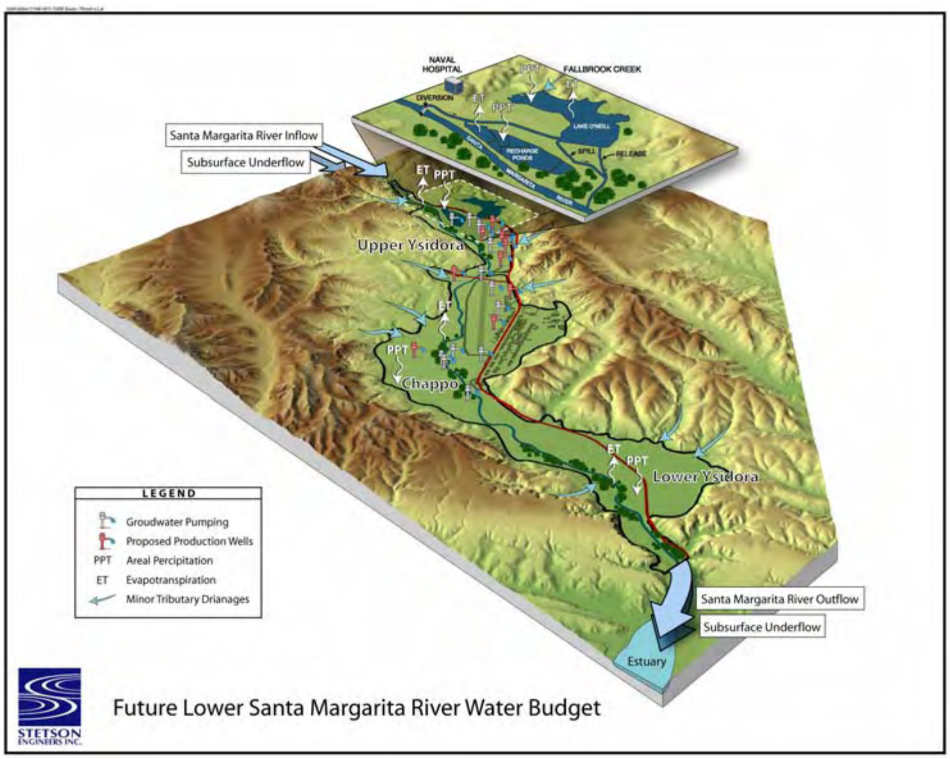
RECLAMATION
Managing Water in the West

Final Technical Memorandum No. 2.2

Santa Margarita River Conjunctive Use Project Volume II – Attachments



U.S. Department of the Interior
Bureau of Reclamation

April 2007

Mission Statements

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitments to island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

Final Technical Memorandum No. 2.2

Santa Margarita River Conjunctive Use Project Volume II – Attachments

Surface Water and Groundwater Modeling Analysis to Determine Santa Margarita River Conjunctive Use Project Yield

Prepared by:

Stetson Engineers

Prepared for:

Bureau of Reclamation
Southern California Area Office

U.S. Department of the Interior
Bureau of Reclamation

April 2007

LIST OF ATTACHMENTS

Attachment A

Acronyms,
Guide to Tables and Graphs,
State Well Numbering System

ACRONYMS

AF	Acre-Feet
AFY or AF/Y	Acre-Feet per Year
AFM or AF/M	Acre-Feet per Month
AN	Above Normal
BAL	Balance
BN	Below Normal
CFS	Cubic Feet per Second
CH	Chappo Subbasin
CUP	Conjunctive Use Project
CWRMA	Cooperative Water Resources Management Agreement
ED	Extremely Dry
ET	Evapotranspiration
FPUD	Fallbrook Public Utility District
FT	Feet
GHB	General Head Boundary
GW	Groundwater
HC	Hydrologic Condition
IC	Indicator Cell
L1	Layer 1
L2	Layer 2
LON	Lake O'Neill
LKNC	Leakance
LSD	Land Surface Datum
LSMR	Lower Santa Margarita River
LY	Lower Ysidora
MSL	Mean Sea Level
MY	Model Year
ROM	Reservoir Operation Model
SMR	Santa Margarita River
STR	Stream
TM	Technical Memorandum
UY	Upper Ysidora
VW	Very wet
WY	Water Year

Legend for Graph Lines

Green lines: Run 1 through 10, Layer 1 and 2

Red Dotted Lines: Baseline, Layer 1 and 2

Thick Patterned black line: Land Surface Datum (LSD)

Thick Patterned red line: Lowest Historical Water Level (WL)

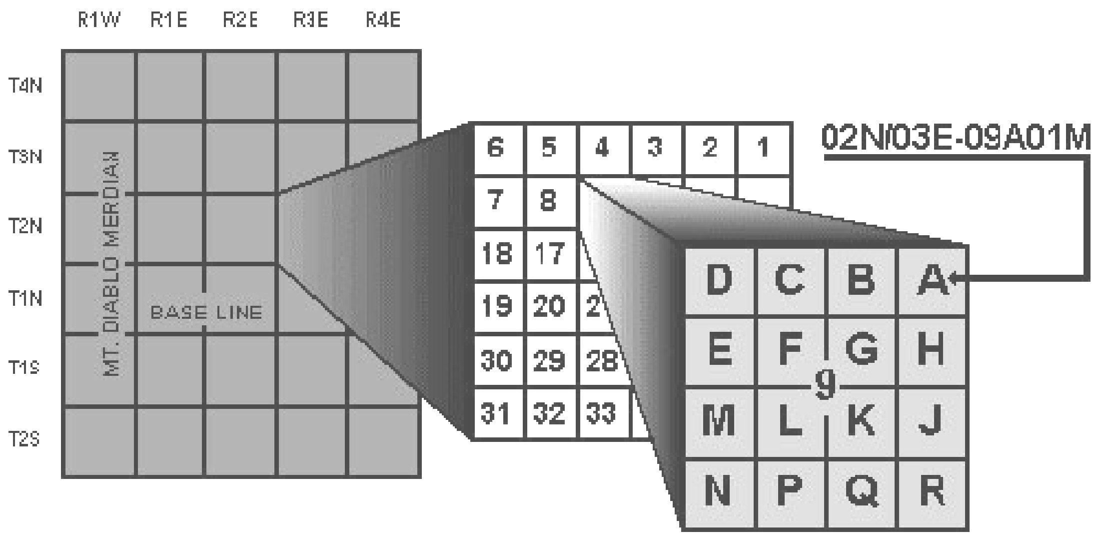
Dash and double dotted red line: Lowest Calibrated Water Level

Note: All numbers are rounded to the nearest 100.

STATE WELL NUMBERING SYSTEM

Wells monitored by the Department of Water Resources and cooperating agencies are identified according to the State Well Numbering system. The numbering system is based on the public land grid, and includes the township, range, and section in which the well is located. Each section is further subdivided into sixteen 40-acre tracts, which are assigned a letter designation as shown in the figure below. Within each 40-acre tract, wells are numbered sequentially. The final letter of the State Well Number refers to the base line and meridian of the public land grid in which the well lies. "M" refers to the Mount Diablo base line and meridian; "S" refers to the San Bernardino base line and meridian; "H" refers to the Humboldt base line and meridian.

Well numbering at Camp Pendleton is based on the San Bernardino base line and meridian.



For additional information:
Department of Water Resources *Water Fact No. 7, Numbering Water Wells in California*
http://www.dpla2.water.ca.gov/publications/waterfacts/water_facts_7.pdf

Source: California Department of Water Resources:
http://www.groundwater.water.ca.gov/technical_assistance/gw_wells/gww_wnosys/index.cfm

THE MANAGEMENT SCENARIO RESULTS

ATTACHMENTS E THROUGH P

Each attachment starts with an annual groundwater pumping summary which includes the pumping schedule by hydrologic condition, the annual pumping summary by subbasin over the 50 model years and the total annual pumping summary over the 50 model years. This table also presents average and median pumping values for each of the four hydrologic conditions by subbasin and total basin yield. The average monthly groundwater pumping by subbasin is also given.

The next table provides a summary of the wells used in the model run and the frequency of their use. It also provides monthly pumping percentages for each subbasin broken into Wet Year Algorithm and Dry Year Management scenarios. The current maximum possible pumping in each subbasin, based on an 80% utilization, and the amount of additional pumping based on the number of new wells added is provided. The median pumping required for each hydrologic condition in each subbasin and how many new wells were called upon to satisfy the pumping is given. A table of Wet Year Algorithm counts by month is also shown. The next well table provides the annual pumping performed by each well for each of the 50 model years. The average monthly pumping performed by these wells is also given.

A series of hydrographs follows the well annual pumping table. There are a total of 6 hydrographs presented. A hydrograph of the groundwater levels at the riparian indicator cell and a hydrograph of the groundwater levels at the grassland indicator cell are given for each of the three subbasins. When performing the model run, these graphs were used to ensure that the groundwater levels in the riparian zone did not go below the recorded historical low, shown in red on the hydrographs.

The forth figure in the summary is a collection of streamflow graphs: there is a graph that shows the streamflow between the Upper Ysidora and Chappo subbasins, a graph that shows the streamflow between the Chappo and Lower Ysidora subbasins, and a graph that shows the streamflow out of the model into the estuary.

A surface water and groundwater hydrologic budget has been included after the streamflow figure to describe the results for each of the ten model runs presented in the Management Scenario Results section. Each budget has three main categories: Inflow, Outflow, and Change in Storage. Inflow numerically describes the amount of water that enters the model boundary by surface flow, subsurface flow, and areal precipitation. Outflow describes the amount of water flowing out of the Model's boundary including losses to riparian vegetation, surface and subsurface flow toward the Santa Margarita River estuary, and groundwater production from wells. The difference between Inflow and Outflow is identified as simulated change of groundwater in storage and represents the quantity of water that is removed from or added to the aquifer from each Management Scenario during the simulated 50-years of hydrologic conditions. Statistically meaningful numbers that describe average annual and median conditions for four hydrologic conditions are presented for each of the three categories so comparison between model runs may be made. A table of annual water budget values are then presented for the same inflow and outflow elements. The annual surface water budget into the model, between subbasins, and out of the model is also presented in this table. The last table provides an average monthly water budget for these surface and groundwater water.

Attachment B

Technical Team Conference Call Notes

STETSON
ENGINEERS INC.

MEETING NOTES

2171 E. Francisco Blvd., Suite K • San Rafael, California • 94901
TEL: (415) 457-0701 FAX: (415) 457-1638 e-mail: dawnt@stetsonengineers.com

TO:	Reclamation	DATE:	March 30, 2006
FROM:	Stetson Engineers	JOB NO:	2148-002

RE: March 23, 2006 Meeting Notes for Technical Support of Feasibility Level Design of Santa Margarita River Conjunctive Use Project

The following meeting notes memorialize the technical discussions from the March 23, 2006 meeting between the technical staff from the Bureau of Reclamation (Reclamation) and Stetson Engineers. The technical team met to discuss the surface water, groundwater, and future hydrologic baseline period presentations to support Reclamation's Feasibility Level Design of the Santa Margarita River Conjunctive Use Project (CUP). Following review by Reclamation, the presentations were then presented to the CUP planning team in the afternoon of March 23, 2006.

TECHNICAL MEETING ATTENDEES:

Tom Bellinger	Reclamation	Stephen Reich	Stetson Engineers
Bob Talbot	Reclamation	Jean Moran	Stetson Engineers
		Dawn Taffler	Stetson Engineers

REVIEW OF PRESENTATIONS:

The technical meeting began by discussing the three powerpoint presentations prepared by Stetson Engineers, including:

1. Lower Santa Margarita River Basin Groundwater Hydrologic Evaluation (Jean Moran).
2. TM 1.0 Statistical Analysis of SMR Surface water Availability at the CUP Point of Diversion (Dawn Taffler).
3. 50-Year Hydrologic Simulation Period to Estimate CUP Yield (Steve Reich).

50-YEAR HYDROLOGIC SIMULATION PERIOD:

The 50-year hydrologic simulation period was discussed in greater detail, focusing on the justification for a 50-year period and the statistical significance of the period to be chosen. The following points were made.

- The 50-year period is representative of the design life of the CUP facilities and the fact that the Feasibility Study's economic analysis would be based on the life of the project.
- There should be consistency with the environmental documentation as to whether its baseline period is also 50 years.

- The modeling period should begin and end on an Above Normal or wetter year.
- The chosen 50-year period should be hydrologically balanced, as determined using the Cumulative Departure from the Mean curves for precipitation and streamflow.
- The chosen 50-year period should include the driest period on record (1959-1968).
- The chosen 50-year period should include the recent wet periods during the 1980s and 1990s.
- The 50-year period should begin in the 1950s, thereby excluding the "natural" conditions that existed before 1950 which will not be repeated in the future.

The anticipated 50-year period will likely be from 1952 through 2001, based on further review of hydrologic conditions and information. Stetson will evaluate this period to ensure that the 50 years are hydrologically balanced and statistically representative of the last 81 years.

IMPACTS OF URBANIZATION:

Stetson will also perform a sensitivity analysis to evaluate the impact of urbanization on the 50-year simulation period. The sensitivity analysis will involve modifying historical hydrographs during storm events to mimic the runoff response likely to occur in an urbanized setting. The daily hydrographs will be redistributed to represent a larger portion of runoff occurring during a shorter period of time due to increases in impervious areas. The master plans from EMWD and RCWD and land use projections from Riverside and San Diego counties will be used to identify projected build-out in the upper basin. An algorithm will be developed to re-proportion the hydrograph as a percent increase in peak flow and subsequent decrease in the recession of the hydrograph. The technical team meeting discussed comparing the maximum potential diversion for no urbanization, a ten percent shift, and a 30 percent shift to determine if the project will realize a significant impact from urbanization.

FRIDAY CONFERENCE CALLS:

The technical team discussed scheduling weekly conference calls to maintain continuous correspondence and make timely decisions during the development of baseline conditions and project scenarios. The conference calls are to be held on Friday mornings, at 10 am Pacific (11 am mountain). Reminders and agendas for the Friday conference call will be sent out on Thursday. The first conference call is schedules for Friday, March 31, 2006.

SCHEDULE:

The following schedule outlines the anticipated time required to complete the second phase of technical analysis.

Anticipated Date	Task/Deliverable
2/14/2006	Date of Contract GS10F0404P
2/17/2006	Stetson received go-ahead to begin work
3/14/2006	Submittal of Groundwater Model to Reclamation for review
3/23/2006	Presentation of TM 1.0 and Groundwater Model to all parties
Mid- Apr	Groundwater Model comments due
End of May	4 Model Runs completed
Mid- June	Provide project flows to Design Team
End of June or Beginning of July	DRAFT TM 2.0 Groundwater Availability delivered to Reclamation for review
Early-July	Comments on DRAFT TM 2.0 submitted to Stetson
Mid- July	Address comments and submit FINAL DRAFT TM 2.0 to Reclamation
7/17/06	Delivery date specified in the contract
Late-July	Presentation of TM 2.0 to all parties

Friday, April 21, 2006

LSMR Conjunctive Use Project
Weekly Modeling Conference Call
Meeting Notes.

Attendees:

Jean Moran – Stetson Engineers
Robert Talbot – USBR, Denver
Doug McPhearson – USBR, Temecula Office
Del Holz – Contractor, Project Manager
Dawn Taffler – Stetson Engineers

Del Holz was on the call at the start, but was on his cell phone and there was a lot of background noise that was interfering with the conference call reception, so Del signed off. Dawn Taffler checked in on the conference call near the end of the call. There were no discussions of surface water issues, and as Tom Bellinger was not on the call, Dawn signed off.

The broad agenda items set for this conference call included:

- Input for 50-year run: ET, Recharge, Pumping, Stream, General Head Boundaries;
- Output for 50-year run: Water Levels, Streamflow, Volumetric Budgets;
- What model output is needed for the Design Team.

Jean had provided three attachments by email dealing with topic #1 – a table of preliminary annual inputs into the LSMR GW model, a powerpoint slide of the GW Model input flow chart or conceptual processes, and a summary of the annual average input values.

Jean started off by explaining the GW Model Input slide – what was included in the input files, etc. Bob had two questions based on the slide and the table of annual inputs: 1) where do areal runoff and tributary runoff get accounted for in the input files, and 2) what about subflow from Lake O'Neil since it is outside the model boundaries and is generally treated as an 'external tributary'? By referring to the table of input values, Jean explained that the tributary runoff is treated as an input to the stream package at the model boundaries, and that the areal runoff is treated as input to the stream package by routing the runoff to stream nodes inside the model.

Jean stated that the Lake O'Neil routine that is calculated outside the model assumes that there is no leakage from Lake O'Neil – based on some coring that was done earlier that showed some 10' of thick mud sediments at the bottom of Lake O'Neil. The thought was that the thick mud effectively sealed the bottom of the lake. Jean did say that there was some underflow in the area of Lake O'Neil from the Fallbrook bypass and the creek that flows into Lake O'Neil – but nothing from the lake itself. The question was raise as to what will happen when the lake is dredged – will not that create leakage from the lake for some period of time – 5, 6, 10 years?? It appears that the lake has only been dredged maybe a couple of times in the last 50 years – so maybe in the big picture, leakage from the lake is not a major input. The questions become – how long do the effects of the dredging last before the lake bottom is sealed off again?, and how often does the Base plan on dredging the lake? If they plan on dredging on a regular and more frequent schedule, then leakage from the lake may become a major input.

ACTION ITEM: Jean will talk with Steve about having Steve talk to the Base to see what their plans are for future dredging operations – frequency and when the next dredging is likely to happen. Based on the answer, Jean will look at how to incorporate leakage from the lake, if necessary – will have to be an engineering estimate as no background data exists on estimates of leakage from the lake.

The rest of the inputs were discussed. Jean mentioned that in the current 50-year input files, the pumping is set at 8,800 AFY for every year. She noted that this will have to be adjusted after some runs are completed to account for the decreased pumping that will be done in the second, and subsequent, dry years – once the criteria are established as to when to curtail pumping and by how much. Not discussed, but will need to be incorporated into the pumping files, is a note from Steve regarding ag pumping for the 50-year baseline conditions:

MY 1 - 2011 - 700 ag pumping, 8,800 total
MY 2 - 2012 - 350 ag pumping, 8,800 total
MY 3 - 2013 - 0 ag pumping, 8,800 total
MY 4- 50 - 2014 – 2060 - 8,800 total pumping

No outputs from the 50-year runs were available yet – so this topic will be tabled until Tom and Bob meet with Jean, Dawn, and Steve on the 26th and 27th in San Rafael (it was mentioned that lunch will be on Stetson).

ACTION ITEM: Jean will make appropriate changes to the input files and make some runs and process the outputs for then next meeting.

Discussion turned to what is needed by the Design Team from the model output. Bob had talked to Jeff earlier and passed along the input from Jeff. Basically, Jeff indicated that the Design Team would need the size of the diversion ditch (currently at about 60 cfs) – would need the maximum size that would be needed, along with smaller, reasonable sizes (my guess is the smaller sizes would be tied to exceedence curves of what the diversion ditch could reasonably capture – and would in some way be tied to economics – i.e. is it cost effective to go after an additional 10 or 15 cfs if those additional amounts are only available one year in five or ten years??). The Design Team would also need monthly gw yields along the lines of:

Net yield	- wet year -	by year -	by annual average -	by annual median
	- above average year -	“	“	“
	- below average year -	“	“	“
	- extreme dry year -	“	“	“

[Personal thought – after the meeting – for the net yields, maybe could display in a graphic form as well – showing frequency of occurrence of a range of yields – another exceedence type curve! – of monthly yields and/or annual yields]

This should not be too difficult to do – just have to think out the means to get this out of the output and into a table that represents what the Design Team needs.

Another form of output that will be needed is something that meets the needs of the environmental folks. Doug forwarded on a report on the SDSU study on relating drawdowns and lower water tables to changes in established riparian habitats and species. Doug also mentioned that SDSU was or will be attempting to create a model from the studies to predict effects of drawdowns and lower water tables on established habitats.

ACTION ITEM: Doug will check with North State on what type of data, model outputs and/or inputs they need for their EIS – to help us decide what outputs we need, and what outputs we can supply – and how to get the outputs in a form that North State can use. Doug will also find a contact person who is working on the SDSU model so that we can talk to them to see what inputs their model needs – so that we can make use of the model as it becomes available.

In the mean time, Jean and Bob will work on producing some maps and/or tables of impacts that can be a starting point for the environmental impacts. Thoughts are along the lines of:
1 – a map showing changes in water table elevations – a typical map from Modflow outputs
2 – a map showing areas where the water table has dropped below extinction depths,
3 – tables of the number of model cells within river corridors where the water table is above and below the extinction depths, and percent change in those numbers from year to year – or annual changes
4 – maps or tables of stream reaches that go from gaining to losing, or from losing to gaining, or back and forth – and maybe the amounts of flows in the reaches, or reaches that stay above or drop below some threshold amount.

ACTION ITEM: Will try to have some initial outputs by the 26th to go over and possibly to forward onto the environmental folks for their input. At some point will need to bring in the environmental folks to work with us on developing the outputs that they need for their EIS.

Next conference call scheduled for March 28th will be cancelled – at least as far as the modeling teams are concerned. However, Jean, Bob, and Doug at a minimum will still hold the conference call on the 28th to bring Doug up to speed as to where the models are in terms of outputting information for the environmental folks. Maybe would be a good idea to have someone from North State on the call – **Doug, could you check into this?**

MEETING NOTES

2171 E. Francisco Blvd., Suite K • San Rafael, California • 94901
TEL: (415) 457-0701 FAX: (415) 457-1638 e-mail: stever@stetsonengineers.com

TO: Reclamation DATE: April 28, 2006

FROM: Stetson Engineers JOB NO: 2148-002

RE: April 26 – 27, 2006 Groundwater Technical Team Meeting and April 28 Conference Call with Environmental Expert from Reclamation

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The following memorandum memorializes the discussions from a groundwater technical meeting between the Bureau of Reclamation (Reclamation) and Stetson Engineers on April 26th and 27th, 2006. A summary of an April 28, 2006 conference call with Reclamation's environmental expert is provided at the end of the meeting notes.

ATTENDEES:

Tom Bellinger	Reclamation
Bob Talbot	Reclamation
Stephen Reich	Stetson Engineers
Jean Moran	Stetson Engineers
Dawn Taffler	Stetson Engineers
Ben Brezing	Stetson Engineers

Review of Previous Conference Call Notes

The team discussed some of the issues related to environmental constraints and the need to support the EIS/EIR efforts. A general discussion regarding the progress to-date and the value of the weekly conference calls was addressed. All participants agreed to continue the weekly conference calls.

Status of Surface and Groundwater Model

A general discussion regarding the status of the surface and groundwater model was conducted. The Surface Water memorandum (TM1.0) has been finalized and not changed. All comments by Reclamation had been incorporated into the final report. The historical 50-year study period from 1952 to 2001 was further identified and characterized in the surface water modeling following the March technical meeting in Fallbrook. The results of TM1.0 reconstruction of streamflow, and the agreed historical 50-year study period, are currently being used in the Reservoir Operations Model (ROM).

The groundwater model has been updated to reflect the issues discussed at the March technical meeting in Fallbrook. The 25-year calibration period and 50-year baseline period are discussed in more detail below. Upgrades to the calibration model, including sensitivity analyses and other refinements, have been made. In general, the team agreed that the progress of the model is on schedule.

Results of 25-Year Calibration Model

Jean Moran and Ben Brezing presented the results of the recent 25-year calibration model. This included the results from a systematic auto-calibration that was performed by subbasin to minimize the difference between measured and simulated water levels. All parties agreed that the sensitivity analyses were a valuable exercise and improved the model's ability to accurately predict groundwater levels in all three sub-basins. The model shows a better response to variations in surface and groundwater levels. The error statistics were enhanced by the calibration effort.

Numerous handouts were presented at the meeting including: simulated v. measured water levels, surface water flow at the model boundary, Ysidora gage, and lower model boundary, water levels in all three sub-basins for both layers 1 and 2. The group discussed the improvement in the new calibration model to both water levels and surface water flows.

Jean and Ben also introduced two other hand-outs that identified volumetric and rate based groundwater budgets during the 25 year calibration period. These tables identified the discrepancy between these two types of budget calculations, as well as the impact to the overall description and explanation of each model run. Zone budgets for each sub-basin were also introduced and discussed with respect to the volumetric and rate based budgets.

Bob Talbot provided additional comments regarding the overall calibration of the model. For example, the model tends to overestimate water levels in the upper and lower parts of the upper Ysidora sub-basin and underestimate water levels in the middle part of the upper Ysidora sub-basin. Stetson indicated that they would setup a calibration run to set up different K zones within subbasins as indicated by the water level results.

Bob Talbot also suggested a review of the mountain front recharge. The question is whether there should be a delay in the mountain front recharge between the months that the rainfall occurs in and when the tributary underflow reaches the alluvial groundwater basin. Stetson will further investigate this issue. Finally, Bob indicated that with respect to time, simulated groundwater levels in the Lower Ysidora subbasin sometimes "lead" the actual water levels in a couple of Layer 1 wells. Again, Stetson acknowledged that they would investigate this issue.

Steve suggested using a low pass filter, i.e. 5 month running average, with the water levels to represent the simulated water level changes over time to the CUP Management Group. This analysis will be graphed and sent to the Technical Group for review before the May 9th meeting.

Underflow and potential leakage from Lake O'Neill was discussed, along with the maintenance and dredging of Lake O'Neill. Stetson will provide a rough estimate of the range of underflow from Lake O'Neill to the Upper Ysidora alluvial groundwater basin. Once this is done, the significance of this water will be assessed and the Model will be adjusted as needed.

A discussion was had with respect to error analysis. It was agreed that Tech Memo 2.0 will contain a table and discussion that describes and/or quantifies sources of errors for the different Model components. Tom Bellinger will provide Stetson with a reference of the Klamath Report for an example of how this has been done in the past.

50-Year Baseline Model Run

The discussion of the 50-year Baseline model run began with a presentation of the ROM by Dawn Taffler. The Surface Water memorandum (TM1.0) has been finalized and not changed. The following topics were discussed:

- Water Years Categorized by Hydrologic Condition
    - Period of Record (WY1925-2005), 50-year Model Period (WY 1952-2002)
- Surface Water for 25-Year Calibration Model
    - Historical Streamflow (WY 1980-2004), Fallbrook Creek Reconstruction, Mountain Tributary runoff during storm events, Historical Diversions
- Surface Water for 50-Year Baseline Model Run
    - Streamflow at Model Boundary (MY 1-50), Fallbrook Creek Reconstruction, Mountain Tributary runoff during storm events, ROM
- Streamflow at Model Boundary (MY 1-50)
    - Reconstructed Streamflow at Model Boundary (WY 1952-2002), Remove Releases by RCWD1940 Stipulated Judgment and 2MGD Demo Project, Add CWRMA Flows (including Emergency Releases during consecutive dry years)
- Reservoir Operations Model (ROM)
    - Diversion Schedule to Lake O'Neill, Lake O'Neill daily operation (wet and dry period), Diversion Schedule to Recharge Ponds, Evap Rates and Infiltration Rates, Daily Calculations (Part I & Part II spreadsheets cover POR), Annual Summaries

A discussion regarding the status of the groundwater model was presented by Jean Moran. Jean introduced multiple figures and plots including: Location of Target Wells, Location of Stream Segments, ROM, Location of ET Zones, Location of Recharge Zones, Production Well Locations, and Aerial photo showing production well locations.

