Comments on the TENTATIVE
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION
MONITORING AND REPORTING PROGRAM
ORDER NO. R5-2008-____ FOR COALITION GROUPS UNDER
AMENDED ORDER NO. R5-2006-0053
COALITION GROUP CONDITIONAL WAIVER OF WASTE DISCHARGE
REQUIREMENTS FOR DISCHARGES FROM IRRIGATED LANDS
Revision 26 November 2007

G. Fred Lee, PhD, DEE and Anne Jones-Lee, PhD
G. Fred Lee & Associates
El Macero, California
gfredlee@aol.com www.gfredlee.com
December 28, 2007

Background

The CVRWQCB staff's November 26, 2007 "Tentative" proposed revised Monitoring and Reporting Program (MRP) for the CVRWQCB Irrigated Lands Conditional Waiver is a somewhat modified version of the staff's draft MRP issued on March 29, 2007. Lee and Jones-Lee provided detailed comments on some of the significant technical deficiencies in that draft MRP:

> Lee, G. F., and Jones-Lee, A., "Comments on 'Working Draft - Draft Monitoring and Reporting Program -Order No. R5-2007-__for Coalition Groups under Amended Order No. R5-2006-0053 Coalition Group Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands' dated March 29, 2007," Report submitted to CVRWQCB, Sacramento, CA by G. Fred Lee & Associates, El Macero, CA, April 13 (2007). http://www.members.aol.com/LFandWQ/CommentsWorkingDraftMRP.pdf

Lee and Jones-Lee's April 13, 2007 comments focused on the unreliability of the basic monitoring approach that the staff had proposed, i.e., to allow the coalition groups to satisfy the MRP requirements based the analysis of one grab sample per month collected at a downstream location. As Lee and Jones-Lee discussed, such a "hit or miss" monitoring approach cannot be relied upon to provide the data needed to meet the MRP-stated objective of detecting violations of CVRWQCB Basin Plan objectives by contaminants in agricultural runoff/discharges. A "hit-or-miss" monitoring approach of the type proposed could readily fail to detect adverse impacts of upstream agricultural discharges that are not detected at downstream monitoring locations. The comments pointed out that meeting the MRP objectives would necessitate expanding the proposed monitoring program to include a highly focused, event-based, upstream edge-of-the-field monitoring program to reliably detect agricultural runoff/discharges that cause violations of CVRWQCB Basin Plan water quality objectives. Such information is essential to the development of management practices that can control the water quality objective violations. A focused, upstream, event-based monitoring program, incorporating studies at those locations most likely to show water quality objective violations, while somewhat more costly, could save years of ineffective hit-or-miss downstream monitoring and funds wasted on ineffective or misdirected control efforts.

Several coalition representatives objected to initiating a focused, event-based, upstream edge-of-the-field monitoring claiming that such an approach is more than required of the agricultural coalition. For example, William Thomas stated in an email to the TIC dated August 13, 2007, in response to an email from Lee and Jones-Lee regarding the need to expand the MRP to include upstream, focused, event-based monitoring to accomplish the MRP-stated objectives:

> *"Thanks for the explanation and I do agree that this is the forum for a far ranging discussion on any scientific issue and it does have some timely reference because we are trying to finalize a new MRP which offers greater flexibility to the coalitions to advance to the board their own long range notion of a monitoring program which reflects their local situation. The global picture however is that we have made fundamental agreements as to what this waiver would entail and the relative obligations of the coalitions who are the parties bearing the costs and actually doing the water quality efforts and those can't be changed unilaterally unless the regional board wants to go back to the original drawing board. The emerging MRP is true to that structure because it will be the coalitions who propose the amendments to the once a month structure if they wish to do so. The coalitions have to guard against governmental creep where programs morph into things which were not envisioned and agreed to."*

Basically, some of the agricultural coalition representatives claim that the MRP only needs to require a monitoring program ,whether or not the program reliably or adequately accomplishes the overall purpose of the CVRWQCB Irrigated Lands water quality management program, i.e., to control adverse impacts of irrigated lands runoff/discharges. Such a position favors the continuance of agricultural practices and activities without the need or commitment to control the adverse water quality impacts of runoff/discharges. Such an approach is obviously contrary to the public's interests, and, for that matter, agricultural interests, as it damages their reputation and credibility.

