

Orcutt ck +  
Santa Maria River

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#86

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SANTA BARBARA • SANTA CRUZ

BRIAN ANDERSON  
MARINE POLLUTION STUDIES LABORATORY  
34500 HIGHWAY 1, GRANITE CANYON  
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ANDERSON@UCDAVIS.EDU

DEPARTMENT OF ENVIRONMENTAL TOXICOLOGY

June 10, 2004

FS #  
2743 both  
LOE's

also see  
ref #461

Dear Craig:

Please accept the enclosed documentation in support of placing the lower Santa Maria River on the California Clean Water Act Section 303(d) List. As you may know, we have been conducting water and sediment quality studies in the Santa Maria River since July 2002. This work is part of coastal river monitoring studies supported by the SWRCB and the Central Coast Regional Water Quality Control Board, in San Luis Obispo. These studies have found water column and sediment toxicity at two stations in the lower Santa Maria River watershed, and chemical analyses and associated Toxicity Identification Evaluation studies demonstrate the toxicity is due to agricultural pesticides. These studies are consistent with previous Bay Protection and Toxic Cleanup Program data demonstrating sediment and toxicity associated with elevated pesticide concentrations in the Santa Maria River estuary, and with more recent Regional Board data showing elevated concentrations of pesticides in tissues of sand crabs collected at stations adjacent to the estuary. Together, these data indicate impaired beneficial uses in the lower Santa Maria River. Given the importance of this estuary as habitat for threatened and endangered fish and bird species, we feel it is important steps are taken to address this impairment.

I have enclosed excel files of our 2002 and 2003 data from two stations: Orcutt Creek (ORC) which is a tributary to the lower Santa Maria River, and Santa Maria River (SMA). These files contain sediment chemistry data, sediment toxicity test results with the amphipod *Hyaella azteca*, and TIE results with sediment. These files also contain water chemistry data, water toxicity tests with *Ceriodaphnia dubia*, and water column TIE results. I have also included data from the separate Regional Board study that monitored pesticide concentrations in sand crabs,

and refer you to the Region 3 BPTCP report for supplemental sediment data in support of this listing. We are providing this information to your unit to include the Santa Maria River on the 303(d) list and to initiate the TMDL process.

Please contact me if you have any questions.

Sincerely,

A handwritten signature in cursive script that reads "Brian S. Anderson".

Brian S. Anderson

Electronically send

**6 a.** Name of person providing the information: Brian S. Anderson  
Department of Environmental Toxicology  
University of California, Davis

**6 b.** Mailing address: c/o Marine Pollution Studies Laboratory  
34500 Highway 1  
Monterey, CA 93940  
p# 831 -624-0947  
f# 831-626-1518  
Email: Anderson@ucdavis.edu

**6 c.** Bibliographic citations:

The primary toxicity and chemistry data provided is original data from an unpublished study supported by the State Water Resources Control Board and the Central Coast Regional Water Quality Control Board. The contract is: Agreement No. 00-114-250-0. "Biological impacts from non-point source runoff to major river systems of the central California coast region". The final report for this project is not due until March, 2005.

Additional sand crab tissue chemistry data is original data from a study supported by the Central Coast Regional Water Quality Control Board and the data is presented in a draft report: Dugan J., et al. (2004). Monitoring of coastal contaminants using sand crabs. Technical report to the Central Coast Regional Water Quality Control Board.

Supporting sediment chemistry and toxicity data cited is from Downing J., et al. (1998): Downing, J. *et al.* (1998). Chemistry, toxicity and benthic community conditions in sediments of the central coast region. Final Report Bay Protection Toxic Cleanup Program. California State Water Resources Control Board. Sacramento, CA, USA.

**6 d.** All data are submitted in Excel spreadsheet format.

**6 e.** Detailed quality assurance and quality control information about sampling and analysis of all numeric data;

Quality assurance and quality control procedures for chemistry, toxicity testing and TIEs for the primary study were identical to those used in the Surface Water Ambient Monitoring Program (SWAMP). The toxicity and chemistry laboratories participating in this study are the same labs responsible for the SWAMP QAPP, and are the labs participating in the SWAMP program. QA/QC data fields are provided in the excel spreadsheets.

QA/QC procedures for the sand crab tissue study also followed SWAMP chemical analysis procedures. The chemistry lab used in this study is the same lab conducting organic chemical analyses for SWAMP.

