Attachment 5. Work Plan

The work plan for RD 2035 consist of two primary work products: (1) The development and implementation of a numerical model using Quantitative Management technology; and (2) a comprehensive update of its groundwater management plan consistent with new state law requirements. The work plan tasks will interact to provide the foundation for implementing RD 2035's Conjunctive Use and Environmental Enhancement Program. Specific tasks under the work plan will follow a brief narrative summarizing the application of quantitative management technology.

RD 2035 Conjunctive Use and Environmental Enhancement Program

The Groundwater Management Plan (GWMP) for the District and the Integrated Regional Water Management Plan for Yolo County (IRWMP) state the shared goal of ensuring a reliable and sustainable supply of surface water and groundwater for its users and the environment. Both plans set forth a conjunctive use management strategy within the District and Yolo County to maximize use while avoiding the potential adverse impacts associated with over utilizing either resource. Just as important, the GWMP and IRWMP recognize the statewide priorities to improve local water management and to contribute to Delta inflow objectives through adaptive management strategies and water banking and exchange agreements. The IRWMP specifically identifies an objective to provide a mechanism or process that facilitates the rational treatment of proposals for water imports, intra-county water transfers, and water exports.

The surface water and groundwater resources within the District can be managed to sustain reliable water supplies within Yolo County to make water available for transfer to areas within and outside the county. The potential constraints on such transfers are groundwater-level declines, land subsidence, stream-aquifer interactions, and water quality. Another constraint is an agreement between the Conaway Ranch, the largest landowner within the District, and Yolo County that irrigated agricultural production will be maintained on the Ranch.

Goals and Objectives

The goal of RD 2035's Conjunctive Use and Environmental Enhancement Program is to develop a decision-making tool and plan for the optimal utilization of the surface-water and groundwater resources within the District for local, regional and statewide benefit. A flowchart of the program logic is illustrated below in Figure 5.1. The objective is to apply the tools of quantitative management to create a plan that:

- Maintains irrigated agriculture within the District
- Maintains sustainable groundwater supplies within the District and adjacent areas
- Avoids permanent land subsidence
- Avoids adverse impacts on the Sacramento River and other streams
- Contribute to statewide planning goals

This would be accomplished by developing a characterization of the hydrologic system, representing that system within a mathematical model, and using the model and the methods of quantitative management to identify the optimal management of surface-water and groundwater resources. The primary focus will be developing a plan that is implementable using the existing infrastructure within the District.

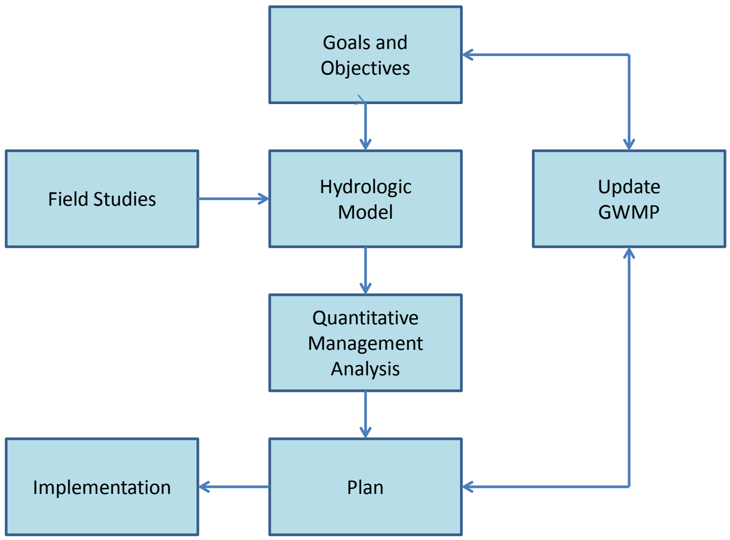


Figure 5.1 – Conjunctive Use Optimization Flowchart Using Quantitative Technology

That infrastructure includes a diversion structure on the Sacramento River, facilities for capturing Cache Creek and Willow Slough streamflows, canals and associated control structures and pumps, and groundwater production wells.

The plan will incorporate objectives delineated in the California Water Plan. The applicable objectives include:

- Expanding integrated regional water management
- Expanding conjunctive use of multiple supplies
- Expanding environmental stewardship
- Managing a sustainable Delta

A plan has been developed for the integration of water supplies among Woodland, Davis, and the RD 2035, and opportunities exist for integration with the Yolo County Flood Control and Water Conservation District (YCFCWCD). This RD 2035 Conjunctive Use and Environmental Enhancement Program will facilitate maximizing those opportunities.

RD 2035 currently manages surface-water and groundwater resources conjunctively, albeit in as a reactive form of management without full knowledge of the extent and magnitude of stream-aquifer interactions (See Project Description Background Summary of Stream-Aquifer

Interactions) or other potential impacts. The RD 2035 Conjunctive Use and Environmental Enhancement Program proposes to develop a decision-making tool and plan that will identify an annual and longer term optimal operations. This tool could be used each year once projected surface water supplies are reasonably known to determine that year's optimal usage of surface water and groundwater supplies. This same decision-making tool can also be used throughout the Sacramento and San Joaquin Valleys to extend the breadth and depth of benefits a forward-thinking conjunctive use plan will do for regions around and throughout the state.

For RD 2035, annual optimal conjunctive use plans will assist the District to better manage its available surface water supplies in conjunction with its underlying groundwater reservoir to benefit local and regional users in the north Delta region. RD 2035 currently manages water resources for agriculture, urban supplies, and habitat. This decision-making tool and plan will identify an annual and long-term optimal management program. The District has participated in water transfers that have benefited the Delta by increasing drought-year inflows, and the plan will be to help optimize the benefits of those transfers, while keeping local users whole.

Numerical Modeling Using Quantitative Management

Quantitative management is a method for translating a management problem into mathematical terms and solving the resulting equation set to optimize resource utilization. The translation identifies decision variables, an objective function, and a set of constraints. The decision variables might be the diversion volume and the pumpage from individual wells. The objective function and constraints are functions of the decision variables. As a simple example, the objective might be to maximize a drought-year transfer, which could have the benefit of increasing Delta inflows, based on the conjunctive use of surface-water and groundwater resources. The decision variables would be the surface-water not diverted and the corresponding groundwater pumping. The constraints would be to meet the irrigation demands within the District, to maintain groundwater-level changes within a specified range both within the District and adjacent areas, to avoid permanent land subsidence, and to avoid adverse impacts on the Sacramento River and other streams.