With the inadequacies of the proposed hit-or-miss, one-downstream-sample-per-month monitoring highlighted, the Technical Issues Committee (TIC) discussed this issue further. That discussion lead to the modification of the March draft MRP (as presented in the November 2007 "Tentative" revised MRP), to allow the coalitions to adopt a basic agricultural waiver monitoring program that could include a focused, event-based, upstream, edge-of-the-field monitoring program as an alternative, or in addition, to the downstream, one-grab-sample-per-month program. The currently proposed MRP greatly strengthens the wording around the need for the coalitions to adopt an MRP that will present a documented program to accomplish the objectives of the MRP, i.e., to reliably determine the water quality violations associated with irrigated agricultural runoff/discharges that occur at any location in a coalition's area of responsibility.

The November 2007-revision of the proposed MRP places the responsibility for reviewing the adequacy of the coalitions' monitoring programs for meeting the MRP requirements on the CVRWQCB Irrigated Lands staff and the Executive Officer. If that review is conducted in a technically valid manner, then implementation of this MRP will be effective in beginning to adequately define the water quality objective violations that occur in the Central Valley associated with irrigated agriculture runoff/discharges. If, however, the staff is not allowed to fully require the coalitions to conduct appropriate MRPs, the irrigated lands conditional waiver monitoring program will continue to be largely ineffective in developing the information needed to begin to effectively assess and control the adverse water quality impacts of Central Valley irrigated agriculture.

An alternative to the proposed approach of requiring that the staff be responsible for performing critical reviews of the adequacy of the coalitions' proposed MRPs, it would be appropriate for the CVRWQCB to appoint an independent advisory panel that would have the responsibility of advising the Board on whether a coalition's proposed MRP can be expected to develop the needed information in a reasonable period of time. That advisory panel should consist of individuals who are experts in water quality evaluation/management issues. Such a peer-review approach would be less prone to subjection to political pressure than could occur with internal staff review.

One of the most significant deficiencies in the current (November) draft MRP is that it repeatedly specifies that the requirements of the MRP apply to agricultural discharges and runoff in the "Coalition Group Boundaries." This approach could result in the failure to evaluate the impact of agricultural runoff/discharges that occur downstream of the coalitions' boundaries. As discussed in previous comments to the CVRWQCB on deficiencies in the agricultural conditional waiver program cited above, several of the pollutants discharged by irrigated agriculture in the Central Valley are adverse to water quality at considerable distances downstream of the monitoring location. For example, irrigated agricultural activities in the Central Valley are a source of nutrients (N and P) that adversely impact water quality in the Delta and in water supply reservoirs in the San Francisco Bay area and southern California. Also, runoff from irrigated agricultural lands is apparently responsible for organochlorine legacy pesticides such as DDT, that bioaccumulate to excessive levels in edible organisms.

Specific Comments on
MONITORING AND REPORTING PROGRAM ORDER NO. R5-2008-____
FOR COALITION GROUPS UNDER AMENDED ORDER NO. R5-2006-0053
COALITION GROUP CONDITIONAL WAIVER OF
WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES
FROM IRRIGATED LANDS
Revision 26 November 2007

Presented below are specific comments on the November 26, 2007 revised order for the Monitoring and Reporting Program (MRP). Many of the issues mentioned herein have been discussed in previous comments on technical problems with the CVRWQCB draft MRP and are available on our website, www.gfredlee.com, in the section on Agricultural Impacts on Water Quality at, http://www.gfredlee.com/pwwqual2.htm#agwaiver.

Page 1, last sentence states,
"The Information Sheet for the Coalition Group MRP (Attachment A), which identifies the regulatory background, program objectives, and development of minimum requirements, is incorporated as part of this Order."
As discussed in a subsequent section, the Information Sheet contains a number of technical errors that need to be corrected.

Page 2 lists the MRP Objectives which include,
"MRP OBJECTIVES

The Water Code mandates that monitoring requirements for a Waiver be designed to verify the adequacy and effectiveness of the Waiver's conditions. One of the conditions of the Waiver is that discharges of waste from irrigated lands to surface waters of the State shall not cause or contribute to an exceedance of an applicable water quality standard. Water quality standards are defined for the Irrigated Lands Regulatory Program (ILRP) in Attachment A of the Coalition Group Conditional Waiver and Attachment B (Applicable Definitions and Acronyms) of this Order."

