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COMMITTEE ACTION SHEET

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11/20

COUNCIL DOCKET OF _____				
<input type="checkbox"/> Supplemental	<input type="checkbox"/> Adoption	<input type="checkbox"/> Consent	<input type="checkbox"/> Unanimous Consent	Rules Committee Consultant Review

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Modified National Pollution Discharge Elimination System (NPDES) Discharge Permit (Waiver) for the Point Loma Wastewater Treatment Plant
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Reviewed Initiated By NR&C On 11/02/07 Item No. 6

RECOMMENDATION TO:

No action taken. This item will come before the full City Council.
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VOTED YEA: N/A

VOTED NAY: N/A

NOT PRESENT: N/A

CITY CLERK: Please reference the following reports on the City Council Docket:

REPORT TO THE CITY COUNCIL NO.

COUNCIL COMMITTEE CONSULTANT ANALYSIS NO.

OTHER:

Rules Agenda of July 26, 2006, Item 1 Motion; MWWD Secondary Treatment Discussion, Community Brief Discussion PowerPoint; University of California's October 1, 2007, Environmental and Sustainability Initiative Final Report; Comprehensive Annual Financial Report

COUNCIL COMMITTEE CONSULTANT 

EXECUTIVE SUMMARY SHEET
CITY OF SAN DIEGO

DATE ISSUED: July 21, 2006 REPORT NO: 06-103
ATTENTION: Rules, Open Government and Intergovernmental Relations
Committee
ORIGINATING DEPARTMENT: Metropolitan Wastewater
SUBJECT: Status of the Point Loma Wastewater Treatment Plant Clean
Water Act Section 310(h) Modified National Pollution
Discharge Elimination System (NPDES) Discharge Permit
COUNCIL DISTRICT(S): All
CONTACT/PHONE NUMBER: (619) 758-2301

REQUESTED ACTION: THIS IS AN INFORMATION ITEM ONLY. NO ACTION IS
REQUIRED ON THE PART OF THE COMMITTEE OR THE CITY COUNCIL

STAFF RECOMMENDATION: The time is approaching when the City will need to make a
decision on what action to take regarding the renewal of the modified permit for the Point Loma
Wastewater Treatment Plant.

EXECUTIVE SUMMARY:

The Point Loma Wastewater Treatment Plant (PLWTP) operates with a modified NPDES permit
that does not require full secondary treatment prior to discharge through a deep ocean outfall.
Authorized by section 301(h) of the Clean Water Act, as initially modified by the Ocean
Pollution Reduction Act of 1994 (OPRA), the modified permit requires renewal every five years.
The Point Loma modified permit contains specific conditions not found in any other modified
permit. These include requirements for an 80 and 58 per cent removal of total suspended solids
and biological oxygen demand respectively, a reduction in the quantity of suspended solids
discharged to the marine environment during the period of modification and to achieve a system
capacity of 45 million gallons of reclaimed wastewater per day by January 1, 2010.
Pt Loma's first modified permit was issued by the USEPA and State of California Regional
Water Quality Control Board (RWQCB) on November 9, 1995 and subsequently renewed
effective September 13, 2002. During the renewal process the RWQCB responded to public
comment and lowered permit limits for the mass emissions of suspended solids, additionally the
State of California Coastal Commission denied the renewal after a public hearing. After a
lengthy appeal process the State Water Resources Control Board (SWRCB) overturned these
actions.
Subsequent to the final approval by the USEPA the renewal was opposed by the environmental
community, who expressed the following concerns:

- a. Adequacy of ocean monitoring to detect possible negative impacts.
- b. Concerns about actual use of reclaimed water versus constructed capacity.
- c. Permitted mass emissions limit of suspended solids too high and not in conformance
with the OPRA legislation.

This resulted in the City and the local environmental community filing cross appeals to the
Environmental Appeals Board (EAB) concerning the SWRCB actions and the applicability of
OPRA.

In an effort to resolve these differences the City and Environmental Representatives (now called Bay Council) began talks about future modified permits. After reaching an agreement regarding the issues of concern to the Bay Council, both sides entered into a joint stipulation whereby all appeals to the EAB were dropped with a reservation of rights. The agreement consisted of:

- 1 - The City working with Scripps Institution of Oceanography for a complete review of the Point Loma ocean monitoring program with Bay Council and public participation.

This project is complete and the City is working with the Bay Council, Scripps, Metro Agencies and regulatory agencies on implementation of its recommendations.

- 2 - The City conducting a comprehensive study of potential uses for reclaimed water, including a re-look at the potential for indirect potable reuse.

This study is complete and awaiting further action by the City Council.

- 3 - The City conducting a pilot test of an innovative treatment process, Biological Aerated Filtration (BAF) that may be a more cost effective alternative than previous facility planning estimates for upgrading treatment at the PLWTP.

This project is complete and BAF was found to be a viable alternative to achieve secondary treatment at the PLWTP. Cost estimates for the full 240 mgd capacity are \$700 million if the City can acquire 28 to 30 acres of land adjacent to the plant and about \$1.2 billion if not.

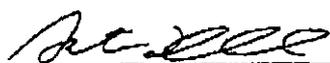
The modified permit for the PLWTP expires again in June 2008. The City is required to submit a renewal application in December 2007 and in order to meet that deadline work on the application should begin in early 2007. A decision needs to be made on whether the City will pursue future modified permits or investigate alternatives for implementation of secondary treatment.

FISCAL CONSIDERATIONS: None at this time.

PREVIOUS COUNCIL and/or COMMITTEE ACTION: None.

COMMUNITY PARTICIPATION AND PUBLIC OUTREACH EFFORTS: Metropolitan Wastewater staff has given presentations on the issue to Bay Council on June 15, 2006; Public Utilities Advisory Commission on June 19, 2006; Metro Commission Technical Advisory Committee on June 21, 2006; and the Metro Commission on July 6, 2006. Presentation to the San Diego Chamber of Commerce is scheduled for August 3, 2006.

KEY STAKEHOLDERS AND PROJECTED IMPACTS: See Executive Summary.


 Scott Tulloch
 Metropolitan Wastewater Director


 R.F. Haas
 Deputy Chief of Public Works



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THE CITY OF SAN DIEGO
REPORT TO THE CITY COUNCIL

DATE ISSUED: November 8, 2007 REPORT NO: 07-190

ATTENTION: Council President and Members of the City Council, City Council
Docket of November 20, 2007

SUBJECT: 1) Submittal of the Modified National Pollution Discharge
Elimination System (NPDES) discharge permit (Waiver) for the
Point Loma Wastewater Treatment Plant (PLWTP)
2) Authorization for the Mayor and Council to hire Outside
Counsel for technical legal support during waiver process, to
report to the Mayor and Council

REFERENCE:

REQUESTED ACTION:

- Approve the Mayor's proposal to submit the modified National Pollution Discharge Elimination System (NPDES) permit (Waiver) application for Point Loma Wastewater Treatment Plant (PLWTP).
- Authorization for the Mayor and Council to hire outside counsel for technical legal support during the waiver process, to report to the Mayor and Council.

STAFF RECOMMENDATION:

- Approve the Mayor's proposal to submit the modified National Pollution Discharge Elimination System (NPDES) permit (Waiver) application for Point Loma Wastewater Treatment Plant (PLWTP).
- Authorize the Mayor and Council to hire outside counsel for technical legal support during the waiver process, to report to the Mayor and Council.

SUMMARY:

The Point Loma Wastewater Treatment Plant (PLWTP) operates with a modified NPDES permit that does not require full secondary treatment prior to discharge through a deep ocean outfall. Authorized by section 301(h) of the Clean Water Act, the modified permit requires renewal every five years. The modified permit (waiver) for the PLWTP expires in June 2008. The City must decide whether to pursue a continuation of the modified permit, or forgo that legally permissible opportunity and instead voluntarily begin moving towards secondary treatment at the PLWTP. The Environmental Protection Agency (EPA) deadline to submit the renewal application is December 14, 2007.

The City of San Diego is unique from other wastewater dischargers once the treated discharge reaches the marine environment. The City discharges its treated wastewater through a four and one half mile long ocean outfall. The outfall is one of the longest in the United States. The outfall depth (320 feet) is one of the deepest in the United States. The thermocline, a temperature layer within the water, keeps the suspended solids deep. The City of San Diego Point Loma discharge has the additional advantages of a cross current, a bottom slope, and utilizes a diffuser design that provides superior dispersion to traditional outfall pipe configurations.

The City of San Diego also conducts one of the most extensive ocean monitoring programs in the world. Extensive ocean monitoring efforts have historically shown that the discharge poses no discernable negative impact to marine organisms surrounding the outfall. This data has been sufficient to allow the City to operate since 1995 with a waiver from the federal regulations governing wastewater discharges to rivers, lakes and coastal waters.

Since the last waiver application, the City has enhanced its ocean monitoring program and is seeking federal appropriations for even more enhancements. A Scientific Technical Review Committee conducted a thorough review of the environmental data collected from the extensive ocean monitoring program associated with the PLWTP. The findings show that the PLWTP does not have a detrimental impact on the ocean environment surrounding the four-and-one-half mile long outfall, along the shoreline or within the Point Loma kelp beds. The findings of the Scientific Technical Review Committee, along with wastewater department staff's assessment that the City meets all of the waiver criteria, and the City's continued compliance with regulatory requirements related to the PLWTP, support the decision to continue operation at the PTLWP at current treatment standards and seek a waiver. Seeking a waiver allows the City to continue to discharge without harming the ocean environment while also following the most prudent course of action for ratepayers in the City and the regional participating agencies.

Should the City not submit the waiver application, the PLWTP would have to be operating at secondary standards by June 2008, the date the current waiver expires. Operating at secondary is not possible by June 2008. Not meeting the criteria of either submitting a waiver, or being at secondary treatment by June 2008, will result in enforcement action or litigation leading to secondary treatment, as well as subject the City to fines for being in violation of the Clean Water Act. Therefore, submitting the waiver application is necessary in order to remain in compliance with the Clean Water Act.

Decision Making Factors:

Before making a decision on what course of action to take regarding the PLWTP, the Mayor made a commitment to have the facts about the impacts of our treatment practices evaluated, and presented in a public forum. Protecting the environment as well as being in compliance with regulatory requirements are a priority and weighed heavily in the decision making process. Because of the complexity of the issue, and the considerable impacts of applying for or not applying for a waiver are considerable, the Mayor also evaluated and took into account the following:

1. Protecting the environment
2. Meeting regulatory requirements

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3. The cost, protecting ratepayers and reducing rate impacts
4. Assessment of federal and state funding opportunities

Protecting the Environment:

Assessing what, if any, ocean environmental impacts were occurring as a result of the Point Loma Wastewater Treatment Plant discharge was the first critical step needed.

In June 2007, Mayor Sanders engaged a distinguished panel of scientists from the University of California San Diego (Scripps Institution of Oceanography) and San Diego State University to provide the City with a comprehensive and independent review of the environmental data collected from the extensive ocean monitoring program associated with the operation of the PLWTP. The scientific findings of the impact to the ocean environment were crucial information to have prior to taking a position on whether the City should voluntarily go to secondary treatment at Point Loma.

From July to September 2007, UCSD/Scripps Institution of Oceanography, San Diego State University professors and their graduate students conducted an independent review of ocean monitoring data to confirm City staff analysis that ocean data supported waiver submission.

A summary of the results included the following findings:

- None of the scientists found evidence of significant adverse impacts of the Point Loma Ocean Outfall
- There is no discernible connection between the wastewater plume and shoreline water quality
- Monitoring of receiving waters environment is comprehensive and well conducted

Areas Reviewed:

- Benthic Ecology
 - Communities have remained fairly stable and changes have been consistent with region wide trends
 - Point Loma outfall has not affected community composition
 - Many different approaches reach the same answer
 - Monitoring of receiving waters environment is comprehensive and well conducted
- Sediment Chemistry
 - Accumulation in the region around the outfall is not discernible
- Microbiology and Public Health
 - Little evidence that the wastewater discharge is impacting shoreline or adversely affecting human health
 - No connection between wastewater plume and shoreline water quality
- Physical Oceanography
 - Probability of discharge reaching surface is very low
 - More plume (transport path for discharged wastewater) data needed
- Bioaccumulation
 - PCB levels in Rockfish livers requires further evaluation
 - Not elevated in sediments/waters near outfall

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- Probable source is nearby dredge dumping area not associated with wastewater discharge
- Not a health risk nor exceeds standards; does not influence decision

Recommendations for further study:

- Review PCB levels in Rockfish livers and isolate source
- Continue/complete efforts to better define plume

In summary, the critical evaluation shows the discharge from PLWTP is not causing harm to the environment. The decision to apply for a waiver and not voluntarily go to secondary treatment was based on the environmental data.

Negative Environmental Impacts of going to Secondary Treatment

Apart from having an independent review of the ocean monitoring data to assess impacts to the ocean environment, MWWD staff also conducted an assessment of what the environmental impacts would be of going to secondary treatment.

Achieving secondary standards would remove nearly 2700 tons of additional suspended solids annually from the discharge, forcing these solids to then be applied at a landfill.

Due to land limitations at the current PLWTP site, integration of secondary design into the existing City property and plant footprint would require removal of over 1 million tons of earth. Removal of this material would be a significant impact on the Point Loma neighborhood due to the number of truck loads required to transport this fill to a disposal or alternative use site.

The most significant environmental effect of achieving secondary standards is the large carbon footprint caused by the electricity requirements. Secondary treatment is a very power intensive process and the PLWTP would shift from being a green power provider to the grid to one of the top electrical loads in the city. The resultant carbon dioxide release at the electrical generation site would exceed 100,000 tons per year based on power needs and the EPA sponsored calculator website.

Staff assessed that the ocean was not being harmed by current discharge from the Point Loma outfall and that secondary treatment was a net negative impact on the environment.

Weighing the Overall Environmental Impact of Secondary Treatment at Point Loma

Ocean:
Reduce Ocean Discharge by
2,740 Tons/Yr Suspended Solids

Land:
- 1,250,000 tons of Earth
Removed at environmentally
sensitive construction site
- Added 2,740 Tons/Yr Biosolids
Applied on Land

Air:
Raise Atmospheric Discharge of
CO₂ (Greenhouse Gas) at
electrical generation site by
104,000 Tons/Yr

**Point Loma Secondary Treatment:
a Net Negative Environmental Impact**

Proponents of secondary treatment argue the precautionary principle, the inability of current monitoring to detect all of the possible impacts to the ocean environment until it is too late. However, even if the City were to voluntarily go to secondary, we would still “not know what we don’t know” even after spending \$1.5 billion to construct secondary treatment.

The outfall extends for 4.5 miles into the ocean and splits into two diffuser arms reaching a total of one mile. Looking along the diffuser section, the current discharge reaches secondary levels within 30 feet of the outfall structure and ocean water samples can not discern discharge versus background particulate after 100 feet. Therefore, the difference between secondary standards and current discharge for Point Loma equals a semicircle with a radius of 30 feet located at the bottom over 24,000 feet from shore.

San Diego’s discharge is different than other locations. The suspended solids discharge is very close to secondary treatment standards already. Using Chemically Enhanced Primary Treatment, the difference in solids removal between what is currently discharged and secondary standards is minimal (Total Suspended Solids (TSS) before treatment at Point Loma is 275 PPM, post treatment, the TSS discharged from Point Loma is 40 PPM vs. 30 PPM standard of the Clean Water Act). Further, the discharge meets all regulatory requirements for shoreline, kelp bed, marine populations and ocean sediments.

San Diego meets Waiver Criteria

Upon receiving the findings of the Scientific Technical Review Committee, the Mayor directed staff to complete the application package required for the waiver.

The waiver application is a very lengthy and comprehensive document. It is MWWD staff’s assessment that the City’s application meets all of the Clean Water Act section 301(h) waiver criteria and is robust enough to handle potential appeals.

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The City of San Diego conducts one of the most extensive ocean monitoring programs in the world. Two vessels are used to collect over 150,000 samples per year, and the samples are analyzed by chemists and biologists.

The City will continue the enhanced ocean monitoring program and assess any potential impact to the ocean environment. The Mayor is committed to continue the City's ocean monitoring program.

Protecting Ratepayers and Reducing Rate Impacts

Seeking a waiver is the most prudent course of action for the City, its ratepayers and the participating agencies.

Moving to secondary treatment would have considerable rate impacts and would require approval of substantial rate increases.

The total cost of secondary treatment at Point Loma is estimated to be:

\$1.5B in 2015 dollars

\$0.8B in interest payments for bonds

\$2.3B total payments

After construction, the average expected Point Loma operations and maintenance cost is \$58M per year (an increase of \$38M over the current Point Loma O&M cost of \$20M). Almost half of this increase is just for electrical power requirements.

Applying for a waiver will provide additional time to develop future options for Point Loma and for the continued improvement in treatment technologies and practices. It also avoids spending \$2.3 billion for a secondary treatment plant that science tells us is not needed and, therefore, an unnecessary burden on ratepayers. The priority should continue to be addressing the current water and wastewater infrastructure needs and improvements to comply with the existing wastewater consent decree and water compliance order, both of which will require additional rate increases.

One of the concerns expressed by those in support of going to secondary treatment is that there is a cost associated with deferring secondary treatment because the cost of construction will only increase with time. While construction costs do continue to increase, the cost of secondary has decreased with time as new technologies emerge and are tested. As the City learned with the Biological Aerated Filtration (BAF) demonstration project, emerging wastewater treatment technologies may provide the region a lower cost alternative to traditional treatment methods. The Mayor is committed, through the Metropolitan Wastewater Department, to identifying and exploring new emerging treatment technologies.

Additionally, submission of the waiver keeps the City in control of the level of treatment at the PLWTP. Under the waiver, the City could decide to proceed to secondary treatment at the PLWTP at any time. As a result, submission of the waiver minimizes litigation risk to the City. Because achievement of secondary standards by June 2008 (expiration date of current permit) is not possible, the City of San Diego will likely be sued for not operating within Clean Water Act

standards if the waiver is not submitted. This will result in significant legal expenses, which will provide no benefit to the City. The resulting settlement may force the City to achieve secondary treatment on a compressed and more costly timeline than could be achieved by a deliberate decision.

Should the PLWTP be required to operate at secondary treatment levels in the future, it is important to continue with a course of action that will protect the ratepayer interests.

