

Inland Empire Utilities Agency
Local Groundwater Assistance Grant Program 2012 Scope of Work
Prado Basin Habitat Sustainability Program

SCOPE OF WORK

Adaptive Management Study

Task 1 – Research a Range Factors Potentially Impacting Habitat

The Adaptive Management Study (Study) is intended to support the Chino Basin Desalting Program and overall Hydraulic Control program within Chino Basin. The Study will specifically address potential changes in groundwater levels, due to the Chino Basin Desalting Program, and investigate all other factors that may impact the Prado Basin Habitat. It is anticipated that as a result of this Study a baseline of the following factors will need to be developed and tracked through time:

- Habitat Acreage in Prado Basin (current and change over time)
- Age of Habitat in Prado Basin
- Mix of Flora & Fauna in Prado Basin
- Surface Water Discharges to Prado Basin (storm & wastewater)
- Groundwater Levels
- Evapotranspiration
- Precipitation
- Temperature

Task 2 – Determine and Define a Range Factors Potentially Impacting Habitat

The Study will determine and define the potential impact(s) by each factor to the riparian habitat. A baseline for each factor will be developed and be the basis for future comparison. The Study will determine the best method to track and monitor each factor.

Task 3 – Provide Adaptive Management Recommendations

The Study will recommend which factors can feasibly and economically be tracked and monitored, as well as provide recommended schedules/timelines for the frequency of tracking and monitoring the recommended factors. The Study will provide recommended adaptive management actions based on the results of the potential impacts to the habitat by the defined factors.

Task 4 – Develop and Submit Draft and Final Adaptive Management Studies

Draft and Final Adaptive Management Studies will be provided for review and comment to DWR. The Draft and Final Studies will be reviewed by the Committee and approved by Inland Empire Utilities Agency, Chino Basin Watermaster and Orange County Water District prior to submittal to DWR.

Construction & Installation of Monitoring Wells

Task 1 – Compile Historical Data and Reports

IEUA/Watermaster has an extensive library of hydrogeologic, groundwater flow, groundwater quality, and modeling reports for the Santa Ana Watershed. IEUA/Watermaster has compiled and reviewed these reports in the context of developing a management plan for the study area. Following is a partial list of reports that are pertinent to the study area:

Burnham, W.L. 1953. The Geology and Ground Water Conditions of the Etiwanda-Fontana Area, California. Unpublished Master's Thesis, Pomona College. 88 p.

California Department of Water Resources. 1970. Meeting Water Demands in the Chino-Riverside Area, Appendix A: Water Supply. Bulletin No. 104-3, 108 p.

Dutcher, L.C. and W.R. Moyle, Jr. 1963. Preliminary Appraisal of the Test-Well Drilling Program in the Bloomington-Colton Area, San Bernardino County, California: USGS Closed-File Report, 15 p.

Eckis, R. 1934. Geology and Ground Water Storage Capacity of Valley Fill, South Coastal Basin Investigation: California Department of Public Works, Division of Water Resources Bulletin No. 45, 273 p.

Fife, D.L., Rodgers, D.A., Chase, G.W., Chapman, R.H., and E.C. Sprotte. 1976. Geologic Hazards in Southwestern San Bernardino County, California: California Division of Mines and Geology Special Report 113, 40 p.

Gleason, G.B. 1947. South Coastal Basin Investigation, Overdraft on Ground-Water Basins: California Department of Public Works, Division of Water Resources Bulletin 53, 256 p.

Gosling, A.W. 1966. The Patterns of Subsurface Flow in the Bloomington-Colton Area, Upper Santa Ana Valley, California: USGS Open-File Report, 14 p.

MacRostie, W., and A.J. Dolcini. 1959. Santa Ana River Investigation: California Department of Water Resources Bulletin No. 15, 194 p.

Mark J. Wildermuth, Water Resources Engineers. 1995. Task 3.1 Report – Alumax Fontana Site Investigations. July, 1995.

Mark J. Wildermuth, Water Resources Engineers. 1997. Phase 1A Task 2.2 and 2.3 Final Report: Describe Watershed Hydrology and Identify Current TDS and TIN Inflows in the Watershed. September, 1997.

Montgomery Watson, and Mark J. Wildermuth Water Resources Engineer. 1994. Final Task 6 Memorandum, Development of Three Dimensional Groundwater Model. March, 1994.

