB's EMFAC2007.
2 - U.S. EPA AB-42 Chapter 11, Tables 11.9-3, 11.9-5
3 - U.S. EPA AB-42, Chapter 13, Tables 13.2.2-1 to 5 & SCAQMD Sample Construction Scenario Projects less than 5 acres

4 - U.S. EPA AB-42, Chapter 11, Tables 11.9-5 & SCAQMD Sample Construction Scenario Projects less than 5 acres
5 - Emission factor is from South Coast Air Quality Management District (SCAQMD) California Environmental Quality Act (CEQA) Air Quality Handbook 1993, Table A9-9 (default values). Emission factors is expressed in lbs/day/acre;
6 - U.S. EPA AB-42, Ch 13.2.4
7 - The scenario assumes a greater ratio of Heavy duty trucks to pasanger cars and a 30 VMT per vehicle per trip.

Estimated PM_{10} Emissions During SWFSC Demolition Period

Vehicle Type	Emission Type	Duration (days)	PM_{10} (lbs/day)	PM_{10} (tons/day)	PM_{10} (tons/project)	PM_{10} (tons/year)	Description of Emissions
Waste Tonnage from Demolition[1]	Fugitive Dust	75	0.03414	0.00002	0.00128	_	Fugitive Dust from Blasting or Wrecking a Building
Passenger cars to Heavy duty trucks[2]	Vehicle Exhaust	75	_	0.02000	1.50000	_	Vehicle Exhaust from Personal vehicles to get to job site and Demolition vehicle emissions
Total PM_{10} Emissions					**0.02002**	**0.02002**	

Notes: 1 - U.S. EPA Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, 11-19-92: 2-14

2 - Exhaust Emissions using CARB's EMFAC2007. The scenario assumes a greater ratio of Heavy duty trucks to passenger cars and a 30 VMT per vehicle per trip.

Estimated Ozone Precursors (NOx) Emissions During SWFSC Construction Period

Year	Vehicle Type	Emission Type	Duration (days)	NOx (tons/day)	NOx (tons/project)	NOx (tons/year)	NOx (tons/year) for 2009	NOx (tons/year) for each year: 2010 and 2011
2009	Passenger cars to Heavy duty trucks[1]	Vehicle Exhaust from Phase I Grading	125	0.8300000000	103.75	_	103.75	_
2009	Passenger cars to Heavy duty trucks[1]	Vehicle Exhaust Phase II Concrete Pours	50	0.3300000000	16.50	_	16.50	_
2009-2012	Passenger cars to Heavy duty trucks[1,2]	Vehicle Exhaust Phase II Concrete Pours	450	1.3400000000	603.00	_	145.57	349.36
Total NOx Emissions			**625**	**2.5000000000**	**723.25**	**294.2594286**	**265.82**	**349.3571429**

Notes:
1 - Exhaust Emissions using CARB's EMFAC2007. The scenario assumes 30 VMT per vehicle per trip.
2 - The scenario assumes a greater ratio of Heavy duty trucks to passenger cars and a 30 VMT per vehicle per trip.

Estimated Ozone Precursors (NOx) Emissions During SWFSC Demolition Period

Vehicle Type	Emission Type	Duration (days)	NOx (tons/day)	NOx (tons/project)	NOx (tons/year)
Passenger cars to Heavy duty trucks[1]	Vehicle Exhaust from Demolition Vehicles	75	0.3300000000	24.75	_
Total NOx Emissions		**75**	**0.3300000000**	**24.75**	**24.75**

Notes: 1 - Exhaust Emissions using CARB's EMFAC2007. The scenario assumes a greater ratio of Heavy duty trucks to passenger cars and a 30 VMT per vehicle per trip.

Estimated CO_2 Emissions During SWFSC Construction Period

Project Phase	Year	Vehicle Type	Emission Type	Duration (days)	CO_2 (tons/day)	CO_2 (tons/project)	CO_2 (tons/year) for 2009	CO_2 (tons/year) for 2010 and 2011	CO_2 (tons/year) for 2013
Construction	2009	Passenger cars to Heavy duty trucks[1]	Vehicle Exhaust from Phase I Grading	125	0.0300000000	3.75	3.75	_	_
	2009	Passenger cars to Heavy duty trucks[1]	Vehicle Exhaust Phase II Concrete Pours	50	0.0100000000	0.50	0.5	_	_
	2009-2011	Passenger cars to Heavy duty trucks[1,2]	Vehicle Exhaust Phase III Building Structure	450	0.0100000000	4.50	1.09	2.61	_
Demolition	2013	Passenger cars to Heavy duty trucks[1,2]	Vehicle Exhaust from Demolition	75	0.0100000000	0.75	_	_	0.75
Project Implementation (slight increase in facility use)	2012 (commences)	Passenger cars to Heavy duty trucks[1]	Vehicle Exhaust	_	0.0100000000	_	_	_	_
Total CO_2 Emissions				**700**	**0.0700000000**	**9.50**	**5.34**	**2.61**	**0.75**

Notes: 1 - Vehicle Exhaust Emissions using CARB's EMFAC2007.
2 - The scenario assumes a greater ratio of Heavy duty trucks to passenger cars and a 30 VMT per vehicle per trip.