Quantitative management would be applied by using a publicly available code such as MINOS, which was developed at Stanford University. MINOS can be used to solve problem with a linear or nonlinear objective function, which mean that the objective function can be linearly and non-linearly related to the decision variables. MINOS also can be used to solve problems containing either linear or nonlinear constraints. Example MINOS applications include the development of a joint simulation model of the California Water Project and central Valley Project (Lefkoff and Kendall, 1996a). The model was used to identify facilities for maximizing the average yield of the State Water Project. Principal constraints were reservoir capacities, minimum streamflows, and Delta regulations. MINOS was also used to develop a management plan for drainage pumping within Turlock Irrigation District. The objective was to minimize operating and capital costs. The principal constraints were maintaining groundwater levels below a specified depth, satisfying irrigation demands, and maintaining total dissolved solids in irrigation canals below a specified maximum. Other water-resource applications of MINOS include Lefkoff (1996), Lefkoff and Kindal (1996b), and Durbin and Atkinson (1993).

The MINOS application to the Turlock Irrigation District required the incorporation of a groundwater model for the Turlock basin into MINOS. The model was used to formulate the groundwater-level constraints within the optimization problem. MINOS has facilities for embedding a model into the MINOS code. However, for that application, constraints were specified in terms of unit-response functions. A unit-response function for this case is the resulting groundwater-level hydrograph for a specified observation well due to pumping a unit volume from a particular production well. The groundwater model was used to develop the unit-response functions for all possible pairs for observation and production wells, and the hydrographs were inputs to MINOS. This approach was adopted because of its computation efficiency and because for linear or near linear groundwater systems the optimization results are the same as would have been obtained by embedding the groundwater model within MINOS. This approach will be used in developing the decision-making tool and plan for RD 2035.

Work Plan Task 1 – Data Collection

The purpose of Task 1 is to collect the available data required to develop the database for future use in the Quantitative Management model and the Groundwater Management Plan Update.

The collection and analysis of data and information is critical to the overall success of this program. This data will be used to formulate operational scenarios, as well as determine ongoing work programs and monitoring requirements. Significant existing data is available in the region, including RD 2035, but needs to be collected and put into an accessible database to apply quantitative management technology. Data will be collected on existing diversions, canal flows, groundwater levels, groundwater quality, surface water quality, cropping, monitoring well logs and other information. Additionally regional data will be collected from YCFCWCD, California Department of Water Resources (DWR), U.S. Geological Survey (USGS) and others. These data will provide regional information that will be stored in one location for access by multiple agencies. This database will be coordinated with YCFCWCD and the State.

A large body of existing studies will also be reviewed to insure consistency in policy objectives and operational goals. Pertinent information will be gleaned from these reports to populate the database. Review shall include, but not be limited to, the RD 2035 GWMP dated April 25, 1995, the IRWMP for Yolo County, the Integrated Groundwater Surface Water Model for Yolo County, Yolo County Land Use Documents, including the Yolo County Groundwater Ordinance, and other local and regional water-planning documents. In addition, water rights documents and water supply contracts will be reviewed in order to determine operational parameters, water delivery requirements and other constraints and obligations.

Sub-Task 1.1. Collect data on existing diversions, canal flows, groundwater levels, groundwater quality, surface water quality, cropping and other information from RD 2035

Sub-Task 1.2. Collect data from YCFCWCD, California DWR, USGS and others

Sub-Task 1.3. Review 1995 GWMP, Yolo IRWMP, and other local/regional water planning documents

Sub-Task 1.4. Review water rights documents and water supply contracts

Sub-Task 1.5. Review Yolo County Groundwater Ordinance

Work Plan Task 2 – Data Analysis and Management

The purpose of Task 2 is to analyze the available data collected under Task 1 and to enter those data into a database. The data will be analyzed and synthesized for later development of the Quantitative Management Model. Determinations will be made on the methods of proper storage and retrieval of the data.

A large mass of data and reports have been collected for RD 2035 and adjacent areas over the last 20 years. These items have been collected on diversions, canal flows, groundwater levels, groundwater quality, surface-water quality, cropping, and other information, which will be critical inputs to developing plans for optimizing the use of groundwater and surface water resources. However, those items are not organized for efficient use. To address that shortcoming, the data and reports will be compiled. From this, a centralized database will be developed for efficient access and use. The database would include both geographic and temporal information. That database also would include reports and other documents. DWR and YCFCWCD are developing water-resource databases, and the development of the proposed database will be coordinated with those agencies.

Sub-Task 2.1. Compile data in centralized database including both geographic and temporal time-series information

Sub-Task 2.2. Develop analytical tools including computer simulation scenarios representing basin groundwater and surface water dynamics

Sub-Task 2.3. Prepare and implement a plan to efficiently organize and retrieve data

Sub-Task 2.4. Determine data gaps and develop a plan to address needed information

Sub-Task 2.5. Determine and satisfy the requisite data needs for the Quantitative Management model

Work Plan Task 3 – Conduct Field Study

The purpose of Task 3 is to conduct and analyze a field study the Sacramento River stream-aquifer interactions. The study will yield information of the local-scale hydraulic characteristics of the connection between the Sacramento River and the underlying groundwater system.

Detailed hydrological, streamflow, groundwater production and ground subsidence information is needed to develop the Quantitative Management model. Key to developing the model is the characterizing of the interconnection between the Sacramento River and the underlying groundwater system. While the large-scale stream-aquifer interactions are well understood, little scientific information is available on the local-scale interactions. Initial steps of model development would be conducted under this task, which include activities such as identifying the modeling approach, determining the hydrogeological setting, analyzing stream-flow and groundwater data and crop irrigation patterns.

A long-term aquifer tests will be conducted using existing monitoring and production wells. The test results will be analyzed to characterize the hydraulic connection between the Sacramento River and the underlying groundwater system. While the Sacramento River is fully connected to the groundwater system, the hydraulic properties of the riverbed and underlying groundwater system probably have significant impacts on the temporal characteristics of stream depletion due to groundwater pumping. However, the purpose of the aquifer tests is to identify the particular impacts.

