

Wilson Creek Detention Facility Hydrogeologic Basin Evaluation

United States Bureau of Reclamation

Statement of Work

1. Background/Purpose/Benefits

The Colusa Basin Drainage District (District) is implementing an Integrated Watershed Management Plan, which consists of a variety of flood control and environmental restoration measures intended to reduce flooding and related damage, improve water quality, and restore and enhance environmental resources within the Colusa Basin, Glenn County, California. The primary goal of the proposed Integrated Watershed Management Plan (IRMP) is to develop facilities and programs to reduce peak flood flows in conjunction with environmental restoration and enhancement measures. The District's objectives in implementing the IRMP include the following:

- Work in tandem with landowners; other interested parties and local, state, and federal agencies;
- Minimize property damage caused by flooding within the study area;
- Maximize landowner benefits;
- Enhance and protect environmental resources;
- Minimize impacts to downstream interests;
- Improve water quality by minimizing erosion and sedimentation;
- Provide additional opportunities for groundwater recharge where feasible; and
- Ensure measures are compatible with the primary objectives of CALFED and the California Department of Water Resources.

In May 2001, Reclamation and the District completed an Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for implementation of the Colusa Basin Integrated Watershed Management Plan. Subsequently, the Record of Decision (ROD) was filed in November 2001.

An important element of the Integrated Watershed Management Plan is the development of three flood detention basins in Glenn County. One of the proposed sites for detention occurs in the Wilson Creek watershed.

The purpose of the Wilson Creek Hydrogeologic Basin Evaluation is to conduct a focused Hydrogeologic Basin Evaluation at the Wilson Creek Detention Facility to supplement ongoing related hydrogeologic work and to support both planning and design elements prior to future construction of a detention basin on Wilson Creek.

There are many benefits of creating the detention facility on Wilson Creek including, but not limited to the following:

1. Alleviate peak flood flows, reduce the risk to public health and safety, and reduce flood damage to residences, businesses and public infrastructure in the vicinity of Willows, CA;
2. Assist in groundwater recharge of the local aquifer; and
3. Capture surface stormwater for conservation, conjunctive use, and increased water supply.

These benefits are consistent with flood protection and integrated resources management as described in Final EIR/EIS and the IRMP. In addition, implementation of this Evaluation would not in any way be inconsistent with the Central Valley Project Improvement Act or the CALFED Bay-Delta Program. The Evaluation, and possible future construction of the detention basin, would compliment ecosystem restoration goals of each program.

2. Responsibilities of Parties

The Colusa Basin Drainage District is responsible for the successful completion of the project. The District will be receiving technical guidance from with the Bureau, the CA Department of Water Resources, and a Technical Advisory Committee (TAC) during the project. Members of the TAC will include Colusa Basin Drainage District, Glenn County Water Advisory and Technical Advisory Committees (WAC/TAC) and local interest groups.

3. Statement of Work

The following tasks were developed consistent with the District IRMP objectives. This effort is being completed in tandem with landowners, other interested parties, and local, state, and federal agencies. The results of this effort will: provide information supporting design of the Wilson Creek Flood Detention facility; improve the understanding of the groundwater recharge feasibility and limitations; and, will help identify opportunities for environmental enhancement along Wilson Creek.

The approach to the hydrogeologic evaluation includes developing an understanding of water needs that could potentially be reduced using detained flood water, identifying additional groundwater monitoring to improve the ability to assess groundwater recharge opportunities and limitations, and completing a focused hydrogeologic evaluation in the project area that will result in an improved understanding of project opportunities for groundwater recharge and environmental enhancement.

The following tasks are components of the Hydrogeologic Basin Evaluation. The expected total cost of the following Statement of Work is \$213,690. This request is for \$129,860. Project partners will provide the remaining funding.

Task 1 – Perform Water Needs Analysis

The objective of Task 1 is to develop an understanding of current water needs in Glenn County, including the assessment of water needs for environmental enhancement and groundwater recharge. The documentation of water needs will assist in the identification

of options associated with the management of the Wilson Creek Detention Facility. Flood water released from the detention facility could be managed to provide water for environmental enhancement or groundwater recharge, based on the results of the needs analysis.