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APPENDIX G
CEQA ENVIRONMENTAL CHECKLIST FORM

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CEQA ENVIRONMENTAL CHECKLIST FORM

I. PROJECT INFORMATION

1. Project title: Replacement of National Oceanic and Atmospheric Administration (NOAA) Southwest Fisheries Science Center (SWFSC) headquarters facility.

2. Lead agency name and address:

   CEQA Lead Agency – University of California (UC)

   NEPA Lead Agency - NOAA

3. CEQA contact person and phone number: Catherine Presmyk, 858-534-3860

4. Project location: UCSD/SIO Campus

5. Project sponsor's name and address: (See #2 & #3): NOAA Project Planning & Management Division-Western Region, 7600 Sand Point Way NE/WC3, Seattle, WA 98115-6226 (attn: Mark Eberling)

6. Custodian of the CEQA administrative record for this project (if different from response to item 3 above.): UCSD Physical Planning Office

7. Identification of previous EIRs relied upon for tiering purposes (including all applicable LRDP and project EIRs) and address where a copy is available for inspection.

   For CEQA purposes, the UCSD 2004 LRDP and 2004 LRDP EIR (Sch. No. 2003081023). Available at the UCSD Physical Planning Office.

II. PROJECT LOCATION AND DESCRIPTION

1. Description of project: (Describe the whole action involved, including but not limited to physical characteristics, site, later phases of the project, and any secondary, support, or off-site features necessary for its implementation and site selection process. Attach additional sheets if necessary.

Construction of a new facility approximately 124,000 sq. ft. in size at an undeveloped 3.3-acre site on the UCSD/SIO campus to replace the existing NOAA SWFSC facility, which is obsolete and has been partially vacated due to bluff erosion hazards. After construction of the replacement facility for SWFSC, two of the four buildings at the existing SWFSC would be demolished and the remaining two buildings (about 60,000 sq. ft. of space) would be turned over to UCSD/SIO for possible rehabilitation and re-use. Construction is expected to occur during 2010 through 2012 and occupancy of the new structure would occur in 2012.

2. Project CEQA Objectives:

The following project objectives have been identified by the University for the proposed project:

- Provide for a new SWFSC facility in the UCSD SIO neighborhood in proximity to other buildings that share programmatic relationships with SWFSC, thereby promoting the interaction and collaboration between SIO and SWFSC researchers and graduate students.
- Provide a new facility with access to a seawater infrastructure system that minimizes environmental disturbance.
- Foster continued collaboration between SIO and the SWFSC, by providing expansion space for future program growth.
- Expand onsite parking opportunities for SWFSC in order to minimize parking impacts offsite on City streets and in other UCSD parking lots.

The objectives of the project are consistent with UCSD's 2004 Long Range Development Plan (LRDP) which serves as the land use plan for the physical development of the campus. Specifically the development of the SWFSC replacement project at UCSD would allow the continuation of forty plus years of productive scientific collaboration between NOAA NMFS and SIO, in addition to expanding and supporting existing and future scientific and research opportunities. The proposed project would also assist the University in its mission and commitment to excellence in teaching, research, and public service, and by maintaining academic excellence, would serve as a resource to the surrounding community, city, state, and nation.

3. Surrounding land uses and environmental setting: Briefly describe the project's surroundings:

The existing SWFSC site is bounded on the north by single-family residences, on the west by a 180-ft tall coastal bluff adjoining Black's Beach, on the south by academic uses, and on the east by La Jolla Shores Drive.

The preferred site for construction of the replacement facility is bounded on the west and north by La Jolla Shores Drive and on the east and south by academic uses.

4. Discretionary approval authority and other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement.)

   UC, NOAA, California Coastal Commission, U.S. Environmental Protection Agency, San Diego Air Pollution Control District

5. Consistency with the LRDP: (Describe the project's consistency with: the scope of development projected in the LRDP; campus and community population levels projected in the LRDP; LRDP designation for this type of project; and applicable policy objectives and goals of the LRDP).