Rees, T.F., Bright, D.J., Fay, R.G., Christensen, A.H., Anders, R., Baharie, B.S., and M.T. Land. 1993. Nitrogen Geochemistry in the Unsaturated Zone beneath Various Land Uses, Riverside and San Bernardino County, California: USGS draft report. 236 p.

Wildermuth Environmental, Inc. 1999. Optimum Basin Management Program – Phase 1 Report. Prepared for the Chino Basin Watermaster. August 1999.

Wildermuth Environmental, Inc. 2000. TIN/TDS Phase 2A: Tasks 1 through 5. TIN/TDS Study of the Santa Ana Watershed. Technical Memorandum. July 2000.

Task 2 – Describe Hydrogeology, Groundwater Conditions & Locate Existing Monitoring Wells in the Study Area

IEUA/Watermaster maintains a relational database of available well information, well construction, water level, and water quality data for the study area. All known monitoring wells within the study area will be added to the geographic information system (GIS) based maps. IEUA/Watermaster will develop the following GIS based maps and figures:

- groundwater elevation contour maps;
- groundwater level maps;
- groundwater flow vectors (direction); and
- monitoring well location map.

Task 3 – Cone Penetration Test Survey

This section describes the CPT survey to be run across the Prado Basin area to characterize the upper 100 ft of sediments, and the occurrence of groundwater within these sediments, will be performed. The information derived from the CPT survey will be used to:

- Characterize the hydrogeology of the area;
- Assist in locating and designing the monitoring wells;
- Assist in the interpretation of the monitoring data; and
- Assist in improving the computer-simulation groundwater-flow model of the Chino Basin.

Task 4 – Drill, Construct and Install Eight Monitoring Wells

IEUA/Watermaster has committed to characterizing the changes in water levels and to determine potential impacts to downstream habitat. To support this effort, eight new monitoring wells will be drilled, constructed and installed. The monitoring wells will be used to better characterize the hydrogeology in this area, including the change water levels over time. Subsequent monitoring at these wells and other existing monitoring wells, along with groundwater modeling efforts, will determine potential impacts to downstream habitat.

Task 4.1 – Monitoring Well Siting Investigation

The aquifer-system within Chino groundwater basin (Chino Basin) consists of interbedded and discontinuous strata of gravel, sand, silt, and clay. Groundwater is produced from wells that are perforated within the saturated portion of the aquifer-system sediments. The aquifer-system sediments can be conceptually simplified into laterally-continuous units of similar sediments – namely, aquifers (predominantly gravels and sands that are relatively permeable) and aquitards (predominantly silts and clays that are relatively non-permeable). The locations of the proposed monitoring wells will be based on the hydrogeological characterization in Task 2, as well as the parameters listed below:

- Proximity to the riparian habitat in Prado Basin;
- The predicted drawdown associated with Peace II implementation ;
- The location of other monitoring wells in the area (existing and proposed);
- Current land use; and
- Elevation relative to the incised stream bed (to protect against potential destruction from floods).

Task 4.2 – Determine Ownership, Required Permits and Access Well Sites

Acquisition of all well permits, discharge permits, encroachment permits, and right of entry agreements will be required to perform the work. Prior to performing work, the drilling locations shall be marked in white paint and Underground Service Alert (USA) notified to clear the locations for underground utilities.

Task 4.3 – Prepare Plans and Specifications

Detailed plans and specifications will be prepared for the monitoring well construction project. After the site selection process is complete, draft plans and specifications will be completed and submitted to the stakeholders and permitting agencies for review. Review comments will be incorporated into the final plans and specifications.

Task 4.4 – Select Contractors

A bid package containing bidding instructions, contract documents, and the final plans and specifications will be prepared and submitted for public bidding. Proposals will be evaluated and a well drilling contractor will be selected based on qualifications, experience, and best value to the stakeholders.

Task 4.5 – Construct Monitoring Wells

Eight monitoring wells will be drilled to help characterize the change in groundwater water levels (overtime). Each well-site will consist of two adjacent boreholes drilled by hollow-stem augur methods. Each borehole will contain a 4-inch PVC casing. One well will be completed and screened within the regional aquifer system at a depth between 50-100 ft. The companion well will be completed and screened across the first occurrence of groundwater (this could be a perched water table). Each monitoring well will have the ability to monitor water-level and water-quality.

