

**NATIONAL WATER RESEARCH INSTITUTE**

**Final Report**

*of the September 11-12, 2008 Meeting, of the*

**Independent Advisory Panel**

*on Reviewing the*

**San Luis Obispo County Los Osos Wastewater Project**

October 23, 2008  
Fountain Valley, California

## **Disclaimer**

This report was prepared by an NWRI Independent Advisory Panel, which is administered by the National Water Research Institute (NWRI). Any opinions, findings, conclusions, or recommendations expressed in this report were prepared by the Panel. This report was published for informational purposes.

## 1. Introduction

The community of Los Osos, California, lacks a centralized wastewater collection system and treatment facility. The community is served by septic tanks, leach fields, and cess pits. A number of studies have been conducted over the years, and several wastewater projects have been proposed. However, for a variety of reasons, no project has been constructed.

### 1.1 First NWRI Panel

In August 2006, the Los Osos Community Services District (LOCSD) requested that the National Water Research Institute (NWRI) of Fountain Valley, California, organize an Independent Advisory Panel (Panel) to provide an independent review of the July 28, 2006, draft *Los Osos Wastewater Management Plan Update (Plan Update)*, which identified alternative technologies and waste management opportunities.

The Panel met with the LOCSD district engineer and LOCSD consultants in Los Osos, California, on November 8-9, 2006, to review assumptions, criteria, and findings of the *Plan Update*. Following this meeting, the Panel submitted a Final NWRI Panel Report to LOCSD dated December 4, 2006,<sup>1</sup> that included the Panel's comments, findings, and recommendations for the *Plan Update*.

### 1.2 Second NWRI Panel

The second NWRI Panel was requested by San Luis Obispo County (County) to review the significant progress that has been made since the first Panel meeting in developing a Wastewater Project for the community of Los Osos.

Panel members include:

- *Chair*: George Tchobanoglous, Ph.D., P.E., University of California, Davis
- Blake P. Anderson, P.E., Consultant (Santa Ana, California)
- Martin B. Feeney, P.G., CHG, Consulting Hydrogeologist (Ventura, CA)
- Robert Jaques, P.E., Consultant (Monterey, CA)
- Valerie J. Young, AICP, Consulting Environmental Planner (San Francisco, CA)

Short biographies on each Panel member are included in Appendix A.

The Panel met with County staff and consultants on September 11-12, 2008, at the County Government Center in San Luis Obispo, California, for the following purposes:

1. Review the assumptions, criteria, and alternatives for the Los Osos Wastewater Project.
2. Review various technical, scientific, and public health aspects of the Los Osos Wastewater Project, including specifically addressing:
  - a. Overall assessment of project.
  - b. Project selection strategies.
  - c. Future needs and long-term challenges.
3. Develop Panel findings and recommendations.

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<sup>1</sup> National Water Research Institute (2006). *Final Report of the Independent Advisory Panel on Reviewing the Los Osos Wastewater Management Plan Update, December 4, 2006*. NWRI, Fountain Valley, CA.

The Panel meeting agenda is included in Appendix B. A list of meeting attendees is included in Appendix C.

The Panel's comments, findings, and recommendations for the Los Osos Wastewater Project, based on a review of written material, presentations, and discussions at the September 11-12, 2008, meeting in San Luis Obispo, are presented in this report.

The report is organized into the following sections:

- Overview
- Guiding Principles
- Project Elements
- Project Selection Process

## **2. Overview**

The Panel process consisted of three separate activities: (1) review of the written material developed by the County and its consultants and other interested stakeholders; (2) meeting with the County staff and its consultants to review key elements of the project plan; and (3) deliberations by the Panel and preparation of this report.

In carrying out its charge, the Panel commends the County and its consultants for the thoroughness of the analysis of the technical and environmental issues surrounding the development of the Wastewater Project. The use of technical memorandums for the analysis of each of the major topic areas has been especially helpful in developing a clearer understanding of the overall project.