1. MWWD will continue to identify and explore new technologies that could further reduce the cost of secondary treatment.
2. Federal and State funding opportunities will continue to be assessed
3. Continue to ascertain the availability of land at Point Loma

Assessment of Federal and State Funding Opportunities:

A thorough assessment of the true existing federal and state funding opportunities, both current and in the foreseeable future was conducted by the City's contract lobbyists in Washington and Sacramento (Attachments 3, 4). The purpose of this detailed review was to determine the likelihood of non-ratepayer funding for the construction of a secondary treatment plant and whether the City would be jeopardizing potential funding should it not pursue available opportunities immediately.

The Orange County Sanitation District decided 5 years ago to construct a secondary treatment plant and seek state and federal funding assistance for construction costs. The District began an all-out effort to secure funding assistance, including contracting with additional intergovernmental consultants to lead the effort before their elected representatives. Their target was to receive \$50 million over ten years. In 2003, they received \$1 million and in 2004 they received an additional \$800,000. Since 2004 they have been unsuccessful at receiving additional funding and have concluded they will unlikely receive anymore. The \$1.8 million total received is woefully below their goal and will now need to be assessed on the ratepayers of the Sanitation District.

The federal and state funding assessments, along with Orange County's lack of funding success despite their aggressive pursuit, demonstrate that should the City volunteer to go to secondary at this time, there is no indication that the City would successfully receive significant federal and state funds for the construction of a secondary treatment plant. Therefore, the costs would be shouldered by the ratepayers. Should future rate increases not be approved by City Council, or by the property owners via the Proposition 218 process, the City would be forced to pay the costs of construction and operation of a secondary treatment plant with General Fund dollars.

Waiver Application and Process Timeline:

If the waiver application is submitted, the following is the estimated timeline for the process and potential actions that would follow:

December 14, 2007	Environmental Protection Agency (EPA) deadline for submission of waiver application
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May 2008	Tentative decision expected by EPA regarding waiver application Scenarios: EPA Tentative Denial: City of San Diego to Appeal EPA Tentative Approval Anticipate environmental groups to appeal
June 2008	Estimated date of Joint hearing by EPA and Regional Water Quality Control Board (RWQCB) to set final decision regarding the City's waiver application

RAMIFICATIONS OF DISAPPROVAL:

Disapproval of Mayor's proposal to submit the waiver application: Disapproval indicates Council desires to proceed to Secondary Treatment and is expected to result in the following sequence of actions:

- o Staff will return with Proposition 218 to raise the funds required to upgrade the PLWTP.
- o After City Council approval to release the Proposition 218, and subsequent City Council approval of the associated rates, staff will negotiate a Secondary Treatment Consent Decree with EPA.
- o After completion of establishment and approval of the Secondary Treatment Consent Decree, MWWD will report to City Council.

Outside Legal Counsel:

The NPDES waiver application and anticipated appeal process is a highly technical process that requires unique and extensive legal and technical expertise. The City of San Diego's last waiver was held up in the appeal process for two years. Outside legal counsel was retained during the previous waiver application and appeal process, and contributed to the City's successful waiver application.

It is expected that an appeal process and/or litigation will follow the Environmental Protection Agency (EPA)/Regional Water Quality Control Board (RWQCB) decision regarding the City of San Diego PLWTP Waiver Application process.

Approval of outside counsel allows the City to best prepare for the waiver application process and the expected appeal process.

Outside counsel would provide the following to the Mayor and City Council:

1. Provide City of San Diego staff and leadership with legal briefings on the various aspects and requirements of the 301h waiver process prior to the Tentative Decision.
2. Tentative Decision and Public Hearing
 - a. Assist with review and analysis of basis for Tentative Decision.
If approval:

i. Expecting a subsequent appeal from outside organizations, counsel will work with staff to prepare needed documents to support the EPA/RWQCB decision and City of San Diego legal rights.

If denial:

i. Legal analysis (rationale, conclusory, arbitrary, supported by the record, consistent with 301(h) and Subpart G, etc.)

ii. Assist where possible with Technical analysis

iii. Support a successful appeal (per (3) below)

- b. Prepare response/ comment letter with assistance of technical staff.
 - c. Consider materials that San Diego may want to add to the record.
 - d. Review EPA's administrative record for the Tentative Decision.
 - e. Consider necessity of extending the public comment period. This may include the time necessary to conduct additional scientific testing/trying alternative methodologies, etc.
 - h. Issue Freedom of Information Act requests (FOIAs) for materials related to (1) the bases for the tentative decision (2) past tentative decisions granting the waiver (to identify contradictions in EPA's approach) and (3) any other issues as appropriate.
 - j. Assist in preparing for Public Hearing
 - k. Assist in submitting comment documents and San Diego's supplements to the administrative record.
3. Assist with Appeal of Final Decision (if necessary)
- a. First step: Environmental Appeals Board Hearing (EAB); standard of review is clear error, although a petition for review may be granted for public policy reasons. (Note: Successful petitions are almost always without prejudice (i.e., EPA can supplement the record to support its position)).
 - b. Second Step: Judicial review in the 9th Circuit; standard of review is arbitrary, capricious, or manifestly contrary to the statute.
4. In general: Assist with a response to any legal arguments that may be presented challenging the application at any point in the process.

FISCAL CONSIDERATIONS:

There is no fiscal impact beyond the current budget if the Council approves the waiver assuming EPA/RWQCB also approve.

If the Council disapproves continued operation under the waiver and supports constructing a secondary treatment plant, substantial rate increases would have to be approved.

The total cost of constructing a secondary treatment plant at Point Loma is estimated to be:

\$1.5B in 2015 dollars

\$0.8B in interest payments for bonds

\$2.3B total payments

After construction, the average expected Point Loma Operations and Maintenance cost is \$58M per year (an increase of \$38M over the current Point Loma O&M cost of \$20M). Almost half of this increase is just for electrical power requirements.

PREVIOUS COUNCIL and/or COMMITTEE ACTION:

July 26, 2006 - *Rules, Open Government and Intergovernmental Relations Committee* Action to work toward a consent decree that would implement secondary treatment at Pt. Loma Wastewater Treatment Plant within terms and timeframe to be determined: and to indicate that it is a priority of the City of San Diego to obtain funding from federal and state government for infrastructure upgrades and seek legislation to support this strategy.

November 2, 2007 Natural Resources and Culture Committee

COMMUNITY PARTICIPATION AND PUBLIC OUTREACH EFFORTS:

Extensive presentations and public input sessions have been held throughout San Diego, covering all 8 Council Districts. All public outreach requested by the Community, Stakeholders or Council Members were scheduled.

Over 50 public meetings have been held and the vast majority of the groups agreed with the waiver submission. Since the Mayor's decision to pursue another waiver, several organizations have voted to support the Mayor's position and none have opposed it.

Date	Presentation
June 29	Assemblymember Lori Saldaña
July 16	SD County Taxpayers Association
July 17	City Attorney Michael Aguirre
July 20	Chamber Infrastructure Committee
July 27	Senator Feinstein Staff
July 31	Region 9 Regional Water Quality Control Board
August 1	State Lobbyist
August 14	Senator Boxer Staff, Representative Davis Staff
August 16	Rancho Bernardo Community Planning
August 22	EPA Region 9 (San Francisco)
August 23	Coastal Commission Staff
August 24	D1, D7, D8 Staffs, IBA
August 27	Linda Vista Community Planning
August 29	Barry Newman (PUAC/IROC)
September 4	Miramar Ranch North Planning Committee
September 5	City Heights Area Planning Committee
September 5	Mission Valley Unified Planning Committee
September 5	Jim Peugh (PUAC/IROC)
September 6	La Jolla Community Planning Association
September 10	Honolulu Wastewater Staff
September 11	Eastern Area Planning Committee
September 12	Carmel Mountain Ranch Community Council

September 13	Del Mar Mesa Community Planning Group
September 14	Representative Davis Staff #2
September 17	Navajo Planning Committee
September 18	Clairemont Mesa Planning Committee
September 18	Torrey Hills Community Planning Board
September 19	Tierrasanta Community Council
September 19	Food and Beverage Organization
September 20	Serra Mesa Planning Group
September 21	Chamber of Commerce Water Committee
September 26	Women's Environmental Council
September 26	Pacific Beach Community Planning
October 1-3	Mayor in DC (Various Federal Legislators, EPA)*
October 02	D1*
October 02	D2*
October 02	D7*
October 03	Rancho Peñasquitos
October 04	Chamber of Commerce Infrastructure Committee
October 04	Metro Commission
October 09	D4*
October 09	D8*
October 09	Eastern Area Planning Committee (Voted to support waiver 9-0-1)
October 10	D3*
October 10	Peninsula Community Subcommittee
October 10	Taxpayers' Executive Committee
October 10	IBA
October 10	Carmel Mountain Ranch Community Council (No quorum)
October 11	Industrial Environmental Association
October 11	Del Mar Mesa Community Planning Group (Voted to support waiver 8-0)
October 12	Catfish Club
October 15	Navajo Planning Committee (no vote)
October 16	Chamber of Commerce Public Policy Committee (Voted to support waiver)
October 16	Clairemont Mesa Planning Committee (Voted to support waiver 11-2)
October 17	Otay Mesa Nestor Community Council (no vote)
October 17	Tierrasanta Community Council (Voted to support waiver 11-2-1)
October 18	Coastkeeper
October 18	Peninsula Community Planning Board (no vote)
October 18	Serra Mesa Planning Group (Voted to support waiver 7-2)
October 22	Linda Vista Community Planning (no vote)
October 23	American Society of Civil Engineers
October 30	Chamber of Commerce Board (Voted to Support Waiver)
November 01	District 8 Staff
November 01	Metro Commission (continued support)
November 01	La Jolla Community Planning Association (15-1)
November 02	RWQCB Executive Officer

November 05	City Heights Area Planning Committee (15-0)
November 06	Miramar Ranch North Planning Committee (10-0)
November 07	Rancho Peñasquitos Planning Committee
November 13	EPA Region 9
November 13	Point Loma Town Council
November 15	Rancho Bernardo Community Planning
November 20	City Council
November 20	Torrey Hills Community Planning Board
November 28	Mission Valley Unified Planning Committee

* indicates briefings by other than MWWD

Blue indicates presentations scheduled

Waiver Positions Known to Date:

The following San Diego agencies, organizations and/or community groups have taken an official position on the Waiver:

<u>Name of Organization</u>	<u>Position</u>
San Diego Taxpayers Association	Support
San Diego Regional Chamber of Commerce	Support
Metro Commission	Support
Eastern Area Planning Committee	Support
Del Mar Mesa Community Planning Group	Support
Clairemont Mesa Planning Committee	Support
Tierrasanta Community Council	Support
Serra Mesa Planning Group	Support
La Jolla Community Planning Committee	Support
City Heights Area Planning Group	Support
Miramar Ranch North Planning Group	Support

KEY STAKEHOLDERS AND PROJECTED IMPACTS:

No ratepayer impact for submitting the waiver; significant rate increases if waiver not submitted.



Timothy C. Bertch, PhD
Metropolitan Wastewater Department Director



R.F. Haas
Deputy Chief of Public Works

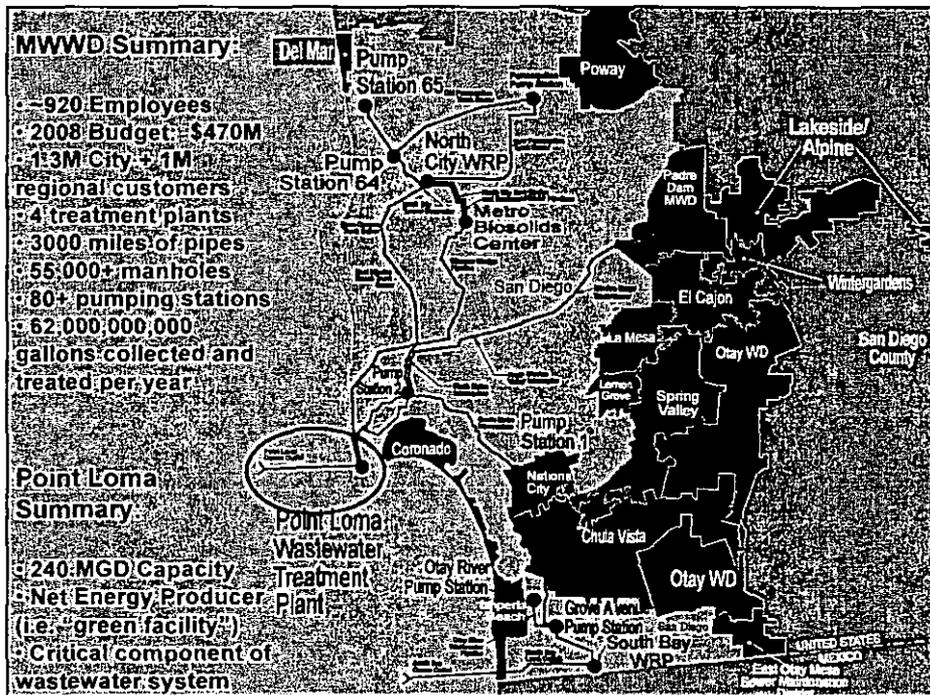
Attachments:

1. Community Power Point Presentation
2. Scientific Review Committee Final Report, October 1, 2007
3. Federal Funding Assessment Memo from Patton Boggs
4. Intergovernmental Relations Department State Bond Assessment
5. Report to the Rules, Open Government and Intergovernmental Relations Committee, July 26, 2006 meeting

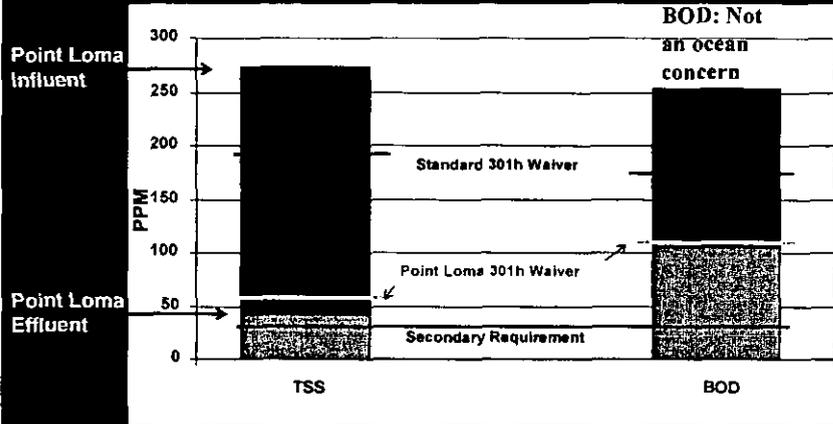
Point Loma Secondary Treatment Discussion

Brief for Council

Dr. Timothy Bertch
Metropolitan Wastewater Department
City of San Diego

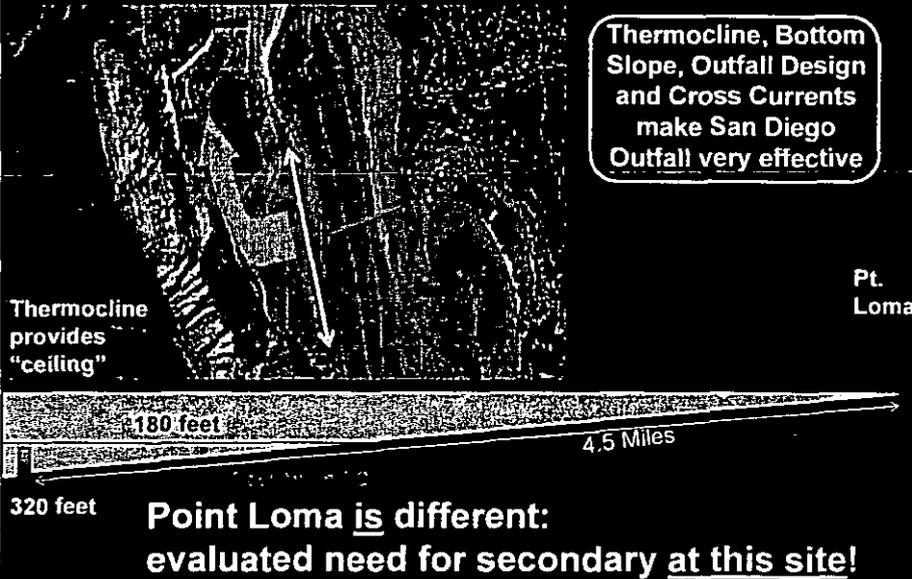


Point Loma Wastewater Treatment Modified Permit Summary

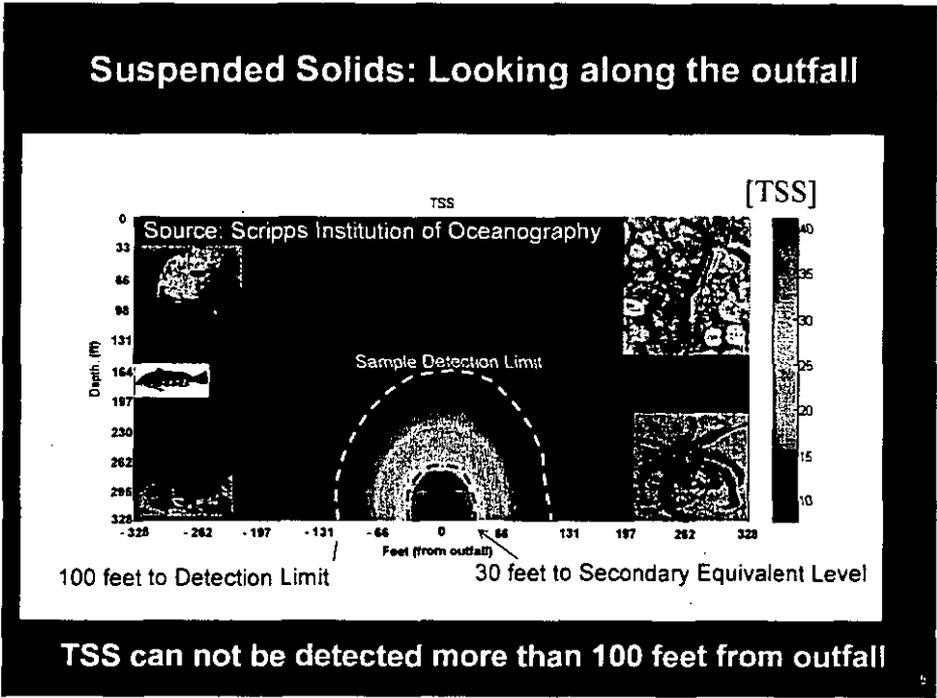


San Diego Removes over 85% of Suspended Solids

Point Loma Outfall Unique: Optimal for Dispersion



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Extensive Ocean Monitoring Effort