**6 f. Water body name(s) and California water body identification number(s):** Lower Santa Maria River, Hydrologic Unit 31201

**6 g. Geographic extent of the potential water quality limited segment:**

Lower Orcutt Creek and the Santa Maria River from its confluence with Orcutt Creek to the mouth of the Santa Maria River estuary where it enters the Pacific Ocean.

**6 h. Pollutant(s) of concern**

Nitrate

Agricultural pesticides:

Chlorpyrifos

Total DDT

Pyrethroid pesticides (permethrin, lambda cyhalothrin, esfenvalerate)

**6 i. Applicable water quality objective or criterion**

1995 Water Quality Control Plan (Basin Plan) for the Central Coast Region:

General Objectives:

All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life. Compliance with the objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, toxicity bioassays of appropriate duration, or other appropriate methods.

No individual pesticide or combination of pesticides shall reach concentrations that adversely affect beneficial uses. There shall be no increase in pesticide concentrations found in bottom sediments or aquatic life.

**6 j. Comparison of results against applicable water quality objective or criterion**

Refer to the attached Table 1 (below). Water was sampled at Orcutt Creek (ORC) and in the Santa Maria River (SMA) on four separate occasions (June 2002, September 2002, March 2003, and May 2003). Water was toxic at both stations in September 2002 and May 2003. Analysis of chlorpyrifos in water showed that on all occasions when water toxicity was observed, concentrations of chlorpyrifos exceeded the LC 50 for this pesticide for toxicity to *Ceriodaphnia dubia*. Toxicity Identification Evaluations of water samples from Orcutt Creek and the Santa Maria River showed toxicity to *C. dubia* was due to chlorpyrifos.

Sediment was sampled at Orcutt Creek (ORC) and in the Santa Maria River (SMA) on two separate occasions (June 2002 and May 2003). Sediment was toxic at both stations in both samples. Analysis of chlorpyrifos in sediment porewater showed that on all occasions when water toxicity was observed, concentrations of chlorpyrifos exceeded the LC50 for this pesticide to the amphipod *Hyaella ezteca*. Toxicity Identification Evaluations of sediment samples from Orcutt Creek and the Santa Maria River showed toxicity was due to a combination of chlorpyrifos and other pesticides, likely pyrethroid pesticides (refer to attached excel spreadsheet file). Sediment bulk-phase chemical analyses showed elevated concentrations of chlorpyrifos, several pyrethroid pesticides, dacthal, and DDTs (refer to attached excel spreadsheet file).

Table 1. Summary of water quality exceedances (from: Contract No. 00-114-250-0. "Biological impacts from non-point source runoff to major river systems of the central California coast region")

WQ Criterion exceeded	GPS coordinates	July 8, 2002	September 3, 2002	March 17, 2003	May 28, 2003
<b>Orcutt Creek (ORC)</b>	34°57.380N 120°37.722W				
Water toxicity to <i>C. dubia</i>			yes (0% survival)		yes (0% survival)

Chlorpyrifos > LC50			Yes (6.6 TUs)		yes (9.2 TUs)
Sediment Toxicity to <i>H. azteca</i>		yes (6% survival)			yes (0% survival)
Elevated sediment pesticides		yes			yes
<b>Santa Maria River (SMA)</b>	34°57.618N 120°38.301W				
Water toxicity to <i>C. dubia</i>			yes (0% survival)		yes (0% survival)
Chlorpyrifos > LC50			Yes (7.6 TUs)		yes (9.7 TUs)
Sediment Toxicity to <i>H. azteca</i>		yes (6% survival)			yes (0% survival)
Elevated sediment pesticides		yes			yes

TU = Toxic Unit, the measured concentration of chlorpyrifos/LC50 for chlorpyrifos toxicity to *C. dubia* (0.053 ug/L).

Concentrations of pesticides were also measured in sand crabs (*Emerita analoga*) collected at the mouth of the Santa Maria River estuary in August 2000 (Dugan et al. 2004). These samples were collected as part of a larger coastline survey in Region 3 that collected sand crabs from a number of beaches. The range of sampling extended from Carpenteria Beach in Ventura County at the southern end of Region 3 to Scott Creek in Santa Cruz County at the northern end of Region 3. Concentrations of DDT in sand crab tissues at the mouth of the Santa Maria River were higher than any other site measured in Region 3, and were as high as 556 ng/g dry wt in samples nearest the Santa Maria River estuary. Mean concentrations of total DDT in sand crabs from the Santa Maria River area were 350 ng/g (dry wt). Results of a gradient study of tissues loads in sand crabs collected north and south of the river mouth confirmed that the Santa Maria River was the source of DDT in sand crab tissues.

