FOLEY

FOLEY & LARDNER LLP

ATTORNEYS AT LAW
402 W. BROADWAY, SUITE 2100
SAN DIEGO, CA 92101-3542
619.234.6655 TEL
619.234.3510 FAX
foley.com

August 29, 2011

CLIENT/MATTER NUMBER
096383-0102

VIA E-MAIL AND U.S. MAIL

David Gibson
San Diego Regional Water Quality Control Board
9174 Sky Park Court
Suite 100
San Diego, CA 92123
dgibson@waterboards.ca.gov

Re: Tentative Investigative Order R9-2011-0033: Request for Extension

Dear Ms. Walsh:

We are in receipt of the above-entitled Tentative Investigative Order ("Tentative Order") issued to Citizens Development Corporation ("CDC") on August 25, 2011. as you are aware, the Tentative Order is to be considered by the Regional Board at its scheduled September 14, 2011 meeting, and any written comments from CDC must be received no later than September 6, 2011. On behalf of our client CDC, we hereby request an extension of this matter until the Regional Board's October 12, 2011 scheduled meeting, with written comments to be accepted until October 4, 2011.

We request this extension on several grounds. First, as demonstrated by the dates noted above, CDC has only one week to provide any written comments to the Regional Board, and has less than three weeks to prepare for the Regional Board meeting. We are entitled to a reasonable amount of time to respond to the terms of the Tentative Order and to prepare a presentation for the Regional Board meeting, and three weeks simply does not provide adequate time.

Furthermore, based on the Regional Board's own estimates, the work contemplated by the Tentative Order will cost approximately $1,000,000, a very significant sum. Unfortunately, while the Regional Board has identified other classes of people who may also be responsible for costs associated with the investigative work, the Regional Board has shifted the entire cost burden onto CDC. On more than one occasion, CDC has offered to contribute its fair pro rata share for the voluntary participation agreement, only to be actively discriminated against by several members of the stakeholders group, with addendums and caveats that made signing the voluntary participation agreement unreasonable and punitive towards CDC.

While CDC is certainly willing to participate in the investigation and the associated costs, it is improper for the Regional Board to require CDC to bear the costs of the investigation alone. As currently proposed, CDC will have not alternative but to object to the Tentative Order. Alternatively, CDC would be willing to negotiate a fair and equitable contribution to the

FOLEY

FOLEY & LARDNER LLP

investigation costs over the next two years, in lieu of an Order. CDC believes that such an arrangement would be far superior than expending funds to litigate the liability for the investigation among the parties already identified by the Regional Board as partially responsible for the alleged contamination of the lake, such as owners of Municipal Separate Storm Sewer Systems[1] and other private property owners whose discharges may be causing or contributing to an exceedance of a water quality objective.

As noted above, CDC is not looking to shirk any and all responsibility for investigation of the causes and extent of nutrient impairment of Lake San Marcos; indeed, CDC looks forward to being an active participant in these investigatory efforts. However, in light of the fact that CDC has had so little time to prepare a response to the Tentative Order, and the fact that CDC alone does not bear full responsibility for the impairment of Lake San Marcos, we respectfully request that this matter be tabled until the Regional Board's October 12, 2011 meeting.

Thank you for your consideration of this matter, we hope to hear from you soon.

Very truly yours,

Elizabeth Cason

Elizabeth A. Cason

EAC

cc: Laurie Walsh
Chiara Clemente
Catherine George Hagan
Jessica Newman
S. Wayne Rosenbaum
Bob Hilber
Matthew DiNofia

[1] We note that the 9th Circuit has made clear that operators of MS4s are subject to receiving water limitations over and above the discharge limitations in their respective NPDES Permits (*See* Natural Resources Defense Council, Inc. v. County of Los Angeles et al. (2011) D.C. No. 2:08-cv-01467-AHM-PLA). We believe the same standard is applicable to POTWs and industrial facilities discharging directly into Lake San Marcos or San Marcos Creek.

FOLEY

FOLEY & LARDNER LLP

ATTORNEYS AT LAW
402 W. BROADWAY, SUITE 2100
SAN DIEGO, CA 92101-3542
619.234.6655 TEL
619.234.3510 FAX
foley.com

August 30, 2011

CLIENT/MATTER NUMBER
096383-0102

VIA E-MAIL AND U.S. MAIL

Laura LaVallee
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812
llavallee@waterboards.ca.gov

Re: Tentative Investigative Order R9-2011-0033: Request for Extension

Dear Ms. LaVallee:

We are in receipt of Tentative Investigative Order R9-2011-0033 ("Tentative Order") issued to Citizens Development Corporation ("CDC") on August 25, 2011. As you may be aware, the Tentative Order is to be considered by the San Diego Regional Water Quality Control Board ("Regional Board") at its scheduled September 14, 2011 meeting, and any written comments from CDC must be received no later than September 6, 2011. While we have requested an extension of this matter until the Regional Board's October 12, 2011 scheduled meeting, with written comments to be accepted until October 4, 2011, we would also like to request a formal hearing at the Regional Board level, for the reasons outlined below.

We have requested an extension of time for the scheduled hearing on several grounds. First, CDC has only one week to provide any written comments to the Regional Board, and has less than three weeks to prepare for the Regional Board meeting. We believe are entitled to a reasonable amount of time to respond to the terms of the Tentative Order and to prepare a presentation for the Regional Board meeting, and three weeks simply does not provide adequate time. Although the Regional Board has indicated the Tentative Order is important to the ongoing efforts by other parties involved on a voluntary basis to investigate and clean up Lake San Marcos, San Marcos Creek and the creek watershed, it is not clear how this is the case. As the Regional Board is well aware, CDC has offered to join in this voluntary effort, but has been rebuffed by the other voluntary parties (local MS4s) whoa re trying to use the Regional Board as a shield to avoid their obligations as the primary polluters of San Marcos Creek and Lake San Marcos.

The Regional Board also asserts that because of CDC's pending bankruptcy proceeding, and the fact that CDC allegedly minimized its potential liability for impairment to Lake San Marcos, proceeding with the Tentative Order in September is critical. Simply put, these arguments are unfounded. CDC has not yet put forth a plan of reorganization, and the hearing on the Debtor's Disclosure Statement will not take place until December 2011, meaning the Court's consideration of the plan will not take place until at least January or February of 2012. If the Regional Board's argument for such a short time line is based on the status of the bankruptcy proceeding, those concerns are unfounded.

FOLEY

FOLEY & LARDNER LLP

Furthermore, CDC has stated to the Regional Board on several occasions that CDC is fully committed to taking on its fair share of the investigatory and cleanup costs. While it is true that CDC has a small land holding adjacent to Lake San Marcos, the vast majority of the drainage and pollutants related to the drainage are under the ownership and control of various public agencies including, but not limited to, the City of San Marcos and the County of San Diego. Moreover, both Lake San Marcos and San Marcos Creek are 303(d)-listed bodies of water as impaired for nutrients. The Vallecitos Water District owns and operates a POTW that has a documented history of discharges of untreated sewage to the Creek and the Lake. Through this Tentative Order, we believe the Regional Board is simply seeking to avoid political controversy by assigning the entire cost of the investigation to the lake owner, who is a victim of the upgradient dischargers who have operated for years in violation of their NPDES permit receiving water prohibitions.

The Regional Board makes reference to the fact that because of the number of vacancies on the Board currently, they may not be able to convene in October to address the Tentative Order. However, this is no reason for the Regional Board to violate CDC's due process rights, particularly when the Regional Board is proposing to impose a $1,000,000 (based on the Regional Board's own estimates) obligation unilaterally on CDC. We do not believe the proposed timeline and procedures provide the required due process to CDC. Instead, CDC should be entitled to a full hearing, including the right to call witnesses, and to cross examine the Regional Board's witnesses. Such cross examination should also be available for the "persons most knowledgeable" for each of the MS4s and NPDES permit holders, Regional Board staff, and past and present Regional Board executive offers who participated in the voluntary negotiations between CDC and the other identified dischargers. Simply put, fourteen days is inadequate to issue the necessary subpoenas for the identified people to ensure their presence at the September hearing. Denial of adequate time constitutes a facial violation of Water Code section 13292, requiring regional boards to provide substantive and procedural due process. If the hearing on the Tentative Order is not postponed, CDC would be forced to immediately seek relief pursuant to Water Code section 13320.

The Regional Board has also asserted that CDC has been aware of the Regional Board's intent to bring this Tentative Order for some time; however, Mr. Gibson has stated publicly on several occasions that if an order were issued, it would be issued to *all* of the MS4 and NPDES permittees that discharge to the Creek and Lake (entities that have been identified by the Regional Board as responsible for costs associated with the investigative work), as well as CDC. Now, without any communications with CDC or its counsel, the Regional Board staff proposes to take this unilateral action against CDC alone. Unfortunately, this will simply force CDC to use resources, that could otherwise have been allocated to its fair share of the investigation, to defend itself against this draconian assessment. As noted above, CDC is not responsible for the pollution of the Lake; the upgradient MS4s and NPDES permit holders did.

If the Regional Board is willing to grant a one-month extension for consideration of the Tentative Order, we would request that in that period the State Board intervene in this matter, in an effort to assist all parties in coming to a fair and amicable settlement. CDC hereby offers a contribution of $150,000 (the debtor will obtain a court order approving the agreement with the

FOLEY

FOLEY & LARDNER LLP

Regional Board, with the first payment to be due within thirty days of the Court's approval of the agreement), payable in two equal annual payments to the Regional Board, as its fair share towards the investigation of Lake San Marcos. Furthermore, CDC will agree to include in its reorganization plan, and the above referenced order, an explicit waiver stating that the current bankruptcy proceedings will not discharge any future claims by the Regional Board for investigation or mitigation costs. We believe this is a more productive and better use of both the State and CDC's limited assets, rather than a prolonged litigation which will do nothing to improve the water quality of Lake San Marcos. We appreciate your attention to this matter, and look forward to a response at your earliest convenience. Please do not hesitate to contact me at the number above to discuss further.

Very truly yours,

Elizabeth Cason for

S. Wayne Rosenbaum

cc: Michael Lauffer
David Gibson
Laurie Walsh
Chiara Clemente
Catherine George Hagan
Jessica Newman
Elizabeth Cason
Bob Hilber
Matthew DiNofia
Krikor Meshefejian

FOLEY

FOLEY & LARDNER LLP

ATTORNEYS AT LAW
402 W. BROADWAY, SUITE 2100
SAN DIEGO, CA 92101-3542
619.234.6655 TEL
619.234.3510 FAX
foley.com

September 6, 2011

CLIENT/MATTER NUMBER
096383-0102

VIA E-MAIL AND U.S. MAIL

Ms. Chiara Clemente
Senior Environmental Scientist, Central
Watershed Unit
Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, California 92123
cclemente@waterboards.ca.gov

Re: Comments from Citizens Development Corporation: Tentative Investigative Order No. R9-2011-0033

Dear Ms. Clemente:

Please accept these written comments on behalf of Citizens Development Corporation ("CDC") to the Tentative Investigative Order No. R9-2011-0033 issued on August 25, 2011 (the "Tentative Order"), in anticipation of the September 14, 2011 hearing. We hereby incorporate by reference all correspondence between CDC, Foley & Lardner LLP, the Regional Board and the State Water Resources Control Board relating to the Tentative Order.

CDC hereby reiterates its objection to the extremely short amount of time provided to review and comment on the Tentative Order. Denial of adequate time constitutes a facial violation of Water Code section 13292, requiring regional boards to provide substantive and procedural due process. As noted in its August 29, 2011 letter to the Regional Board, CDC was given only one week to submit its written comments to the Tentative Order, and less than three weeks to prepare for the hearing. CDC is entitled to a reasonable amount of time to respond to the terms of the Tentative Order and to prepare a presentation for the Regional Board meeting, and three weeks simply does not provide adequate time. Although the Regional Board has indicated the Tentative Order is important to the ongoing efforts by other parties involved on a voluntary basis to investigate and clean up Lake San Marcos, San Marcos Creek and the creek watershed, it is not clear how this is the case. As the Regional Board is well aware, CDC has offered to join in this voluntary effort, but has been rebuffed by the other voluntary parties (local MS4s) who are trying to use the Regional Board as a shield to avoid their obligations as the primary polluters of San Marcos Creek and Lake San Marcos.

The Regional Board has also asserted that because of CDC's pending bankruptcy proceeding, and the fact that CDC allegedly minimized its potential liability for impairment to Lake San Marcos, proceeding with the Tentative Order in September is critical. Simply put, these arguments are unfounded. While CDC has filed a plan of reorganization with the Bankruptcy Court, no hearing on the confirmation of the plan has yet been set. The confirmation of the reorganization

FOLEY

FOLEY & LARDNER LLP

plan is in fact a two part process which first requires approval of a disclosure statement which will not take place until December 2, 2011 at the earliest. At that time, if the disclosure statement is approved, a hearing on the confirmation of the plan will then be set, which will be a minimum of thirty to forty-five days after the approval of the disclosure statement, meaning the Court's consideration of the plan will not take place until at least January or February of 2012. If the Regional Board's argument for such a short time line is based on the status of the bankruptcy proceeding, those concerns are unfounded. *See* the attached Declaration of Krikor J. Meshefejian.

The Regional Board has also asserted that CDC has been aware of the Regional Board's intent to bring this Tentative Order for some time; however, Mr. Gibson has stated publicly on several occasions that if an order were issued, it would be issued to *all* of the MS4 and NPDES permittees that discharge to the Creek and Lake (entities that have been identified by the Regional Board as responsible for costs associated with the investigative work), as well as CDC. Now, without any communications with CDC or its counsel, the Regional Board staff proposes to take this unilateral action against CDC alone. As the Regional Board is well aware, CDC is not solely responsible for the pollution of the Lake; the upgradient MS4s and NPDES permit holders are the primary sources of stormwater discharges into the Lake, and are responsible for the current contamination. While it is true that CDC has a small land holding adjacent to Lake San Marcos, the vast majority of the drainage and pollutants related to the drainage are under the ownership and control of various public agencies including, but not limited to, the City of San Marcos and the County of San Diego. Moreover, both Lake San Marcos and San Marcos Creek are 303(d)-listed bodies of water as impaired for nutrients. The Vallecitos Water District owns and operates a POTW that has a documented history of discharges of untreated sewage to the Creek and the Lake.

CDC also strenuously objects to the proposed imposition of the full burden to perform a water quality investigation on Lake San Marcos solely on CDC. Based on the budget prepared by the various municipalities who are part of the voluntary cleanup group (a copy of both the budget estimate sent to the State Board in support of a Regional Board grant request and the voluntary agreement are attached hereto for reference), the estimated cost of the investigation is $1,000,000. Because the Tentative Order is directed solely at CDC, there is no legal basis to assume that any other party will be required to contribute to the investigative costs.

CDC has stated to the Regional Board on several occasions that it is fully committed to taking on its fair share of the investigatory and cleanup costs. Water Code section 13267 requires that "[t]he burden, including costs of [investigative orders and technical reports] shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports." Simply stated, the Regional Board must balance the benefits to be derived from the Tentative Order and the investigation work with the costs imposed on CDC through that Tentative Order. As the Regional Board is well aware, CDC is already in bankruptcy, and is currently trying to develop a plan for reorganization. By imposing the costs of investigation solely on CDC, rather than on *all* parties responsible for stormwater discharge into the Lake, the Regional Board will effectively prevent CDC's efforts at reorganization, resulting in a Chapter 7 liquidation of all its assets,

FOLEY

FOLEY & LARDNER LLP

including the Lake. The ultimate result would be that CDC's repeated offer to contribute $150,000 over two years as its fair share of the costs would, through Chapter 7, be reduced to zero.

In addition, the Regional Board cannot issue the Tentative Investigative Order against CDC without violating the automatic stay. Pursuant to Section 362 of the Bankruptcy Code, the filing of a bankruptcy petition initiates the automatic stay which prevents certain actions against the bankrupt and its assets. Pursuant to Section 362(b)(4), "a governmental unit may pursue actions against the debtor or the estate, but it may not enforce a money judgment or seize or seek control over property of the estate without first obtaining relief from the automatic stay." 3 *Collier on Bankruptcy* ¶ 362.05[5][a] (Alan N. Resnick & Henry J. Sommer eds., 16th ed.). Here, the Tentative Order is in essence an improper attempt by the Regional Board to elevate its claim against CDC from an unsecured claim to an administrative claim. As acknowledged in the Tentative Order, the Regional Board filed a proof of claim for $459,000 which is the exact same amount as the estimated amount for "investigation and eventual remediation" estimated in paragraph 31 of the Tentative Order. The Regional Board's attempt to qualify its claim as an "injunctive claim" and part of its "police or regulatory power" is unavailing. As explained in *Collier*, "Closer to the *Kovacs* approach, one court has held that an EPA order requiring the debtor in possession to remove asbestos contamination from a waste site was subject to the automatic stay since it required the substantial expenditure of funds from the assets of the estate and, therefore, was equivalent to enforcement of a money judgment subject to the automatic stay. *U.S. v. Johns-Manville Sales Corp.*, 18 Env't Rep. Cas. (BNA) 1177, 1178 (D.N.H. 1982). Another court has used its equitable authority under section 105(a) of the Bankruptcy Code to enjoin a state from taking any action against the debtor in possession where the debtor was liquidating chapter 11 or in a liquidation case 'under chapter 7 of the Bankruptcy Code. *In re Thomas Solvent Co.*, 44 B.R. 83, 81-88(Banki. \V.D. Mich. 1984)." 3 *Collier on Bankruptcy* ¶ 362.05[5][b] n. 108. Therefore, issuance of the Tentative Order by the Regional Board constitutes a willful violation of the automatic stay.

Thank you for your attention to this matter.

Very truly yours,

S. Wayne Rosenbaum

cc: David Gibson
Michael Lauffer
Laurie Walsh
Jessica Newman
Catherine Hagan
Elizabeth Cason
Bob Hilber

FOLEY

FOLEY & LARDNER LLP

Matt DiNofia
Krikor Meshefejian

Attachments

DRAFT

PARTICIPATION AGREEMENT AMONG THE LAKE SAN MARCOS WORKING GROUP

This Participation Agreement Among the Lake San Marcos Working Group (Agreement) is made by the undersigned political subdivisions of the State of California, organizations, and individuals (collectively the Parties), and the San Diego Regional Water Quality Control Board, Region 9 (RWQCB), as follows,

PARTIES AND JURISDICTION

1. Parties. The Parties to this Agreement consist of the undersigned political subdivisions of the State of California, organizations, and individuals, and the San Diego Regional Water Quality Control Board, Region 9 (RWQCB). Additional public agencies, organizations, and individuals may become a Party to this Agreement after the Effective Date of this Agreement (New Party). Each Party shall (a) hold the capacity and power to contract, sue, and be sued under California law, (b) execute the Lake San Marcos Working Group Common Interest Agreement described in Paragraph 26, and (c) otherwise meet the requirements of this Agreement. A Party may voluntarily withdraw or be terminated from this Agreement (Withdrawing or Terminated Party) as provided in Paragraphs 2, 18, 26, 30, and 31.

2. Voluntary Agreement. This Agreement has been negotiated in good faith and neither the execution of this Agreement nor the actions undertaken by a Party under this Agreement including, without limitation, the apportionment activities under Paragraphs 23 through 27 and/or the Work activities prescribed under Paragraphs 10 through 13, shall in any way constitute or otherwise be construed as an admission of any fact, liability or responsibility in any way related to water quality or other conditions existing or threatened in, on or about Upper San Marcos Creek Watershed (see Paragraph 6(j)) and/or Lake San Marcos (see Paragraph 6(g)) of whatsoever kind or nature. The Parties expressly retain the right to controvert, deny, and fully defend against any claim, demand, penalty, cause of action, or proceeding of whatsoever kind or nature made or brought in any administrative, judicial, or other forum, by any federal, state, or local governmental agency having jurisdiction or by any organization or person, arising out of or in any way in connection with the water quality or other conditions in Upper San Marcos Creek Watershed and/or Lake San Marcos. Subject to Paragraph 21 and other express provisions of this Agreement, any Party may voluntarily withdraw from this Agreement upon written notice to the remaining Parties served personally or by certified mail at the addresses for such Parties set forth in this Agreement.

3. Jurisdiction. The Parties enter into this Agreement in lieu of enforcement action against the Parties by RWQCB in the exercise of its authority under Water Code Sections

13050, 13260, 13225, 13267, Sections 13240 et seq., Sections 13300 et seq., Sections 13370 et seq., and/or any other legal basis to compel such Parties to assess and undertake corrective action related to water quality conditions in Upper San Marcos Creek Watershed and/or Lake San Marcos, as necessary to delist such waters from the list of impaired water bodies identified under Section 303(d) of the Clean Water Act; and to avoid the need for implementation of the Total Maximum Daily Load (TMDL) process under Title 40 of the Code of Federal Regulations, Section 130.7.

4. Working Group. Each Party is a member of the Working Group under this Agreement. The Working Group shall be responsible for performing the Work and the other activities and obligations the Parties are collectively required to perform and satisfy under this Agreement.

5. Sub-Group. A Party may determine, from time to time, that, apart from its shared rights and obligations under the Agreement and as a member of the Working Group, such Party's legal interests are either adverse to or not shared in common with one or more other Parties under the Agreement. In such event, such Party may form and/or join a Sub-Group consisting of other Parties having common interests with the Party. In the event a Party joins a Sub-Group, such Party's rights and obligations under this Agreement and as a member of the Working Group shall remain unchanged. Parties which have joined a Sub-Group may elect to enter into a common interest agreement to protect the confidentiality of attorney-client communications and attorney work product such Parties may share within such Sub-Group. Party members of a Sub-Group may elect to act as a group to meet their collective obligations and responsibilities under this Agreement.

DEFINITIONS

6. Unless otherwise expressly provided in this Agreement, terms used in this Agreement which are defined in the California Water Code, the California Code of Regulations (CCRs), the federal Clean Water Act (CWA), or the Code of Federal Regulations (CFRs) shall have the meaning assigned to them in such laws and regulations. Whenever the terms listed below are used in this Agreement or in the exhibits attached hereto and incorporated herein, the following definitions shall apply:

(a) "Agreement" shall mean this Participation Agreement Among the Lake San Marcos Working Group.

(b) "Budget" shall mean the established sum of expenditures estimated by the Working Group to be necessary for the satisfactory completion of the Work and the other fiscal responsibilities of the Working Group.

(c) "Consultant" or "Contractor" shall mean any person or entity selected by the Working Group to perform any part of the Work described in this Agreement.

(d) "Day" shall mean a calendar day, unless otherwise expressly provided. In computing any period of time under this Agreement, where the last day would fall on a Saturday, Sunday, or California or federal holiday, the period shall run until the close of business of the next working day.

(e) "Effective Date" shall mean November __, 2009.

(f) "Initial Work" shall mean the scope of work described in Exhibit C attached hereto and incorporated herein by this reference.

(g) "Lake San Marcos" shall mean those waters of the United States and the State of California where the boundary area of the Lake is defined by the maximum topographical elevation of the Lake San Marcos spillway along the perimeter of the Lake as defined by the California Division of Dams; and the Lake is fully contained within the border of the Richland Hydrologic Subarea 904.52.

(h) "Municipal Separate Storm Sewer" shall have the meaning set forth in 40 CFR 122.26(b).

(i) "New Party" shall mean a Party which executes Addendum 1 to this Agreement after the Effective Date and meets the requirements of this Agreement, including, without limitation, Paragraph 21.

(j) "Upper San Marcos Creek Watershed" shall mean Twin Oaks Hydrologic Subarea 904.53 and Richland Hydrologic Subarea 904.52 within the Region 9, Carlsbad Hydrologic Unit, San Marcos Hydrologic Area, as described in the San Diego Basin Plan and shown on Exhibit A attached hereto and incorporated herein by this reference.