   The proposed project is an academic research use which is consistent with the underlying 2004 LRDP land use designation of "Academic".

III. ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages. The 2004 LRDP EIR concluded that implementation of the 2004 LRDP did not have the potential to result in significant impacts related to Agricultural Resources and Mineral Resources. Therefore, further analysis of potential impacts to those resources has been scoped out for the project level analysis.

☐ Aesthetics	☐ Agriculture Resources	☒ Air Quality
☐ Biological Resources	☐ Cultural Resources	☐ Geology/Soils
☐ Hazards & Hazardous Materials	☐ Hydrology/Water Quality	☐ Land Use/Planning
☐ Mineral Resources	☐ Noise	☐ Population/Housing
☐ Public Services	☐ Recreation	☐ Transportation/Traffic
☐ Utilities/Service Systems	☐ Mandatory Findings of Significance	

IV. DETERMINATION: (To be completed by lead agency)

On the basis of the initial evaluation that follows:

☐ The proposed project WOULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☐ Although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been

made that will avoid or reduce any potential significant effects to a less than significant level. A MITIGATED NEGATIVE DECLARATION will be prepared.

☒ The proposed project MAY have a significant effect on the environment. An ENVIRONMENTAL IMPACT REPORT has been* prepared.

***A joint EIS/EIR was prepared for the proposed project and the purpose of this checklist is to identify where each CEQA related impact is discussed in the document.**

V. EVALUATION OF ENVIRONMENTAL IMPACTS

During the completion of the environmental evaluation, the lead agency relied on the following categories of impact noted as column headings in the IS checklist:

A) "Potentially Significant Impact" is appropriate if there is substantial evidence that the project's effect may be significant. If there are one or more "Potentially Significant Impacts" a Project EIR will be prepared.

B) "Less Than Significant With Mitigation Incorporated" applies where the incorporation of project specific mitigation measures will reduce an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." All mitigation measures must be described, including a brief explanation of how the measures reduce the effect to a less than significant level.

C) "Less Than Significant Impact" applies where the project will not result in any significant effects. The project impact is less than significant without the incorporation of mitigation.

D) "No Impact" applies where a project would not result in any impact in the category or the category does not apply. "No Impact" answers need to be adequately supported by the information sources cited, which show that the impact does not apply to projects like the one involved (*e.g.*, the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (*e.g.*, the project will not expose sensitive receptors to pollutants, based on a project specific screening analysis).

Impact Questions and Responses

	(A)	(B)	(C)	(D)
Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
1. AESTHETICS – Would the project:				
a) Have a substantial adverse effect on a scenic vista? **EIS/EIR Section - 4.10.2, 4.10.3**	☐	☐	☒	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway? **EIS/EIR Section - 4.10.2**	☐	☐	☐	☒
c) Substantially degrade the existing visual character or quality of the site and its surroundings? **EIS/EIR Section - 4.10.2, 4.10.3**	☐	☐	☒	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area? **EIS/EIR Section - 4.10.2, 4.10.3**	☐	☐	☒	☐

Issues	Potentially Significant Impact	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
2. AIR QUALITY -- Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan? **EIS/EIR Section 4.8.2, 4.8.3**	☐	☒	☐	☐

Issues	Potentially Significant Impact	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
2. AIR QUALITY (continued)				
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation? **EIS/EIR Section 4.8.2, 4.8.3**	☐	☒	☐	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)? **EIS/EIR Section 4.8.2, 4.8.3**	☒	☐	☐	☐
d) Expose sensitive receptors to substantial pollutant concentrations? **EIS/EIR Section 4.8.2**	☐	☐	☐	☒
e) Create objectionable odors affecting a substantial number of people? **EIS/EIR Section 4.8.2**	☐	☐	☐	☒
f) Result in greenhouse gas emissions that would result in a conflict with State plans to achieve the goal of reducing greenhouse gas emissions pursuant to AB 32? **EIS/EIR Section 4.8.2, 4.8.3**	☐	☐	☒	☐

Issues	Potentially Significant Impact	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
3. BIOLOGICAL RESOURCES -- Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service? **EIS/EIR Section 4.4.2**	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service? **EIS/EIR Section 4.4.2, 4.4.3**	☐	☒	☐	☐
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means? **EIS/EIR Section 4.4.2**	☐	☐	☐	☒
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites? **EIS/EIR Section 4.4.2**	☐	☐	☐	☒
e) Conflict with any applicable policies protecting biological resources? **EIS/EIR Section 4.4.2, 4.4.3**	☐	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other applicable habitat conservation plan? **EIS/EIR Section 4.4.2**	☐	☐	☐	☒