Much of the discussion, regarding the 50-year Baseline, identified the use and limitation of the model with respect to providing data to the CUP management group and engineering team. The discussion addressed the model's ability to identify overall versus cell by cell impacts. For instance, we discussed the use and limitation of the model to identify changes on a site-specific and cell-specific basis. Further discussion on this topic is provided below.

The discussion also included identification of 50-year baseline conditions including recharge, ET, and Pumping. Aspects of changes in recharge included both water quantity and water quality. The team posed the question whether there will be a change in water quality over time as development in the upper basin continues. The team also discussed whether there will be changes in baseflow rates during the summer months from urban runoff. While water quality (TDS) may be expected to degrade over time, it was not determined whether base flow rates would or would not change.

The pumping schedule for the Baseline model was presented by Steve Reich. Pumping will be held constant at 8,800 afy throughout the 50-year period, except for dry year management scenarios that may limit the pumping. Ag pumping on Camp Pendleton will be replaced by reclaimed water by 2013 (model year 3). A table of CPEN pumping was presented to the group.

It was questioned whether ET should vary from dry year to wet year based on ET removal by large flood events. Although this topic was discussed, it was agreed not to change ET rates unless more detailed data is provided by the environmental team. It was discussed that changes in ET rates from vegetation removal during extreme wet periods would have no measurable impact on water supply during these types (Very Wet) of hydrologic conditions.

Review of Proposed Model Runs

The team reviewed the scope of work to further identify the proposed model runs that will be executed following the completion of the 50-year baseline model. The following agreement was reached:

Run 1: Maximum Basin Yield without Mitigation

No Pumping from Lower Ysidora after MY 3 (2013)
Pumping from Upper Ysidora and Chappo Sub-basins
No pumping from wells with known regulated contaminates (123-TCP at well 2202)

Environmental Constraints: Yes (historical variation)

Note: Stetson will use particle tracking, or other appropriate method, to check for cross gradient contaminant migration and to identify which well may be used for production. The purpose of this run is not to cause migration of known contaminates.

Run 2: Dual Well-field without Mitigation

Maximum Basin Yield
Maximum Pumping
Pumping from Upper Ysidora, Chappo, and Lower Ysidora Sub-basins

Environmental Constraints: Yes (historical variation), No seawater intrusion

Stetson will provide a TDS concentration map for the 5/5/06 conference call.

Note: Stetson will use existing data and professional judgment to separate water quality for purposes of reducing treatment costs while maintaining maximum yield.

Run 3: Maximum Basin Yield with Mitigation

Maximum Pumping
No Pumping from Lower Ysidora after MY 3 (2013)
Pumping from Upper Ysidora and Chappo Sub-basins

Environmental Constraints: No. Need discussion on May 8/9

Run 4: Maximum Basin Yield without CWRMA without Mitigation

Run 1 conditions without CWRMA

Environmental Constraints: Yes (historical variation)

Run 5: Yield -- TBD

Environmental Constraints: TBD

Run 6: Yield -- TBD

Environmental Constraints: TBD

In addition to the spreadsheets provided to Bob/Tom, the following data will be presented at the conclusion of each model run:

- Groundwater levels:
  - Two wells (Riparian/Grassland) in each sub-basin
- Surface water:
  - Model Boundary In, Ysidora Gage, Model Boundary Out
- Other:
  - Water quality/migration well.

All data from each model run will be compared to the 50-year Baseline model results.

Discussion of Management Scenarios

In addition to Calibration and Monitoring model runs, the team discussed the need for dry-year management scenarios, as well as wet-year management scenarios. Permit 15000 modeling resulted in the reduction of groundwater pumping during the 2^{nd} and 3^{rd} consecutive dry years. Results from Stetson's previous analyses suggest the need to anticipate and meet environmental constraints by altering dry year pumping.

The team also discussed the need to develop wet year management scenarios in order to maximize the sustainable yield from the three sub-basins. The wet year management scenario would include increasing groundwater pumping in order to maximize surface diversions to project facilities. Previous modeling efforts optimized the maximum pumping to median values.

Groundwater pumping management scenarios will be based on meeting the conditions identified in Technical Memorandum 1.0. Pumping will be identified for Very Wet, Above Normal, Below Normal, and Extremely Dry conditions. While these values may be translated into a frequency recurrence curve, the management scenarios will be optimized to aid economists and design engineers for the feasibility study.

The team discussed the needs of the design team. These needs will be reflected in the presentation of the management scenarios.

Deadlines and Meetings

A draft agenda for the May 8th /May 9th meeting was discussed among the team. The following is an example of the agenda that will be sent to Del Holtz by Tuesday, May 2:

1) Project Timeline

2) Status Update
   25-Year Calibration
   50-Year Baseline
   Run 1 through 4 (including yield and environmental constraint discussion)

3) Management Decisions Incorporated into the Model
   Environmental Constraints
   Mitigation Triggers
   Potential Constraints

4) Format of Model Output and Data Presentation
   Data available for environmental team

The timeline for the completion of the Draft Memorandum and availability of the project yield values were discussed. The team agreed that we were still on track for completion of the Baseline and four model runs by the end of May; and the last two model runs and draft technical memorandum by the end of June 2006.

April 28, 2006 Conference Call with Reclamation

Following two days of technical meetings between Reclamation and Stetson, a conference call was conducted on April 28, 2006 with Mr. Doug McPherson from Reclamation. The additional participants on the conference call included Tom Bellinger, Bob Talbot, Jean Moran, and Steve Reich. The conference call lasted approximately 45 minutes between 10:15 and 11:00 PDT.

The use and limitations of the model were discussed to indicate the data that will be available for use by the environmental team. While the model should not be used to predict cell-by-cell changes in vegetation or stream condition that have been tied to actual monitoring data, the model is able to provide an assessment of general conditions in each of the three sub-basins. It was explained that the model would provide general conditions and maximum probable areas of stream/vegetation impacts based on data output and professional judgment.

Mr. Doug McPherson indicated that he would be contacting the environmental consultant to request the types of constraints, with respect to the groundwater model, that they will require. Bob Talbot pointed out the need for the environmental consultant to be at the May 9th meeting so we could have agreement on the use and limitation (output) of the model and move forward towards its completion. Doug McPherson indicated that he would request their presence at the May 9th meeting, based on the availability allowed in their contract.

In general, the need to prepare the model and data for review by resource agencies was discussed. The accuracy and ability of the model to predict changes form historical conditions, and changes from baseline conditions, was also explored. The team finally discussed the need to review Camp Pendleton's P-527B and San Diego State University's monitoring project and incorporate any appropriate information into our modeling effort. At this point, it was agreed that Doug McPherson would provide Stetson with a copy of the 2004 report and that we would review it prior to the May 9th meeting.

Memorandum (Meeting Notes)

To: Stetson Engineers

From: Bureau of Reclamation, Denver Technical Service Center

Subject: June 2, 2006 Modeling Technical Team Conference Call regarding work on the Santa Margarita River Conjunctive Use Project (CUP)

The following memorandum memorializes the discussions from a modeling conference call between the Bureau of Reclamation (Reclamation) and Stetson Engineers (Stetson) on June 2, 2006.

Attendees:

Tom Bellinger	Reclamation Denver Technical Services Center (TSC)
Robert Talbot	Reclamation TSC
Jeff Baysinger	Reclamation TSC
Chuck Borda	Reclamation TSC
Travis Bauer	Reclamation TSC
Doug McPherson	Reclamation SCAO
Del Holz	Contractor representing SCAO
Steve Reich	Stetson
Jean Moran	Stetson

Discussion items/notes:

1. *Sedimentation work on Fallbrook Sump:* A discussion of the data needs for the sedimentation analysis for Alternative 2 were discussed. Stetson has reconstructed flows for this area (daily, 1925 to present). There are two datasets: historic and future. Stetson will provide daily flows.

2. *CPEN engineering data*: Jeff Baysinger was advised that the data he has requested from CPEN during the May 25-26 meetings will be forwarded. Stetson contacted Steven Evanko for permission to forward data and is waiting for reply.

3. *"Surface Water Corridor" issue:* A discussion was held regarding the proposal that Stetson evaluate a "corridor" that would discriminate surface from ground water based on the State definition. It was suggested that it might be better to just assume the worst-case condition for now (all water will be treated by the surface water rule). This is a conservative approach (worst case treatment cost).

   Steve Reich suggested that CPEN be given the opportunity to weigh in on this subject. They have been able to avoid this issue in the past and may have more information on how to proceed. Jean Moran suggested that the 'corridor" work be considered a future study and (and new contract task) if required.

Del Holz will be setting up a call with the SCAO on this subject.

4. *Runs 1 through 4:* Stetson provided a handout summarizing the parameters for runs 1 through four and for several potential runs (5, 6 and beyond – designated as Runs A through G). Tom Bellinger suggested that several sub-tables be developed to augment the information presented in these tables for the Tech Memo. Steve Reich will work on this over the next week.

   Stetson requested Reclamation to provide guidance on the desired parameters for runs 5 and 6 by the next conference call to be held on June 9. Stetson and Reclamation discussed the possible priority of runs for consideration:

   Priority 1: Run C: Double QWRMA flows.
   Priority 2: Run A: VOC run.
   Priority 3: Run B: Title 22
   Priority 4: Run E: Increased bypass of 3, 6, 9, 12 cfs, etc. This would be a more involved run which would be out of scope with the contract.

   Reclamation will discuss this issue and prioritize a list of suggested runs during the week. This will be discussed with the SCAO.

5. *Update on environmental data requirements:* Doug McPherson stated that is difficult to define just what is needed for the environmental analysis with regard to consequences of any project component. This information may have to be partly developed as the runs are made. NSR will need to weigh in on this (Steve Towers was absent). Doug McPherson will discuss this issue with NSR during the week.

6. *Economic issues/analysis:* Chuck Borda stated that the basis of his economic analysis will be cost of water. He may consider the 10-year rate study by MWD as suggested by Steve Reich. This information is on the MWD website. Chuck will plan to attend the July 6 meeting in Temecula and attempt to gather as much rate information as possible. He asked if CPEN had an economist – Steve Reich stated that to his knowledge, there is none.

7. *Review of Runs 1 and 2:* The group discussed the results of 3 pumping scenarios for Run 1. Handouts were presented. One suggestion from this discussion was the development of a Run H to be considered for either the 5th or 6th open runs. This would be designated as a maximum project yield or 'overall basin run". This led to a discussion of the process of interfacing the run results with the design data needs. It was suggested that the modeling team pass a proposed yield number for design purposes (due in July), realizing that the number may be fine-tuned based on environmental or economic consequences.

A summary of runs that have been used to fine-tune and finalize Run 1 were discussed:

1A. 45/55 Upper Ysidora/Chappo pump split.
1B. Reduced pumping effects.
1C. Effects of shifting the pumping center (with same amount of pumping)
1D. Fine tuning (close to the final run 1). The team will need to decide what level of pumping reduction in dry years optimizes the system as redistributing pumping is not proving effective.

Steve Reich made a general comment to the team that thus far, the model is behaving as expected.

8. Next week: The following action items were proposed for the June 9 conference call:
    a. Tom Bellinger will draft the meeting minutes.
    b. Run 2 will be completed and discussed on June 9.
    c. Preliminary Run 3 will be completed by the June 9 call.
    d. Detailed run parameter tables will be completed for the June 9 call.
    e. Doug will discuss environmental aspects of the runs with NSR during the week.
    f. Reclamation will propose the parameters for Runs 5 and 6 on June 9.

June 13, 2006

Memorandum (Meeting Notes)

To: Stetson Engineers

From: Bureau of Reclamation, Denver Technical Service Center

Subject: June 9, 2006 Groundwater Technical Team Conference Call regarding work on the Santa Margarita River Conjunctive Use Project (CUP)

The following memorandum memorializes the discussions from a modeling conference call between the Bureau of Reclamation (Reclamation) and Stetson Engineers (Stetson) on June 9, 2006.

Attendees:

Tom Bellinger	Reclamation Denver Technical Services Center (TSC)
Robert Talbot	Reclamation TSC
Doug McPherson	Reclamation Southern California Area Office (SCAO)
Kerri Mikkelsen Rose	North State Resources
Steve Reich	Stetson
Jean Moran	Stetson

Discussion items/notes:

1. *Contract runs 5 and 6:* A discussion took place regarding the two "open" contract runs to be performed by Stetson. The end result of this discussion was that Run 5 will be represented by run B in the Stetson memo dated June 28, 2006. Run 6 will represent the Stetson memo Run H, or the Alternative 2 simulation. For now this run will be run with an instream requirement of 5 cfs.

   Doug McPherson will verify this instream flow quantity through evaluation of previous planning documents developed by Bill Rohwer (former SCAO Planning Officer). The team was advised to hold off on this run until SCAO and FPUD discuss the instream flow requirement. Stetson will delay this run until June 23rd and still remain on schedule.

   Doug Mcpherson was concerned regarding the 40 cfs figure that has been used as a water supply figure. This number will be revised in July as determined by the model operating under the various constraints of the system.

   It was proposed that a sensitivity analysis be performed for Run 6 (Alternative 2) testing instream flow values of 5, 10, and 25 cfs. This was determined to be out of scope of the current Stetson contract and will have to be revisited.

2. *Status of the Decision Memo*: The Team was advised that the parties have until July 9 to agree on the document or work will be stopped. Doug McPherson will fax the

latest version to Stetson. Note: It was determined that since the modeling contract work will be nearly complete by July 9, and that it would make sense to complete the modeling contract despite the Decision Memo outcome.

3. *Surface Water Treatment Rule:* A discussion took place regarding the assumption of ground water needing to be treated as surface supply. Doug McPherson's read portions of the California definition of "Groundwater under the direct influence of surface water" (22 CCR 64651.50) to the team.

   CALIFORNIA CODE OF REGULATIONS
   TITLE 22. SOCIAL SECURITY
   DIVISION 4. ENVIRONMENTAL HEALTH
   CHAPTER 17. SURFACE WATER TREATMENT
   ARTICLE 1. GENERAL REQUIREMENTS AND DEFINITIONS
   This database is current through 06/02/06, Register 2006, No. 22.

   s 64651.50. Groundwater Under the Direct Influence of Surface Water.

   "Groundwater under the direct influence of surface water" means any water beneath the surface of the ground with significant occurrence of insects or other macroorganisms, algae or large diameter pathogens such as Giardia lamblia, or significant and relatively rapid shifts in water characteristics such as turbidity, temperature, conductivity or pH which closely correlate to climatological or surface water conditions.

   Note: Authority cited: Sections 208 and 4023.3, Health and Safety Code. Reference: Sections 4010, 4010.1, 4011, 4012, 4013, 4014, 4016, 4023.1 4023.3, 4024, 4025, 4026.4 and 4031, Health and Safety Code.

   HISTORY
   1. New section filed 5-6-91; operative 6-5-91 (Register 91, No. 25).
   22 CA ADC s 64651.50

   Doug expressed that - based on this regulation – he was relatively comfortable with Camp Pendleton's position that the SWTR does not apply to their groundwater wells, especially since the DHS reportedly does not apply the SWTR to Camp Pendleton's existing groundwater treatment system.

   The above lays the background as to why CPEN has been able to treat their well water as groundwater. Glen Howard of the TSC is working up numbers incase the Surface Water Treatment (SWT) Rule is invoked. If the SWT Rule becomes a factor, Stetson could develop a surface water corridor analysis – but it would require a modification to the contract. This would be a substantial amount of work.

   Regarding water quality issues on the base that are accommodated by the model, CPEN plans on putting a 50 foot sanitary seal in all of its old wells – any new project wells will also have this requirement. Thus, this needs to be considered in the final project cost. The model has accommodated this (resulting in some reduced aquifer capacity).

4. *Run Management Memo:* Steve Reich presented an updated version of the Run Management Memo (tables) that detail the parameters for the proposed runs. The first two pages remain unchanged. These were expanded on in the tables presented in pages 3 through 7. Comments/notes and recommended changes to the memo were discussed and include:
    a. Page 3: Check marks will be replaced by appropriate numbers in each cell.
    b. Page 4: This table documents flows that will be passed in the model by Rancho.
    c. Page 5: Details maximum emergency flows. CWRMA is obligated to pass the flows listed in the last column if CPEN makes a call on them (from Rancho).
    d. Page 6: Details the wet year management that is simulated in the model. The model treats October through April cumulative streamflow as a trigger for the hydrologic condition type that will be used in management in any year. Note that the model was stated to simulate reality in that the management forecast and operations for any year are modeled without foresight. Therefore, management inefficiencies based on forecasting criteria are considered as part of the system operation.
    e. Page 7: Details the dry year management scenario. Again, this operations criteria is simulated without foresight. The annual management decision for dry or wet years is made in May and sets the groundwater pumping for the next 12 months. This corresponds to the criteria listed in Jean Moran's run summary tables. The general plan is that the dry year management scenario will be generally applied unless the hydrologic condition changes during the year. If this is the case the management option will shift to the new condition (adaptive management).

        It was recommended to clarify the management decision process used in the model – this will be accomplished by Steve Reich in the form of a decision tree. The decision tree will be developed for the next conference call.

5. Run Results: Jean Moran presented run results for Run 1 (final) and Run 2 (provisional). Annual groundwater production summary tables and monthly graphs were provided. Doug McPherson requested that some of the output graphs be stacked for easier comparison. It was discussed that historical measured data is compared to the Calibration Run, the Baseline Run is comapred to the Calibration Run, and all future runs are compared with the Baseline Run. Historical water level hydrographs will also be included as an attachment to Tech Memo 2.

6. Wrap up: The next call will take place on June 15 (Thursday) and 1 PM Mountain time. Tom Bellinger will draft notes from this meeting for review and set up the next call. Future calls may be scheduled on Thursdays to accommodate schedules.

June 21, 2006

Memorandum (Meeting Notes)

To: Stetson Engineers

From: Bureau of Reclamation, Denver Technical Service Center

Subject: June 15, 2006 Groundwater Technical Team Conference Call regarding work on the Santa Margarita River Conjunctive Use Project (CUP)

The following memorandum memorializes the discussions from a modeling conference call between the Bureau of Reclamation (Reclamation) and Stetson Engineers (Stetson) on June 15, 2006.

Attendees:

Tom Bellinger	Reclamation Denver Technical Services Center (TSC)
Robert Talbot	Reclamation TSC
Jeff Baysinger	Reclamation TSC
Doug McPherson	Reclamation Southern California Area Office (SCAO)
Steve Reich	Stetson
Jean Moran	Stetson

Discussion items/notes:

1. *Operations Decision Tree:* Steve Reich presented a draft decision tree to the Team for comment. The version presented represented an overview of pumping operations based on hydrologic conditions. It is designed for annual operations without foresight, similar to what might be used for an adaptive groundwater management plan during project operations. Based on suggestions from the TSC team, Steve will develop a more detailed version of the Decision Tree for the next call. Included in future versions will be monthly management options and more detail regarding adaptive management rules. Other additions may include environmental constraints and statistical data regarding probability of occurrence of each decision tree node.

2. *Run Results:* Jean Moran presented run results for Runs 3 and 4 (provisional).

   Run 3:
   - A 65:35 pumping split between Upper Ysidora and Chappo basins appeared to be optimal for this run (70:30 and 60:40 splits were also evaluated).
   - Bob Talbot asked about the possibility of upsizing wells for better productivity. Jean felt that the wells were at their limit based on transmissivity data.
   - Also discussed was well efficiency – Jean has not had time to look into this at this time.
   - Run 3 indicated that Riparian areas in the Chappo basin are stressed and pumping may need to be curtailed. The topic of a mitigation envelope was

discussed and will need further evaluation (how much can we mitigate – based on the Chappo drawdown?).
  - Run 3 is considered a "doom and gloom" scenario in terms of riparian effects. Saltwater intrusion was not a factor (it was being limited in this run).
  - Jean Moran will take another look at Run 3 in terms of potential subsidence/aquifer collapse issues.

Run 4:
  - This run removes the additional CWRMA flows.
  - A 65/35 aquifer pumping split in the second Below Normal year was tested.
  - In Extremely Dry years, pumping was at 3,000 AF. Steve Reich will perform a reality check on this (under historic conditions with no CWRMA, pumping was higher). A tailored adaptive management scheme may need consideration.

3. *Distribution System:* Jeff Baysinger discussed design concerns with the team. One point of focus was the possibility of modifying the existing well distribution system with regard to the existing manifold conveyance problems (thought to be a result of 90-degree joints in the system). Since the modeling essentially ends at the wellhead, this is out of the modeling effort's scope. Doug McPherson offered to talk to CPEN regarding the possibility of redesigning the well field manifold as part of the CUP study.

4. *Alternative 2 Discussion:* Doug McPherson advised the team that he discussed the 25 cfs diversion at the Fallbrook sump with Joe Jackson (FPUD). Joe wants the 25 cfs diversion evaluated. Steve will draft a document outlining what the Team understands about this run (Model Run H). The team believes that Alternative 2 needs to be set up in a cooperative, rather than adversarial mode and is proposing to evaluate the 25 cfs diversion with a 3 cfs bypass. Doug McPherson also stated that FPUD and CPEN hope to resolve their differences on this alternative by June 28.

5. *Wrap up/Next Steps:*
   - A summary of results will be drafted by Stetson for the next call (Runs 1-4). This will be in the form of comparative tables that can be used for overall evaluation of the runs and for making adaptive management decisions. Jeff Baysinger will forward some ideas to Stetson that will help him in his design work.
   - The next call will take place on June 23 (Friday) at 11 PM Mountain time.
   - Tom Bellinger will draft notes from this meeting for review and set up the next call.

June 30, 2006

Memorandum (Meeting Notes)

To: Stetson Engineers

From: Bureau of Reclamation, Denver Technical Service Center

Subject: June 26, 2006 Groundwater Technical Team Conference Call regarding work on the Santa Margarita River Conjunctive Use Project (CUP)

The following memorandum memorializes the discussions from a modeling conference call between the Bureau of Reclamation (Reclamation) and Stetson Engineers (Stetson) on June 26, 2006.

Attendees:

Tom Bellinger	Reclamation Denver Technical Services Center (TSC)
Robert Talbot	Reclamation TSC
Jeff Baysinger	Reclamation TSC
Doug McPherson	Reclamation Southern California Area Office (SCAO)
Steve Reich	Stetson
Jean Moran	Stetson
Del Holz	Contractor for SCAO

Discussion items/notes:

1. *Groundwater Model Results Memorandum Review:* Steve Reich presented a review of the Stetson June 26 Memo (Subject: Santa Margarita River Conjunctive Use Groundwater Model Results.) Steve emphasized that this memo is a work in progress. It summarizes what has been accomplished on the groundwater model work to date and that the job is proceeding on schedule. The following revisions to the draft document were discussed:
    a. Add a table to compare the Permit 15000 results against Run 1 (the current proposed action).
    b. Add explanatory/transition text to introduce the table presented on page 4.
    c. Correct the last column on table 4 (Permit 15000) to read 14,100.

2. *Model Run and Groundwater Pumping Management Memorandum Review:* Steve Reich presented a review of the Stetson June 26 Memorandum (Subject: DRAFT Summary of Model Runs and Groundwater Pumping Management Tables.) The following revisions were discussed:
    a. Run designations were kept consistent with earlier documentation. As a result, Run B is excluded from the table (Run B was chosen to be one of the undesignated contractual runs – Run 5). A footnote will be provided to explain the “missing” run. The previously undesignated Run H was chosen to be the undesignated contractual Run 6.

b. Regarding new wells: Jean Moran reported that there is some interference between wells at maximum pumping. Therefore, the model logic will assume some coordination of pumping to minimize interference while optimizing project yield. Some wells may occasionally require shut down as part of this plan, however, they could be considered as backup wells during downtime or maintenance periods.
c. Regarding well maps in the final documentation, Jean Moran stated that well numbers will be sequenced by order of use by subbasin.
d. Page 10 Tables: These tables were presented in an effort to provide Jeff Baysinger with additional design information. Jeff felt that they probably would not be needed. Therefore, the tables on pages 10 and 11 will be eliminated.
e. Decision Tree: Steve Reich explained his improved version of the operation decision tree on page 12. This is still an annual version of the decision process. It was decided that a monthly version would be too burdensome for the documentation and that the table in its present form adequately explains the adaptive management concept being considered by the Modeling Team.

3. *Run Status:* Jean Moran stated that Run 6 is currently in progress. The Baseline and runs 1 through 5 outputs are now ready for review and will be sent to the TSC along with the results of Run 6 when it is completed.

   In addition to a new "proposed project" run, Steve Reich is proposing an 8th run for presentation to the Study Team. This run will consider the use of emergency water supplies for an extreme drought as simulated in the 7-year drought of history. Since the project yield is bound by this historic drought condition, it was decided that a model run should be done to illustrate how the project yield could be enhanced through the use of emergency supplies. This should add a new dimension of operation management to the proposed action. The Team will present this proposed run to the Study Team on July 6 for consideration as additional work.

4. *Deliverables – July 6 Meeting:* The Team decided that an executive summary will be developed for presentation for the upcoming July 6 meeting. Steve Reich will draft the ES by July 29 for review by the Team. Detailed Technical Memorandum information will continue to be developed. Because of the short time frame between this call and the July 6 meeting, and due to the situation with the Decision Memo and new preferred alternative not being signed off until later this week, an analysis of the new proposed action will not be possible by July 6. Instead, the original contracted run results will be presented to the Study Team and the new proposed alternative presented at a later date.

   Inclusion of the new proposed action will require a contract modification. Steve Reich will provide a cost estimate to the TSC and SCAO.

   It was noted that North State Resources will be present at the July 6 meeting.

5. *Wrap up/Next Steps:*
   a. The next conference call will take place on Friday, June 30th at 11:00 MT. The call in number will remain the same as past Friday calls.
   b. The executive summary will be discussed along with final preparations for the July 6 presentation. Del Holz will draft an agenda for the meeting.
   c. Stetson and TSC personnel will have a final conference call on July 5th to finalize the presentation for the following day.
   d. Tom Bellinger will draft notes from this meeting for review and set up the next call.
   e. Steve Reich will provide Del Holz with a proposed agenda for Stetson's discussion items at the July 6th meeting.

July 2, 2006

Memorandum (Meeting Notes)

To: Stetson Engineers

From: Bureau of Reclamation, Denver Technical Service Center

Subject: June 30, 2006 Groundwater Technical Team Conference Call regarding work on the Santa Margarita River Conjunctive Use Project (CUP)

The following memorandum memorializes the discussions from a modeling conference call between the Bureau of Reclamation (Reclamation) and Stetson Engineers (Stetson) on June 30, 2006.

