



Proposal Description

The City of Ventura is proposing to conduct the Upper Ventura River Basin Surface Water/Groundwater Interaction Study (Interaction Study) to advance the formalization of a groundwater management plan (GWMP) for the Upper Basin. The Interaction Study will enhance the understanding of the relationship between groundwater pumping and surface water flows by developing baseline data. This study will form the basis for groundwater modeling by developing a water balance analysis and correlation of groundwater pumping to surface water flows. Additionally, the study will increase stakeholder involvement in local groundwater management and establish the stakeholder framework for the GWMP.

Specifically the project will:

- Formalize a data collection strategy: establish twelve transects for flow measurement, finalize locations for well measurements, finalize specific timing for data collection, and document parameters to be measured. **Figure 1** shows the area of study, the locations of groundwater wells, and locations of transects that define critical reaches to be studied.
- Perform field data collection of surface and groundwater data over two seasons; and
- Develop a water balance for each designated river section (including inflow, outflow, and pumping volume to estimate the change in storage for that week) and compare that to published water balances.

These tasks will be undertaken with significant stakeholder input. For a detailed work plan, see Attachment 5 of this application.

Datasets developed by the study will serve as essential inputs to basin-specific groundwater models that will enable the effects of pumping activities on surface water flows to be estimated. With this information, pumpers and water resource managers will have the ability to optimize groundwater management and groundwater use for long-term sustainability of all beneficial uses, both surface water and groundwater.

Purpose, Goals, and Objectives

The purpose of this study is to advance the development of a GWMP for the Upper Basin. The specific goals and objectives of the proposed study are presented below.

Goal: Obtain baseline data and estimate relationship between surface and groundwater flows and pumping.

Objective: Perform reliable field measurements and obtain data for:

- Surface water flows
- Basic quality of surface and groundwater water (temperature, TDS, pH)
- Groundwater levels
- Aquifer properties
- Groundwater pumping rates in nearby alluvial areas

Objective: Determine correlation between pumping and surface flows for acute (short term) impacts in sub-reaches and for long-term impacts across the study area.

Objective: Analyze water balances in sub-reaches and overall Upper Basin study area.

Goal: Create stakeholder group.

Objective: Solicit groundwater pumper input to Interaction Study.

Location Description

The Ventura River is located within the Ventura River watershed in the northwestern portion of Ventura County, which drains an estimated area of 228 square miles. The main stem of the Ventura River extends approximately 17 miles from the confluence of the Matilija Creek and North Fork Matilija Creek to the river estuary draining at the Pacific Ocean. The aquifer system underlying the Ventura River is made up of the Ventura River Valley Groundwater Basin, consisting of the Upper and Lower subbasins. The study area of the proposed project covers the Upper Ventura River basin, which is bounded on the east by the Ojai Valley Groundwater Basin, on the south by the Lower Ventura River Subbasin, and elsewhere by



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impermeable rocks of the Santa Ynez Mountains¹. **Figure 2** depicts the groundwater basins and the study area vicinity.

The northern half of the Ventura River watershed is contained within the Los Padres National Forest. There are significant open space preserves along the river. Agriculture is one of watershed's major industries and there are large pockets of agricultural uses adjacent to the river (primarily orchard crops). Major urban areas include the City of Ojai and City of Ventura. There are also many small rural residential communities, including Meiners Oaks, Oak View, Live Oak Acres, and Casitas Springs.

Precipitation varies throughout the watershed and typically occurs in the fall and winter months. About 80 percent of the year, there is no significant surface flow in the Ventura River above the confluence of San Antonio Creek (see Figure 2), which overlies the Upper Ventura Valley Basin². Following precipitation the Ventura River can rise rapidly. The river is characterized as an alluvial fan, a braided stream that is not easily channelized and has a tendency to form new channels during storm events.