(k) "Terminated Party" shall mean a Party which is terminated from this Agreement as provided in Paragraphs 18, 26, 30, or 31.

(l) "Withdrawing Party" shall mean a Party which elects to withdraw from the Working Group and to terminate its participation under this Agreement as provided Paragraph 2.

(m) "Voting Share" a Party's voting power shall be apportioned in accordance with its proportionate share of responsibility to perform Work.

(n) "Working Group" shall consist of all the Parties to this Agreement.

COVERED WATER BODIES

7. Water Bodies Subject to this Agreement. The Upper San Marcos Creek Watershed and Lake San Marcos are located within the Carlsbad Hydrologic Unit (HU 904.53 and 904.52) (Exhibit B) and are listed as impaired water bodies under Section

303(d) of the federal Clean Water Act (CWA). Upper San Marcos Creek Watershed is listed for sediment toxicity, phosphorus, and DDE. Lake San Marcos is listed for ammonia (as nitrogen), nutrients, and phosphorus. The San Marcos Creek Watershed is the second largest watershed within the Carlsbad Hydrologic Unit, dominated by Upper San Marcos Creek Watershed, it extends approximately 14.11 miles inland from the Pacific Coast, is about 36,050 acres in area, and represents 27% of the Carlsbad Hydrologic Unit. There are three basins within the watershed. Two are located upstream of the Lake San Marcos dam. The upper basin is centered on Twin Oaks Valley at the southern end of the Merriam Mountains. The middle basin, the Richland Hydrologic Subarea, is centered on the valley occupied by the City of San Marcos. The middle basin in ovoid in shape and at its lower end the Upper San Marcos Creek Watershed was impounded in the 1940's to create Lake San Marcos. Lake San Marcos is the largest impoundment within the watershed. Downstream of the Lake San Marcos Dam, the lower basin (the Batiquitos Hydrologic Subarea 904.51) begins.

8. Affected Water Bodies. This Agreement covers the upper two basins of the San Marcos Creek Watershed and Lake San Marcos. For purposes of this Agreement, Lake San Marcos shall consist of the lake and all of its waters as defined in Paragraph 6(g) herein and the perimeter of the lake shall extend to a point within San Marcos Creek to be designated by the RWQCB. Such point is generally described as being at a location approximately one hundred feet (100 ft) upstream of Lake San Marcos, downstream of which no further conveyances discharge into the San Marcos Creek above the Lake.

PURPOSE

9. Purpose. The Parties agree to engage in the Work described in this Agreement for the express purpose of developing and implementing a water quality strategy and remediation scheme to achieve water quality conditions in Upper San Marcos Creek Watershed and Lake San Marcos which would trigger the application of Section 4 of California's Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (2004) and the delisting of such water bodies from such list for the constituents described in Paragraph 7. The delisting of such covered water bodies under CWA Section 303(d) and 40 CFR 130.7 will provide reasonable protection of beneficial uses designated for such covered water bodies.

WORK

10. Upper San Marcos Creek Watershed Work. Pursuant to Section 402(p) of the Clean Water Act, and California's Municipal Storm Water Permitting Program, the RWQCB has issued Order No. R9-2007-0001, NPDES No. CAS 0108758, entitled, "Waste Discharge Requirements for Discharges of Urban Runoff From the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, the San Diego Unified Port District, and the San Diego County Regional Airport Authority", the State Water Resources

Control Board (SWRCB) has issued National Pollutant Discharge Elimination System (NPDES) Permit For Storm Water Discharges From The State Of California, Department Of Transportation (Caltrans) Properties, Facilities, And Activities (Order No. 99 – 06 - DWQ), and the SWRCB adopted Water Quality Order No. 2003 – 0005 – DWQ National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000004 Waste Discharge Requirements (WDRS) For Storm Water Discharges From Small Municipal Separate Storm Sewer Systems (General Permit). The permittees under the aforementioned permits are herein collectively known as the MS4 Permittees. Certain of the MS4 Permittees are Parties under this Agreement, herein sometimes called the "MS4 Party Permittees.) Among other things, the MS4 Permittees are required to implement controls to reduce the discharge of pollutants by any person into MS4 conveyances and conveyance systems to the maximum extent practicable (MEP), including the imposition of management practices, control techniques and system, design and engineering methods." In addition, the Party MS4 Permittees have agreed to upgrade their Watershed Urban Runoff Management Programs (WURMPs) to include the implementation of a so-called 10-10 Program to reduce the concentrations of pollutants in urban run-off entering the Upper San Marcos Creek Watershed, as more fully described in the "MS4 10-10 Program" attached hereto as Exhibit E and incorporated herein by this reference (the "MS4 Work"). For purposes of this Agreement, the Party MS4 Permittees shall perform the MS4 Work as is necessary and reasonable to achieve the Purpose, as it applies to Upper San Marcos Creek Watershed as described in Paragraph 6(j). Unless expressly stated to the contrary in this Agreement, the term "Work" and "Initial Work", as opposed to the "MS4 Work", shall apply exclusively to Lake San Marcos as described in Paragraph 6(g). All Parties shall participate in the Initial Work and the Work.

11. Initial Work. The Parties agree to perform the Initial Work described in the Scope of Work, Water Quality Management in Lake San Marcos: Analysis of Available Data, attached hereto as Exhibit C and incorporated herein by this reference and preliminary In-Lake sampling and analysis to obtain information about late summer conditions in the lake as described in Exhibit D attached hereto and incorporated by this reference. The Initial Work and in-lake sampling described in Exhibits C and D represent a preliminary step toward achieving the Purpose. Proceeding with the implementation of such Initial Work using Michael A. Anderson Ph.D, a professor at University of California, Riverside, was generally agreed upon by the Parties prior to the execution of this Agreement. Upon executing this Agreement, the Parties hereby ratify and approve the Initial Work as an obligation of the Working Group and that the Initial Work shall be performed by Dr. Anderson.

12. Future Work. The Parties agree that additional Work will be necessary to achieve the Purpose. As a part of the implementation of this Agreement, the Parties agree to diligently identify, define, schedule, and conduct such additional Work as is reasonable and necessary to achieve appropriate increments of progress toward attainment of the Purpose. The Parties agree to proceed in a diligent manner with the goal of achieving the

Purpose within a reasonable and feasible timeframe; and the Parties agree that future Work may be undertaken in appropriate and reasonable phases. The Parties may elect to hire consultants and/or contractors to perform all or some of the Work.

13. Procurement and Approval Methods. The Parties acknowledge that the California Public Contract Code and the enabling statutes creating and empowering the public agencies who are Parties to this Agreement may constrain the means and methods such public agencies must follow to procure and approve Work to be performed under this Agreement. The Parties agree to provide reasonable accommodation to such public agencies, and the means and methods each must follow, in the implementation of this Agreement.

VOTING

14. Apportionment of Voting Power. Votes shall be apportioned among the Parties in accordance with their proportionate share of responsibility to perform the Work, as such proportionate responsibility has been determined by the Parties pursuant to the means and methods described in Paragraphs 23 through 27 of this Agreement. Until such time as the Parties have apportioned the share of responsibility each Party must bear, the Parties shall vote in accordance with the following Interim Schedule of Votes:

Interim Schedule Of Votes

Party	Votes
City of San Marcos	1
County of San Diego	1
City of Escondido	1
Caltrans	1
San Marcos Unified School District	1
Vallecitos Water District	1
California State University San Marcos	1
Community of San Marcos Homeowners	1
Citizens Development Corporation	1
Palomar College	1

15. Voting. Unless the Parties expressly agree to require a higher voting percentage for any particular action, the acts of the Parties or Working Group under this Agreement shall be approved by an affirmative vote of a majority of the votes constituting a quorum. A quorum shall consist of those Parties present in person or proxy, holding a majority of the votes allocated to the Parties under this Agreement. The MS4 Work shall only require approval by a majority vote of the Party MS4 Permittees, and Parties which are not Party MS4 Permittees shall not be entitled to vote on such matters.

COSTS OF WORK

16. Obligation of Parties to Pay Costs of Work. The Parties agree to timely contribute sufficient cash to the Working Group to ensure that the required compensation due for, and the costs and expenses incurred performing the Work are fully and timely paid (Costs of Work). Each Party has an obligation to pay a part of the Costs of Work incurred by the Working Group, in accordance with a share equal to the Party's proportionate share of the total Working Group votes. Thus, as provided in the Interim Schedule of Votes set forth in Paragraph 14, until such time as the Parties have apportioned each Party's proportionate responsibility for the Work, under Paragraphs 23 through 27, the Parties shall each have equal votes and shall each bear an equal share of the responsibility for funding the Work and other fiscal responsibilities of the Working Group.

17. Cash Contributions. The Working Group shall issue calls for cash contributions to the Parties in writing at least forty-five (45) days prior to the need to disburse Costs of Work or for other fiscal responsibilities of the Working Group. The Parties agree to make the cash contributions for which they are responsible within thirty (30) days after their receipt of the Working Group's written call for cash contributions.

18. Penalties for Non-Payment of Cash Contributions. The Parties agree that the timely and complete payment of Costs of Work is essential. Therefore, the Parties agree that Parties failing to make cash contributions to the Working Group in full within the time prescribed by Paragraph 17, may be assessed a penalty by the Working Group equal to five percent (5%) of the amount of the cash contribution called, for each month and fraction thereof such cash contribution is not made in full, up to a total penalty of twenty-five percent (25%). In addition, after the Party failing to make its cash contribution has had a reasonable opportunity to be heard, the Working Group may terminate such Party's rights under this Agreement. In the event a Party's rights under this Agreement are terminated, such Party shall remain liable to the Working Group for the payment of such Party's share of the Costs of Work for Work provided by the Working Group as of the date such Party's rights under this Agreement are terminated, the Penalty amount, and such Party's share of any other fiscal obligation incurred by the Working Group prior to the date of such termination.

19. Covenant-Not-To-Sue and Reservation of Rights. Except in accordance with Paragraphs 18, 26, and the Conflict Resolution procedures provided in this Agreement,

Parties to this Agreement covenant not to initiate, bring, or support any claim, order, demand, enforcement action or other civil or administrative proceeding against each other arising out of or related in any way to water quality conditions in, on, or about the covered water bodies, or any liability or responsibility therefore, and agree to resolve any such disputes among them in accordance the Conflicts Resolution procedures provided in this Agreement. Except as provided in this Paragraph, each Party expressly reserves the right to claim, bring a cause of action, and/or to commence a proceeding in any judicial, administrative and/or other forum against any person to collect reimbursement and/or contribution equal to all or any part of such Party's aggregate expenditures under this Agreement.

20. Distribution of Excess Funds. Upon completion of the Work, or upon sooner termination of this Agreement, and after payment of all outstanding fiscal responsibilities of the Working Group, the Working Group shall distribute any excess funds remaining in the Working Group account to the Parties in proportion to their respective aggregate cash contributions made under this Agreement.

21. Change in Number of Parties. In the event the number of Parties shall change during the term of this Agreement, the future cash contributions of the Parties under this Agreement shall be appropriately and proportionally adjusted. New Parties to this Agreement shall be responsible for making a cash contribution to the Working Group, within __ days of becoming a Party, equal to their retroactive proportionate share of all Costs of Work and other fiscal responsibilities incurred by the Working Group since the Effective Date. Withdrawing or terminated Parties shall remain responsible for making cash contributions to pay for all Costs of Work, other obligations procured or incurred by the Working Group, and penalties levied against such Party under Paragraphs 18 and/or 26 prior to such Party's withdrawal or termination from the Working Group.

22. Claims Against Non-Parties. The Parties, either jointly or individually, shall at all times have the right to make a claim and to commence an action against any person, subject to Paragraph 19, for reimbursement and/or contribution for the aggregate amount of any and all expenditures made by such Parties under this Agreement.

APPORTIONMENT

23. Apportionment of Responsibility. The Parties agree to include as a part of the Work, the development, establishment, and implementation of reasonable means and methods of apportioning responsibility for the Work, the Costs of the Work, and other obligations of the Working Group among the Parties; and, the identification and apportionment of responsibility for water quality conditions in, on, or about the covered water bodies among non-Parties. Such means and methods need not result in mathematical perfection, but shall be deemed reasonable if they achieve a reasonable apportionment of responsibility supported by substantial evidence. Such means and methods may consider the length of time and frequency of the discharge, the estimated

mass loading of the discharge, the instrumentalities, actions, and non-actions that have caused the pollutants to be deposited where they are, within the meaning of Water Code Section 13050, the Parties operating and controlling the site, the type of pollutants involved, and the extent to which such pollutants have contributed to the overall water quality conditions and the cost to abate or remedy the impaired conditions to achieve the Purpose. In addition, where one or more Parties have an apportioned share which is de minimus in nature, the Working Group may negotiate fair and reasonable "buy-out" agreements with such de minimus Parties who upon meeting the requirements of such agreement shall be deemed to have completed its obligations under the Agreement.

24. Apportionment of the Vote. The votes available to the Working Group shall be apportioned among the Parties in a manner equal to the apportionment of shares of responsibility among the Parties (excluding the apportionment of responsibility among non-Parties).

25. Apportionment of Cash Contributions. The responsibility for making cash contributions to the Working Group under this Agreement shall be apportioned among the Parties in a manner equal to the apportioned shares of responsibility among the Parties (excluding the apportionment of responsibility among non-Parties).

26. Call For Party Data and Information. The Parties shall respond to a written call for Party Data and Information made by the Working Group to apportion Party responsibility in accordance with the means and methods developed and established under Paragraph 23, by making a good faith and diligent investigation to discover and collect all data and information responsive to the Call for Party Data and Information. Each Party shall provide such information and data to the Working Group, subject to the protections afforded in the Working Group Common Interest Agreement to preserve the Party's attorney-client communications and its counsel's work product from waiver, and to preserve the Party's confidential and proprietary information and data from third party disclosure. Failure of a Party to meet the requirements of this Paragraph will entitle the Working Group to sanction such Party in an amount of _____ Dollars ($_____) for each week such Party fails to comply with the requirements of this Paragraph and/or to terminate such Party from the Working Group after a reasonable period in which the Party has an opportunity to be heard in its defense.

27. Adjustments to Apportioned Shares. Apportioned shares of responsibility made under the provisions of Paragraph 23 shall be appropriately adjusted upon discovery of new and credible information supporting such adjustment, provided such new information would result in a statistically significant change in the apportioned shares among the Parties.

RWQCB COVENANTS

28. RWQCB Covenant Not-To-Sue and Contribution Protection. Except upon the written consent of a Party and except as otherwise set forth this Agreement, the RWQCB covenants that the Parties shall not be subject to further liability or responsibility in any way related to those water quality conditions existing or threatened to arise in, on, or about the covered water bodies which are the subject of the RWQCB's decision to list the covered water bodies under CWA Section 303(d) as set forth in Paragraphs 7 and 8; provided such Parties diligently proceed with the Work and substantially achieve the Purpose described in Paragraph 9; and, in such event, RWQCB covenants and agrees not to initiate, bring, or support any claim, order, demand, enforcement action or other civil or administrative proceeding against the Parties arising out of or related to such water quality conditions under any local, state or federal statute or the common law, including but not limited to, the United States Code, the various California Codes, or other applicable laws, regulations, ordinances, or civil, judicial or administrative authorities, having application to the handling, release, presence, migration, cleanup, containment or maintenance of such water quality conditions. The RWQCB agrees that this Agreement resolves the Parties' liability to the Water Boards in respect of such water quality conditions. Parties who are performing their obligations under the Agreement, or who have completed their obligations under the Agreement, shall be entitled to contribution protection. The parties agree that this Agreement is an administrative settlement for purposes of Water Code Sections 13300 et seq., and that the Parties are entitled, as of the Effective Date, to protection from contribution actions or claims for matters addressed in the Agreement.

29. Covenant Shall Not Apply to Non-Parties. This Agreement shall not prejudice or otherwise affect in any way the ability of the RWQCB to take action against any person not a Party to this Agreement, relating to the investigation, abatement, or cost of investigation or abatement of water quality conditions in the covered water bodies.

30. RWQCB Reservation of Rights. Notwithstanding any other provisions of this Agreement, the RWQCB reserves the right to assert any claims, enforcement actions or other civil or administrative proceedings against any Party relating to the acts or omissions of the Party arising after the Effective Date and which are based on the failure of the Party, to the extent it has control over the water bodies, to (i) exercise due care with respect to the conditions described in Paragraph 7; (ii) implement and comply with the terms of this Agreement; and (iii) cooperate in providing reasonable access to the properties reasonably necessary for performing the Initial Work, the Work, the MS4 Work, and other actions reasonably necessary to attain the Purpose described in Paragraph 9. If RWQCB determines that a Party has failed to comply with any of these three enumerated requirements, after notice and a reasonable opportunity for cure, and RWQCB elects to proceed against such Party, then this Agreement shall be suspended with respect to such Party, and RWQCB and the Party shall then have any rights or

defenses they would have had if this Agreement and Covenant Not to Sue had not existed.

31. RWQCB Termination of a Party. If, following such proceeding, the RWQCB determines such action to be warranted, it may declare this Agreement to be terminated for such Party. Nothing contained in this Agreement shall be deemed a waiver of, or a release by, any Party of any defense, cross-claim, counter claim, offset or other rights available to such Party in response to any claim, order, demand, enforcement action or other civil or administrative proceeding by the RWQCB, as specifically reserved hereunder

32. No Assumption of Liability by RWQCB. The RWQCB, by this Agreement, assumes neither liability nor responsibility for any acts performed by Parties in the course of Parties' actions related to the Initial Work, Work, the MS4 Work, or the other obligations of the Parties under this Agreement. The Parties, on their own behalf and their respective successors in interest, hereby covenant not to sue the RWQCB, its authorized officers, employees or representatives, with respect to any and all liabilities or claims associated with or arising out of the conditions described in Paragraph 7.

33. Clean-Up and Abatement Account. At such time as the Working Group has developed a meaningful and feasible water quality strategy and Work strategy to attainment the Purpose of this Agreement, the RWQCB agrees to coordinate with the Working Group to prepare and support an application for funds from the California Clean-Up and Abatement Account pursuant to Water Code Sections 13440-13443, such funds to be used to pay Costs of Work.

34. Identification of and Activation of New Parties. The RWQCB agrees to cooperate with the Working Group to identify and seek the participation of other responsible parties in the Work using such means and methods as RWQCB may determine to be appropriate from time to time, which means and methods may include use of enforcement strategies available to it (e.g., Water Code Sections 13267, 13225, and Sections 13300 et seq.).

ACCESS TO SITE

35. Access to Lake San Marcos. The Parties owning or controlling property where access is necessary to implement this Agreement shall provide RWQCB, the Working Group, and their respective consultants and contractors with such access to such property at all reasonable times as necessary to permit the MS4 Party Permittes to perform the MS4 Work, the Working Group to conduct the Work and other actions required or authorized under this Agreement to achieve the Purpose.

36. Non-Party Owned Property. Where any action under this Agreement is to be performed in, on, or about property owned by or in possession of a person other than a Party or Parties, the Parties shall use their best efforts to obtain reasonable access rights

from such persons. Parties shall notify RWQCB if they are unable to obtain the necessary access to such property. For purposes of this Paragraph, "best efforts" does not include the payment of money in consideration of access.

37. RWQCB Reserved Rights. Notwithstanding any provision of this Agreement, RWQCB retains all of its power and authority to require access, its rights to require and impose appropriate and reasonable land/water use restrictions, and all enforcement authorities related thereto, under the federal Clean Water Act (CWA) or the California Porter-Cologne Water Quality Control Act ("Water Code") and any other applicable statutes or regulations.

38. Transfer of Property Subject to Access. The Parties agree that at least thirty (30) days prior to their conveyance of any interest in such property over, in, or under which the RWQCB and/or the Working Group requires access, such Parties shall give written notice to the transferee that the property is subject to this Agreement and written notice to the Working Group and RWQCB of the proposed conveyance, including the name and address of the transferee.

WORKING GROUP COMMITTEES

39. Steering Committee. The Parties may elect to establish a "Steering Committee" to represent the Parties in the administration of this Agreement.

40. Project Manager. The Parties may elect to designate one or more of the Working Group to act as the Project Manager(s) to administer the Working Group's contracts with consultants and/or contractors performing Work.

41. Treasurer. The Working Group may designate a Party to serve as Working Group Treasurer.

42. Secretary's Office. The Working Group shall designate one or more Parties to serve in the Office of the Secretary which shall have the responsibility to take and record minutes of all Working Group and Working Group committee meetings, establish and maintain a record of all Working Group documents and records.

MINUTES

43. Minutes. Minutes shall be kept of all Working Group and of all Working Group committee meetings and recorded in the Office of the Secretary.

PUBLIC PARTICIPATION

44. Group Water Quality Strategy Meetings. Working Group meetings held to discuss water quality strategy and the Work shall be open to all interested members of the community, including private citizens, landowners, public agencies, agriculture, trade

groups, and environmental groups. Working Group water quality strategy meetings shall be aimed at developing and implementing the Work necessary to achieve the Purpose on a long term basis, in coordination with the MS4 Work in the Upper San Marcos Creek Watershed and associated land uses, and in coordination with appropriate long term strategies affecting the existence, configuration, management, maintenance, and use of Lake San Marcos, the Lake San Marcos dam, and surrounding land uses; and, which Work and long term strategies shall be reasonable, feasible, and cost effective. To proceed with the water quality strategies in a diligent manner, a focused structure for public participation in these meetings is needed. The meeting provides an opportunity for the Working group to hear and consider public input and concerns related to the Work to be done. The goal of these meetings is to enable the Working group to reach an informed consensus on the Work and strategy. The meetings will be designed to be open and inclusive to interested groups, but at the same time will be small and structured to allow the work of the Working Group to be completed. As such, interested stakeholders will be asked to designate one or more persons from their group to regularly attend the meetings as an active participant (or spokesperson for the group) who will then report back to the interested parties. The Working Group may employ the services of a facilitator to assist to ensure that the goals and objectives of the Working group for the for the meetings are achieved and public input is received.

CEQA AND OTHER REGULATORY REQUIREMENTS

45. CEQA and Other Regulatory Requirements. The water quality strategy and the Work shall be developed, established, and implemented in a manner consistent with all other legal and regulatory requirements, including the California Environmental Quality Act (CEQA). To the extent possible, the Working Group will develop the Work necessary to meet CEQA and other legal requirements.

AUDIT

46. Parties' Right to Audit. The Parties shall each have the right to audit and inspect the books and records of the Working Group during reasonable business hours.

PROGRESS REPORTS

47. Progress Reports. The Working Group shall submit quarterly written progress reports to RWQCB concerning actions undertaken pursuant to this Agreement until completion or termination of this Agreement. These progress reports shall describe all significant developments during the preceding period, including the actions performed and any problems encountered, analytical data received during the reporting period, and the developments anticipated during the next reporting period, including a schedule of actions to be performed, anticipated problems, and planned resolutions of past or anticipated problems.

FINAL PROGRESS REPORT

48. Final Report. Within ___ days after completion of the Work required by this Agreement, the Parties shall submit for RWQCB review and approval a final report. The final report shall include a presentation of the analytical results of all sampling and analyses performed, and accompanying appendices containing all relevant documentation generated during the Work.

49. Submissions to RWQCB. The Parties shall submit three (3) copies of all reports or other submissions required by this Agreement to RWQCB. Upon request by RWQCB, Parties shall submit such reports or other submissions in electronic form.

