

Lower San Juan Basin Groundwater Yield Enhancement Study GWMP Status

The SJBA is currently in the process of preparing its update to its 1994 "Groundwater Management and Facility Plan" for the Lower San Juan Basin. This update is being prepared for SJBA by Wildermuth Environmental, Inc. The status of the GWMP through June 30, 2012 is provided in the attached letter dated July 5, 2012.

As part of MWDOC's SOCOD Project work, a comprehensive and updated surface/groundwater flow and solute transport model is being developed for the Lower San Juan Basin. This model has now been developed and calibrated. Various scenario runs will be made in conjunction with the GWMP work and for the SOCOD Project evaluation.

The SJBA is scheduled to complete and adopt its GWMP update by the end of this year.



July 5, 2012

Santa Margarita Water District
Attention: Dan Ferons
26111 Antonio Pkwy
Rancho Santa Margarita, CA 92688

City of San Juan Capistrano
Attention: West Curry
32400 Paseo Adelanto
San Juan Capistrano, CA 92675

Subject: *San Juan Basin Groundwater Management Plan and Facilities Plan, July 2012 Progress Report*

Gentlemen:

Wildermuth Environmental, Inc. (WEI) has prepared this progress report to summarize the work completed on the San Juan Basin Groundwater Management and Facilities Plan through June 30, 2012. In addition, this report includes a discussion on alternatives being evaluated to improve the production sustainability of the San Juan Basin.

Summary of Work Completed to Date

Task 1 Define Water Management Objectives and Task 5 Describe Water Management Issue and Strategies – 100 percent complete.

Task 2 Describe Planning Area and Its Resources – 100 percent complete.

Task 3 Describe Historical and Future Water Requirements – 100 percent complete.

Task 4 Describe Existing Resources – 100 percent complete.

Task 6 Define Alternative Management Plans – 100-percent complete. The physical initiative included in the management plans are geared to increasing sustainable production and include (1) producing as much as currently planned limited by the greater of planned production or what can be produced at any one time; (2) constructing "T" levees within the San Juan Creek Channel between Interstate 5 and the Stonehill Drive Bridge to increase recharge; (3) replacing some or all the conventional wells at SJBA and South Coast Water District desalters with Raney collector wells or their functional equivalent.

Task 7 Evaluate Alternative Management Plans – This task is under way. Attached are the notes from our June 12, 2012 meeting that describes the alternatives that are being analyzed.

Task 8 Describe Recommended Management Plan – This task has not been started. Task 8 requires that Task 7 be substantively completed prior to starting.

Task 9 Develop Monitoring and Reporting Protocols – This task has not been started. Task 9 requires that Tasks 7 and 8 be substantively completed prior to starting.

Task 10 Prepare Groundwater Management Plan Report – This task has not been started. Task 10 requires that Tasks 7 and 8 be substantively completed prior to starting.

Task 11 Project Meetings and Coordination Activities – Ongoing. A meeting was held with Trabuco Canyon Water Agency in May to discuss their need to be considered or participate in the groundwater management plan. We coordinated with GeoScience regarding their progress on the development of the groundwater model, and we coordinated with the MWDOC regarding the water demand and supply plans for the SJBA area. We expect this task to ramp up in July.

Task 12 Preliminary CEQA Analysis – This task has not been started. Task 12 requires that Tasks 7 and 8 be substantively completed prior to starting.

Task 13 Project Management – 80 percent complete.

Coordination with the Municipal Water District of Orange County

WEI has met with Municipal Water District of Orange County (MWDOC) and their consultants to coordinate their modeling work with the update of the San Juan Basin groundwater management plan. WEI staff obtained from MWDOC model-projected stream discharge data into and over the San Juan Basin. These data were used to estimate the sustainable yield if the San Juan Basin and the storage required in the basin to develop the sustainable yield. WEI also attended a meeting with MWDOC and their consultant to review the progress of their groundwater modeling work.

Schedule

We are in the process of updating the schedule and will submit to you a revised schedule in a couple of weeks. We expect to produce a completed draft report by the end of August 2012.

Please call me if you have any questions.

Very truly yours,

Wildermuth Environmental, Inc.