- ▣ Water Quality
 - Shoreline and kelp beds
 - Offshore
- ▣ Ocean Floor Sediments
 - Chemical Constituents
 - Grain Size
- ▣ Ocean Biological Communities
 - Seafloor Invertebrates
 - Bottom Dwelling Fish
- ▣ Bioaccumulation Studies
 - Trawl Caught Fish
 - Rig Caught Fish



150,000 Samples/year: NO ADVERSE IMPACT
**VALIDATED BY SCRIPPS INDEPENDENT
 SCIENTIFIC REVIEW COMMITTEE**

Ocean data supports deferring Secondary Treatment

Secondary Treatment Power Demands

Point Loma (MWhr/day)	Advanced Primary	Secondary
Green Power Generation Capacity	210	210*
Plant Power Requirements	55	→ <u>464</u>
Excess Power (Power Needed)	155	(254)
Cost Savings (Cost) to System	\$2.2M/year	(\$15.6M)/year

* Additional 38 MWhr/day capacity can be obtained with additional upgrade to existing plant

The secondary treatment cost just for electricity is \$17.8M per year

Point Loma WWTP would shift from 'green' electricity provider to a 'Top 20' user in San Diego:
 San Diego Committed to Minimizing Carbon Footprint

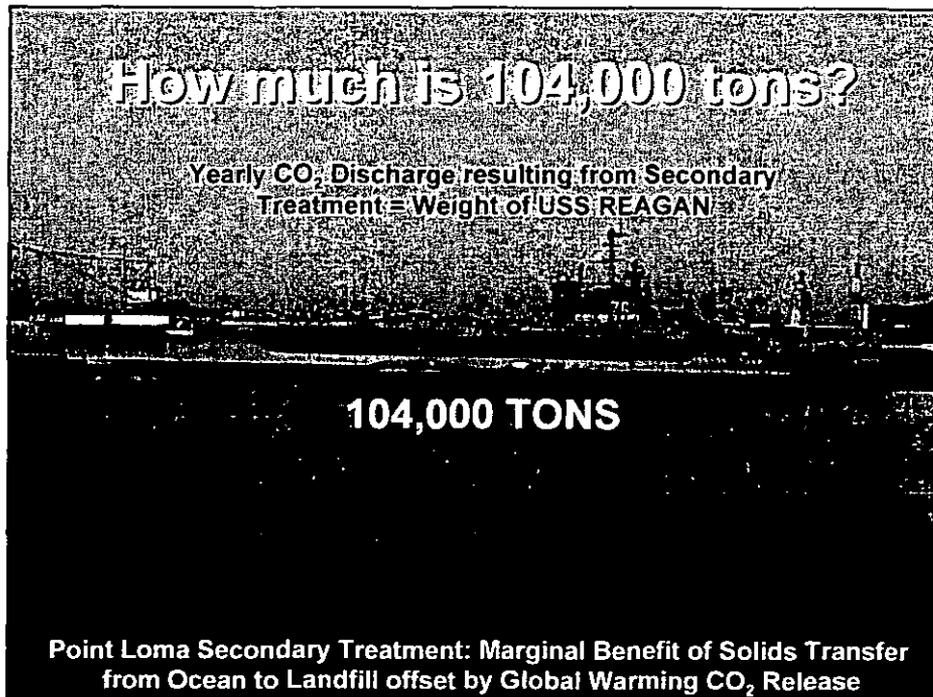
Weighing the Overall Environmental Impact of Secondary Treatment at Point Loma

Ocean:
 Reduce Ocean Discharge by 2,740 Tons/Yr Suspended Solids

Land:
 - 1,250,000 tons of Earth Removed at environmentally sensitive construction site
 - Added 2,740 Tons/Yr Biosolids Applied on Land

Air:
 Raise Atmospheric Discharge of CO₂ (Greenhouse Gas) at electrical generation site by 104,000 Tons/Yr

**Point Loma Secondary Treatment:
 a Net Negative Environmental Impact**



The Decision was about Secondary Treatment at Point Loma

- Based on science
 - Ocean Monitoring data reviewed by Independent Scientific Review Committee
- Deferring Secondary Treatment the right choice
 - Overall net negative environmental effect due to greenhouse gas emissions
 - Submit the waiver
 - If no waiver submitted, City obligated to build Secondary Treatment
- Continue to monitor; move to Secondary Treatment if/when conditions change



But what about COST?

Ocean:
Reduce Ocean Discharge by
2,740 Tons/Yr Suspended Solids

Cost:
- **\$1.5B Construction Cost**
- **\$40M Annual Operating Cost**

Land:
- 1,250,000 Tons Earth Removed
at construction site
- Added 2,740 Tons/Yr Biosolids
Applied on Land
- **Major Construction/Operational
Challenges with existing Land**

Air:
- 104,000 Tons/Yr CO₂ in Air

**Decision made on Science / Environmental criteria
Cost and space constraints reinforce decision**

The Decision was about Secondary Treatment at Point Loma



- Based on science
 - Ocean Monitoring data reviewed by Scientific Technical Review Committee
- Deferring Secondary Treatment the right choice
 - Overall net negative environmental effect due to greenhouse gas emissions
 - Submit the waiver
 - If no waiver submitted, City obligated City to Secondary Treatment
 - Any Secondary project challenging
 - Unneeded Burden to Ratepayers
- Continue to monitor; move to Secondary Treatment if/when conditions change



000823

THE CITY OF SAN DIEGO
REPORT TO THE CITY COUNCIL

DATE ISSUED: July 21, 2006 REPORT NO: 06-103

ATTENTION: Rules, Open Government and Intergovernmental Relations Committee
Agenda of July 26, 2006

SUBJECT: Status of the Point Loma Wastewater Treatment Plant Clean Water Act
Section 310(h) Modified National Pollution Discharge Elimination
System (NPDES) Discharge Permit

REFERENCE: 1) City Manager's Report No. 05-156 dated July 13, 2005: Status Report
on Pilot Study of Biological Aerated Filtration (BAF) at the Point Loma
Wastewater Treatment Plant; 2) Review of the Pt. Loma Ocean
Monitoring Program by Scripps Institution of Oceanography; and 3) The
Water Reuse Study

REQUESTED ACTION:

THIS IS AN INFORMATION ITEM ONLY. NO ACTION IS REQUIRED ON THE PART OF
THE COMMITTEE OR THE CITY COUNCIL.

STAFF RECOMMENDATION: The time is approaching when the City will need to make a
decision on what action to take regarding the renewal of the modified permit for the Point Loma
Wastewater Treatment Plant.

SUMMARY:

BACKGROUND

The Point Loma Wastewater Treatment Plant (PLWTP) operates with a modified NPDES permit that does not require full secondary treatment prior to discharge through a deep ocean outfall. Authorized by section 301(h) of the Clean Water Act, as initially modified by the Ocean Pollution Reduction Act of 1994 (OPRA), the modified permit requires renewal every five years. The Point Loma modified permit contains specific conditions not found in any other modified permit. These include requirements for an 80 and 58 per cent removal of total suspended solids and biological oxygen demand respectively, a reduction in the quantity of suspended solids discharged to the marine environment during the period of modification and to achieve a system capacity of 45 million gallons of reclaimed wastewater per day by January 1, 2010.

Point Loma's first modified permit was issued by the USEPA and State of California Regional Water Quality Control Board (RWQCB) on November 9, 1995 and subsequently renewed

effective September 13, 2002. During the renewal process the RWQCB responded to public comment and lowered permit limits for the mass emissions of suspended solids, additionally the State of California Coastal Commission denied the renewal after a public hearing. After a lengthy appeal process the State Water Resources Control Board (SWRCB) overturned these actions.

Subsequent to the final approval by the USEPA the renewal was opposed by the environmental community, who expressed the following concerns:

- a. Adequacy of ocean monitoring to detect possible negative impacts.
- b. Concerns about actual use of reclaimed water versus constructed capacity.
- c. Permitted mass emissions limit of suspended solids too high and not in conformance with the OPRA legislation.

This resulted in the City and the local environmental community filing cross appeals to the Environmental Appeals Board (EAB) concerning the SWRCB actions and the applicability of OPRA.

In an effort to resolve these differences the City and Environmental Representatives (now called Bay Council) began talks about future modified permits. After reaching an agreement regarding the issues of concern to the Bay Council, both sides entered into a joint stipulation whereby all appeals to the EAB were dropped with a reservation of rights.

The agreement consisted of:

- 1 - The City working with Scripps Institution of Oceanography for a complete review of the Point Loma ocean monitoring program with Bay Council and public participation.
This project is complete and the City is working with the Bay Council, Scripps, Metro Agencies and regulatory agencies on implementation of its recommendations.
- 2 - The City conducting a comprehensive study of potential uses for reclaimed water, including a re-look at the potential for indirect potable reuse.
This study is complete and awaiting further action by the City Council.
- 3 - The City conducting a pilot test of an innovative treatment process, Biological Aerated Filtration (BAF) that may be a more cost effective alternative than previous facility planning estimates for upgrading treatment at the PLWTP.
This project is complete and BAF was found to be a viable alternative to achieve secondary treatment at the PLWTP. Cost estimates for the full 240 mgd capacity are \$700 million if the City can acquire 28 to 30 acres of land adjacent to the plant and about \$1.2 billion if not.

DISCUSSION

The modified permit for the PLWTP expires again in June 2008. The City is required to submit a renewal application in December 2007 and in order to meet that deadline work on the application should begin in early 2007. A decision needs to be made on whether the City will pursue future

modified permits or investigate alternatives for implementation of secondary treatment. Several factors should be considered when making such a decision:

Possible factors against future renewals

- California Coastal Commission denied last waiver.
- RWQCB lowered mass emission limit in last waiver.
- SWRCB overruled Coastal Commission and RWQCB during last renewal, but the SWRCB indicated San Diego should "not expect to receive waivers forever."
- SWRCB is considering aligning the California Ocean Plan with Federal secondary treatment standards for Total Suspended Solids which would not allow waivers.
- Environmental groups have indicated they will oppose future waivers.
- San Diego may be last large waiver holder in U.S. by 2008 (and the only waiver holder in California).
- Choosing to implement secondary could facilitate getting grants/loans.
- The present waiver requires a reduction in mass emissions. When these limits are exceeded secondary will be required anyhow.

Possible factors in favor of future renewals

- Using BAF technology could cost \$700 million in capital costs and \$30 million annually in operation and maintenance costs if additional land is available at Point Loma. Some environmental groups and regulators may oppose the use of additional land.
- The City has invested \$1.5 billion since 1992 to upgrade and expand the wastewater and ocean disposal system.
- The extended outfall reduces impacts to the ocean.
- The OPRA waiver reduces impacts to the ocean beyond a normal 301(h) waiver.
- Present ocean monitoring shows no indication that operating Point Loma now, or in the future, will have a negative impact on the ocean even at 240 mgd.
- The new more comprehensive Ocean Monitoring Program provides additional means of identifying potential impacts.
- Point Loma has demonstrated:
 - 100% compliance with all permit requirements.
 - MWW's Industrial Source Control Program is highly effective in keeping toxic pollutants out of the sewer system.

FISCAL CONSIDERATIONS: None at this time.

PREVIOUS COUNCIL and/or COMMITTEE ACTION: None.

COMMUNITY PARTICIPATION AND PUBLIC OUTREACH EFFORTS: Metropolitan Wastewater staff has given presentations on the issue to Bay Council on June 15, 2006; Public Utilities Advisory Commission on June 19, 2006; Metro Commission Technical Advisory Committee on June 21, 2006; and the Metro Commission on July 6, 2006. Presentation to the San Diego Chamber of Commerce is scheduled for August 3, 2006.

KEY STAKEHOLDERS AND PROJECTED IMPACTS: See Executive Summary.

Scott Tulloch
Metropolitan Wastewater Director

R.F. Haas
Deputy Chief of Public Works

Attachments: 1. PowerPoint Presentation

TULLOCH/LANGWORTHY:oc

Document1

Secondary Treatment Discussion

Community Brief

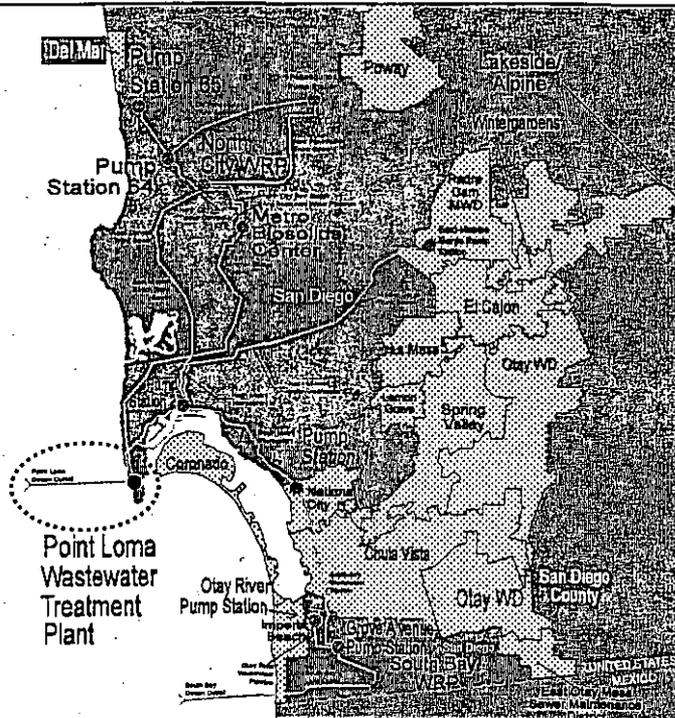


MWWD Summary:

- ~920 Employees
- 2008 Budget: \$470M
- 1.3M City + 1M regional customers
- 4 treatment plants
- 5000 miles of pipes
- 55,000+ manholes
- 80+ pumping stations
- 62,000,000,000 gallons collected and treated per year

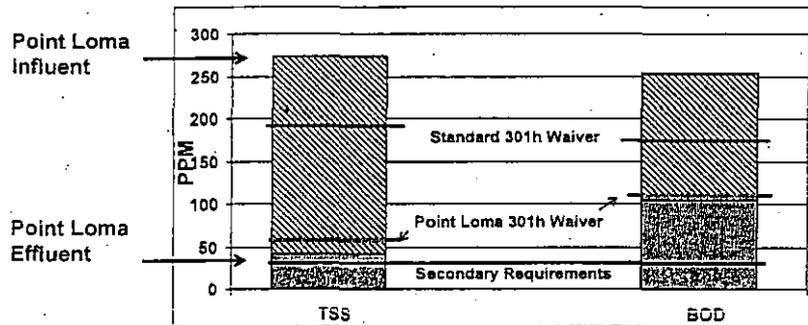
Point Loma Summary:

- 240 MGD Capacity
- Net Energy Producer (i.e. "green facility")
- Critical component of wastewater system
- 93% of system flows
- All treatment plants depend on Point Loma

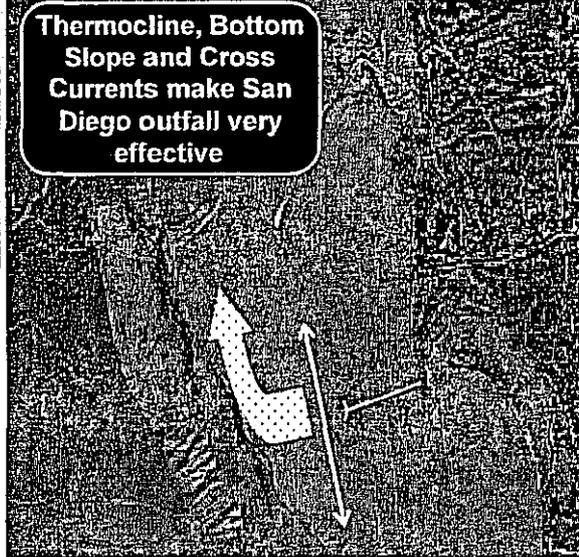
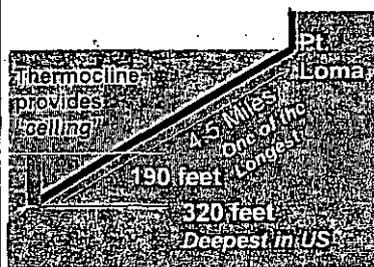


Point Loma Wastewater Treatment Modified Permit Summary

- Regulates Discharge Levels including Suspended Solids and Oxygen Demand (1972)
 - About 100 limits being met
 - BOD regulated component but not a physical concern
- Modified Permit allowed within the Law
 - Recognizes not all discharges equal; applied to ocean dischargers
- No Sunset requirements

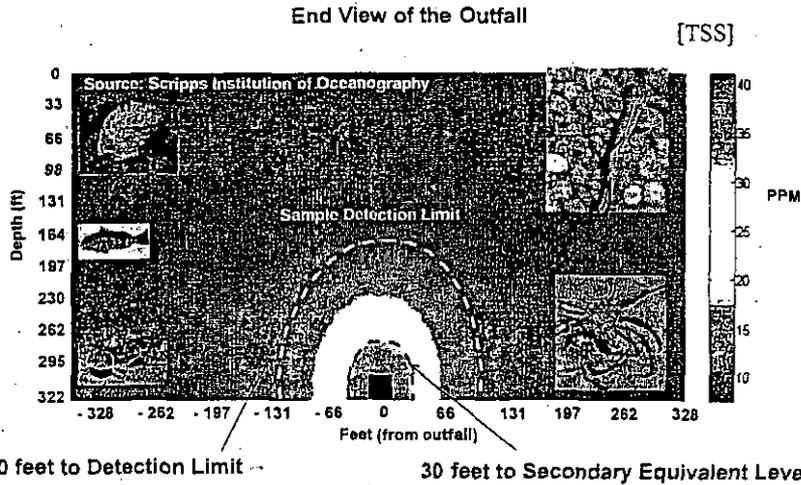


San Diego Outfall Unique: Optimal for Dispersion



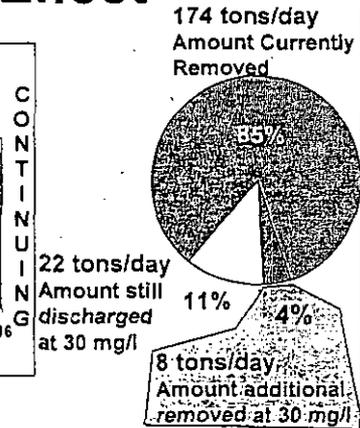
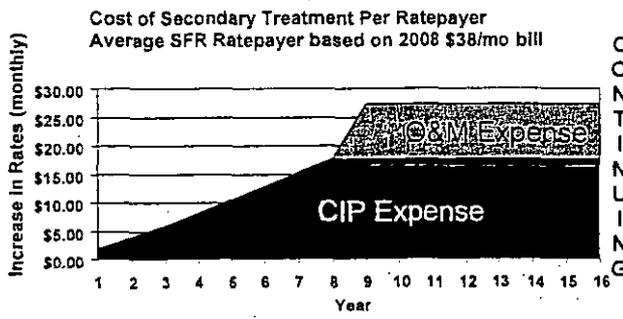
- Unique because:
- Deepest in US
 - One of Longest (4.5 miles)
 - Highly Efficient Design (initial dilution very high)
 - Thermocline keeps discharge deep
 - Currents and slope move away from beach
 - Bottom type does not hold solids

End view of Outfall: Prompt Dispersion of Solids



NO Detectable Impact on Marine Ecology; Gain from Secondary Treatment Minimal

Compare Cost and Effect



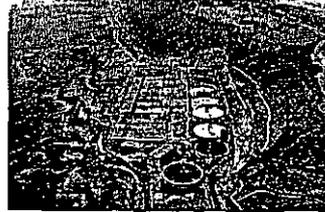
Rate hike for Secondary Treatment = \$27.25 per month
once plant operational (average SFR Customer)

If you are not the average SFR customer:
Your Monthly Expense for Secondary after all rate hikes

= Current Monthly Wastewater Bill x 1.67

The Decision is about Secondary Treatment at Point Loma

- Base on science and costs
 - Ocean Monitoring data being reviewed by Scientific Technical Review Committee
- Any Secondary project challenging
- Avoid backing into a decision;
not submitting 'waiver' obligates City to Secondary Treatment
- Decision expected this Fall



7

Questions?