This section contains the Five Questions that must be addressed as part of developing the Coalitions' MRPs. As discussed in our April 13, 2007 comments and above, in order to meet those objectives and answer these questions it will be necessary to expand the MRP to include focused, event-based, upstream edge-of-the-field monitoring.

Page 9, paragraph 3 states,

"Assessment and Core monitoring shall be conducted according to a three-year cycle. In the absence of a technically acceptable alternative identified in the Monitoring Strategy, <u>assessment monitoring shall be conducted on a monthly basis for 12 months during Year 1 at all Assessment and Core monitoring sites."</u>

As discussed in our April 13, 2007 comments and above, monthly grab samples cannot provide the data needed to meet the MRP Objectives and answer the Five Questions. Detailed information on the deficiencies in this approach has been provided in our previous comments.

Page 12 **TABLE II.D MONITORING PARAMETERS** lists the monitoring parameters and the frequency of monitoring. Comments on this listing include the following:

TOC – In addition to monitoring TOC, DOC should be monitored since it is an important drinking water parameter.

Organochlorines – As discussed in our previous comments, water column monitoring for organochlorine legacy pesticides does not yield the information needed to determine if those compounds are bioaccumulating to excessive levels in edible fish. The analytical methods available are not sufficiently sensitive to detect those chemicals at concentrations that can, in some waters, bioaccumulate to excessive levels in organisms. Further, finding one or more of those chemicals in a water sample does not mean that it is in a form that can bioaccumulate in fish to excessive levels. The monitoring for organochlorine legacy pesticides should focus on once-a-year sampling of fish from the coalition groups' boundaries and measuring the concentrations in the edible fish tissue. This is the technically valid approach for assessing excessive bioaccumulation of these types of chemicals.

Also, since PCBs are being found in excessive concentrations in edible tissue of fish in areas dominated by agricultural discharges, PCBs should be added to the list of chemicals that should be measured in fish tissue in the once-a-year sampling.

Metals – Some agricultural coalitions use irrigation water that contains mercury from upstream sources. Conditions within a coalition's area can result in mercury's being converted to methyl mercury. Mercury should be added to the list of metals that are measured. Methyl mercury should also be measured since that is the form that bioaccumulates.

Nutrients – There is need for the CVRWQCB to provide guidance on how to interpret nutrient concentration data relative to the Basin Plan objective for Biostimulatory Substances.

The ***SEDIMENT SAMPLING*** section includes pyrethroid-based pesticides**.** It is well-known that those pesticides cause water column toxicity at the time of runoff. Such runoff toxicity may not be found in sediments if the stream contains large amounts of erosional sediments that dilute the pyrethroids in the sediments. Lee and Taylor, DPR, and Weston have found water column toxicity due to pyrethroid-based pesticides.

Comments on INFORMATION SHEET FOR ORDER NO. R5-2008-_____ COALITION GROUP MONITORING AND REPORTING PROGRAM

Presented below are comments on technical deficiencies in the draft MRP Information Sheet

Page 3 second paragraph states,
"The Regional Water Board encourages the use of collaboration for the development of Coalition Group-specific MRP Plans. Frequent meetings held between Coalition Group representatives, Regional Water Board staff and other relevant stakeholders to discuss the critical aspects of the monitoring design, is considered to be the most efficient and effective strategy for plan development."

What is meant by "relevant" stakeholders? These discussions should be noticed so that anyone interested can participate.

Page 4 third paragraph states,
"Monitoring data must be collected by the Coalition Group in a format that provides a complete assessment of the conditions of waters of the State within the Coalition Group boundaries, and that provides an evaluation of trends in conditions over time."

It has been my experience that it will be very difficult to reliably detect trends in data of the type that will be generated in the MRP. Because of the typically high variability in concentrations in such systems, a much more comprehensive monitoring program will be needed to detect trends in the data. The coalitions should be required to determine how great a change will have to occur in the concentration of a parameter in order to reliably see a change in its concentration over time.

The *MRP Part III. Reporting Requirements* states,
"Routine reports include the initial Watershed Evaluation Report (WER) the Coalition Group's MRP Plan, the Quarterly Data Reports, and the Annual Monitoring Reports (AMRs) as described in Part III of the Order. Components of the AMR shall include an update on management practices and current chemical use reports. Exceedance Reports are required any time an exceedance occurs and Management Plans are required when more than one exceedance of a water quality standard occurs within a three-year period and when required by the Executive Officer."