Attendees:

Tom Bellinger	Reclamation Denver Technical Services Center (TSC)
Robert Talbot	Reclamation TSC
Jeff Baysinger	Reclamation TSC
Chuck Borda	Reclamation TSC
Steve Reich	Stetson
Jean Moran	Stetson

Discussion items/notes:

1. *Model Runs 1 – 6:* Jean Moran presented a review of model results for the Baseline and Runs 1 through 6. The discussion focused mainly on the Baseline and Run 1 output data (the Team was provided output for all 7 runs). Comments and discussion items are summarized below:
    a. Various corrections/reformatting based on TSC input will be accommodated.
    b. A master list of acronyms and a master legend for graphs and tables will be included in the next TM 2.0 draft. These will be placed in front of the appendices
    c. Graph colors have been standardized. Datum colors will be checked for standardization.
    d. Only "model years" will be listed on future documentation.
    e. Regarding graph plots for Layers 1 and 2, these are essentially on top of one another (with very little separation). A note will be added to the graphs advising the reader that both lines are included in the graphs.
    f. For the Baseline run, data for existing wells will be presented in the same format as future wells for Runs 1 - 6.
    g. It was suggested that a "difference" table of results be developed to help the reader gain a quick understanding of the net differences in results for each run. Tables will be developed for each run as it compares to Baseline and Run 1 (the current preferred alternative). Stetson has already started to develop these tables and will include them in the final TM.

h. Differences in aerial precipitation values were noted for different runs. Jean Moran will look into this.
i. The well utilization level in the updated model runs was changed from 75% to 80%. This is due to the greater flexibility afforded by the additional wells added to the system in future scenarios.
j. Well pumping results were presented on an annual basis. Stetson will provide the TSC with monthly pumping tables for Jeff Baysinger's use. Due to their volume, they will not be included in the final TM, but will be retained in the files as supporting data.
k. Regarding Run 6 and projected Fallbrook Pumping (25 cfs diversion at the Fallbrook Sump), a table and exceedance curve (presenting a percent and number of months exceeded) will be developed for Technical and Study Team members' use.
l. It was noted that approximately 12 runs were needed to reach the current output of each run (5 runs were executed to complete Run 6). This was a tremendous amount of work for the fast track timeline associated with this modeling effort.

2. *Technical Memorandum (TM) Draft:* Steve Reich presented a review of a portion of the TM 2.0 draft (primarily the recommendation and summary sections). The following discussion items are noted:
   a. The document was toned down with regard to technical details. This was a result of a Team decision as a way of providing the Study Team with a less complex document that covers all the modeling issues and results. TM appendices will contain a greater level of technical detail for those readers who are interested in its review.
   b. Steve Reich will send another version of the TM (full document) to the TSC by Monday (July 3) for review. The Study Team draft TM and an accompanying Powerpoint presentation will be completed on Wednesday July 5.
   c. Steve Reich discussed the concept of "planning range" as a way of illustrating the range of yields associated with each run. It was suggested that this be elaborated on in the report with reference to the associated exceedance curve already in the text.
   d. Regarding the concern that the historic 7-year drought could be exceeded in the future, language will be added to the TM indicating that this situation has been considered. Recommendations for long-term drought management will be briefly presented in the TM.
   e. Recommended Model Run #3 will be broken down to Runs 3a and 3b as these are related runs to address one issue.

3. *July 6 Meeting:* The TM will be available at the July 6 meeting. If required, the Team will call or meet on Wednesday afternoon (July 5) to clear up any remaining issues. A final meeting agenda will be prepared early next week. Recommendations for future runs (contained in the TM) will be considered to be future contract work – as decided upon by the Study Team.

4. *Wrap up/Next Steps:*
    a. No conference calls are scheduled until after the July 6 meeting.
    b. Tom Bellinger will draft the notes from this call and distribute to the Team for comment.

Study Team Meeting
Santa Margarita River Conjunctive Use Study
July 6, 2006
8:30 AM – 2:00 PM

Location: Southern California Area Office, Temecula, CA

Attendees: See last page

Objectives: **1.)** Provide Study Team with an overview of Reclamation's and Stetson Engineering, Inc (Stetson) modeling efforts as presented in the Draft TM 2.0; **2.)** Update on EIS/EIR activities; **3.)** Update on Decision Memorandum; **4.)** Introduce the Economics technical team member.

Meeting Notes:

- Del Holz started the meeting with introductions and a review of the meeting agenda. The order of agenda items was modified to accommodate presenters' schedules and a conference call with Glenn Howard to discuss his Technical Memorandum (86-68230-1) addressing water treatment issues was added to the agenda.

- Steve Reich and Jean Moran provided meeting participants with a color copy of their power point presentation. Study Team members were provided a copy of the draft TM 2.0 for their review. These notes will highlight point of the discussion.

- The five main areas of the presentation were: 1) Overview of the groundwater model; 2) Calibration and baseline models; 3) Presentation and results of the six management scenario model runs (See TM 2.0 for detailed description of Model Runs 1-6); 4) Conclusions and recommendations.

- Steve Reich and Tom Bellinger highlighted the technical peer review that occurred throughout the modeling process. The process included four meetings of the technical team (Reclamation and Stetson) and 14 conference calls.

- The resulting groundwater levels of the management scenarios were compared to the no-project baseline conditions. The groundwater levels within the riparian corridor of the management model runs, except for Model Run 3, were constrained to the historic variability of groundwater fluctuations and groundwater levels in the grassland areas were allowed to drop below historic minima.

- Groundwater wells – Model Runs 1-6 require six to nine new well; in maximizing wet weather pumping, some wells are pumped less than 2% of the time; there was no well interference during normal operations; and pumping did not cause VOC migration in the Chappo Subbasin.

- Steve Reich presented a comparison of the average annual and median annual water budget of the six management scenarios to the baseline model run. Conclusions were: Model Run 3 provided the greatest groundwater yield, Model Run 6 provided the greatest total water yield, application of a wet-year algorithm provided maximum water yield during wet periods, dry year management protected the riparian corridor; and optimal groundwater yield was achieved by recharging the aquifers on Camp Pendleton by shifting the maximum pumping to the winter.

- Future Model Runs were discussed. Four additional Model Runs discussed included: 1) Model Run that simulates the recently identified preferred alternative; 2) Model Run that quantify additional water supply required to mitigate adverse impacts to declining water level during worst case seven-year drought; 3) Model Run that optimizes the Chappo Subbasin without concern of migrating VOCs; and 4) Model Run that identifies the sensitivity of riparian and other environmental demands based on changes in by-pass flows. Reclamation's existing contract with Stetson does not include these additional Model Runs.

- Steve Towers of North State Resources, Inc (NSR) provided an update of their EIS/EIR progress. Work is progressing on the 50% review draft; botany surveys are complete; wetland delineation is complete and NSR is working on the report; and the draft work plan for cultural resource surveys is about 80% complete. The California Gnatcatcher surveys are complete for 2006. Depending on the location of new wells and the newly developed proposed plan, Reclamation and NSR will need to evaluate the completeness of the field work.

- Charles (Chuck) Borda was introduced as the Economist on the TSC Technical Team. Chuck briefly presented the types of information he would be looking for in the economic assessment of the proposed plan and alternatives. Steven Evanko (CPEN) and Joe Jackson (FPUD) will be the Study Partner contacts for Chuck as the economic assessment proceeds.

- Glenn Howard joined the meeting by conference call to discuss the water treatment process requirements and treatment costs if groundwater is under the influence of surface water. Study Team member were provided the Technical Memorandum (86-68230-1) prepared by Glenn discussing in process. Glenn presented three potential treatment processes to meet the California Surface Water Treatment Rule. Glenn suggested getting input from the California State Health Department on the issue of groundwater under the influence of surface water prior to going any further on design of the water treatment facilities.

- Completion and signing of the Decision Memorandum for the SMRCUP was discussed. The Study Partners are in agreement with the newly developed preferred plan; however, agreement could not be obtained on Alternative Two (Alt. 2) presented in the Decision Memorandum. Alt. 2 included construction of a diversion dam at the Fallbrook sump. Camp Pendleton is not willing to sign the Decision Memorandum with this alternative included and Fallbrook will not sign the memo if it is not included. Further discussion will be necessary by the Study Partners to resolve this issue.

Action Items:

- SCAO will coordinate a meeting with Camp Pendleton and Fallbrook to discuss resolution of the Decision Memorandum.

- Reclamation will negotiate with Stetson to include additional Model Runs to their existing contract.

- Design Team will move forward with work based on the newly developed proposed plan, which includes 10 cfs surface diversion and 30 cfs groundwater production.

- Reclamation will meet with NSR following resolution to the Decision Memorandum to discuss scheduling issues and any changes in work based on the Decision Memorandum.

Next Meeting:

- Next Study Team meeting was scheduled for August 17, 2006, at Reclamation's office located in Temecula.

Meeting Attendees:

Meena Westford	Reclamation
Joe Jackson	FPUD
Steven Evanko	CPEN
Hiphil Clemente	Navel Weapons Facility
Doug McPherson	Reclamation
Colleen Eckenroad	CPEN
Ron Couchot	CPEN
Andrew Entingh	CPEN
Steven Towers	NSR
Kerri Mikkelsen Rose	NSR
Steve Reich	Stetson
Jean Moran	Stetson
Tom Bellinger	Reclamation
Bob Talbot	Reclamation
Jeff Baysinger	Reclamation
Charles Borda	Reclamation
Del Holz	Reclamation (Contractor)

July 17, 2006

Memorandum (Meeting Notes)

To: Stetson Engineers

From: Bureau of Reclamation, Denver Technical Service Center

Subject: July 17, 2006 Groundwater Technical Team "Kick Off" Conference Call Regarding Amended Contract Work on the Santa Margarita River Conjunctive Use Project (CUP)

The following memorandum memorializes the discussions from a modeling conference call between the Bureau of Reclamation (Reclamation) and Stetson Engineers (Stetson) on July 17, 2006.

Attendees:

Tom Bellinger	Reclamation Denver Technical Services Center (TSC)
Robert Talbot	Reclamation TSC
Chuck Borda	Reclamation TSC
Doug McPherson	Reclamation Southern California Area Office (SCAO)
Steve Reich	Stetson
Jean Moran	Stetson
Del Holz	Project Manager

Discussion items/notes:

1. *Contract Schedule:* A discussion took place regarding the proposed schedule for the contract. Several small adjustments were made. The schedule will be updated by Stetson and sent to Reclamation.

   It was suggested that the upcoming Study Team meeting scheduled for 8/17 be postponed to better accommodate the modeling work and reporting. A new date of 8/31 was proposed. Del Holz will talk to Meena Westford regarding this change.

2. *Water Quality Monitoring:* Stetson will install the water quality probe with the algal sensor in the near future.

3. *Run Constraints:* A listing of constraints for upcoming runs will be developed by Stetson and sent to the Modeling Team prior to the next conference call.

4. *Tech Memos:* Regarding the final disposition of the Technical Memoranda for the modeling work:

   - *Tech Memo 2.0:* will not be finalized. It will remain in its present form as a DRAFT final.

- *Tech Memo 2.1:* will summarize all of the modeling work. This TM will be finalized as a deliverable for the contract modification.

5. *Next Call:* The next conference call will be occur on 7/21/06 at 11:00 AM Mountain Time. Tom Bellinger will arrange for the call and pass call-in information to the Team. It was suggested that Steve Towers of NSR be invited to that call.

July 24, 2006

Memorandum (Meeting Notes)

To: Stetson Engineers

From: Bureau of Reclamation, Denver Technical Service Center

Subject: July 21, 2006 Groundwater Technical Team Conference Call Regarding Amended Contract Work on the Santa Margarita River Conjunctive Use Project (CUP)

The following memorandum memorializes the discussions from a modeling conference call between the Bureau of Reclamation (Reclamation) and Stetson Engineers (Stetson) and North State Resources (NSR) on July 21, 2006.

Attendees:

Tom Bellinger	Reclamation Denver Technical Services Center (TSC)
Robert Talbot	Reclamation TSC
Chuck Borda	Reclamation TSC
Doug McPherson	Reclamation Southern California Area Office (SCAO)
Steve Reich	Stetson
Jean Moran	Stetson
Del Holz	Project Manager
Steve Tower	NSR

Discussion items/notes:

1. *Run 9:* Highlights of a discussion regarding Run 9 results are as follows:
   - Result: there was an increase in pumping of 200 af/year (median).
   - Result: there was an increase in pumping of 600 af/year on an average annual basis.
   - The run illustrated that when pumping is optimized in Above Normal and Below Normal years, there is increased drawdown in the grass/riparian areas above those noted in Run 1.
   - Salt water intrusion was not increased in this run.
   - Model outflow:
     a. Run 1 = 29,100 af/yr
     b. Run 9 = 28,700 af/yr
     c. Difference on an average annual basis = 400 af/yr
   - Note: the lower portion of the Chappo basin is under consideration as a limiting factor to yield.
   - There was no pumping in the Lower Ysidora in Run 9.
   - Regarding comparing this and other runs with Run 1: it was agreed that eventually, a similar comparison, not currently contracted, will have to take place with the Proposed Action when it is completed (currently not Run 1).

2. *Run 10 (Diversion By-Pass):* The following points were made regarding this run:
   - The question about some items to consider regarding constraints and run optimization were raised by Steve Reich:
     a. If we allow more by-pass flow, will it limit the project yield?
     b. Do we reduce pumping to allow the by-pass flow to arrive intact to the estuary (i.e. increase estuary flow, an environmental benefit), or do we allow it to be re-pumped below the project?
     c. If the mean flow out of the model is 3+ cfs, what is the best way to accommodate this flow through pumping alterations?
     d. Some by-pass flow will re-enter the aquifer and therefore be delayed in reaching the estuary. Impact?
     e. What is our goal regarding this run? Do we leave more for the environment by cropping high flows and let baseflow pass or consider other options?
   - In consideration of the above questions, the team proposed a general strategy for Run 10:
     a. Perform a sensitivity analysis on different by-pass flow levels that occur at the top of the model. This process will help discern the impact to varying by-pass flows on project yield, assist in optimizing the impact of ET while keeping simulated water levels in riparian indicator cells above historical low.
     b. The goal of the sensitivity analysis will be, through trial and error, to determine the optimization inflection point on yield and impact.
     c. The sensitivity analysis strategy will be to:
        i. Run with by-pass flow levels of: 0, 3, 6, 9 cfs flow as a first step. These flows will be set up in two ways: (1) by-pass flow will merely pass by the project with no concern about downstream areas, and (2) the flow will be carried through from the model top to bottom.
        ii. The progress of this work will be discussed in the August 4 conference call and provide information for discussing further optimization strategies.
        iii. If time and budget permits, a variable flow run could be developed and analyzed.
   - One concern was raised by Doug McPherson, that the evaluators of the environmental impacts typically consider only the bypass flow at the diversion point. The Technical team discussed the need to consider the benefits of the by-pass flow reaching further downstream toward the esturay.

3. *Run 8, Proposed Action:* A discussion of the upcoming Proposed Action run (Run 8) included the following points:
   - Stetson is working on optimizing the surface water portion of the run.
   - The question was raised: Do we use Run 1 or Run 8 as the main comparison scenario with alternative runs? It was suggested that in the long term, this run, the Proposed Action, will have to be included for comparison with all alternatives.

Doug McPherson suggested that the Decision Document be held for signing until the modeling process gives the Study Team more information to finalize the Proposed Action details. This action will be under discussion in the SCAO. Currently, model runs have been setup to be compared with Run 1.

4. *Design Data:* Regarding Jeff Baysinger's design data needs, it was decided that a table of maximum pumping levels for each will be developed and placed in a table for Jeff by next week.

5. *Other discussion items:*
   1. Doug McPherson asked about how Runs 9 and 2 compare (i.e., Does Run 9 reduce the L. Ysidora yield over Run 2?). Stetson will look at this over the next several days.
   2. Stetson will perform a comparison of Runs 2, 5, and 9.
   3. Doug McPherson advocated that Run 1 still be used as a comparative tool since it has been used for this purpose to date. However, the team also concluded that Run 8 (proposed action) will still yield valuable information and should be considered, even though it is another level of work to be performed.

6. Water Quality Scope of Work: The SOW provided by Glenn Howard was discussed:
   - Jean Moran has sent Glenn's SOW to their lab personnel for evaluation and costing.
   - Steve Reich will discuss the possibility of CPEN doing the lab work with Steve Evanko) and compare the cost.
   - Water Quality metering will continue and grab samples are planned in the near future
   - It was noted that Jean Moran will be on leave from 7/26 to 8/2.

7. *Schedule/Next Call:* The next conference call will be occur on 8/4/06 at 11:00 AM Mountain Time. Tom Bellinger will arrange for the call and pass call-in information to the Team. If other informal calls are needed between now and 8/4, they will be arranged as necessary.

   It was suggested that the 8/17/06 meeting with the Study Team be postponed to make better use of time and information management. It was suggested that the period of 9/6-7 be considered for the meeting (9/8/06 has been scheduled as of this writing).

August 11 2006

Memorandum (Meeting Notes)

To: Stetson Engineers

From: Bureau of Reclamation, Denver Technical Service Center

Subject: August 4, 2006 Groundwater Technical Team Conference Call Regarding Work on the Santa Margarita River Conjunctive Use Project (CUP)

The following memorandum memorializes the discussions from a modeling conference call between the Bureau of Reclamation (Reclamation) and Stetson Engineers (Stetson) on August 4, 2006.

Attendees:

Tom Bellinger	Reclamation Denver Technical Services Center (TSC)
Robert Talbot	Reclamation TSC
Jeff Baysinger	Reclamation TSC
Doug McPherson	Reclamation Southern California Area Office (SCAO)
Steve Reich	Stetson
Jean Moran	Stetson
Molly Palmer	Stetson

Discussion items/notes:

1. *WQ Data to Glenn Howard:* Stetson has received clearance from CPEN and will send a CD with historic water quality data to Glenn Howard and Del Holz. Jeff Baysinger stated that Steve Evanko (CPEN) will try to send some "Home to Ocean" data sets to Del and Glenn as well.

2. *Run 7:* Steve Reich and Jean Moran presented the results from Run 7. The basis premise behind this run was to ignore the 7-year drought though the use of imports. This run will give insight on how the dry year management may be optimized for the study area.

   This run simulated a 3000 AF pumping addition to the area for the first 11 model years. The remaining 39 years were scrutinized for optimization. The run is still in its preliminary stages (more optimization work ahead) and will be discussed further on the next call.

   It should be noted that Run 7 is one of the more complex and expensive runs for this modeling effort. The attempt to optimize conditions while not increasing environmental impacts has been time consuming (as expected). Results from this run will eventually be compared to Run 1.

3. *Run 8:* Stetson presented preliminary surface water assumptions for this run. Run 8 includes:
   - An added diversion in Pond 2 that ranges from 3 to 10 cfs.
   - The evaporation and seepage requirements of this pond are a priority before the new diversion.
   - Pond 1 acts as a settling basin prior to the Pond 2 diversion.
   - The Reservoir Operations Model (ROM) is flexible enough to change the diversion point to any pond or Lake O'Neill as desired.
   - The operation priority is to maintain the 3 cfs bypass and retain the Lake O'Neill filling requirement. Excess water from these operations will be spilled to Pond 3.
   - The diversion canal is maintained at a 200 cfs capacity.
   - The new water rights permit is exercised prior to using the full pre-project right, but the 4000 AF requirement is met ASAP. The run ensures that the permit is satisfied and not in danger of abandonment.
   - Stetson will proceed with these assumptions and setup the groundwater model run. A run with maximum groundwater pumping and a run limiting the groundwater pumping to 30 cfs (40 cfs groundwater production and new diversion) will be completed for comparison.

4. *Design Notes:* Jeff Baysinger requested any input on how a diversion might be constructed from Pond 2 (or wherever the final diversion is placed). It was suggested that an infiltration gallery or Rainey Well might be considerations. Bob Talbot will supply Jeff with some design information.

5. *ROM:* Molly Palmer recently "upgraded" the ROM making it more efficient and user friendly. Results showed some minor changes. As per Bob Talbot's request, Molly will rerun Runs 1-6 with the new version to test for any significant differences in the output. It is expected that the upgrade version will not produce any significant changes of concern.

6. *Next Steps/Call:*
   - Run 10 is being developed and preliminary results will be available for the next call.
   - The next conference call will be occur on 8/11/06 at 11:00 AM Mountain Time. Tom Bellinger will arrange for the call and pass call-in information to the Team.

September 26, 2006

Memorandum (Meeting Notes)

To: Stetson Engineers

From: Bureau of Reclamation, Denver Technical Service Center

Subject: August 11, 2006 Groundwater Technical Team Conference Call Regarding Amended Contract Work on the Santa Margarita River Conjunctive Use Project (CUP)

The following memorandum memorializes the discussions from a modeling conference call between the Bureau of Reclamation (Reclamation) and Stetson Engineers (Stetson) on August 11, 2006.

Attendees:

Tom Bellinger	Reclamation Denver Technical Services Center (TSC)
Robert Talbot	Reclamation TSC
Jeff Baysinger	Reclamation TSC
Chuck Borda	Reclamation TSC
Doug McPherson	Reclamation Southern California Area Office (SCAO)
Jean Moran	Stetson
Molly Palmer	Stetson

Discussion items/notes:

1. *Water Quality Data:* Glenn Howard expressed his concern that there appears to be limited water quality data to complete a feasibility level study for the surface water treatment plan. Data on hand will only suffice for an appraisal level (Reclamation standards).
   - Jean Moran gave Glenn the contact information for Environmental Security (Andrew Entingh). Andy had mentioned that he had surface water quality data during the July 6th meeting in Temecula. If needed, Stetson could collect the water quality samples during their next site visit. They have checked with their lab regarding the water quality parameters that Glenn had put together last month. Glenn said that this was not needed at this time, rather that historical data was needed.
   - CPEN is still checking for other data. Steve Evanko only provided groundwater data.
   - Doug McPherson has 3 grab samples in his office from storm flow events. Does Glenn want these evaluated?
   - The TSC will have Jim Yahnke sort and evaluate data that has been received to date.

2. *Run 7 Analysis:* The following points were made by Jean Moran regarding this run:

- 6 optimization runs were used to evaluate the Run 7 scenario.
- This run included the Permit 15K dry year management scenario. CWRMA emergency management flows were not used in this run.
- Based on Run 7 results it appears that the main constraint on yield are the existing CWRMA flow rules. It will be recommended (in TM 2.1) that the CWRMA banking scheme should be modified (hold some water as "economic reserve") to increase project yield.

3. *Upgraded ROM reruns of Runs 1-6:* Molly Palmer executed reruns of Runs 1-5 using the upgraded ROM. Minimal differences (between the old and upgraded ROM) were observed (as expected – as most model improvements were cosmetic in nature). Run 6 will be re-executed this week.

4. *Run 8 status:* Molly Palmer will present results of this run on the next conference call.

5. *Run 10 discussion:* Molly Palmer presented results of the ROM for Run 10. Results appeared to be reasonable. It was requested that the final graph be changed to a log scale. It was noted that from July through September no diversions were made to the ponds in order to replace evaporation at Lake O'Neill as per the existing water agreement.

6. *Schedule/Next Call:* The next conference call will be occur on Thursday August 17 at 1 PM PT (2 PM MT). Tom Bellinger will arrange for the call and pass call-in information to the Team. Other items:
   - Stetson will evaluate yield for each increment of Run 10 and evaluate the impact on groundwater based on the 3 levels of bypass flow (3, 6 and 9 cfs). Project yield will be optimized for each bypass flow level. Bypass flows will be maintained throughout the model (top to bottom).
   - Run 8 results will be presented on the next call.

September 8, 2006

Memorandum (Meeting Notes)

To: Stetson Engineers

From: Bureau of Reclamation, Denver Technical Service Center

Subject: September 8, 2006 Modeling Team Conference Call Regarding Amended Contract Work on the Santa Margarita River Conjunctive Use Project (CUP)

The following memorandum memorializes the discussions from a modeling conference call between the Bureau of Reclamation (Reclamation) and Stetson Engineers (Stetson) on September 8, 2006.

Attendees:

Tom Bellinger	Reclamation Denver Technical Services Center (TSC)
Bob Talbot	Reclamation TSC
Jeff Baysinger	Reclamation TSC
Chuck Borda	Reclamation TSC
Del Holz	Contractor to Reclamation
Steve Reich	Stetson
Jean Moran	Stetson
Natalie Schommer	Stetson

Discussion items/notes:

1. *New Team Member:* Steve Reich introduced Natalie Schommer who has been assisting Jean Moran with the groundwater modeling. Natalie will continue to assist Jean on the modeling effort.

2. *Temecula Meeting:* The next meeting scheduled with the Study Team (Temecula) is on September 28, 2006. All parties indicated they were available to attend.

3. *Schedule Recap:* Steve Reich and Jean Moran recapped the events of the past several weeks and discussed projected work in the near future. Several runs and their assumptions were also explained as per the Stetson Memorandum of September 5, 2006 (Subject: *Proposed September 2006 Model Run Schedule; Technical Conference Call Schedule*). Highlights of this discussion follow:
    - CWRMA flow limits: 2,200 AF/Year limit with a 5,000 AF total bank limit during dry periods or until the bank can be recharged. Releases are still constrained by an 11.5 cfs system capacity.
    - Emergency Flows (Low Range): This operational philosophy was developed by Stetson as a conservative use of CWRMA emergency water. Comparison of high and low range CWRMA emergency water would provide a potential range of impact this resource provides to the project.

- Run 7: is considered complete (regarding the water supply analysis). Some analysis regarding emergency flows is still in progress.
- Preferred Action Run: This run will use the assumption (as discussed in earlier conference calls) that the 4,000 AF license will be satisfied prior to diverting 3-10 cfs downstream of Pond 2. Summer-time diversions will be used to first replace Lake O'Neill evaporation and then be diverted to the ponds and the direct surface diversion downstream of Pond 2 under the new permit.
  - This assumption was not part of the first Run 6 results. Run 6 was originally set up not to meet existing permits before diverting surface water. In its present state (Run 6R), the modelers are following the legal water right process. If modifications to this process are requested (to optimize yield), additional runs could be completed at a later date.
- Design note: Jeff Baysinger explained that his design now incorporates 2 variable speed pumps for the 3 to 10 cfs diversion range downstream of Pond 2. This was acceptable to the Team.
- Is a surface water diversion worth the effort? The modeling should provide insight to this question in the next week or so.
- Run 9: Complete.
- Run 10: Confusion over the bypass flows in this run was discussed. For the 6 and 9 cfs bypass runs, 3 cfs will be bypassed as available at the diversion until both the Lake O'Neill and 4,000 AF/Year Pond water rights are met, and then the bypass will be increased to 6 or 9 cfs as available. For the "0" and 3 cfs bypass runs, "0" or 3 cfs will be bypassed as available for the entire water year. A run will be completed with no bypass (0.1 to 1 cfs, to simulate minimal bypass). The other runs will assume a 3, 6, and 9 cfs bypass flow.

4. *Schedule/Next Call:* Jean Moran stated that Stetson would like to continue with weekly conference calls in the near future even though the calls set in the contract have all been used. The team will schedule two more calls prior to the meeting on September 28, 2006. The next call will be at 11:00 AM on September 15th to discuss the results of all runs. A second call will be scheduled the following week to discuss draft Technical Memorandum 2.1. The team will have a few days prior to the second call to review the TM. Steve Reich will then "finalize" the draft and send it to the Study Team on September 25 or 26 for review prior to the September 28 meeting. Tom Bellinger will schedule the conference bridge for these calls and draft notes from this call.

September 18, 2006

Memorandum (Meeting Notes)

To: Stetson Engineers

From: Bureau of Reclamation, Denver Technical Service Center

Subject: September 15, 2006 Modeling Team Conference Call Regarding Amended Contract Work on the Santa Margarita River Conjunctive Use Project (CUP)

The following memorandum memorializes the discussions from a modeling conference call between the Bureau of Reclamation (Reclamation) and Stetson Engineers (Stetson) on September 15, 2006.