These results are consistent with previous BPTCP studies that found DDT in sediments from the Santa Maria River estuary were among the highest measured in the state (Total DDT = 679.5 ug/kg dry wt., Downing et al. 1998 Section VII). High total DDT in the sediment sample from this station corresponded with high sediment toxicity to amphipods (amphipod *Eohaustorius estuarius* mortality = 98%; Downing et al. 1998, Section II).

6 k. Designated beneficial use(s) that may be impacted by pollutant(s)

Aquatic life  
Aquatic habitat

6 l. Complete background information (metadata) for field data (i.e., when and where measurements were taken, number of samples, detection limits, etc.).

Table 2. Summary of metadata information (from: Contract No. 00-114-250-0. "Biological impacts from non-point source runoff to major river systems of the central California coast region").

Sample metadata	GPS coordinates	Sample collection dates			
		July 8, 2002	September 3, 2002	March 17, 2003	May 28, 2003
<b>Orcutt Creek (ORC)</b>	34°57.380N 120°37.722W				
No. water samples		1	1	1	1
Chlorpyrifos water detection limit (ug/L)		0.053	0.053	0.053	0.053
No. sediment samples		1			1
Sediment pesticide detection limits		0.5 – 10 ug/kg dry wt.			0.5 – 10 ug/kg dry wt.
<b>Santa Maria River (SMA)</b>	34°57.618N 120°38.301W				
No. water samples		1	1	1	1
Chlorpyrifos water detection limit (ug/L)		0.053	0.053	0.053	0.053
No. sediment samples		1			1
Sediment pesticide detection limits		0.5 – 10 ug/kg dry wt.			0.5 – 10 ug/kg dry wt.

Summary of metadata for the sand crab study are in the attached PDF report by Dugan et al. 2004. Summary of metadata for the BPTCP study are included in the report by Downing et al. (1998).



**Jeffrey Shu - Re: Fwd: Administrative Records**

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**From:** Sheila Vassey  
**To:** Shu, Jeffrey  
**Date:** 5/9/2007 9:43 AM  
**Subject:** Re: Fwd: Administrative Records  
**CC:** Steven Blum

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Hi Jeffrey,

Sorry I didn't respond sooner. You appear to have covered everything.  
Sheila

>>> Jeffrey Shu 5/8/2007 5:51 PM >>>  
Sheila,

I've consulted with Jack E. Fort, Senior Records Management Consultant, from California Records and Information Management Program (CalRIM), (916) 322-1727, and he said the same thing about Gov't Code section 14756. We are able to convert our paper documents and use electronic copies as our official administrative records. Technically, we are not destroying our records because we are simply converting them into electronic format. Destroying records means to have no copy whatsoever and that's not what we are proposing. However, we will need to update our retention schedule using STD.73 to reflect the new storage of our records.

As a practical matter of performing our unit's responsibilities, our unit needs to make available our entire administrative records to the regional boards (and ultimately the public) to complete the Clean Water Act 303(d) List. Without an official administrative record in electronic format, our unit's "paper option" is to copy and ship 200,000 pages of documents to all 9 Regional Boards so they have the documents required to work on the 303 (d)/305(b) Integrated Report. Our plan is to have our administrative record converted within 60 days and made available to the regional board staff for use as part their 303(d)/305(b) reports.

If you think there's something else we need to address regarding the conversion of our records, please let me know.

Jeffrey Shu  
Environmental Scientist  
State Water Resources Control Board  
Division of Water Quality  
1001 I Street, 15th Floor

>>>If they want to amend their retention policy to allow destruction of paper documents once digitized, I would recommend that they include information about how they will digitize their documents and how they will be stored. That will, at the very least, give the Department of General Services an opportunity to comment on our proposal and it would give the process DGS's imprimatur once approved.

>>>In the near future, I will research the issue of retaining documents through electronic means without keeping the paper. At this time, as we move forward with tests of electronic office issues, I would suggest that electronic documents be stored in .pdf format (universally accepted) and stored in a redundant manner. We should keep the paper records somewhere until further notice.

Steve

>>> Sheila Vassey 4/19/2007 2:29 PM >>>

Hi Jeffrey,

I know very little about the requirements for electronic records so I'm sending you Steven Blum's response to your inquiry. Basically, Steven recommends that we keep paper records for the time being, until further notice.  
Sheila

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Santa Maria River  
303 (d) data  
Anderson 2004

~~Drewitt Creek~~

~~Santa Maria River & dates~~