Fourteen wells are located near the Sacramento River in the vicinity of the Highway I-5 Bridge. See Figure 5.2 – Potential Wells for Stream-Aquifer Pump Test. Each of those wells is located within 2,500 feet of the river. The completed depths range from 90 to 500 feet. Three of the monitoring wells have multiple casings and completion depths. Wells are different distances from the river will be pumped in sequence. The test design will have characteristics of a step-drawdown test in a well. However, instead of varying the pumping rate, the pumping location will be varied. Most likely three different wells will be pumped in sequence with an expected duration of at least 30-days. The particular test design will be developed by running model simulations of the test to assess the physical relationship (mathematical description of the physical properties) or "identifiability" of the stream-aquifer connection. Identifiability is a property that a test must satisfy in order for inference to be possible. The tests will be designed so that the stream-aquifer connection can be characterized from the resulting data. The objective is to design a test such that test results are sensitive to the important characteristics of the connection.

The data collection and compilation will include measurements of pumping discharge, groundwater levels, river stage, groundwater chemistry, and streamflow chemistry. Groundwater-level and river-stage data will be collected using data loggers. Data compilation will start at least 30-days before starting pumping in the first well and 30-days after stopping pumping in the third well. In addition to these field data, geologic logs will be obtained and analyzed for the test and monitoring wells, geotechnical borings for construction of the Highway I-5 Bridge, and geotechnical borings for the construction of the RD 2035/Woodland-Davis Clean Water Agency (CWA) diversion structure on the Sacramento River. Data will be compiled from existing sources on the riverbed sediments. All the data collected above will be refined, categorized, classified and where appropriate mapped into a Geographical Information System (GIS).

The collected and compiled data will be analyzed using a three-dimensional local-scale groundwater model. The model also will be used in the design of the field study. The result of

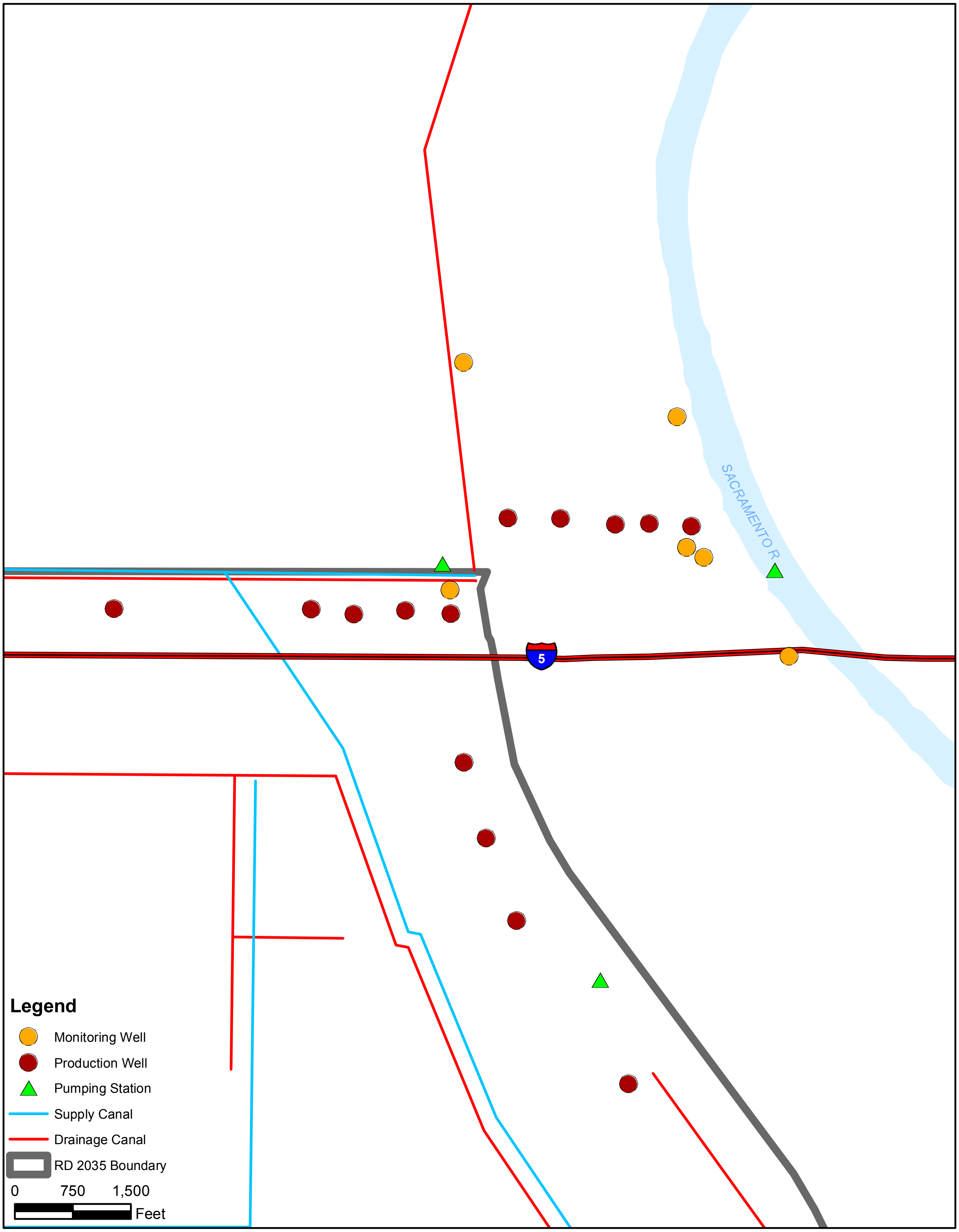


Figure 5.2 - Potential Wells for Field Test of Stream-Aquifer Interactions

the analysis will be a quantification of the hydraulic connection between the Sacramento River and underlying groundwater system within the vicinity of RD 2035.

Sub-Task 3.1. Review existing data on stream-aquifer interactions, including data within other Sacramento Valley areas

Sub-Task 3.2. Design a field study to quantify the hydraulic connection between the Sacramento River and underlying groundwater system within the vicinity of RD 2035

Sub-Task 3.3. Analyze the field data, along with other information, using a local-scale groundwater model

Work Plan Task 4 – Development of Operational Alternatives

The purpose of Task 4 is to identify potential operational rules, alternative procedures and scenarios. The result will be a collection of alternative objective functions for use within the Quantitative Management model and corresponding sets of operational constraints.