As I pointed out to the CVRWQCB staff, the US EPA staff has determined that a three-year period for exceedances is inappropriate for bacterial indicators of sanitary quality.

Page 5, first paragraph states,

"*The assessment monitoring is a key component of the Monitoring Strategy and shall consist of a more comprehensive suite of analyses including water column toxicity, pesticides and metals that will be used to assess the effects of irrigated agriculture on waters of the State within Coalition Group boundaries."*

Because some of the impacts of contaminants in irrigated agricultural runoff/discharges (such as nutrients and organochlorine pesticides) can occur downstream of a coalition group's boundaries, the assessment monitoring should be expanded to include any location where irrigated agricultural discharges impact the state's water quality.

Page 9, last paragraph states in VII. OTHER CHANGES IN MRP MINIMUM MONITORING REQUIREMENTS,
*"Pyrethroids in water, which were removed due to the hydrophobic nature of the pesticides. Their detection is much greater in the sediment. Sufficient sediment will be collected when the sediment toxicity tests are processed so that pyrethroids can be analyzed if the sediments indicate the presence of toxicity. Water column monitoring for pyrethroids has been conducted and are detected relat*ively *infrequently."*

As I have pointed out in the past to the CVRWQCB staff, this approach is technically invalid because pyrethroid-based pesticides are typically present in toxic amounts in runoff from urban and agricultural areas in which they have used. The statement quoted above that pyrethroids "*are detected relatively infrequently*." is more a reflection of the poor quality of the monitoring programs that have been used thus far by the coalitions than an indication of their absence. If the monitoring had been event-based at the edge of the field, pyrethroid-based pesticides would likely have been detected.

Page 10, first paragraph states,
"Monitoring for Color, which was required under MRP Order RB5-2003-0833, was removed due to the fact that Total Suspended Solids and turbidity are more applicable measurements."

As discussed previously in comments on draft MRPs, that statement is technically invalid. Color is an independent, drinking water and ecological parameter that is not measured by Total Suspended Solids and turbidity.

Page 10, last paragraph states,
"*- Unionized ammonia was added to the MRP list because the Tulare Lake Basin has a numeric limit for unionized ammonia and not total ammonia. This does not constitute an additional analysis, as it is calculated from total ammonia using pH, temperature and hardness. All of those parameters are already on the monitoring list."*

Hardness is not a parameter in determining ammonia toxicity.

Supplement to
Comments on the CVRWQCB Tentative November 26, 2007 Draft MRP
G. Fred Lee, PhD, DEE and Anne Jones-Lee, PhD
December 28, 2007

This annotated list of references supplements our comments on Tentative November 26, 2007 Draft MRP discussions on the need for the Coalitions' MRPs to include evaluation of the water quality impacts of irrigated agricultural runoff/discharges that occur within the Coalitions' boundaries at any location where adverse impacts are occurring, including downstream of Coalitions' boundaries.

Nutrients–Excessive Fertilization

Lee and Jones-Lee have organized the "Delta Nutrient Water Quality Modeling Workshop" on behalf of the California Water and Environmental Modeling Forum; it will be presented in Sacramento on March 25, 2008. The objective of that workshop is to provide an overview discussion of the major water quality problems caused by nutrients discharged to tributaries of the Delta, and within the Delta, primarily by irrigated agriculture. The issues of concern include taste and odors problems in Delta waters used for domestic water supplies, excessive growths of water weeds (hyacinth and egeria) that interfere with recreational use of Delta waters and that are adverse to primary productivity and the food web, and low-dissolved oxygen conditions in the San Joaquin River (SJR) Deep Water Ship Channel (DWSC) near the Port of Stockton and at other locations in the Delta that develop as a result of algal growth. Nutrients discharged in the SJR watershed support the growth of algae; the decomposition of the dead algae in the SJR DWSC utilizes oxygen and contributes to low-DO conditions. Adverse impacts of the low-DO conditions include reduction of fish growth rates, fish kills, and interference with the reproduction-related homing of Chinook salmon to upstream tributaries of the SJR. The excessive discharge of nutrients by irrigated agriculture and, to a limited extent, urban sources, is one of the most significant causes of water quality impairment in the Delta. The Tetra Tech Conceptual Model of nutrient sources for the Delta that was developed to support the CVRWQCB Drinking Water Policy, will be discussed at the workshop.