## **3. Guiding Principles**

The development of guiding principles is of critical importance in evaluating projects of this type and in developing community support for the selected project. It is important for everyone participating in the review process to have a clear understanding of the basis for the decisions that are made. Some of the guiding principles developed in the December 2006 NWRI Panel Final Report are still valid and relevant. Additional guiding principles are also presented.

Guiding principles (with original enumeration) from the December 2006 NWRI Panel Final Report that are still relevant include:

- 2.1 Doing nothing is not an option.
- 2.2 The continued use of individual septic tank/leachfield systems for a community of this size does not reflect the modern state of wastewater management.
- 2.3 Whatever wastewater management system is selected, careful attention must be devoted to the minimization of odors.
- 2.5 The project must be implemented in a timely and cost-effective manner.

- 2.6 Given the many issues related to the wastewater management in Los Osos, it is imperative that priorities be established for project implementation. The first priority of the project must remedy the existing water pollution control problems. Secondary priorities may be incorporated to address other water management issues, including effluent reuse and saltwater intrusion.
- 2.7 Alternatives should be presented with sufficient detail in terms of description and estimated costs so that rational comparisons can be made.
- 2.8 The solution to the saltwater intrusion problem should have lower priority relative to the resolution of wastewater compliance issues. However, the resolution of saltwater intrusion is recognized as a key element of the integrated water management plan.

In addition to the guiding principles presented in the December 2006 NWRI Panel Final Report, the Panel now adds the following:

- Cost estimates should be stated clearly and compared on an equivalent basis with the same degree of variability and specificity. Refined and updated cost estimates are needed for each alternative so that decision makers and stakeholders can make informed judgments.
- Process/project selection must include stakeholder participation and feedback that is adequately conveyed to the decision makers.

The Panel also concurs with the sustainability goals stated in the *Statement of Key Environmental Issues* prepared by the San Luis Bay Chapter of the Surfrider Foundation et al.<sup>2</sup> in which the collection system for the Los Osos Wastewater Project should:

- Provide the greatest possible protection against overflows and other releases of partially treated or untreated wastewater from the system, which could pollute Morro Bay Estuary and other sensitive coastal ecosystems.
- Provide the greatest possible protections to the groundwater of the Los Osos water basin.
- Avoid environmental impacts related to construction and installation of the system to the greatest extent possible, including the impacts of open trenching (e.g., dewatering, soil stabilization, and street reconstruction).
- Avoid impacts to Native American Chumash sites to the greatest extent possible.
- Provide the most energy-efficient solution and enable the use of clean, renewable energy sources, avoiding environmental impacts related to non-renewable energy production (e.g., GHG emissions).

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<sup>2</sup> San Luis Bay Chapter of the Surfrider Foundation, SLO Green Build, Santa Lucia Chapter of the Sierra Club, Terra Foundation, Los Osos Sustainability Group, and Northern Chumash Tribal Council (2008). *Statement of Key Environmental Issues for the Collection System of the Los Osos Wastewater Treatment Project*. Presented to the Board of Supervisors of San Luis Obispo County, September 9, 2008.

## 4. Project Elements

There are a number of process elements that can be combined to form defined projects that will meet Central Coast Regional Water Quality Control Board (RWQCB) prohibition requirements. The following list of elements is taken in part from the work products prepared by the Project Team and County staff. In combining these process elements, the objective is to form project alternatives that are implementable and unencumbered by unreasonable risk.

### 4.1 Collection System

#### 4.1.1 Options

- Hybrid Gravity
- STEP/STEG

#### 4.1.2 Findings:

The Panel believes that the two collection system options are both viable. Both options have risks and benefits that are unique to themselves and, when viewed as a whole, make them functionally equivalent. The cost estimates of these two options must be refined significantly to provide cost estimates that are comparable. For example, both should use the same assumptions for overhead, profit, and contingencies, so they are directly comparable. Clarification of homeowner responsibilities remains an issue. In the end, the decision should be based on an informed community preference using a robust comparative matrix of differentiating factors.