Task 1.1. Gather, Compile, and Evaluate Data and Information

Data and information related to determining historic and existing water use would be compiled and evaluated. This would include land use maps prepared by DWR for 1993 and 1998, which are available in electronic form. To the extent land use information for 2003 is available from DWR, the work from it would be used also. Additional information would include historic and future population projections, land use plans from the cities of Glenn County, agricultural crop water use from the UC Extension Service that would be validated with the agricultural community, soils and crop suitability maps, and resources management plans of local public and private entities, State and Federal agencies as may be related to wetlands, habitat, and fisheries management. Obtaining information from the public and private water purveyors and agricultural water districts related to water rights, contracts, and water use would be important as well. To the extent some of this information has been compiled for other work that has been completed or is underway every effort will be made to avoid duplication of effort.

Task 1.2. Inventory Existing Water Purveyors

In the course of gathering data and information, particular attention would be given to identifying all purveyors of municipal and agricultural water supplies. This would include both public and private entities. This information would be relevant not only for this assignment, but useful in the future for considering the location and timing of recharge below the Wilson Creek Detention Facility, drought contingency planning, and in complementing the formulation of the groundwater monitoring program.

Task 1.3. Inventory Existing Water Supplies

Using information gathered under Activity 1, existing water supplies would be characterized in terms of quantity, quality, and reliability and the place of use. Any constraints related to the flexibility in the place of use would be identified. This information would be compiled and presented in both text and graphical formats.

Task 1.4. Determine Existing Water Use

Unit water use values would be determined for the respective water use categories, including environmental, agriculture, industrial, and municipal and domestic. The unit water use values would be extrapolated to the respective uses to determine total values. Water use would be defined in terms of applied water, consumptive use, and return flow or excess applied water.

Task 1.5. Estimate Future Water Use

Future water use would be estimated for the water use categories noted above. Since the water use projections would extend beyond the time frame of current

general plans of the Cities and County, close coordination would be required with the planning and public works personnel of the respective entities. Where land use changes the overall water balance, estimates and characterization of the impacts would be determined.

Task 1.6. Identify Existing and Future Water Supply Deficiencies

Using the information developed in Tasks 1.3 and 1.4, the geographic locations, amounts, and conditions under which water supply deficiencies may exist would be identified. This information would assist in evaluating how releases from the Wilson Creek Detention Facility could be managed to address such deficiencies.

Task 2 – Complete Formulation of the Groundwater Monitoring Plan and Identify Future Monitoring Needs

The objective of Task 2 is to evaluate existing groundwater monitoring activities and to develop an implementation plan that will contribute to an improved understanding of opportunities for groundwater recharge. Specific to Wilson Creek, groundwater monitoring will assist in defining opportunities associated with the use of detained water for groundwater recharge. Through the efforts of WAC/TAC and water entities throughout the county and region, staff will lay the foundation to complete the groundwater monitoring plan and identify future monitoring needs in the county. An improved groundwater monitoring program will assist the District during IRMP implementation activities associated with the IRMP objective of providing additional opportunities for groundwater recharge. The following activities are being undertaken to develop a comprehensive understanding of groundwater monitoring needs.

Task 2.1. Gather, Compile, and Evaluate Existing and Proposed Groundwater Monitoring Programs

Through the WAC and TAC and with the professional assistance of DWR, Glenn County has made a great deal of progress on its groundwater monitoring program for both groundwater level and quality and subsidence, yet more remains to be done to have a countywide program. The existing groundwater monitoring programs conducted by the WAC are well known, however, the plans of the various water purveyors for future groundwater monitoring is not well known. Accordingly, this activity would focus on compiling the plans or thoughts of the various purveyors for evaluation as part of an overall County groundwater monitoring program. Other information gathered under this activity includes groundwater quality data that might be available from the DWR, the USGS, Department of Public Health Services, County Public Health Department, and Department of Pesticide Regulation.

Task 2.2. Develop Countywide Groundwater Monitoring Program

Using the information compiled and evaluated from the previous activities, the framework for a countywide groundwater monitoring program would be developed. Particular “target” areas may be identified.