From the information collected under tasks 1 thru 3, "draft" rules of operations based on seasonal, annual and long-term conditions will be developed. The result will be sets of alternative objectives and constraints to be analyzed with the Quantitative Management model. Examples of alternative objectives include optimizing drought-year water supplies, maximizing intra-basin and inter-basin transfers, water-quality conditions, or habitat quality. Examples of alternative constraints include satisfying municipal, agricultural, and environmental water demands within RD 2035 and adjacent areas; limiting groundwater-level impacts, limiting stream-aquifer impacts, or preventing permanent land subsidence. These "draft" alternatives will be tested and analyzed under Task 5 Quantitative Management modeling.

Historical and projected periods will be selected for analyzing alternatives. The historical data on weather, streamflows, and other factors will be analyzed to identify a period representative of long-term historical conditions. The modeling results available from CALSIM and other models could be used define alternative future periods. An initial step in identifying the historical and future modeling periods will be to specify the water-use, streamflow, and weather characteristics to be represented. The operational objectives and constraints will set the stage for model development.

Sub-Task 4.1. Identify alternative operational objectives based on seasonal, annual and long-term conditions

Sub-Task 4.2. Identify the constraints associated with each objective

Sub-Task 4.3. Identify historic and projected periods for analyzing alternatives

Sub-Task 4.4. Develop Technical Memorandum #1 to memorialize alternative operational objectives and constraints

Work Plan Task 5 – Quantitative Management Model Development

The purpose of Task 5 is to create the Quantitative Management Model, which includes the development of an embedded groundwater model representing higher resolution stream-aquifer interactions.

A Quantitative Management Model will be created for the optimal utilization of the surface-water and groundwater resources within RD 2035. The objective would be to develop a model that would act within the constraints of maintaining the current irrigated cropping, maintaining sustainable groundwater supplies within both RD 2035 and adjacent areas, avoiding permanent land subsidence, avoiding adverse impacts on the Sacramento River and other streams, and other constraints identified within Task 4. This would be accomplished by developing a characterization of the hydrologic system, representing that system within a Quantitative Management Model, and using the model and the methods of quantitative management to identify the optimal management of surface-water and groundwater resources.

The Quantitative Management Model will embed a groundwater model. A groundwater model has been developed for Yolo County, but that model does not have sufficient detail within RD 2035 for creating an optimization plan. The existing model does not have sufficient geographical and vertical detail near the Sacramento River, and it does not have sufficient detail with respect to rice production and flood-control flooding within the Yolo Bypass. A new local groundwater model will address these shortcomings of the existing model.

The groundwater model will be used in conjunction with the methods of quantitative management. Quantitative management is a systematic and scientific approach to problem solving and decision making in complex environments and situations of uncertainty and conflict. The discipline is characterized by a search for an optimal answer for a problem by using mathematical models. Quantitative management is a practical method: It has been applied in many settings, including water-resources management, manufacturing, businesses management, banking, environmental planning, and other settings. The methods will be applied quantifying the objectives and constraints with respect to water-resources management within RD 2035.

A final report will be prepared to document the development, calibration, and application of the quantitative management model. This model can then be adapted for use by other water suppliers for conjunctive use purposes.

Model Development

A local groundwater model will be developed for the RD 2035 and adjacent areas. The model will be a refinement of two existing models: (1) a model developed for the RD 2035 to assess the impacts due to assigning surface-water from the District to the Woodland-Davis CWA. The assignment involves delivery of surface water from the RD 2035 to the CWA, a reduction in pumping by the agency member, and an increase in pumping within the RD 2035 to replace the assigned surface water; and (2) the Integrated Groundwater Surface Water Model (IGSM) for Yolo County. The new model will have a higher resolution mesh within the District and adjacent areas, and it is formulated based on the principal of superposition (Durbin and others, 2008). Accordingly, the model simulates change in groundwater levels and stream-aquifer interactions due to changes in pumping and recharge. See Figures 5.3 and 5.4 below showing new higher resolution modeling mesh to more accurately characterize stream-aquifer interactions.

As seen in both figures, the existing model does not have sufficient geographical and vertical detail near the Sacramento River. The characteristic horizontal dimension of elements within the model range from 1,500- to 5,400-feet (Average 2,800 feet), and the vertical dimension of elements is about 500-feet (Three element layers). Furthermore, the model does not have sufficient detail with respect to the Sacramento River and its connection to the groundwater system.

The new groundwater model addresses these shortcomings, but it needs additional refinement. One need is to refine the characterization of the groundwater system underlying the District and immediately adjacent areas. Another need is to refine the representation of the Sacramento River and its connection to the groundwater system. The first need will be addressed by re-examining the geologic and geophysical logs for wells within and adjacent to the District. The second need will be addressed by conducting and analyzing aquifer tests. The characteristic horizontal dimension of elements within the new model will range from 100- to 6,800-feet (Average 1,200 feet), and the vertical dimension of elements about 180 feet (8 element layers).

Aquifer characteristics for the refined model will be based largely on an existing Yolo County models developed for the Yolo County WRA (Yolo County IGSM, May 2006) and the Central Valley model developed by DWR. Information derived from those models will be supplemented with the analysis of specific-capacity data extracted from Well Completion Reports for Yolo County and surrounding counties overlying the Sacramento Valley groundwater basin and on long-term aquifer tests conducted previously within RD 2035 and adjacent areas.

Because the groundwater model will be developed and used based on the principal of superposition, a traditional model calibration will not be applied. The model will simulate only changes in groundwater levels due to changes in pumping or recharge. Correspondingly, hydraulic properties will be assigned to the model based on composite of sources. First, aquifer properties will be derived by applying the model to various existing aquifer-test data. By that application, the model will be calibrated to the drawdowns measured during the tests. Second, the identification of hydraulic properties will incorporate results of 2,000 specific-capacity test covering RD 2035 and adjacent areas. Finally, the identification of hydraulic properties will incorporate parameter values used within other models, which includes the Yolo County IGSM, the Central Valley model developed by DWR, a Central Valley model developed by the USGS, and a Sacramento Valley model developed for the Glenn Colusa Irrigation District. Appropriate statistical methods will be applied to the final assignment of hydraulic properties in order to quantify the predictive reliability of the model. All of the assumptions, parameters, and model development will be subject to rigorous quality assurance protocol as indicated in Attachment 8.