8

Final Report

Environment and Sustainability Initiative
University of California, San Diego

Submitted to the
Metropolitan Wastewater Department
City of San Diego
October 1, 2007

Contact information:
Dr. Lisa R. Shaffer
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UCSD Environment and Sustainability Initiative
9500 Gilman Drive, MC 0446
La Jolla, CA 92093-0446
858-822-2489

**Final Report
Point Loma Outfall Review**

Environment and Sustainability Initiative
University of California, San Diego

October 1, 2007

The City of San Diego operates a regional wastewater treatment plant located on the Point Loma Peninsula. Effluent from this facility is discharged approximately 4.5 miles offshore at a depth of 310 feet. The treatment plant has the physical facilities to handle 240 million gallons per day (mgd), and has been permitted for that capacity by the State Regional Water Quality Control Board. The effluent flow has averaged about 175 mgd in recent years. The City has monitored ocean water quality and biological parameters surrounding the outfall in compliance with the National Pollutant Discharge Elimination System permit issued by the San Diego Regional Water Quality Control Board.

The City requested a scientific review of the impact of the Point Loma Ocean Outfall (PLOO) as the City considers a request to the Environmental Protection Agency for a new modified permit for the facility. The Environment and Sustainability Initiative at the University of California, San Diego assembled a team to review data collected in the coastal and near-shore receiving water over the last five-to-ten years, focusing on benthic ecology, sediment chemistry, physical variables, and marine microbiology. The interdisciplinary scientific team included scientists who have worked on the Point Loma Outfall in the past, and several new experts who bring "fresh eyes" to the task, including UCSD Prof. Paul Linden and Dr. Richard M. Gersberg of the Graduate School of Public Health at San Diego State University.

This document provides preliminary findings in addressing the City's goal of identifying any significant observable impact of the Point Loma Outfall on receiving waters, based on a 3-month review of existing data and analyses already performed. The Principal Investigator, Prof. Paul Linden, and the Project Coordinator, Dr. Lisa Shaffer, participated with City staff and the Mayor in a public event announcing the start of the study, and provided information in response to media inquiries. Preliminary findings were reported to the Mayor and staff on September 25. This document serves as the final report for the project.

The team from Scripps Institution of Oceanography and the Jacobs School of Engineering consisted of experts in benthic ecology (Paul Dayton and Ed Parnell); physical oceanography and coastal and nearshore transport (Linda Rasmussen and Ed Parnell); and molecular marine microbiology and microbial human pathogens present in the marine environment (Douglas Bartlett, assisted by one of his graduate students), as well as Dr. Kathleen Dohan, a post-doctoral fellow at Scripps who worked closely with Prof. Linden. The UCSD Environment and Sustainability Initiative provided

administrative support. Dr. Richard Gersberg from the Graduate School of Public Health, San Diego State University conducted the marine microbiology and public health assessment under a separate contract, but his results are included in this consensus report. The details of each team member's work are presented in the Background and Analysis section.

SUMMARY OF FINDINGS

The consensus conclusions of the team are summarized below. We found no evidence of significant adverse impacts of the PLOO. Following this summary, we have included the more detailed assessment of each area. In all cases, it is important to note that the scientific team did not conduct new, fundamental research and performed limited analysis of observational data. They reviewed existing analyses and reports, as requested by the City. Their conclusions are constrained by the limited time and scope of this project. In some cases, specific recommendations are presented that would enable further analysis to be conducted.

MICROBIOLOGY, SEDIMENT CHEMISTRY AND BIOACCUMULATION: We reviewed the existing information about the densities of total and fecal coliforms and enterococci as a function of source and time and provided an assessment based on evaluation of this microbiology data. We also conducted a review of the data on bioaccumulation of selected chemicals and levels of these chemicals in the sediments in the area of the PLOO.

Our primary conclusion is that after a careful review of the bacterial monitoring data and reports, there is little evidence that the wastewater plume is significantly impacting the shoreline or beaches in the region and adversely affecting human health. Even at densities below the California Ocean Plan [California State Water Resources Control Board (2001)] standards, there is no discernible connection between the wastewater plume and shoreline water quality. In terms of sediment chemistry, we concluded that, based on comparison of outfall versus reference sites, accumulation of the selected compounds (mercury, arsenic, selenium, zinc, PCBs, DDD, DDE, DDT, and chlordane) in the region around the outfall is not discernible.

With regard to bioaccumulation of chemicals in fish, a statistical analysis on total PCB levels showed rockfish fish liver levels in the zone near the PLOO were significantly higher than rockfish liver levels in the reference zone north of the PLOO. However, further investigations using trawl fishing data, which are collected over a larger area, suggest that the LA-5 dredge disposal site located south of the PLOO station could be the source. Unfortunately, currently it is impossible to know definitively whether the elevated levels are due to the PLOO or the LA-5 site. We recommend that the City of San Diego conduct a more detailed analysis of this finding and perhaps search for more suitable bioaccumulation reference sites, away from known sources of PCBs.

We also concluded that the PLOO has a minimal influence on its adjacent shoreline in terms of microbiology. More analyses of effluent tracking data and its relation to kelp

station and shore station indicator bacterial counts will be useful in making more definitive conclusions.

BENTHIC ECOLOGY: The benthic ecology team focused on benthic faunal components to assess benthic community patterns, processes, and responses to the outfall. With regard to the ability to evaluate the relative ecological impact of pollutants on the benthic community, all of the very different approaches described later in this report are strongly correlated, and there are no indications of significant impacts on the Point Loma benthic community. The benthic communities off Point Loma have remained fairly stable over the years in terms of species richness, density, biomass, and dominance, and these parameters have been consistent with Bight-wide trends. Comparisons of pre and post discharge data do show some trends. For example, there was an overall post-discharge increase in the number of species and infauna density and a decrease in dominance, the opposite of expectations of environmental degradation. There is no evidence that benthic communities off Point Loma outside the zone of initial dilution (ZID) (or San Diego in general) are dominated in any way by pollution tolerant species. If there are measurable impacts of the Point Loma outfall on the macrobenthos, they are subtle. There is also no indication that the Point Loma outfall significantly affects the community composition of megafauna off San Diego.

PHYSICAL OCEANOGRAPHY: We focused on the physical circulation and water mass properties of the receiving waters. We report that the complexity of the oceanographic conditions in the Point Loma area demands more observations before any conclusions can be made about the transport of the plume. Engineering model runs using recent stratification data are consistent with earlier predictions for dilution. While plume surfacing cannot be ruled out entirely, the probability is likely very low. The spatial distribution of bacteria also suggests that the plume is trapped at depth and does not reach the shore. However, more extensive data collection to analyze the shoreward plume transport is currently underway. Hydrographic work to track the plume and fine-scale modeling are both planned for the immediate future.

BACKGROUND INFORMATION AND ANALYSES

MICROBIOLOGY AND PUBLIC HEALTH (Rick Gersberg, Douglas Bartlett, Alexandra Purdy)

The following narrative is a summary of the findings of the Scientific Review Team that was organized to evaluate the impact of the Point Loma Ocean Outfall. In 2006 the average daily outfall from PLOO was 170 mgd (ranging from 162 to 180 mgd). PLOO discharges effluent from the Point Loma Wastewater Treatment Plant and has been in operation since 1963. It was extended to a length of approximately 7.2 km in November 1993. Weekly counts of total coliforms, fecal coliforms and enterococci are determined for many stations in order to evaluate compliance with California Ocean Plan standards. Many offshore locations are also sampled on a monthly or quarterly basis.

The present report includes an evaluation of the following aspects of the PLOO discharge:

1. **MICROBIOLOGY**-An assessment of data on marine microbiology, which includes data on the comprehensive monitoring of bacterial indicators, and allows an assessment of the possible impact of the PLOO on human health.
2. **BIOACCUMULATION**-An assessment of the monitoring data on selected toxic chemicals in the tissues of fish in the region of the PLOO in order to evaluate the potential for bioaccumulation of selected pollutants through the food chain.
3. **SEDIMENT CHEMISTRY**-An assessment of the sediment chemistry in the area of the PLOO discharge (as compared to the north reference sites) in order to evaluate the potential accumulation of selected toxic chemicals in the nearby sediments.

In addition to reviewing data from the Annual Reports for 2001-2006 and datasets listed in the Reference section below, some original data sorting and statistical analyses were carried out on selected pollutants and datasets, analyses that were above and beyond those that are presently available from the City of San Diego, Metropolitan Wastewater Division database and reports. However it is important to note here, that due to the limited timeframe and scope of the Scientific Review Panel, such original analyses as performed in this evaluation are necessarily selective and limited in scope.

MICROBIOLOGY: The City of San Diego performs shoreline and water column bacterial monitoring in the region surrounding the PLOO. This program is designed to assess the microbial quality of the regional marine waters, evaluate the movement and dispersal of the PLOO wastewater plume, and monitor compliance with the 2001 California Ocean Plan. Microbiology monitoring includes determination of the densities of the fecal indicator bacteria (FIB) including total and fecal coliforms and enterococci. These bacterial indicators are not generally pathogens themselves, but instead are

indicative of fecal contamination of marine waters and the possible presence of other microbial pathogens which may include viruses as well as bacteria and parasites. However, since the die-off of FIB (particularly total and fecal coliforms) may be more rapid than pathogenic viruses, these FIB may not always be conservative (the most protective) indicators of the degree of human health risk.

Despite the caveat above, after a careful review of the bacterial monitoring data and reports, Professor Gersberg's analysis finds that *there is little evidence that the wastewater plume is significantly impacting the shoreline or beaches in the region and adversely affecting human health*. This finding is based on the general conclusion from review of the 2001-2007 bacterial monitoring dataset, that elevated densities of bacteria in the region of the PLOO are generally limited to the stations in the vicinity of the PLOO and to waters deeper than 60m. Indeed, the absence of direct evidence for bacterial contamination in the surface waters in the winter months, when water column is well mixed (not stratified), suggests that stratification is not the only factor limiting the depth of the plume to deeper than 60m. Apparently, the depth of the discharge site (around 98m) may be the dominant factor keeping the PLOO wastewater from reaching the surface waters [City of San Diego (2005)].

In an attempt to further discern whether there was any relationship between water quality at the shore stations and the deeper waters offshore, Professor Gersberg conducted a Spearman correlational analysis for paired D (shoreline) and C (nearshore kelp, surface, mid and bottom depths) FIB densities for the dry season (May through October) for the period 2001-2007. In this case, analysis was restricted to the dry season since it was expected that during this period, not only is stratification well developed, but any confounding of the relationship by terrestrial sources of contamination at the shoreline is minimized. Results indicated that most, if not all, of the paired stations showed no statistically significant (p -value < 0.05) correlations, and for the very few paired stations that did, results became non-significant when the few statistical outliers were removed from the dataset. This suggests that even at densities below the Ocean Plan standards, *there is no discernible connection between the wastewater plume and shoreline water quality*.

Indeed, the very high rate of compliance with the California Ocean plan FIB standards for both the shoreline and kelp stations reflects the fact that the public health risk posed by the PLOO at the shoreline stations is most probably not significant. For example, data presented in Appendix A, Table 1a, show that compliance at the shoreline (D4 -D12) stations within the period 1994-2007 for all FIB for both the geometric mean and the single-sample maximum standards range from 95-100%. For the kelp stations at the 10-20m contour (A1, A6, A7, C4-C8), compliance was even higher (Table 1b). Considering the directional gradient of possible impact of the PLOO wastewater plume, the fact that the water quality at the kelp stations was higher than at the shore stations, indicates that terrestrial sources of fecal contamination account for much (if not all) of the shoreline pollution, rather than the PLOO wastewater plume. However, because the FIB may arise from a variety of both point (like the PLOO plume) and non-point sources (incl. terrestrial sources such as urban runoff, warm-blooded animals especially shorebirds, and

leaking sewer systems), resolution of the specific source of contamination at shore stations, particularly at levels below ocean plan standards, is difficult to attain, short of a more robust statistical and spatial analysis as mentioned above. In spite of this, Prof. Gersberg concludes that *the very high rates of compliance shown in Table 1a and b, coupled with the lack of a continuous gradient of contamination from the PLOO through to the kelp stations and the shoreline stations, indicate that the human health risk posed by the PLOO is most probably not significant.*

The Annual Receiving Waters Monitoring reports for 2005 and 2006, ocean monitoring bacteriological count data and total coliform data listed in the Reference section were examined by Dr. Bartlett along with Lindbergh Airport precipitation data (courtesy of Kayo Watanabe [NOAA (2007)]).

During the 27 month pre-extension period from August 1991 to Oct. 1993 there were 169 shoreline total coliform counts equal to or greater than 1,000 CFU/100 ml sample (mean of these samples ~ 23,000, high ~ 300,000). In contrast during the 142 month period between Feb 1994 and Nov. 2006 there were only 76 such samples (mean of these samples ~ 3,000, high =16,000). *This represents a change in the frequency of such high counts from 15.6 to 1.3%, clearly a dramatic result.*

If one discounts as possible runoff-related events those counts that were recorded within a 7 day period of measurable rainfall (recorded at Lindbergh Field) then the 76 high coliform count samples obtained since 1994 drop down to 22. In a few of these cases some of the kelp stations also have high total coliform counts within a week of the shoreline counts. In none of these cases does an analysis of the offshore station counts and kelp station counts lead to the impression that the plume is reaching the shoreline. However, such counts are rarely within a day or two of the shore sampling dates, and so it is not possible to conclude unambiguously that none of these high counts are related to the PLOO effluent plume. The high counts which occasionally occur at shore station D11 may result from contaminated San Diego River or Mission Bay waters.

The distribution of mean coliform plots presented in the Annual Receiving Waters Monitoring Reports for 2005 and 2006 are extremely useful. The April 2005 and 2006 plots in particular indicate that the plume may have moved towards the shoreline at that time to at least the 60m depth contour. If kelp and shore station data were obtained at the same time as that of the offshore locations (obviously not a trivial additional undertaking) the possibility of plume impact to the shoreline could be addressed more directly. However, although not taken on the same day, the shore and kelp and stations sampled near the same times showed no indication that the plume reached those areas. For example, the relatively high values indicated in the 2005 and 2006 plots were for station F8 sampled on 4/12/05 (Totals = 16,000 CFU/100 mL) and station F10 sampled on 4/12/06 (Totals = 9,400 CFU/100 mL). In 2005, kelp stations were sampled on 4/7 and 4/13, while shore stations were sampled on 4/9 and 4/15; all values were low with total coliforms <100 CFU/100 mL. In 2006, shore and kelp stations bracketing the F10 sampling date were also relatively low (i.e., <400).

The expanded array of PLOO offshore sampling sites begun in 2004 and MODIS satellite remote sensing data are being used for improved effluent tracking. In addition, the City's very recent Moored Observation System Pilot Study described in the Physical Oceanography section will also improve plume tracking. Correlating this information to the bacteriological counts is probably being done, but it is not described in the City of San Diego reports and would be useful to describe explicitly.

In summary, it is evident that *the PLOO has a minimal influence on its adjacent shoreline*. More analyses of effluent tracking in relation to kelp station and shore station indicator bacterial counts will be useful.

BIOACCUMULATION: The bioaccumulation portion of the PLOO monitoring program is conducted in order to evaluate the potential for bioaccumulation of selected pollutants through the food chain. It consists of two components:

1. analysis of muscle (and liver) tissues from fishes collected by rig fishing
2. analysis of liver tissues from trawl-caught fishes.

In this regard, the analysis conducted by Dr. Gersberg consisted of a review of the bioaccumulation data in existing reports and databases of the City of San Diego, as well as some original data analyses on bioaccumulation data for 1995-2006 in which selected fish tissue contaminant levels for rig fishing stations and trawl fishing stations in the vicinity of the PLOO (RF1 and TF1) were compared statistically to comparable values at stations away from the PLOO (RF2 and TF2). However, given the limited scope and timeframe for the present Scientific Review Team assessment, this analysis is mostly focused on a select group of chemicals of concern (mercury, selenium, arsenic, zinc, total PCBs, and the pesticides DDE, DDD, DDT, and chlordane. Moreover, for the most part, this analysis focused on fish livers (except for total PCB levels for which both fish muscle and liver were analyzed), because the liver is the organ where chemical contaminants are typically concentrated, and as such, liver levels of contaminants of concern may be used to gauge the potential for these same contaminants to bioaccumulate in the food chain.