RECORD RETENTION

50. Records Retention. Parties shall retain their records of activities undertaken in the performance of this Agreement for a period of five (5) years and shall also instruct their consultants and contractors to preserve all documents, records, and information of whatever kind, nature or description relating to performance of the Work for the same period. At the conclusion of the aforementioned document retention period, the Parties shall notify each other and the RWQCB in writing at least 90 days prior to the destruction of any such records or documents, and, upon request by RWQCB, Parties shall deliver any such records or documents to RWQCB. Parties may assert that certain documents, records and other information are privileged under the attorney-client privilege or any other privilege recognized by California or federal law.

COMPLIANCE WITH OTHER LAWS

51. Compliance With Laws. Parties shall perform all actions required pursuant to this Agreement in accordance with all applicable local, state, and federal laws and regulations.

DISPUTE RESOLUTION

52. Exclusive Mechanism. Unless otherwise expressly provided for in this Agreement, the dispute resolution procedures of this Section shall be the exclusive mechanism for resolving disputes arising under this Agreement. The Parties shall attempt to resolve any disagreements among themselves concerning this Agreement in good faith, expeditiously and informally.

53. Informal Process. Any dispute which arises under or with respect to this Agreement shall in the first instance be the subject of informal negotiations between the Parties to the dispute. The period for informal negotiations shall not exceed thirty (30) days from the time the dispute arises, unless it is modified by written agreement of the Parties to the dispute. The dispute shall be considered to have arisen when one Party sends the other Parties a written Notice of Dispute.

54. Agency Decision. In the event that the Parties cannot resolve a dispute by informal negotiations under the preceding Paragraph, then the decision of _____shall be considered binding unless, within ____ days after the conclusion of the informal negotiation period, the Parties invoke the formal dispute resolution procedures of this Paragraph by serving on the _____ and the other Parties a written Statement of Position on the matter in dispute, including, but not limited to, any factual data, analysis or opinion supporting that position and any supporting documents for the Parties' position as to whether formal dispute resolution should proceed under subparagraphs (a) or (b). Within ____ days after receipt of such Parties' Statement of Position, _____ and the other Parties will serve on Party their Statement of Position, including, but not limited to, any factual data, analysis, or opinion supporting that position and all supporting documentation relied upon by _____ and such other Parties. The Statement of Position shall include a statement as to whether formal dispute resolution should proceed under subparagraph (a) or (b). Within ____ days after receipt of the Statement of Position, the Party may submit a Reply. If there is disagreement between _____ and the Party as to whether dispute resolution should proceed under subparagraph (a) or (b), the Parties to the dispute shall follow the procedures set forth in the paragraph determined by _____ to be applicable. However, if the Party ultimately appeals to the Court to resolve the dispute, the Court shall determine which subparagraph is applicable in accordance with the standards of applicability set forth in subparagraphs (a) and (b).

(a) Formal dispute resolution for disputes pertaining to the selection or adequacy of any response action and all other disputes that are accorded review on the administrative record under applicable principles of administrative law shall be conducted pursuant to the procedures set forth in this subaragraph. For purposes of this subaragraph, the adequacy of any response action includes, without limitation: (1) The adequacy or appropriateness of plans, procedures to implement plans, or any other items requiring approval by RWQCB under this Agreement; and (2) the adequacy of the performance of response actions taken pursuant to this Agreement. An administrative record of the dispute shall be maintained by Parties and shall contain all statements of position, including supporting documentation, submitted pursuant to this Section. Where appropriate, _____ may allow submission of supplemental statements of position by the Parties to the dispute. The _____ will issue a final administrative decision resolving the dispute based on the administrative record described in Paragraph 11. This decision shall be binding upon the Party, subject only to the right to seek judicial review pursuant to Paragraph __. Any administrative decision made by _____ pursuant to subparagraph (a) shall be reviewable by a Court of competent jurisdiction, provided that a motion for judicial review of the decision is filed by the Parties with the Court and served on all Parties within 10 days of receipt of _____'s decision. The motion shall include a description of the matter in dispute, the efforts made by the parties to resolve it, the relief requested, and the schedule, if any, within which the dispute must be resolved to ensure orderly implementation of this Agreement. The _____ may file a response to Party's

motion. In proceedings on any dispute governed by this subparagraph, Parties shall have the burden of demonstrating that the decision of the _____ is arbitrary and capricious or otherwise not in accordance with law. Judicial review of _____'s decision shall be on the administrative record compiled pursuant to subparagraph (a).

(b) Formal dispute resolution for disputes that neither pertain to the selection or adequacy of any response action nor are otherwise accorded review on the administrative record under applicable principles of administrative law, shall be governed by this subparagraph. Following receipt of Party's Statement of Position submitted pursuant to Paragraph 11, the _____ will issue a final decision resolving the dispute. The _____ decision shall be binding on the Parties unless, within __ days of receipt of the decision, the Parties file with the Court and serve on the parties a motion for judicial review of the decision setting forth the matter in dispute, the efforts made by the parties to resolve it, the relief requested, and the schedule, if any, within which the dispute must be resolved to ensure orderly implementation of the Agreement. The _____ may file a response to Parties' motion. Judicial review of any dispute governed by this Paragraph shall be governed by applicable principles of law. The invocation of formal dispute resolution procedures under this subparagraph shall not extend, postpone or affect in any way any obligation of the Party under this Agreement, not directly in dispute, unless _____ or the Court agrees otherwise. Stipulated penalties with respect to the disputed matter shall continue to accrue but payment shall be stayed pending resolution of the dispute as provided in Paragraph __. Notwithstanding the stay of payment, stipulated penalties shall accrue from the first day of noncompliance with any applicable provision of this Agreement. In the event that Parties do not prevail on the disputed issue, stipulated penalties shall be assessed and paid as provided in Section __

55. Settlement. Any agreement reached by the Parties under Paragraph 10 pursuant to a dispute shall be in writing and shall, upon signature by such Parties, be incorporated into and become an enforceable part of this Agreement.

FORCE MAJEURE

56. Force Majeure. The Parties agree to perform all requirements of this Agreement within the time limits established under this Agreement, unless the performance is delayed by a force majeure. For purposes of this Agreement, an event of force majeure is defined as any event arising from causes beyond the control of the Parties, or of any entity controlled by the Parties, including but not limited to their consultants and subconsultants, which delays or prevents performance of any obligation under this Agreement despite the Parties' best efforts to fulfill the obligation. Force majeure does not include financial inability.

57. Notice to RWQCB. If any event occurs or has occurred that may delay the performance of any obligation under this Agreement, whether or not caused by a force majeure event, the Parties shall notify RWQCB orally within _____days of when Parties

first knew that the event might cause a delay. Within __ days thereafter, Parties shall provide to RWQCB in writing an explanation and description of the reasons for the delay; the anticipated duration of the delay; all actions taken or to be taken to prevent or minimize the delay; a schedule for implementation of any measures to be taken to prevent or mitigate the delay or the effect of the delay; Parties' rationale for attributing such delay to a force majeure event if they intend to assert such a claim; and a statement as to whether, in the opinion of Parties, such event may cause or contribute to an endangerment to public health, welfare or the environment. Failure to comply with the above requirements shall preclude Parties from asserting any claim of force majeure for that event for the period of time of such failure to comply and for any additional delay caused by such failure.

58. Extension of Time. The time for performance of the obligations under this Agreement that are affected by the force majeure event will be extended for such time as is reasonably necessary to complete those obligations.

INDEMNIFICATION

59. Indemnity. The Parties shall indemnify, save and hold harmless the RWQCB, its officials, agents, contractors, subcontractors, employees and representatives (the RWQCB Indemnitees) from any and all losses, liabilities, costs and expenses (including reasonable attorney's fees) the RWQCB Indemnitees, or any of them, may incur or suffer, to the extent the same arise from or in connection with the negligent acts or omissions of the Parties, their officers, directors, employees, agents, contractors, or subcontractors, in carrying out the Parties' obligations pursuant to this Agreement. The RWQCB shall not be held out as a party to any contract entered into by or on behalf of Parties in carrying out activities pursuant to this Agreement. Neither the Parties nor any such consultant or contractor shall be considered an agent of the RWQCB.

60. Notice of Claim. The RWQCB shall give the Parties notice of any claim for which the RWQCB plans to seek indemnification pursuant to Paragraph 59. laim.

61. Waiver. The Parties waive all claims against the RWQCB for damages or reimbursement or for set-off of any payments made or to be made to the RWQCB, arising from or on account of any contract, agreement, or arrangement between any one or more of the Parties and any person for performance of Work on or relating to the Agreement. In addition, the Parties shall indemnify and hold harmless the RWQCB with respect to any and all claims for damages or reimbursement arising from or on account of any contract, agreement, or arrangement between any one or more of the Parties and any person for performance of Work on or relating to the Agreement.

INSURANCE

62. Insurance. Prior to commencing any work under this Agreement, the Parties shall secure, and shall maintain for the duration of this Agreement, commercial general liability insurance and automobile insurance with limits of two million dollars, combined single limit, naming RWQCB as an additional insured. Within the same time period, the Parties shall provide RWQCB with certificates of such insurance and, if requested by the RWQCB, a copy of each insurance policy. The Parties shall submit such certificates and copies of policies each year on the anniversary of the Effective Date during the performance of this Agreement. In addition, for the duration of the Agreement, the Parties shall satisfy, or shall ensure that their contractors or subcontractors satisfy, all applicable laws and regulations for all persons performing the Work on behalf of the Parties in furtherance of this Agreement.

MODIFICATIONS

63. Changes in the Work. If the Parties seek permission to deviate from any approved Work plan or schedule, the Parties shall submit a written request to RWQCB for approval outlining the proposed modification and its basis. The Parties may not proceed with the requested deviation until receiving written approval from the RWQCB which shall be provided within thirty (30) days of the request. No informal advice, guidance, suggestion, or comment by RWQCB representatives regarding reports, plans, specifications, schedules, or any other writing submitted by the Parties shall relieve the Parties of their obligation to obtain any formal approval required by this Agreement, or to comply with all requirements of this Agreement, unless it is formally modified.

NOTICE OF COMPLETION OF WORK

64. Work Completion. When RWQCB determines, after RWQCB's review of the Final Report, that all Work has been fully performed in accordance with this Agreement, RWQCB will provide written notice of such fact to the Parties. If RWQCB determines that any such Work has not been completed in accordance with this Agreement, RWQCB will notify the Parties, provide a list of the deficiencies, and require that the Parties correct such deficiencies.

INTEGRATION/APPENDICES

8. Entire Agreement. This Agreement and its Exhibits constitute the final, complete and exclusive agreement and understanding among the Parties with respect to this Agreement. The Parties acknowledge that there are no representations, agreements or understandings relating to the settlement other than those expressly contained in this Agreement.

9. Power to Sign. Each of the undersigned Parties hereby certifies, and warrants that to the best of his or her knowledge, he or she is authorized to bind his or her agency or entity to the continuing obligations described herein.

The undersigned representative(s) of RWQCB and the Parties certify that they are fully authorized to enter into the terms and conditions of this Agreement and to bind the parties they represent.

San Diego Regional Water Quality
Control Board

By: _____
Title: _____
Date: _____

Parties:

Party:_____
By: _____
Title: _____
Address:_____
Date: _____

Party:_____
By: _____
Title: _____
Address
Date: _____

Party:_____
By: _____
Title: _____
Address:_____
Date: _____

Party:_____
By: _____
Title: _____

Address: _____
Date: _____

Party: _____
By: _____
Title: _____
Address: _____
Date: _____

Party: _____
By: _____
Title: _____
Address: _____
Date: _____

Party: _____
By: _____
Title: _____
Address: _____
Date: _____

EXHIBIT A

Carlsbad WMA

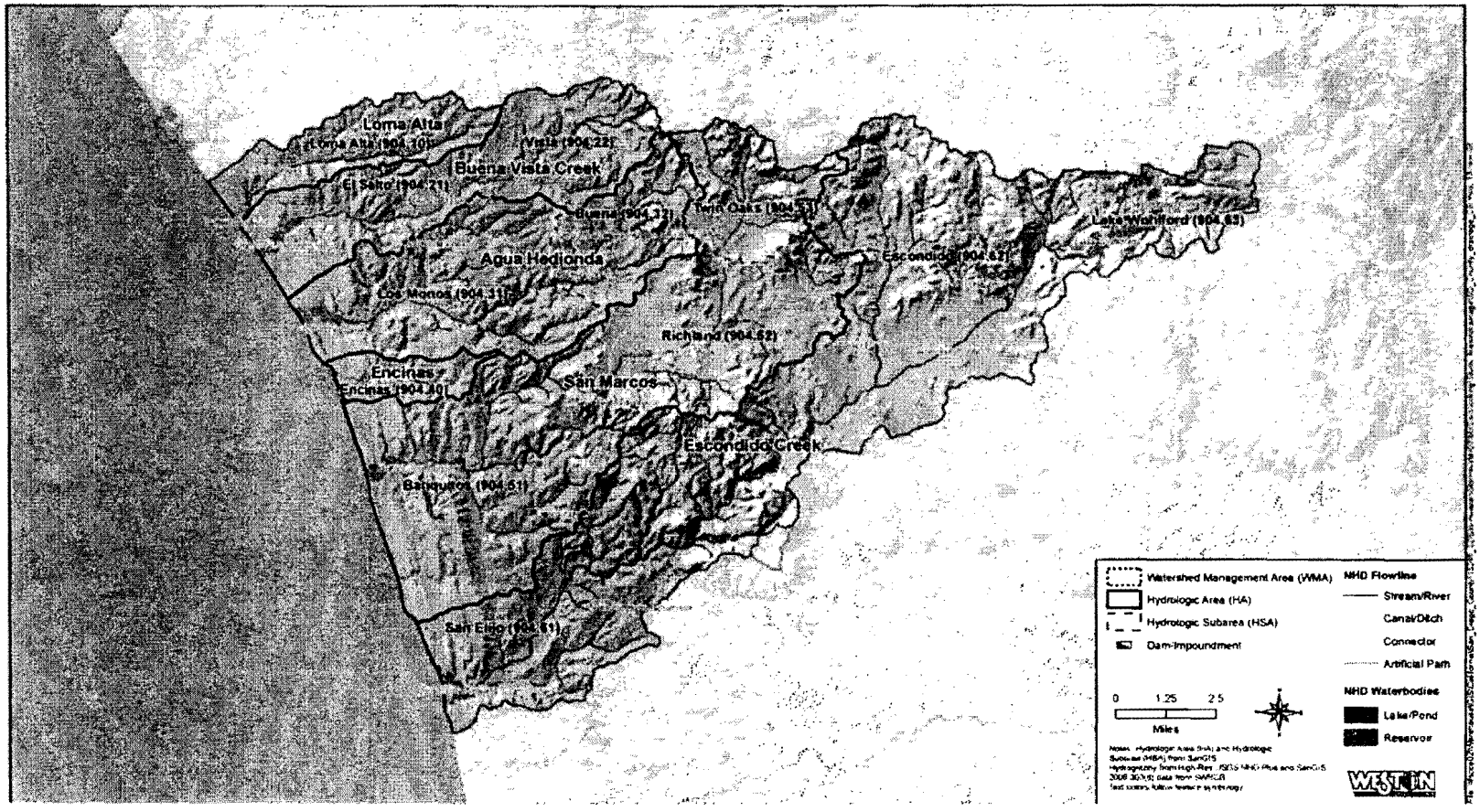

Figure 5-1. Carlsbad Watershed Management Area

EXHIBIT B

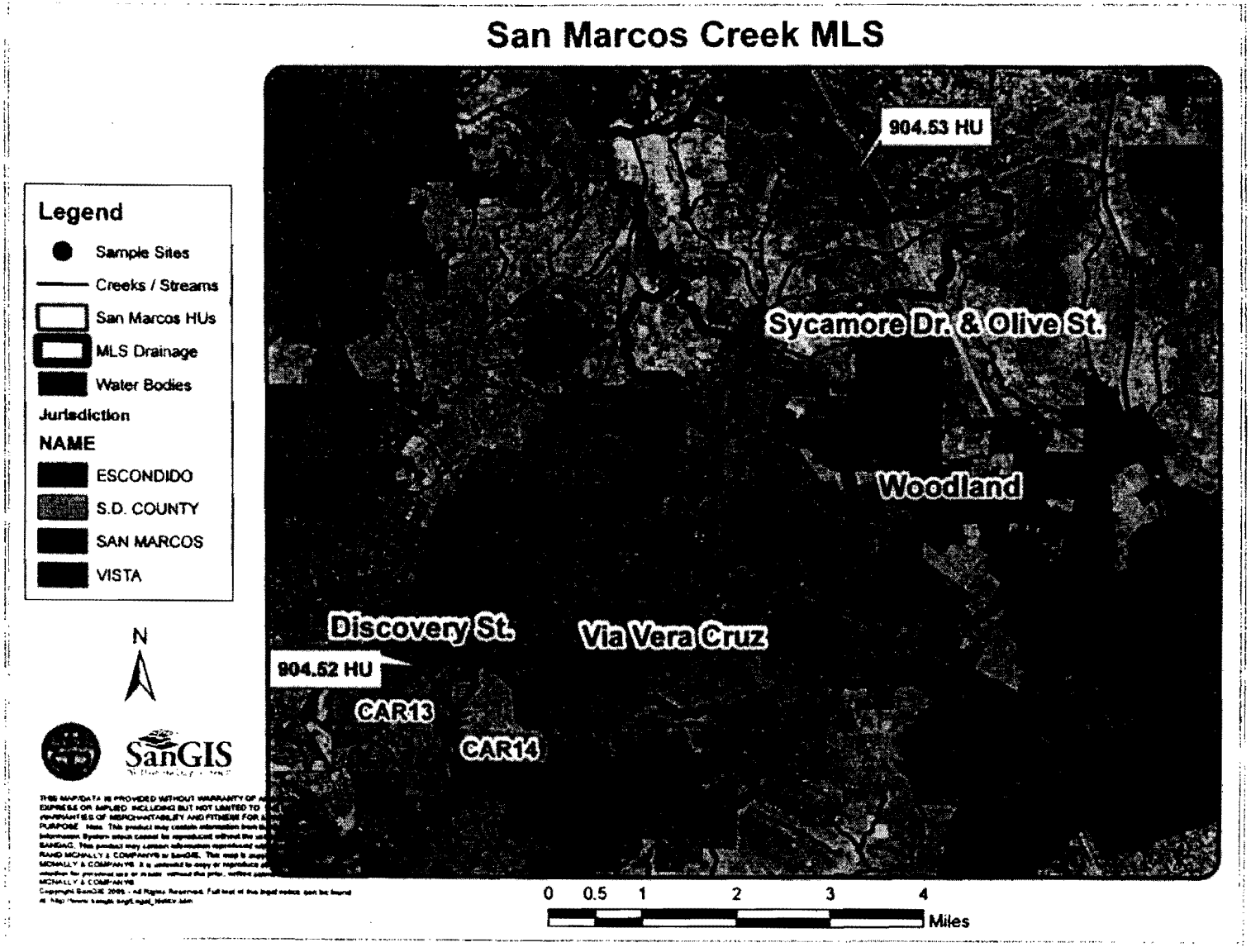
San Marcos Creek MLS
904.53 HU
Sycamore Dr. & Olive St.
Woodland
Discovery St.
Via Vera Cruz
904.52 HU
CAR13
CAR14
Legend
Sample Sites
Creeks / Streams
San Marcos HUs
MLS Drainage
Water Bodies
Jurisdiction
NAME
ESCONDIDO
S.D. COUNTY
SAN MARCOS
VISTA
N
SanGIS
0 0.5 1 2 3 4
Miles

EXHIBIT C

Dr. Michael A. Anderson's Phase 1 Scope of Work

EXHIBIT D

In-Lake Sampling Proposal

Procopio
Procopio, Cory, Hargreaves and Savitch LLP

John J. Lormon
Direct Dial (619) 515-3217
E-mail: john.lormon@procopio.com

May 26, 2010

VIA EMAIL AND HAND DELIVERY

Mr. David Gibson
Executive Officer
California Regional Water Quality Control
Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: Lake San Marcos Watershed SWRCB Cleanup and Abatement Fund Application for the June 9, 2010 Regional Board Hearing

Dear Mr. Gibson,

Enclosed herein please find the following documents for the City of San Marcos Cleanup and Abatement Account Application:

1. State Water Resources Control Board Cleanup and Abatement Account Fund Application

2. Lake San Marcos Contributing Watershed Nutrient Workplan (Scope of Work and Budget)

In addition, per the request of the Regional Board, we are providing letters of commitment from the listed Work Parties who agree to meaningfully participate in this project until the recommended cleanup and abatement of the nutrient impairment of Lake San Marcos and San Marcos Creek, to the extent it is causing nutrient impairment in the Lake, is complete.

1. Department of Transportation (Caltrans)
2. Citizen's Development Corporation
3. City of Escondido
4. County of San Diego
5. Lake San Marcos Community Association
6. San Marcos Unified School District

Procopio

As you know the City of San Marcos has signed a Participation Agreement and Vallecitos Water District is signing the Participation Agreement at their June 2, 2010 Board meeting, so no letter of commitment is necessary from San Marcos, nor Vallecitos if their Board agrees to sign the Participation Agreement next week.

If there is anything else that you need, please call me.

Sincerely,

John J. Lormon

JJL:mkk
Enclosures

cc: Ms. Laurie A. Walsh
Ms. Chiara Clemente
Ms. Amy Mecklenborg
Mr. Armand Ruby
Applicant: City of San Marcos, Ms. Erica Ryan
Work Parties: See Attached Distribution List

LAKE SAN MARCOS
WORKING PARTIES DISTRIBUTION LIST

1. Department of Transportation
2. Citizen's Development Corporation
3. City of Escondido
4. County of San Diego
5. Lake San Marcos Community Association
6. San Marcos Unified School District

Attachment 1

STATE WATER RESOURCES CONTROL BOARD
CLEANUP AND ABATEMENT ACCOUNT (CAA)
FUNDING REQUEST FORM

Send the completed form and attached documentation to via mail or email to:

Cristina Mayorga-Ochoa
1001 I Street,17th Floor
Sacramento, CA 95814
cochoa@waterboards.ca.gov

APPLICANT INFORMATION

Agency Name: (maximum of 40 characters)	**City of San Marcos**
Address:	**1 Civic Center Drive, San Marcos, CA 92029**
Agency Phone Number:	**760-744-1050**
Agency Representative:	**Erica Ryan**
Region:	**San Diego**
Region Representative:	**Dave Gibson, E.O.**
Representative Phone Number:	**858-467-4387**

PROJECT INFORMATION

Name of Project:	Lake San Marcos	**Project Start and End Dates:**	
Project Location:	County of San Diego		
Funding Amount:	$989,466		

PURPOSE OF REQUEST

1) Purpose of Request (attach additional sheet if needed):

The City of San Marcos ("Applicant") makes this request for a grant of $989,466 from the Cleanup and Abatement Account ("CAA") for the following purposes: **[CONTINUED ON ATTACHMENT 1]**

2) Background:

The Lake is located in northern San Diego County south to south-west of the City of San Marcos. Since its creation in 1946, the Lake has been an impoundment of the Creek upstream of the Dam. The Dam is licensed as a diversion structure for the impoundment of appropriated waters by the State Water Resources Control Board. In 1962 the Dam was enlarged, the shoreline was re-contoured, and the Lake expanded from a 40-acre to a projected 80-acre facility. **[CONTINUED ON ATTACHMENT 2]**

3) Impact to community or surrounding areas in regards to water quality:

The presence of the nutrients in the sediment and water column at the Lake can result in a number of water quality and public use and enjoyment impacts. The diminished water quality results in algae blooms, fish kills, and odors emanating from the Lake. These impacts affect what should be a more natural variability in the biological assemblage in the Lake and prevents a healthy Lake system from occurring.