Project Need

There is no access to imported water in the Ventura River watershed; residents, agriculture, and businesses are dependent on local supplies, including surface water from the Ventura River and local groundwater. The surface water supply is variable. The groundwater basin is shallow with an estimated storage capacity of no more than 14,000 acre-feet³. There are limited opportunities for groundwater recharge.

The Ventura River system and groundwater system serve many beneficial uses, including water supply and fishery habitat. Water from the Ventura River and Upper Basin is diverted and extracted by various users, including the City of

Ventura, Meiners Oaks Water District, Ventura River County Water District, and other local pumpers along the length of the Upper Basin mainstem. The Upper Basin is also the location of the majority of municipal and agricultural pumping along the river. Currently the water supply of the Ventura River and Ventura River Valley Groundwater Basin are the subject of scrutiny as water purveyors, private irrigators, and public trust agencies try to balance competing water demands. As described in Attachment 3, the entire portion of the Ventura River overlying the Upper Basin has been listed by the Los Angeles Regional Water Quality Control Board as impaired due to water diversions and pumping⁴. Recently the National Marine Fisheries Service included the Ventura River in its Southern California Steelhead Recovery Plan. The plan calls for better river and groundwater management to improve the local fisheries.

Data needed to make sound management decisions on water supply and environmental resources for the Ventura River and its groundwater basins does not exist.

There is a need to establish a more comprehensive understanding of the interactions and interdependencies existing within the Ventura River watershed, including surface and groundwater interactions and hydrology.

Relevance of Project to Advancing Development of GWMP

The proposed project is instrumental in advancing the development of a formal GWMP. This project addresses the data gaps to lay the foundation for an effective GWMP. The project has brought together a group of stakeholders that will form the basis of the public outreach essential to development of a GWMP.

The Groundwater Subcommittee of the Ventura River Watershed Council was created in order to plan and implement the proposed study. This Subcommittee consists of local agencies and other stakeholders committed to improving groundwater management in the Upper Basin.

¹ California Department of Water Resources, 2004. Bulletin 118 – Ventura River Valley Groundwater Basin, Upper Ventura River Subbasin.

² U.S. Army Corps of Engineers. 2004. Final Environmental Impact Statement/Environmental Impact Report F-5 Milestone for the Matilija Dam Ecosystem Restoration Project. September.

³ Ventura County Watershed Protection District. 2012. *Ventura River Watershed Protection Plan Report*. February.

⁴ State Water Resources Control Board. 2010. Final 2010 Integrated Report. Available at: http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml. Accessed: June 1, 2012.



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In an effort to enhance collaboration for the proposed study, the seven members of the Groundwater Subcommittee have entered into an MOA. Members include: the City of Ventura, Ventura River County Water District, Meiners Oaks Water District, Ventura County Watershed Protection District, Casitas Municipal Water District, Ojai Valley Sanitary District, and Ojai Valley Land Conservancy. This agreement (provided within Attachment 2) outlines the cost-share obligations of the funding parties, including the City of Ventura, for the preparation of this LGA grant application. It also establishes obligations of parties to participate in, and support efforts to, obtain grant funding for groundwater studies, as well as provide reasonable access to property for groundwater and surface water measurements. While this MOA was formed primarily for the purposes of this grant application, it sets the stage for collaborative efforts to formalize a GWMP.

The Groundwater Subcommittee has initiated a broader stakeholder outreach process to increase groundwater pumper collaboration and keep stakeholders notified of ongoing actions related to the groundwater basin.

In addition to a stakeholder process, steps necessary for the development of a GWMP include identifying local issues and basin management objectives. The proposed Interaction Study is consistent with guidance on formalizing local groundwater management described by AB 3030. According to AB 3030, the GWMP shall include among others, components relating to surface flow interactions on groundwater, including how they affect groundwater levels and may contribute to replenishment of the basin. Further, technical components listed in AB 3030 that may be included in a GWMP also include "facilitating conjunctive use operations".⁵ These components will be directly addressed by the proposed study.