Results of the above analysis of the selected chemicals of concern at the RF1 and TF1 stations (close to the outfall) compared to away (north) of the outfall (RF2 and TF2) showed no clear and significant differences, except for total PCBs in fish livers at the RF stations (Appendix C, Table C1). Rockfish fish liver levels at RF1 were significantly higher than rockfish liver levels for RF2. Details of the analyses are provided in Appendix C.

Dr. Parnell has performed additional robust analyses of the PCB data that include a) evaluating how the numerous nondetects in these data are handled and reanalyzing the data, b) looking at individual PCB congeners instead of total PCBs, and c) a more in depth comparison among sites that includes the southern farfield areas (i.e., near the LA5 disposal site and further south). Appendix C includes details of Dr. Parnell's work as well.

He found that the trawl fishing station near the LA-5 dredge disposal site (trawl fishing zone 3) has the highest concentrations for all PCB congeners and this difference is significant for most congeners. PCB concentrations decrease with increasing distance from the LA-5 site both to the north and to the south (*i.e.*, lower concentrations of PCBs at the outfall and even less further north off Mission Beach). In all cases, trawl fishing zone 3 (near LA-5) has the highest median values, upper quartiles, and outliers. The rig fishing results show that there are greater concentrations for most PCB congeners at the outfall site compared to the Mission Beach site.

The spatial patterns for the rig fishing and the trawl fishing stations are consistent at the two sites where both collections are performed. The trawl fishing provides the additional information that the centroid of PCB contamination on the shelf is likely the LA-5 disposal site. This suggests that the LA-5 dredge disposal site is the most likely source of significant PCB contamination in fish on the Point Loma shelf.

However, there currently is no way to know definitively whether the elevated levels in the rig fishing are due to the PLOO or the LA-5 site. We recommend that the City of San Diego conduct a more detailed analysis of this finding and perhaps search for more suitable bioaccumulation reference sites, away from known sources of PCBs.

SEDIMENT CHEMISTRY: Ocean outfalls are only one of many anthropogenic sources that may influence the chemical composition of the sediments through the discharge of wastewater and the subsequent deposition of a wide variety of organic and inorganic chemicals. Some of the most commonly detected chemicals in municipal wastewater discharge include various organic compounds, trace metals, and pesticides. The City of San Diego collects sediment samples at 22 stations in the region of the PLOO in order to assess the impact of wastewater discharge on sediment quality near the discharge site. For the present analysis, a comparison was conducted for a selected subset of chemicals of concern (mercury, arsenic, selenium, zinc, PCBs, DDD, DDE, DDT, and chlordane) between levels at the outfall stations (stations E14, E11, E15 and E17) and the north reference stations at similar depth contours (stations B9, B10, B12). The comparison with the north reference stations avoided possible confounding by the dredge disposal site LA5 which exists south of the PLOO. Overall, the data analysis conducted by Dr. Gersberg for this comparison of outfall versus reference sites, indicated that *accumulation of the selected compounds above in the region around the outfall is not discernible.*

It should be noted here that it is also possible that contaminated sediments are accumulating downslope from the shelf. The City began some deep slope monitoring off San Diego in 2003 as part of the Bight'03 regional monitoring program and more specifically as a separate, more intensive "Deep Benthic Pilot Study" of sites 200-500m depth west of Pt Loma in 2005 [Stebbins and Parnell (2005)]. The latter is referred to briefly below in the Benthic Analysis section. Additionally, further work is planned for deep habitats in the upcoming Bight'08 regional program. As such, it is not known

presently if the effects of the PLOO or other sources of contaminants are accumulating in these areas [Scripps Institution of Oceanography (2004)].

BENTHIC ANALYSIS (Paul Dayton, Ed Parnell)

This analysis addresses benthic infauna, demersal fishes and large invertebrates as well as a brief description of ecological thresholds and indicators of ecological stress. The City has been working under the terms of their permit in which they need to maintain natural conditions in sediments and biota beyond the wastewater zone of initial dilution (ZID). In order to insure compliance they have carried out the standard EPA and State Regional Water Quality Control Board monitoring programs and analyses. These data provide the basis for this review. The Scripps report [Scripps Institution of Oceanography (2004)] found some concerns about other regional sources of contaminants and the City is studying them. When available, these extra data will be discussed as well.

BENTHIC INFAUNA: The benthic macrofauna community is extremely diverse and represents the best known and probably the most sensitive indicators of stress to this system. The reason that the infauna are particularly useful for monitoring benthic stress is that many species are sensitive to various environmental parameters that could be driven by pollution stress. These animals cannot escape stress because they are not very mobile, often respond quickly to adverse conditions, either natural or anthropogenic, and in most cases are relatively short-lived so that their populations depend on recruitment that is itself sensitive to many environmental factors including, especially, pollution. But the challenge with any such study is to evaluate natural variability in time and space from changes possibly induced by ocean outfalls or other pollutant sources. The infaunal community is composed of species that are sensitive to these factors and tend to have relatively fast turnover rates so that the populations respond quickly to changes of all sorts, natural and anthropogenic. Before treatment of sewage began, the impacts were obvious and virtually complete as entire benthic areas became anaerobic and covered with mats of bacteria or dominated by a handful of pollution tolerant species. As wastewater treatment improved, the level of degradation changed such that there was not a clear criterion of how much ecological change is too much. The fact that the changes induced by wastewater outfalls became almost impossible to measure coincided with an appreciation of the considerable background variation, which challenged regulators and ecologists to find ways of teasing apart natural and anthropogenic changes.

EPA waiver requirements are rigorous and allow virtually no change in the area beyond the ZID. Traditionally the natural background variation in benthic communities is monitored at distant reference stations, and they developed a format in which samples are taken from a grid designed to evaluate the community impacts of the outfall over a large spatial area. During the 1960s – 1980s most outfalls had significant effects on the benthic community, and ecologists developed a sophisticated understanding of species-specific responses. This understanding has been integrated into indices that are sensitive to small amounts of contamination because they select and emphasize those species known to be most sensitive.

San Diego has always complied with all waiver requirements for its discharge from Point Loma. Monitoring of the receiving waters environment is comprehensive and well conducted. The analytical problems discussed above are acute because there are thousands of infaunal species in local coastal waters and their patterns of distribution and abundance are highly variable over space and time. In order to evaluate possible impacts of the outfall, the City employs many different types of analyses to evaluate changes in critical community parameters, including species richness and abundance, species diversity, dominance, evenness, and populations of various indicator species. These are typical community analyses that are responsive to large changes. There are other more specialized pollution indices that have been developed over the last 50 years to be extremely sensitive to outfall perturbations. The Infaunal Trophic Index (ITI) was used for many years for assessments of southern California waters, while the more recently developed Benthic Response Index (BRI) has been shown to be a powerful tool for detecting impacts at continental shelf depths up to 200 m. The BRI is considered a more robust index than the ITI because the ITI does not necessarily account for differences in physical factors such as depth and grain size while the BRI does indirectly. Other successful indices include the Shannon diversity index (H'), Pielou's evenness index (J'), and the Swartz dominance index. One of the best analytical tools to examine possible outfall effects in the face of the extreme regional variability is to use powerful trend analysis statistics that evaluate localized changes in the area around the outfall. One of the most popular analyses is the BACIP (before-after-control-impact-paired) analysis. This analysis tests differences between control and impact sites before and after a possible impact event (e.g., initiation of wastewater discharge). Another interesting approach was published recently by the Southern California Coastal Water Research Project (SCCWRP) [Weisberg *et al.* (2006)]. Here, the authors independently asked a large number of the most experienced pollution benthic ecologists in the country to evaluate several large data sets and rank them from stressed to non-stressed. There was an almost perfect agreement on the relative abundance of a small number of indicator species. With regard to the ability to evaluate the relative ecological impact of pollutants on the benthic community, *all of the very different approaches are strongly correlated, and there are no indications of significant impacts on the Point Loma bottom community.*

One problem for the Point Loma region, and for most other areas as well, is identifying appropriate reference or control sites. This relates to the fact that most of the benthic biota important for these analyses are extremely sensitive to their sedimentary habitat. For example, grain size and the amount of organic material present are critical. For the Point Loma monitoring program, the sediments of the northern stations originally chosen as reference stations include sites with both coarser and finer sediments than sites nearer the outfall. The composition of grain size in sediments so profoundly affects both the chemistry and the biological community within the sediments that natural differences would be expected between sites having different grain size compositions even without the presence of a sewage outfall. Additionally, several monitoring sites to the south of the outfall are likely impacted by a nearby toxic waste dump site (EPA's LA-5 dredge material disposal site) or outflow from the mouth of San Diego Bay. It is important to note that the prevalence of coarse sediments in the outfall area indicates that it is in an

erosive environment in which currents will disperse flocculent material. In summary, *there are complications with any analysis of the Point Loma Outfall because there are such large amounts of spatial and temporal variation in the background parameters.* Addressing such concerns was a major recommendation of the previous Scripps Point Loma Outfall Project report.

In response to the above and related issues and to recommendations of the Model Monitoring Program for large ocean discharges developed by SCCWRP for the State Water Quality Control Board, the City is actively involved in several relevant benthic-monitoring projects. These include a large comprehensive Sediment Mapping Project of both the Point Loma and South Bay outfall regions as well as pilot study of deeper habitats (200-500m) west of the Point Loma outfall [Stebbins, Schiff and Ritter (2004); Stebbins and Parnell (2005)]. Reports from the first phases of both projects are expected to be completed by the end of 2007. The purpose of the Sediment Mapping Project is to determine more meaningful spatial scales of sediment monitoring thereby increasing the sensitivity of monitoring. The purpose of the deeper sediment-sampling program is to determine whether there is any accumulation of pollutants further offshore from the outfall where natural sediment processes are most likely to transport sediment-associated pollutants. Additionally, the City has conducted summer benthic surveys of randomly selected sites of the San Diego coast from Mexico to Del Mar since 1994. The information from all of these surveys combined will be useful in evaluating the effectiveness of the current Point Loma monitoring grid, and if necessary, determining the appropriate locations for additional reference and/or monitoring sites.

An ophiuroid-polychaete assemblage that is common in the Southern California Bight (SCB) characterizes the infaunal communities off Point Loma. Changes in community composition at Point Loma probably reflect the general patterns of variation around the SCB related to oceanographic forcing such as El Niños or simple stochastic changes in populations relating to all sorts of natural ecological interactions. The benthic communities off Point Loma have remained fairly stable over the years in terms of species richness, density, biomass, and dominance, and these parameters have been consistent with Bight-wide trends. Comparisons of pre and post discharge data do show some trends. For example, there was an overall post-discharge increase in the number of species and infauna density and a decrease in dominance, the opposite of expectations of environmental degradation. *There is no evidence that benthic communities off Point Loma outside the ZID (or San Diego in general) are dominated in any way by pollution tolerant species. If there are measurable impacts of the Point Loma outfall on the benthos, they are subtle.*

The outfall depth stations are located along the 98-m depth contour and span the terminus of the Point Loma outfall. Station E14 is located nearest the outfall, approximately 111 meters north and 256 meters west of the center of the diffuser "Y." This station is considered the Near-ZID or ZID boundary station and is the site most likely to be impacted by the outfall. Stations E11 and E17 are the closest near field stations, located approximately 204 m from the south and north ends of the respective diffuser legs. The remaining "E" stations are considered far field sites. The "B" stations are located >11 km

from the outfall and were originally selected to represent reference or control sites. However, benthic communities differed between the "B" and "E" stations prior to operation of the outfall [Smith and Riege (1994); City of San Diego (1995a)] most likely because these areas have different grain size compositions and therefore represent different habitats. Thus, station E26 was chosen to represent an additional control or reference site. This station is located ~8 km from the outfall and is considered the least likely "E" station to be impacted.

The City analyzed the reference stations and found that E26 and B9 were the most appropriate stations. BACIP analysis showed significant trends in which E14 differed from the control sites for species richness and abundance. Interestingly, the changes were opposite from what one would expect of a stressed community. There were no differences in the pollution indicators *Ampelisca spp* and *Rhepoxynius spp*. The most famous pollution indicator is the polychaete worm *Capitella capitata* that can reach densities $>500/0.1 \text{ m}^2$ but only 6 individuals were found in 2006 in the stations near the outfall (E17, E14, and E11). Certainly these data are strong indication that there is no important benthic impact of the outfall. However, there were some changes that might reflect outfall impacts around E14. These include a modest but significant increase in the BRI index as well as significantly reduced densities of *Amphiodia spp*. and a small shift in the ITI index. None of these results indicate that the Point Loma benthic community is altered to the extent that it would serve as a warning about significant outfall impacts on the benthos. One consistent change relates to a small decrease in the density of *Amphiodia urtica*, a small white brittle star that universally decreases after a pipe is installed. Because *Amphiodia urtica* is preyed upon by fish and crabs attracted to the structural habitat of outfalls, populations of this brittle star have been observed to be equally reduced along pipes that have long transported secondarily treated sewage. Therefore, it seems likely that the decreased abundance of this species near the Point Loma outfall is also due to the predation of fish and crabs attracted to the structure of the discharge pipe and mixing box and is not, as often claimed, caused by sewage discharge.

Unlike the infauna, megafauna species tend to be more long-lived but are much more mobile and can respond to environmental changes simply by moving into more appropriate environments. While their natural history is poorly studied, many are known to move a great deal; for example, some move seasonally following seasonal shifts in food or often to form breeding aggregations. There is little evidence that they have strong site fidelity so that the movements are probably sufficient to mask possible bioaccumulation. That is, bioaccumulation might occur from pollutants at one site but the fish may move to clean sites, so bioaccumulation is not a sensitive indicator unless it is pronounced and occurs in a large number of individuals. *There is no indication that the Point Loma outfall significantly affects the community composition of megafauna off San Diego.*

PHYSICAL OCEANOGRAPHY (Linda Rasmussen, Kathleen Dohan, Ed Parnell, Paul Linden)

The City of San Diego has performed an extensive monitoring program throughout the area surrounding the Point Loma outfall, with approximately bi-weekly CTD (conductivity, temperature, depth) casts near the shore and CTD casts throughout the entire area four times a year. The City report for 2006 gives an overview of the mean hydrographic conditions in the area of the Point Loma outfall with a comparison to decadal patterns. They found no connections between the outfall and the distributions of pH, chlorophyll A, transmissivity and dissolved oxygen.

What the annual reports do not include is an analysis of episodic events that could lead to shoreward transport of the plume. The complexity of the oceanographic conditions in the Point Loma area demands more observations on a continuous basis before any conclusions can be made about the transport of the plume.

The City of San Diego, together with Ed Parnell and Linda Rasmussen from Scripps, has recently implemented a series of thermistor chains and ADCP (Acoustic Doppler Current Profiler) moorings [Storms, Stebbins and Parnell (2006)]. The first batch of data available for study is from two thermistor chains: one chain at the Y of the outfall, the other at the 60m isobath along the outfall pipe. The temperature data was collected every 10 minutes from June 2006 - April 2007. The ADCP data available is from two moorings: one at the Y, one south of the Y. The velocity data was collected every 3 minutes from September 2006 - the middle of December 2006. Five more thermistor chains are in place with data to be collected in the fall of 2007.

These high-resolution data sets clearly exhibit the variability in the coastal waters near the outfall. For example, at the Y the 12°C isotherm fluctuates about its average depth by 11.5 m, with many extreme events such as a change in mean location from 30m to 50m in 5 days. Internal tides, bottom currents, and diurnal currents can all contribute to these fluctuations and a "sloshing" of the colder underlying waters onshore, with potential for onshore transport of the plume. Two thermistor chains are insufficient to capture the full spatial extent of the significant fluctuations for this report, but the additional data being collected will be used in the future to study these events.

The velocities also exhibit short timescale variability. The mean across-shore velocity is 0.3cm/s onshore at the bottom, but is predominantly offshore above 10m at approximately 4cm/s amplitude. As an illustration, this average speed of 0.3cm/s means water could reach the shore in 3 days. This is unlikely because the change in temperature as the seafloor depth rises towards shore impedes shoreward currents, but without more observations across-shore such transport cannot be eliminated. The mean along-shore velocity ranges from 0cm/s at the bottom to 5cm/s in the middle of the column back to 0cm/s at the top. The standard deviation of the currents at all levels is 10cm/s. The range in bottom across-shore velocities during a three-month period was from 47cm/s offshore to 33 cm/s onshore.

Most of the energy is in mean, diurnal and tidal fluctuations. Most of the variability, at approximately 75%, is in the barotropic mode (i.e., the velocity is constant with depth). The next significant mode is the first baroclinic mode, capturing approximately 20% of the variability in the currents. In this mode currents are in different directions with depth with a reversal in direction between the surface and the bottom. This results in shear, which could contribute to mixing of the water column. This behavior is consistent with other coastal studies. These types of currents are probably forced by large-scale remote winds with local winds affecting the top few meters of the water column only. The tidal currents have approximately 5cm/s cross-shore amplitudes with no consistent alignment in time or between depths.

A plume mixing and dilution model (RSB [Frick *et al.* (2003)]) was run as part of the 1994 waiver application to determine the initial volumetric dilution of the plume and its variability throughout the year. The waiver presented average monthly dilution factors, as well as some model results from individual days, using the annual average daily flow rate of 205 mgd and zero ambient current (per California Ocean Plan regulatory guidelines). The model was replicated using a more recent version of RSB (Visual Plumes NRFLD model [Frick *et al.* (2003)]) and comparable results were obtained. Temperature profiles were selected from recent thermistor string data to represent weak winter stratification (19 February 2007), strong summer stratification (27 July 2006) and summer upwelling conditions (28 August 2006). The winter and upwelling profiles were chosen to represent potential 'worst case' scenarios in which the subsurface density gradient is weak and thus more likely to allow the plume to rise higher. Previous model results have shown that a well-mixed bottom to mid-depth water column is most likely to allow surfacing of the outfall plume.

The predicted volumetric dilution at mid-plume was within or slightly higher than the range of average monthly values given in the waiver application (December-February dilution ratio of 200-250:1; June-August 320-360:1) As with results shown in the waiver application, maximum plume height in winter was deepest (58 m depth), though dilution is somewhat lower because of earlier trapping (263:1). The shallowest plume height occurred during the summer upwelling simulation (42 m depth) but with a correspondingly higher dilution factor (411:1).