### 4.2 Treatment Sites

#### 4.2.1 Options:

- Branin
- Cemetery Site
- Giacomazzi
- Tonini

#### 4.2.2 Findings:

While all the sites are technically feasible, the Tonini site has the greatest flexibility both from a siting and disposal standpoint as compared to the other sites, which have a variety of constraints, such as proximity to adjoining land use.

### 4.3 Treatment Technology

#### 4.3.1 Options:

- Biolac
- Facultative Pond
- Oxidation Ditch
- Membrane Bioreactor (added by Panel)

#### 4.3.2 Findings:

The four treatment processes can be designed to meet the anticipated terms and

conditions of a RWQCB discharge permit for spray disposal. However, the Biolac/oxidation ditch and membrane bioreactor provide additional flexibility in meeting existing and anticipated RWQCB and Title 22 water reclamation criteria and constituent limits that may be added to future permit conditions. Also, the Biolac/oxidation ditch and membrane bioreactor produce an effluent that is more amenable for advanced treatment. In the case of STEP as the collection system alternative, if nitrogen removal is required, an additional carbon source would be needed to meet nitrogen requirements. If a membrane bioreactor option were selected, the product water could be used for agriculture exchange without the need for tertiary treatment.

#### 4.4 Effluent Management

##### 4.4.1 Option:

- Spray Application

##### 4.4.2 Findings:

Of the sites so far identified, the Tonini site represents the best opportunity for the disposal of the entire flow produced by the treatment plant with the least number of constraints and risk factors. For this option, the County should immediately request a set of draft Waste Discharge Requirements (WDR) from the RWQCB for the spray disposal of effluent. The availability of preliminary WDRs would clear up any uncertainty as to whether facultative pond effluent will be acceptable for direct spray disposal, or whether additional treatment (nitrogen removal, for example) will be necessary to meet RWQCB requirements.

#### 4.5 Future Reuse

The effluent from the treatment process constitutes a valuable water resource. This resource can be used in the future as one of the components of an integrated water management plan to bring the area into balance with its water supply. However, effective reuse of the effluent will and should require the cooperation and participation of parties other than the County. Therefore, in the interest of solving the immediate water quality problems, the reuse options are best considered a future project.

##### 4.5.1 Options:

- Reuse at facilities within the community
- Seawater intrusion mitigation at Broderson site
- Agriculture use and exchange

##### 4.5.2 Findings:

Regardless of which project is selected, it would be smart to install a return line for anticipated water reuse at the same time that the collection system force main from the community to the treatment site is installed. Reuse facilities within the community could include public parks, schools, greenbelts, and commercial developments. If the Broderson site is needed for seawater intrusion mitigation, it is important to evaluate regulatory compliance, particularly with regard to California Department of Public Health groundwater recharge regulations.

Agricultural exchange would be facilitated with a membrane bioreactor process because tertiary filtration is not required.

#### 4.6 Biosolids Management

##### 4.6.1 Options:

- Mechanical dewatering and hauling (filter, screw press [newer technology], etc.)
- Greenhouse or solar drying and co-composting with green waste, land application, and/or landfilling

##### 4.6.2 Findings:

“Predictions are difficult, especially about the future” (Yogi Berra). Therefore, it is important that, as a minimum, two disposal options be developed and pursued to provide long-term flexibility and sustainability.

#### 4.7 Project Options

Based on a review of the facilities options presented above, the project options listed in Table 1 would encompass a range of costs and performance for the Project Status Report and to support the Draft Environmental Impact Report (EIR).