Issues	Potentially Significant Impact	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
4. CULTURAL RESOURCES -- Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5? **EIS/EIR Sections 4.11.2**	☐	☐	☐	☒
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5? **EIS/EIR Sections 4.11.2, 4.11.3**	☐	☒	☐	☐
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature? **EIS/EIR Sections 4.11.2**	☐	☐	☐	☒
d) Disturb any human remains, including those interred outside of formal cemeteries? **EIS/EIR Sections 4.11.2, 4.11.3**	☐	☒	☐	☐

Issues	Potentially Significant Impact	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
5. GEOLOGY AND SOILS -- Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42. **EIS/EIR Section 4.2.2**	☐	☐	☐	☒
ii) Strong seismic ground shaking? **EIS/EIR Sections 4.2.2, 4.2.3**	☐	☒	☐	☐
iii) Seismic-related ground failure, including liquefaction? **EIS/EIR Section 4.2.2**	☐	☐	☐	☒
iv) Landslides? **EIS/EIR Sections 4.2.2, 4.2.3**	☐	☒	☐	☐
b) Result in substantial soil erosion or the loss of topsoil? **EIS/EIR Sections 4.2.2, 4.2.3, 4.3.3**	☐	☒	☐	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse? **EIS/EIR Section 4.2.2, 4.2.3**	☐	☒	☐	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property? **EIS/EIR Section 4.2.2**	☐	☐	☐	☒

Issues	Potentially Significant Impact	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
5. GEOLOGY AND SOILS (continued)				
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water? **EIS/EIR Section 4.3.2**	☐	☐	☐	☒

Issues	Potentially Significant Impact	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
6. HAZARDS AND HAZARDOUS MATERIALS – Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? **EIS/EIR Section 4.15.2, 4.15.3**	☐	☐	☒	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment? **EIS/EIR Section 4.15.2, 4.15.3**	☐	☐	☒	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school? **EIS/EIR Section 4.15.2**	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment? **EIS/EIR Section 4.15.2**	☐	☐	☐	☒

Issues	Potentially Significant Impact	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
6. HAZARDS AND HAZARDOUS MATERIALS (continued)				
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area? **EIS/EIR Section 4.1.2**	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area**?** **EIS/EIR Section 4.1.2**	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan? **EIS/EIR Section 4.14.2, 4.14.3**	☐	☒	☐	☐
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands? **EIS/EIR Section 4.13.2**	☐	☐	☐	☒

Issues	Potentially Significant Impact	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
7. HYDROLOGY AND WATER QUALITY -- Would the project:				
a) Violate any water quality standards or waste discharge requirements? **EIS/EIR Sections 4.3.2, 4.3.3**	☐	☒	☐	☐

Issues	Potentially Significant Impact	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
7. HYDROLOGY AND WATER QUALITY (continued)				
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)? **EIS/EIR Section 4.3.2**	☐	☐	☐	☒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site? **EIS/EIR Section 4.3.2**	☐	☐	☐	☒
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site? **EIS/EIR Sections 4.3.2, 4.3.3**	☐	☐	☒	☐
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff? **EIS/EIR Sections 4.3.2, 4.3.3**	☐	☒	☐	☐
f) Otherwise substantially degrade water quality? **EIS/EIR Sections 4.3.2, 4.3.3**	☐	☒	☐	☐
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map? **EIS/EIR Section 4.3.2**	☐	☐	☐	☒

Issues	Potentially Significant Impact	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
7. HYDROLOGY AND WATER QUALITY (continued)				
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows? **EIS/EIR Section 4.3.2**	☐	☐	☐	☒
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam? **EIS/EIR Sections 4.3.2**	☐	☐	☐	☒
j) Inundation by seiche, tsunami, or mudflow? **EIS/EIR Sections 4.3.2**	☐	☐	☐	☒

Issues	Potentially Significant Impact	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
8. LAND USE AND PLANNING -- Would the project:				
a) Physically divide an established community? **EIS/EIR Section 4.1.1**	☐	☐	☐	☒
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the LRDP, general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect? **EIS/EIR Section 4.1.1**	☐	☐	☐	☒
c) Conflict with any applicable habitat conservation plan or natural community conservation plan? **EIS/EIR Section 4.1.1**	☐	☐	☐	☒
d) Create other land use impacts? **EIS/EIR Section 4.1.1**	☐	☐	☐	☒