It is possible that conditions may occur that allow a greater plume rise, given the extreme temporal variability of the temperature and currents in this region. However, the weakest density gradients appear to be associated with upwelling events that also provide cold, dense water that mixes with the plume to neutralize buoyancy sooner. *So while plume surfacing cannot be ruled out entirely, the probability is likely very low.*

The variability seen in the thermistor and ADCP data illustrates the uncertainty in using only snapshots from intermittent CTD profiles to describe complex local hydrography. However, the combination of time series from CTD, thermistor and ADCP data will be useful in initializing and validating a high-resolution numerical simulation of the currents and plume transport. The *in situ* data, plus output from the plume model described above, will eventually be used by Linda Rasmussen to seed a small-scale Regional Ocean Model (ROMS [Moore *et al.* (2004)]) simulation for the area. Such a model would be

invaluable for understanding the structure of the circulation in the region and the patterns of plume transport. In addition to this future phase of the detailed regional oceanographic study, tow-yos with plume tracers will be deployed.

The physical oceanographic data at present is inadequate to predict with certainty either the location or the dilution rate of the plume. The best indicator of the plume location at present is the distribution of high bacterial counts in the weekly surveys, which do not show any significant transport above 40m depth with most of the higher counts confined to 80m depth. The bacteria data does show transport of the plume north and south along the 100m isobath, occasionally out of range of the sampling stations, but predominantly northward. This is consistent with the results from the extreme test-case plume runs and the preliminary ADCP data and suggests that the plume is trapped at depth.

The next two stages of further study will provide more insight into the oceanographic conditions near the Point Loma outfall. Although the ADCP and thermistor data will soon be available, presently we do not have enough data to definitively rule out transport of the plume to shore.

CONCLUSIONS

In the case where sufficient data is available, there is no discernible evidence of significant adverse impacts of the PLOO. In the case where more data is required, initial results suggest no adverse environmental impacts except for one concern with elevated PCBs in fish livers closer to the outfall, although this is possibly due to the LA5 dredge site. The City is currently involved with several projects to address the various data collection needs at which point proper assessments can be made.

This overall conclusion is based on the following specific conclusions. In terms of microbiology, there is no discernible connection between the wastewater plume and shoreline water quality. Regarding sediment chemistry, there is no discernible accumulation of the selected compounds in the region around the outfall. Other than the PCB issue, there is no significant elevation of chemical levels near outfall.

The benthic analysis concludes that there are no indications of significant impacts on the Point Loma bottom community (infaunal, macrobenthos, or megafauna). All of several very different approaches to evaluate the ecological impacts of pollutants on the benthic community are strongly correlated. There are complications with analysis due to the large spatial and temporal variation in the background parameters. The City is actively involved in several benthic-monitoring projects with reports from the first phases expected by the end of 2007, which should provide important new understanding.

In the analysis of physical oceanography, the complexity of the oceanographic conditions in the Point Loma area demands more observations before any conclusions can be made about the transport of the plume. Engineering model runs and bacteria distributions

suggest that the plume is trapped at depth and does not reach the shore. More extensive data collection to analyze the shoreward plume transport is currently underway, with plume tracking and fine-scale modeling of the currents in the region both planned for the immediate future.

The final bottom line is that where data were sufficient to support conclusions, no areas of concern were identified. We did identify several areas where further observations and analysis may be warranted, and it appears that work is already underway to address these needs.

APPENDIX A

Table 1a. Summary of compliance with bacteria standards (single-sample maximum) for PLOO shore stations between 1994 and 2007

10000 Total Coliform Standard 1994-2007				
Shore Stations	# of times exceeded	N (# of observations)	% of exceedance	% Compliance
D1	14	386	3.6	96.4
D2	10	353	2.8	97.2
D3	1	344	0.3	99.7
D4	0	579	0.0	100.0
D5	0	588	0.0	100.0
D6	0	340	0.0	100.0
D7	0	583	0.0	100.0
D8	0	595	0.0	100.0
D9	0	583	0.0	100.0

400 Fecal Coliform Standard 1994-2007				
Shore Stations	# of times exceeded	N (# of observations)	% of exceedance	% Compliance
D1	17	386	4.4	95.6
D2	10	353	2.8	97.2
D3	3	344	0.9	99.1
D4	0	579	0.0	100.0
D5	0	588	0.0	100.0
D6	0	340	0.0	100.0
D7	1	583	0.2	99.8
D8	8	595	1.3	98.7
D9	2	583	0.3	99.7
D10	1	239	0.4	99.6
D11	11	239	4.6	95.4

104 Enterococcus Standard 1994-2007				
Shore Stations	# of times exceeded	N (# of observations)	% of exceedance	% Compliance
D1	25	386	6.5	93.5
D2	15	353	4.2	95.8
D3	3	344	0.9	99.1
D4	2	579	0.3	99.7
D5	4	588	0.7	99.3
D6	1	340	0.3	99.7
D7	2	583	0.3	99.7
D8	11	595	1.8	98.2
D9	6	583	1.0	99.0
D10	9	239	3.8	96.2
D11	13	239	5.4	94.6
D12	5	239	2.1	97.9

000850

Table 1a (continued). Summary of compliance with bacteria geometric mean standards for PLOO shore stations

Geometric Mean Total Coliform Standard					
Shore Stations	# of times exceeded	N (# of observations)	% of exceedance	% Compliance	Year
D1	22	380	5.8	94.2	1994-2003
D2	3	353	0.8	99.2	1994-2003
D3	0	343	0.0	100.0	1994-2003
D4	0	574	0.0	100.0	1994-2007
D5	0	584	0.0	100.0	1994-2007
D6	0	334	0.0	100.0	1994-2003
D7	0	547	0.0	100.0	1994-2007
D8	1	588	0.2	99.8	1994-2007
D9	0	581	0.0	100.0	1994-2007
D10	0	233	0.0	100.0	2003-2007
D11	0	234	0.0	100.0	2003-2007
D12	0	234	0.0	100.0	2003-2007

Geometric Mean Fecal Coliform Standard					
Shore Stations	# of times exceeded	N (# of observations)	% of exceedance	% Compliance	Year
D1	3	382	0.8	99.2	1994-2003
D2	2	353	0.6	99.4	1994-2003
D3	0	344	0.0	100.0	1994-2003
D4	0	574	0.0	100.0	1994-2007
D5	0	584	0.0	100.0	1994-2007
D6	0	334	0.0	100.0	1994-2003
D7	0	549	0.0	100.0	1994-2007
D8	1	594	0.2	99.8	1994-2007
D9	0	581	0.0	100.0	1994-2007
D10	0	234	0.0	100.0	2003-2007
D11	0	234	0.0	100.0	2003-2007
D12	0	234	0.0	100.0	2003-2007

Geometric Mean Enterococcus Standard					
Shore Stations	# of times exceeded	N (# of observations)	% of exceedance	% Compliance	Year
D1	56	381	14.7	85.3	1994-2003
D2	12	353	3.4	96.6	1994-2003
D3	0	343	0.0	100.0	1994-2003
D4	0	574	0.0	100.0	1994-2007
D5	1	584	0.2	99.8	1994-2007
D6	0	334	0.0	100.0	1994-2003
D7	0	549	0.0	100.0	1994-2007
D8	39	594	6.6	93.4	1994-2007
D9	3	581	0.5	99.5	1994-2007
D10	2	234	0.9	99.1	2003-2007
D11	3	234	1.3	98.7	2003-2007
D12	0	234	0.0	100.0	2003-2007

000851

Table 1b. Summary of compliance with bacteria standards (single-sample maximum) for PLOO kelp stations (1994-2007).

10000 Total Coliform Standard (1994~)					
Stations	Depth	# of times exceeded	N (# of observations)	% of exceedance	% Compliance
C4	Surface	2	840	0.002	99.998
	Mid	2	1679	0.001	99.999
	Bottom	0	0	NA	NA
C5	Surface	2	839	0.002	99.998
	Mid	2	1677	0.001	99.999
	Bottom	0	0	NA	NA
C6	Surface	0	838	0.0	100.0
	Mid	0	1676	0.0	100.0
	Bottom	0	0	NA	NA
C7	Surface	0	837	0.0	100.0
	Mid	0	212	0.0	100.0
	Bottom	0	1674	0.0	100.0
C8	Surface	0	837	0.0	100.0
	Mid	0	212	0.0	100.0
	Bottom	0	1674	0.0	100.0
A1	Surface	1	840	0.001	99.999
	Mid	0	214	0.0	100.0
	Bottom	0	1680	0.0	100.0
A6	Surface	0	839	0.0	100.0
	Mid	0	214	0.0	100.0
	Bottom	0	1678	0.0	100.0
A7	Surface	1	839	0.001	99.999
	Mid	0	214	0.0	100.0
	Bottom	0	1678	0.0	100.0

400 Fecal Coliform Standard (1994~)					
Stations	Depth	# of times exceeded	N (# of observations)	% of exceedance	% Compliance
C4	Surface	2	840	0.002	99.998
	Mid	2	1679	0.001	99.999
	Bottom	0	0	NA	NA
C5	Surface	1	839	0.001	99.999
	Mid	2	1677	0.001	99.999
	Bottom	0	0	NA	NA
C6	Surface	0	838	0.0	100
	Mid	0	1676	0.0	100
	Bottom	0	0	NA	NA
C7	Surface	0	837	0.0	100
	Mid	0	212	0.0	100
	Bottom	0	1674	0.0	100
C8	Surface	0	837	0.0	100
	Mid	0	212	0.0	100

000852

	Bottom	0	1674	0.0	100
A1	Surface	1	840	0.001	99.999
	Mid	0	214	0.0	100
	Bottom	0	1680	0.0	100
A6	Surface	0	839	0.0	100
	Mid	0	214	0.0	100
	Bottom	0	1678	0.0	100
A7	Surface	1	839	0.001	99.999
	Mid	0	214	0.0	100
	Bottom	0	1678	0.0	100

104 Enterococcus Standard (1994)

Stations	Depth	# of times exceeded	N (# of observations)	% of exceedance	% Compliance
C4	Surface	3	840	0.004	99.996
	Mid	3	1679	0.002	99.998
	Bottom	0	0	NA	NA
C5	Surface	4	839	0.005	99.995
	Mid	6	1677	0.004	99.996
	Bottom	0	0	NA	NA
C6	Surface	1	838	0.001	99.999
	Mid	1	1676	0.001	99.999
	Bottom	0	0	NA	NA
C7	Surface	4	837	0.005	99.995
	Mid	1	212	0.005	99.995
	Bottom	3	1674	0.002	99.998
C8	Surface	2	837	0.002	99.998
	Mid	0	212	0.0	100
	Bottom	4	1674	0.002	99.998
A1	Surface	2	840	0.002	99.998
	Mid	0	214	0.0	100
	Bottom	2	1680	0.001	99.999
A6	Surface	1	839	0.001	99.999
	Mid	0	214	0.0	100
	Bottom	0	1678	0.0	100
A7	Surface	5	839	0.006	99.994
	Mid	0	214	0.0	100
	Bottom	3	1678	0.002	99.998

Table 1b (continued). Summary of compliance with bacteria geometric mean standards for PLOO kelp stations

Geometric Mean Total Coliform Standard (1994-2007)			
Stations	Depth	# of times exceeded	% Compliance
C4	Surface*	0	100
	Mid**	0	100
	Bottom†	NA	NA
C5	Surface	0	100
	Mid	0	100
	Bottom	NA	NA
C6	Surface	0	100
	Mid	0	100
	Bottom	NA	NA
C7	Surface	0	100
	Mid	0	100
	Bottom	0	100
C8	Surface	0	100
	Mid	0	100
	Bottom	0	100
A1	Surface	0	100
	Mid	0	100
	Bottom	0	100
A6	Surface	0	100
	Mid	0	100
	Bottom	0	100
A7	Surface	0	100
	Mid	0	100
	Bottom	0	100

Geometric Mean Fecal Coliform Standard (1994-)			
Stations	Depth	# of times exceeded	% Compliance
C4	Surface	0	100
	Mid	0	100
	Bottom	NA	NA
C5	Surface	0	100
	Mid	0	100
	Bottom	NA	NA
C6	Surface	0	100
	Mid	0	100
	Bottom	NA	NA
C7	Surface	0	100
	Mid	0	100
	Bottom	0	100
C8	Surface	0	100
	Mid	0	100
	Bottom	0	100

000854

A1	Surface	0	100
	Mid	0	100
	Bottom	0	100
A6	Surface	0	100
	Mid	0	100
	Bottom	0	100
A7	Surface	0	100
	Mid	0	100
	Bottom	0	100

Geometric Mean Enterococcus Standard (1994-)

Stations	Depth	# of times exceeded	% Compliance
C4	Surface	3	99.996
	Mid	3	99.996
	Bottom	NA	NA
C5	Surface	2	99.998
	Mid	2	99.998
	Bottom	NA	NA
C6	Surface	0	100
	Mid	0	100
	Bottom	NA	NA
C7	Surface	0	100
	Mid	0	100
	Bottom	0	100
C8	Surface	0	100
	Mid	0	100
	Bottom	0	100
A1	Surface	0	100
	Mid	0	100
	Bottom	0	100
A6	Surface	0	100
	Mid	0	100
	Bottom	0	100
A7	Surface	0	100
	Mid	0	100
	Bottom	0	100

Note:* Surface: calculated by taking mean value of depth (1.0, 1.5, 2.0M) and comparing this value to geometric criteria.

** Mid: calculated by taking mean value of depth (3, 6.0, 6.1, 9.0M) and comparing this value to geometric criteria.

† Bottom: calculated by taking mean value of depth (12, 12.2, 18.0, 18.3M) and comparing this value to geometric criteria.

APPENDIX B

SOUTH BAY MICROBIOLOGY

The following summarizes the findings of Doug Bartlett and Alexandra Purdy on the impact of the South Bay Ocean Outfall (SBOO) which treats effluent to the full secondary/tertiary level. This study was performed in conjunction with analysis of the Point Loma Ocean Outfall and serves as an interesting contrast to the Point Loma findings.

In 2006 the average daily outfall from the South Bay Ocean Outfall (SBOO) was 24.5 mgd with about 5 mgd secondary effluent from San Diego's South Bay Reclamation Plant, the rest coming from the International Wastewater Treatment Plant operated by the IBWC. SBOO discharges treated effluent from both the South Bay Reclamation Plant (SBWRP) and the International Wastewater Treatment Plant (IWTP) and is about 5.6 km in length. Discharge from IWTP began in January 1999 and from SBWRP in May 2002.

The South Bay region is a much greater problem than the Point Loma region. In the 138-month period from July, 1995 to December, 2006 the shoreline stations along the South Bay contained 1,465 samples with coliform counts equal to or greater than 1,000 CFU/100 ml (mean = 10,700; high = 38,000). During a 130 month period from 1996 through 2006 the 3 kelp stations had 392 samples with total coliform counts equal to or exceeding 1,000 CFU/100 ml (mean ~8,300; high = ~18,000). This overall frequency of these high counts is similar among the two types of locations, but for those shore sites near the Tijuana River the maxima can be approximately twice as high. To put this into greater perspective some of the SBOO region shore stations are 30-40 times more likely to have high coliform counts compared to their counterparts in the PLOO region.

Shoreline contamination sources (such as the Tijuana River and the Los Buenos Creek) are a major problem. In 2006 the kelp stations had no periods in which they were out of compliance with the California Ocean Plan total coliform levels, whereas two of the shoreline stations near the Tijuana River were out of compliance about 50% of the time. Excessive coliform counts in the South Bay very clearly correlate with rainfall. In contrast to the PLOO data, total and fecal coliform levels have only slightly decreased at the shore stations since the initiation of outfall discharge. This modest decrease appears to be due in part to diverting discharge once destined for the Tijuana River to the SBOO.

A description of the plumes associated with the SBOO, the Tijuana River and the Los Buenos Creek in relation to other existing water quality assays derived from the MODIS satellite data should be included in the reports.

In summary, while it is evident that the PLOO and SBOO have a minimal influence on their adjacent shorelines, it is unclear why the South Bay shoreline indicator bacteria counts have not gone down more since the operation of the IWTP began in 1999. It is also not clear what fraction of the sewage flowing through the Tijuana River has been diverted thus far to the IWTP.

APPENDIX C

PCB BIOACCUMULATION

The bioaccumulation portion of the PLOO monitoring program is conducted in order to evaluate the potential for bioaccumulation of selected pollutants through the food chain. It consists of two components:

3. analysis of muscle (and liver) tissues from fishes collected by rig fishing
4. analysis of liver tissues from trawl-caught fishes.

This appendix describes the details of the PCB bioaccumulation analyses performed by Rick Gersberg and Ed Parnell.

The analysis conducted by Dr. Gersberg consisted of a review of the bioaccumulation data in existing reports and databases of the City of San Diego, as well as some original data analyses on bioaccumulation data for 1995-2006 in which selected fish tissue contaminant levels for rig fishing stations and trawl fishing stations in the vicinity of the PLOO (RF1 and TF1) were compared statistically to comparable values at stations away from the PLOO (RF2 and TF2). For the total PCB level analysis described here, both fish muscle and liver were analyzed.

A Mann-Whitney U-test conducted on total PCB levels for the dataset for 1995-2003, showed rockfish fish liver levels at RF1 (median = 189; mean = 332.2 $\mu\text{g}/\text{kg}$) were significantly ($p\text{-value} = 0.002$) higher than rockfish liver levels for RF2 (median = 73; mean = 177 $\mu\text{g}/\text{kg}$). On the other hand, statistical comparison of total PCB in rockfish muscle at the RF1 and RF2 stations showed no significant ($p\text{-value} = 0.828$) difference. Although it is important to note here that a comparison between RF1 and RF2 stations should be considered with caution because different species of fish may have been collected at these two sites, and the liver is not consumed by most humans, the results regarding the highly bioaccumulative (and cancer-causing) PCBs may be suggestive of underlying bioaccumulative effects which deserves further scrutiny.

However, the significance of this finding is unclear, since the area located just south of the PLOO (zone 3) is near the LA-5 dredge disposal site, and elevated levels of PCBs in various fish species have been demonstrated at this location. Resuspension of fines from the dredged materials, or migration of fish into this zone south of the PLOO, could then account for the differences in total PCB levels observed at RF1 (near the PLOO) as compared to RF2 (north of the PLOO).