Attendees:

Tom Bellinger	Reclamation Denver Technical Services Center (TSC)
Bob Talbot	Reclamation TSC
Jeff Baysinger	Reclamation TSC
Del Holz	Contractor to Reclamation
Steve Reich	Stetson
Jean Moran	Stetson
Molly Palmer	Stetson
Natalie Schommer	Stetson

Discussion items/notes:

1. *Tech Memo 2.1:* Steve Reich stated that the draft TM 2.1 will be sent to Reclamation by 9/22/06 for review. Reclamation will then pass comments to Stetson by the morning of 9/25. Steve Reich will finalize the review draft (by 9/26) and send it to Tom Bellinger. Tom will then transmit the final draft version by close of business on 9/26 to Del Holz and Meena Westford who will forward it to the Study Team for review.

2. *Run 6R:* Jean Moran presented the results of Run 6R (includes the Fallbrook surface diversion with dry year management). Highlights of this presentation follow:
   - A daily occurrence graph for the Fallbrook diversion was requested by Reclamation and will be completed for TM 2.1 (this will also be done for Run 8).
   - Several tasks have been completed over the past week to ensure that the ROM and GW models are complete, correct, and represent the current groundwater right permits. This work resulted in some limits to the potential pumping from the surface water diversion; however, it was agreed that this was a vital step in ensuring that the model properly considered existing water rights (optimization work that may deviate from these rules can be completed at a later date if requested).

- Regarding the difference between Run 6 and 6R, the yield results were similar, however the source of the yield tended to shift more towards the groundwater supply in Run 6R.

3. *Run 10:* Jean Moran recapped results of Run 10, which tested the sensitivity of the system to a bypass of 1, 3, 6, and 9 cfs. Highlights of this presentation follow:
    - The 1 cfs run represented a zero bypass condition, a zero condition could not be mathematically be completed by the software
    - Under higher bypasses, groundwater recharge shifts from the pond areas to the area under the streambed.
    - Under the 6 and 9 cfs scenarios, July and August diversions increased (counter-intuitive). This might be caused by model noise or timing of water right rules. Molly will investigate.
    - In dry years, the potential for optimization work was demonstrated. This can be revisited if requested.
    - Model Years 48 and 49 produced counter-intuitive results with regard to pumping rates. Jean Moran will investigate this. Speculation is that this could be a result of Chappo's recharge response properties, differences in percent split of pumping between subbasins, or model noise.
    - Table O-3 needs revision regarding units.
    - It was noted that the ET for the 6 and 9 cfs bypass runs decreased. This could be a result of season or location of recharge (noise). Stetson will revisit this issue during the next several days.
    - Run 10 provides evidence that the system can accommodate in-stream resources that require a larger bypass than the 3 cfs CWRMA level and not significantly impact project yield.

4. *Schedule/Next Call:* The next Team call is scheduled for Friday, September 22 at 11 AM MT. Tom Bellinger will schedule the conference bridge for the next call and draft notes from this call.

   The Team will also plan on meeting (in person in Temecula or by phone) at 3:00 PM PT on September 27 to clear up any remaining issues prior to the Planning Team meeting the following day.

September 26, 2006

Memorandum (Meeting Notes)

To: Stetson Engineers

From: Bureau of Reclamation, Denver Technical Service Center

Subject: September 22, 2006 Modeling Team Conference Call Regarding Amended Contract Work on the Santa Margarita River Conjunctive Use Project (CUP)

The following memorandum memorializes the discussions from a modeling conference call between the Bureau of Reclamation (Reclamation) and Stetson Engineers (Stetson) on September 22, 2006.

Attendees:

Tom Bellinger	Reclamation Denver Technical Services Center (TSC)
Bob Talbot	Reclamation TSC
Del Holz	Contractor to Reclamation
Jean Moran	Stetson
Molly Palmer	Stetson
Natalie Schommer	Stetson

Discussion items/notes:

1. *Tech Memo 2.1:* The draft TM will be sent to Reclamation by close of business 9/22/06 for review. Reclamation will then pass comments to Stetson by the morning of 9/25. Steve Reich will finalize the review draft (by 9/26) and send it to Tom Bellinger who will forward it to the Study Team by close of business on 9/26.

2. *Runs 8, 8A, and 1A:* Jean Moran presented the results of Runs 8 and 8A (Proposed action). Highlights of this presentation follow:
   - Run 8 represents using the high range of emergency CWRMA flows to supplement supply.
   - Runs 8A and 1A represents using the low range of emergency CWRMA flows to supplement supply.

3. *Run 7:* High and low range CWRMA emergency flows were discussed using a revised table developed for Run 7 model output. The additional water supply needed to mitigate for a 7-Year drought was compared with these emergency flows.

4. Median and average comparisons of all run budget components (tables provided by Stetson) were then discussed. Run 1's results will be repeated as Run 10-3cfs to allow for easier comparison of Run 10 results.

3. *Run 10 counter-intuitive results (from the 9/15/2006 call):* Jean Moran recapped results of Run 10. The two issues that were brought up the previous week were then discussed. Highlights of this presentation follow:

   - Under the 6 and 9 cfs scenarios, July and August diversions increased (counter-intuitive). This was investigated and reported that the results were due to Lake O'Neill filling operations and water right compliance. A note was included on the graph which will be a part of the attachment for Run 10 in TM 2.1.
   - Regarding the comment that ET for the 6 and 9 cfs bypass runs decreased: the 1cfs by-pass run had a different percentage of pumping split between the UY and CH subbasins which could in turn affect the amount of drawdown in the riparian zone and the resulting ET volumes. The final volumetric budget numbers are rounded to the nearest 100 afy and these "counter-intuitive" results end up disappearing as noise.

4. *Schedule/Next Call:* The next Team (TSC and Stetson only) call is scheduled for Monday, September 25 at 11:30 AM MT to discuss TM 2.1 comments prior to release to the Project Team. Reclamation will initiate the call.

   The Modeling Team will also conduct a meeting by phone at 3:00 PM PT on September 27 to review the model presentation for the Planning Team meeting the following day.

Study Team Meeting
Santa Margarita River Conjunctive Use Study
September 28, 2006
8:30 AM – 1:00 PM

Location: Southern California Area Office, Temecula, CA

Attendees: See last page

Objectives: **1.)** Update on Decision Memorandum; **2.)** Update of the TSC engineering status; **3.)** Update on EIS/EIR activities; **4.)** Provide Study Team with an overview of Reclamation's and Stetson Engineering, Inc (Stetson) latest modeling efforts as presented in the Draft TM 2**.**

Meeting Notes:

- Del Holz started the meeting with introductions and a review of the meeting agenda. Mark Anderson of Camp Pendleton was welcomed to the meeting. He has been filling in temporarily for Colleen Eckenroad. Mark's e-mail address is mark.w.anderson4@usmc.mil.

- Doug McPherson (SCOA) provided a copy of the Decision Memo to the Study Team showing the latest redline strikeout revisions. Fallbrook and Camp Pendleton requested that a final draft version be provided for their review. Doug agreed to provide the parties with a final draft and the parties agreed to provide any comment on the final draft within a week.

- Jeff Baysinger (TSC Denver Design Team) discussed the engineering drawings and feature locations that have been developed for the SMRCUP. Study Team participants agreed to provide Meena Westford the SCAO office with comments on the drawings and feature locations by October 14, 2006.

- Meeting participants were provided with a color copy of the power point presentation by Tom Bellinger, Steve Reich, and Jean Moran. Study Team members were provided a copy of the draft TM 2.1 (also electronic copy) for their review. Camp Pendleton and Fallbrook were also provided a copy of the appendices.

- Tom Bellinger introduced the presentation with a description of the hydrology modeling process and coordination by Reclamation and Stetson Engineers (Stetson). Tom then turned the remainder of the presentation over to Steve Reich (Stetson). Steve provided an overview of the model, a description of the ten model runs, aquifer water level constraints, locations and use of indicator cell, groundwater management constraints, and existing and future groundwater wells. Steve then highlighted the conclusions and recommendations contained in TM

2.1. The Study Team agreed to provide SCAO with comments on the draft TM 2.1 by October 18 so that Stetson could finalize TM 2.1 by October 26.

- Meena Westford informed the Study Team that the contract with North State Resources, Inc (NSR) would expire September 30, 2006. Steve Towers (NSR) provided an update of their EIS/EIR progress and listed the deliverable items that would be presented to Reclamation. The main items included: the 50% EIS/EIR review draft; botany surveys; wetland delineation; and the draft work plan for cultural resource surveys; California Gnatcatcher surveys; library and map data bases; and closing report. Reclamation will be developing a scope of work for a new contract to complete the EIS/EIR process.

Action Items:

- SCAO will provide Camp Pendleton and Fallbrook with a final draft of the Decision Memorandum and the parties will provide comments with a week of receiving the final draft.

- Reclamation Design Team has provided Camp Pendleton and Fallbrook with engineering drawings of the project. The parties agreed to complete their review by October 14. Comments are to be sent to SCAO.

- Study Team participants will provide the SCAO comments on the hydrology modeling analysis presented in draft TM 2.1 prepared by Stetson Engineers for Reclamation.

Next Meeting:

- Next Study Team meeting was scheduled for 8:00 PM, October 19, 2006, at Reclamation’s office located in Temecula. It was suggested that the next meeting would involve only the SCAO, Camp Pendleton, and Fallbrook Study Team members.

- Del Holz will be in contact with the Study Team participants to develop the agenda for the October 19 meeting.

September 28, 2006, SMRCUP Study Team Meeting Attendees:

Meena Westford	Reclamation
Joe Jackson	FPUD
Steven Evanko	CPEN
Hiphil Clemente	Navel Weapons Facility
Doug McPherson	Reclamation
Mark Anderson	CPEN
Andrew Entingh	CPEN
Lt. Col. Greg Thomas	CPEN
Capt. Chad Seber	CPEN
Steven Towers	NSR
Kerri Mikkelsen Rose	NSR
Steve Reich	Stetson
Jean Moran	Stetson
Tom Bellinger	Reclamation
Bob Talbot	Reclamation
Jeff Baysinger	Reclamation
Del Holz	Reclamation (Contractor)

November 1, 2006

Memorandum (Meeting Notes)

To: Stetson Engineers

From: Bureau of Reclamation, Denver Technical Service Center

Subject: November 1, 2006 Modeling Team Conference Call Regarding Proposed New Model Runs 11 - 14 on the Santa Margarita River Conjunctive Use Project (CUP)

The following memorandum memorializes the discussions from a modeling conference call between the Bureau of Reclamation (Reclamation) and Stetson Engineers (Stetson) on November 1, 2006.

Attendees:

Bob Talbot	Reclamation Denver Technical Services Center (TSC)
Jeff Baysinger	Reclamation Denver TSC
Doug McPherson	Reclamation SCAO
Del Holz	Contractor to Reclamation (left early due to dropped cell)
Steve Reich	Stetson Engineers
Jean Moran	Stetson Engineers
Natalie Schommer	Stetson Engineers

Discussion items/notes:

1. *Tables 18 & 1B:* Jean described the latest revisions to Tables 1B and 18. Table 1B resulted from discussion on improving Table 1. Table 1 will be renumbered to 1A and Table 1B will be included immediately after 1A. Some additional text will be included in the overview that emphasizes the fact that runs 2 – 10 are essentially Run 1 with one parameter/condition changed (either a new parameter is added, one of Run 1's parameters is deleted, or there is a major change in one of the parameters). Reference will be made to highlight the fact that several of the parameters/conditions may be combined as options – and that this is discussed in more detail later (see Table 18).

2. *Total Basin Yield vs Maximum Potential Basin Yield:* Jeff suggested that the column on Table 18 that is "Total Basin Yield" should be changed to Potential Basin Yield as that yield will only be realized if ALL the wells and diversions are installed. Steve indicated that he understood what Jeff was suggesting, and that he preferred to use something along the lines of 'Maximum Potential Basin Yield' – since all model runs were designed to maximize basin yield under the pre-set constraints and the parameters/conditions of the model run.

3. *Clarification on Runs 6R & 8, Table 18:* Total Basin Yield numbers for these two runs includes both surface and groundwater sources – this should be included in the table – suggested that additional column(s) be added. Jean said that the table was

getting too crowded as it is – would prefer to just add a footnote to those two values. Steve/Bob indicated that by the time the reader got to Table 18, it should be apparent that 6R & 8 includes surface diversions in addition to gw. Steve would prefer the footnotes for those readers who just read the Executive Summary or skip to the conclusions.

4. *System sizing:* Jeff expressed concern over the system size to design – if the LY is included in the proposed project along with the UY, CH, and direct diversions, then the system size is approaching 50 cfs (39 cfs gw + 10 cfs direct diversion). Maximum yields would be cumulative. This came from some confusion/misunderstanding over CPEN's intent of using the LY as an option for Run 8. Steve's understanding of CPEN's intent was that the LY would be used to increase/maximize basin yield. Bob's understanding (based on comments that Del had made in a previous meeting) was that CPEN only intended to use the LY to offset reduced production from the UY/CH during or following drought conditions or ED years. In the first case the system sizes would have to be increased, in the latter case, the system sizes would not need to be increased. Doug understood the issue but was not completely sure what CPEN's intent was.

5. Modifications to Decision Document: Doug indicated that CPEN 'understood' that the Falbrook Sump Diversion would only be used AFTER all of CPEN's operations are maximize – in other words, it would only be used to capture what would otherwise spill over the Obermeyer dam and be lost to the estuary. The Decision Document is being revised to reflect this. This is also the driving force behind Run 11.

6 Additional Runs – Schedule and Costs: Steve will get a proposal off to Del this afternoon with a proposed schedule and budget estimate for the additional runs #'s 11 – 14.

7. *Revised Draft 2.1:* A partial Response to Comments Matrix will be filled in and sent out on November 8, 2006 prior to the next conference call.

8. *Numbering and Revision of TM 2.1:* To be consistent with the logic for designating the latest TM as 2.1 versus an amended TM 2.0, the next draft of the TM that will include the additional Runs 11 – 14 should be designated as TM 2.2 It should have an introductory paragraph that indicates that 2.2 incorporates all the work, results, comments, and revisions of 2.0 and 2.1 – plus the results of the new runs – and supersedes TM2.1

9. *Next Conference Call:* The next conference call will be set up for Thursday, November 9, 2006 @ 1300 MST/1200 PST. Bob will set up the conference call number and forward the information to all participants.

The following notes were received from Doug McPherson. As I understand it, one of the new model runs (#11 I think) is designed to address Doug's comment on Item 5.:

Item 4 - I've been trying to find out the maximum instantaneous pumping rate from all 3 basins, so that we might consider a collection system design that allows future development of the Lower Ysidora basin. As I understand it, Camp Pendleton's concept would turn on LY wells while other wells were off, so that the collection system would not need to be upsized.

Item 5 - Camp Pendleton wants a model run that only diverts from the FPUD sump after the lower basin facilities - including direct diversion from the recharge ponds are maximized. In other words, the FPUD sump would only divert if water otherwise would waste to the estuary. They want the decision document to include direct diversion from the recharge ponds in Alternative 2. The decision document will not define operation, only the project components to be installed

November 9, 2006

Memorandum (Meeting Notes)

To: Stetson Engineers

From: Bureau of Reclamation, Denver Technical Service Center

Subject: November 9, 2006 Modeling Team Conference Call Regarding Proposed New Model Runs 11 - 14 on the Santa Margarita River Conjunctive Use Project (CUP)

The following memorandum memorializes the discussions from a modeling conference call between the Bureau of Reclamation (Reclamation) and Stetson Engineers (Stetson) on November 9, 2006.

Attendees:

Bob Talbot	Reclamation Denver Technical Services Center (TSC)
Jeff Baysinger	Reclamation Denver TSC
Del Holz	Contractor to Reclamation
Steve Reich	Stetson Engineers
Jean Moran	Stetson Engineers
Natalie Schommer	Stetson Engineers

Agenda: discuss proposal for runs 11 through 14
discuss timeline for completion of runs 11 thru 14
discuss handouts from Stetson

Discussion items/notes:

1. *Revised Comment Response Matrix:* Stetson has revised the Response Matrix to include comments and responses to date (for both TM 2.0 and TM 2.1). Changes and responses were discussed to the extent that folks have had a chance to review them. All new comments are to be sent to Tom Bellinger no later than Wednesday, 11/15, at noon Denver time. Tom will consolidate the comments and forward to Stetson by early afternoon on the 15th, Pacific Standard Time. Stetson will revise the response matrix and get out to Meena and Del on the 16th. Del and/or Meena will forward Response Matrix onto study team members as a final document (i.e. – not asking for comments from the study team members).

   Bob will forward Response Matrix onto Glenn Howard for his comments.

2. *Proposal for Runs 11 through 14:* Table 1 is in response to M. McPherson's concern about constraint of keeping drawdowns in riparian areas no greater than the historical lows. CPEN's opinion is that they have a biological opinion (BO) with Fish and Wildlife Service that allows them to drawdown the water table below the riparian zones as much as they want without concern for consequences to the riparian habitats. This was discussed to some extent – consensus was that runs 12 & 13 would not put a

constraint on the water levels in the riparian zones in the sense of limiting the water levels to any specific amount of drawdown in relation to historical lows – however, the water levels would still be constrained by the limitations of sea water intrusion and compaction of the aquifer- which mostly affect the Lower Ysidora and Chappo, respectively.

Stetson indicated that they would summarize the operational parameters listed in the new Table 18 (operational paramaters) and include it in the last attachment, Related Technical Memoranda. The summary will include what the operational parameters are, how they were determined, and the rational/reasoning for them.

There were no other major issues with the proposal. Del indicated that he had talked to Tom earlier and that Tom did not have any significant comments regarding the proposal. Bob also stated that he had reviewed the proposal and did not have any significant comments other than the need for some sort of schedule or timeline.

3. *Schedule/Timeline for Proposed Runs 11 thru 14:* Del indicated that the next study team meeting is not scheduled until mid-January (on the third Thursday of January). Stetson agreed that a schedule/timeline would be a good idea, and would indicate at which conference call the various runs would be discussed (the set-up of the runs at one call and the preliminary results at the subsequent call). Steve indicated that Stetson would aim at distributing the draft Tech Memo (2.2?) to the study team at least one week before their meeting – and would plan on a presentation at the meeting. Accordingly, the modeling team will need to have the draft TM reviewed, comments submitted to Stetson, and Stetson will need to incorporate those comments by about the 11th of January. Based on this, Steve indicated that they would take that date and work backwards to figure out which runs will be discussed at which conference calls. This would be put into a table and included in the proposal when it is submitted. Also, the Stetson contract should be extended through the end of January, 2007 to allow time for this new work, and the documentation of the work, and the finalization of the Tech Memo.

4. *System sizing:* The system sizing, at this point, should continue with the assumptions for Run 8. CPEN's intent to pump from the Lower Ysidora should not be included in the sizing computations at this point since this is only CPEN's intent, and has not been agreed to by the study team as the newest preferred or proposed project de jour.

5. *Modifications to Decision Document:* Doug had sent an email earlier indicating that the Decision Document was being modified to reflect CPEN's request to include a direct diversion from the perc ponds – Pond #2. Pumping from the Lower Ysidora is not going to be in the Decision Document as was earlier thought. It is unknown how Fallbrook will respond to this modification.

6. *Discussion of Run 14 set up*: Stetson has begun working on setting up Run 14. Jean had sent out some preliminary tables and graphs illustrating how they envisioned setting up the run. The methodology is similar to that used for Run 7. The

methodology appears to be reasonable in this case as well. Some discussion was held as to how to incorporate CPEN's contention that they can impact the riparian zones as much as they want. It was decided to not have a 'riparian constraint' as it relates to drawdowns below the riparian zones in relation to historic lows – but that the constraints for sea water intrusion and aquifer compaction would still be operative.

6 *Next Conference Call:* The next conference call will be tentatively set up for Wednesday, November 22, 2006 @ 1000 MST/0900 PST. This conference call, and any conference calls needed prior to the 22nd, will be 'played by ear' – i.e. will be scheduled or adjusted as needed. A lot will depend upon when Stetson gets the 'go ahead' from the CO. Bob or Tom will set up the conference call number and forward the information to all participants by the 20th if it is still needed.

December 12, 2006

Memorandum (Meeting Notes)

To: Stetson Engineers

From: Bureau of Reclamation, Denver Technical Service Center

Subject: December 7, 2006 Modeling Team Conference Call Regarding Runs 11 and 12 for the Santa Margarita River Conjunctive Use Project (CUP)

The following memorandum memorializes the discussions from a modeling conference call between the Bureau of Reclamation (Reclamation) and Stetson Engineers (Stetson) on December 7, 2006.

Attendees:

Tom Bellinger	Reclamation Denver Technical Service Center (TSC)
Bob Talbot	TSC
Jeff Baysinger	TSC
Del Holz	Contractor to Reclamation
Steve Reich	Stetson
Jean Moran	Stetson
Molly Palmer	Stetson
Natalie Schommer	Stetson

Discussion items/notes:

1. *Run 11 Discussion:* Molly Palmer described the surface water analysis used for Run 11. The analysis focused on the availability of water flowing "out of the model" as computed by Run 8. The analysis is summarized below:

    - A baseflow separation was developed using a percent time exceedance graph created from Run 8's monthly simulated streamflow out of the groundwater model. An inflection point on the graph at about 0.5 cfs (representing a 43% time exceedance) was identified as the limit of baseflow for this model run. Surface water flows above this baseflow limit were designated as available for an upstream diversion.
    - This monthly "available" water was considered to represent water potentially available for diversion at the Fallbrook Sump in Run 11. The monthly baseflow analysis was then analyzed using the daily streamflow ROM to compute the water that could be diverted from a 25 cfs upstream direct use diversion.

    Run 11 surface water diversion results were provided to the Team for discussion. In summary, Fallbrook can divert about 5% of the days during the 50-year simulation period.

Groundwater pumping results for Run 11 were provided to Team members and discussed. Run 11's total basin yield was estimated to be 13,100 af/y (average). Of this yield 1,200 af/y was diverted from the CPEN direct diversion, 900 af/y from the FPUD direct diversion, and 11,000 af/y was from groundwater. This represents an average increase in basin yield of 900 af/y over Run 8.

2. *Run 12 Discussion:* The assumptions for Run 12 were discussed based on a summary handout provided by Stetson. The following is a summary of Run 12 operational parameters:
   - No VOC constraint
   - No riparian water level constraint
   - Groundwater levels can drop below the lowest measured historical levels; however, groundwater levels will be constrained by the threshold of compaction (damage to the aquifer) and salt water intrusion.
   - Additional water is considered as a supply option to mitigate for the 7-year drought during the 50-year simulation period (similar to Run 7).
   - Direct use surface water diversion downstream of recharge pond 2 is a maximum of 10 cfs
   - Excess surface water simulated out of the Lower Ysidora Subbasin (using the same method as described above) is available for FPUD direct use diversion
   - No groundwater pumping from the Lower Ysidora
   - CWRMA flow, including emergency water included
   - Diversion bypass of 3 cfs
   - Run 12 diversion priority sequence: 1) Lake O'Neill and Recharge Ponds; 2) CPEN direct use diversion downstream of recharge pond 2; 3) FPUD direct use diversion.

   Regarding no riparian water level constraint, Steve Reich stated that CPEN thought this was a reasonable based on the Base's Biological Opinion. Steve Reich will request that CPEN (Steve Evanko) draft a memorandum concurring with this Run 12 assumption. The requested memo will have the following routing: from Steve Evanko (CPEN) to Mike McPherson (CPEN) with a courtesy copy to Meena Westford (SCAO).

3. *Schedule:* The following schedule milestones were determined:
   - January 9: Stetson will complete a draft memorandum (TM 2.2) of Run 11 and 12 results for presentation to the Team. The memo will be discussed on a conference call on this date. Reclamation will set up the call. Interim calls will be made as required.
   - January 11: Complete TM 2.2 Draft for Study Team review.
   - January 18: Study Team meeting in Temecula (discussion of TM 2.2).

The following conference call took place after the Technical Team Conference call was completed on December 7, 2006.

Attendees:

Doug McPherson	Reclamation Temecula Office
Steve Reich	Stetson
Jean Moran	Stetson

Doug McPherson expressed some dismay that the additional production of Run 12 due to no riparian or VOC constraints will be confused or masked by the additional water parameter (note that this additional water may be beyond the CWRMA emergency flows). The additional water would not be easily backed out of the model run, but Camp Pendleton is paying for these runs and this is the operational parameters that they have requested.

Doug noted that at some point, someday, it may be desirable to run a 3-basin model with no riparian or VOC constraint to estimate a maximum project yield bookend (within the aquifer compaction and seawater intrusion constraints). While Reclamations is unlikely to propose this alternative now, it might be useful to know the maximum potential yield and flow rates so that design sizing decisions can take potential future project expansions into consideration.

A discussion was had with respect to Mike McPherson's concern regarding the effects of the FPUD diversion on surface flows to the estuary. Doug speculated that the yield of any project alternative will translate into decreased flow to the estuary, regardless of whether the water is produced from wells or surface diversion. Groundwater extracted by the project allows recharge from the river channel to the aquifer, reducing flows to the estuary just as direct diversion will. Reduced flows to the estuary may be an issue for all project alternatives, not just the FPUD diversion.

As discussed last month, there is not a need to bring a new constraint (estuary flows) into the model work at this point. Stetson is contracted to model potential basin yields. Reclamation can do new additional model runs with new constraints later if the environmental review process identifies a need.

January 10, 2007

Memorandum (Meeting Notes)

To: Stetson Engineers

From: Bureau of Reclamation, Denver Technical Service Center

Subject: Notes from the January 9, 2007 Santa Margarita River Conjunctive Use Study Modeling Team Conference Call

The following memorandum memorializes the discussions from a conference call between the Bureau of Reclamation (Reclamation) and Stetson Engineers (Stetson) on January 9, 2007.

Attendees:

Tom Bellinger	Reclamation Denver Technical Service Center (TSC)
Bob Talbot	TSC
Jeff Baysinger	TSC
Del Holz	Contractor to Reclamation
Jean Moran	Stetson
Natalie Schommer	Stetson
Ben Brezing	Stetson

Discussion items/notes:

1. *TM 3.0:* No comments were received from Reclamation. Tom Bellinger will check the status of the review. *(Note: (After the call) Jim Yahnke and Glenn Howard stated that they will review the document. A review was not completed earlier. Tom Bellinger will pass final comments to Stetson when received).*

   Jean Moran stated that December 2006 data will be included in the TM as monitoring continues prior to the finalization of the document. Jean noted that upstream station will remain active; however, the estuary station may be discontinued by the USGS for Camp Pendleton. Finalization of the current report is planned for January 26, 2007.

2. *TM 2.2:* Stetson received and edited TM 2.2 as per Reclamation comments with respect to Sections written for Runs 11 and 12. Essentially all comments were incorporated into the document except a few which were discussed on the call. Highlights of this discussion follow:

   - Table 1, WQ column, 'TDS' designation. To avoid confusion, this designation will be changed to a checkmark with a footnote (footnote 4) to explain that TDS was an additional water quality constraint for runs 2 and 5. An explanation will also be added to the text on page 2.

- Table 2 (and others): Tables that indicate the average annual percent flow from various components of the outflow water budget are rounded. As a result, the percentages actually sum to 99.2 (the table indicates 100%). Therefore, the underflow component (0.2 %) will be rounded to zero, the total will be reported as 99 %, and a footnote will be called out to alert the reader to the rounding.