The proposed Interaction Study is also following recommendations described in the 2010 Ventura County Watershed Protection District *Groundwater Budget Approach to a Groundwater Management Plan, Upper and Lower Ventura River Basins*. The approach described in the report includes establishing

management objectives for the groundwater basin and describing how meeting these objectives would contribute to a more reliable supply for long-term beneficial uses of groundwater in the plan area. The report recommends adoption of monitoring protocols that will capture changes in surface flow and surface water quality that would directly affect groundwater. The Interaction Study will gather data to establish an understanding of groundwater and surface water interactions and provide the foundation for relevant management objectives.

A vast number of studies have been conducted and published relating to the Ventura River system, the Ventura River watershed, and the associated groundwater system. However, data and knowledge gaps still exist, including an understanding of how to optimize management of stream diversions and nearby groundwater pumping in order to balance water supply with the protection of fishery habitat. Data are largely unavailable on streamflow characteristics and surface water/groundwater interactions, and these gaps limit the development of a comprehensive water budget for the Ventura River watershed. The proposed Interaction Study constitutes a crucial step to fill existing information gaps and advance the development of an effective GWMP for the Upper Basin.

Utility of Information Gained and Methods Used

There is a need for a better understanding of surface water/groundwater interactions in the Upper Basin. As part of the Interaction Study data will be collected to establish a correlation between surface flows and groundwater pumping.

Data to be collected will include:

- Surface water flows (weekly)
- Surface water quality parameters (TDS, pH and temperature) – simultaneous with surface water flow measurements
- Groundwater levels (weekly)
- Aquifer properties (total of 24 tests)
- Groundwater pumping rates (quarterly)

Data collected will be analyzed for the study area as a whole, as well as for individual

⁵ California Water Code, Part 2.75. Groundwater Management.



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reaches of the Ventura River, which will allow for a better understanding on how localized pumping activities can affect surface water flows and beneficial uses (e.g., estuarine habitat, wildlife habitat, recreation) within a given reach.

Data collection will be performed over 2 years. The timing and timeframe of surface water data collection will be based on seasonal surface flow variations. Based on the understanding that pumping activities have minimal to no influence on surface water flows during and after winter storm seasons, surface water sampling efforts will focus on the critical flow season during spring and summer. Aquifer tests will be conducted at the end of streamflow monitoring. Groundwater levels and pumping rates will be measured and collected year round.

The City of Ventura performed surface water measurements based on field transects in the spring of 2010, 2011, and 2012. Meiners Oaks Water District conducted surface water and groundwater data collection over the period January to April 2012. The Interaction Study will be based on experience from these past monitoring programs. Past experience will provide useful insight into optimal access points to the river and where to conduct sampling activities.

Surface Water Measurements

For surface water measurements, 12 temporary transects will be established at accessible locations along the Ventura River that define local reaches influenced by municipal wells or that define a reach with flow impediments. Due to the nature of the braided stream, measuring sites may have to be re-established at the beginning of the second year of sampling. A threshold, such as a flow minimum, will be established to define when measurements are to start. Surface water data will be collected on a weekly basis, during a set timeframe, and scheduled for the same day each week for consistency. Water quality data will be collected with surface flow measurements and will include TDS, pH, and temperature.

USGS stream flow gages currently collect data at some locations along the Ventura River. Field measurements collected for the study will be calibrated with data from these USGS gage stations to ensure validity of data. In addition,

USGS standards for stream gauging will be followed during the study.

Groundwater Data

Information on groundwater dynamics will be obtained through direct measurements and through analysis of records available from local pumpers. Direct measurements of groundwater levels and transmissivity data will be collected at wells along the river main stem. Well production data will be collected from municipal agencies, mutual water companies, and agricultural users.