Information on this workshop is available at:

> "Overview of Delta Nutrient Water Quality Problems: Nutrient Load – Water Quality Impact Modeling," Agenda for Technical Workshop sponsored by California Water and Environmental Modeling Forum (CWEMF), Scheduled for March 25, 2008 in Sacramento, CA (2008).
> http://www.members.aol.com/GFLEnviroQual/CWEMF_Workshop_Agenda.pdf

Additional information on excessive fertilization of the Delta and its control is available at:

> Lee, G. F., and Jones-Lee, A., "Delta Nutrient Water Quality Modeling Workshop — Background Information," Report of G. Fred Lee & Associates, El Macero, CA, September (2007).
> http://www.members.aol.com/GFLEnviroQual/NutrWorkshopRev4.pdf

Lee, G. F., and Jones-Lee, A., "Managing Nutrient (N & P) Water Quality Impacts in the Central Valley, CA," [Excerpts from: Lee, G. F. and Jones-Lee, A., "Review of Management Practices for Controlling the Water Quality Impacts of Potential Pollutants in Irrigated Agriculture Stormwater Runoff and Tailwater Discharges," California Water Institute Report TP 02-05 to California Water Resources Control Board/Central Valley Regional Water Quality Control Board, 128 pp, California State University Fresno, Fresno, CA, December (2002)], Report of G. Fred Lee & Associates, El Macero, CA (2002). http://www.members.aol.com/GFLEnviroQual/CentralValleyNutrientMgt.pdf

Lee and Jones-Lee have presented the following discussions of approaches that should be used to evaluate whether the concentrations/loads of nutrients found at a particular monitoring location cause adverse impacts on water quality at the monitoring location and downstream in:

Lee, G. F., and Jones-Lee, A., "Interpretation of Nutrient Water Quality Data Associated with Irrigated Agricultural Ag Waiver Monitoring," Submitted to Central Valley Regional Water Quality Control Board, Rancho Cordova, CA, by G. Fred Lee & Associates, El Macero, CA, November (2005). http://www.members.aol.com/annejlee/InterprNutrWQData.pdf

Lee, G. F. and Jones-Lee, A., "Assessing the Water Quality Significance of N & P Compound Concentrations in Agricultural Runoff," Invited presentation to the Agrochemical Division, American Chemical Society national meeting, San Francisco, CA, September (2006). http://www.members.aol.com/annejlee/N-PRunoffACS.pdf

Lee, G. F., and Jones-Lee, A., "Assessing Water Quality Significance of N & P Compound Concentrations in Agricultural Runoff," PowerPoint Slides for Invited Paper Presented at Agrochemical Division, American Chemical Society National Meeting, San Francisco, CA, September (2006). http://www.members.aol.com/GFLEnviroQual/N-PSlidesACS.pdf

Lee, G. F. and Jones-Lee, A., "Nutrient TMDLs and BMPs" PowerPoint slide presentation to the UC Agricultural Extension farm advisors and researchers, Woodland, CA (2005). http://www.members.aol.com/annejlee/FarmAdvisorsWoodland.pdf

Lee, G. F. and Jones-Lee, A., "Assessing the Water Quality Impacts of Phosphorus in Runoff from Agricultural Lands," In: Hall, W. L. and Robarge, W. P., ed., Environmental Impact of Fertilizer on Soil and Water, American Chemical Society Symposium Series 872, Oxford University Press, Cary, NC, pp. 207-219 (2004). http://www.gfredlee.com/ag_p-1_012002.pdf

Lee, G. F. and Jones-Lee, A., "Developing Nutrient Criteria/TMDLs to Manage Excessive Fertilization of Waterbodies," Proceedings Water Environment Federation TMDL 2002 Conference, Phoenix, AZ, November (2002). http://www.gfredlee.com/WEFN.Criteria.pdf

Lee, G. F., and Jones-Lee, A., "Role of Aquatic Plant Nutrients in Causing Sediment Oxygen Demand Part I – Origin of Rapid Sediment Oxygen Demand," Report of G. Fred Lee & Associates, El Macero, CA, May (2007). http://www.members.aol.com/LFandWQ/NutrientSOD1RapidOD.pdf

Lee, G. F., and Jones-Lee, A., "Role of Aquatic Plant Nutrients in Causing Sediment Oxygen Demand Part II – Sediment Oxygen Demand," Report of G. Fred Lee & Associates, El Macero, CA, June (2007) http://www.members.aol.com/LFandWQ/NutrientSOD2SOD.pdf

Lee, G. F., and Jones-Lee, A., "Role of Aquatic Plant Nutrients in Causing Sediment Oxygen Demand Part III – Sediment Toxicity," Report of G. Fred Lee & Associates, El Macero, CA, (2007) http://www.members.aol.com/LFandWQ/NutrientSOD3Tox.pdf

Additional discussion of excessive fertilization of waterbodies and its control is available at www.gfredlee.com in the Excessive Fertilization section at, http://www.gfredlee.com/pexfert2.htm.