**Table 1: Project Options**

<b>Collection System</b>	<b>Treatment Technology</b>	<b>Biosolids Management</b>	<b>Effluent Management</b>
Hybrid gravity sewer	Oxidation ditch/Biolac	Mechanical dewatering with landfill disposal	Spray application
STEP/STEG	Oxidation ditch/Biolac	Mechanical dewatering with landfill disposal	Spray application
Hybrid gravity sewer	Facultative pond	Hauling	Spray application
STEP/STEG	Facultative pond	Hauling	Spray application
Hybrid gravity sewer	Oxidation ditch/Biolac	Solar drying and co-composting with landfilling as needed	Spray application
STEP/STEG	Oxidation ditch/Biolac	Solar drying and co-composting with landfilling as needed	Spray application

### 5. Project Selection Process

Because of the complexity of this project with respect to the selection of the type of collection system, the location of the treatment plant site, and the type of treatment process, it is imperative that every effort is made to have the selection process be as transparent as possible. No one project alternative will please every stakeholder. As a result, it is important that stakeholders be well-informed of the basis for the selection process. To this end, the Panel offers the following observations and comments.

5.1 The County’s selection of the preferred project needs to be supported by a clear and robust selection process. The Panel feels that a matrix approach must be used which

includes all of the principal differentiating factors that are relevant to affected stakeholders. In developing the matrix, it may be appropriate to develop weighting factors for the differentiating factors. Further, the review process should provide an opportunity for stakeholders to clearly state their concerns. Commenter statements should be supported by verifiable sources of information and data.

- 5.2 The County's proposed approach to evaluating four alternative projects at an equal level of detail in the EIR is a good one. It provides great flexibility should they decide to mix and match the various components when they ultimately select a project. The alternatives should be designed to "bracket" or "envelope" the range of impacts (i.e., worst case and best case) that might be expected. The principal caveat in this approach is that the California Environmental Quality Act (CEQA) statutes and case law are very clear that the project description should be accurate, stable, and consistent throughout the EIR process to allow for informed decision-making. The County Counsel and the County's CEQA team should be sure that this approach can be achieved successfully.
- 5.3 The Panel recommends that the County coordinate the Draft EIR with the planned Project Status Report, which will be released a few weeks after the Draft EIR goes out for public review. The Panel offers the following observations and comments:
  - 5.3.1 The public should be invited to comment on the Project Status Report. The County should address those comments in an addendum or follow up report.
  - 5.3.2 The Project Status Report should provide a summary of project issues and outline the approach to final project selection. This summary should be consistent with the four alternatives identified in the Draft EIR. It will be important to use the Project Status Report to summarize the four Draft EIR alternatives and other options for the public.
  - 5.3.3 The decision process and criteria used by the County to select the preferred project should be described clearly in the Project Status Report
  - 5.3.4 In releasing the Project Status Report, the County should explain how the environmental review process will help inform its project selection. The County needs to show how input from the environmental review process will help inform the selection process.
  - 5.3.5 The Notice of Preparation (NOP) states that "the public review of the Draft EIR is planned to coincide with a community preferences survey and the issuance of a design/build Request for Proposals (RFP) for two different collection system alternatives (hybrid gravity and STEP/STEG). This approach will allow the County to identify the preferred alternative using the environmental, economic, and community preferences information." To help the public understand the review of alternatives and the selection of the preferred project, the County should describe in the Project Status Report the process for reconciling the Draft EIR review and comments, the community preferences survey, the issuance of a design/build RFP, and comments on the Project Status Report.

## **Appendix A: Panel Biographies**

### **GEORGE TCHOBANOGLIOUS, PH.D., P.E. (Chair)**

*Professor Emeritus*

*University of California, Davis (Davis, California)*

For over 35 years, wastewater expert George Tchobanoglous has taught courses on water and wastewater treatment and solid waste management at the University of California, Davis, where he is Professor Emeritus in the Department of Civil and Environmental Engineering. He has authored or coauthored over 350 publications, including 13 textbooks and five engineering reference books. Tchobanoglous has been past President of the Association of Environmental Engineering and Science Professors and currently serves as a national and international consultant to both government agencies and private concerns. Among his honors, he received the Athalie Richardson Irvine Clarke Prize from NWRI in 2003, was inducted to the National Academy of Engineers in 2004, and received an Honorary Doctor of Engineering degree from the Colorado School of Mines in 2005. Tchobanoglous received a B.S. in Civil Engineering from the University of the Pacific, an M.S. in Sanitary Engineering from the University of California, Berkeley, and a Ph.D. in Environmental Engineering from Stanford University.