Mark J. Wildermuth, PE
President

San Juan Basin Management Plan Section 6 and 7 Discussion Items

June 12, 2012
Revised June 13, 2012

Planning Assumptions

1. In 2012 there is about 20,000 acre-ft of water in storage. The theoretical storage capacity of the San Juan Basin is about 26,000 acre-ft. The maximum operable storage for buffering wet and dry years assuming vertical turbine pumps is about 13,000 acre-ft. The remaining 13,000 acre-ft of capacity is dead storage and is required to get groundwater to flow into conventional wells. Under current storage conditions, there is 7,000 acre-ft of operable storage [equal to 20,000 acre-ft minus 13,000 acre-ft]. The dead storage requirement could be reduced if Raney collector wells were used and thus the operable would then be increased.
2. In the future, dry-weather discharge will decrease even with growth. Dry-weather flow will be diverted and used in the service area where it originates and reduced due to conservation.
3. In the future, there will not be a significant increase in stormwater discharge in the San Juan Creek due to compliance with the MS4 permit.¹
4. High groundwater level conditions in the downstream half of the San Juan Basin have limited stormwater recharge in the historical period. Stormwater recharge will increase in the San Juan Basin in the future due to the elimination of high groundwater level conditions caused by future groundwater pumping.
5. The theoretical stormwater recharge into the San Juan Basin without high groundwater limitations will range between 20,600 acre-ft/yr to 1,400 acre-ft/yr and average 6,800 acre-ft/yr based on the hydrologic period of 1948 through 1977 and with current land use and stormwater management. See Table 1 for the monthly and annual recharge and statistics.
6. The amount of operable storage required to generate a yield equal to the theoretical average recharge stated about is 27,000 acre-ft based on the 1948 through 1977 hydrology. See Figure 1 for the derivation of this value. The amount of operable storage capacity requirement is equal to difference between the maximum and minimum storage [equal to 13,128 minus -13,524] assuming a draft of 6,800 acre-ft..

¹ The safe yield report prepared by Stetson in the early 1998 (and its earlier draft) assumed an increase in stormwater and dry-weather discharge with upstream development and its subsequent contribution to groundwater recharge.

7. The theoretical maximum yield based on the stormwater recharge shown in Table 1 is about 6,800 acre-ft/yr and will likely be less because there is not enough operable storage capacity to buffer the range in stormwater recharge.
8. There are other sources of recharge that should be included in the developed yield of the basin although their magnitude is small and should decrease over time due to the increased cost of water and conservation.
9. There are currently about 9,876 acre-ft/yr² in water rights granted by the SWRCB and future groundwater pumping is projected to reach about 8,300 acre-ft/yr. Groundwater pumping is projected to exceed the average recharge by about 1,500 acre-ft/yr [equal to the projected groundwater pumping of 8,300 acre-ft/yr minus the average stormwater recharge of 6,800 acre-ft/yr].
10. If the goal is to ensure sustainable groundwater production then the average streambed recharge (or its functional equivalent) must increase by an average of 1,500 acre-ft/yr [equal to the projected pumping of 8,300 acre-ft/yr minus the average annual stormwater recharge of 6,800 acre-ft/yr] being mindful of the variability of stormwater recharge. That is, the additional recharge must be scalable over time such that the average recharge equals 8,300 acre-ft/yr [equal to the projected groundwater pumping] with low variability in the combined total of stormwater and supplemental water recharge. The low variability is a requirement due to limited operable storage.
11. The additional recharge could consist of increased stormwater recharge, and or the recharge of recycled and imported waters.
12. Increased stormwater recharge would require the construction of off-stream and in-channel recharge facilities (e.g., OCWD "T" levees). In-channel facilities would have to be reconstructed on the fly during the storm season when they are damaged by stormwater discharge.
13. Recycled and imported water recharge could be accomplished with the same facilities as stormwater and with injection wells. If recycled water recharge is used, these recharge facilities would have to be strategically located to ensure minimum travel times and dilution pursuant to draft Title 22 regulations.
14. In the absence of increased recharge the SJBA and the SCWD desalters could be operated consistent with the available supply each year. This would mean that the desalters would have to reduce pumping in years when groundwater levels limit pumping.

² The maximum appropriation is 12,552 acre-ft/yr. Both of these numbers exclude any rights of the City of San Juan Capistrano (CVWD) that may be prescribed. This was brought up at the March 26, 2012 workshop, but no one knew the quantity of the right. The State Board has a "pending application" on file for CVWD from 1998 in the amount of 3,325 acre-ft/yr.

Alternative Management Plans

Alternative 1 Status Quo with Adaptive Management

The objective of this alternative is to produce as much groundwater as possible within the limitations of the existing stormwater recharge and wells in the San Juan Basin. The actions required by the SJBA members include the following:

1. Pump and treat groundwater up to the planned capacity of their facilities unless groundwater levels limit production. Imported water will be used to meet the shortfall in desalter production when groundwater levels limit desalter production.
2. The SJBA and the SCWD will need to develop an agreement on how to equitably reduce desalter production during shortage.
3. The SMWD and MNWD will take SJBA desalter production in excess of the SJBA desalter production required by the City of San Juan Capistrano.

Alternative 2 Augment Yield by Increasing Stormwater Recharge in San Juan Creek

The objective of this alternative is increase the stormwater recharge over that achievable in Alternative 1 through the construction of in-stream “T” levees. This alternative is identical to Alternative 1 except of the inclusion of the “T” levees. The actions required by the SJBA members include the following:

- Items 1 through 3 from Alternative 1.
4. Construct “T” levees in Trabuco (about 6 acres potential) and San Juan Creek (about 31 acres of potential) to maximize the wetted area of the stream bottom and thereby maximize recharge. These levees will be damaged periodically by storm water discharge and have to repaired five to seven times per year.

Alternative 1a

Same as Alternative 1 except that some or all of the desalter wells are replaced with Raney collector wells allowing the basin to be operated at lower groundwater levels.³

Alternative 2a

Same as Alternative 2 except that some or all of the desalter wells are replaced with Raney collector wells allowing the basin to be operated at lower groundwater levels.

³ The substitution of Raney collector wells or their functional equivalent will increase the operable storage and decrease the dead storage requirement.