3. *Schedule:* The following items were agreed upon for the Team's upcoming schedule:

    - **January 11, 2007:** Stetson will complete edits to TM 2.2. This document will represent the Draft Review version for the Study Team. Stetson will forward the document to Del at Reclamation, who will forward it to Steven Evanko, Joe Jackson, and Meena Westford for review.

    - **January 18, 2007:** FPUD, CPEN, and Reclamation will meet to discuss TM 2.2 and provide comments. Jean Moran and Bob Talbot will present the document to the attendees. The meeting will begin at 8:30 AM at the FPUD offices. Jean Moran and Bob are scheduled to arrive by 10 AM to deliver the TM presentation.

    - **January 26, 2007:** Stetson and the TSC request that TM 2.2 Study Team comments be sent to Reclamation and Stetson on this date.

    - **January 31, 2007:** TM 3.0 will be finalized on this date.

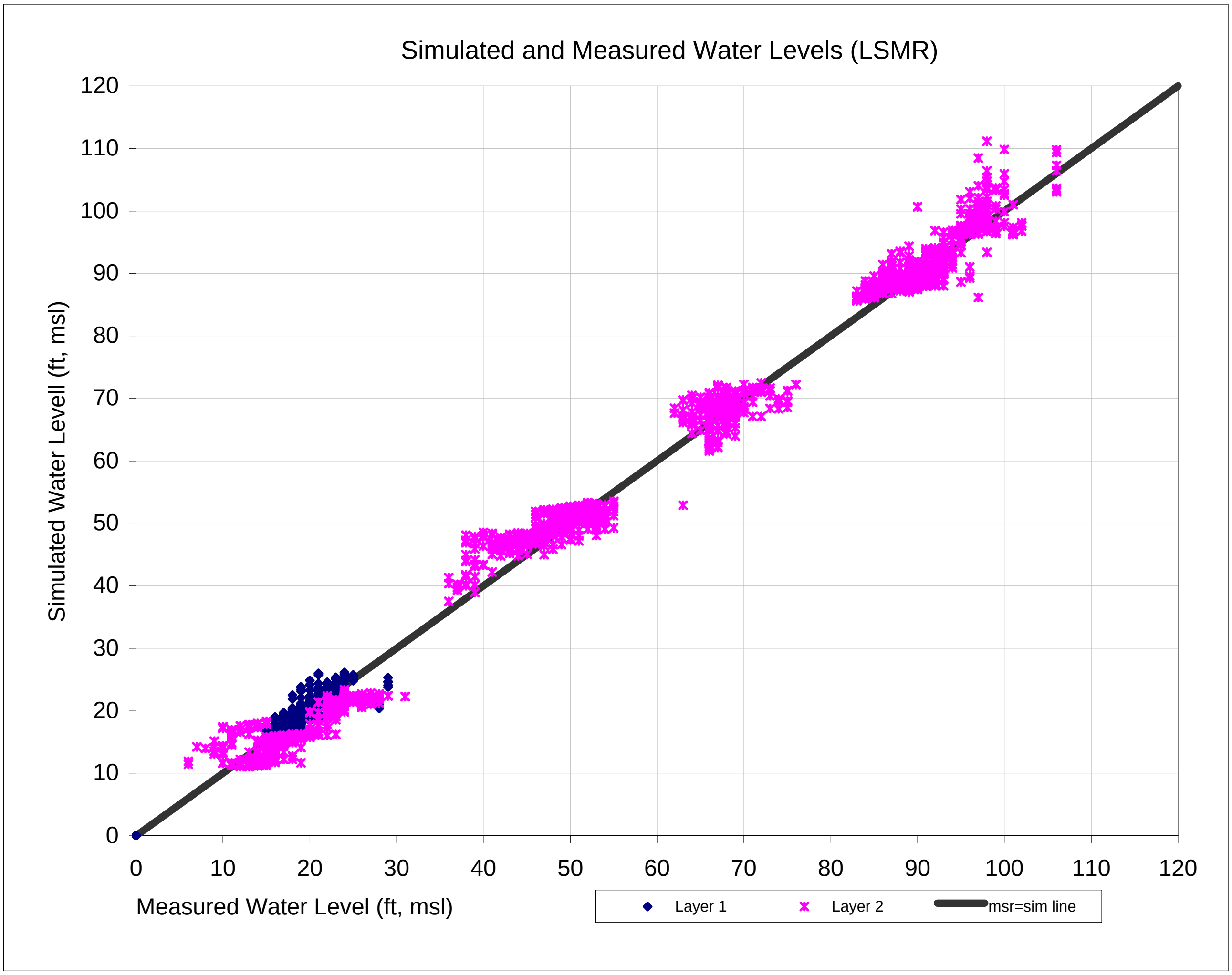
    - **February 2, 2007:** Stetson and the Denver TSC will have all TM 2.2 comments incorporated. The document will tentatively be final on this date. Upon receipt by Reclamation, if required, the document will be converted to comply with Reclamation's Visual Identity Program.

    - Note: No future conference calls are scheduled.

Attachment C

Calibration Model Results

Calibration: Simulated and Measured Water Levels
24 wells and 1,983 wl targets



GW Model Statistics							
Residual = Measured - Simulated							
	Upper Ysidora		Chappo		Lower Ysidora		**All**
count		656		579	298	450	1,983
	L1	L2	L1	L2	L1	L2	**Basins**
		(feet)		(feet)	(feet)	(feet)	(feet)
Avg	-	**-0.43**	-	**-1.17**	**-0.53**	**1.71**	**-0.18**
Median	-	**-0.48**	-	**-1.29**	**-0.82**	**2.25**	**-0.17**
Min. Residual	-	-13.33	-	-10.24	-5.11	-7.66	-13.33
Max. Residual	-	10.94	-	10.54	7.33	8.51	10.94
Residual Range	-	24.27	-	20.77	12.44	16.17	24.27
		(ft, msl)	-	(ft, msl)	(ft, msl)	(ft, msl)	(ft, msl)
Min. Simulated	-	85.60	-	37.53	14.63	11.02	11.02
Max. Simulated	-	111.18	-	72.49	26.12	23.39	111.18
WL Sim Range	-	25.59	-	34.97	11.49	12.37	100.16
		(ft, msl)	-	(ft, msl)	(ft, msl)	(ft, msl)	(ft, msl)
Min. Measured	-	82.58	-	35.86	14.54	5.55	5.55
Max. Measured	-	106.00	-	75.50	28.50	30.77	106.00
WL Msr Range	-	23.42	-	39.64	13.96	25.22	100.45
		(feet)		(feet)	(feet)	(feet)	(feet)
Abs. Res. Mean	-	1.85	-	2.47	1.37	2.72	2.16
Total # WL msr	-	656	-	579	298	450	1,983
Res. Std. Dev.	-	**2.43**	-	**2.85**	**1.84**	**2.56**	**2.73**
Sum of Squares	-	3,998	-	5,500	1,096	4,278	14,873
StdDev/Range	-	0.104	-	0.072	0.132	0.102	0.027

Count
Layer 1
298
Layer 2
1,685
Total
1,983

D:\Camp_Pendleton\SMR\USBR_model\25yr_Calibration\Calibr-4\POST\3.Calbr3-LYstr+targadj_TargetWell_graphs.xls / printed 7/2/2006

D:\Camp_Pendleton\SMR\USBR_model\25yr_Calibration\Calibr-4\POST\3.Calbr3-LYstr+targadj_TargetWell_graphs.xls / printed7/2/2006

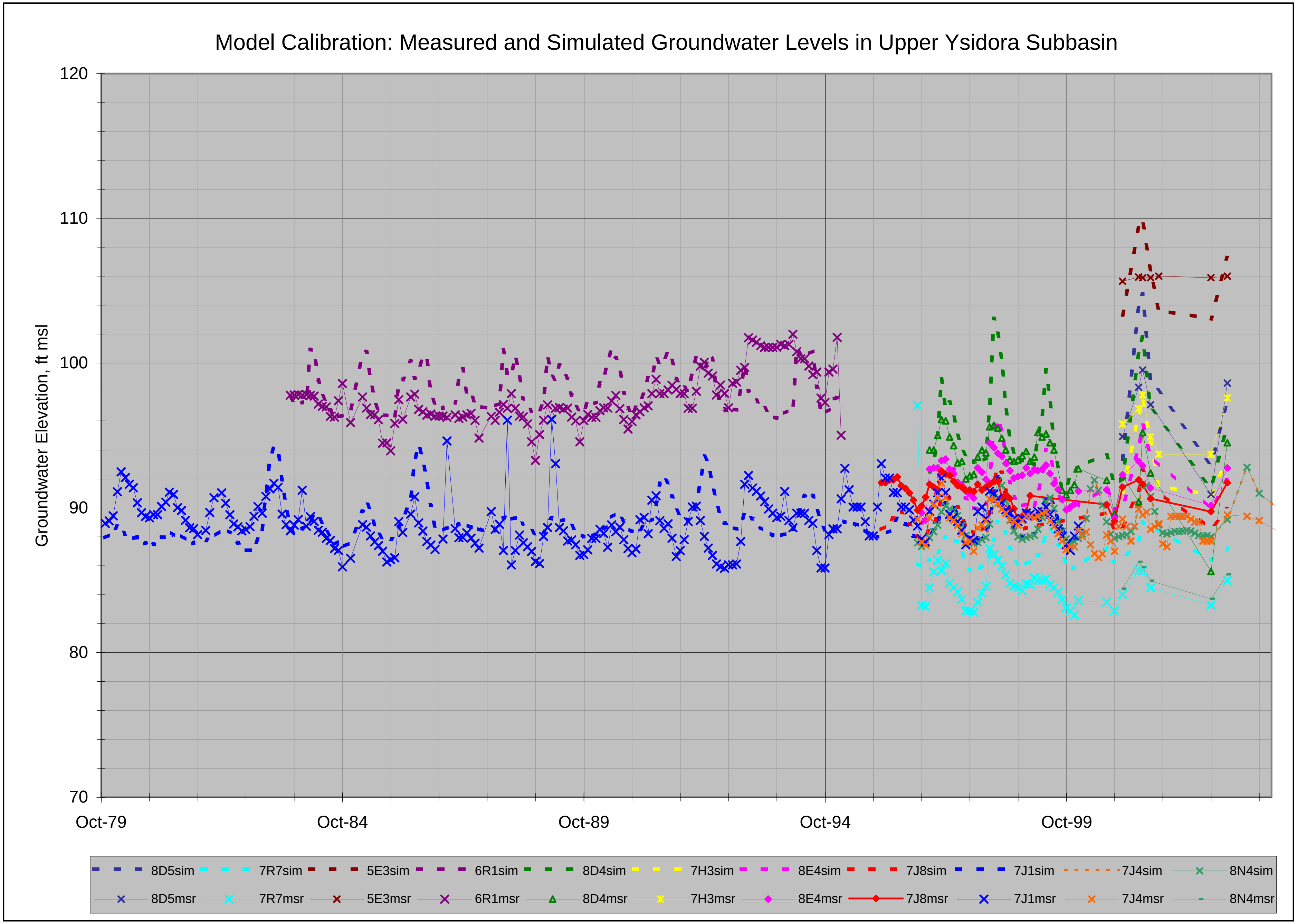


FIGURE C-1

D:\Camp_Pendleton\SMR\USBR_model\25yr_Calibration\Calibr-4\POST\3.Calbr3-LYstr+targadj_TargetWell_graphs.xls / printed7/2/2006

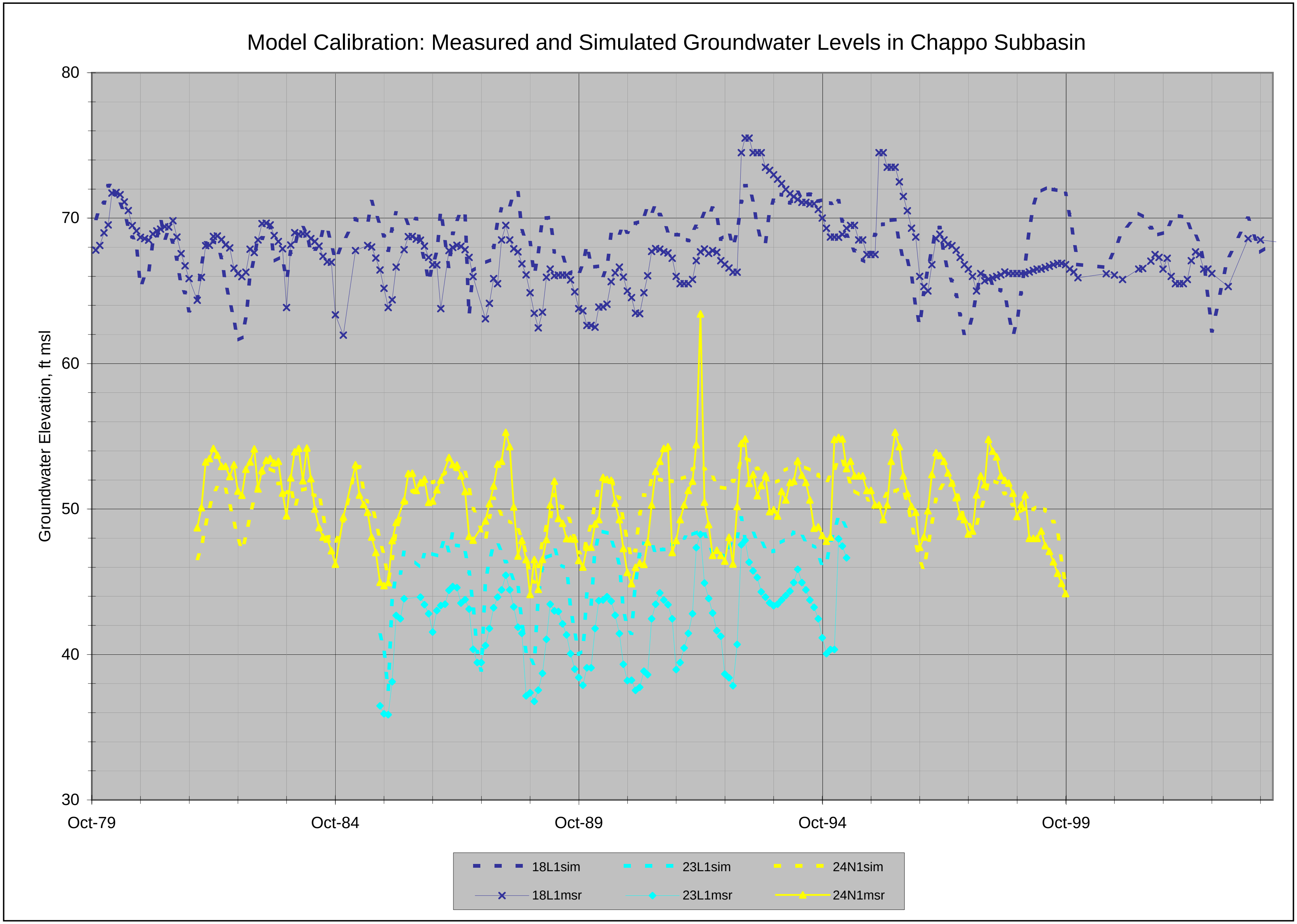


FIGURE C-2

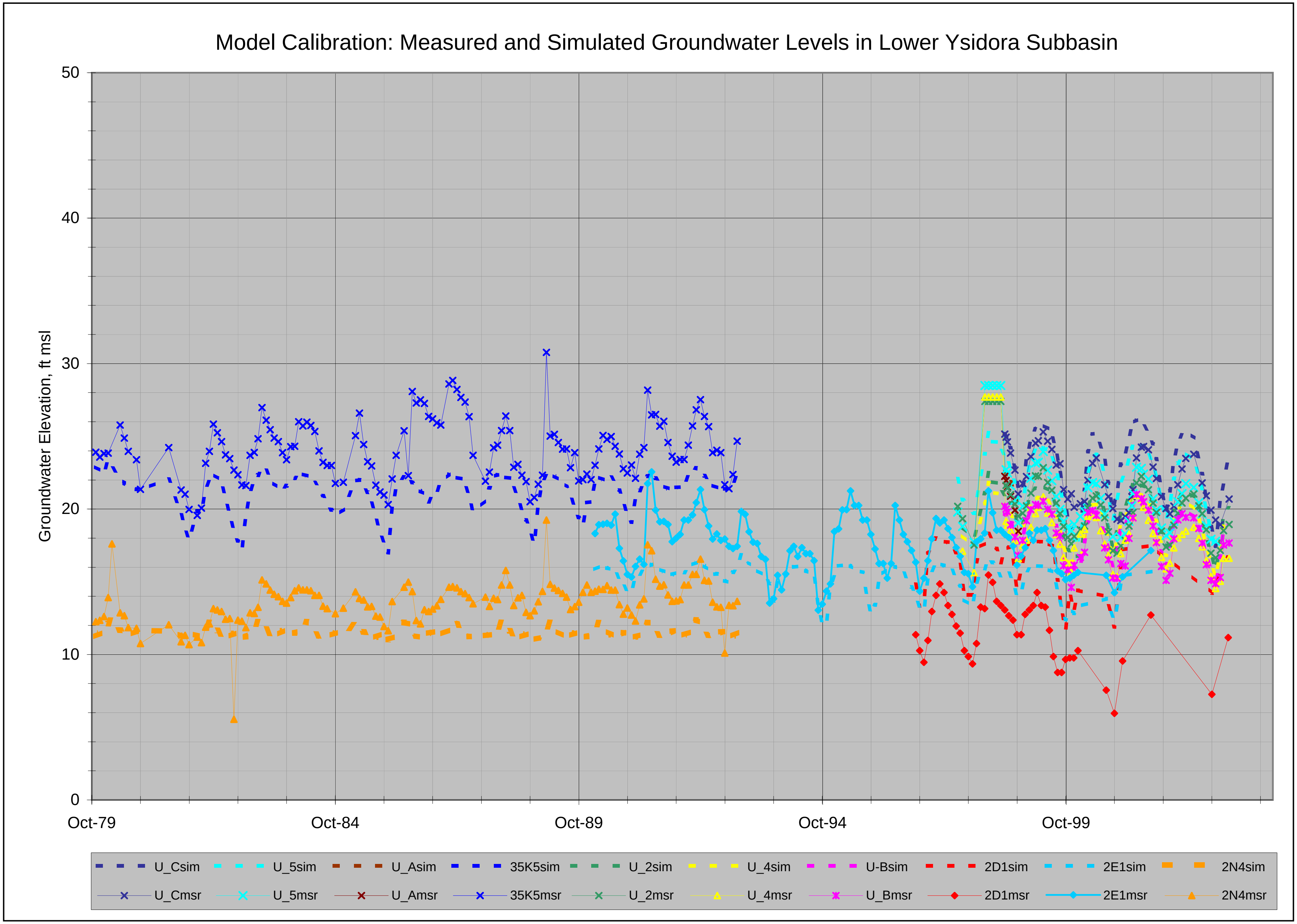

Model Calibration: Measured and Simulated Groundwater Levels in Lower Ysidora Subbasin
Groundwater Elevation, ft msl
50
40
30
20
10
0
Oct-79
Oct-84
Oct-89
Oct-94
Oct-99
U_Csim
U_5sim
U_Asim
35K5sim
U_2sim
U_4sim
U-Bsim
2D1sim
2E1sim
2N4sim
U_Cmsr
U_5msr
U_Amsr
35K5msr
U_2msr
U_4msr
U_Bmsr
2D1msr
2E1msr
2N4msr

FIGURE C-3

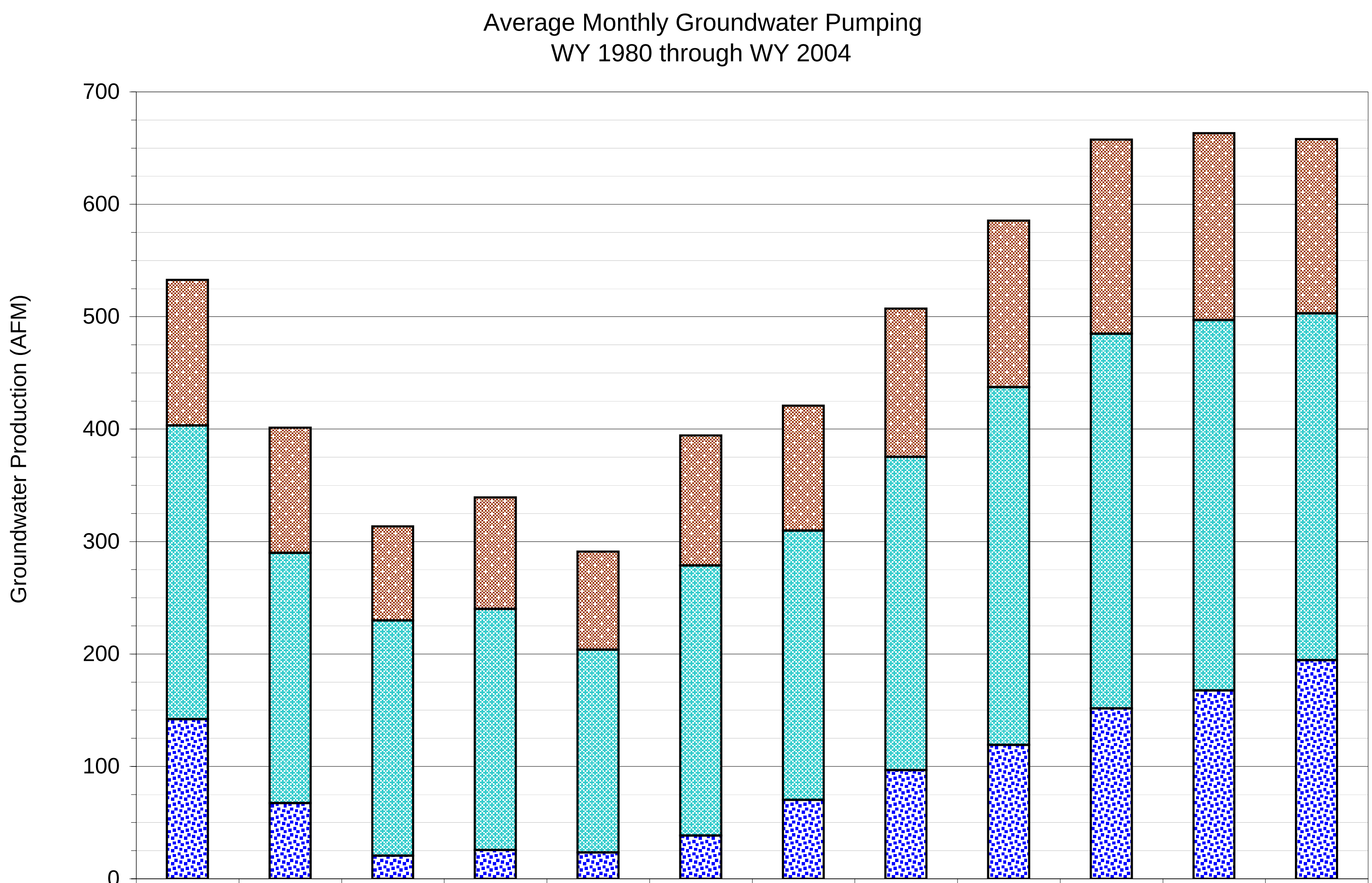
Historical Pumping Well Summary (af/wy)

	Upper Ysidora	Chappo	Lower Ysidora	Total	10/4-5D1	10/4-7A2	10/4-7A3	10/4-7H2	10/4-7R2	10/4-18E3	10/4-18M4	10/5-13R2	10/5-23G3	10/5-23G4
					27911	2673	26072	2671	2603	2393	2373	2363	33926	33925
					UY	UY	UY	UY	UY	CH	CH	CH	CH	CH
AF/W-Yr	AFY	AFY	AFY	AFY	AFY	AFY	AFY	AFY	AFY	AFY	AFY	AFY	AFY	AFY
1980	1,986	3,395	949	6,331	0	613	0	586	788	0	381	1,082	265	0
1981	1,914	3,326	1,466	6,705	258	475	0	401	779	128	945	793	346	0
1982	2,093	2,878	1,500	6,471	466	531	0	290	805	540	914	350	32	0
1983	1,897	2,317	944	5,158	398	172	0	479	848	592	901	0	0	0
1984	1,787	2,713	1,078	5,579	402	328	0	480	577	783	476	0	0	0
1985	2,338	2,132	1,362	5,833	524	850	0	0	964	835	0	0	0	0
1986	1,257	3,417	1,086	5,760	385	608	0	148	117	1,150	204	0	84	0
1987	1,334	3,365	1,237	5,936	254	515	0	438	127	643	979	0	1	0
1988	1,280	3,249	1,415	5,944	0	650	0	182	449	293	536	0	20	0
1989	1,578	3,442	880	5,900	0	766	0	190	622	476	949	0	0	0
1990	1,502	2,725	855	5,083	0	557	0	370	575	703	633	114	0	0
1991	812	2,338	573	3,724	0	387	0	75	350	394	276	312	4	0
1992	847	2,393	898	4,138	0	709	0	0	139	7	753	450	33	0
1993	1,115	1,865	1,067	4,046	0	740	0	375	0	96	537	259	29	0
1994	1,416	1,734	1,471	4,621	0	1,106	0	310	0	365	0	0	69	0
1995	1,087	2,688	979	4,754	0	619	0	283	185	478	459	808	0	0
1996	1,593	3,605	1,000	6,199	0	1,160	0	354	80	290	723	637	0	0
1997	1,661	3,577	1,066	6,304	0	902	0	260	499	464	1,057	815	0	0
1998	1,400	4,068	1,026	6,494	0	0	0	384	1,016	326	1,444	1,047	0	0
1999	1,636	3,418	1,065	6,119	0	854	235	246	302	273	0	20	0	444
2000	1,847	3,917	1,296	7,060	0	868	347	9	624	720	397	0	0	974
2001	1,463	3,877	1,023	6,364	0	641	424	372	25	326	427	66	0	1,124
2002	1,148	4,118	1,183	6,450	0	376	603	169	0	422	384	487	0	940
2003	1,144	4,066	1,270	6,480	0	446	302	42	354	701	279	170	0	449
2004	1,661	3,769	1,225	6,655	0	774	422	6	459	478	489	0	0	176
Average	1,512	3,136	1,117	5,764	107	626	93	258	427	459	566	296	35	164
Median	1,502	3,365	1,067	5,944	0	619	0	283	449	464	489	114	0	0
Maximum	2,338	4,118	1,500	7,060	524	1,160	603	586	1,016	1,150	1,444	1,082	346	1,124
Minimum	812	1,734	573	3,724	0	0	0	0	0	0	0	0	0	0

	Upper Ysidora	Chappo	Lower Ysidora	Total	10/4-5D1	10/4-7A2	10/4-7A3	10/4-7H2	10/4-7R2	10/4-18E3	10/4-18M4	10/5-13R2	10/5-23G3	10/5-23G4
					UY	UY	UY	UY	UY	CH	CH	CH	CH	CH
Avg AF/M	AFY	AFY	AFY	AFY	AFY	AFY	AFY	AFY	AFY	AFY	AFY	AFY	AFY	AFY
Oct	130	261	142	533	9	56	8	21	36	37	48	29	3	14
Nov	111	222	67	401	6	40	5	25	36	34	36	21	1	10
Dec	84	209	20	313	4	34	5	19	22	33	38	21	3	6
Jan	99	215	26	339	7	36	5	20	31	34	34	21	2	4
Feb	87	180	23	291	7	32	6	17	26	28	28	20	1	8
Mar	116	240	38	394	7	40	8	23	37	40	42	24	2	14
Apr	111	240	70	421	7	42	8	21	33	39	40	19	4	15
May	132	279	97	507	11	57	8	23	33	43	42	24	5	17
Jun	148	318	119	585	14	67	8	22	37	41	62	32	6	20
Jul	173	333	152	657	16	76	10	25	46	44	65	31	4	21
Aug	166	330	167	663	10	78	12	22	44	42	69	26	2	18
Sep	155	308	194	658	11	67	10	22	45	45	62	28	2	17
Avg Mo.	126	261	93	480	9	52	8	21	36	38	47	25	3	14
Med Mo.	123	251	83	464	8	49	8	22	36	39	42	24	3	15
Avg Ttl=Anl	1,512	3,136	1,117	5,764	107	626	93	258	427	459	566	296	35	164