### **BLAKE P. ANDERSON, P.E.**

*Independent Consultant*

*Blake Anderson Consulting (Santa Ana, California)*

Blake Anderson is an independent consultant specializing in strategic planning, describing environmental public policy, drafting public policy, providing senior level planning advice on public infrastructure decision-making, organizational development, facilitating conflict resolution and addressing regulatory matters related to water quality protection, public infrastructure, water supply and environmental issues. He works independently and in association with other firms for public sector and private sector clients. Mr. Anderson was the General Manager of the Orange County Sanitation District for five years and with the agency for 25 years in number of leadership capacities. Mr. Anderson has been active in watershed management and other public policy issues related to integrated planning. He received a BS in civil engineering from California State Polytechnic University, Pomona. He attended Harvard University's Kennedy School of Government summer program for state and local officials. He is a registered civil engineer in California and is a member of the American Society of Civil Engineers, the Sierra Club, and the Water Environment Federation.

### **MARTIN B. FEENEY, PG, CEG, CHg**

*Consulting Hydrogeologist (Ventura, California)*

Martin Feeny has been a consulting hydrogeologist since 1997, providing hydrogeologic consulting services to water agencies, private industry, and engineering firms. Prior to this, he served as hydrogeologist at various consulting firms such as Balanced Hydrologics, Inc. and Fugro West, Inc., where he provided analysis of groundwater basins, developed groundwater flow and transport, and developed saline groundwater source for desalination plants, injection wells/artificial recharge programs, and underground storage tank site assessment and

remediation. He has been involved in numerous groundwater resources and water well projects throughout California, working for groups such as Monterey County, Salinas Valley, Santa Clara Valley Water District, Ventura County, and various others. Feeney received a B.S. in Earth Sciences from the University of California, Santa Cruz and an M.S. in Environmental Planning (Ground Water) from California State University.

**ROBERT JAQUES, P.E.**

*Consultant (Monterey, California)*

Bob Jaques has been a private engineering consultant since retiring from the Monterey Regional Water Pollution Control Agency in September 2005 after 30 years of service. His areas of interest include obtaining permits and approvals for various types of water and wastewater projects, and coordinating these activities with the Monterey County Health Department, the Regional Water Quality Control Board, and other regulatory agencies; preparing concept-level wastewater treatment alternatives studies; and preparing storm water programs, budgets, and work plans for Phase II storm water entities. He also continues to work part-time for the Monterey Regional Water Pollution Control Agency on certain projects and programs, including serving as the Program Manager for the regional storm water program of eight participating entities and five coordinating entities. Jaques received a B.S. in Civil Engineering, and an M.S. in Sanitary Engineering, both from the University of California, Berkeley.

**VALERIE J. YOUNG, AICP**

*Consulting Environmental Planner  
San Francisco, California*

Valerie Young is a senior environmental planner and water reuse specialist with 29 years of professional planning experience. Since 1993, she has focused her environmental planning work (CEQA/NEPA) on recycled water and water-related projects in California. She has been a contributor to the success of California recycled water programs in Redwood City, San Jose, and the San Ramon and Upper San Gabriel Valleys. Her primary role has been to shepherd these projects through the environmental review process, preparing environmental documents and addressing community and agency concerns, and supporting engineering teams to bring water projects to fruition. She has served on three National Water Research Institute advisory panels (San Francisco Recycled Water Alternatives, Los Osos Wastewater Management Plan, and Davis-Woodland Water Supply Project) and is currently serving on a WateReuse Foundation Project Advisory Committee researching the relationship between recycled water supply and growth inducement. She is an active member of the WateReuse Association and Association of Environmental Professionals, and a member of the American Institute of Certified Planners since 1986. Young received a B.A. in History from the University of California, Santa Barbara, and an M.A. in Geography from Arizona State University.