Data Analysis

The proposed study will develop a 2 year dataset of surface water and groundwater measurements that will enable surface water flows to be correlated with groundwater pumping. Data collected will be analyzed to develop a water balance on a weekly basis and at the end of each year, using a lumped parameter analysis. This analysis will show inflows and outflows in relation to pumping volumes for each of the 11 reaches located between the temporary transects and for the mainstem of the Upper Basin as a whole. Water quality data collected at the same time as flow measurements will enhance the overall analysis by allowing observed parameters to be correlated with losing or gaining portions of the stream. This will facilitate better characterization of surface water and groundwater dynamics.

Data will be summarized in the form of a water balance that will provide input to groundwater models to evaluate and estimate surface water and groundwater interactions in the Upper Basin. Based on results of the analysis, further tests and/or flow studies can be recommended to address other information needs.

Utility of Information Gained

Results from this study will advance formalization of a GWMP and enhance local water resource management in the Upper Basin. Datasets developed within this study will serve as essential inputs to basin-specific groundwater models. These modeling efforts that will enable the effects of pumping activities on surface water flows within the Upper Basin to be estimated and therefore groundwater activities to be better coordinated in conjunction with surface water uses.



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Information gained from this study is particularly relevant to the SCS Recovery Plan, as it will help establish more specific guidelines to support aquatic habitat protection. The study will provide an improved understanding of the interactions of groundwater and surface water flows, not only along the Upper Basin portion of the Ventura River as a whole, but with reach-specific information. This will facilitate maintaining proper instream flows along reaches that support fish populations without unnecessarily limiting other beneficial water uses, particularly groundwater pumping.

Collaboration

The Ventura River watershed has a history of collaborative efforts to enhance sustainable management of the local water and ecological resources. As detailed in Attachment 3, many studies have been conducted relating to the Ventura River and groundwater systems. These studies provide part of the information necessary for the development of a formalized GWMP and effective management of the groundwater resources for long-term sustainability. The proposed study will provide critical data on surface water groundwater interactions.

Efforts to understand and manage the groundwater basin and other local water resources have included broad involvement from local public and private agencies, public stakeholders and the formation of organizations, providing venues for collaborative discussion and actions to address critical issues in the watershed.

At the forefront of these groups, is the Ventura River Watershed Council, a coalition of stakeholders that include government agencies, such as the City of Ventura, water and sanitation districts, environmental and educational non-profits, agricultural organizations, community volunteer groups, as well as engineers, biologists, businesses and private citizens who engage in watershed planning efforts in the Ventura River Watershed. Meetings are held eight times a year and are open to the public.

The Groundwater Subcommittee of the Ventura River Watershed Council consists of a group of local agencies and other public stakeholders committed to improving groundwater management in the Upper Ventura River groundwater basin. The MOA developed by the

Groundwater Subcommittee sets the stage for continued collaboration in preparation of a formalized GWMP.

The high level of cooperation between the members of the Ventura River Watershed Council has been recognized by the Los Angeles Regional Water Quality Control Board, which has provided a Letter of Support for the proposed project. This Letter of Support (provided with this attachment) emphasizes the importance of the proposed project to address existing impairments in the Ventura River and suggests that the level of cooperation existing among the Ventura River Watershed Council, the Subcommittee, and the development of the MOA, are indicative of successful completion of the work proposed as part of this application.

Stakeholder Involvement Process

The scope of work for the proposed Interaction Study includes a focused stakeholder involvement process. In June of 2012, a letter was sent out to groundwater pumpers along the Ventura River, inviting them to participate in the Interaction Study. The letter explained the need to gather data to document the relationship between groundwater pumping and surface flows in the Ventura River. This letter is provided with Attachment 3.

In addition to local stakeholder involvement, the Subcommittee actively encourages participation by federal and State agencies (invitations to meetings, provision of work products). The Regional Water Quality Control Board and the National Marine Fisheries Service have participated, and input has been solicited on past meetings as well as ongoing efforts, including input on the work plan for this application. Outreach to these interested parties will continue throughout the study.