	10/5-23J1	10/5-23K1	10/5-23K2	10/5-23K3	10/5-26C1	10/5-26C3	10/5-26F1	11/5-2D3	11/5-2A1	11/5-2A3	
	2301		**33924**	**33923** (8?)	**2201**	**2202**	**2200**		**19122**		**Historic**
	CH	**CH**	**CH**	**CH**	**CH**	**CH**	**LY N**	**LY**	**LY**	**LY**	**Pumping**
AF/W-Yr	AFY	AFY	AFY	AFY	AFY		AFY	AFY	AFY	AFY	**af/m**
1980	528	228	0	0	911	0	835	0	0	114	6,331
1981	502	0	0	0	611	0	1,464	0	0	1	6,705
1982	0	0	0	0	1,042	0	1,447	0	0	53	6,471
1983	122	0	0	0	703	0	942	0	0	2	5,158
1984	1,155	0	0	0	299	0	1,078	0	0	0	5,579
1985	834	0	0	0	463	0	1,069	0	0	294	5,833
1986	617	0	275	0	1,088	0	731	222	0	134	5,760
1987	458	0	370	0	914	0	1,098	0	0	139	5,936
1988	1,585	0	242	0	574	0	1,109	115	0	192	5,944
1989	1,210	0	296	0	510	0	805	52	24	0	5,900
1990	471	0	162	0	642	0	790	65	0	0	5,083
1991	475	0	160	0	716	0	501	72	0	0	3,724
1992	105	0	184	0	860	0	695	203	0	0	4,138
1993	116	0	214	0	612	0	844	223	0	0	4,046
1994	83	0	0	0	1,217	0	1,153	317	0	0	4,621
1995	440	0	0	0	504	0	797	182	0	0	4,754
1996	544	0	0	0	1,412	0	926	74	0	0	6,199
1997	40	0	0	0	1,201	0	969	97	0	0	6,304
1998	0	0	160	0	1,091	0	856	170	0	0	6,494
1999	1,138	0	343	461	739	0	898	167	0	0	6,119
2000	988	0	290	547	0	0	1,071	225	0	0	7,060
2001	866	0	142	927	0	0	872	152	0	0	6,364
2002	954	0	171	441	0	319	1,023	161	0	0	6,450
2003	872	0	188	142	0	1,265	995	275	0	0	6,480
2004	654	0	179	503	0	1,290	869	356	0	0	6,655
Average	590	9	135	121	644	115	953	125	1	37	5,764
Median	528	0	160	0	642	0	926	115	0	0	5,944
Maximum	1,585	228	370	927	1,412	1,290	1,464	356	24	294	7,060
Minimum	0	0	0	0	0	0	501	0	0	0	3,724

	10/5-23J1	10/5-23K1	10/5-23K2	10/5-23K3	10/5-26C1	10/5-26C3	10/5-26F1	11/5-2D3	11/5-2A1	11/5-2A3	Historic
	CH	**CH**	**CH**	**CH**	**CH**	**CH**	**LY N**	**LY**	**LY**	**LY**	**Pumping**
Avg AF/M	AFY	AFY	AFY	AFY	AFY		AFY	AFY	AFY	AFY	**af/m**
Oct	45	2	12	11	54	7	120	19	1	2	533
Nov	45	1	10	11	47	6	60	6	0	2	401
Dec	38	0	9	9	42	10	16	4	0	1	313
Jan	46	1	9	7	44	13	21	2	0	3	339
Feb	41	1	6	4	35	8	20	2	0	2	291
Mar	46	2	11	6	45	8	33	1	0	5	394
Apr	54	1	14	7	41	7	64	1	0	5	421
May	49	1	16	7	68	6	88	5	0	5	507
Jun	58	0	14	11	66	8	108	6	0	5	585
Jul	60	0	11	17	68	13	135	13	0	4	657
Aug	57	0	13	17	70	16	135	30	0	3	663
Sep	50	0	11	15	63	14	155	37	0	2	658
Avg Mo.	49	1	11	10	54	10	79	10	0	3	480
Med Mo.	48	1	11	10	50	8	76	5	0	3	464
Avg Ttl=Anl	590	9	135	121	644	115	953	125	1	37	5,764



	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Upper Ysidora	130	111	84	99	87	116	111	132	148	173	166	155
Chappo	261	222	209	215	180	240	240	279	318	333	330	308
Lower Ysidora	142	67	20	26	23	38	70	97	119	152	167	194

FIGURE C-4

D:\Camp_Pendleton\SMR\PRE\pkg_WEL\Historical pumping\H PUMPING_1980-2004.XLS / printed 7/2/2006

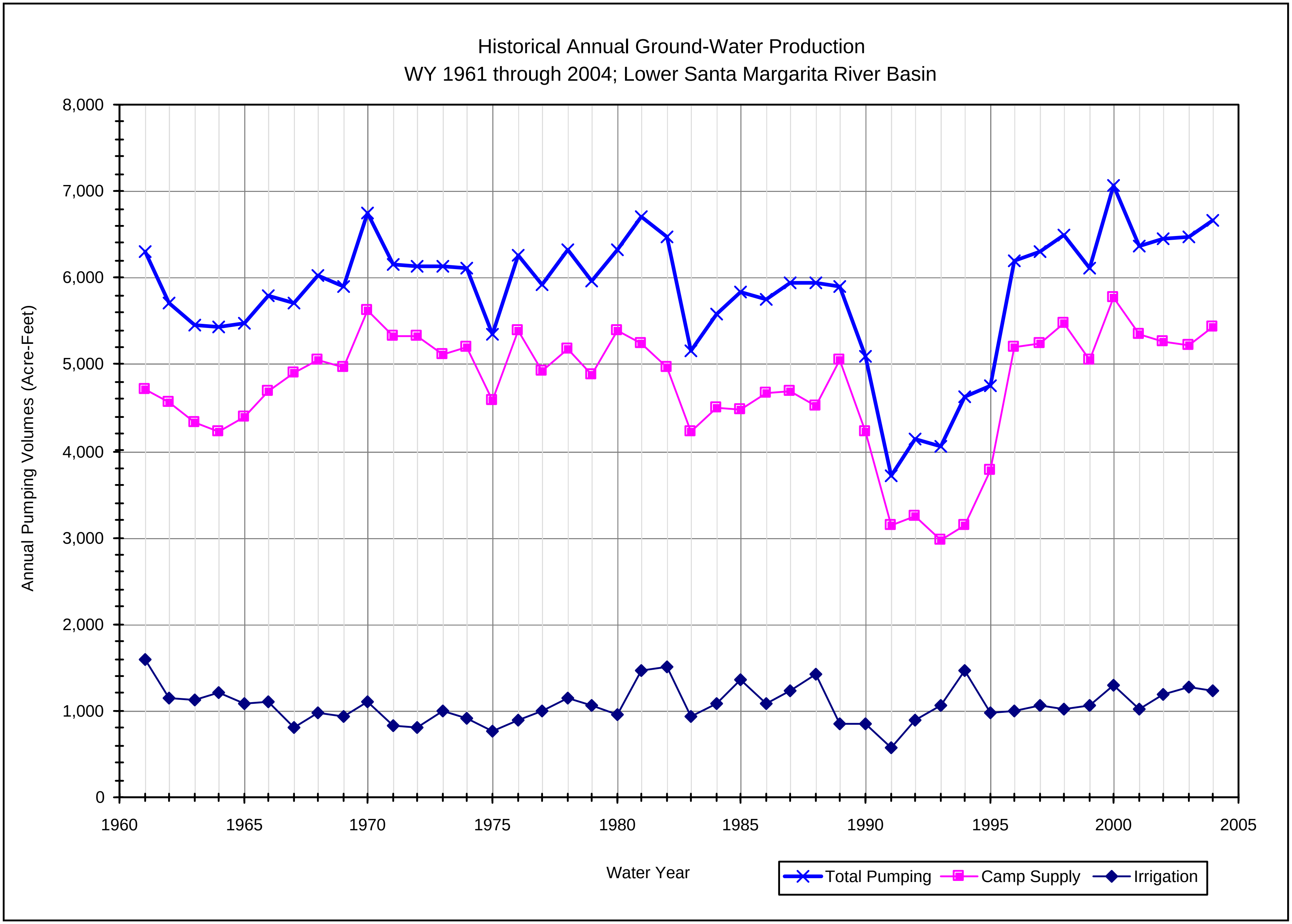
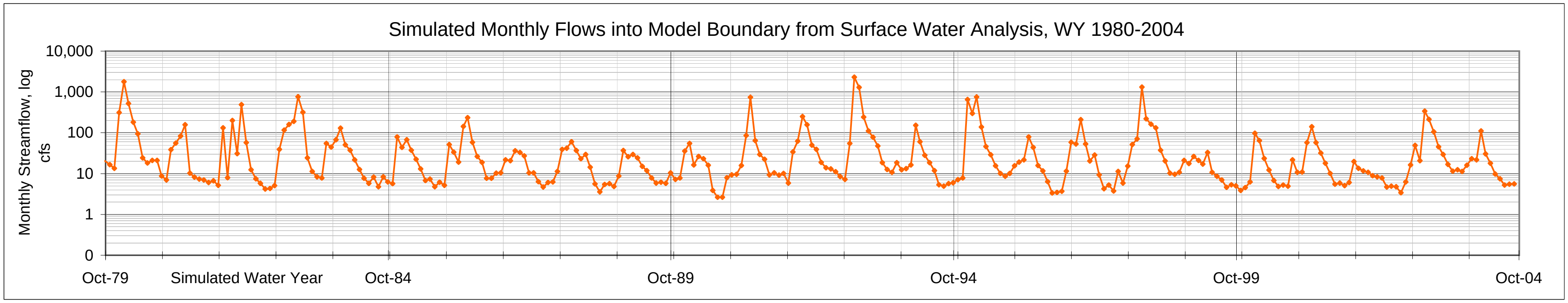
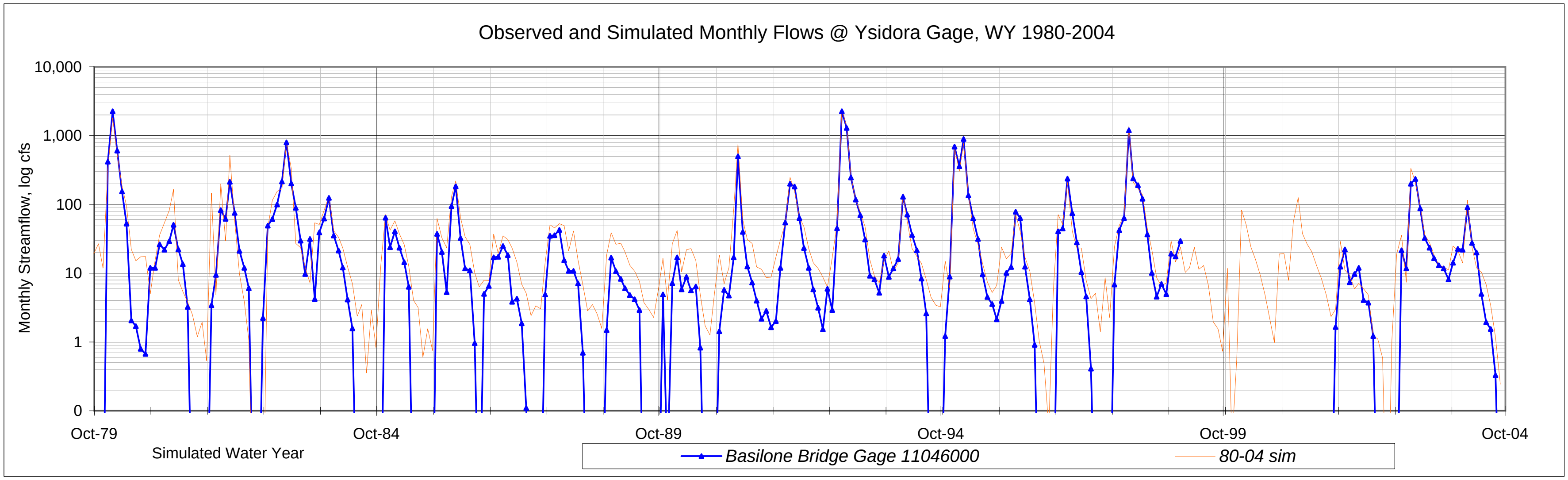


FIGURE C-5


Simulated Monthly Flows into Model Boundary from Surface Water Analysis, WY 1980-2004
Monthly Streamflow, log cfs
10,000
1,000
100
10
1
0
Oct-79
Simulated Water Year
Oct-84
Oct-89
Oct-94
Oct-99
Oct-04


Observed and Simulated Monthly Flows @ Ysidora Gage, WY 1980-2004
Monthly Streamflow, log cfs
10,000
1,000
100
10
1
0
Oct-79
Oct-84
Oct-89
Oct-94
Oct-99
Oct-04
Simulated Water Year
Basilone Bridge Gage 11046000
80-04 sim

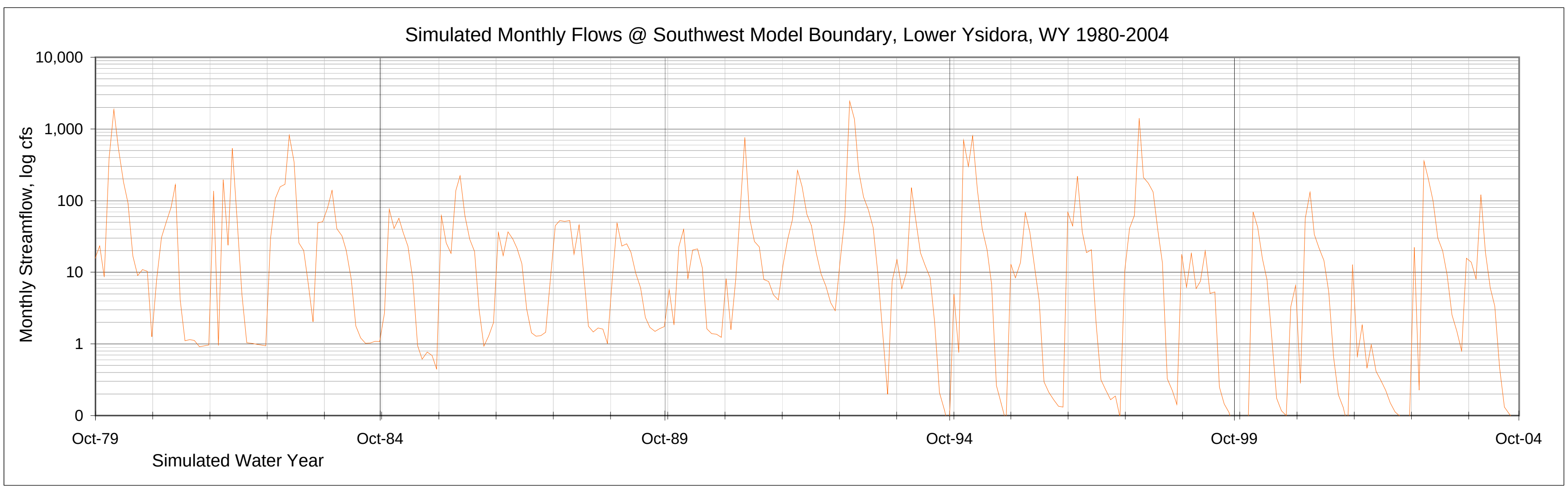

Simulated Monthly Flows @ Southwest Model Boundary, Lower Ysidora, WY 1980-2004
Monthly Streamflow, log cfs
10,000
1,000
100
10
1
0
Oct-79
Oct-84
Oct-89
Oct-94
Oct-99
Oct-04
Simulated Water Year

FIGURE C-6

LSMR Groundwater Model Input: Simulated Oxidation Ponds

Simulated Annual Discharges (af/m) to Santa Margarita River and Infiltration into Groundwater Aquifer

70-90% Discharge to Santa Margarita River						
AF/WY	STP 1	STP 2**	STP 3	STP 8	STP 13	Total
1980	808	56	450	200	661	2,174
1981	649	52	466	201	681	2,050
1982	573	50	364	179	703	1,868
1983	528	40	603	182	793	2,147
1984	439	59	625	226	775	2,124
1985	519	62	577	360	767	2,285
1986	395	64	479	314	693	1,944
1987	731	87	347	448	1,094	2,706
1988	785	79	712	319	1,105	2,999
1989	422	134	678	154	1,085	2,472
1990	408	95	662	148	1,104	2,417
1991	360	117	567	52	894	1,990
1992	410	104	445	54	1,061	2,074
1993	401	112	538	70	523	1,643
1994	367	82	481	111	-	1,040
1995	393	85	460	81	-	1,019
1996	346	49	443	67	-	904
1997	400	51	486	63	-	1,000
1998	416	51	419	81	-	967
1999	35	124	400	64	-	623
2000	-	181	454	106	-	740
2001	-	150	525	112	-	788
2002	-	168	530	-	-	698
2003	-	33	573	-	-	606
2004	-	-	630	-	-	630
25 yr avg	375	83	516	144	478	1,596
25 yr med	401	79	486	111	661	1,868
25 yr ttl	9,384	2,084	12,909	3,594	11,938	39,909

10% Infiltration to Ground Water				STP 2-->	
AF/WY	STP 3	STP 8	STP 13	EOD Pnd	Total
1980	50	22	73	8	154
1981	52	22	76	7	157
1982	40	20	78	7	146
1983	67	20	88	6	181
1984	69	25	86	8	189
1985	64	40	85	9	198
1986	53	35	77	9	174
1987	39	50	122	12	222
1988	79	35	123	11	249
1989	75	17	121	19	232
1990	74	16	123	14	226
1991	63	6	99	17	185
1992	49	6	118	15	188
1993	60	8	58	16	142
1994	53	12	-	12	77
1995	51	9	-	12	72
1996	49	7	-	7	64
1997	54	7	-	7	68
1998	47	9	-	7	63
1999	44	7	-	18	69
2000	50	12	-	26	88
2001	58	12	-	21	92
2002	59	-	-	24	83
2003	64	-	-	5	68
2004	70	-	-	0.00	70
Average	57	16	53	12	138
Median	54	12	73	11	146
Total	1,434	399	1,326	298	3,458

Attachment D

Baseline Model Results

Table D-1. Baseline Annual Pumping Summary
Lower Santa Margarita River Groundwater Model

						Year	AG	CS	Total
						2011	700	8,100	8,800
						2012	350	8,450	8,800
				Pumping Condition		2013	0	8,800	8,800
Hydrologic Condition				Monthly		2014	0	8,800	8,800
HC	Cnt	**Oct to Apr Strflw**		PC	Cnt	etc	0	8,800	8,800
VW	9	Very Wet > 56,164		1	281	AN, VW		0	8,800
AN	15	Above Normal > 13,600		2	108	1st BN or ED		-1,000	7,800
BN	14	Below Normal < 13,600		3	36	2nd BN		-2000	6,800
ED	12	Extremely Dry < 5,840		4	175	3+ BN / 2+ED		-4000	4,800
	50								

MY	HC	Oct-Apr HC descrip	May-Apr Pumping Condition	UY Total (af/y)	CH Total (af/y)	LY Total (af/y)	LSMR Total (af/y)	+Q
1	VW	Very Wet	3	3,689	2,459	700	6,848	
2	BN	Below Normal	4	4,763	3,175	350	8,288	
3	AN	Above Normal	3	4,843	3,325	-	8,168	
4	ED	Extremely Dry	6	5,023	3,315	-	8,339	
5	ED	Extremely Dry	6	3,758	2,506	-	6,264	
6	ED	Extremely Dry	6	2,880	1,920	-	4,800	
7	AN	Above Normal	3	4,109	2,739	-	6,848	
8	ED	Extremely Dry	6	4,973	3,315	-	8,288	
9	ED	Extremely Dry	6	3,758	2,506	-	6,264	
10	ED	Extremely Dry	6	2,880	1,920	-	4,800	
11	BN	Below Normal	6	2,880	1,920	-	4,800	
12	ED	Extremely Dry	6	2,880	1,920	-	4,800	
13	ED	Extremely Dry	6	2,880	1,920	-	4,800	
14	ED	Extremely Dry	6	2,880	1,920	-	4,800	
15	AN	Above Normal	3	4,109	2,739	-	6,848	
16	AN	Above Normal	2	5,280	3,520	-	8,800	X
17	ED	Extremely Dry	6	4,973	3,315	-	8,288	
18	VW	Very Wet	3	4,987	3,325	-	8,312	
19	BN	Below Normal	4	4,973	3,315	-	8,288	
20	BN	Below Normal	5	4,373	2,915	-	7,288	
21	ED	Extremely Dry	6	3,466	2,310	-	5,776	
22	BN	Below Normal	6	2,880	1,920	-	4,800	
23	BN	Below Normal	6	2,880	1,920	-	4,800	
24	BN	Below Normal	6	2,880	1,920	-	4,800	
25	BN	Below Normal	6	2,880	1,920	-	4,800	
26	ED	Extremely Dry	6	2,880	1,920	-	4,800	
27	VW	Very Wet	3	4,109	2,739	-	6,848	
28	AN	Above Normal	2	5,280	3,520	-	8,800	X
29	VW	Very Wet	1	5,280	3,520	-	8,800	X
30	AN	Above Normal	2	5,280	3,520	-	8,800	X
31	AN	Above Normal	2	5,280	3,520	-	8,800	X
32	VW	Very Wet	1	5,280	3,520	-	8,800	X
33	AN	Above Normal	2	5,280	3,520	-	8,800	X
34	AN	Above Normal	2	5,280	3,520	-	8,800	X
35	AN	Above Normal	2	5,280	3,520	-	8,800	X
36	BN	Below Normal	4	4,973	3,315	-	8,288	
37	AN	Above Normal	3	4,987	3,325	-	8,312	
38	BN	Below Normal	4	4,973	3,315	-	8,288	
39	BN	Below Normal	5	4,373	2,915	-	7,288	
40	VW	Very Wet	3	4,694	3,130	-	7,824	
41	AN	Above Normal	2	5,280	3,520	-	8,800	X
42	VW	Very Wet	1	5,280	3,520	-	8,800	X
43	AN	Above Normal	2	5,280	3,520	-	8,800	X
44	VW	Very Wet	1	5,280	3,520	-	8,800	X
45	BN	Below Normal	4	4,973	3,315	-	8,288	
46	AN	Above Normal	3	4,987	3,325	-	8,312	
47	VW	Very Wet	1	5,280	3,520	-	8,800	X
48	BN	Below Normal	4	4,973	3,315	-	8,288	
49	BN	Below Normal	5	4,373	2,915	-	7,288	
50	AN	Above Normal	3	4,694	3,130	-	7,824	

		UY Total (af/y)	CH Total (af/y)	LY Total (af/y)	LSMR Total (af/y)
	Min	2,880	1,920	-	4,800
Notes:	Max	5,280	3,520	700	8,800
Hydrologic Condition: Oct - Apr	**Median**	**4,908**	**3,315**	**-**	**8,288**
Model starts after 3+ BN or ED	% of Median	59.2%	40.0%	0.0%	
	Average	**4,390**	**2,928**	**21**	**7,339**
	% of Average	59.8%	39.9%	0.3%	

Table D-1. Baseline Annual Pumping Summary (continued)

	Oct-Apr HC Description	HC Count	UY Total (af/y)	CH Total (af/y)	LY Total (af/y)	LSMR Total (af/y)
AVERAGES	ED	12	3,603	2,399	-	6,002
	BN	14	4,082	2,721	25	6,828
	AN	15	5,017	3,351	-	8,368
	VW	9	4,876	3,250	78	8,204
MEDIANS	ED	12	3,173	2,115	-	5,288
	BN	14	4,373	2,915	-	7,288
	AN	15	5,280	3,520	-	8,800
	VW	9	5,280	3,520	-	8,800

Average Monthly Pumping

	Month	UY Total (af/m)	CH Total (af/m)	LY Total (af/m)	LSMR Total (af/m)
8%	Oct	363	242	2	607
8%	Nov	310	206	1	517
10%	Dec	258	172	0	430
11%	Jan	271	181	0	452
11%	Feb	244	163	0	407
10%	Mar	340	227	0	567
9%	Apr	347	231	1	578
7%	May	380	254	2	635
6%	Jun	442	295	3	740
6%	Jul	504	336	3	843
6%	Aug	483	322	4	809
8%	Sep	450	300	4	754
	Avg Anl	4,390	2,928	21	7,339

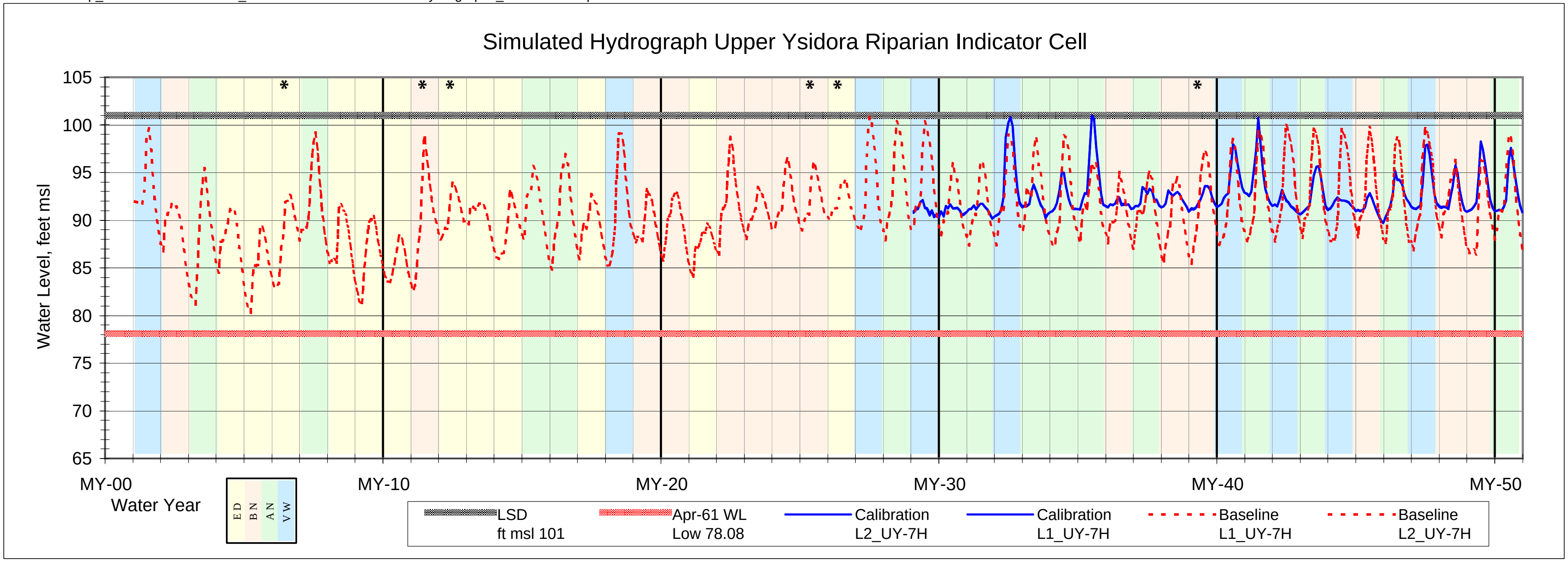
Table D-2. Baseline Pumping Summaries
Lower Santa Margarita River Groundwater Model