- over -

4) What is the waste being addressed by this project?

The nutrients in the Lake and the Creek.

5) List any responsible party:

The County of San Diego; the City of San Marcos; the City of Escondido; Vallecitos Water District; California Department of Transportation; the San Marcos Unified School District; California State University, San Marcos; Palomar College; the North County Transit District; the Community Development Corporation; and the Lake San Marcos homeowners individually and through the homeowners association.[1]

6) Will any of these funds be used for Regional Board oversight? ☒ YES ☐ NO
If YES, how much?

Because the Applicant is conducting the day-to-day operation for this project and because it is acting as the coordinator for a diverse group of stakeholders, the grant request includes a 5% administrative fee to cover some of the Applicant's administration costs for this project. Due to its more limited role in administering this project, the Regional Board is not asking for funding.

SUPPORTING DOCUMENTATION ATTACHMENTS

☐ **Regional Board Resolution or proof of Regional Board support Attached**
☐ **Scope of Work Attached**
☐ **Project Budget Attached**

State Board Decision for $100,000 and Below:

☐ **Approved** ☐ **Denied**

Deputy Director **Date**

Deputy Director's Recommendation for Funding (over $100,000):

Deputy Director **Date**

[1] There have been many historical discharges by parties who are not known; nevertheless, the Applicant and work parties are making efforts to address these legacy pollutants through the Workplan.

ATTACHMENT 1

to complete a comprehensive investigation involving Monitoring, Data Analysis, and Interpretation (collectively, the "Diagnostic Phase"); and to conduct a complete analysis of the preferred options to clean up and abate the nutrient impairments in Lake San Marcos ("Lake") and San Marcos Creek ("Creek") for that portion of the Creek that is upstream of the concrete arched dam ("Dam") located at the southern end of the Lake (the "Feasibility Analysis and Cleanup Implementation Planning Phase").[1] The funding will allow the Applicant to conduct the diagnostic, feasibility, and implementation planning to mitigate and abate the excess nutrient levels in the Lake, and to mitigate the water quality and public health effects associated with those nutrient levels.

The importance of funding for this project cannot be overstated as it would allow the Applicant, in conjunction with other volunteer work parties, to expand upon the already completed first phase of the project that included data gathering and initial diagnostic work. This first phase of the project started in April 2009, immediately after the Applicant and other parties were invited by the Executive Officer of the California Regional Water Control Board, San Diego Region ("Regional Board") to voluntarily address the nutrient impairment in the Lake and the Creek.[2]

The Applicant estimates that, during the first phase of the voluntary activities, expenses totaling more than $250,000 have been incurred for water quality testing and preparation of the preliminary report and that more than $400,000 in money or in-kind administrative services and third party professional services costs have been expended on this project by the Applicant and the Work Parties to gather existing data, to analyze and report on that data, and to establish the legal and consensual framework necessary to support this voluntary process.[3]

Applicant is seeking CAA funds to support a detailed diagnostic investigation of the physical parameters of the Lake and Creek systems and the sources of the nutrient impairment in the Lake and Creek including, but not be limited to, development of seasonal and annual water and nutrient budgets for the Lake (i.e., water and nutrient flow into and out of the Lake through surface water, and/or groundwater), determination of the nutrient concentrations in surface and groundwater, and assessment of natural sources of nutrients such as atmospheric depositions, fish behavior, assessment of the internal nutrient recycling resulting from thermal stratification and mixing of surface and deeper waters in the late Fall and early Winter. In addition, sediment depth, volume, and chemistry will be measured and evaluated in order to better understand the role that sediment and other Lake parameters play in the nutrient processes. Water chemistry, biological measurements, and other water quality monitoring are also part of the diagnostic work that will be performed.

All monitoring, research, and assessment will follow approved state and federal protocol and

[1] Attached to this application as Exhibit A is the Workplan, including the scope of work and budget in support of this application.

[2] The voluntary model TMDL is a "non-TMDL approach to address water quality impairments." The term "TMDL" involves specific regulatory meaning and includes specification of in-stream "targets" (usually concentrations equivalent to the water quality objectives), calculation of "(waste)load allocations" for point and non-point sources, and an implementation plan as to how to abate the impairment. The road to delisting without that TMDL process would include similar steps, but because it would be outside the state's 303(d) process it might better be termed a non-TMDL approach.

[3] For example, in January 2010, the group developed the Upper San Marcos Creek Watershed Nutrient Management Plan and, instituted dry and wet weather water quality monitoring to provide valuable new flow and water quality data that will help us address gaps that exist in the current understanding of watershed nutrient sources, watershed hydrology, and the internal lake process.

QA/QC (e.g., SWAMP Guidelines) and will be conducted under an approved quality assurance project plan. The Diagnostic Phase of the project will provide critical information that will allow the Applicant to identify the most promising measures to address the nutrient impairment in the Lake during the Feasibility Phase, and to conduct the planning for the development of a remedial action plan for this project during the Cleanup Implementation Planning Phase. While not a part of the current Workplan, the last stage of this project will involve the completion and implementation of the remedial action plan (the "RAP Phase") to accomplish the cleanup and abatement of the Lake nutrient impairment.[4]

[4] At this time the Applicant does not know what is the best remedial action, however upon completion of the tasks included in the attached Workplan it will be able to identify and budget for the RAP Phase and we anticipate that additional funding will be requested at that time.

ATTACHMENT 2

The redeveloped Lake was filled with Colorado River water from the San Diego Canal in 1963. Pursuant to a 1969 Department of Water Resources memorandum, the maximum depth of the Lake was 38.5 feet with an average depth of 8 to 9, and a Lake surface of 54 acres, and a capacity of 480-acre feet of water. Following raising of the Dam, the Lake surface area, capacity and depth were reported to have increased with a current capacity of approximately 1,200-acre feet of water.

In 2006 and 2008, the Lake was listed under Clean Water Act (CWA) Section 303(d) as an impaired water body (called "San Marcos Lake" in the Listing) for ammonia as nitrogen, nutrients, and phosphorus, and the Creek was listed as impaired for phosphorus. The Lake has been subject to periodic algal blooms, confirmed presence of cyanobacteria toxins, and occasional fish kills likely due to the presence of excessive nutrients in the water. Residents living near the Lake have reported algae and odor conditions to the Regional Board for several years.

The Lake water experiences periods of low dissolved oxygen concentrations when the Lake stratifies and the bottom water becomes anoxic. In the late Fall and Winter the surface water gets cooler, sinks, and mixes with the deeper anoxic water which can contribute to fish kills and subsequent algal blooms. Turbidity in the water column (due to both phytoplankton and suspended solids) results in low transparity and water quality that limits aquatic plant growth.

In 2009, the Applicant collected all available data about the Lake and Creek and provided that information to Professor Michael Anderson, Ph.D. Limnology, University of California, Riverside, to review and to provide a preliminary report with his assessment and recommendation on the nutrient conditions in the Lake. On February 3, 2010, Dr. Anderson released his report entitled: "Water Quality Management in Lake San Marcos: Analysis of Available Data". Among his findings, Dr. Anderson noted that the Lake serves as sediment trap, reducing sediment load to downstream reaches of the impounded Creek. In addition to the loss to storage capacity, the average depth of the Lake is decreasing and particulate forms of nutrients can be retained in this reservoir. These processes lead to long-term biogeochemical recycling of nutrients from the sediments to the water column. Thus, in-lake processes and the impact of the Dam on the Lake water quality are among the most important issues that will be addressed as part of this project.

After a full Diagnostic Phase is completed and a preferred alternative is identified, the Applicant will begin the Feasibility and the Cleanup Implementation Planning Phase for the preferred cleanup and abatement program.[1] In order to abate the nutrient impairment in the Lake, all of the Workplan steps must be undertaken before the final cleanup and abatement is commenced in the RAP Phase.

[1] In January of this year the Executive Officer requested that data gaps be filled as a necessary next step in order to conduct the feasibility assessment and undertake the cleanup and abatement planning. As part of the Regional Board package, Dave Gibson, Executive Officer, San Diego Regional Board to State Water Resources Control Board will provide a letter of support for this Application.

SAN MARCOS
UNIFIED SCHOOL DISTRICT
engaging students...inspiring futures

255 Pico Avenue, Suite 250
San Marcos, CA 92069

T 760.752.1299
F 760.471.4928

www.smusd.org

May 21, 2010

Mr. Dave Gibson
Executive Director
California Regional Water Quality Control Board
San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: Commitment to support cleanup and abatement of excess nutrient levels in San Marcos Creek and Lake San Marcos

Dear Mr. Gibson:

The San Marcos Unified School District ("SMUSD") owns and operates several school facilities in the San Marcos Creek Watershed. As a member of the community, SMUSD has an obligation to be a good environmental steward, and ensure that its facilities do not cause or contribute to poor water quality conditions in the San Marcos Creek Watershed.

To that end, the purpose of this letter is to express SMUSD's support for current efforts by the City of San Marcos, Vallecitos Water District, the City of Escondido, the County of San Diego, the lake's owner, the surrounding community, and others, to cleanup and abate excess nutrient levels in San Marcos Creek and Lake San Marcos. SMUSD further supports the City of San Marcos' decision to act as the Lead Agency for the application of cleanup and abatement funds for the development of a diagnostic study of San Marcos Creek and Lake San Marcos, and for the potential subsequent remediation work.

SMUSD has been involved in cleanup and abatement efforts to date, donating funds and hours of staff time to the development of an initial report by Dr. Michael Anderson, and to the development of a subsequent scope of work based on Dr. Anderson's report. To the extent feasible, considering both budgetary constraints and SMUSD's contribution of constituents of concern, SMUSD is committed to continued participation in the process of addressing nutrient levels of concern in San Marcos Creek and Lake San Marcos.

Thank you for your attention to this matter. If you have any questions or comments regarding SMUSD's support for cleanup and abatement efforts in the San Marcos Creek Watershed or any other related matters, please do not hesitate to contact me.

Sincerely,

Katherine Tanner
Executive Director
Facilities Planning and Development

KT/dps

C: Kevin D. Holt, SMUSD
Gary M. Hamels, SMUSD
Erica Ryan, City of San Marcos
Andre Monette, BBK
Tyree Dorward, BBK
Chiara Clemente, San Diego Regional Water Quality Control Board

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY ARNOLD SCHWARZENEGGER, Governor

DEPARTMENT OF TRANSPORTATION
DISTRICT 11
4050 TAYLOR STREET, M.S. 242
SAN DIEGO, CA 92110
PHONE (619) 688-0100
FAX (619) 688-4277
TTY 711

Flex your power!
Be energy efficient!

May 25, 2010

Mr. David Gibson, Executive Officer
California Regional Water Quality Control Board
San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123

Attn: Chiara Clemente

Dear Mr. Gibson:

SUBJECT: Lake San Marcos and San Marcos Creek Commitment Letter

This letter serves as the California Department of Transportation (Caltrans) commitment for continued involvement in the Stakeholders workgroup to address the water quality impairment in Lake San Marcos (Lake) and San Marcos Creek (Creek). Under the federal Clean Water Act Section 303(d), the Lake is listed for ammonia (as nitrogen), nutrients, and phosphorus; the Creek is listed for phosphorus.

Caltrans is committed to the process of investigation and addressing the impairment of the Lake and the Creek and has been an active volunteer member of the workgroup since April 2009. Over the past year, significant progress has been made in the collection and assessment of available data related to the Lake and Creek. Caltrans is in full support of the City of San Marcos (the City) acting as the lead agency for applying to the State Water Resources Control Board for Cleanup and Abatement Account funds to assist the City and all work parties in investigating and addressing the nutrient impairment of the Lake and Creek. In addition, Caltrans agrees to meaningfully participate until the recommended cleanup and abatement phase of the project for the nutrient impairment of the Lake and Creek is complete.

If you have any questions, please feel free to contact me at (619) 688-0100.

Sincerely,

SUSANNE GLASGOW
Deputy District Director, Environmental

County of San Diego

DEPARTMENT OF PUBLIC WORKS

JOHN L. SNYDER
DIRECTOR

5201 RUFFIN ROAD, SUITE D
SAN DIEGO, CALIFORNIA 92123-4310
(858) 694-2055 FAX: (858) 694-8928
Web Site: www.sdcounty.ca.gov/dpw/

RICHARD E. CROMPTON
ASSISTANT DIRECTOR

May 24, 2010

David Gibson, Executive Officer
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego CA 92123-4340

Dear Mr. Gibson:

WATER QUALITY IMPAIRMENT IN LAKE SAN MARCOS AND SAN MARCOS CREEK

This letter is regarding the water quality impairment in Lake San Marcos and San Marcos Creek, and the County of San Diego's (County) commitment to addressing that impairment. As you know, both the Lake and the Creek are listed under Section 303(d) of the Federal Clean Water Act as impaired for nutrients. The Lake is listed for ammonia (as nitrogen), nutrients, and phosphorus; the Creek is listed for phosphorus.

The County is committed to the process of investigating and addressing the impairment of the Lake and the Creek. The County has already dedicated substantial staff time and resources to that process and will continue to participate in the process until the impairment is addressed. In addition, the County agrees the City of San Marcos (the City) may act as the lead agency for an application to the State Water Resources Control Board for Cleanup and Abatement Account funds to assist the County, the City, and other public agencies in investigating and addressing the nutrient impairment in the Lake and the Creek.

Please contact Tom Deak, Office of County Counsel, at (619) 531-4810 or thomas.deak@sdcounty.ca.gov, with questions about these comments.

Sincerely,

JOHN L. SNYDER, Director
Department of Public Works

ESCONDIDO
City of Choice

Lori Vereker
Utilities Director
201 North Broadway, Escondido, CA 92025
Phone: 760-839-4528 Fax: 760-839-4597

May 25, 2010

Mr. David W. Gibson, Executive Officer
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

RE: *Letter of Commitment Upper San Marcos Creek / Lake San Marcos Watershed Nutrient Abatement Project*

Dear Mr. Gibson:

This letter is regarding the water quality impairment in Lake San Marcos (the "Lake") and San Marcos Creek (the "Creek"), and the City of Escondido's (the "City") commitment to addressing that impairment. As you know, both the Lake and the Creek, to the degree it affects the Lake, are listed under Section 303(d) of the federal Clean Water Act as impaired for nutrients. The Lake is listed for ammonia (as nitrogen), nutrients, and phosphorus; the Creek is listed for phosphorus.

The City strongly supports the cooperative efforts undertaken to address the excess nutrient loads in the Lake and the Creek and is committed to the process of investigating and addressing the impairment of the Lake and the Creek to the degree it affects the Lake. To this end, the City has expended significant staff time and resources toward the process and will continue to participate in the process until the impairment in the Lake and the Creek, to the degree it affects the Lake, is addressed.

The City is in full support of the City of San Marcos's request for State Water Cleanup and Abatement Account ("CAA") funding to clean up and abate the nutrient impairment in the Lake and the Creek to the degree it affects the Lake. The City will work with San Marcos to accomplish all aspects of the scope of work included in San Marcos' CAA grant request.

If you have any questions concerning this matter, please feel free to contact me.

Sincerely,

John Burcham
Deputy Director of Utilities/Wastewater
City of Escondido

cc: Chiara Clemente, Senior Environmental Scientist, Central Watershed Unit, San Diego Regional Water Quality Control Board
Clay Phillips, City Manager
Jeffrey Epp, City Attorney
Charlie Grimm, Assistant City Manager
Lori Vereker, Director of Utilities
Corrine Neuffer, Deputy City Attorney
Cheryl Filar, Environmental Programs Manager

LOUNSBERY FERGUSON
ALTONA & PEAK LLP

ATTORNEYS AT LAW

960 Canterbury Place, Suite 300
Escondido, California 92025-3870
Telephone (760) 743-1201
Facsimile (760) 743-9926
www.LFAP.com

OF COUNSEL:
JAMES P. LOUGH
GARTH O. REID

SPECIAL COUNSEL:
JOHN W. WITT

May 26, 2010

David Gibson, Executive Director
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Ste. 100
San Diego, CA 92123-4340

Re: *Letter of Commitment Upper San Marcos Creek / Lake San Marcos Watershed Nutrient Abatement Project*

Dear Mr. Gibson:

This office is retained as General Counsel to assist the Lake San Marcos Community Association ("the Association") as it participates in the process of addressing and resolving the water quality impairment issues in Lake San Marcos and San Marcos Creek.

The Board of Directors of the Association has, by a unanimous vote, authorized its joinder of the Participation Agreement signed by the City of San Marcos, subject to appropriate stipulations. Consistent with that stipulated authorization, the Association is committed to participate in all diagnostic, feasibility and cleanup and abatement work required to remove the Clean Water Act section 303(d) listing of nutrient impairment at Lake San Marcos ("Lake").

Since April 2009, the Association has been working on a voluntary basis with the San Diego Regional Water Quality Control Board, the City of San Marcos and other stakeholders to address the nutrient impairments in the Lake and Creek upstream of the Lake dam. Over the past year, significant progress has been made in the collection and assessment of all available data related to the Lake and Creek, and in the development of a participation agreement that provides the architecture which allows this voluntary process to function. The project is an important and unique opportunity to cleanup and abate the effects of the nutrient impairment in the Lake and Creek and to remedy a significant water pollution problem for the San Diego Region.

The Association is in full support of the City of San Marcos' request for State Water Cleanup and Abatement Account ("CAA") funding to clean up and abate the nutrient impairment in the Lake and the Creek to the degree it affects the Lake. The Association commits to work with the Applicant to accomplish all aspects of the scope of work included in the City's CAA grant request. In addition, subject to the terms of its commitment to become a party to the

Participation Agreement, the Association shall participate as directed by the Regional Board or as agreed to by the work parties, until the recommended cleanup and abatement phase of the project for the nutrient impairment of the Lake and the Creek is completed.

Sincerely,
LOUNSBERY FERGUSON ALTONA & PEAK, LLP

Kenneth H. Lounsbery
General Counsel for
Lake San Marcos Community Association

:kld

cc: John Lorman
Ken Davis

FOLEY

FOLEY & LARDNER LLP

ATTORNEYS AT LAW

402 W. BROADWAY, SUITE 2100
SAN DIEGO, CA 92101-3542
619.234.6655 TEL
619.234.3510 FAX
foley.com

WRITER'S DIRECT LINE
619.685.6413
srosenbaum@foley.com EMAIL

CLIENT/MATTER NUMBER
096383-0101

May 25, 2010

David Gibson
Executive Officer
San Diego Regional Water Quality Control San
Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA. 92123-4340

Re: Lake San Marcos and San Marcos Creek Water Quality Impairment

Dear Mr. Gibson:

This firm represents Citizen's Development Corporation ("CDC") in the above referenced matter. This letter is regarding the water quality impairment in Lake San Marcos and San Marcos Creek, and Citizen's Development Corporation ("CDC") commitment to addressing that impairment. As you know, both the Lake and the Creek are listed under Section 303(d) of the federal Clean Water Act as impaired for nutrients. The Lake is listed for ammonia (as nitrogen), nutrients, and phosphorus; the Creek is listed for phosphorus.

The CDC is committed to the process of investigating and addressing the impairment of the Lake and the Creek. The CDC has already dedicated substantial staff time and resources to that process and will continue to participate in the process until the impairment is addressed. In addition, CDC agrees the City of San Marcos (the "City") may act as the lead agency for an application to the State Water Resources Control Board for Cleanup and Abatement Account funds to assist the County, the City, and other public agencies in investigating and addressing the nutrient impairment in the Lake and the Creek.

Please contact me should you have any questions in this matter

Sincerely,

S. Wayne Rosenbaum

LAKE SAN MARCOS WATERSHED
SWRCB CLEANUP AND ABATEMENT FUND APPLICATION

NUTRIENT WORKPLAN
May 26, 2010

Lake San Marcos ("the Lake") is listed under CWA Section 303(d) as an impaired water body (called "San Marcos Lake" in the listing) due to impairments caused by:

- Ammonia as Nitrogen*,
- Nutrients, and
- Phosphorous*.

The Lake is an impoundment of San Marcos Creek ("the Creek") upstream of a concrete arched dam (the "Dam"). The Creek is also listed as an impaired water body for Phosphorous. This Workplan addresses only Lake San Marcos and nutrient sources from the contributing watershed upstream of the Dam.

The 303(d) listings include a schedule for development of TMDLs to address the impairments. A group of local stakeholders (the "Working Group") has been working over the past year to address these issues, and San Diego Regional Water Quality Control Board ("Water Board") staff has encouraged the stakeholders to proceed with a non-TMDL approach to address the listings. This Workplan is a product of the Working Group, and specifically meets the following Working Group goal:

> *"Develop a technically sound Workplan (including a Scope of Work and Budget) for a Cleanup and Abatement Fund application to address nutrient issues in Lake San Marcos and San Marcos Creek upstream of the Dam."*

Essential background documents that were used as references during the development of the Workplan include:

- Lake San Marcos CWA Section 303(d) Listings (2006) (Attachment A-1)
- RWQCB Executive Officer Summary Report, 4/8/2009, Revised 2/10/2010; Status Report: Lake San Marcos (Attachment A-2)
- Water Quality Management in Lake San Marcos: Analysis of Available Data, Final Report, Michael Anderson, 3 February 2010 (Attachment A-3)

Those documents are appended to this Workplan.

As indicated in both the Executive Officer's Summary Report and Dr. Anderson's report cited above, substantial gaps exist in knowledge and understanding of internal Lake processes, watershed sources of nutrients, and watershed hydrology. These gaps must be addressed before a meaningful or comprehensive plan for cleanup, abatement, and mitigation can be developed. This Workplan describes the necessary diagnostic and investigative research that is proposed, the need for comprehensive data analysis and interpretation, and the preparation of a feasibility study to facilitate and inform cleanup implementation planning.

---

* Throughout this Workplan nitrogen is abbreviated as "N" and phosphorous is abbreviated as "P".

As specified in the CAA fund application, the City of San Marcos will serve as lead agency for the proposed work. The following three phases of activity are proposed under this Workplan:

A. Monitoring and Research – this is the investigative/diagnostic phase of the Workplan. This phase will include multiple projects and studies involving data collection, targeted to address identified knowledge gaps.

B. Data Analysis and Interpretation – this phase is essential in order to make effective use of the results of the Monitoring and Research phase – for both individual investigative/diagnostic studies as well as to synthesize results across multiple studies. The results of the Data Analysis and Interpretation phase will be published in a separate report and submitted to the Water Board as a Workplan deliverable.

C. Feasibility Study and Cleanup Implementation Planning – based on the results of the Monitoring and Research and Data Analysis and Interpretation phases, a feasibility study will be performed, and a prioritized list of cleanup and abatement options will be developed. This will include measures aimed at reducing the primary causes of nutrient impairment in Lake San Marcos, with the goal of meeting applicable water quality standards, and may include actions designed to mitigate, abate, remediate or cleanup nutrient levels in the Lake. The work product from this phase will include a priority-ranked list of specific measures expected to result in demonstrable improvements in lake water quality.

The specific activities proposed under each of these phases are described in the Scope of Work, below.[1] The Workplan Schedule and estimated Budget follows the proposed Scope of Work.

SCOPE OF WORK

A. Monitoring and Research

1) Determine Modeling Approach

This task will involve creation of a conceptual model for the watershed, and selection of a surface water hydrology model, groundwater hydrology model, and water quality model (or modules for the hydrology models). Note that the model selection will be done in a comprehensive way to ensure that the models can be effectively integrated. Upon model selection and review of existing data, the conceptual model will be updated and additional data needed to run each model will be specified. [The models also will be used to predict improvements in Lake nutrient levels based on evaluations of various alternatives and scenarios for cleanup/mitigation/remediation; see Task C.] This task includes the following steps:

a) Develop Conceptual Model

A conceptual model will be created to illustrate the key sources, sinks, transport pathways, and transformational processes of nutrients within the watershed. The conceptual model will be used to help identify the areas where significant data gaps exist, as well as guide the selection and development of the surface water and groundwater models.