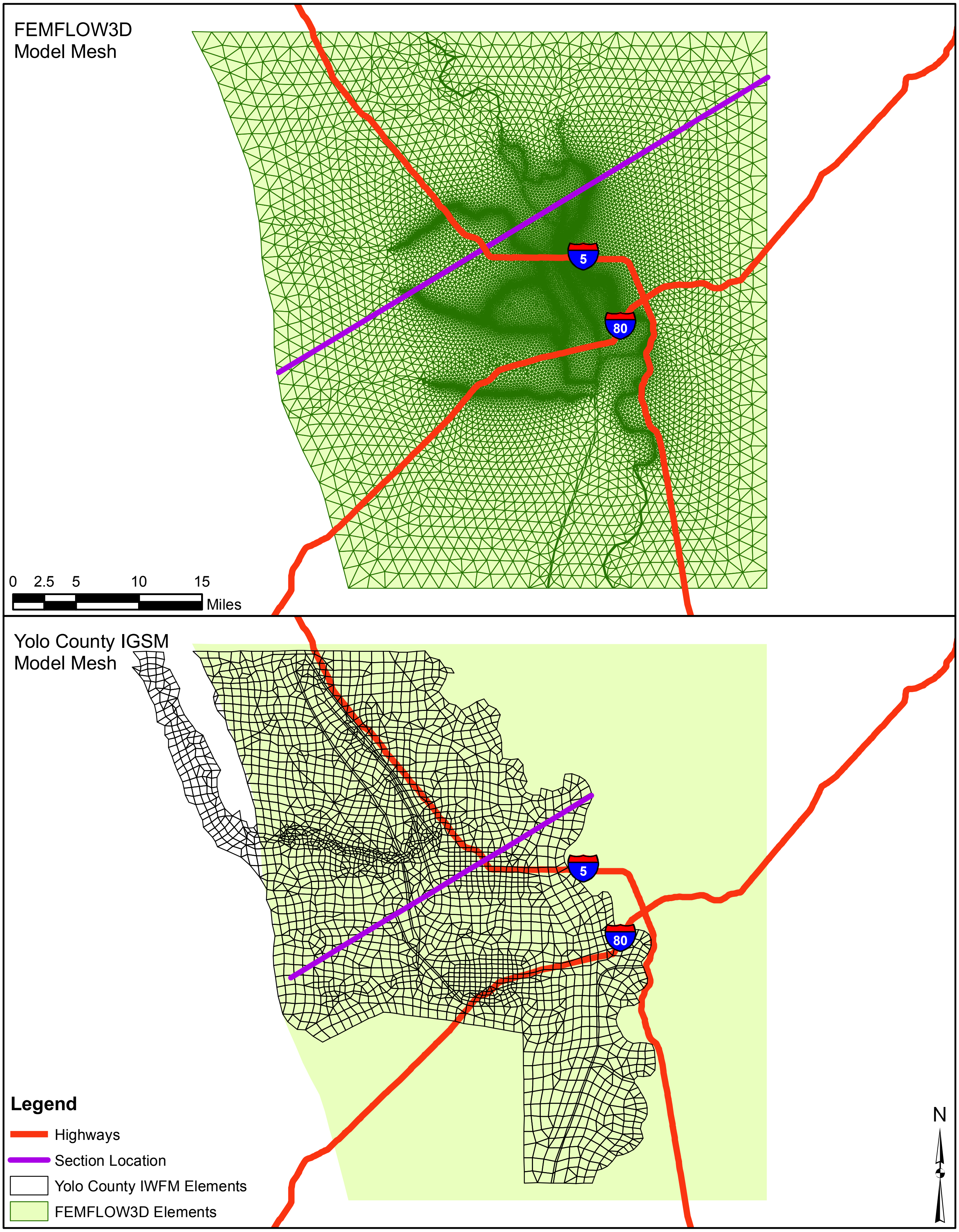
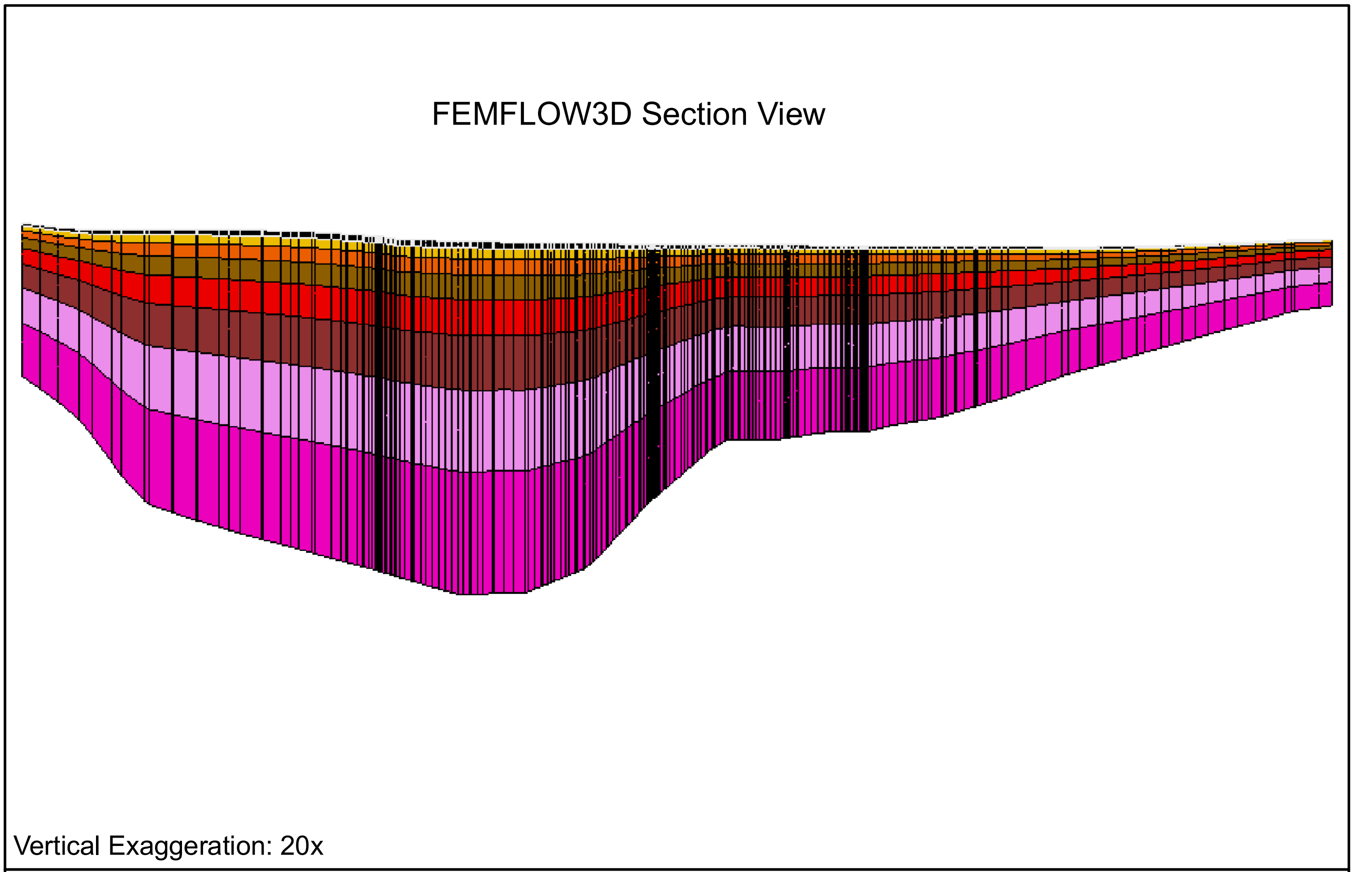