		Bldg #	State ID #	Label	Potential Subbasin Production %	Potential Camp Supply Production %	Potential w/ 75% Utilization af/y	Potential Well Yield gpm
1	UY	2673	10/4-7A2	7A2	25%	10%	133.58	1300
2	UY	26072	10/4-8D1	8D1	21%	8%	113.03	1100
3	UY	2671	10/4-7H2	7H2	15%	6%	77.07	750
4	UY	PW-6	PW-6	PW-6	19%	8%	102.75	1000
5	UY	2603	10/4-7R2	7R2	19%	8%	102.75	1000
6	CH	2393	10/4-18E3	18E4	14%	8%	113.03	1100
7	CH	2373	10/4-18M4&5	18M5	17%	11%	143.85	1400
8	CH	2363	10/5-13R2	13R2	15%	9%	123.30	1200
9	CH	33925	10/5-23G4	23G4	15%	9%	123.30	1200
10	CH	2301	10/5-23J1	23J1	19%	11%	154.13	1500
11	CH	33924	10/5-23K2	23K2	6%	4%	51.38	500
12	CH	33923	10/5-23K3	23K3	15%	9%	123.30	1200
13	LY N	2200	10/5-26F1	26F1	62%	0%	169.54	1650
14	LY	2D3	11/5-2D3	2D3	19%	0%	51.38	500
15	LY	2D4	11/5-2D4	2D4	19%	0%	51.38	500

	median					
	UY af/m	CH af/m	LY af/m	Total af/m	Max Mo Pumping	cfs
ED	321	211	0	530	891	15
BN	329	219	0	548	905	16
AN	419	279	0	698	1,005	17
VW	419	279	0	698	1,033	18

		Table D-3. Baseline Annual Pumping by \					Table D-3. Baseline Annual Pumping by Well (continued)									
	Building #:	2673	26072	2671	PW-6	2603	2393	2373	2363	33925	2301	33924	33923			
		UY	UY	UY	UY	UY	CH	CH	CH	CH	CH	CH	CH	LY N	LY	LY
		10/4-7A2	10/4-8D1	10/4-7H2	PW-6	10/4-7R2	10/4-18E3	10/4-18M4&5	10/5-13R2	10/5-23G4	10/5-23J1	10/5-23K2	10/5-23K3	10/5-26F1	11/5-2D3	11/5-2D4
MY	HC	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	
1	VW	525	980	508	838	838	351	415	203	528	404	123	437	407	73	221
2	BN	654	1,230	693	1,093	1,093	468	531	269	656	543	164	543	203	36	110
3	AN	549	1,299	714	1,141	1,141	485	557	279	696	562	170	576	0	0	0
4	ED	733	1,284	723	1,141	1,141	489	555	281	685	567	171	567	0	0	0
5	ED	507	958	560	867	867	375	418	215	509	437	131	421	0	0	0
6	ED	398	747	415	660	660	282	322	162	399	326	98	330	0	0	0
7	AN	583	1,088	569	934	934	392	461	226	586	451	137	485	0	0	0
8	ED	683	1,284	723	1,141	1,141	489	555	281	685	567	171	567	0	0	0
9	ED	507	958	560	867	867	375	418	215	509	437	131	421	0	0	0
10	ED	398	747	415	660	660	282	322	162	399	326	98	330	0	0	0
11	BN	398	747	415	660	660	282	322	162	399	326	98	330	0	0	0
12	ED	398	747	415	660	660	282	322	162	399	326	98	330	0	0	0
13	ED	398	747	415	660	660	282	322	162	399	326	98	330	0	0	0
14	ED	398	747	415	660	660	282	322	162	399	326	98	330	0	0	0
15	AN	583	1,088	569	934	934	392	461	226	586	451	137	485	0	0	0
16	AN	729	1,370	762	1,210	1,210	517	589	297	732	598	181	606	0	0	0
17	ED	683	1,284	723	1,141	1,141	489	555	281	685	567	171	567	0	0	0
18	VW	693	1,299	714	1,141	1,141	485	557	279	696	562	170	576	0	0	0
19	BN	683	1,284	723	1,141	1,141	489	555	281	685	567	171	567	0	0	0
20	BN	600	1,129	637	1,004	1,004	430	488	247	602	499	150	498	0	0	0
21	ED	470	888	512	798	798	344	386	197	472	400	120	391	0	0	0
22	BN	398	747	415	660	660	282	322	162	399	326	98	330	0	0	0
23	BN	398	747	415	660	660	282	322	162	399	326	98	330	0	0	0
24	BN	398	747	415	660	660	282	322	162	399	326	98	330	0	0	0
25	BN	398	747	415	660	660	282	322	162	399	326	98	330	0	0	0
26	ED	398	747	415	660	660	282	322	162	399	326	98	330	0	0	0
27	VW	583	1,088	569	934	934	392	461	226	586	451	137	485	0	0	0
28	AN	729	1,370	762	1,210	1,210	517	589	297	732	598	181	606	0	0	0
29	VW	729	1,370	762	1,210	1,210	517	589	297	732	598	181	606	0	0	0
30	AN	729	1,370	762	1,210	1,210	517	589	297	732	598	181	606	0	0	0
31	AN	729	1,370	762	1,210	1,210	517	589	297	732	598	181	606	0	0	0
32	VW	729	1,370	762	1,210	1,210	517	589	297	732	598	181	606	0	0	0
33	AN	729	1,370	762	1,210	1,210	517	589	297	732	598	181	606	0	0	0
34	AN	729	1,370	762	1,210	1,210	517	589	297	732	598	181	606	0	0	0
35	AN	729	1,370	762	1,210	1,210	517	589	297	732	598	181	606	0	0	0
36	BN	683	1,284	723	1,141	1,141	489	555	281	685	567	171	567	0	0	0
37	AN	693	1,299	714	1,141	1,141	485	557	279	696	562	170	576	0	0	0
38	BN	683	1,284	723	1,141	1,141	489	555	281	685	567	171	567	0	0	0
39	BN	600	1,129	637	1,004	1,004	430	488	247	602	499	150	498	0	0	0
40	VW	656	1,229	665	1,072	1,072	454	525	262	659	525	159	546	0	0	0
41	AN	729	1,370	762	1,210	1,210	517	589	297	732	598	181	606	0	0	0
42	VW	729	1,370	762	1,210	1,210	517	589	297	732	598	181	606	0	0	0
43	AN	729	1,370	762	1,210	1,210	517	589	297	732	598	181	606	0	0	0
44	VW	729	1,370	762	1,210	1,210	517	589	297	732	598	181	606	0	0	0
45	BN	683	1,284	723	1,141	1,141	489	555	281	685	567	171	567	0	0	0
46	AN	693	1,299	714	1,141	1,141	485	557	279	696	562	170	576	0	0	0
47	VW	729	1,370	762	1,210	1,210	517	589	297	732	598	181	606	0	0	0
48	BN	683	1,284	723	1,141	1,141	489	555	281	685	567	171	567	0	0	0
49	BN	600	1,129	637	1,004	1,004	430	488	247	602	499	150	498	0	0	0
50	AN	656	1,229	665	1,072	1,072	454	525	262	659	525	159	546	0	0	0
	Min	398	747	415	660	660	282	322	162	399	326	98	330	0	0	0
	Max	733	1,370	762	1,210	1,210	517	589	297	732	598	181	606	407	73	221
	Median	669	1,284	714	1,141	1,141	485	555	279	685	562	170	567	0	0	0
	Average	605	1,140	633	1,006	1,006	429	490	247	609	498	150	504	12	2	7
Average Monthly Well Production																
	Month	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)
	Oct	50	76	55	91	91	33	39	23	51	35	12	48	2	0	0
	Nov	30	55	62	81	81	31	31	17	38	37	11	41	1	0	0
	Dec	34	64	50	55	55	29	33	16	20	30	10	33	0	0	0
	Jan	39	56	46	66	66	33	32	18	16	40	10	31	0	0	0
	Feb	31	62	40	56	56	26	25	17	29	36	7	22	0	0	0
	Mar	38	94	50	79	79	38	38	21	54	42	13	21	0	0	0
	Apr	44	106	48	74	74	37	35	16	57	48	16	23	1	0	0
	May	58	111	55	78	78	42	36	21	65	41	17	31	1	0	1
	Jun	71	106	60	102	102	37	50	25	70	45	14	53	1	0	1
	Jul	76	135	63	115	115	41	56	26	76	50	13	75	2	0	1
	Aug	77	144	52	105	105	39	61	22	70	49	15	67	2	0	2
	Sep	57	132	52	104	104	42	54	24	64	44	12	60	2	1	1
Annual Total		605	1,140	633	1,006	1,006	429	490	247	609	498	150	504	12	2	7

D:\Camp_Pendleton\SMR\USBR_model\Baseline4\POST\C.IC-hydrographs_Baseline.xls / printed 7/5/2006



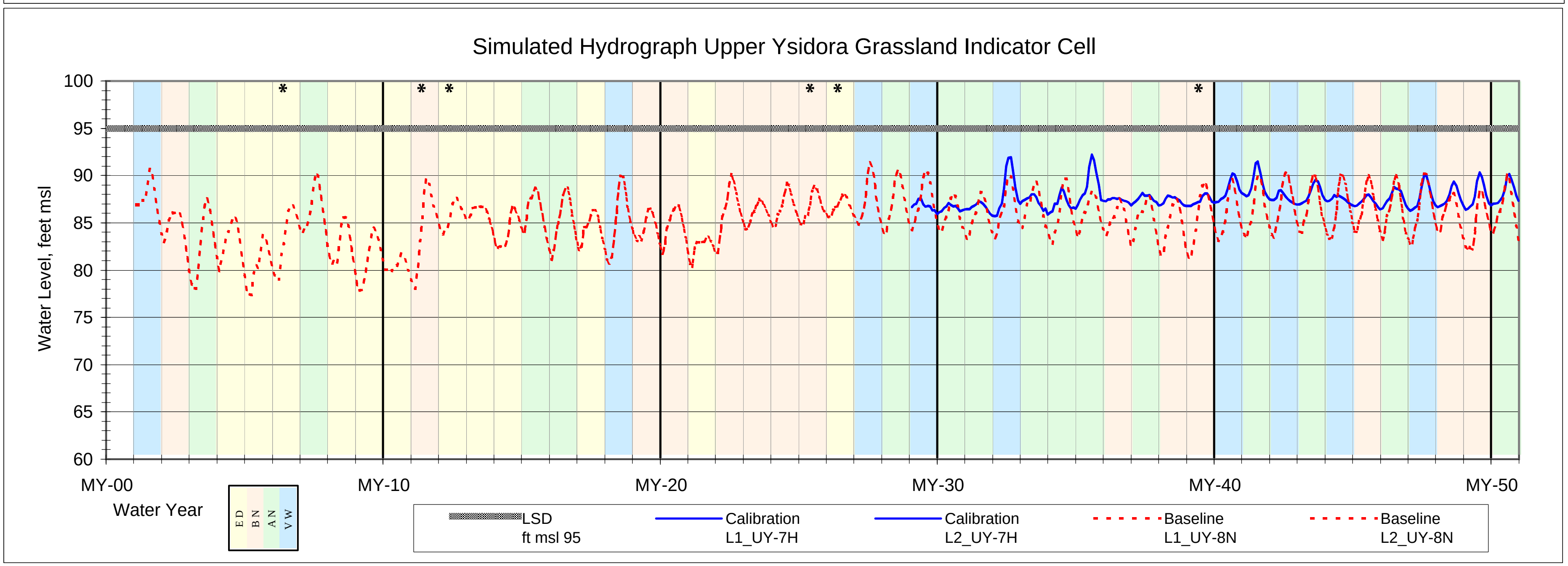
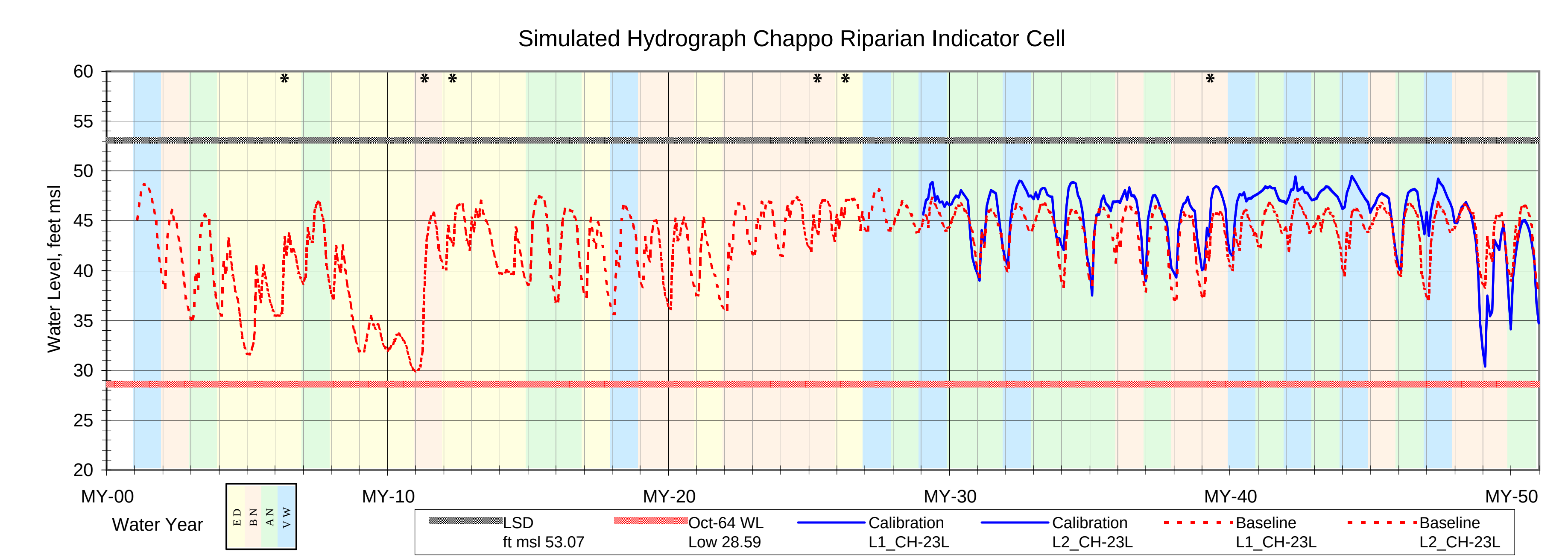
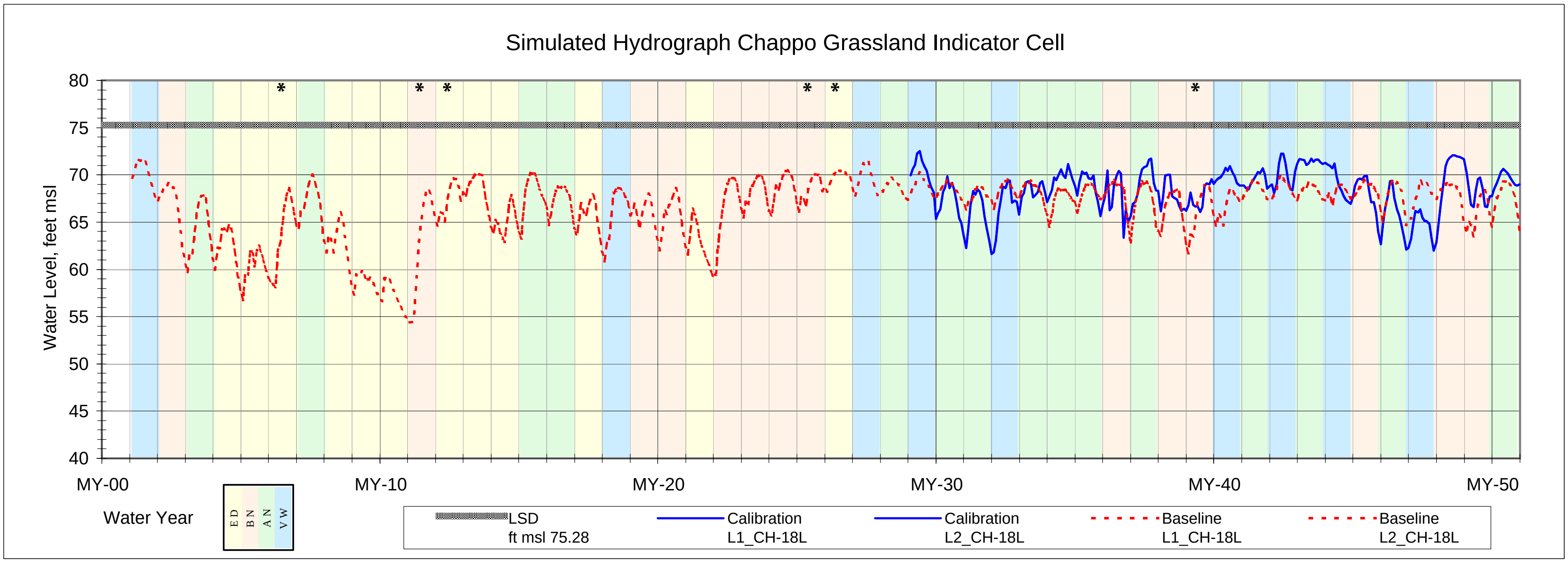


FIGURE D-1
Baseline and Calibration Hydrographs

***** Emergency flows called upon during water years marked with an asterisk.

Layer 1 (L1) and Layer 2(L2) simulated groundwater levels are at similar elevations and the graph lines are printed on top of each other.





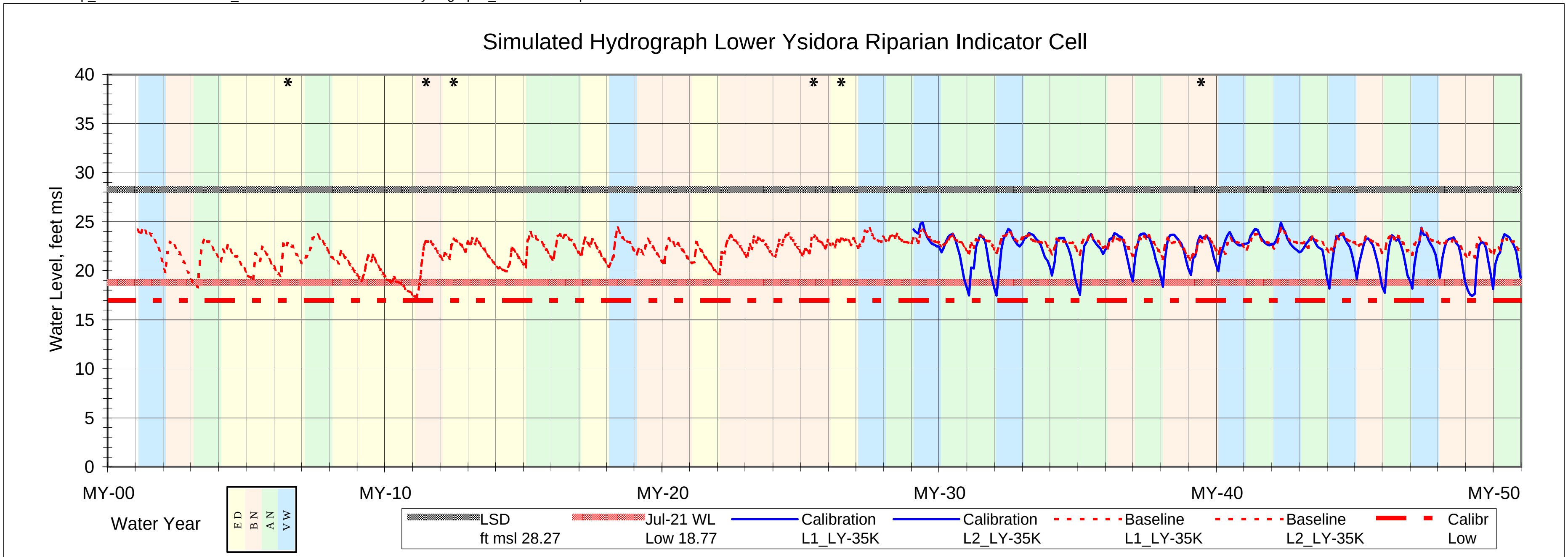
* Emergency flows called upon during water years marked with an asterisk.

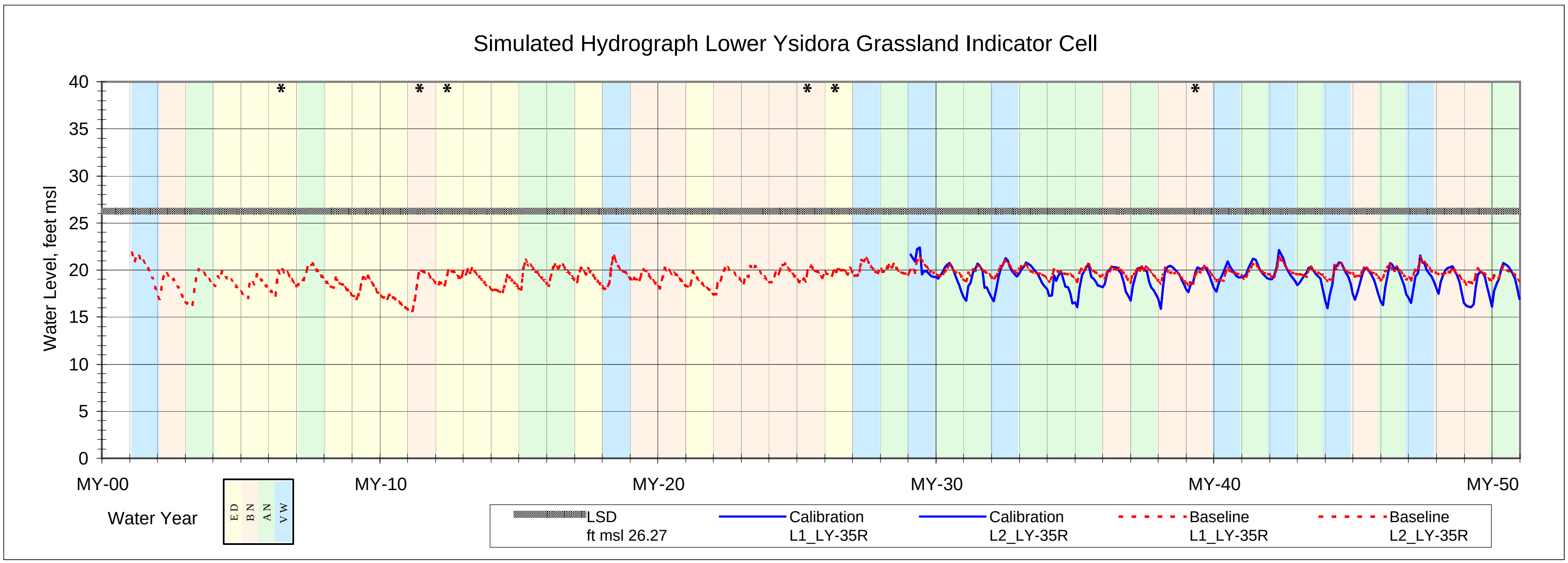
Layer 1 (L1) and Layer 2(L2) simulated groundwater levels are at similar elevations and the graph lines are printed on top of each other.

FIGURE D-2

Baseline and Calibration Hydrographs

D:\Camp_Pendleton\SMR\USBR_model\Baseline4\POST\C.IC-hydrographs_Baseline.xls / printed 7/5/2006





* Emergency flows called upon during water years marked with an asterisk.

Layer 1 (L1) and Layer 2(L2) simulated groundwater levels are at similar elevations and the graph lines are printed on top of each other.