Task 2.3. Develop Priority Implementation Plan

From a practical standpoint programs as envisioned for this task cannot be implemented at one time. The success of Glenn County to date in addressing its groundwater monitoring plan incrementally is a good example. Accordingly, the intent here is to prioritize the components of the county's groundwater monitoring plan so that as funding becomes available it is known beforehand what the next increment should be to best serve the needs of the county. This activity would identify increments in implementation using a budget for each increment as agreed upon with the WAC.

Task 3 – Wilson Creek Hydrogeologic Evaluation

Initial evaluation of the Wilson Creek Detention Facility site indicated the existence of gravel strata from the embankment foundation site extending downstream for a considerable distance. Evaluation of the gravel characteristics, lateral extent, and vertical extent will help guide the design of the outlet structure at the facility, because the extent of downstream recharge will directly affect the size of the outlet structure. Stream gravel characteristics will also directly affect the flood control operation of the Facility because groundwater recharge acts to reduce peak flows in the Wilson Creek channel.

In addition, local geology and the aquifer characteristics must be evaluated prior to design of the flood water detention facility to ensure that facility operation does not create downstream impacts through intermittently high groundwater conditions. By conducting groundwater monitoring, the facility can be designed and operated to minimize potential environmental impacts, including damage to downstream orchards and crops, which could result from high groundwater conditions. Understanding the gravel characteristics and extent coupled with defining areas needing improved or additional groundwater monitoring will further the twin goals set forth in the ROD of "reducing flooding and improving the environment of the Colusa Basin."

The following tasks describe work efforts associated with developing an improved understanding of the opportunities and limitations associated with groundwater recharge associated with the potential construction and operation of the Wilson Creek Detention Facility.

Task 3.1. Wilson Creek Exploratory Borings

Exploratory borings will be advanced to characterize the alluvial gravels in the Wilson Creek area and gravels of the underlying Tehama Formation. A series of twelve - 100 to 200 foot deep test holes will be drilled along Wilson Creek to develop an understanding of the relationship between the upper gravels of Wilson Creek and the underlying Tehama Formation gravels. The exploratory borings will provide needed information on each of the gravel characteristics, lateral extent, and vertical extent

Deliverables:

The lithology of shallow exploratory borings will be logged to document strata inter-connection and hydrogeologic conditions immediately downstream of the proposed Wilson Creek Detention Facility.

Task 3.2 Compile Hydrogeologic Data

Currently, there is a minimum of 30 deep agricultural production wells with precise electrical log and construction data available in the vicinity of the study area. This high quality data will be compiled and reviewed in a comprehensive manner in conjunction with data collected from this project. The Tehama Formation, underlying the surficial gravels along Wilson Creek, is composed mainly of clay and discontinuous layers of sand and gravel. The compiled data will provide needed information to support the evaluation of the possible continuity and/or connection between shallow alluvial gravels and deeper Tehama formation gravels.

Deliverables:

Data compiled under Task 3.2 will be used to support the evaluation and reporting under Task 3.3.

Task 3.3 Evaluation and Reporting of Hydrogeologic Data

Compiled data will be evaluated and summarized into a final report that will document the activities completed in Task 3.1 and Task 3.2. Based on the evaluation of new and existing information, a report will be developed that describes the methods, information, and findings resulting from the hydrogeologic investigation. The report will include cross-sections that provide a graphical representation of the lateral and vertical extent of gravels in the project area. The report will document the nature and extent of surficial gravels and possible sand and gravel layers in the Tehama Formation. Information contained in the report will be utilized during subsequent Wilson Creek Detention Facility design activities.

Deliverables:

The District will provide Bureau of Reclamation with a draft copy of the report for comment. Following incorporation of comment received from the Bureau of Reclamation, the District will finalize the report and provide both a hardcopy and electronic copy.

Task 4 - Project Management

The Colusa Basin Drainage District will be responsible for the successful completion of the project. The District will work collaboratively with the Glenn County Department of Agriculture to schedule and oversee work performed in the field, oversee the budget, prepare all necessary contracts and agreements as required, compile and prepare reports, conduct public outreach, provide monthly status reports on the progress of the work, and present pertinent information as it is developed. The Glenn County Department of Agriculture has been involved with integrated water resource activities in

the project area and will provide value through its local technical knowledge and relationships.