Figure 5.3 - Model Mesh Comparison: Plan View



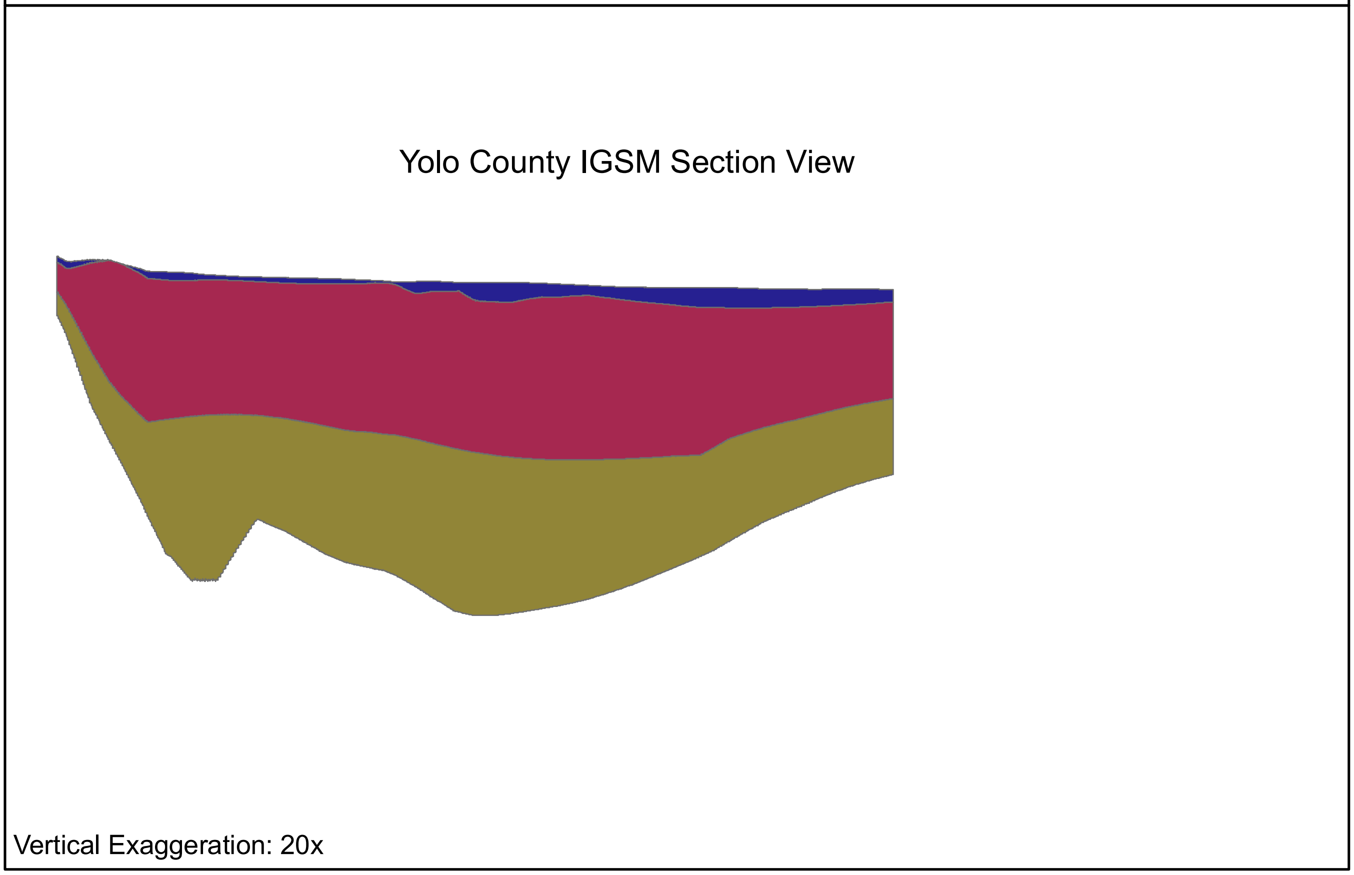


Figure 5.4 - Model Layer Comparison: Section View

The superposition principal is most familiarly applied to relatively simple problems, but it also can be applied to more complicated analyses (Durbin and others, 2008; Leake, 2008; Halford, 2011; Durbin and Loy, 2010). Superposition can be applied to problems with nonlinear head-dependent fluxes, such as streams-aquifer interactions, groundwater use by phreatophytes, and springs (Durbin and other, 2008; Halford, 2011; and Durbin and Loy, 2010). For developing a management plan for the District, the superposition model will be used to simulate changes in groundwater levels and stream-aquifer interactions with the Sacramento River and possibly other streams due to changes in pumping and recharge. The model will likely be based on the finite-element code FEMFLOW3D (Durbin and Bond, 1998), but other model codes will be considered.

Sub-Task 5.1. Create groundwater model using refined mesh to represent better stream-aquifer interactions.

Sub-Task 5.2. Create Quantitative Management Model based on MINOS for similar quantitative management software.

Sub-Task 5.3. Use the Quantitative Management Model to evaluate the alternative identified within Task 4.

Sub-Task 5.4. Quality Assurance will be done per Attachment 8.