To investigate these elevated levels at the outfall site further, Ed Parnell has used robust regression of ordered statistics to develop probability distributions of the individual PCB congeners for liver tissue for all rig fishing and trawl fishing stations. This analysis deals with non-detects in the most robust manner available (state of the art for this field [Helsel (2005)]). Non-detects mean that the concentration of the analyte of interest is below the detection limits of the method/machine. It does not mean the concentration is zero. Assuming zero or a constant number can bias the results of any subsequent statistical analysis. Because there are so many non-detects among the various PCBs 27,897 out of

38,063 (~73%), each PCB (the City analyzed for 50 PCBs) needs to be compared using methods that are robust to censored data. Due to time constraints he focused on liver tissue because that is where the significant results described above were found and where PCBs are in much higher concentrations than in the muscle.

The trawl fishing station near the LA-5 dredge disposal site (trawl fishing zone 3) has the highest concentrations for all PCB congeners and this difference is significant for most congeners. PCB concentrations decrease with increasing distance from the LA-5 site both to the north and to the south (*i.e.*, lower concentrations of PCBs at the outfall and even less further north off Mission Beach). In all cases trawl fishing zone 3 has the highest median values, upper quartiles, and outliers. The results are shown in the boxplot of Figure 1. The rig fishing results show that there are greater concentrations for most PCB congeners at the outfall site compared to the Mission Beach site, shown in Figure 2.

The spatial patterns for the rig fishing and the trawl fishing stations are consistent at the two sites where both are done. The trawl fishing provides the added piece of information that the centroid of PCB contamination on the shelf is likely the LA-5 disposal site.

A straightforward interpretation of these results (based on the spatial patterns observed) is that the LA-5 dredge disposal site is the most likely source of significant PCB contamination in fish on the Point Loma shelf. The rig fishing results suffer from not having stations further south toward LA-5.

In conclusion, there is currently no way to definitively know whether the elevated levels in the rig fishing are due to the PLOO or the LA-5 site. It is recommended that the City of San Diego conduct a more detailed analysis of this finding and perhaps search for more suitable bioaccumulation reference sites, away from known sources of PCBs.

A similar analysis could be performed for fish tissue samples, as well as for PCBs and metals in sediment samples. Additional rig fishing sampling south of the PLOO would further test the hypothesis that the source is LA-5.

Table C1. Mann-Whitney U-test for total PCBs at RF1, RF2, TFZONE1* and TFZZONE2**

Station	N	median	Year
RF1(fish liver)	41	189	1995-2003
RF2(fish liver)	40	73	1995-2003
<i>p</i> =0.002#			
RF1(fish muscle)	53	1.5	1995-2003
RF2(fish muscle)	54	1.15	1995-2003
<i>p</i> =0.828			
TFZONE1	117	327	1995-2006
TFZONE2	118	234.2	1995-2006
<i>p</i> =0.220			

Note: Starting in August of 2003, stations changed to Zones 1 and 2.

* TFZONE1 consists of stations SD10 and SD12

** TFZONE2 consists of stations SD13 and SD14

Indicates significant result at $p < 0.05$

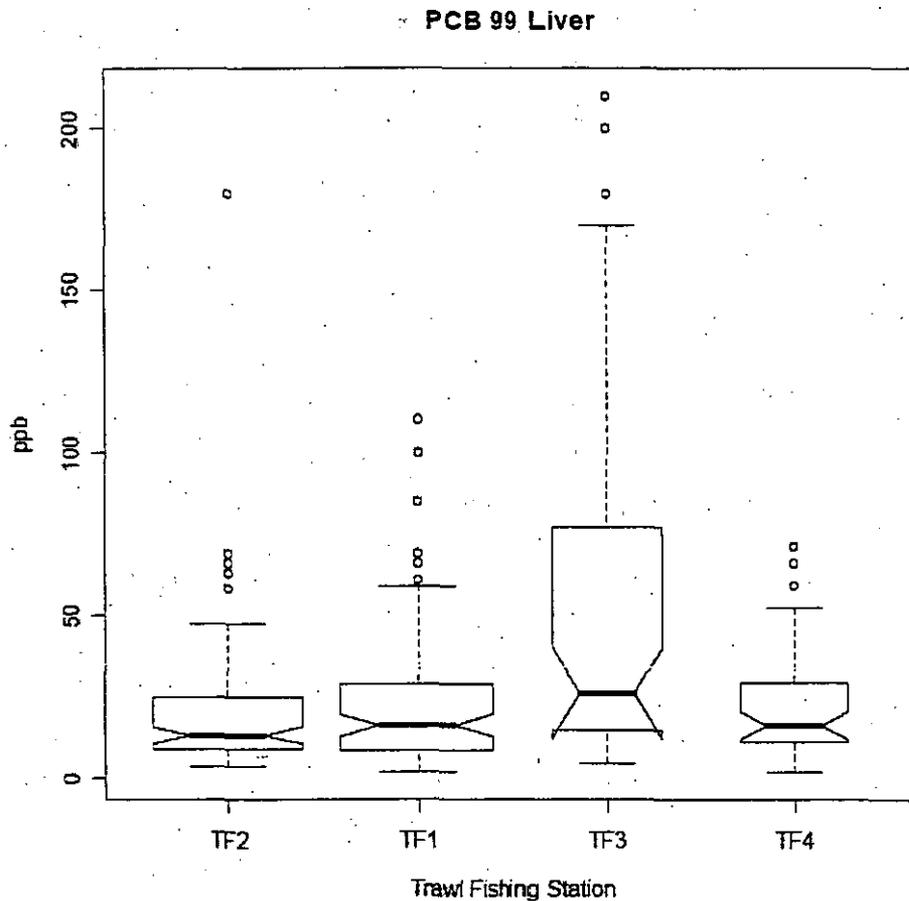


Figure 1: Trawl fishing boxplots showing frequency distributions of PCB congeners at each site. Depth=100m; Zone TF1=Outfall; Zone TF2=Mission Beach; Zone TF3=Near LA-5; Zone TF4=Silver Strand.

Boxplots show frequency distributions of PCB congeners at each site. Data are pooled over time at each site (1995-2006). Frequency plots include actual values for concentrations detected above method detection limits, and modeled concentrations (lognormal) for concentrations below detection limits using robust regression of ordered statistics (Helsel, 2005). Congeners were only analyzed if the sample size was >30 and the percentage of nondetects was <80%. Bold bars=median, boxes=quartiles, whiskers=smallest and largest non-outliers, circles=values for outliers, notches indicate 95% confidence limits (McGill et al., 1978), width of boxes is proportional to sample size ($n^{1/2}$) for each site.

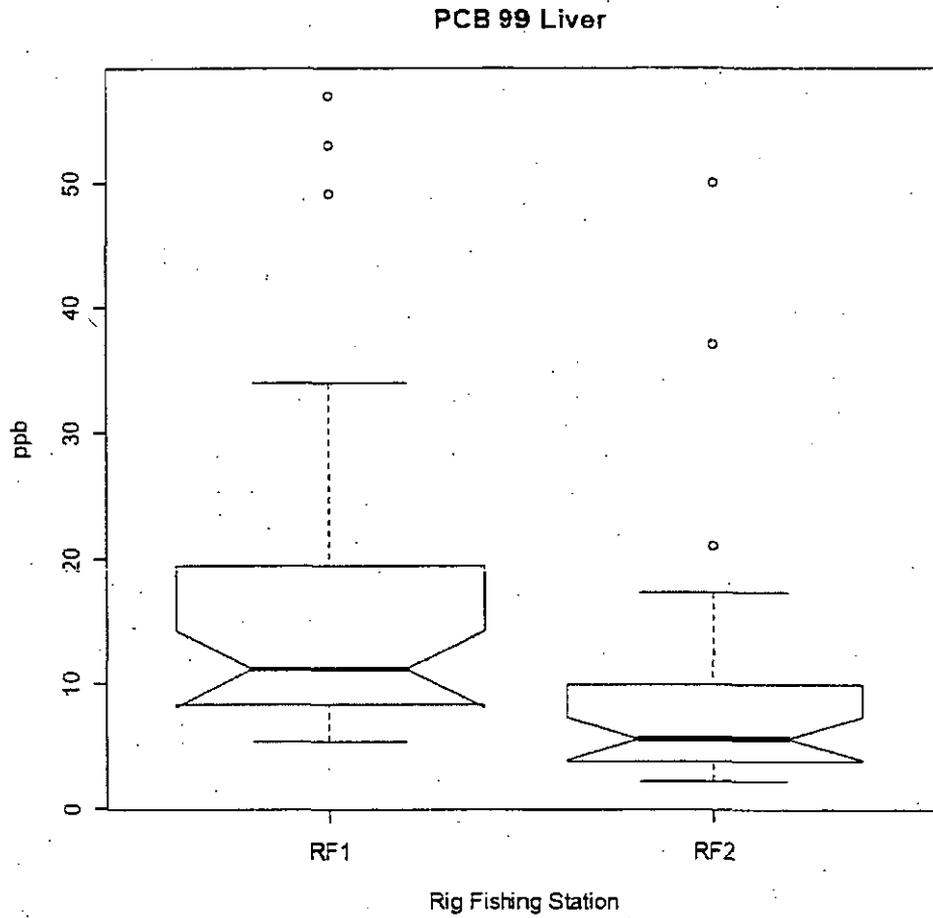


Figure 2: Rig fishing boxplots showing frequency distributions of PCB congeners at each site. Site RF1=Outfall; Site RF2=Mission Beach.

Acronyms

ADCP: Acoustic Doppler Current Profiler
BRI: Benthic Response Index
CTD: instrument to measure conductivity, temperature, and depth
EPA: Environmental Protection Agency
FIB: fecal indicator bacteria
ITI: Infaunal Trophic Index
IWTP: International Wastewater Treatment Plant
mgd: million gallons per day
MODIS: Moderate Resolution Imaging Spectroradiometer
PCBs: Polychlorinated Biphenyls
PLOO: Point Loma Ocean Outfall
SBOO: South Bay Ocean Outfall
SBWRP: South Bay Reclamation Plant
SCB: Southern California Bight
SCCWRP: Southern California Coastal Water Research Project
SWRCB: State Water Resources Control Board
tow-yo: a CTD that is towed behind a ship while being cycled through the water
ZID: zone of initial dilution

References

Databases

Ocean monitoring databases for 2001-2007 used in this review are publicly available on the City of San Diego website (<http://www.sandiego.gov/mwwd/environment/data/>). The available data is for bacteriology, fish trawls, benthic invertebrates, invertebrate trawls, and water quality. Additional data was provided by the City which was not available online:

1. ocean monitoring databases for 1991-2000
2. bacterial indicator monitoring data: PLOOWQ_Kelp_Micro_1994_2001.xls;
PLOOWQ_Shore_Micro_1994_2001.xls;
PLOOWQ_Mon_Micro_1994_2001.xls
3. data on bioaccumulation of toxic chemicals in fish tissue:
PLOOBioaccum_1995_2006.xls
4. sediment chemistry data: PLOOSedChem_1996_2000.xls;
PLOOSedChem_2001_2006.xls
5. total coliform counts equal to or greater than 1000 CFU/100 ml for a number of PLOO and SBOO locations going back to 1991
6. CTD casts from 1991-2006.

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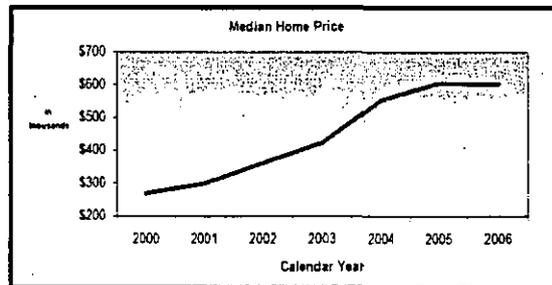
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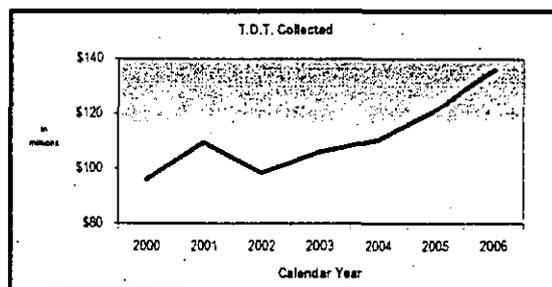
Housing and Construction

According to a report by the National Association of Realtors, the median residential home price in the San Diego area dropped 0.4% from calendar year 2005 to 2006. However, median residential home prices in the San Diego area increased 125% from calendar years 2000 to 2005. Home sales during this growth in median home prices have resulted in stronger than average property tax returns for the City and have fueled increased activity in the construction sector. However, there has recently been a significant slowing in the housing market and a softening in housing prices and therefore the recent growth in property tax revenues may not continue and may in fact decline.



Tourism

The City of San Diego has continued to experience a growth in tourism during calendar year 2006, resulting in a 12.3% increase in Transient Occupancy Tax (TOT) collections from calendar year 2005, and a 41.6% increase from calendar year 2000. According to the San Diego Convention & Visitors Bureau, average occupancy rates of hotels located in the San Diego area have also continued to improve during calendar years 2005 and 2006, increasing 1.7% and 1.5%, respectively. Additionally, a total of 32.2 million visitors spent approximately \$7.7 billion at local businesses in the San Diego area during calendar year 2006.



Water Supply

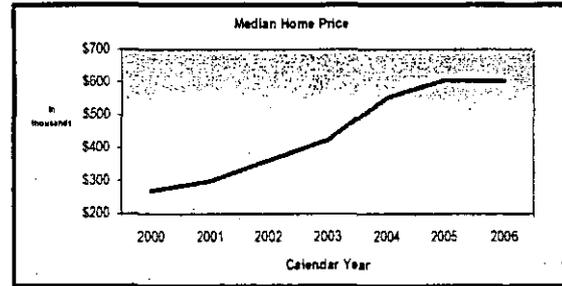
The City of San Diego is located in a semi-arid coastal climate environment and receives an average annual rainfall of approximately 10 inches. The 1.3 million people living in San Diego use an average of 210 million gallons per day of potable water. The City's population is projected to increase 50% in the next 25 years, and the City projects this growth will increase demand for potable water by approximately 25%. Up to 90% of the City's existing water supply is imported from the Colorado River and the California State Water Project ("SWP"). The San Diego County Water Authority ("CWA") purchases the majority of its water supplies from the Metropolitan Water District of Southern California ("MWD"). As of July 18, 2007, MWD indicated that it had sufficient water supplies in storage to sustain two years of a supply/demand scenario similar to 2007 with enhanced conservation efforts beginning immediately.

The majority of MWD's water supplies originate from the Sacramento River Delta before being pumped into the California Aqueduct for transportation to Southern California. On August 31, 2007, a federal court ordered state and federal water managers to reduce pumping out of the Delta during certain times of the year in order to protect the Delta Smelt, an endangered fish species. It is unknown how long these restrictions will be in place but they are expected to last at least one year. The California Department of Water Resources (DWR) estimates that the court order will reduce the amount of water available by 10% to 35%. Statewide, California has experienced one of the driest years on record for the 2007 water year (ended September 30). While the National Weather Service is predicting above average precipitation for Northern California, dry weather is expected to persist in Southern California, potentially reducing the amount of local water available to the CWA and the City.

The potential for drought and the reduced availability of imported water could have an adverse impact on the City's economic growth. The San Diego Municipal Code provides that the Mayor, upon the recommendation of the Director of the Water Department, is authorized to determine the appropriate water conservation stages, if any. It was the advice of the Director, which was accepted by the Mayor, to declare a stage 1 (voluntary compliance) water watch. Under state law, the City is required to verify that there will be a sufficient water supply over a 20 year window before approving certain large developments. In the event that the City is unable to make such determinations due to the reduction of water availability, the level of development in the City could be reduced.

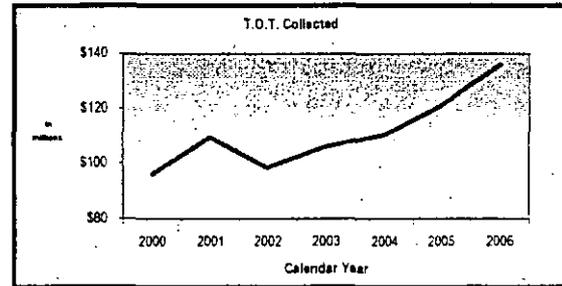
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000871

THE COMMITTEE ON
RULES, OPEN GOVERNMENT, AND INTERGOVERNMENTAL RELATIONS
OF THE CITY COUNCIL OF THE CITY OF SAN DIEGO

ACTIONS FOR
WEDNESDAY, JULY 26, 2006, AT 9:00 A.M.

COUNCIL COMMITTEE ROOM (12TH FLOOR), CITY ADMINISTRATION
BUILDING
202 C STREET, SAN DIEGO, CALIFORNIA

For information, contact Penni Takade,
Policy and Legislative Analyst
202 C Street, 3rd Floor, San Diego, CA 92101
Email: Ptakade@sandiego.gov
619-236-6445

NON-AGENDA PUBLIC COMMENT: None.

COMMITTEE COMMENT: Council President Pro Tem Young introduced his niece, Amanda Jocelyn, from Sacramento.

CITY ATTORNEY, IBA, AND MAYORAL STAFF COMMENT: Independent Budget Analyst Andrea Tevlin introduced Penni Takade who is assuming the role of Policy and Legislative Analyst for the Rules Committee.

ADOPTION AGENDA

Approval of the Record of Action Items for July 12, 2006.

ACTION: Motion by Councilmember Madaffer, second by Council President Pro Tem Young, to approve.

VOTE: 5-0; Peters-yea, Young-yea, Maienschein-yea, Frye-yea, Madaffer-yea

ITEM-1: Presentation from the Metropolitan Wastewater Department on the POINT LOMA WASTEWATER TREATMENT PLANT MODIFIED PERMIT- "THE WAIVER."

(See Report to City Council No. 06-103)

ACTION: Motion by Councilmember Frye, second by Councilmember Madaffer, to work toward a consent decree that would implement secondary treatment at Pt. Loma Wastewater Treatment Plant within terms and timeframe to be determined; and to indicate that it is a priority of the City of San Diego to obtain funding from federal and state government for infrastructure upgrades and

ACTIONS

Committee on Rules, Open Government, and Intergovernmental Relations
July 26, 2006

- 2 -

seek legislation to support this strategy.