Several meetings will take place in order to bring together and inform stakeholders of efforts related to the study. Meetings will include a kick off meeting prior to the start of each sampling season, a progress meeting to present and discuss initial results and a meeting intended to solicit stakeholder input during the draft report review process (see Task 4 of Attachment 5).

At conclusion of the study, the draft report summarizing the findings of the study will be made available for stakeholder review prior to



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finalization. The final report will then be available on the Ventura River Watershed Council website. Summarized field data will also be made available for further use in future groundwater studies.

Project Funding Following LGA Grant

The data obtained from the Interaction Study will itself have independent utility by providing information about how different pumping regimes may or may not affect flows within 11 reaches of the Ventura River. It will also provide a scientific basis for future use of the river for surface water diversion and groundwater diversion, while protecting environmental resources. After this project is complete, it is anticipated that members of Ventura River Watershed Council will continue data collection as part of their normal operations because once measuring equipment is installed, the cost of data collection is very low. This will allow a large dataset to be developed for the Ventura River and Upper Basin.

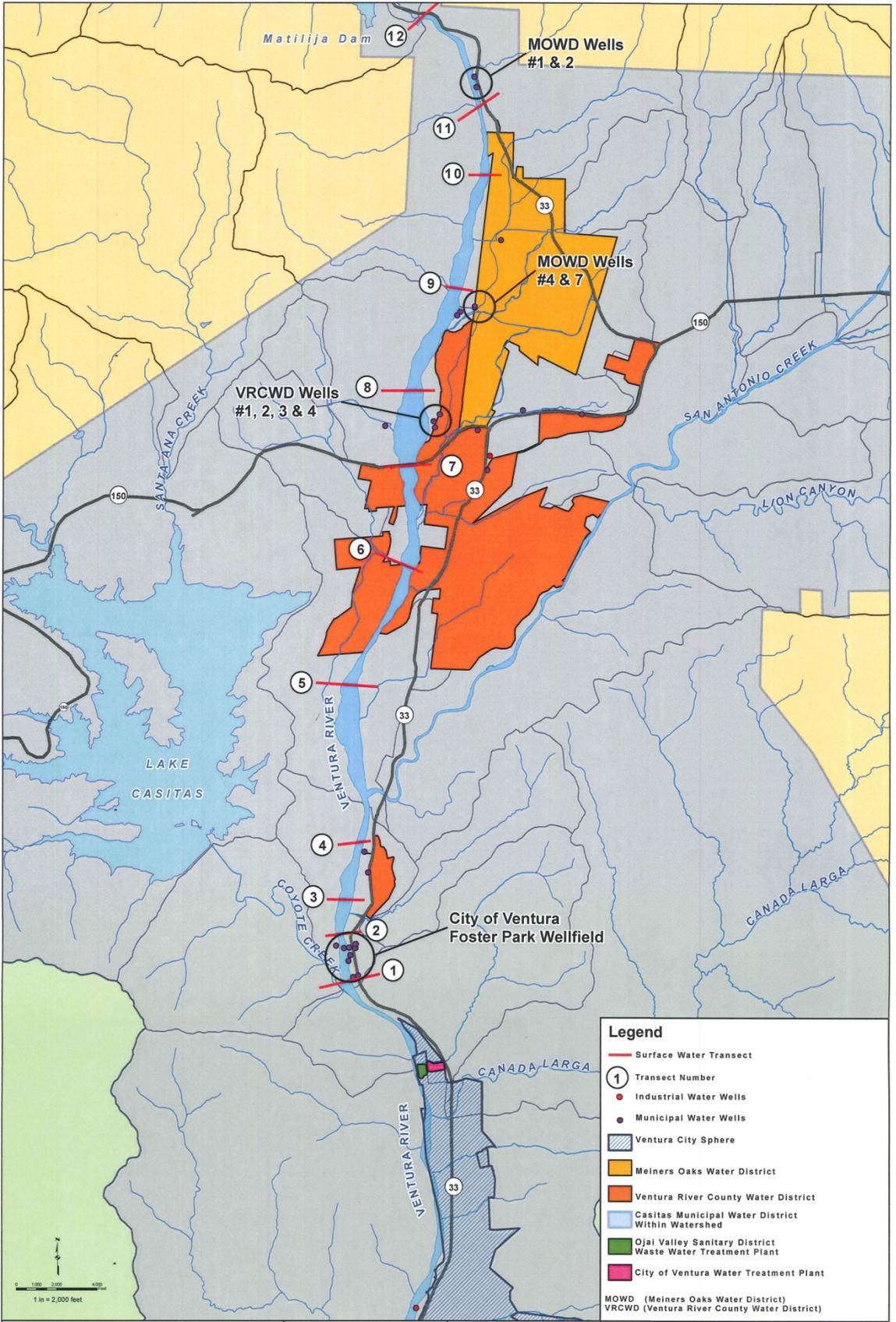
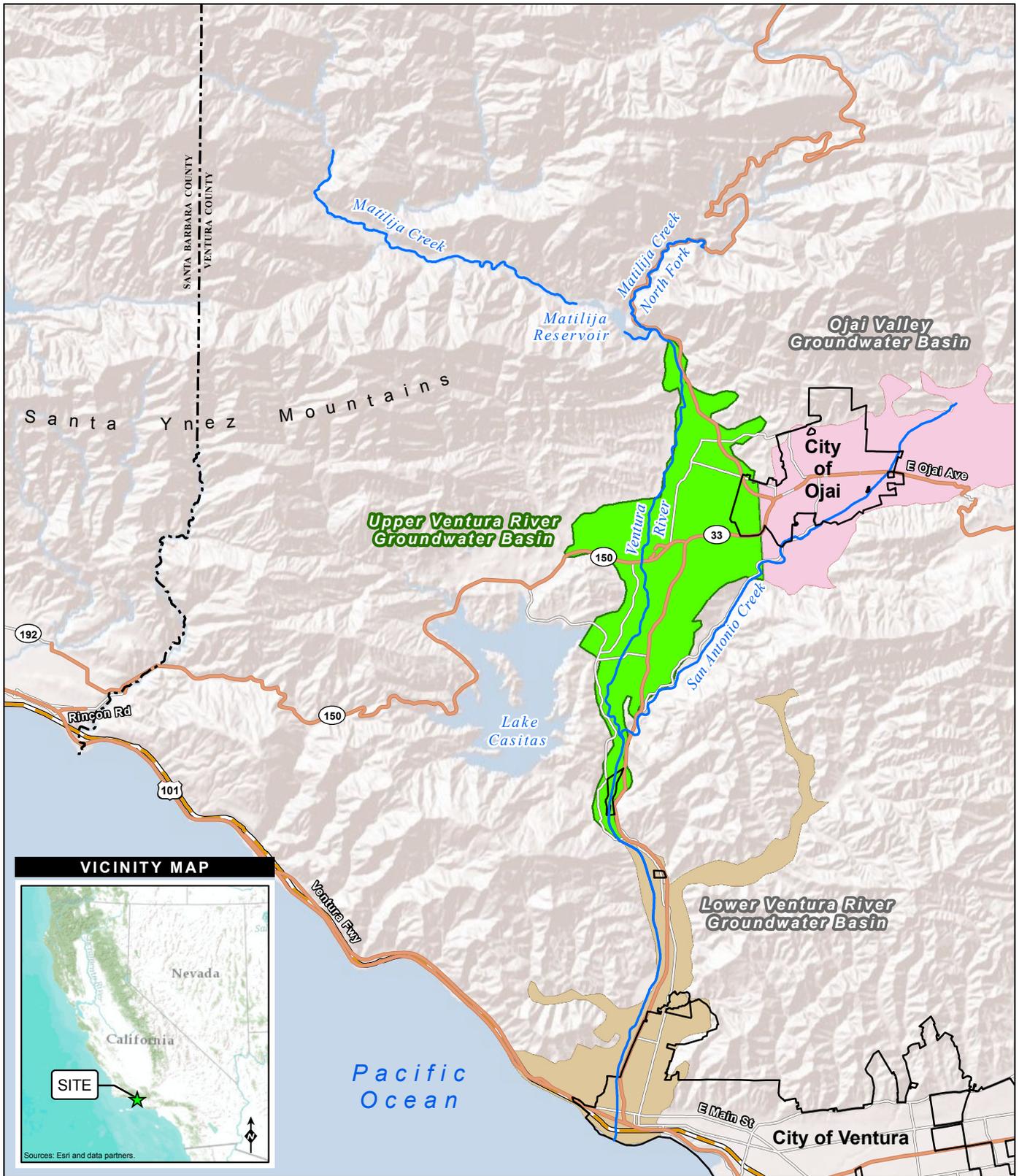
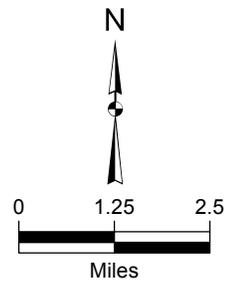