[1] Phases A and B are referred to as the Diagnostic Phase and Feasibility and Cleanup Implementation and Planning Phase in the CAA Application.

b) Surface Water (Hydrological) Model Selection
A surface water model will be developed as a tool for understanding the hydrology of the watershed, including providing a means of evaluating seasonal and annual variations in the water budget. This initial task will involve the following steps:

- Select model
- Contract with modeling consultant
- Refine conceptual model
- Assess data gaps; Specify needed data

The modeling consultant will review the known conditions and existing data within the watershed, help refine the conceptual model, and then specify the additional data that will be needed for model input, calibration, and verification.

c) Groundwater (Hydraulic) Model Selection
A groundwater model will be used as a tool for understanding the sources and volumes of groundwater contributing to the water budget of Lake San Marcos, and the pathways groundwater takes to reach the lake: directly through subsurface flow, via infiltration into storm sewers, by pumping from groundwater dewatering wells, or by contributing to base flow in the creek. This initial task will involve the following steps:

- Select model
- Contract with modeling consultant
- Refine conceptual model
- Assess data gaps; Specify needed data

The modeling consultant will review the known conditions and existing data within the watershed, help refine the conceptual model, and then specify the additional data that will be needed for model input, calibration, and verification.

d) Water Quality Model/Module Selection
A water quality model will be used as a tool for understanding the concentrations and loadings of nutrients from the various sources contributing to nutrient levels in the Lake, including in-lake processes and seasonal and annual variations. It is anticipated that the water quality modeling can be accomplished by adding the appropriate components or modules to the surface water hydrology and groundwater models. This initial task will involve the following steps:

- Select model(s)/module(s)
- Contract with modeling consultant (may be same as selected for hydrological/hydraulic models above)
- Refine conceptual model
- Assess data gaps; Specify needed data

The modeling consultant will review the known conditions and existing data within the watershed, help refine the conceptual model, and then specify the additional data that will be needed for model input, calibration, and verification.

For subtasks 1b, 1c, and 1d, the existing/historical data will be compiled and evaluated as part of the data gap analysis. This analysis will identify data collection targets and monitoring frequencies that will be supportive of the statistical data requirements of the modeling efforts, with due consideration of budgeting constraints and established

protocols, to help ensure scientifically valid and statistically verifiable outcomes for the various studies described in this Workplan.

2) Understand Water Budget

The rate at which water flows into the Lake from various sources is a key determinant of nutrient loadings, and both water flow rates and Lake water levels are key factors in understanding the fate and transport of nutrients affecting the Lake. Therefore, it is critical to understand the differential rates of water movement through the various pathways into and out of the Lake. Sources of inflow include urban and agricultural irrigation, stormwater runoff (urban, agricultural and open space), groundwater inflows (surface and subsurface), direct precipitation, and dewatering. Outflows (losses) include loss to groundwater, evaporation, dewatering/diversion, and flows over or through the Dam. A key issue involves the relative contribution of groundwater to the Lake volume under both dry and wet season conditions. This includes the following steps:

a) Quantify Surface Inflows/Outflows

Based on the data gap analysis from Task 1, field measurements will be made to quantify specific types of surface inflows to the lake, as well as outflows. This will involve field collection of flow data at representative locations within the watershed. In addition to quantifying standard rainfall/runoff and dry weather inflows, including precipitation and evaporation, the effects of the operation of the Dam (including issues relating to impoundment and bypass) and the exercise of riparian, overlying, and appropriative water rights (including issues relating to dewatering) will be quantified.

b) Calibrate and Validate Surface Water Model

The flow measurements will be used as input to the surface water hydrology model. The model will be calibrated and validated, and run to illustrate the range of seasonal and annual (e.g., wet vs. dry years) conditions.

c) Quantify Groundwater Inflows/Outflows

Evaluate groundwater elevation contours (if available) to assess hydraulic gradient, review available hydraulic parameters (hydraulic conductivity and storativity) from the local aquifers, and assess likely discharges to derive a local groundwater budget – inflow (recharge sources), outflow (e.g., pumping) and storage.

This will be validated against a macro water budget obtained by calculation from estimated surface flows and evaporation.

d) Differentiate Groundwater Sources

Once the relative proportion of groundwater contributing to the lake water budget has been estimated, it will be necessary to determine the proportional origin of that groundwater; i.e., to distinguish between "natural" groundwater derived from local aquifers or percolation of precipitation through the soil, vs. irrigation water derived from surface sources that infiltrates through the soil and migrates to the lake. This will be done by attempting to establish "signatures" or "fingerprints" for the various groundwater and surface water sources, using standard water quality parameters such as Total Dissolved Solids (TDS) or conductivity, as well as stable isotopes of oxygen and hydrogen. TDS and conductivity are easily measured in the field or lab using standard field equipment. Stable isotope

analyses also can be performed in commercial laboratories using standard procedures. Groundwater samples are analyzed using EPA Test Method CF-IRMS for oxygen isotope ratios and EPA Test Method DI-IRMS for hydrogen isotope ratios. Stable isotopes of oxygen (delta oxygen-18 $d^{18}O$) and hydrogen (delta deuterium dD) are presented as ratios in parts per thousand (commonly expressed "permil" and indicated by ‰) relative to Vienna Standard Mean Ocean Water (VSMOW).

e) Calibrate and Validate Groundwater Model
Available hydraulic and other data will be used as input to the groundwater model. The model will be calibrated and validated, and run to illustrate the range of seasonal and annual (e.g., wet vs. dry years) conditions.

3) Understand Nutrient Budget
It is necessary to quantify concentrations and loadings of nutrients in inflows to the Lake, within the Lake (water column, sediments, and flora), and in discharges from the Lake. Nutrient sources likely include urban and agricultural irrigation, stormwater runoff (urban, agricultural and open space), groundwater inflows (surface and subsurface), dewatering discharges, and direct inputs from wildlife. Losses may include biological uptake, sedimentation within the lake, loss to groundwater, dewatering/diversion, and flows over or through the dam. Seasonal and annual variation in relative concentrations and loadings from various sources may be substantial. This includes the following steps (internal Lake processes are covered under Task 5):

a) Quantify Nutrient Concentrations in Surface Inflows/Outflows
Based on the data gap analysis from Task 1, monitoring will be performed to quantify N and P concentrations in specific types of surface inflows to the lake, as well as outflows. In addition to quantifying nutrient concentrations in runoff and dry weather inflows, the effects of the operation of the Dam (including issues relating to impoundment and bypass) and the exercise of riparian, overlying, and appropriative water rights (including issues relating to dewatering) on Lake nutrient levels will be quantified.
This will involve collection and analysis of samples for concentration data at representative locations within the watershed. Samples will be analyzed for the standard set of field parameters (temperature, dissolved oxygen, pH, conductivity, and possibly turbidity), and analyzed by a certified laboratory for total suspended solids, total dissolved solids, total and dissolved organic carbon, biochemical oxygen demand, hardness, silica, chlorophyll a, and major anions, in addition to the various forms of N and P (including Total N, Total P, Total Dissolved N, Total Dissolved P, Nitrate+Nitrite, Ammonium, and Soluble Reactive P). This work will be coordinated to the extent feasible with the flow monitoring performed under Task 2a.

b) Quantify Atmospheric Deposition of Nutrients
Monitoring will be performed to quantify N and P concentrations in atmospheric deposition within the watershed. This will involve collection and analysis of samples of bulk dry and wet deposition at representative locations within the watershed during both dry season and wet season.

c) Calibrate and Validate Surface Water Quality Model
The available nutrient concentration data will be used as input to the surface water quality model/module. The model will be calibrated and validated, and run to illustrate the range of seasonal and annual (e.g., wet vs. dry years) conditions.

d) Quantify Nutrient Concentrations in Groundwater Inflows/Outflows
Based on the data gap analysis from Task 1, monitoring will be performed to quantify N and P concentrations in specific types of groundwater inflows to the lake, as well as outflows. This will involve collection and analysis of samples for concentration data at representative locations within the watershed. For irrigated lands that drain to the lake, the irrigation source water also will be tested. Samples will be analyzed for the standard set of field parameters (temperature, dissolved oxygen, pH, conductivity, and possibly turbidity), and analyzed by a certified laboratory for total suspended solids, total dissolved solids, total and dissolved organic carbon, biochemical oxygen demand, hardness, silica, chlorophyll a, and major anions, in addition to the various forms of N and P. The newly-acquired data will be combined with existing/historical data to create a more comprehensive picture of groundwater quality.

e) Calibrate and Validate Groundwater Quality Model/Module
The available nutrient concentration data will be used as input to the groundwater quality model/module. The model will be calibrated and validated, and run to illustrate the range of seasonal and annual (e.g., wet vs. dry years) conditions.

4) Calculate External Nutrient Loadings
The results of Tasks 2 and 3 will be evaluated to create a picture of nutrient loadings to the Lake from the various external sources, and the fate of those nutrients once discharged to the Lake, including quantification of any outflows. This will include quantification of seasonal and annual variations (depending upon type of water year).

5) Understand In-Lake Processes
The two processes most critical to the nutrient impairment of the Lake are the build-up of sediment behind the Dam and thermal stratification of the Lake.

Dams provide a physical barrier that blocks the downstream movement of sediment and associated constituents, and they also slow the water flow, enhancing the sedimentation process. In Lake San Marcos, as in other lakes formed by a dam across a creek, sediment builds up on the Lake bottom over the years – in the case of Lake San Marcos this process has been ongoing for several decades. Various forms of N and P are among the constituents contained within the sediment build-up.

In thermally-stratified lakes, the lake is separated vertically into three distinct strata:

- the epilimnion, or upper layer, where temperature and dissolved oxygen are relatively high,
- the thermocline, an area of rapidly declining temperature and dissolved oxygen, and
- the hypolimnion, or lower layer, where temperature and dissolved oxygen are relatively low.

The hypolimnion has very little exposure to air or photosynthetic activity, and therefore tends to be very low in dissolved oxygen, and may even be anoxic. As there is nominally little vertical mixing in stratified lakes, constituents tend to become trapped in the lower level of the lake (the hypolimnion), below the thermocline, and the water may be anoxic. Exchange of pollutants between water column and sediment is limited to this zone during periods of thermal stratification. As the upper layer of water cools with the onset of winter, the stratification may break down, and the lake can mix rapidly in a process known as turnover. If turnover occurs, pollutants trapped within the hypolimnion and the sediments can be mixed throughout the lake. Dr. Anderson's report confirms that the lake is thermally stratified, but he was not able to conclude whether turnover occurs.

The following monitoring programs and studies are proposed to provide needed information regarding in-lake processes:

a) Depth Profiling
It is essential to understand stratification within the lake as it changes seasonally, and particularly important to know whether turnover occurs. This will be determined with a vertical series of measurements (depth profiling) of key water quality parameters* (temperature, dissolved oxygen, pH, conductivity, and turbidity) throughout the water column at two selected locations within the lake: in deeper water near the dam, and at a midway point (corresponding to Dr. Anderson's sites 1 and 2).
*These parameters all can be field-measured using standard field equipment. Depth profiles will be field-measured as described above during the quarterly field monitoring described in Task A.5.e below. In addition, automated data sondes (*in situ* monitoring devices) will be installed in place to automatically record these parameters at three specific depths (near surface, mid-depth and near-bottom) at two locations: the deep-water and mid-lake sites identified in Dr. Anderson's report as sites 1 and 2, respectively.

b) Determine Depth and Volume of Accumulated Sediment
It is important to determine how much sediment has accumulated within the lake, as the sediments represent a substantial potential source of nutrients, particularly in the event of lake turnover. This will be assessed through comparisons of historical vs. contemporary bathymetry. A field survey employing multi-beam survey equipment will be performed to determine the current, detailed bathymetry of the lake; the results of this survey will be stored in computerized format (auto-CAD or GIS shape files) and compared to as-built drawings from the original construction of the dam, also in computerized format.

c) Contributions from Shallow Sediments
In shallow areas of the lake stratification typically does not occur, and sediments that accumulate in those areas are subject to mixing into the water column by wind turbulence, storm flows, or physical disturbance from human activities such as use of watercraft. An attempt will be made to assess the extent to which these activities release nutrients from the sediments of shallow areas.

d) Sediment Chemistry
Sediment samples will be collected from approximately 20 sites throughout the lake, including the side "fingers". Samples will be collected from the upper layer of sediment and analyzed by a certified laboratory for a suite of standard

sediment properties, including % solids, grain size distribution, total and dissolved organic carbon, biochemical oxygen demand, pH, hardness, silica, sulfides and sulfites, in addition to the various forms of N and P.
Three sediment cores also will be collected if feasible in the deepest area of the lake, near the dam, with analysis of discrete core sections by a certified laboratory for the list of parameters given above.

e) Water Chemistry
Water quality monitoring will be performed at several locations throughout the lake, with sufficient numbers of samples to characterize seasonal differences, including wet weather vs. dry weather. This will include at a minimum quarterly sampling during dry weather (all four seasons), plus three storm events (early, middle and late wet season). Samples will be collected within one foot of the lake surface. For sites located in areas where the depth exceeds 10 feet, additional samples will be collected from a depth of one-half the estimated water depth. Samples will be analyzed for the standard set of field parameters (temperature, dissolved oxygen, pH, conductivity, and possibly turbidity), and analyzed by a certified laboratory for total suspended solids, total dissolved solids, total and dissolved organic carbon, biochemical oxygen demand, hardness, silica, chlorophyll a, and major anions, in addition to the various forms of N and P (including Total N, Total P, Total Dissolved N, Total Dissolved P, Nitrate+Nitrite, Ammonium, and Soluble Reactive P).

f) Other Water Quality Measurements
Secchi depth measurements will be collected at representative locations in the Lake on an ongoing basis as an indication of Lake water transparency/clarity, along with Lake level measurements, and near-surface measurements of dissolved oxygen and temperature. This task may be performed by trained citizen volunteers, with professional QA/QC oversight, in accordance with SWAMP protocols.

g) Biological Measurements
Several studies will be conducted to assess the biological conditions of the Lake, including:

- Biomass – collection and analysis of phytoplankton and zooplankton, with taxonomic identification of algal community to understand current conditions. Three samples will be collected from a late-summer algal bloom and analyzed taxonomically.
- Lake flora – survey several key locations within the Lake to assess relative amounts of periphyton (attached algae), emergent macrophytes (aquatic plants), and riparian canopy cover.
- Fish and wildlife study – population structure and composition will be assessed using standard ecological assessment techniques.
- Food Web/Trophic Study – based on results of preceding studies.

6) Protocols, Documentation and QA/QC
All monitoring programs and research studies funded under this application will be performed according to SWAMP-approved protocols, or USEPA-approved or USGS-approved protocols in the absence of applicable SWAMP protocols. Sample collection

and analytical protocols and quality assurance/quality control (QA/QC) procedures will be documented in a Quality Assurance Project Plan (QAPP) following SWAMP format. All monitoring programs and studies will prepare a Monitoring Plan for approval by the Grant Manager prior to commencing work. All monitoring sites will be geo-located using standard GPS techniques.

B. Data Analysis and Interpretation

Data Analysis and Interpretation is essential in order to make effective use of the monitoring and research results – for both individual projects as well as to synthesize results across multiple projects.

Key analytical assessments for this Workplan include the following:

- Lake water quantity inputs: groundwater vs. surface water sources, including seasonal and annual variation
- Relative proportions of different sources of groundwater, including seasonal and annual variation
- Relative loadings of N and P from various external sources to Lake, including seasonal and annual variation
- The effects of lake level management and dam operations on water budget and in-lake nutrient levels
- Amount of accumulated sediment in Lake; historical decrease in Lake water storage volume
- Amounts of N and P in Lake sediment reservoir
- Seasonal patterns in Lake thermal stratification; estimated frequency of Lake turnover
- Relative importance of external vs. in-Lake sources of N and P
- Historical patterns in Lake sediment chemistry based on core samples
- Estimated quality of sediment that would be released from the Lake if water is released from the lower Dam outlet (based on core sample results)
- Biological condition of Lake, effects of current nutrient conditions on biota, and effects of fish and wildlife on current nutrient levels

The results of the data analysis and interpretation phase will be published in a separate report and submitted to the Water Board as a Workplan deliverable.

C. Feasibility Study and Cleanup Implementation Planning

Using the results of the various monitoring and research studies described in this Workplan, and based on the analytical and interpretive work described in Task B above, an assessment will be made of the cleanup measures most likely to produce measurable reductions in nutrient loadings to the Lake and/or mitigation of in-Lake nutrient concentrations.

A feasibility study will be performed to evaluate and rank the most promising measures. The surface water and groundwater models will be run to evaluate various alternatives and scenarios for cleanup/mitigation/remediation, including activities related to dam operations and lake management. This task will involve an evaluation and ranking of alternative measures, with an assessment of cost relative to amount of loading reduced or in-Lake concentration improvement expected.

The product of this task will be a prioritized list of cleanup and abatement options. This will include measures aimed at reducing the primary causes of nutrient impairment in Lake San Marcos, with the goal of meeting applicable water quality standards, and may include actions designed to mitigate, abate, remediate or cleanup nutrient levels in the Lake. The work product will include a priority-ranked list of specific measures expected to result in demonstrable improvements in Lake water quality.

SCHEDULE

Task	Scope Items	Timing
A	Monitoring and Research	(months from start)
1	*Determine Modeling Approach*	3
2	*Understand Water Budget*	15
3	*Understand Nutrient Budget*	15
4	*Calculate External Nutrient Loadings*	15
5	*Understand In-Lake Processes*	18
B	Data Analysis and Interpretation	21
C	Feasibility Study/Cleanup Implementation Planning	24
	QAPP and Monitoring Plan (SWAMP-Compat.)	4

BUDGET ESTIMATE

Task	Scope Items	Costs
A	Monitoring and Research	
1	*Determine Modeling Approach*	$59,500
2	*Understand Water Budget*	$200,000
3	*Understand Nutrient Budget*	$190,000
4	*Calculate External Nutrient Loadings*	$15,000
5	*Understand In-Lake Processes*	$333,849
B	Data Analysis and Interpretation	$70,000
C	Feasibility Study/Cleanup Implementation Planning	$50,000
	QAPP and Monitoring Plan (SWAMP-Compat.)	$24,000
	Project Management/Administration	$47,117
	TOTAL:	$989,466

WATER BODY NAME	WATER TYPE	WATERSHED CALWATER/ USGS HUC	POLLUTANT o POTENTIAL SOURCES	ESTIMATED AREA ASSESSED	FIRST YEAR LISTED	TMDL REQ. STATUS	DATE
San Marcos Creek	River & Stream	90451000 / 18070303	* DDE (Dichlorodiphenyldichloroethylene) o Source Unknown	19 Miles	2006	5A	2019
			* Phosphorus o Source Unknown o Unknown Nonpoint Source o Unknown Point Source o Urban Runoff/Storm Sewers	19 Miles	2006	5A	2019
			* Sediment Toxicity o Unknown Nonpoint Source o Unknown Point Source o Urban Runoff/Storm Sewers	19 Miles	2006	5A	2019
			* Selenium o Source Unknown	19 Miles	2008	5A	2021
San Marcos Lake	Lake & Reservoir	90452000 / 18070303	* Ammonia as Nitrogen o Unknown Nonpoint Source o Unknown Point Source o Urban Runoff/Storm Sewers	17 Acres	2006	5A	2019
			* Nutrients o Unknown Nonpoint Source o Unknown Point Source o Urban Runoff/Storm Sewers	17 Acres	2006	5A	2019
			* Phosphorus o Source Unknown o Unknown Nonpoint Source o Unknown Point Source	17 Acres	2006	5A	2019

State of California
Regional Water Quality Control Board
San Diego Region

REVISED
EXECUTIVE OFFICER SUMMARY REPORT
April 8, 2009

ITEM: 8

SUBJECT: Status Report: The Lake San Marcos owner, dischargers, and members of the community will provide updates to the San Diego Water Board on progress made in the past year to improve water quality in Lake San Marcos. *(Chiara Clemente)*

PURPOSE: To be briefed on progress made to improve water quality in Lake San Marcos.

PUBLIC NOTICE: Notice was provided by publication of the Board agenda on January 22, 2010. The agenda was forwarded by e-mail to the lyris list of Lake San Marcos interested parties on January 25, 2010.

DISCUSSION: According to the 2008 303(d) list of impaired water body segments, Lake San Marcos is listed as impaired due to ammonia as nitrogen, phosphorous, and nutrients. San Marcos Creek is listed as impaired due to phosphorous, DDE, toxicity, sediment toxicity, and selenium. The Lake has been subject to periodic algal blooms, confirmed presence of cyanobacteria toxins, and occasional fish kills, likely due to the confirmed presence of excessive nutrients in the water. Residents living near the Lake have reported nuisance algae and odor conditions to the Regional Board for several years. Due to the wide range of potential contributors, it has been difficult to determine how to abate these pollutants.

Lake San Marcos is the product of a dam that was built in 1953 through San Marcos Creek. The impoundment was originally used for agricultural irrigation, but the area was later developed, and the water rights appropriation was transferred to the Citizen's Development Corporation (CDC) for the current irrigation of its lakeside golf course. The Lake is still subject to agricultural discharges from surrounding groves, but the majority of the Lake

(Supporting Document No. 1 & 2) watershed now consists of commercial and residential land use.

In April 2009, the San Diego Water Board invited all known interested parties to meet and discuss a collaborative effort to identify and abate nutrient sources to the Lake. Participating dischargers included the CDC (La Jolla Development Corporation), the Cities of San Marcos and Escondido, the County of San Diego, and the Vallecitos Water District which is responsible for the sewage collection system in the Lake watershed. Additional participants included the Lake San Marcos Community Association, the Lake San Marcos Remediation Group, and Coast Law Group. Since that time, there have been multiple meetings, and participation has extended to include Caltrans and some of the Phase II MS4 designees.

Collectively, the group has:

1) Compiled all existing Lake San Marcos historical information and water quality monitoring data into a compendium document.
2) Collected additional monitoring data.
3) Indentified all drains discharging to the Lake.
4) Contracted with Dr. Michael Anderson (UC Riverside) to review existing data, fill in data gaps, and provide a report on the Lake's characteristics and possible remedial measures (Supporting Document No. 3).
5) Increased the surrounding community's awareness of potential pollution practices, and possible source control measures through public meetings, community publications, and heightened complaint response (by the MS4 entities). Pursuant to the Watershed Urban Runoff Management Plan (WURMP) requirements of the MS4 permit, the Cities and County have submitted a Nutrient Management Plan for the Upper San Marcos Creek Watershed (Supporting Document No. 4)
6) Codified source control BMPs in HOAs (e.g. prohibiting car washing, controlling irrigation and landscape application of pesticides, herbicides, and fertilizer, and disposal of yard waste).
7) Drafted a Participation Agreement that stipulates the process, roles, and cost-sharing mechanism for future work.

8) Reviewed the existing water rights agreement, and sought to bring certain requirements in compliance with their license conditions.
9) Become aware of groundwater discharges to the Lake and the need to enroll and comply with the groundwater dewatering permit.

The group currently faces challenges in:

1) Defining the desired outcome (i.e. defining the "lake" area and agreeing on success criteria).
2) Agreeing on remediation alternatives to consider.
3) Agreeing on who should be engaged in this process, and at what level the public should be engaged.
4) Obtaining appropriate representation from certain dischargers. The agricultural growers, homeowners, and HOAs that have direct and indirect discharges to the Lake are not represented by a single entity.
5) Soliciting participation and funding commitments.
6) Agreeing on a framework for how to proceed.