## NATIONAL WATER RESEARCH INSTITUTE

### Independent Advisory Panel Meeting: San Luis Obispo County Los Osos Wastewater Project

September 11-12, 2008  
FINAL Meeting Agenda

**Meeting Location**

County Government Center  
1055 Monterey Street - Room 160  
San Luis Obispo, CA 93408  
(805) 781-5000

**On-Site Contacts**

Tammy Russo (NWRI)  
Cell: (714) 614-7386  
Jeff Mosher (NWRI)  
Cell: (714) 705-3722

**Meeting Objectives:**

1. Review the assumptions, criteria, and alternatives for the Los Osos Wastewater project.
2. Review various technical, scientific, and public health aspects of Los Osos Wastewater Project, including specifically addressing:
  - a. Overall assessment of project.
  - b. Review project selection strategies.
  - c. Future needs and long-term challenges.
3. Develop Panel findings and recommendations.

**Thursday, September 11, 2008**

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8:30 – 8:35 am	Welcome and Introductions - Jeff Mosher (NWRI) - George Tchobanoglous (Panel Chair)	
8:35 – 8:50 am	Status of Project and Charge to Panel	Paavo Ogren, San Luis Obispo County
8:50 – 9:30 am	Collection System and Flow and Loads	Karl Hadler and Lydia Holmes, Carollo Engineers
9:30 – 10:10 am	Treatment Alternatives including Decentralized Treatment	Karl Hadler
10:10 – 10:20 am	<b>Break</b>	
10:20 – 11:00 am	Treatment Sites	Mark Hutchinson, San Luis Obispo County
11:00 – 11:40 am	Disposal/Reuse and Sludge Management	Karl Hadler and Spencer Harris, Cleath & Associates

11:40 – 12 noon	Regulatory and Greenhouse Gas Emissions	Lydia Holmes and Mark Hutchinson
12:00 - 1:00 pm	<b>Working Lunch</b> – <b>Morning Session: Q&amp;A</b>	
1:00 – 3:30 pm	Project Alternatives/ Scenarios – 3 or 4 Options – Implementation – Project next steps	Mark Hutchinson
3:30 - 3:45 pm	<b>Break</b>	
3:00 - 4:00 pm	Discussion and Q&A	
4:00 - 5:30 pm	Panel Only Discussion	

### **Friday, September 12, 2008**

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8:30 - 10:30 am	Panel Only Discussion	George Tchobanoglous (Panel Chair)
10:30 - 10:45 am	<b>Break</b>	
10:45 - 12 noon	Panel Only Discussion	
12:00 - 1:00 pm	<b>Working Lunch</b>	
1:00 - 2:30 pm	Panel Only Discussion	
2:30 pm	<b>Adjourn</b>	

## **Appendix C: List of Attendees at September 11-12, 2008, Panel Meeting**

### Panel Members:

- *Chair:* George Tchobanoglous, Ph.D., P.E., University of California, Davis
- Blake P. Anderson, P.E., Blake Anderson Consulting (Santa Ana, California)
- Martin B. Feeney, P.G., CHG, Consulting Hydrogeologist (Ventura, CA)
- Robert Jaques, P.E., Private Consultant (Monterey, CA)
- Valerie J. Young, AICP, Consulting Environmental Planner (San Francisco, CA)

### NWRI Staff:

- Jeffrey J. Mosher, Executive Director
- Tammy Russo, Program and Events Manager
- Gina Melin Vartanian, Outreach and Communications Manager

### San Luis Obispo County Public Works Department Staff:

- Paavo A. Ogren, Deputy Director
- Genaro Diaz
- Mark Hutchinson

### San Luis Obispo County Consultants

- Lou Carella P.E. (Carollo Engineers)
- Chris Clark (Consultant)
- Karl W. Hadler, P.E. (Carollo Engineers)
- Spencer Harris (Cleath & Associates)
- Lydia Holmes (Carollo Engineers)
- Robert S. Miller, P.E. (Wallace Group)

### Regional Water Quality Control Board:

- Harvey Packard

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