Figure 1

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Topo Map Source: ESRI ArcGIS Online and data partners including USGS and © 2007 National Geographic Society



Kennedy/Jenks Consultants
 City of Ventura LGA Grant Application
 Ventura County, California

Site Map

K/J 1289018*00
 July 2012

Figure 2



EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIGUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

Los Angeles Regional Water Quality Control Board

July 6, 2012

California Department of Water Resources
Division of Integrated Regional Water Management
Regional Planning Branch
P. O. Box 942836
Sacramento, CA 94236-0001
Attn: Tom Lutterman

RE: LETTER OF SUPPORT FOR THE CITY OF SAN BUENAVENTURA'S
APPLICATION FOR A GROUNDWATER ASSISTANCE GRANT FOR THE UPPER
VENTURA RIVER BASIN SURFACE WATER/GROUNDWATER INTERACTION STUDY

Dear Mr. Lutterman:

We are pleased to provide this letter of support for the proposal submitted by the City of San Buenaventura for a Local Groundwater Assistance Grant entitled "Upper Ventura River Basin Surface Water/Groundwater Interaction Study". The reach of the river overlying the Upper Ventura River Groundwater Basin is listed as impaired for water diversions and pumping; the beneficial uses most impacted are those relating to maintenance of a viable steelhead trout population. The impairment and timeline to address it are part of a consent decree between the USEPA and several environmental organizations; a plan to address this impairment must be in place by March 2013. It is apparent that the surface water and groundwater in this watershed are closely connected. We see the eventual development of a groundwater management plan, preceded by needed studies such as the one described in this grant application, as a key element of an array of management activities that will be crucial to resolving this impairment.

The Ventura River Watershed Council (with its subcommittees) serves as the main venue to discuss and collaborate on issues of importance in the watershed and it will also play an important outreach and support role as part of this study. Los Angeles Regional Board staff have participated with the Watershed Council since its inception and have seen a high level of cooperation between its diverse members. The good relationships seen between the Watershed Council members, as well as the formal Memorandum of Agreement among the water agencies most closely involved with the study bodes well for successful completion of the work.

MARIA MEHRANIAN, CHAIR | SAMUEL UNGER, EXECUTIVE OFFICER

320 West 4th St., Suite 200, Los Angeles, CA 90013 | www.waterboards.ca.gov/losangeles

We encourage a favorable response to the grant proposal and look forward to the results of this effort. Please contact Shirley Birosik, the Board's Watershed Coordinator at sbirosik@waterboards.ca.gov or 213-576-6679, should there be any questions concerning this letter.

Sincerely,

A handwritten signature in black ink, appearing to be 'Deborah J. Smith', written over a faint, illegible typed name.

Deborah J. Smith
Chief Deputy Executive Officer