The Regional Board faces the additional challenge of identifying the best authorities under which our limited resources should be directing the reduction of pollutant loading to, and clean-up of, the Lake.

SIGNIFICANT CHANGES: N/A

COMPLIANCE: N/A

LEGAL ISSUES: None.

SUPPORTING DOCS:
1. Site Map
2. Lake San Marcos Area Map
3. Report by Dr. Michael Anderson
4. Upper San Marcos Creek Watershed Nutrient Management Plan
5. Background Materials Submitted by the Lake San Marcos Community Association

RECOMMENDATION: Informational item only.

Water Quality Management in Lake San Marcos: Analysis of Available Data

Final Report

Submitted to:
City of San Marcos
San Marcos, CA 92069

Submitted by:
Michael A. Anderson
Riverside, CA 92504

3 February 2010

ATTACHMENT A-3

Table of Contents

List of Figures

List of Tables

Introduction

Lake San Marcos is a small privately owned reservoir located within the San Marcos Creek watershed in the Carlsbad hydrologic unit. The watershed includes urban, suburban and agricultural land uses, as well as wildlands. The lake suffers algal blooms and has been placed on the 303(d) list for nutrients, ammonia as N and phosphorus. The primary tributary to the lake, San Marcos Creek, is also listed for phosphorus, as well as DDE and sediment toxicity.

Objectives

A review was conducted to (i) analyze available water quality data and related information for Lake San Marcos, (ii) identify, to the extent possible, the factors and processes controlling lake water quality, (iii) identify any gaps in understanding of the limnology, ecology and water quality conditions in the lake, and (iv) to assess the feasibility of various techniques for improving water quality in Lake San Marcos.

Approach

Available data describing water quality conditions of San Marcos Creek and Lake San Marcos have been provided by the City of San Marcos, San Diego County, the San Diego Regional Water Quality Control Board, Vallecitos Water District, City of Escondido, San Marcos Unified School District, Lake San Marcos Community Association, and other private parties. The available documents and data have been compiled into 3 bound volumes totaling 3259 pages. This compendium has been reviewed, with key documents and datasets pertinent to the lake used to develop a summary of historical water quality as well as current conditions. The primary references used in this assessment are identified in Table 1.

Table 1. Primary references used in analysis.

Report	Topic	Sampling Date	Compendium Pages
Ball, 1974	Limnology, water quality	July - November, 1974	CMS 707-725; 2330-2338
Ball, 1979	Fishery	1978	CSM 707-725
Risk Science, 1991	Habitat, biology, water quality	October 1991	CSM 2561-2635 + Appendices
LSM Task Force, 2005	Bacteria, DO, DRP	June 2005	CSM 863-872
SDRWQCB, 2009	Water quality	May 2009	CSM 1023-1043
Anderson, 2009	Limnology, water quality	September 2009	Appendix to this report

Other documents and datasets were also used and have been identified and cited as needed. In many instances, these documents represent memos or short letters, often without clear authorship, and are simply cited by their page number in the compendium.

Results

Lake Basin Characteristics

The physical dimensions of a lake represent important baseline information needed to manage and restore lakes and reservoirs. For example, the area, depth and volume of a lake is needed to develop water and nutrient budgets, design aeration and oxygenation systems, and implement lake management strategies. Lake San Marcos came into being as a 40-acre lake following construction of a small dam on San Marcos Creek in 1946 (CSM000326). The current concrete arch dam was completed in 1962, the shoreline was recontoured, and the lake filled with Colorado River water from the San Diego Canal in 1963 (Ball, 1974). In response to a request from the County of San Diego concerning the elevation-area-volume relationships for the lake (CSM000669), a 1969 DWR memo provided area, capacity and depths taken from a 1952 application indicating a maximum depth of 38.5 ft, a lake surface area of 54 acres and a capacity of 480 acre-feet (CSM000671). This yields an average depth of 8.9 ft (Table 2). Following raising of the dam and other activities, the area, capacity and depth were reported to have increased by 50% or more (e.g., area of 80 acres and capacity of 1200 acre-feet) (LSM Fact Sheet).

Table 2. Basin characteristics reported for Lake San Marcos.

Characteristic	1952[a]	1963[b]	1974[c]	2006[b]
Area (acres)	54.0	80	57.9	NA
Capacity (acre-ft)	480	1200	658.5	NA
Mean Depth (ft)	8.9	15.0	11.4	NA
Maximum Depth (ft)	38.5	54	34	38

[a]DWR, 1969; [b]LSM Fact Sheet; [c]Ball, 1974

Ball conducted a bathymetric survey for the lake in 1974 and found values quite a bit lower than reported however (Table 2). In that survey, he reported the upper part of the lake, representing 78% of the lake surface area, was a constructed basin of rather flat uniform depth between 8-9 ft (CSM000711). The lower portion of the lake located within the natural steep-sided canyon was about 12 acres (22% of the lake area), with an average depth of 20 ft and a maximum depth of 34 ft (CSM000712). These values can be compared with more recent values measured by Norman Peet for the County of

San Diego Department of Public Works on Nov.19-20, 2005 (CSM000896-906). In that survey, lake depth was measured at 19 transects across the short axis of the lake (approximately E-W) with about 15 depth measurements per transect. The maximum depth reported was 27.9 ft at a transect in the southern part of the lake near the dam, while depths were typically 6-8 ft near the middle and upper-middle region of the lake. While the lake surface elevation was not specified in Ball's survey in 1974, assuming similar water levels, it appears that the upper part of the lake has filled in with about 2 ft of sediment in the intervening 31 years. This corresponds to an average sedimentation rate of about 0.8 inches/yr or 2 cm/yr. This sedimentation rate is intermediate between the sedimentation rate of 2.4 cm/yr reported by the USGS for Canyon Lake in southwestern Riverside County for the period 1927-1998 (USGS, 1998), and the average 20th century value of 1.35 cm/yr for Lake Elsinore (Byrne et al., 2004). A higher rate of sediment deposition near the dam is likely to have occurred due to the focusing of fine organic sediments into deeper water (Anderson et al., 2008), although the trend in maximum depth is unclear. A maximum depth of 34 ft reported by Ball (1974) is actually lower than that reported more recently by the LSM Task Force of 38 ft, although a survey transect about 100 ft from the dam conducted as part of the 2005 survey for the County revealed a maximum depth of 27.9 ft (CSM000899).

Infilling of lakes and reservoirs with sediment is a natural process, although accelerated sediment accumulation is commonly found in disturbed watersheds, especially those with significant agricultural activities. Lake San Marcos thus serves as a sediment trap, reducing sediment load to downstream reaches of the impounded San Marcos Creek. In addition to the loss of storage capacity and average depth of the lake, particulate forms of nutrients are also retained in the reservoir. This can lead to long-term biogeochemical recycling of nutrients from the sediments to the water column. Such nutrient recycling can persist for several years, or even a decade or longer in some cases.

Nutrients

Nutrient concentrations have been measured occasionally at the lake, with Ball (1974) offering the most comprehensive look at water quality. In that study, nutrient concentrations and other water quality parameters were measured monthly from July – November 1974. Concentrations reported in that study were averaged across all

samples sites and dates for comparison with site-averaged single-day measurements made in 1991, 2005 and 2009 (Table 3).

Nutrient concentrations were very high in 1974, *e.g.*, with the average NO_3-N concentration over 14 mg/L and dissolved reactive phosphorus (DRP) of 1.6 mg/L (Ball, 1974). These very high concentrations of readily bioavailable forms of nutrients indicate that the availability of light, rather than nutrients, regulated phytoplankton abundance in the lake. By 1991, significantly lower nutrient levels were present in Lake San Marcos (Table 3). Dissolved nutrient concentrations were only about 5-10% of those found 17 years prior; total P was also substantially lower (0.37 mg/L, a reduction 85% from 1974) (Table 3). Moreover, relatively little of the total P was in a dissolved form, suggesting P may have been limiting algal growth.

Table 3. Dissolved and total nutrient concentrations in Lake San Marcos – surface samples.

Nutrient	1974[a]	1991[b]	2005[c]	2009[d]	2009[e]
	Jul-Nov (n=5)	*Oct (n=2)*	*Jun (n=1)*	*May (n=3)*	*Sep (n=3)*
NH_4-N	1.07±0.34	0.13±0.03	-	0.16±0.04	0.16±0.13
NO_3-N	14.66±4.92	<0.1	-	0.07±0.03	0.16±0.04
Total N	-	-	-	2.72±0.79	3.14±0.12
DRP	1.64±0.49	0.085±0.035	0.34±na	0.044±0.023	0.064±033
Total P	2.56±0.93	0.37±0.08	-	0.23±0.03	0.16±0.01

[a]*Ball, 1974;* [b]*Risk Sciences, 1991;* [c]*LSM Task Force;* [d]*RWQCB, 2009;* [e]*Anderson, 2009*

Following the near-record runoff in early 2005 and resulting problems in the watershed, the measured DRP concentration in June 2005 had increased to 0.34 mg/L. Increases in DRP concentrations were also observed during this time period in other lakes in the region; e.g., DRP concentrations in Lake Elsinore increased markedly from values of 0.036 mg/L in June 2004 to 0.449 mg/L in June 2005 (Anderson and Lawson, 2005). Nutrient concentrations in May (RWQCB, 2009) and September (Anderson, 2009) of this year (2009) were comparable to concentrations reported in 1991 (Risk Sciences, 1991). It seems likely that changes in land-use and improvements in agricultural practices and waste treatment and disposal were responsible for the dramatic reductions in nutrient concentrations between 1974 and 1991. Analysis of water quality data suggests, however, that limited subsequent improvements have been achieved over the past 18 years, with periodic episodes of large external nutrient loading from the watershed.

Nutrient concentrations are known to increase dramatically in bottom waters of eutrophic lakes that are thermally stratified. Measurements of concentrations above the sediments were made only in 1974 and 2009 (Table 4). Very high concentrations were present in bottom waters of the lake in 1974; high concentrations of dissolved nutrients result from the mineralization and release of N and P from the sediments and accumulation in the hypolimnion of the lake. Concentrations of NH_4-N and DRP in 2009 were about 40% lower than found in 1974 (Table 4), but remain very high and no doubt contribute to algal blooms following cooling and mixing of the water column in the fall. Internal loading of nutrients from bottom sediments can account for >95% of the overall annual nutrient loading to the water column in shallow lakes during periods of drought (Anderson, 2001).

Table 4. Dissolved and total nutrient concentrations in Lake San Marcos – bottom samples.

Nutrient	1974[a]	1991[b]	2005[c]	2009[d]	2009[e]
	Jul-Nov (n=3)	*Oct*	*Jun*	*May*	*Sep (n=1)*
NH_4-N	18.62±3.14	-	-	-	10.27
NO_3-N	18.10±5.96	-	-	-	0.37
Total N	-	-	-	-	8.73
DRP	5.76±2.46	-	-	-	3.63
Total P	6.56±2.05	-	-	-	3.45

[a]Ball, 1974; [b]Risk Sciences, 1991; [c]LSM Task Force; [d]RWQCB, 2009; [e]Anderson, 2009

Other Water Quality Measurements

In addition to nutrient concentrations, a number of other measurements are often made to provide information about water quality in lakes. A simple measurement of water clarity is routinely made using a Secchi disk, a small disk with alternating quadrants of white and black. The Secchi depth (Z_{sd}) represents the depth at which the disk is no longer visible and is directly related to the turbidity in the water column due to both phytoplankton and suspended solids. The average Z_{sd} values have been very low since 1974 (Table 5). Values less than 2.0 m are generally considered to be excessively productive (eutrophic) and values <0.5 m are considered hypereutrophic (Carlson, 1977; Carlson and Simpson, 1996). Low transparencies also limit aquatic plant growth. Secchi depths were observed to increase since 1974, however, with transparencies 50% higher in 1991 (0.76 m) and 100% (2x) higher in 2009 (0.95 m) (Table 5). For comparison, Z_{sd} values for Canyon averaged about 1.0 m in 2006-07 (Anderson, 2007).

Chlorophyll concentrations were only measured on two occasions (October 1991 and May 2009) (Table 5). The reported concentration of 11.8 µg/L for 1991 is considered somewhat suspect given the low Z_{sd} value. A regression of Z_{sd} values and chlorophyll a concentrations yielded an equation by Rast and Lee (1978) of the form:

$$Z_{sd} = 6.35 * Chl\ a^{-0.473} \quad (1)$$

A chlorophyll concentration of 11.8 µg/L would thus be expected to yield a Z_{sd} value of 1.98 m (compared to the value of 0.76 m reported) (Table 5). This Z_{sd} value is in fact predicted to yield a chlorophyll a concentration of 90 µg/L.

Table 5. Other water quality measurements in Lake San Marcos – near surface.

Property	1974[a]	1991[b]	2005[c]	2009[d]	2009[e]
	Jul-Nov	*Oct (n=2)*	*Jun (n=1)*	*May (n=3)*	*Sep (n=3)*
Z_{sd} (m)	0.48±na	0.76±0.15	-	-	0.95±0.15
Chl a (µg/L	-	11.8±3.3	-	152±67	-
pH	9.15±0.18	9.15±0.05	-	8.83±0.09	8.06±0.08
DO (mg/L)	-	3.8±1.5	8.4±na	17.4±3.2	5.0±2.6

[a]Ball, 1974; [b]Risk Sciences, 1991; [c]LSM Task Force; [d]RWQCB, 2009; [e]Anderson, 2009

The pH values found in Lake San Marcos are typical of productive lakes here in the arid western U.S., with daytime values exceeding somewhat the theoretical pH near 8.2 for waters in a calcareous watershed in equilibrium with atmospheric CO_2. Photosynthesis depletes dissolved CO_2, shifting the following equilibria to the left:

$$CO_2 + H_2O \leftrightarrows H_2CO_3 \leftrightarrows H^+ + HCO_3^- \quad (2)$$

To compensate for the utilization of CO_2 by phytoplankton during photosynthesis, carbonic acid (H_2CO_3) undergoes dehydration; protons (H^+) react with bicarbonate (HCO_3^-) to replace lost H_2CO_3, thus lowering the H^+ concentration and raising the pH. The slightly lower pH found this past fall is thought to result from a partial mixing of deep water into the surface, bringing lower pH water with excess CO_2 to the surface as well.

The final and often critical water quality parameter for lakes is dissolved oxygen (DO). Adequate DO is necessary to support fish and other organisms in aquatic ecosystems. A value of 5 mg/L or higher is considered suitable for a productive fishery, although fish kills often result only when DO concentrations drop below 1-2 mg/L. Water in equilibrium with atmospheric O_2 has a DO concentration of about 8-10 mg/L (depending upon temperature), so values less than this indicates undersaturation resulting from net consumption of DO, while values greater than that indicates supersaturation (net production). The reported DO levels varied from values of 3.8 –

17.4 mg/L (Table 5); values below 8-10 mg/L found in October 1991 and late September 2009 indicate that anoxic bottom waters were partially mixed into the surface waters . Strong sulfide odors were present in bottom waters and very low DO levels were also present near the dam in the morning during the recent sampling on September 30, 2009 (Appendix). Rapid mixing of sulfidic bottom waters in the surface waters has resulted in numerous fish kills this past summer and fall (*e.g.*, Lake Elsinore and Canyon Lake), and extreme odors (*e.g.*, Upper Oso Reservoir).

Dissolved oxygen thus varies vertically within the water column of most stratified lakes in a manner that is related to the distribution of heat. That is, lakes thermally stratify with warm less-dense water floating on top of cooler, denser water (Fig. 1). Heat is added at the lake surface due to absorption of shortwave and longwave radiation, with wind energy only able to mix the heat a finite distance into the water column (the epilimnion). Beneath this layer is an often pronounced thermal gradient (metalimnion) and layer of cool, dense water (hypolimnion) (Fig. 1a). Buoyant forces keeping heat from being mixed down through the entire water column also prevent DO from being mixed downward; bacterial decomposition and respiration reactions rapidly consume available DO, resulting in anoxic or anaerobic conditions in the hypolimnion (Fig. 1b). It is in this zone that H_2S, NH_4-N and DRP accumulate (Table 4).

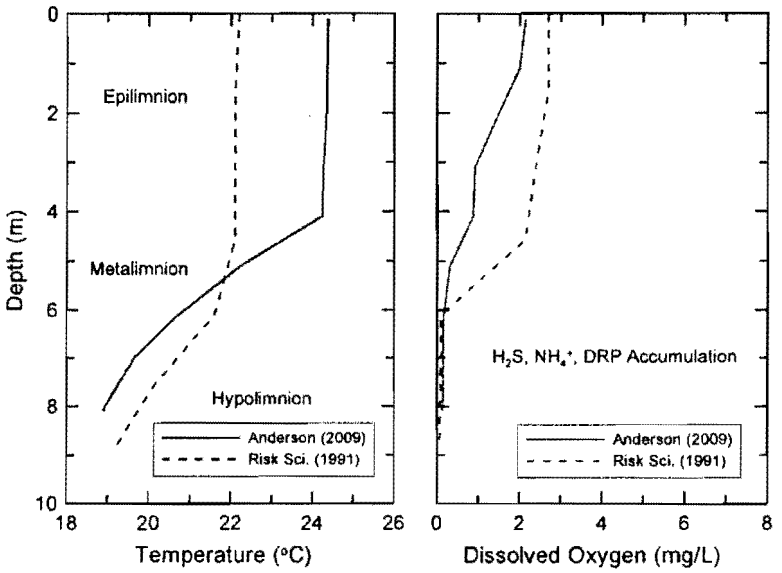

Fig. 1. Vertical profiles of a) temperature and b) dissolved oxygen in Lake San Marcos.

Broadly similar temperature and DO profiles were present on both September 30, 2009 (Appendix) and October 17, 1991 (Risk Sciences, 1991) (Fig. 1). Slightly greater cooling into the fall lowered the epilimnetic temperature of the water column measured by Risk Sciences relative to that present in late September.

These temperature and DO profiles are part of the regular seasonal trends in most lakes here in Southern California (*e.g.*, Fig. 2), where cool isothermal conditions are present in the winter, the surface water warms in the spring forming an epilimnion that reaches maximum temperatures in late summer (August) before cooling in the fall (Fig. 2). DO concentrations are initially high throughout the water column, although levels decline rapidly in the hypolimnion once the lake stratifies in the spring (Fig. 2).

An anoxic hypolimnion is thus present through much of the spring, summer and into the fall, with significant DO recurring only in the winter when the lake is well-mixed (Fig. 2). The mixing event in late fall brings this anoxic bottom water, also enriched in NH_4-N, DRP and H_2S, up into the surface resulting in potential fish kills and subsequent algal blooms.

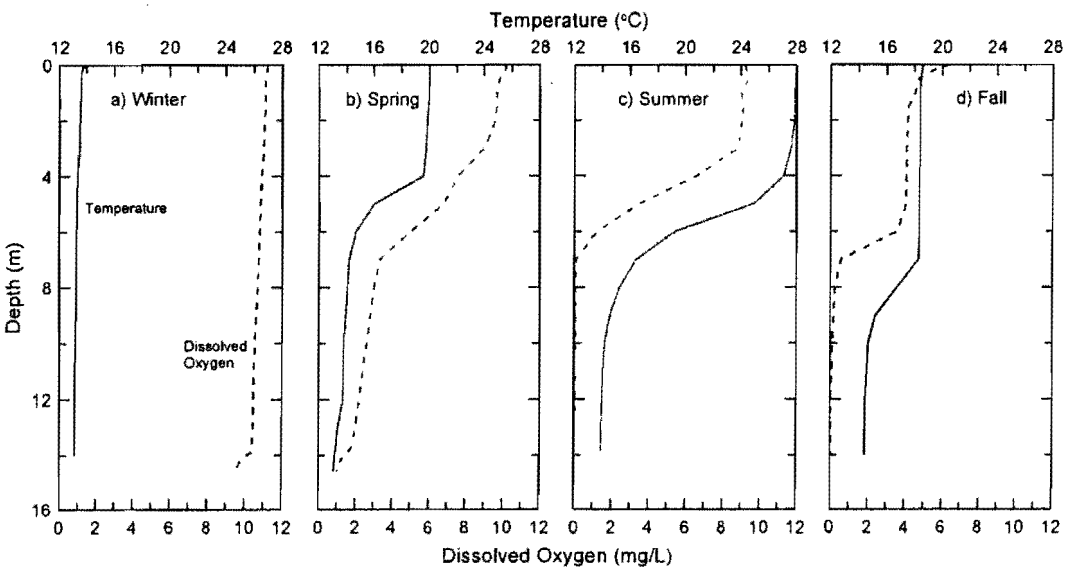

Fig. 2. Seasonal temperature and DO profiles in small lakes in Southern California (Canyon Lake, CA).

Fishery

Fish kills have in fact occurred occasionally at the lake; fish kills were recorded in 1968, 1974, 1976 and 2006, although other smaller episodes may have also occurred. Information concerning the fishery is restricted to two studies: Ball (1979) and Risk

Sciences (1991). A seine survey by Ball (1979) found most of the fish biomass to be in small bluegills, followed by bass and catfish (Table 6). This mass distribution is rather unusual since the fewer number of large fish tend to dominate the total fish biomass in a lake. Ball (1979) noted the presence of too many small bluegills and apparent over-fishing of bass. He made several recommendations to improve the fishery in Lake San Marcos, including the stocking of threadfin shad as forage for bass; construction of habitat in upper part of the lake through addition of rocks, aquatic vegetation such as water lilies; and installation of an aeration system.

Table 6. Summary of available fishery survey results.

Species	Ball (1979) (% by Mass)	Risk Sciences (1991) (% by Abundance)
Bluegill	46.9 %	-
Black bass	22.6 %	4.3 %
Catfish	19.3 %	-
Green Sunfish	6.1 %	-
Bullhead	0.1 %	1.4 %
Threadfin Shad	-	94.2 %

Risk Sciences (1991) conducted an overnight gill net survey about 12 yrs later and reported a different fishery in the lake. While the use of a very different sampling technique makes it difficult to compare these results with those from Ball (1979), the survey clearly shows the emergence of threadfin shad as a dominant fish in the lake. It is not clear if the shad were stocked based on Ball's recommendation or if they simply arrived in flows from the Colorado River aqueduct. The threadfin shad appear to have remained a dominant species, *e.g.,* in 2006 a fish kill removed a large number of the population. While threadfin shad are a favorite prey species for many large piscivores, they are zooplanktivores, grazing down beneficial zooplankton populations in the lake. As a result, they can adversely affect the zooplankton community and impair water quality.

Zooplankton and Benthic Invertebrates

The report by Risk Sciences (1991) provides the only assessment of invertebrates in Lake San Marcos. Zooplankton were sampled with a plankton trap deployed during the day in the photic zone at 2 sites on the lake. Surprisingly, no zooplankton were reported present in either of the samples. The small sample volume (30 L) near the surface during the daytime may have resulted in a severe undersampling of individuals.

Risk Sciences (1991) concludes that predation by shad and poor food quality may be responsible for their apparent absence in the lake.

Benthic invertebrates were sampled at the same 2 sites with an Ekman dredge. The dredge was used to sample the uppermost 10 cm or so of soft bottom sediments, with organisms subsequently sieved out of the mud. Risk Sciences reported high abundance of chironomids at one of the sites, although few other types of benthic invertebrates were found (Risk Sciences, 1991). Chironomids (midge larvae) are common in nutrient-rich bottom sediments with low DO concentrations, and are thus often an indicator of poor water quality (EPA). These benthic invertebrates are presumably a part of the diet of bluegills and other fish species in the lake.