Sub-Task 5.5. Prepare two reports: (1) Technical Memorandum #2 summarizing initial model development and findings (To be presented at GWMP update kick-off meeting, Task 7.4); and (2) A Final Quantitative Management Model Report, including operational instructions.

Work Plan Task 6 – Groundwater Management Plan Update

The purpose of Task 6 is to prepare and write a comprehensive update of RD 2035's Groundwater Management Plan in full compliance with California Water Code (CWC) Section 10750 et. seq.

RD 2035 adopted a GWMP on April 25, 1995 and has issued annual groundwater monitoring reports pursuant to the plan since that time. The adopted plan will be updated to be consistent with revisions to the California Water Code (CWC) resulting from Senate Bill No. 1938 (SB 1938) and any new laws pertaining to groundwater management. The update will be integrated with the results of Tasks 4, 5 and 7.

SB 1938 establishes a revised framework for GWMPs with the intent of encouraging local agencies to work cooperatively to manage groundwater. SB 1938 became effective on January 1, 2003 through amendments to CWC §10750 et. seq. To be eligible for funding for construction and groundwater projects administered by the California Department of Water Resources (DWR), the CWC revisions require local agencies to:

1. Make available to the public a written statement describing the manner in which interested parties may participate in development of a GWMP, which may include appointing an advisory committee.

2. Prepare and implement a GWMP that includes Basin Management Objectives (BMOs) for the groundwater basin that is subject to the plan.

3. Include components relating to the monitoring and management of groundwater levels within the groundwater basin, groundwater quality degradation, inelastic land subsidence, and changes in surface water flow and quality that directly affect groundwater levels or quality or are caused by groundwater pumping in the basin. Consider additional components listed in CWC §10753.8 (a) through (l).

4. Prepare a GWMP that involves other agencies and enables the local agency to work cooperatively with other public entities whose service areas or boundaries overly the groundwater basin.

5. Adopt monitoring protocols that are designed to detect changes in groundwater levels, groundwater quality, inelastic subsidence in basins for which subsidence has been identified as a potential problem, and flow and quality of surface water that directly affect groundwater levels or quality, or are caused by groundwater pumping in the basin. The monitoring protocols should be designed to generate information that promotes efficient and effective groundwater management and supports attainment of the BMOs.

6. Prepare a map that details the areas of the groundwater basin, as defined in DWR Bulletin 118, the area that will be subject to the plan, and the boundaries of the local agencies overlying the basin.

The revised statutes apply to DWR-administered funding authorized or appropriated after September 1, 2002. The CWC identifies key milestones in preparing the GWMP. These are:

1. Issue a public notice in advance of a hearing on whether or not to adopt a resolution of intent to prepare a GWMP.

2. Hold a public hearing on whether or not to adopt a resolution of intent (first hearing). The hearing could be part of a publicly-noticed Board of Directors meeting.

3. Adopt the resolution of intent at the Board of Directors meeting after hearing public comment.

4. Issue a public notice announcing the adopted notice of intent (to be provided to any person on written request). Include a statement on how members of the public can participate in the planning process.

5. Prepare and adopt the GWMP within two years of adopting resolution of intent.

6. Issue public notice in advance of hearing on whether or not to adopt the GWMP.

7. Hold public hearing on whether or not to adopt the GWMP and to consider protests (second hearing). The hearing can be held in conjunction with a Board of Directors meeting.

8. Adopt the plan within 35 days of second hearing, if a majority protest has not been filed.

Sub-Task 6.1. Review existing RD 2035 GWMP and California Water Code Section 10750 et.seq. to ensure groundwater management plan update is consistent with the latest California Water Code provisions related to groundwater management planning requirements.

Sub-Task 6.2. Incorporate data developed under Task 1 through Task 5 to incorporate into GWMP.

Sub-Task 6.3. Summarize existing BMO's within region and develop BMO's for the GWMP update consistent with existing monitoring and management components, regional BMO's, the California Water Plan, and other regional planning documents. Ensure updated BMO's tie in to Task 5, Quantitative Management Model.

Sub-Task 6.4. Establish means and methods to involve various agencies, stakeholders and the public in development of the GWMP.

Sub-Task 6.5. Prepare groundwater basin maps and other documents in accordance with DWR Bulletin 118.

Sub-Task 6.6. Prepare and adopt Final Groundwater Management Plan and circulate copies of the Plan to local agencies, the State, and post on web page to make available to community.

Developing an overall groundwater management goal and supporting BMO's using a process that involves the public and basin stakeholders is essential. Developing a statement of the overall purpose or goal of groundwater management plan efforts will be developed and presented to local agencies and the community to begin the dialogue. This statement of purpose or overall goal should include language pertaining to maintaining a long-term, sustainable, reliable supply of high quality groundwater for beneficial use in the RD 2035 service area and adjacent areas.

BMO's are the objectives set to support the overall goal of maintaining a long-term, sustainable, reliable supply of acceptable quality water for beneficial use within RD 2035 service area. BMO's are the means of identifying and prioritizing the most important issues in meeting water resources needs.

BMO's can range from being entirely qualitative to entirely quantitative. Each BMO should have a criterion or threshold, which can be used to assess progress towards the BMO and trigger management actions. Complying with the groundwater management plan components required under SB 1938 results in the establishment of BMO's for the management of:

- Groundwater elevations.
- Groundwater quality degradation.
- Inelastic land subsidence.
- Changes in surface water flow and quality that directly affect groundwater levels or quality, or are caused by groundwater pumping in the basin.

BMO's will be established in coordination with local agencies, the community, and the State. Preliminary thresholds for physical values, such as groundwater elevations, will be based on an evaluation of historical monitoring data. BMO's will then be linked to management actions that are planned or triggered to attain the BMO's and the overall groundwater management goal during development of the GWMP.

The overall management goal and BMO's will be developed in a series of three workshops with RD 2035 staff. Draft management objectives, draft BMO's, supporting rationale and technical bases will be prepared and distributed to RD 2035 staff in preparation for the public workshops. Following each workshop, an update of the management objectives and BMO's will be redistributed to RD 2035 staff for further consideration. After the first workshop the management goal and BMOs will be considered sufficiently well-defined to begin development of the draft GWMP. If desired by RD 2035, one or more of the workshops will be public workshops.