VOTE: 5-0; Peters-yea, Young-yea, Maienschein-yea, Frye-yea,
Madaffer-yea

ITEM-2: Report from the City Clerk on the RECOMMENDATION OF THE ELECTIONS
TASK FORCE REGARDING MAIL-ONLY BALLOT ELECTIONS.

(See Elections Task Force's July 26, 2006, memo)

ACTION: Motion by Councilmember Frye, second by Council President Peters,
to accept the report and request the IBA and City Clerk to provide more research
and data on cost savings and voter turnout; and request the City Attorney to
prepare a draft implementing ordinance for concurrent review.

VOTE: 3-2; Peters-yea, Young-yea, Maienschein-nay, Frye-yea,
Madaffer-nay

ITEM-3: Presentation from the Mayor's Office and City Attorney's Office on the
Implementation Ordinances related to the MAYOR'S BALLOT PROPOSITIONS
REGARDING MANAGED COMPETITION AND PENSION REFORM.

(See Lisa Briggs' July 24, 2006, memo with draft implementation ordinances; City
Council's March 27, 2006, minutes for Item-150; Mayor's Version G on Managed
Competition; Mayor's Version E on Retirement System Benefit Increases)

ACTION: Motion by Councilmember Madaffer, second by Councilmember
Frye, to receive the report and refer it to the IBA and to closed session.

VOTE: 5-0; Peters-yea, Young-yea, Maienschein-yea, Frye-yea,
Madaffer-yea

Note: At the request of Council President Peters, Item-4 has been pulled from the
agenda and is anticipated to be re-docketed in September 2006.

ITEM-4: Report from the City Attorney on CREATION OF A GRAND JURY
IMPLEMENTATION COMMITTEE.

Scott Peters
Council President

MEMORANDUM

To: Mayor Jerry Sanders
From: Patton Boggs LLP
Date: November 6, 2007
Subject: Potential for federal funding of Pt. Loma Wastewater Treatment Plant upgrade to secondary standards

Per your request, this memorandum reports on the prospects for direct federal funding to the City of San Diego to pay for possible upgrade of the Point Loma Wastewater Treatment plant to secondary treatment standards.

This funding assessment considered opportunities and precedent for annual appropriations line-items, grants, program authorizations, and other mechanisms for possible federal assistance, building on detailed reviews previously provided on federal water infrastructure funding via EPA, the Army Corps of Engineers, and the Bureau of Reclamation.

Overall, the analysis reaffirmed that the City should not make plans based on an expectation of receiving any significant direct, targeted federal funding for an upgrade of the Point Loma facility. At best, federal assistance could marginally supplement local and State funding sources.

Although an aggressive strategy for pursuing federal assistance can be outlined that offers at least some potential for success, even an optimal execution of that strategy would require several years to achieve, with the most likely result that the City might recover at best less than 5% of total construction costs. Other legislative options that could offer greater funding are too speculative to estimate possible returns.

Summary Analysis of Primary Options for Potential Funding

Competitive Grant Programs

No existing federal competitive grant opportunities are available to pay for secondary treatment conversions.

Historically, beginning in 1971 and ending in 1990, the EPA Construction Grant program provided more than \$60 billion in direct grants for construction of public wastewater treatment projects,

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ATTORNEYS AT LAW

including wastewater treatment plant upgrades, which financed the transition to secondary treatment standards in many localities. This grant program was authorized under the Federal Water Pollution Control Act, Title II, with federal project share at 75% for the first 13 years and reduced to 55% for the remainder. 33 U.S.C. 1282(a)(1).

The program was deauthorized and phased out in favor of capitalizing the Clean Water State Revolving Fund (CWSRF), shifting the method of municipal financial assistance from grants to loans. That emphasis on loans remains the preferred policy direction in Congress and the Administration.

Annual Appropriations

Upgrades to achieve secondary treatment standards qualify for project-based "earmarks" in annual federal appropriations, but the potential amounts are almost inconsequential compared to the cost of the Pt. Loma transition.

The appropriations process is increasingly competitive, and the maximum amount that can be secured for any single project is limited. In the pending FY2008 appropriations cycle, the largest water infrastructure earmark totaled \$1.6 million, with the vast majority at \$500,000 or less. In the Senate, California received five earmarked projects at about \$1 million each (with Sen. Feinstein chairing the relevant appropriations subcommittee; in the House, California received twelve earmarks averaging \$500,000 each.

For comparison, in seeking earmarks for its own ongoing transition to secondary treatment, the Orange County Sanitation District received a total of \$1.8 million over the past five years.

To secure a 50% project contribution from the federal government through the appropriations process, San Diego would need to get the entire nationwide earmarked budget for five to ten years.

Army Corps of Engineers

In certain circumstances, the Army Corps can be authorized and funded to help design and construct wastewater treatment projects if sufficiently linked to a purpose within its principal mission, including environmental protection and restoration (Section 219 Authority). These projects may advance on an expedited basis, without having to go through the typical extended procedures of conducting a reconnaissance study and feasibility study, and drafting a Chief's Report.

Projects using Section 219 authority must be specifically authorized by Congress through a Water Resources Development Act (WRDA), with new WRDA bills scheduled to be enacted every two years. However, the most recent WRDA bill has languished for seven years and only is likely to be enacted this week with override of a Presidential veto. Although committee leaders expressed intent to advance another WRDA bill next year in order to restore the regular timing, the combination of an election and recent difficulties moving this legislation suggest that it will take another two or three years before a new authorization is possible.

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While there technically is no statutory dollar cap on Section 219 authority, projects typically total well below \$50 million, averaging \$10 - \$20 million.

In addition, project inclusion in WRDA does not guarantee any federal funding, but only allows recipients to seek annual appropriations at substantially higher levels than could be secured through earmarks. The current backlog of ongoing Corps construction projects requires at least \$38 billion in future appropriations to complete, and the new WRDA authorizes more than 900 new projects totaling \$28 billion in additional authorization.

Although the San Diego delegation is well-positioned on committees of jurisdiction that would be helpful to this effort, the uncertainty of both timing and appropriations prospects require that the City not make plans that rely on success.

Future Possibilities

Congress is beginning to focus on the need for major investment in water quality and wastewater infrastructure, and legislation to provide additional assistance is likely to advance over the next two or three years.

For example, H.R. 720, the Water Quality Financing Act, which authorizes potential appropriations of \$14 billion over four years for the Clean Water State Revolving Fund, passed the House and should be taken up by the Senate Environment and Public Works Committee soon. In addition, the House passed H.R. 569, the Water Quality Investment Act, which authorizes \$1.7 billion in federal grants over five years to address combined sewers and sanitary sewers overflows.

More comprehensive proposals for innovative financing also may be debated, such as S. 1926, the National Infrastructure Bank Act, creating an independent bank to underwrite projects over \$75 million and with substantial regional and national significance, qualifying highways, transit, and housing, as well as water projects.

This environment may create an opportunity for a legislative strategy to enact new, targeted funding mechanisms that support conversion projects like Point Loma. For example, a coalition of the remaining publicly owned treatment plants that still operate under Section 301(h) waivers and/or must move to secondary standards could be formed to pursue creation of a new upgrade grant program. Several of those facilities are located in States whose Congressional delegations include key members of relevant appropriations and authorizing committees. As the largest impacted jurisdiction with greatest capacity, San Diego leadership would be required to organize and execute a multi-year effort. Similarly, if San Diego sought to utilize innovative alternative technologies for secondary treatment, some small demonstration grant might be established (or reauthorized as a subset within the lapsed EPA Construction Grants) based on the scientific merits.

However, because these legislative opportunities require action in an unpredictable political environment and are much more speculative than pursuing routes like existing Corps Section 219 authority, the City should not plan based on an assumption that such funding options will be available.

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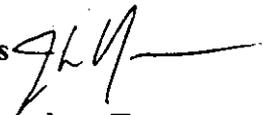


OFFICE OF MAYOR JERRY SANDERS

MEMORANDUM

DATE: November 7, 2007

TO: Tim Bertch, Director of Wastewater

FROM: Job Nelson, Director of Intergovernmental Relations 

RE: Assesment of State Bond Money for Point Loma Secondary Treatment

Per your request, in consultation with our state lobbyists Sloat, Higgins, Jensen and Associates, I have evaluated the likelihood of significant state bond money to help defray the capital costs of moving to secondary treatment at the Point Loma Wastewater Treatment Plant (PLWTP). As we have discussed, the state is facing a large deficit and therefore the possibility of large appropriations is very unlikely. Which means the only potential major source of state revenue would be an existing state water bond or potential state water bond. At this point it appears highly unlikely that there are significant subsidies for PLWTP in present or future bond funding.

Proposition 50- The state is currently in cycle 2 for local water project funding. The region is eligible for cycle 2 funds through the San Diego Integrated Regional Water Management Plan (IRWMP) and could receive up to \$25 million. Unfortunately, those subventions are to be designated for IRWMP eligible projects and the PLWTP is not an eligible project at this time.

Proposition 84- As with Prop 50, there are competitive grant funds for Integrated Water Management projects within Prop 84. Even if secondary treatment could be classified as an IRWMP project, the City would receive only negligible financial assistance (under \$10 million) compared to the overall cost of the project. There are no other eligible funds within Prop 84 for secondary treatment at PLWTP.

Proposition 1E- There are no eligible funds within Prop 1E.

Future Water Bonds- While both the Governor and Senate President Perata have both supported a potential water bond in 2008, neither have supported the inclusion of earmarks for this type of project. In fact the only projects that have been proposed as earmark projects are large surface water storage projects which can be shown to provide water supplies statewide. No wastewater project funds have been proposed.

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REQUEST FOR COUNCIL ACTION
CITY OF SAN DIEGO

1. CERTIFICATE NUMBER (FOR AUDITOR'S USE ONLY) 330
AC 28003 11/20

TO: CITY COUNCIL

2. FROM (ORIGINATING DEPARTMENT): Metropolitan Wastewater Department

3. DATE: 11/06/2007

4. SUBJECT: Modified National Pollution Discharge Elimination System (NPDES) discharge permit (Waiver) for the Point Loma Wastewater Treatment Plant

5. PRIMARY CONTACT (NAME, PHONE, & MAIL STA.) Darlene Morrow-Truver 858-292-6384, MS 901A

6. SECONDARY CONTACT (NAME, PHONE, & MAIL STA.) Alan Langworthy 619 758-2301

7. CHECK BOX IF REPORT TO COUNCIL IS ATTACHED

8. COMPLETE FOR ACCOUNTING PURPOSES

FUND	41508	9. ADDITIONAL INFORMATION / ESTIMATED COST:	
DEPT.	772	See attached Reports to the City Council	
ORGANIZATION	100		
OBJECT ACCOUNT	4141		
JOB ORDER	031300		
C.I.P. NUMBER			
AMOUNT	\$200,000		

10. ROUTING AND APPROVALS

ROUTE (#)	APPROVING AUTHORITY	APPROVAL SIGNATURE	DATE SIGNED	ROUTE (#)	APPROVING AUTHORITY	APPROVAL SIGNATURE	DATE SIGNED
1	ORIG. DEPT	<i>[Signature]</i>	11/5/07	8	DEPUTY CHIEF	<i>[Signature]</i>	11-8-07
2	E.A.S.	<i>[Signature]</i>	11/8/07	9	C.O.O.	<i>[Signature]</i>	11-8-07
3				10	CITY ATTORNEY		
4	DOCKET LIAISON	<i>[Signature]</i>	11/8/07	11	ORIG. DEPT	<i>[Signature]</i>	11-8-07
5	C.F.O./FM	<i>[Signature]</i>	11/8/07	DOCKET COORD: <i>[Signature]</i> COUNCIL LIAISON: <i>[Signature]</i>			
6	C.F.O./AUDITOR	<i>[Signature]</i>	11/8/07 ✓	COUNCIL PRESIDENT: <i>[Signature]</i> <input type="checkbox"/> SPOB <input type="checkbox"/> CONSENT <input checked="" type="checkbox"/> ADOPTION			
7				REFER TO: _____ COUNCIL DATE: 11/20/07			

11. PREPARATION OF: RESOLUTIONS ORDINANCE(S) AGREEMENT(S) DEED(S)
- Approve the Mayor's proposal to submit the modified National Pollution Discharge Elimination System (NPDES) permit (Waiver) application for Point Loma Wastewater Treatment Plant (PLWTP).
 - Authorize the Mayor and Council to hire outside counsel for technical legal support during the waiver process, and to report to the Mayor and Council.
 - Direct the City Attorney to expeditiously prepare the appropriate resolutions.

11A. STAFF RECOMMENDATIONS: Adopt the Resolutions

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COUNCIL DISTRICT(S): All

COMMUNITY AREA(S): All

ENVIRONMENTAL IMPACT: "This activity is not a "project" and is therefore not subject to CEQA pursuant to State CEQA Guidelines Section 15060(c)(3)."

ATTACHMENTS:

1. Report to the City Council
2. Community Power Point Presentation
3. Scientific Review Committee Final Report October 1, 2007
4. Federal Funding Assessment Memo from Patton Boggs
5. Intergovernmental Relations Department State Bond Assessment
6. Report to the Rules, Open Government and Intergovernmental Relations Committee July 26, 2006 meeting

CITY CLERK INSTRUCTIONS: Please forward one copy of the executed Council Action and two copies of the Resolution to MWWD
Attn.: Rose Salarda, MS 901A.

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REPORT TO THE CITY COUNCIL

EXECUTIVE SUMMARY SHEET

DATE REPORT ISSUED:	November 6, 2007	REPORT NO.:
ATTENTION:	Council President and City Council	
ORIGINATING DEPART:	Metropolitan Wastewater Department	
SUBJECT:	Modified National Pollution Discharge Elimination System (NPDES) discharge permit (Waiver) for the Point Loma Wastewater Treatment Plant	
COUNCIL DISTRICT(S):	All	
STAFF CONTACT:	Darlene Morrow-Truver/Jeanne Cole (858-292-6384/ 6313)	

REQUESTED ACTION:

1. Approve the Mayor's proposal to submit the modified National Pollution Discharge Elimination System (NPDES) permit (Waiver) application for Point Loma Wastewater Treatment Plant (PLWTP).
2. Authorize the Mayor and Council to hire outside counsel for technical legal support during the waiver process, and to report to the Mayor and Council
3. Direct the City Attorney to expeditiously prepare the appropriate resolutions

STAFF RECOMMENDATION:

1. Approve the Mayor's proposal to submit the modified NPDES permit application for the PLWTP
2. Authorize the hiring of outside counsel for legal support during the waiver process, to report to the Mayor and Council

EXECUTIVE SUMMARY:

The Point Loma Wastewater Treatment Plant (PLWTP) operates under a Clean Water Act 301(h) Modified Permit which does not require full secondary treatment prior to discharge through a deep ocean outfall. The permit, which expires in June 2008, requires a review and approval every five years. The City must decide whether to pursue a continuation of the modified permit, or forgo that legally permissible opportunity and instead voluntarily begin moving towards secondary treatment at the plant. The deadline to submit the application to renew the permit to the Environmental Protection Agency is December 14, 2007.

The City of San Diego is unique from other wastewater dischargers in how the treated discharge reaches the marine environment. The City discharges its treated wastewater through a four and one half mile long ocean outfall at a depth of 320 feet. The outfall is one of the longest and deepest in the United States. Also, the City conducts one of the most extensive ocean monitoring programs in the world. Extensive ocean monitoring efforts have historically shown that the discharge poses no discernable negative impact to marine organisms surrounding the outfall. This data has been sufficient to allow the City to operate since 1995 with a waiver from the federal regulations governing wastewater discharges to rivers, lakes and coastal waters.

A Scientific Technical Review Committee of scientists from the University of California San Diego (Scripps Institute of Oceanography) and San Diego State University conducted a thorough review of the environmental data collected from the extensive ocean monitoring program associated with the PLWTP. Their findings were that the PLWTP does not have a detrimental impact to the ocean environment surrounding the outfall, along the shoreline or within the Point Loma kelp beds. The findings of the Scientific Technical Review Committee support the decision to submit the NPDES permit application and to continue to operate the PLWTP under the modified permit. Based on the findings of the Review Committee, the assessment of Wastewater Department staff that the City meets all of the waiver criteria, and the City's continued compliance with regulatory requirements related to the plant support the decision

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that proceeding to secondary treatment is unwarranted at this time.

Should the City not submit the waiver application, the plant would not meet secondary treatment standards by June 2008, when the existing permit expires. This will result in enforcement action or litigation leading to secondary treatment, as well as subject the City to fines for being in violation of the Clean Water Act.

Given the electrical requirements, staff assesses that proceeding to secondary treatment would result in a net negative effect to the environment due to greenhouse gas emissions at the electrical generation site.

It is expected that an appeal process and/or litigation will follow the Environmental Protection Agency (EPA)/Regional Water Quality Control Board (RWQCB) decision regarding the City's NPDES waiver application process. The waiver appeal process is highly technical and requires unique expertise. Authorization to hire outside counsel is requested and will allow the City to best prepare for the anticipated legal process.

FISCAL CONSIDERATIONS:

This item authorizes \$200,000 for outside legal services. This funding is available in the MWWD Operating Sewer Fund. This action is funded from sewer revenue rates only. If the waiver submission is successful, no significant cost. If waiver submittal is not approved the City will incur costs estimated at \$1.5B (in 2015 \$s) to upgrade the Point Loma Treatment Plant. An assessment of recent plant upgrades in other communities indicates the City would not receive significant state or federal funding to offset these costs, which would then be borne by sewer customers and participating agencies.

PREVIOUS COUNCIL and/or COMMITTEE ACTION:

July 26, 2006, Rules, Open Government and Intergovernmental Relations Committee: Action to work toward a consent decree that would implement secondary treatment at the PL WTP within terms and timeframe to be determined: and to indicate that it is a priority of the City of San Diego to obtain funding from federal and state government for infrastructure upgrades and seek legislation to support this strategy.

November 2, 2007, Natural Resources and Culture Committee:

COMMUNITY PARTICIPATION AND PUBLIC OUTREACH EFFORTS:

Extensive presentations and public input sessions have been held throughout San Diego, covering all 8 Council Districts. All requests for public presentations were scheduled. The Report to City Council provides a listing of over 60 presentations.

KEY STAKEHOLDERS & PROJECTED IMPACTS (if applicable):

Citywide Sewer Customers and Participating Agencies will be impacted by significant rate increases needed to go to secondary treatment at Point Loma, should the NPEDES waiver application not be submitted.


Originating Department


Deputy Chief/Chief Operating
Officer