Phytoplankton

Abundant blue-green algae have been reported in Lake San Marcos in 1974 (Ball, 1974) and more recently in the summer of 2005 (CSM000866 & 877). Risk Sciences also evaluated the phytoplankton community in the lake in October 1991. A comparatively diverse community was present at that time, with diatoms and dinoflagellates comprising 22 and 32% of the total population, with a substantial number of cryptophytes and green algae also present (20 and 18%, respectively). As a group, blue-green algae comprised only 8% of the phytoplankton of the lake (Risk Sciences, 1991). Inspection of water samples from July 2009 found a diatom-dominated phytoplankton community (chiefly *Synedra spp.*), while a more diverse community was present in September 2009, one that included diatoms, green algae, dinoflagellates and small colonial blue-green algae (Appendix). Unlike other types of phytoplankton, diatoms and dinoflagellates both have a nutrient requirement for silicon (Si); the presence of large numbers of diatoms in mid-July is somewhat unusual, since diatoms are most abundant in the winter and early spring, when cooler temperatures are present and runoff delivers a fresh supply of Si to the lake. Si limitations (<0.5 mg/L) are often witnessed by late spring (*e.g.*, in Lake Elsinore, Big Bear Lake), at which time green algae and then blue-green algae tend to take over. The large numbers of diatoms in mid-July provides some indication of a steady-input of Si to the lake, presumably through groundwater flow.

Water Budget

Sources of water to Lake San Marcos include flows from San Marcos Creek, direct precipitation onto the lake surface during rain events, local runoff into the lake from storm drains and the local watershed, and spring and other ground water sources. Water is lost from the lake due to outflow and to evaporation. Mathematically this can be represented as:

$$\frac{dV}{dt} = Q_{SMC} + Q_{Runoff} - Q_{out} + PA_s - EA_s \pm G \qquad (3)$$

where V is the volume of the lake, t is time, Q_{SMC} is the surface inflow from San Marcos Creek, Q_{Runoff} represents other surface inflows, *e.g.*, storm drain flows, Q_{out} is the flow at the spillway, P is the precipitation rate, A_s is the lake surface area, E is the evaporation rate, and G is net groundwater flow. Groundwater flow is often calculated from the difference between observed lake volume and the other inputs and outputs.

During the summer, there is no direct precipitation on the lake and greatly reduced inflows from San Marcos Creek and local runoff. As a result of such conditions, most lakes in the region undergo pronounced reductions in lake surface level in the summer due to evaporation. In fact, evaporation removes about 0.8 m (2.6 ft) of water over the May-September time period based upon meteorological data at the Escondido CIMIS station (CIMIS, 2009). At a surface area of 58 acres, this corresponds to 150 acre-feet of water lost from the lake due to evaporation, occurring at an average rate of 3 acre-feet per day (or 1.5 cfs). Observations of the surface elevation within an estimated 6-8" of the dam crest in July and September 2009 suggests large inputs of water into the lake through the summer. The magnitude of these inputs can be estimated from equation 3 assuming approximate steady-state volume (i.e., dV/dt=0). Thus, to maintain approximate steady-state volume in the lake, inflows of about 1.5 cfs are required (eq 3). Recent measurements made by San Diego County indicate that inflows due to San Marcos Creek is about 0.3 cfs, while the sum of the major storm drains adds another 0.12 cfs inflow to the lake (CSM000152). Against an average evaporative flux of 1.5 cfs, and correcting for the change in storage (about 0.1 cfs), this leaves an unspecified additional input of up to 1 cfs to the lake that we can reasonably hypothesize is principally due to groundwater flow (Table 7).

This groundwater would be high in dissolved Si, and thus may account for the previously noted persistence of diatoms in the lake through much of the year. Interestingly, Ball (1974) also noted high lake levels and estimated that >200 af of water

enters the lake annually from springs and irrigation drainage. Groundwater flows are thus helping to maintain lake level, unlike most other lakes in the region.

Table 7. Dry-weather water balance (July 2009).	
Water	**Flow rate (cfs)**
Inflows (+)	
San Marcos Creek	0.3
Storm drains	0.12
Precipitation	0
Losses (-)	
Evaporation	1.5
Outflow	0
Change in Storage	0.1 cfs
Difference (Groundwater)	0.98 cfs

Current Understanding of Lake San Marcos

This review allows one to draw some general conclusions concerning the lake:

- The northern and middle part of lake is shallow with direct connection between nutrient-rich sediments and the surface layer of the water column
- Internal recycling of nutrients maintains high algal productivity and low water clarity throughout the year
- Algal turbidity limits the growth of aquatic macrophytes
- The southern part of lake is deeper and thermally-stratified through the summer-fall
- Rapid depletion of DO occurs in hypolimnion following stratification, making it unsuitable for fish, zooplankton and other aerobic organisms
- NH_4-N, DRP and H_2S accumulate to high concentrations in the hypolimnion
- Cooling temperatures in fall results in mixing of H_2S, NH_4-N and DRP into upper water column
- This depletes DO there, potentially triggering fish kills, while also fueling subsequent algal blooms
- The ecology in the lake is probably not presently suited for sustaining good water quality
- Groundwater flows help to maintain lake level through much of the year

Gaps in Understanding

While the available data is very important in defining the water quality conditions and processes affecting water quality in Lake San Marcos, some significant questions remain. Additional insights about the lake can help guide the restoration and efficient management of the lake. Five specific areas were identified (although additional data needs will likely be identified in the future):

i. *Better understanding of the current bathymetry and depth-area-volume relationships.* The recent survey conducted for the County of San Diego clearly indicates the accumulation of sediment and loss of depth through much of the lake. Notwithstanding, the estimated 300 soundings collected along the 19 horizontal transects are not sufficient to develop a detailed bathymetric map and depth-area-volume relationships for Lake San Marcos. These data are needed to conduct more accurate water budget, modeling and water management calculations for the lake.

ii. *Direct information about sediment distribution, thickness and properties.* Related to the need for higher resolution bathymetry is the need for information about the thickness, properties and distribution of sediment within the basin. In addition to depth to sediments, the thickness and distribution of bottom sediments provides essential information about the volume of sediment retained in the lake, and depositional processes operating here. This information is critical if sediment dredging is being considered anywhere in the lake now or in the future. Understanding the characteristics of the sediments (*e.g.*, hardness, texture, nutrient and contaminant concentrations) is also necessary when considering dredging or recontouring of the lake bottom. The distribution of different sediment types can also influence selection and design of in-lake treatment.

iii. *Rates of internal nutrient recycling.* In addition to understanding the distribution, thickness and types of sediments in the lake, it is also important to quantify the rate of internal nutrient recycling from each of the major sediment types, and the contribution of internal recycling to the lake's overall nutrient budget. Moreover, being able to focus on regions of high-nutrient sediments allows one to more carefully target treatment to those regions that are responsible for disproportionately large fraction of nutrients entering the water column.

iv. *Rates of external loading of nutrients.* The rate of external loading of nutrients from San Marcos Creek, and from groundwater, nuisance runoff and other inputs represents a critical gap in knowledge about the lake. Quantifying the flows, concentrations and external loading of nutrients are required for development of an overall nutrient budget for the lake, for its management, and for the efficient use of resources in managing water quality. Following the development of a nutrient budget, water quality modeling can be conducted to predict the extent of reductions in external and internal loading that would be necessary to achieve specific water quality objectives.

v. *Ecology and food web of the lake, including fishery and zooplankton communities.* Finally, significant questions remain about the ecology in Lake San Marcos. It will be essential to characterize the ecology, especially the zooplankton community, if one is to favorably modify it to improve water quality and develop a balanced sustainable food web and fishery.

Possible Remediation Strategies

Despite uncertainties about the lake, it is helpful to review some of the approaches used to improve water quality in impaired lakes. The focus here will be on in-lake techniques for the control of nutrients and algae, although it is implicit that BMPs and other actions within the watershed also need to be undertaken to limit external loading of nutrients to the lake. A number of different options exist for reducing algae (and nutrients) in lakes. Techniques include a range of mechanical, chemical and biological controls that differ in their mode of action, advantages and disadvantages (Table 8) (NALMS, 2001).

Out of these 17 different control strategies, 13 of them could conceivably play some role in the restoration of Lake San Marcos. Dilution and flushing were not considered practical given the limited water supply in the region, since flushing rates of 10-15% each day would probably be needed to substantively improve water clarity. Settling agents and pathogens were also discounted since settling agents treat only the symptom of the problem and would represent a significant recurring cost, while use of pathogens remains an experimental technique to this point. Selective nutrient addition was also discounted since it has not been demonstrated to be effective in lake studies and is more appropriate for nutrient-poor lakes where increased fish production is desired, rather than for algal control in eutrophic lakes (Table 8).

Table 8. Management options for control of algae in lakes (NALMS, 2001).			
Option	**Mode of Action**	**Advantages**	**Disadvantages**
Physical Controls			
1. Hypolimnetic aeration or oxygenation	Addition of air or O_2 maintains oxic water & sediments	Reduces internal loading of P; provides habitat for fish, zoo	May promote supersaturation of gases for fish
2. Circulation and destratification	Use of air or water to mix water column	Reduces surface algal scums, internal P loading; adds DO	May spread problems
3. Dilution and flushing	Addition of water can dilute or flush nutrients, algae	Reduces nutrient concentrations and their detention in lake	Diverts water from other uses; possible downstream effects
4. Drawdown	Lowering lake level allows oxidation of sediments	Reduce nutrients, increase capacity for flood control	Possible impacts to aquatic plants, downstream impacts
5. Dredging	Sediment is removed	Can reduce internal loading, increases water depth	Removes vegetation, benthic invertebrates; disposal issues
6. Light limitation	Creates light limitation	May achieve control of rooted plants as well	May induce thermal stratification, anoxia
7. Mechanical removal	Filters lake water	Algae and nutrients removed as needed	High backwash and sludge handling, labor, capital
8. Selective withdrawal/ release	Discharge of anoxic high nutrient bottom water	Removes bad water efficiently	Downstream problems if not treated
Chemical Controls			
9. Algaecides	Algaecides applied to target areas	Rapidly eliminates algae,	Toxic to non-target organisms, nutrient recycling
10. Phosphorus Inactivation	Application of alum or other salts that floc, bind P	Removal of algae and P; forms barrier limiting P release	Possible pH and toxic effects
11. Sediment Oxidation	Addition of chemicals to oxidize sediments	Slows internal recycling of nutrients, reduce SOD	May affect benthos
12. Settling agents	Addition of floc agent to settle algae	Removes algae and increase clarity	May affect benthos
13. Selective nutrient addition	Change nutrient ratio, alter algal community	Can promote non-nuisance forms of algae	Increase algal abundance, downstream effects
Biological Controls			
14. Enhanced grazing	Manipulation to achieve grazing control over algae	May increase water clarity, increase fish biomass naturally	May involve new species, difficult to control
15. Bottom-feeding fish removal	Remove fish that resuspend bottom sediments, nutrients	Reduces turbidity and nutrient inputs to water column	Targeted fish species difficult to control
16. Pathogens	Addition of inoculum to attack algal cells	Can be highly specific	Experimental, uncertain results
17. Competition and allelopathy	Plants can compete with algae for nutrients, light	Natural biological interactions, improve habitat	Plants can become nuisance

The remaining control strategies all offer some potential benefit to water quality, although costs vary widely (Table 9). For example, the simple strategy of selective withdrawal/release can be a relatively inexpensive way to remove nutrients from the lake if some makeup water is available, although downstream effects would need to be considered. Aeration is the most commonly used lake management technique, helping to mix DO throughout the water column, slow release of nutrients from the sediments, and keep nuisance algae fro accumulating to excessive levels near the lake surface. Dredging often represents the most expensive technique, but is the only one that deals with excess sediment accumulation and loss of depth and storage volume in lakes.

Table 9. Relative costs of possible management options for Lake San Marcos.

Option	Suitability	Relative Cost
Physical Controls		
1. Hypolimnetic aeration or oxygenation	Y	$$$
2. Circulation and destratification	Y	$$$
3. Dilution and flushing	N	-
4. Drawdown	Y	$-$$
5. Dredging	Y	$$$$
6. Light limitation	Y	$$
7. Mechanical removal	Y	$$$
8. Selective withdrawal/release	Y	$
Chemical Controls		
9. Algaecides	Y	$$
10. Phosphorus Inactivation	Y	$$$
11. Sediment Oxidation	Y	$$$
12. Settling agents	N	-
13. Selective nutrient addition	N	-
Biological Controls		
14. Enhanced grazing	Y	$-$$
15. Bottom-feeding fish removal	Y	$$
16. Pathogens	N	-
17. Competition and allelopathy	Y	$-$$

[a] *these relative costs represent very rough order-of-magnitude estimates: $ = $1K-$10K; $$ = $10K-100K; $$$ = $100K-$500K; $$$$ = >$500K.*

Chemical controls, such as algaecide application, can be comparatively inexpensive, although recurring treatments are typically needed since this treats only the symptom of the problem. Algaecides are generally effective at low µg/L concentrations and keep nuisance algae from accumulating to excessive levels; other chemical treatments that may require multiple mg/L doses to be effective become very expensive owing to the large volume of water in the lake. Algaecides can also render the sediments

toxic with excessive applications, creating other longer-term problems. Phosphorus inactivation with alum has been used with some success in lakes, although it is necessary to reduce external loading as much as possible to extend the effectiveness of such a treatment. The El Nino cycle in Southern California makes it difficult to use alum to achieve long-term nutrient and algal control. Sediment oxidation via the introduction of nitrate or other oxidants into the sediments is a way to oxidize the sediments and slow internal nutrient recycling, although this approach can potentially create problems for benthic organisms. (It may be that groundwater flow into the lake is helping to achieve this if NO_3^- is present.)

Biological controls potentially offer the least invasive and most natural ways to improve water quality in lakes and reservoirs (Table 8). Since zooplankton graze upon phytoplankton a part of the natural food web in lakes, actions to maximize zooplankton populations can result in improved water clarity especially at low-moderate nutrient levels. *Daphnia* and other large-bodied zooplankton are especially important in this regard. Removal of benthivorous (bottom-feeding) fish such as carp can also improve water quality by reducing the amount of sediment and nutrients resuspended during their foraging. Competition with phytoplankton for nutrients by aquatic plants and attached algae can also favorably shift biomass production away from phytoplankton and thus increase water clarity and overall water quality.

A Strategy for Lake San Marcos

As one can see, a number of different in-lake strategies can be employed to improve water quality in Lake San Marcos. Emphasis should be placed on those actions that can reduce nutrient concentrations in the water column (per the 303(d) listing), avoid fish kills and other problems such as odors, and improve water clarity. Excessive nutrients are the cause of the impairment, and thus properly deserve intense focus. While it will be critical to control external loading of nutrients to the lake, actions within the lake will also be necessary to meet water quality goals. In some cases, in-lake treatment can offer a more cost-effective strategy for reducing nutrient concentrations than actions in the watershed. Insufficient information exists about the nutrient budget for the lake, its ecology, sediment characteristics, and rates of internal nutrient recycling and oxygen demand to predict the extent of improvements that could be expected by implementing particular restoration actions. Nevertheless, it is useful to discuss, in general terms, possible strategies for the lake.

1. Selective withdrawal/release - It is estimated that about 100 acre-feet or 15% of the lake volume lies below the thermocline in summer. This volume of (hypolimnetic) water receives NH_4-N, DRP and H_2S liberated from the sediments in the deep water in the southern part of the lake that accumulate to high concentrations (Table 4). These chemicals remain out of the surface layer, however, and thus typically present problems only when mixed into the surface waters in the fall. This can create severe algal blooms and fish kills however. One way to reduce the amount of nutrients and H_2S accumulated in the hypolimnion would be to release water through the 6" pipe near the bottom of the dam when sufficient inflows exist. That is, excess water would be better released from the bottom of the lake than over the spillway. This would reduce the accumulation of nutrients and H_2S and deepen the generally well-aerated epilimnion. This action would potentially have no direct costs to implement, although very careful consideration would need to be given to the downstream impacts.

2. Aeration, hypolimnetic oxygenation, or destratification - All of these strategies aim to eliminate anoxia (low DO) in the bottom waters of the lake and reduce internal nutrient recycling, especially of phosphorus. Aeration involves mixing the water column using air injected in the bottom of the lake (Fig. 3a); the air bubbles rise to the surface, driving anoxic bottom water up to the surface while mixing aerated water downward. This destratifies the lake (*i.e.*, eliminates the thermal gradient in the water column (Fig. 2).

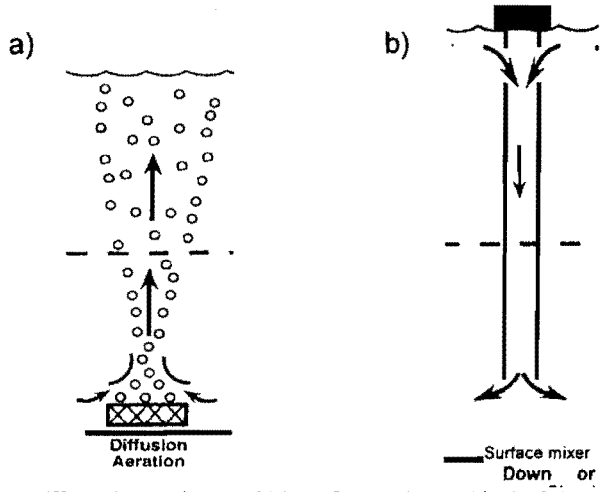

Fig. 3. Schematic of a) diffused aeration and b) surface mixer with draft tube (taken from NALMS, 2001).

Clean Lakes Inc. has recently submitted a proposal for two alternate configurations for a diffused aeration system for the lake (CMS000978-984), a deep-water aeration system that addresses the anoxia and stratification in the southern deep part of the lake ($24,031), and a whole-lake system that would also include the shallower upper part of the lake ($74,350). The upper system would help prevent stagnation of the water column.

An alternative approach is to mix warm naturally well-aerated surface water downward using a surface impeller, delivering DO to the bottom waters, setting up circulation and serving to destratify the water column as well (Fig. 3b). The diffused aeration approach is more commonly used than surface mixers, although the surface mixers are theoretically more efficient, using less energy than diffused aeration systems that require operating a compressor(s). Surface mixers do require anchoring a relatively large floating platform on the lake, however.

The third approach involves injection of pure O_2 or O_2-saturated water into the hypolimnion of the lake. This can be done in several ways, including full-lift or partial lift aerators, a Speece cone, or other large devices that include a surface structure. The size and cost of these devices would not be practical for Lake San Marcos, although direct O_2 injection into the bottom waters in a way similar to the diffused aeration system (Fig. 3a) could potentially be implemented. Such a system involves pumping pure O_2 into gas permeable tubing, where it dissolves fully into the water. No bubbles form, so vertical mixing of the water column does not occur and therefore differs from the diffused aeration system. The O_2 can be either delivered or produced on site.

While each of these systems may achieve the goals of increasing DO, reducing nutrients, and improving clarity, capital costs, operating costs, reliability, and aesthetic and navigational impacts should also be considered. Given the small surface area of the lake, a fully submersed system would be preferable since it would not negatively impact the view across the lake or present navigational concerns. On those grounds, the diffused aeration system or hypolimnetic oxygenation systems would be preferable to surface mixers or full- or partial-lift aerators. Simplicity, reliability and low capital costs make a diffused aeration system, such as that proposed by Clean Lakes, Inc. (CSM000978-988) a reasonable engineering approach to improving water quality in the lake. It may be advisable to initially install the deep-water system to gain some experience with lake aeration and its impact on water quality. Operating costs should be

low (per specs on CSM000982 it should be only about $9/day assuming two 10.6 Amp/115 V compressors at an average electricity cost of $0.15/kWh).

3. Biomanipulation.

a) Enhanced Grazing - Diffused aeration and (if practical) bottom withdrawal/ release represent engineering activities that are expected to reduce nutrient levels and improve DO concentrations and clarity, especially in the southern part of the lake. Efforts to optimize natural processes should also be considered. Although current information about the zooplankton and fish communities is not available, it is expected that enhanced grazing of phytoplankton by large bodied *Daphnia* and other zooplankton will improve clarity of the lake. To achieve this, a top-down approach is recommended whereby periodic stocking of the lake with piscivorous fish such as largemouth bass will control threadfin shad populations in the lake. This top-down approach can be seen assuming a simple linear food web for Lake San Marcos that consists of 4 types of organisms: phytoplankton, zooplankton, zooplanktivores (such as threadfin shad), and piscivores (*e.g.*, largemouth bass) (Fig. 4). Phytoplankton abundance is directly related to the availability of nutrients (*e.g.*, P) in the lake, so control of nutrients through watershed actions and through aeration via the so-called "bottom-up" approach is expected to reduce phytoplankton levels. At the same time, grazing by zooplankton (*i.e.*, "top-down" control) also lowers the phytoplankton levels in the lake. Minimizing nutrient inputs *and* maximizing zooplankton grazing thus yields the lowest standing crop of phytoplankton, and best clarity and overall water quality (Fig. 4).

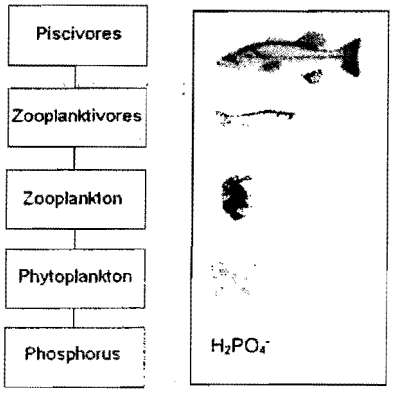

Fig. 4. Simplified linear food web showing relationship between availability of nutrients and different trophic levels in a lake.

However, zooplankton themselves are subject to predation by zooplanktivores, especially shad and other small fish. Thus, in lakes with high rates of predation, there are correspondingly low populations of zooplankton, resulting in little loss of phytoplankton due to grazing (a healthy *Daphnia* population can potentially filter the entire lake volume in 10 days). A correlation thus exists between zooplanktivore population and phytoplankton abundance, while an inverse relationship exists between zooplankton and their predators. It is advantageous then to minimize excessive zooplanktivore predation on zooplankton. This can be achieved through introduction of large sport fish capable of preying on, *e.g.*, shad. This strategy has been implemented at Lake Elsinore for several years. Along with removal of benthivorous carp and other actions, we have seen a favorable change in the fishery there (Anderson, 2008). (Carp, if shown to be present in high numbers in Lake San Marcos, should also be removed from the lake.) At the same time, aeration will help make the deep water in the lake more habitable for zooplankton.

b) Competition - Efforts should also be made to foster growth of non-nuisance aquatic plants such as water lilies, as found in the southern part of the lake. Aquatic plants remove nutrients from the sediments, thus reducing internal nutrient recycling. Aquatic plants also provide surfaces for attached algae that directly compete with phytoplankton for available nutrients in the water column. Aquatic plants further provide DO to the water column and protection for zooplankton and larval and juvenile fish. Moreover, water lilies and other emergent and floating-leaved aquatic plants provide habitat for birds and offer an attractive natural looking shoreline.

Development and Implementation of Regular Monitoring Program

It will be important to begin a regular monitoring program for the lake. Such a program is necessary to quantify the improvements in water quality achieved through in-lake and watershed management efforts. It will also provide needed information to guide adaptive management for the lake, quantify seasonal and longer-term trends in water quality, record inter-annual variability in water quality and response to drought and El Nino events, and develop a more complete understanding of the limnology of Lake San Marcos. At the absolute minimum, 2 simple but critical measurements should be made, specifically Secchi depth and lake level. If a staff gage is not presently installed at the lake, then one should be installed immediately. Secchi depth and lake level should be

recorded weekly, and more frequently following rain events in the watershed. These measurements can be done from a dock, so it is not necessary to launch a boat. Secchi depth measurements should be made in an area that is open so as to avoid stagnant water where surface algal scums may accumulate. Several sites on the lake could be used to capture the spatial variability in transparency, but a single consistent sampling site, *e.g.*, off the far end of dock near the boat launch, would be adequate to capture short-term and longer-term trends in clarity of the water.