The GWMP will be prepared consistent with guidelines provided in DWR Bulletin 118: California's Groundwater – Update 2003. Development of the GWMP will begin after working drafts of RD 2035's overall management objective and BMO's have been reviewed by RD 2035 staff under Task 6.3. The GWMP will be developed in consultation with RD 2035 staff following the process defined in Task 7.3 below for keeping stakeholders and members of the public involved and informed. The GWMP update will also address the following items from DWR Bulletin 118:

- Advisory Committee. RD 2035 will invite stakeholders and local agencies to participate in a technical advisory committee (TAC) to coordinate the planning process and its implementation, and facilitate periodic review of the model development and update of its groundwater management plan.
- Management Area Definitions. Management areas and sub-areas may be defined based on physical, institutional and legal boundaries. BMO's may be developed down to the level of the individual management areas using a process that accounts for overlapping spheres of influence and the cumulative effects of groundwater production by multiple stakeholders.

- Clear Linkage of Goals, BMO's and Actions. The GWMP will clearly state the goals and provide links between these goals, the supporting BMOs and actions that are planned or triggered to attain the BMO's.

- Describe the Plan Monitoring Program. The GWMP will incorporate CWC Section 10750 et. seq. requirements for its monitoring program tailored to RD 2035 needs.

- Integration of Water Management Planning Efforts. The GWMP will be written to integrate RD 2035's planning efforts with other regional efforts. These could include Yolo County planning efforts and efforts undertaken by YCFCWCD, the WRA and its member agencies.

- Reports on Implementation. An implementation report will be developed to show tasks and timeline for completing annual conjunctive use analysis and issuance of periodic reports summarizing the condition of the groundwater basin within the RD 2035 service area, results of management actions, and recommendations for future actions.

- Periodic Evaluation of the GWMP. A proposed schedule for review and update of the GWMP by RD 2035's TAC will be developed to manage conditions as they evolve and new information about the groundwater basin is obtained. The review process will also include evaluation of the management actions taken by RD 2035 to determine whether similar actions could be expected to be successful in the future.

A draft of the GWMP will be prepared for review by RD 2035 staff. After incorporating comments, an administrative draft will be prepared of the GWMP that will be distributed to stakeholder agencies for review. After incorporating stakeholder comments, the revised draft GWMP will be redistributed to RD 2035 staff and stakeholders to verify that all comments are appropriately addressed. A revised draft GWMP will be provided to RD 2035 for public review. After a 30-day review period the GWMP will be finalized and submitted to the RD 2035 Board for adoption.

Work Plan Task 7 – Management, Environmental Considerations and Public Outreach

The purpose of Task 7 is to conduct a policy-level determination of potential environmental issues, obtain a high-level of stakeholder, agency and public participation in the project and manage the project to comply with all DWR contract requirements.

The project will include extensive public agency, stakeholder and general public involvement. Activities to maximize public input shall include the following:

- Initial Public Meeting explaining the Program after contract award

- Ongoing information posted to web site regarding the status of the Program

- Initiation of a Technical Advisory Committee (TAC) made up of agency personnel and other qualified members to provide input on the development of the model

- Development of a mailing list, email list and/or social media page to inform interested parties and stakeholders in respect to program activities and milestones
- Regular discussion and program updates at appropriate public meetings held within the region
- Public workshop to explain Quantitative Management Models and GWMP
- Public Hearing before adoption of the quantitative model
- Two public hearings associated with the GWMP update

Other activities will include coordinating RD 2035's program with DWR and overall project management. Additionally, coordination activities with the TAC, WRA, and other stakeholders through completion of the scope of work will be provided.

Sub-Task 7.1. **Project Management**. Good project management is essential to carry out the LGA contract requirements efficiently and effectively and to ensure the contract goals and objectives are met. The Project Director and Project Manager assigned to carrying out this LGA grant Program have demonstrated success with many years of experience. This project management task will develop and maintain appropriate consulting contracts and invoices and will prepare quarterly progress reports in accordance with the LGA agreement. Project management will also be responsible to ensure project deliverables are done well and on time.

Sub-Task 7.2. **Environmental Considerations.** Upon completion of model development and management strategies, Task 5 above, perform policy and legal analysis of program implementation. Project manager will engage appropriate counsel and technical resources to provide a summary report recommending the appropriate level of environmental analysis that should be done to implement the conjunctive use program.

Sub-Task 7.3. **Public Outreach and Education.** Effective development of Quantitative Management Strategies and the GWMP Update will depend on the public outreach and education efforts. Public outreach and education provides the means for RD 2035 to understand the needs and concerns of stakeholders (those who may be impacted by implementation of the conjunctive use program and the GWMP, often being individuals or entities that are using the groundwater resources) and stakeholder entities with groundwater management responsibilities.

Education and outreach efforts also provide the means to educate the stakeholders and management entities about RD 2035's groundwater management activities. A written statement will be prepared describing the process that RD 2035 plans using to inform the basin stakeholders and the public, and will assist RD 2035 in performing public outreach and stakeholder coordination. This task will also include identifying basin stakeholders that may have interest in the GWMP. These are anticipated to include:

- Yolo County
- YCFCWCD
- City of Woodland
- City of Davis
- Woodland-Davis Clean Water Agency
- Water Resources Association of Yolo County

Public outreach and an education program will be central to the model development and GWMP update. Specific items to be accomplished for public outreach and education include the following:

- Issuance of a public notice 30 days in advance of a public hearing on whether or not to adopt a resolution of intent to prepare a GWMP (per CWC).

- Convening of a public meeting to consider adopting a resolution of intent to prepare a GWMP. This could be an RD 2035 Board meeting or WRA advisory committee meeting (first hearing, per CWC).

- Issuance of a written statement describing the manner in which interested parties may participate in development of the GWMP (per CWC).

- Conducting a stakeholder workshop to discuss model development and initial findings, along with purpose and plan for developing the GWMP update.

- Conducting a public workshop to discuss the public draft GWMP.

- Convening of a public meeting to consider adopting the GWMP (second hearing, per CWC).

Conjunctive Use Optimization Implementation Strategy and Schedule

With the completion of this proposed RD 2035 Conjunctive Use and Environmental Enhancement Program, an optimal conjunctive use plan will be ready for implementation. The Technical Advisory Committee developed during the SB 1938 update will continue to meet in coordination with RD 2035 to discuss and oversee an implementation plan for this conjunctive use optimization tool. The TAC will continue to meet at least quarterly to discuss changing hydrologic conditions within the basin and to evaluate BMO’s developed during the SB 1938 GWMP update.

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