The monitoring well installation shall be supervised by a California Registered Geologist or a California Certified Hydrogeologist. The wells shall be constructed in compliance with the latest edition or supplement of: State of California Water Well Standards, Bulletin No. 74-81 dated December 1981 and Bulletin No. 74-90 dated June 1991, local modifications to these Standards, and Sections 13800 through 13806 of the California Water Code.

Task 4.6 – Mobilizations, Demobilization, and Site Clean up

Mobilization shall include the transportation of personnel, equipment, and operating supplies to and from the site; establishment of portable sanitary facilities, drinking water, drilling water and field office, and other necessary facilities at the site; and other preparatory work at the site, as well as all work at the site

necessary to conduct drilling, construction and development operations. Other preparatory work might include traffic abatement barricades, signs, ramps, earthworks, and noise control. The entire area used for material storage and drilling operations including areas occupied by the field office, construction equipment, engines, motors and dewatering equipment shall be enclosed by fabric screened chain link fencing. Noise attenuation/suppression methods shall be implemented to minimize disturbance to persons living and/or working nearby, and to the general public.

A pre-approved drilling unit will be used for the construction of the monitoring wells and their associated equipment shall be in good condition and have sufficient capacity to drill a 4-inch hole in diameter up to 100 feet deep.

The drilling pipe shall be in good condition and shall be connected by standard tool joints. The drill pipe shall be steam-cleaned prior to its arrival at the site. Drill pipe suspected of being contaminated shall be removed and steam-cleaned prior to its use at the site. Environmentally safe pipe dope or other lubricating material shall be used on the threads of the drill stem and tremie pipe.

Demobilization shall include removal of all equipment, materials, and temporary facilities installed during mobilization, well drilling, completion, and development phases of the work. Demobilization will also include restoration of the sites to their original condition or as specified by the property owner.

Care shall be taken to protect public and private properties adjacent to the work and exercise due caution to avoid damage to such properties. Existing improvements that are damaged or removed as a result of site operations shall be repaired. Such improvements include curbs, gutters, sidewalks, pavements, utility installations, structures, lawns, etc. Repair and replacements will be at least equal to existing improvements and will match them in finish and dimension.

Data Collection

Per the cost sharing Bright Line Agreement between IEUA and Watermaster, the Watermaster currently performs and funds groundwater monitoring and data collection within the Chino Basin. Watermaster will perform and fund the ongoing data collection from the monitoring wells constructed and installed under this grant. The data will be reported on an annual basis in an existing annual report titled; Optimum Basin Management Program, Chino Basin Maximum Benefit Monitoring Program.

Watermaster will include this additional monitoring data in their existing Chino Basin groundwater model. These additional monitoring wells will provide sufficient data to the model to, as accurately as possible, project the expected groundwater level change overtime and provide stakeholders the opportunity to predict any potential impact on the habitat within Prado Basin.

Vegetative & Aerial Surveys

Using the existing monitoring stations developed by Reclamation in the 2003 and 2008 reports, conditions of the riparian habitat will be documented by collecting and evaluating plot growth data (of both study and control areas). The methods, data analysis and deliverables will be the same as in 2003 and 2008 (as outlined in MOU No. 04-MU-35-001).

Task 1 – Startup, Oversight and Coordination

Reclamation technical personnel will generate random points, create data sheets, review preliminary data and obtain all necessary equipment.

Task 2 – Vegetative Monitoring

Field biologists will take photos and vegetation measurements at the sampling points in Chino Creek and Mill Creek.

Task 3 – Aerial Photography

Aerial photographs will be taken of the Prado Basin.

Task 4 – Data Analysis and Report Writing

After performing field work, Reclamation staff will complete and submit a monitoring report.

Monthly Photo Station Monitoring

Using the existing and new photo monitoring stations developed by the Committee, conditions of the riparian habitat will be documented with monthly photos.

Task 1 – Startup, Oversight and Coordination

The Committee will select photo monitoring stations, create data sheets and obtain all necessary equipment.

Task 2 – Vegetative Monitoring

Monthly photos will be taken at the selected photo monitoring stations.

Task 3 – Data Analysis and Report Writing

After performing field work, a report will be compiled.