To quantify progress with respect to numeric nutrient targets or other water quality objectives for the lake, samples should also be collected and analyzed for total N and total P and dissolved nutrient concentrations (NH_4-N, NO_3-N and DRP). Chlorophyll concentrations and Secchi depth measurements at these sites could also be determined. These samples would be best collected from a boat on a quarterly basis. Three sites representing the northern, central and southern parts of the lake should be sampled. Samples collected directly into bottles below the surface of the lake would be adequate.

References

Anderson, M.A. 2001. *Internal Loading and Nutrient Cycling in Lake Elsinore*. Final Report. Santa Ana Regional Water Quality Control Board. 52 pp.

Anderson, M.A. and R. Lawson. 2005. *Continuation of Recycled Water and Aeration Monitoring at Lake Elsinore: July 1, 2004 – June 30, 2005*. Final Report. Lake Elsinore-San Jacinto Watersheds Authority. 31 pp.

Anderson, M.A. 2007. *Canyon Lake Nutrient Monitoring Study*. Final Report. San Jacinto River Watershed Council. 19 pp.

Anderson, M.A. 2008. *Hydroacoustics Fisheries Survey for Lake Elsinore: Spring, 2008*. Final Report to the City of Lake Elsinore. 15 pp.

Anderson, M.A., L. Whiteaker, E. Wakefield and C. Amrhein. 2008. Properties and distribution of sediment in the Salton Sea, California: an assessment of predictive models. *Hydrobiol.* 604:97-110.

Ball, O.P. 1974. *Lake San Marcos – A Lake Management and Rehabilitative Investigation*. Summarized in Ball, 1979, pp.2-9. CSM000708-715.

Ball, O.P. 1979. *Lake San Marcos*. Report to the Lake San Marcos Sportsman Club. CMS000707-725.

Ball, O.P. 1984. *San Marcos Creek – Proposed Flood Control Project. Water Quality Considerations*. CMS002330-2354.

Carlson, R.E. 1977. A trophic state index for lakes. *Limnol. Oceanogr.* 22:361-369.

Carlson, R.E. and J. Simpson. 1996. *A Coordinator's Guide to Volunteer Lake Monitoring Methods.* North American Lake Management Society. 96 pp.

County of San Diego. 2009. *Lake San Marcos Storm Drain Discharge Sampling: July 2009.* Presentation. CSM000143-153.

NALMS, 2001. *Managing Lakes and Reservoirs.* 3rd Ed. North American Lake Management Society, Madison, WI. 382 pp.

Rast, W. and G.F. Lee. 1978. *Summary Analysis of North American Project (US portion) OECD Eutrophication Project: Nutrient Loading-Lake Response Relationships and Trophic State Indices.* USEPA Corvallis Environmental Research Laboratory, Corvallis, OR. EPA-600/3-78-008.

Risk Sciences, 1991. *Preliminary Impact Assessment of Live Stream Discharge to San Marcos Creek.* CSM002561-2619+Appendices.

San Diego Regional Water Quality Control Board. 2009. *Lake San Marcos Water Quality Monitoring: May 18, 2009.* CMS001023-1043.

Sondegaard, M., Jensen, J.P., Jeppesen, E., 1999. Internal phosphorus loading in shallow Danish lakes. *Hydrobiologia* 408/409, 145-152.

USGS Special Report. 1998, National Water-Quality Assessment Program - Santa Ana Basin, http://water.wr.usgs.gov/sana~nawqa/index.html.

Byrne, R., L. Reidy, M. Kirby, S. Lund and C. Poulsen. 2004. *Changing Sedimentation Rates during the Last Three Centuries at Lake Elsinore, Riverside County, California.* Final Report to the Santa Ana Regional Water Quality Control Board. 49 pp.

Appendix

Lake San Marcos: September 30, 2009

Field and Laboratory Results

Water column measurements and water samples were taken at 3 locations on Lake San Marcos on September 30, 2009 (Fig. 1; Table A1). Sampling was conducted between about 9:00 – 11:30 a.m. I was assisted by Keith Plank and Fran Geneau. Special thanks to Keith Plank who graciously provided his boat and his time for this sampling.

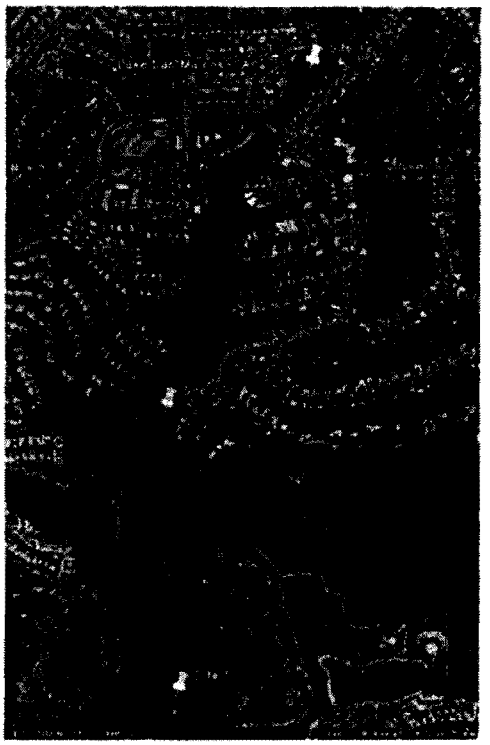

Fig. A1. Sampling sites.

Location of the sites were recorded using a Garmin eTrex GPS using the WGS84 datum. Water column temperature, dissolved oxygen (DO) and electrical conductance (EC) were recorded at 1 m depth intervals from the surface of the lake to the bottom sediments using a Hydrolab Quanta sonde. Maximum depth and conditions just above the sediments were also recorded. Transparency of the water was measured using a Secchi disk. Water samples were taken using a van Dorn sampler.

Table A1. Sampling sites on Lake San Marcos (9/30/09): latitude, longitude, depth and Secchi depth.

Site	Latitude	Longitude	Depth (m)	Z_{sd} (m)
1	33° 06.582'	117° 12.527	8.1	1.1
2	33° 07.035'	117° 12.549'	3.6	0.8
3	33° 07.584'	117° 12.262'	1.2	ND

Water samples were returned to the lab, promptly filtered through a 0.4 μm polycarbonate filter, and frozen until analysis of dissolved nutrients (NH_4-N, NO_3+NO_2-N and dissolved reactive P, DRP). Unfiltered water samples were digested using persulfate following Standard Methods (APHA, 1998). NO_3+NO_2-N, NH_4-N and DRP

concentrations in the filtered and digested samples using colorimetric methods on a Spectronic 100 (Hach, 2009).

Depth at the 3 stations varied markedly, from a depth of 8.1 m at site 1 near the dam to 1.2 m near the inflow from San Marcos Creek (Table A1). Secchi depths were uniformly low in the lake, although the measured Z_{sd} value was slightly higher at site 1 (1.1 m) than at site 2 (0.8 m) (Table A1). A measurement was not made at site 3.

Results from the Hydrolab casts reveal a stratified water column was in place at this time, with about a 5.5°C difference in temperature between the surface and above the sediments at site 1 (Table A2). More significantly, low DO concentrations were present even in the epilimnion there (DO about 2 mg/L near the surface, and <0.5 mg/L below 4 m depth) (Table A2). Strongly reducing conditions were evident based upon the H_2S odor from the bottom water sample. An anoxic hypolimnion is common in eutrophic lakes in the region, although such low DO concentrations in the surface are unusual. It seems that a partial mixing event may have occurred, and mixed some of the cooler anoxic hypolimnion in the upper part of the water column. Observations reported by fisherman of patches of water with colloidal white particles in suspension are consistent with such a mixing event that also brings up bicarbonate and promotes precipitation of $CaCO_3$.

Table A2. Results from water column profile measurements.

Site	Depth	Temperature (°C)	DO (mg/L)	EC (mS/cm)
1	0	24.38	2.15	2.28
	1	24.36	2.00	2.28
	2	24.34	1.45	2.28
	3	24.27	0.92	2.28
	4	24.24	0.88	2.27
	5	22.24	0.32	2.14
	6	20.72	0.17	2.04
	7	19.66	0.15	2.01
	8	18.95	0.15	2.12
	8.1	18.9	0.13	2.12
2	0	25.03	5.51	2.28
	1	24.62	1.60	2.27
	2	24.51	0.80	2.27
	3	24.43	0.35	2.27
	3.6	24.13	0.25	2.21
3	0	25.54	7.32	2.16
	1	24.78	5.45	2.16
	1.2	24.78	4.41	1.83

Electrical conductance, a measure of the salinity or ionic concentration of the water, remained relatively stable near 2.2 mS/cm, although limited variability was present.

Water column conditions at the other 2 sites indicated no substantial vertical stratification of temperature present, owing to their shallow depth, although DO concentrations did vary (Table A2). The low DO concentrations above the sediments at site 2 may reflect high sediment oxygen demand. At the very shallow site 3, the surface layer was over 1°C warmer than at site 1, reflecting heating (Site 1 was sampled first, at about 9:00 a.m., followed by site 2 at about 10:30 a.m., and finally site 3 shortly after 11:00 a.m.). Higher surface DO concentrations at sites 2 and 3 results from increased rates of photosynthesis and production of DO.

Inspection of the water sample from site 2 following centrifugation under a Nikon E600 compound microscope revealed a fairly diverse phytoplankton community. No effort was made to quantify cell abundance, although diatoms, green and blue-green algae, and some dinoflaggelates were observed, without a single group dominating the community.

Chemical analyses indicate nutrient concentrations well in excess of Basin Plan objectives for total N and total P, with comparatively little N and P in surface water samples in dissolved readily-available forms such as NO_3-N, NH_4-N or DRP (Table A3). Much higher concentrations of dissolved nutrients, especially NH_4-N and DRP, were present in the water sample collected from 7 m depth near the dam that resulted from mineralization and release from the bottom sediments (Table A3). Here, total N and total P concentrations were actually somewhat lower than the dissolved forms. This was attributed to the high sulfide concentrations present in this sample that reduced the efficiency of the persulfate digestion process.

Table A3. Results from nutrient analyses.

Site	Depth (m)	NO_3-N	NH_4-N	DRP	Total N	Total P
				(mg/L)		
1	3	0.19	0.30	0.04	3.26	0.16
	7	0.37	10.27	3.63	8.73	3.45
2	1.8	0.17	0.14	0.10	3.12	0.16
3	0.5	0.12	<0.10	0.05	3.03	0.16

References

APHA. 1998. *Standard Methods for the Examination of Water and Wastewater.* 20th Edition. American Public Health Association, Washington, DC.

DECLARATION OF KRIKOR J. MESHEFEJIAN

I, Krikor J. Meshefejian, hereby declare as follows:

1. I am over 18 years of age. I have personal knowledge of the facts set forth herein, and, if called as a witness, could and would testify competently with respect thereto.

2. I am an attorney at Levene, Neale, Bender, Yoo & Brill L.L.P., bankruptcy counsel for Citizens Development Corp., the Chapter 11 debtor and debtor in possession (the "Debtor") in the currently pending Chapter 11 bankruptcy case, Case No. 10-151-42-LT11, pending in the United States Bankruptcy Court for the Southern District of California (the "Bankruptcy Court").

3. I have personal knowledge of the facts set forth herein and if required to do so would testify to the accuracy of the facts herein.

4. I have received and read that certain "Tentative Investigative Order No. R9-2011-0033, for the investigation of nutrient impairment in Lake San Marcos San Diego County" (the "Tentative Order").On October 14, 2010, the Court held an initial hearing on the Substantive Consolidation Motion (the "Initial Hearing").

5. Page 10 of the Tentative Order provides that "[b]ecause the Bankruptcy Court is scheduled to consider confirming CDC's Plan of Reorganization on or about October 6, 2011, it is important that this order be issued to CDC prior to September 30, 2011." This statement is untrue. The Bankruptcy Court will not be considering whether to confirm the Debtor's Plan of Reorganization on or anywhere near October 6, 2011. Rather, October 6, 2011 was previously scheduled as solely the hearing date on the Bankruptcy Court's consideration of the Debtor's Disclosure Statement and whether the Disclosure Statement contained "adequate information." At no point in time has a hearing on the confirmation of the Debtor's Plan been noticed or specifically scheduled. Confirmation of the Debtor's Plan can only be considered *after* the Debtor's Disclosure Statement is approved, which has not yet occurred and will not occur until at least December 2, 2011. Currently, the hearing on the Debtor's Disclosure Statement is scheduled for December 2, 2011. Attached hereto as Exhibit "1" is the Bankruptcy Court's Order evidencing the continuance of the hearing on the Debtor's Disclosure Statement to December 2, 2011. (See paragraph 8 to the

attached Bankruptcy Court Order). On that date, if and only if the Bankruptcy Court approves the Disclosure Statement, then and only then will a hearing on whether to confirm the Debtor's Plan of Reorganization be set. Assuming the Debtor's Disclosure Statement is approved, (meaning simply that the Court has found that the Disclosure Statement contains "adequate information"), then and only then will the Court establish a hearing date for the considering whether to confirm the Debtor's Plan of Reorganization. Additionally, assuming the Bankruptcy Court approves the Debtor's Disclosure Statement on December 2, 2011, a hearing on the Debtor's Plan of Reorganization will not take place until at least January 2012, if not later, because after approval of its Disclosure Statement, the Debtor will be required to serve its Plan on all creditors, afford such creditors sufficient time to vote for or against the Plan, and file responses to the Plan. The Plan confirmation process, therefore, will take at least 30-45 days after approval of the Debtor's Disclosure Statement.

6. Accordingly, the Tentative Order's rationale for issuing an order against the Debtor prior to September 30, 2011, is erroneous and based upon incorrect facts regarding the status of the Debtor's bankruptcy case.

I declare under penalty of perjury that the foregoing is true and correct. Executed this 6th day of September, 2011, in Los Angeles, California.

Krikor J. Meshefejian

EXHIBIT 1

CSD 1001A [11/15/04]
Name, Address, Telephone No. & I.D. No.

RON BENDER (SBN 143364)
KRIKOR J. MESHEFEJIAN (SBN 255030)
LEVENE, NEALE, BENDER, YOO & BRILL L.L.P.
10250 Constellation Boulevard, Suite 1700
Los Angeles, California 90067
Telephone: (310) 229-1234
Facsimile: (310) 229-1244

Order Entered on
August 29, 2011
by Clerk U.S. Bankruptcy Court
Southern District of California

UNITED STATES BANKRUPTCY COURT
SOUTHERN DISTRICT OF CALIFORNIA
325 West "F" Street, San Diego, California 92101-6991

In Re

CITIZENS DEVELOPMENT CORP.

Debtor.

BANKRUPTCY NO. 10-15142-LT11

Date of Hearing: October 14, 2010
Time of Hearing: 2:00 p.m.
Name of Judge: Hon. Laura S. Taylor

ORDER ON STIPULATION (1) SCHEDULING FURTHER CONTINUED TRAIL DATES FOR RELIEF FROM STAY MOTION FILED BY TELESIS COMMUNITY CREDIT UNION, (2) CONTINUING HEARING ON DISCLOSURE, AND RELATED RELIEF

IT IS ORDERED THAT the relief sought as set forth on the continuation pages attached and numbered two (2) through 2 with exhibits, if any, for a total of 2 pages, is granted. Motion/Application Docket Entry No. 413

//

//

//

//

//

//

DATED: August 26, 2011

Judge, United States Bankruptcy Court

Signature by the attorney constitutes a certification under Fed. R. of Bankr. P. 9011 that the relief in the order is the relief granted by the court.

Submitted by:

Levene, Neale, Bender, Yoo & Brill L.L.P.
(Firm name)

By: /s/ Krikor J. Meshefejian
Attorney for ☑ Movant ☐ Respondent

The Court, having read and considered the "Stipulation (1) Further Scheduling Continued Trial Dates For Relief From Stay Motion Filed By Telesis Community Credit Union, (2) Continuing Hearing On Disclosure Statement Describing Debtor's Plan Of Reorganization, And (3) Authorizing Debtor To Continue To Use Cash Collateral In Which Telesis Asserts A Security Interest" (the "Stipulation"), with good cause appearing, hereby orders as follows (capitalized terms herein shall have the same meaning as the meaning ascribed to such terms in the Stipulation)

1. The Stipulation is granted in its entirety.

2. Evidentiary hearings on the RFS Motion shall be held on November 14, 2011, commencing at 10:00 a.m.; November 15, 2011, commencing at 10:00 a.m.; and November 16, 2011, commencing at 10:00 a.m.

3. All witnesses who submit direct testimony via declaration must be present for cross examination on one of those evidentiary hearing dates. Any witness who fails to appear for cross-examination will have their direct testimony stricken from the record.

4. The parties are to exchange all documents that the parties intend to use at trial by October 14, 2011.

5. The parties shall produce their witnesses for deposition without subpoena on mutually agreed upon days during any time between September 1, 2011 and October 30, 2011.

6. The parties shall produce any expert appraisal reports by September 30, 2011, shall produce other expert reports by September 30, 2011, and shall produce their expert witnesses for deposition without subpoena on mutually agreed upon days during any time between September 1, 2011 and October 30, 2011.

7. The parties shall file and exchange trial briefs, declarations of direct testimony, including the identification of testimony to be offered via deposition transcripts and exhibits by November 7, 2011.

8. The hearing on the Debtor's Disclosure Statement shall be held on December 2, 2011, at 10:00 a.m. Telesis' objection to the Disclosure Statement shall be due on November 28, 2011.

9. The Debtor shall be authorized to continue to use cash collateral in which Telesis asserts a security interest, through and including November 16, 2011, pursuant to the terms of the Telesis Cash Collateral Order.

IT IS SO ORDERED.

Signed by Judge Laura Stuart Taylor August 26, 2011

In re: CITIZENS DEVELOPMENT CORP., Debtor(s).	CHAPTER 11 CASE NO. 10-15142-LT11

PROOF OF SERVICE OF DOCUMENT

I am over the age of 18 and not a party to this bankruptcy case or adversary proceeding. My business address is: 10250 Constellation Blvd., Suite 1700, Los Angeles, CA 90067.

A true and correct copy of the foregoing document described as: **ORDER ON STIPULATION (1) SCHEDULING FURTHER CONTINUED TRAIL DATES FOR RELIEF FROM STAY MOTION FILED BY TELESIS COMMUNITY CREDIT UNION, (2) CONTINUING HEARING ON DISCLOSURE, AND RELATED RELIEF** will be served or was served (a) on the judge in chambers in the form and manner required by LBR 5005-2(d); and (b) in the manner indicated below:

I. **TO BE SERVED BY THE COURT VIA NOTICE OF ELECTRONIC FILING ("NEF")** – Pursuant to controlling General Order(s) and Local Bankruptcy Rule(s) ("LBR"), the foregoing document will be served by the court via NEF and hyperlink to the document. On _____, I checked the CM/ECF docket for this bankruptcy case or adversary proceeding and determined that the following person(s) are on the Electronic Mail Notice List to receive NEF transmission at the email address(es) indicated below:

N/A

II. **SERVED BY U.S. MAIL OR OVERNIGHT MAIL:** On **August 25, 2011**, I served the following person(s) and/or entity(ies) at the last known address(es) in this bankruptcy case or adversary proceeding by placing a true and correct copy thereof in a sealed envelope in the United States Mail, first class, postage prepaid, and/or with an overnight mail service and/or by attorney service addressed as follows. Listing the judge here constitutes a declaration that mailing to the judge will be completed no later than 24 hours after the document is filed.

By Overnight Mail
Hon. Laura S. Taylor
U.S. Bankruptcy Court
Jacob Weinberger U.S. Courthouse
325 West F Street, Room 129
San Diego, CA 92101-6998

III. **SERVED BY PERSONAL DELIVERY, FACSIMILE TRANSMISSION OR EMAIL** (indicate method for each person or entity served): Pursuant to F.R.Civ.P. 5 and/or controlling LBR, on _____, I served the following person(s) and/or entity(ies) by personal delivery, or (for those who consented in writing to such service method), by facsimile transmission and/or email as follows. Listing the judge here constitutes a declaration that personal delivery on the judge will be completed no later than 24 hours after the document is filed.

None.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

August 25, 2011	Stephanie Reichert	*/s/ Stephanie Reichert*
Date	*Type Name*	*Signature*

Signed by Judge Laura Stuart Taylor August 26, 2011

In re: CITIZENS DEVELOPMENT CORP., Debtor(s).	CHAPTER 11 CASE NO. 10-15142-LT11

NOTICE OF ENTERED ORDER AND SERVICE LIST

Notice is given by the court that a judgment or order entitled: **ORDER ON STIPULATION (1) SCHEDULING FURTHER CONTINUED TRAIL DATES FOR RELIEF FROM STAY MOTION FILED BY TELESIS COMMUNITY CREDIT UNION, (2) CONTINUING HEARING ON DISCLOSURE, AND RELATED RELIEF** was entered on the date indicated as "Entered" on the first page of this judgment or order and will be served in the manner indicated below:

I. **SERVED BY THE COURT VIA NOTICE OF ELECTRONIC FILING ("NEF")** - Pursuant to controlling General Order(s) and Local Bankruptcy Rule(s), the foregoing document was served on the following person(s) by the court via NEF and hyperlink to the judgment or order. As of **August 25, 2011**, the following person(s) are currently on the Electronic Mail Notice List for this bankruptcy case or adversary proceeding to receive NEF transmission at the email address(es) indicated below.

- Ron Bender rb@lnbyb.com
- Judith A. Descalso descalso@pacbell.net
- Philip J Giacinti pjg@procopio.com, caw@procopio.com;laj@procopio.com
- Haeji Hong Haeji.Hong@usdoj.gov, USTP.Region15@usdoj.gov;shannon.m.vencill@usdoj.gov;tiffany.l.carroll@usdoj.gov
- Raffi Khatchadourian raffi@hemar-rousso.com
- Dean T. Kirby dkirby@kirbymac.com, jrigg@kirbymac.com;gsparks@kirbymac.com;rrobinson@kirbymac.com;jcastranova@kirbymac.com;jlewin@kirbymac.com
- Christina Melhouse cm@ldplaw.com
- Krikor Meshefejian kjm@lnbyb.com
- Andrew S. Pauly apauly@gpfm.com
- Richard J. Pekin rpekin@foxjohns.com
- Wayne R. Terry wterry@hemar-rousso.com, mgranzow@hemar-rousso.com
- Kelly Ann Mai Khanh Tran ktran@mkblaw.com, ssandbeck@mkblaw.com
- United States Trustee ustp.region15@usdoj.gov
- Dennis J. Wickham wickham@scmv.com, havard@scmv.com
- Alan Steven Wolf wdk@wolffirm.com;faxes@wolffirm.com

II. **SERVED BY THE COURT VIA U.S. MAIL:** A copy of this notice and a true copy of this judgment or order was sent by United States Mail, first class, postage prepaid, to the following person(s) and/or entity(ies) at the address(es) indicated below:

None.

III. **TO BE SERVED BY THE LODGING PARTY**: Within 72 hours after receipt of a copy of this judgment or order which bears an "Entered" stamp, the party lodging the judgment or order will serve a complete copy bearing an "Entered" stamp by U.S. Mail, overnight mail, facsimile transmission or email and file a proof of service of the entered order on the following person(s) and/or entity(ies) at the address(es), facsimile transmission number(s), and/or email address(es) indicated below:

Signed by Judge Laura Stuart Taylor August 26, 2011