Issues	Potentially Significant Impact	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
9. NOISE -- Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in any applicable plan or noise ordinance, or applicable standards of other agencies? **EIS/EIR Sections 4.9.2, 4.9.3**	☐	☒	☐	☐
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels? **EIS/EIR Sections 4.9.2, 4.9.3**	☐	☒	☐	☐
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project? **EIS/EIR Section 4.9.2**	☐	☐	☒	☐
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project (including construction)? **EIS/EIR Sections 4.9.2, 4.9.3**	☐	☒	☐	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels? **EIS/EIR Section 4.1.1**	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels? **EIS/EIR Section 4.1.1**	☐	☐	☐	☒

Issues	Potentially Significant Impact	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
10. POPULATION AND HOUSING -- Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)? **EIS/EIR Section 4.14.2**	☐	☐	☒	☐
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere? **EIS/EIR Section 4.14.2**	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere? **EIS/EIR Section 4.14.2**	☐	☐	☐	☒

Issues	Potentially Significant Impact	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
11. PUBLIC SERVICES				
Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
a) Fire protection? **EIS/EIR Sections 4.13.2, 4.13.3**	☐	☐	☒	☐

Issues	Potentially Significant Impact	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
11. PUBLIC SERVICES (continued)				
b) Police protection? **EIS/EIR Section 4.13.2**	☐	☐	☒	☐
c) Schools? **EIS/EIR Section 4.13.2**	☐	☐	☒	☐
d) Parks? **EIS/EIR Section 4.13.2**	☐	☐	☒	☐
e) Other public facilities? **EIS/EIR Section 4.13.2**	☐	☐	☒	☐
f) Create other public service impacts? **EIS/EIR Section 4.13.2**	☐	☐	☒	☐

Issues	Potentially Significant Impact	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
12. RECREATION				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated? **EIS/EIR Section 4.6.2, 4.6.3**	☐	☐	☒	☐
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment? **EIS/EIR section 4.6.2**	☐	☐	☐	☒

Issues	Potentially Significant Impact	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
13. TRANSPORTATION/TRAFFIC -- Would the project:				
a) Cause an increase in traffic, which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)? **EIS/EIR Sections 4.5.2, 4.5.3**	☐	☐	☒	☐
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways? **EIS/EIR Section 4.5.2**	☐	☐	☐	☒
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks? **EIS/EIR Sections 4.5.2**	☐	☐	☐	☒
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)? **EIS/EIR Section 4.5.2**	☐	☐	☒	☐
e) Result in inadequate emergency access? **EIS/EIR Sections 4.14.2 and 4.14.3**	☐	☐	☒	☐
f) Result in inadequate parking capacity? **EIS/EIR Section 4.5.2**	☐	☐	☐	☒
g) Conflict with applicable policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)? **EIS/EIR Section 4.5.2, 4.5.3**	☐	☐	☐	☒

Issues	Potentially Significant Impact	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
14. UTILITIES AND SERVICE SYSTEMS -- Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board? **EIS/EIR Section 4.3.2**	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects? **EIS/EIR Section 4.13.2**	☐	☐	☐	☒
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects? **EIS/EIR Section 4.3.2**	☐	☐	☐	☒
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed? **EIS/EIR Section 4.13.2**	☐	☐	☒	☐
e) Result in a determination by the wastewater treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments? **EIS/EIR Section 4.13.2**	☐	☐	☒	☐
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs? **EIS/EIR section 4.15.2**	☐	☐	☒	☐
g) Comply with applicable federal, state, and local statutes and regulations related to solid waste? **EIS/EIR Sections 4.15.2, 4.15.3**	☐	☐	☒	☐
h) Create other utility and service system impacts? **EIS/EIR Section 4.13.2**	☐	☐	☒	☐

Issues	Potentially Significant Impact	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
MANDATORY FINDINGS OF SIGNIFICANCE				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory? **EIS/EIR Section 5.2**	☐	☒	☐	☐
b) Does the project have the potential to achieve short-term environmental goals to the disadvantage of long-term environmental goals? **EIS/EIR Section 5.4**	☐	☐	☒	☐
c) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of past, present and probable future projects)? **EIS/EIR Section 6**	☐	☒	☐	☐
d) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly? **EIS/EIR Section 5.2**	☒	☐	☐	☐

Fish and Game Determination

Based on consultation with the California Dept. of Fish and Game, there is no evidence that the project has a potential for a change that would adversely affect wildlife resources or the habitat upon which the wildlife depends.

☐ Yes (No Effect)

☒ No (Pay fee)

VI. SUPPORTING INFORMATION SOURCES – See the EIS/EIR

VII. INITIAL STUDY PREPARERS – See the EIS/EIR

APPENDIX H
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