Excessive Bioaccumulation of Organochlorine Legacy Pesticides

Runoff from irrigated agricultural lands contains organochlorine legacy pesticides such as DDT that bioaccumulate to excessive levels in edible fish in the Delta and its tributaries. Lee and Jones-Lee summarized the information available on the excessive bioaccumulation of organochlorine legacy pesticides in Delta and Delta tributary fish in:

Lee, G. F. and Jones-Lee, A., "Organochlorine Pesticide, PCB and Dioxin/Furan Excessive Bioaccumulation Management Guidance," California Water Institute Report TP 02-06 to the California Water Resources Control Board/Central Valley Regional Water Quality Control Board, 170 pp, California State University Fresno, Fresno, CA, December (2002). http://www.gfredlee.com/OClTMDLRpt12-11-02.pdf

Lee, G. F. and Jones-Lee, A., "Excessive Bioaccumulation of Organochlorine Legacy Pesticides and PCBs in California Central Valley Fish," US EPA, California OEHHA and ATSDR 2004 National Forum on Contaminants in Fish, Report of G. Fred Lee & Associates, El Macero, CA, January (2004). http://www.members.aol.com/duklee2307/OCl-slides-SanDiego.pdf

Lee, G. F., and Jones-Lee, A., "Excessive Bioaccumulation of Organochlorine Legacy Pesticides in Central Valley Fish," Report of G. Fred Lee & Associates, El Macero, CA, September 23 (2007). http://www.members.aol.com/GFLEnviroQual/LegacyPestCentralValleyFish.pdf

Lee, G. F., and Jones-Lee, A., "Need for Funding to Support Studies to Define the Magnitude of the Excessive Bioaccumulation of Organochlorine 'Legacy' Pesticides and PCBs in Edible Fish That Can Cause Cancer in Those Who Use Delta/Central Valley Fish as Food," Report of G. Fred Lee & Associates, (2005). http://www.members.aol.com/annejlee/OClProblemProject.pdf

As discussed in our September 2007 report, a review of the current CVRWQCB Ag Waiver monitoring data for the Delta shows that some water samples contain DDT in sufficient concentrations to bioaccumulate to excessive levels in some edible fish.

Other Delta and Delta Tributary Water Quality Problems

Further information on Delta water quality problems that could be caused or exacerbated by runoff/discharges from irrigated agriculture is available in:

> Lee, G. F. and Jones-Lee, A., "Overview of Sacramento-San Joaquin River Delta Water Quality Issues," Report of G. Fred Lee & Associates, El Macero, CA, June (2004). http://www.members.aol.com/apple27298/Delta-WQ-IssuesRpt.pdf
>
> Lee, G. F., and Jones-Lee, A., "Overview—Sacramento/San Joaquin Delta Water Quality," Presented at CA/NV AWWA Fall Conference, Sacramento, CA, PowerPoint Slides, G. Fred Lee & Associates, El Macero, CA, October (2007). http://www.members.aol.com/GFLEnviroQual/DeltaWQCANVAWWAOct07.pdf
>
> Lee, G. F., and Jones-Lee, A., "Water Quality Issues of Irrigated Agricultural Runoff/Discharges—San Joaquin River, Central Valley, California," Presented at *Agriculture and the Environment* - 2007 Conference, Central Coast Agricultural Water Quality Coalition, Monterey, CA, November (2007). http://www.members.aol.com/GFLEnviroQual/SJR-WQ-Ag-Monterey.pdf

Stormwater Runoff Water Quality Newsletter NL 10-10/11 provides a summary of Delta water quality issues that have been addressed in Lee and Jones-Lee writings. This Newsletter is available at, http://www.gfredlee.com/newsindex.htm.

Additional information on Delta and Delta tributary water quality problems is available at: http://www.gfredlee.com/psjriv2.htm. Comment or questions on those papers and reports should be directed to gfredlee@aol.com.