FIGURE D-3

Baseline and Calibration Hydrographs

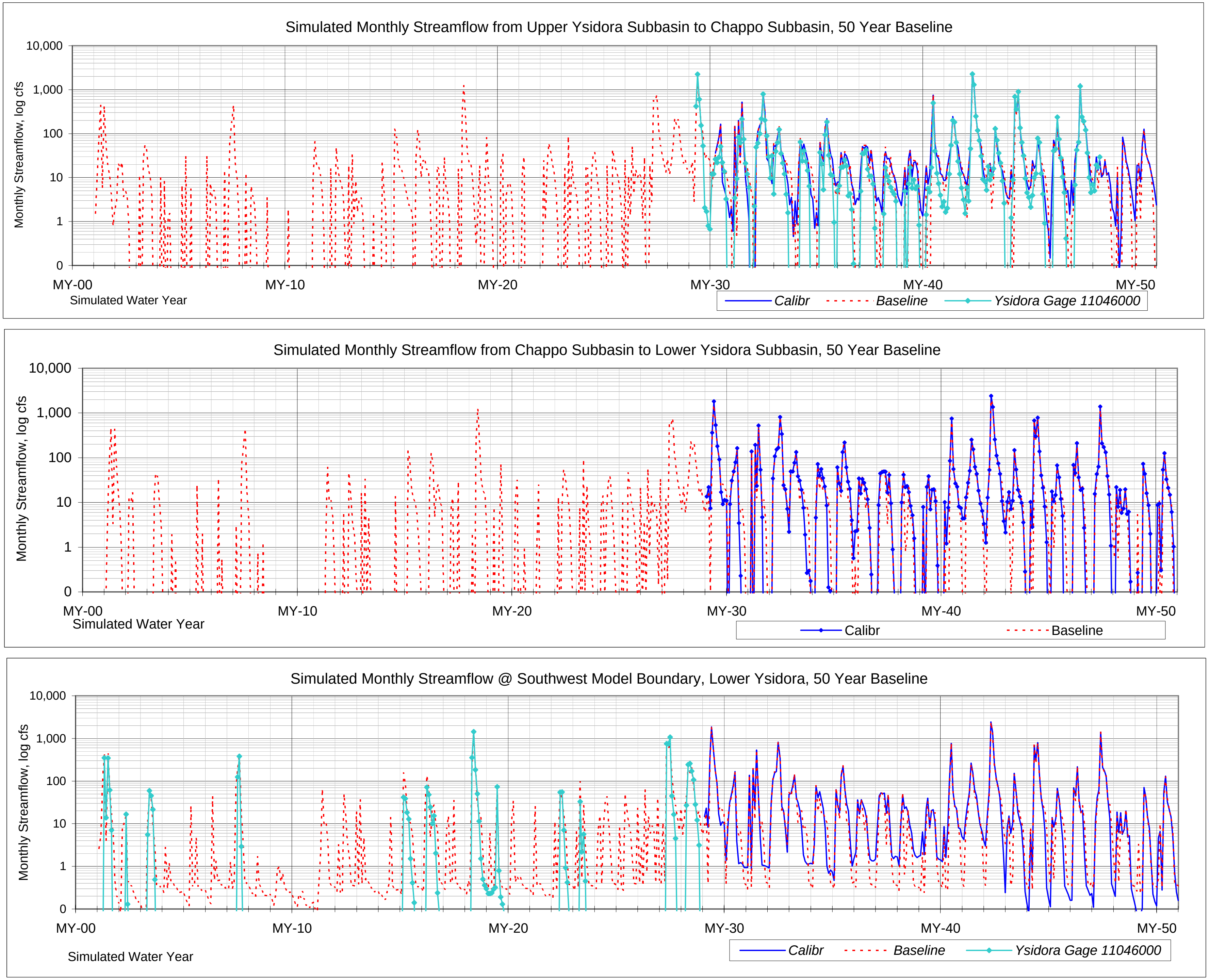


Figure D-4. Simulated Streamflow, Baseline, Calibration, and Gage

Table D-4. 50-Year Baseline

Average Hydrologic Condition Water Budget (af/y)

% Time Exceedence	*> 76%*	*76% to 50%*	*50% to 19%*	*< 19%*
# Years	*12*	*14*	*15*	*9*
	Extremely Dry	Below Normal	Above Normal	Very Wet
Inflow:				
Santa Margarita River Inflow	7,400	13,300	32,300	127,100
Subsurface Underflow	1,000	900	900	900
Lake O'Neill Spill and Release	800	1,400	1,800	2,200
Fallbrook Creek	100	400	1,400	3,800
Minor Tributary Drainages	1,700	1,400	2,400	4,900
Areal Precipitation	500	500	600	1,500
Total Inflow:	11,500	17,900	39,400	140,400
Outflow:				
Santa Margarita River Outflow	2,400	6,300	25,400	125,900
Subsurface Underflow	100	100	100	100
Groundwater Pumping	6,000	6,800	8,400	8,200
Evapotranspiration	2,200	2,800	3,100	3,200
Diversions to Lake O'Neill	1,200	1,900	2,400	2,700
Total Outflow:	11,900	17,900	39,400	140,100
Net Simulated Change of Groundwater in Storage:	-400	0	0	300

Median Hydrologic Condition Water Budget (af/y)

% Time Exceedence	*> 76%*	*76% to 50%*	*50% to 19%*	*< 19%*
# Years	*12*	*14*	*15*	*9*
	Extremely Dry	Below Normal	Above Normal	Very Wet
Inflow:				
Santa Margarita River Inflow	6,800	13,200	28,800	120,200
Subsurface Underflow	900	900	900	900
Lake O'Neill Spill and Release	700	1,300	2,100	2,300
Fallbrook Creek	100	300	1,100	3,500
Minor Tributary Drainages	1,500	1,400	2,500	4,700
Areal Precipitation	400	300	500	1,500
Outflow:				
Santa Margarita River Outflow	1,900	6,900	20,300	117,400
Subsurface Underflow	100	100	100	100
Groundwater Pumping	5,300	7,300	8,800	8,800
Evapotranspiration	2,100	2,800	3,000	3,100
Diversions to Lake O'Neill	1,300	1,700	2,700	2,700
Net Simulated Change of Groundwater in Storage:	-400	-100	0	500

Average Subbasin Water Budget (af/y)

	Upper Ysidora	Chappo	Lower Ysidora	SMR Basin	
Inflow:					
Santa Margarita River Inflow	38,000	33,800	32,100	38,000	85%
Subsurface Underflow *	900	1,900	500	900	2%
Lake O'Neill Spill and Release	1,500	0	0	1,500	3%
Fallbrook Creek	1,200	0	0	1,200	3%
Minor Tributary Drainages	600	1,100	700	2,400	5%
Areal Precipitation	200	300	200	800	2%
Total Inflow:	42,400	37,100	33,500	44,800	
Outflow:					
Santa Margarita River Outflow	33,800	32,100	32,600	32,600	73%
Subsurface Underflow *	1,900	500	100	100	0%
Groundwater Pumping	4,400	2,900	0	7,300	16%
Evapotranspiration *	800	1,100	900	2,800	6%
Diversions to Lake O'Neill	2,000	-	-	2,000	4%
Total Outflow:	42,900	36,600	33,600	44,800	
Net Simulated Change of Groundwater in Storage: *	-500	500	-100	0	

Note: * Subbasin Medians are based on the last rate of the stress period
Values are rounded to the nearest 100 acre-feet, closest number adjusted to eliminate rounding error

Median Subbasin Water Budget (af/y)

	Upper Ysidora	Chappo	Lower Ysidora	SMR Basin
Inflow:				
Santa Margarita River Inflow	16,000	10,500	7,900	16,000
Subsurface Underflow *	900	2,000	500	900
Lake O'Neill Spill and Release	1,500	0	0	1,500
Fallbrook Creek	600	0	0	600
Minor Tributary Drainages	200	0	100	2,100
Areal Precipitation	6,300	0	4,392	500
Outflow:				
Santa Margarita River Outflow	10,500	7,900	8,500	8,500
Subsurface Underflow *	2,000	500	100	100
Groundwater Pumping	5,000	3,300	0	8,300
Evapotranspiration *	800	1,200	1,000	2,900
Diversions to Lake O'Neill	2,200	0	0	2,200
Net Simulated Change of Groundwater in Storage: *	0	0	0	100

Note: The sum of median values does not reflect the change of groundwater in storage.
Median values are not cummulative.
* Subbasin Medians are based on the last rate of the stress period
Values are rounded to the nearest 100 acre-feet

Table D-5 Annual Water Budget Summary

Lower Santa Margarita River Groundwater Model — 50-Year Baseline

Annual Surface Water Budget

MY		SMR Flow In	LON Diversion	Ponds Diversion	Str Gain+ / Loss-	GAGE SMR @ UY->CH	Str Gain+ / Loss-	SMR @ CH->LY	Str Gain+ / Loss-	SMR Flow Out	LSMR Str Gain+ / Loss-
1	VW	66,423	2,364	6,516	-1,658	64,765	-3	64,762	1,643	66,405	-18
2	BN	8,728	1,531	3,326	-4,212	4,517	-2,176	2,340	-111	2,230	-6,499
3	AN	15,648	1,063	4,682	-6,087	9,560	-3,093	6,467	-183	6,284	-9,363
4	ED	6,763	1,323	2,646	-5,523	1,240	-1,095	145	278	423	-6,340
5	ED	6,150	337	1,336	-3,563	2,587	-988	1,598	413	2,012	-4,138
6	ED	8,229	1,307	2,764	-5,182	3,047	-923	2,124	762	2,887	-5,343
7	AN	46,754	1,151	6,726	-3,209	43,545	-1,361	42,185	766	42,950	-3,804
8	ED	6,745	1,291	3,114	-5,253	1,493	-1,379	114	144	258	-6,487
9	ED	4,839	786	1,820	-4,633	206	-203	3	286	289	-4,550
10	ED	3,399	393	1,216	-3,290	110	-110	-	113	113	-3,286
11	BN	13,729	1,569	5,631	-6,105	7,624	-2,616	5,009	254	5,263	-8,466
12	ED	11,058	1,665	3,537	-4,183	6,876	-1,876	4,999	379	5,378	-5,681
13	ED	4,968	577	1,724	-1,867	3,101	-895	2,206	428	2,633	-2,334
14	ED	5,799	412	2,498	-4,059	1,741	-940	801	192	993	-4,806
15	AN	21,918	2,747	5,212	-4,578	17,340	-969	16,371	1,323	17,694	-4,224
16	AN	23,856	2,344	6,960	-5,061	18,796	-1,566	17,230	1,122	18,352	-5,504
17	ED	10,104	1,979	3,868	-5,606	4,498	-1,452	3,046	650	3,696	-6,409
18	VW	105,468	2,415	8,009	-1,963	103,505	-1,276	102,229	1,482	103,711	-1,757
19	BN	13,128	2,317	3,887	-5,819	7,309	-2,333	4,976	89	5,065	-8,064
20	BN	8,943	1,265	3,458	-4,357	4,586	-2,015	2,571	369	2,940	-6,003
21	ED	7,737	1,831	1,408	-5,104	2,633	-1,062	1,572	133	1,705	-6,032
22	BN	14,799	1,515	6,347	-4,087	10,711	-2,785	7,926	-15	7,911	-6,887
23	BN	12,324	1,607	2,912	-3,598	8,726	-1,055	7,671	642	8,314	-4,010
24	BN	11,385	1,698	4,787	-3,568	7,817	-1,374	6,443	536	6,979	-4,406
25	BN	12,391	1,733	4,798	-3,887	8,504	-1,710	6,794	401	7,195	-5,196
26	ED	12,735	2,156	3,963	-3,891	8,844	-984	7,860	803	8,663	-4,072
27	VW	126,848	2,791	8,229	1,054	127,903	262	128,165	2,209	130,373	3,525
28	AN	55,087	2,722	10,947	-4,053	51,034	-2,900	48,134	509	48,643	-6,444
29	VW	181,131	2,723	11,110	-305	180,826	-662	180,164	1,998	182,162	1,031
30	AN	28,809	2,750	6,231	-5,129	23,680	-3,426	20,253	90	20,344	-8,465
31	AN	62,362	2,698	6,217	-3,056	59,306	-2,585	56,721	638	57,359	-5,003
32	VW	105,857	2,721	8,692	-1,106	104,751	-2,152	102,599	977	103,576	-2,281
33	AN	29,591	2,714	8,856	-4,906	24,685	-2,706	21,978	317	22,296	-7,295
34	AN	22,091	2,701	8,036	-5,839	16,252	-3,772	12,480	-68	12,412	-9,679
35	AN	39,332	2,235	7,179	-2,828	36,504	-2,875	33,629	599	34,228	-5,104
36	BN	14,229	2,155	4,331	-4,403	9,826	-2,359	7,467	171	7,638	-6,591
37	AN	19,248	1,923	5,329	-2,913	16,334	-2,340	13,994	588	14,582	-4,666
38	BN	12,653	1,726	4,828	-4,282	8,371	-2,589	5,782	247	6,029	-6,624
39	BN	16,168	2,439	8,048	-6,005	10,163	-3,303	6,860	-104	6,756	-9,412
40	VW	64,398	2,820	7,665	-3,432	60,966	-2,974	57,992	305	58,297	-6,101
41	AN	42,484	2,711	8,860	-5,125	37,359	-3,318	34,041	324	34,365	-8,119
42	VW	251,832	2,723	10,402	270	252,102	-1,377	250,725	1,361	252,086	254
43	AN	24,418	2,752	9,967	-5,691	18,726	-3,176	15,550	177	15,727	-8,690
44	VW	121,462	2,675	9,714	-2,212	119,250	-1,907	117,342	1,230	118,573	-2,889
45	BN	18,009	2,750	8,821	-5,614	12,394	-3,221	9,173	-51	9,122	-8,886
46	AN	30,001	2,137	8,121	-4,539	25,463	-1,739	23,724	706	24,430	-5,571
47	VW	120,226	2,717	10,119	-1,933	118,293	-2,253	116,040	1,355	117,396	-2,831
48	BN	13,178	2,745	6,733	-5,771	7,406	-2,925	4,482	-27	4,455	-8,723
49	BN	15,901	1,871	5,796	-5,626	10,275	-2,723	7,552	-79	7,474	-8,427
50	AN	22,536	2,602	7,801	-5,039	17,497	-2,668	14,829	222	15,051	-7,485
	avg	38,037	2,004	5,904	**-3,976**	34,061	**-1,919**	32,142	**532**	32,674	**-5,363**
	med	16,034	2,155	6,006	-4,247	10,493	-1,961	7,893	374	8,488	-5,626
AVERAGES											
ED	12	7,377	1,171	2,491	(4,346)	3,031	(992)	2,039	382	2,421	-4,957
BN	14	13,254	1,923	5,264	(4,810)	8,445	(2,370)	6,075	166	6,241	-7,014
AN	15	32,276	2,350	7,408	(4,537)	27,739	(2,566)	25,172	475	25,648	-6,628
VW	9	127,072	2,661	8,940	(1,254)	125,818	(1,371)	124,447	1,396	125,842	-1,230
	50										
MEDIANS											
ED	12	6,754	1,299	2,572	(4,408)	2,610	(986)	1,585	332	1,858	-5,075
BN	14	13,153	1,729	4,813	(4,380)	8,437	(2,474)	6,618	130	6,867	-6,755
AN	15	28,809	2,698	7,179	(4,906)	23,680	(2,706)	20,253	509	20,344	-6,444
VW	9	120,226	2,721	8,692	(1,658)	118,293	(1,377)	116,040	1,361	117,396	-1,757

Table D-5 Annual Water Budget Summary (contined)

Lower Santa Margarita River Groundwater Model — Model Run: 50-Year Baseline

Annual Groundw ater Budget

	INFLOW:					**OUTFLOW:**					
MY	Storage	Recharge	Stream Leakance	GHB	TOTAL GW IN	Storage	Wells	ET	Stream Leakance	GHB	TOTAL GW OUT
1	5,184	7,573	6,254	866	19,877	3,100	6,848	3,294	6,578	63	19,884
2	5,222	3,514	5,387	916	15,038	2,802	8,288	2,493	1,418	47	15,049
3	5,204	4,890	8,530	956	19,581	6,355	8,312	2,329	2,547	48	19,591
4	5,852	2,930	5,322	927	15,032	3,918	8,287	2,008	781	55	15,048
5	4,969	1,636	6,070	1,083	13,758	5,483	6,265	1,641	337	51	13,777
6	3,726	3,479	5,934	1,005	14,144	5,780	4,800	2,126	1,393	57	14,157
7	4,871	7,323	7,013	889	20,097	5,007	6,848	2,803	5,375	64	20,097
8	6,125	3,260	4,642	921	14,948	3,655	8,287	2,009	973	50	14,974
9	3,772	2,169	4,711	994	11,646	3,531	6,265	1,419	385	51	11,650
10	3,053	1,341	2,658	1,011	8,063	1,944	4,798	1,121	163	42	8,069
11	3,882	6,088	8,512	919	19,402	8,163	4,800	2,199	4,199	51	19,414
12	2,941	3,792	6,882	906	14,522	4,366	4,800	2,785	2,528	57	14,536
13	3,866	1,956	4,385	917	11,124	1,779	4,800	2,817	1,694	59	11,150
14	3,446	2,819	4,559	950	11,775	3,682	4,800	2,181	1,067	52	11,783
15	4,463	6,251	6,800	877	18,391	4,403	6,848	2,913	4,180	66	18,411
16	4,513	7,562	8,368	876	21,319	4,754	8,799	2,888	4,819	66	21,326
17	4,894	4,176	6,680	899	16,649	3,994	8,287	2,562	1,758	60	16,662
18	4,513	9,199	8,747	869	23,327	6,088	8,313	2,785	6,088	65	23,339
19	4,803	4,070	6,531	895	16,299	3,540	8,287	2,557	1,878	57	16,320
20	4,621	3,820	6,685	906	16,032	4,215	7,289	2,555	1,933	59	16,050
21	3,687	1,685	5,062	954	11,388	3,138	5,776	2,087	351	52	11,404
22	4,020	6,685	7,360	877	18,942	6,198	4,800	2,773	5,122	60	18,953
23	3,274	3,363	5,978	905	13,520	3,404	4,798	2,909	2,360	61	13,532
24	3,363	5,225	6,426	879	15,893	3,643	4,800	3,051	4,346	64	15,904
25	3,182	5,356	6,575	881	15,994	3,994	4,800	3,014	4,139	63	16,011
26	2,771	4,362	6,380	882	14,394	2,511	4,800	3,189	3,836	67	14,403
27	4,024	9,438	7,670	861	21,993	4,107	6,848	3,285	7,691	75	22,005
28	3,618	11,329	8,081	843	23,871	3,483	8,799	3,264	8,262	69	23,877
29	3,701	12,140	7,893	836	24,568	3,781	8,799	3,320	8,604	74	24,578
30	3,223	6,437	8,207	870	18,737	2,544	8,799	3,131	4,203	64	18,742
31	3,473	6,639	8,581	875	19,568	3,579	8,802	2,980	4,157	65	19,583
32	3,724	9,428	8,792	854	22,798	4,247	8,799	3,147	6,543	71	22,807
33	4,135	9,054	7,727	859	21,775	3,186	8,799	3,186	6,545	66	21,783
34	3,891	8,251	8,763	870	21,775	4,123	8,806	2,941	5,856	62	21,789
35	3,574	7,585	8,772	868	20,799	4,066	8,792	3,042	4,832	65	20,798
36	4,252	4,575	7,208	888	16,924	2,677	8,287	2,957	2,943	63	16,928
37	4,107	5,723	8,173	882	18,884	4,093	8,310	2,932	3,496	66	18,897
38	4,408	5,069	7,828	893	18,198	4,096	8,287	2,723	3,035	61	18,201
39	4,141	8,200	7,507	872	20,721	5,239	7,300	2,808	5,326	60	20,733
40	3,717	7,865	8,081	882	20,544	4,474	7,805	2,876	5,315	61	20,532
41	3,395	9,210	8,724	861	22,190	3,549	8,815	3,168	6,591	65	22,189
42	3,845	11,249	7,989	843	23,926	3,969	8,792	3,228	7,899	70	23,959
43	3,976	10,147	7,622	852	22,596	3,471	8,792	3,134	7,133	63	22,593
44	3,827	10,399	8,310	856	23,393	4,327	8,815	3,060	7,137	67	23,407
45	4,392	8,976	7,071	859	21,297	3,359	8,287	3,136	6,474	62	21,318
46	4,791	8,494	7,645	861	21,791	4,474	8,310	2,955	5,996	65	21,800
47	3,522	11,065	8,907	847	24,341	4,901	8,792	3,085	7,505	71	24,355
48	3,972	6,910	6,818	865	18,565	2,539	8,287	3,069	4,594	64	18,553
49	4,722	5,946	6,818	895	18,382	4,754	7,300	2,661	3,652	57	18,425
50	4,761	8,127	7,369	863	21,120	4,525	7,805	2,941	5,778	62	21,112
avg	4,108	6,336	7,060	894	18,398	4,060	7,341	2,751	4,196	61	18,409
med	3,974	6,344	7,284	880	18,913	3,994	8,287	2,911	4,201	63	18,925
AVERAGES											
ED	4,092	2,800	5,274	954	13,120	3,649	5,997	2,162	1,272	54	13,134
BN	4,161	5,557	6,908	889	17,515	4,187	6,830	2,779	3,673	59	17,528
AN	4,133	7,802	8,025	873	20,833	4,107	8,376	2,974	5,318	64	20,839
VW	4,006	9,817	8,071	857	22,752	4,333	8,201	3,120	7,040	69	22,763
MEDIANS											
ED	3,749	2,875	5,192	939	13,951	3,669	5,288	2,106	1,020	53	13,967
BN	4,197	5,290	6,818	891	17,561	3,819	7,300	2,790	3,896	61	17,564
AN	4,107	7,585	8,173	870	21,120	4,093	8,792	2,955	5,375	65	21,112
VW	3,827	9,438	8,081	856	23,327	4,247	8,792	3,147	7,137	70	23,339

Table D-5 Annual Water Budget Summary (contined)

Lower Santa Margarita River Groundwater Model

Annual Groundw ater Budget

MY	NET Storage	NET Str Lknc	In-Out	% bal
1	-2,084	324	-7.1	-0.04%
2	-2,419	-3,969	-10.4	-0.07%
3	1,151	-5,983	-9.8	-0.05%
4	-1,934	-4,541	-16.6	-0.11%
5	515	-5,733	-19.6	-0.14%
6	2,054	-4,541	-12.2	-0.09%
7	135	-1,638	0.0	0.00%
8	-2,470	-3,669	-26.2	-0.18%
9	-241	-4,326	-4.1	-0.04%
10	-1,109	-2,495	-5.8	-0.07%
11	4,281	-4,313	-11.8	-0.06%
12	1,426	-4,355	-14.2	-0.10%
13	-2,087	-2,691	-25.9	-0.23%
14	236	-3,492	-8.3	-0.07%
15	-60	-2,619	-20.2	-0.11%
16	241	-3,549	-6.5	-0.03%
17	-900	-4,922	-13.0	-0.08%
18	1,575	-2,658	-11.6	-0.05%
19	-1,263	-4,653	-20.7	-0.13%
20	-406	-4,752	-18.3	-0.11%
21	-549	-4,711	-15.7	-0.14%
22	2,179	-2,238	-11.1	-0.06%
23	131	-3,618	-12.5	-0.09%
24	280	-2,080	-11.4	-0.07%
25	813	-2,436	-17.4	-0.11%
26	-259	-2,544	-9.2	-0.06%
27	83	21	-12.6	-0.06%
28	-135	181	-6.8	-0.03%
29	80	712	-9.7	-0.04%
30	-680	-4,004	-4.6	-0.02%
31	106	-4,424	-14.5	-0.07%
32	523	-2,250	-8.7	-0.04%
33	-948	-1,182	-8.9	-0.04%
34	232	-2,906	-14.0	-0.06%
35	491	-3,939	1.3	0.01%
36	-1,575	-4,265	-3.7	-0.02%
37	-14	-4,676	-12.9	-0.07%
38	-312	-4,793	-3.4	-0.02%
39	1,097	-2,181	-12.1	-0.06%
40	758	-2,766	12.4	0.06%
41	154	-2,133	1.4	0.01%
42	124	-90	-33.1	-0.14%
43	-505	-489	3.7	0.02%
44	500	-1,173	-13.8	-0.06%
45	-1,033	-597	-21.1	-0.10%
46	-317	-1,648	-9.4	-0.04%
47	1,380	-1,403	-13.8	-0.06%
48	-1,433	-2,225	11.9	0.06%
49	32	-3,166	-43.2	-0.23%
50	-236	-1,591	8.7	0.04%
avg	-48	-2,864	-10.9	-0.06%
med	56	-2,728	-11.5	-0.06%
AVERAGES				
ED	-443	-4,002	-14.2	-0.11%
BN	27	-3,235	-13.2	-0.08%
AN	-26	-2,707	-6.2	-0.03%
VW	326	-1,031	-10.9	-0.05%
MEDIANS				
ED	-404	-4,341	-13.6	-0.09%
BN	-140	-3,392	-11.9	-0.07%
AN	-14	-2,619	-6.8	-0.03%
VW	500	-1,173	-11.6	-0.05%

Table D-6 50-Year Average Monthly Water Budget

Lower Santa Margarita River Groundwater Model — 50-Year Baseline

Average Monthly Water Budget

Avg AF/M	SMR Flow In	Diversion	Str Gain+ / Loss-	SMR @ UY->CH	Str Gain+ / Loss-	SMR @ CH->LY	Str Gain+ / Loss-	SMR Flow Out	LSMR Str Gain+ / Loss-
Oct	526	315	-359	167	-86	81	21	102	-424
Nov	1,299	605	207	1,506	-423	1,083	-12	1,071	-228
Dec	1,969	530	-575	1,394	-96	1,298	59	1,358	-611
Jan	8,358	840	-754	7,604	-40	7,564	146	7,710	-648
Feb	10,272	1,477	-922	9,350	-58	9,291	122	9,414	-858
Mar	8,848	1,511	-505	8,342	-127	8,215	109	8,324	-524
Apr	3,161	1,069	-247	2,914	-224	2,690	41	2,731	-430
May	1,345	741	-164	1,182	-265	917	1	918	-428
Jun	756	555	-72	684	-229	455	0	455	-301
Jul	499	133	-91	407	-166	242	6	248	-250
Aug	458	62	-222	236	-102	134	20	154	-304
Sep	548	60	-273	274	-102	172	18	191	-357
Avg Monthly	3,170	658	-331	2,838	-160	2,679	44	2,723	-447
Med Monthly	1,322	580	-260	1,288	-115	1,000	20	994	-426
Avg Total=Anl	38,037	7,899	-3,976	34,061	-1,919	32,142	532	32,674	-5,363

Lower Santa Margarita River Groundwater Model

Modflow Volumetric Budget Output

Average Monthly Water Budget

Avg AF/M	INFLOW: Storage	Recharge	Stream Leakance	GHB	TOTAL IN	OUTFLOW: Storage	Wells	ET	Stream Leakance	GHB	TOTAL OUT	NET Storage	NET Str Lknc	In-Out	% bal
Oct	414	45	382	81	922	76	607	188	44	8	923.2952663	-338	-338	-1.7	-0.18%
Nov	53	584	1,069	78	1,784	980	517	198	80	8	1781.937277	926	-989	2.2	0.12%
Dec	267	146	640	79	1,132	358	430	221	116	7	1132.040225	91	-524	-0.4	-0.03%
Jan	96	356	885	77	1,414	574	451	233	150	6	1413.543439	478	-735	0.9	0.07%
Feb	57	1,397	639	74	2,167	1,107	408	229	422	0	2165.752066	1,049	-217	1.5	0.07%
Mar	70	1,565	638	73	2,345	627	566	264	884	1	2342.471304	558	246	3.0	0.13%
Apr	231	1,099	598	67	1,996	229	578	261	921	9	1996.973324	-2	322	-0.7	-0.04%
May	369	790	521	70	1,749	60	635	267	780	10	1751.547062	-309	259	-2.4	-0.13%
Jun	665	272	459	69	1,464	9	742	248	462	7	1467.434481	-656	3	-3.0	-0.21%
Jul	743	65	404	73	1,286	3	843	237	202	4	1288.465381	-740	-203	-2.4	-0.19%
Aug	641	10	384	77	1,112	8	810	215	83	0	1115.828053	-634	-301	-3.8	-0.34%
Sep	501	9	440	76	1,026	30	754	192	52	1	1029.844353	-471	-388	-4.1	-0.40%
Avg Monthly	342	528	588	75	1,533	338	612	229	350	5	1534.094353	-4	-239	-0.9	-0.09%
Med Monthly	318	314	560	75	1,439	153	592	231	176	6	1440.48896	-156	-259	-1.2	-0.09%
Avg Total=Anl	4,108	6,336	7,060	894	18,398	4,060	7,341	2,751	4,196	61	18409.13223	-48	-2,864	-10.9	

Attachment E

Run 1 (Project) Model Results

Table E-1. Run 1 Annual Pumping Summary
Lower Santa Margarita River Groundwater Model

Hydrologic Condition

HC	Cnt	Oct to Apr Strflw
VW	9	Very Wet > 56,164
AN	15	Above Normal > 13,600
BN	14	Below Normal < 13,600
ED	12	Extremely Dry < 5,840
	50	

Pumping Condition

PC	HC	Q Adjst	Anl Q	Cnt	
1	2+ AN @ VW	4,000	18,100	5	10%
2	2+ AN @ AN	2,000	16,100	9	18%
3	Standard	500	14,600	10	20%
4	1st BN	-4,000	10,100	6	12%
5	2ndBN, 70/30 split	-7,700	6,400	3	6%
6	3+BN/all ED	-8,700	5,400	17	34%
				50	100%

MY	HC	Oct-Apr HC descrip	May-Apr Pumping Condition	UY Total (af/y)	CH Total (af/y)	LY Total (af/y)	LSMR Total (af/y)	+Q*
1	VW	Very Wet	3	8,571	7,012	-	15,583	
2	BN	Below Normal	4	7,224	5,911	-	13,135	
3	AN	Above Normal	3	5,733	4,602	-	10,335	
4	ED	Extremely Dry	6	6,744	4,225	-	10,970	
5	ED	Extremely Dry	6	3,761	1,275	-	5,036	
6	ED	Extremely Dry	6	4,080	1,275	-	5,355	
7	AN	Above Normal	3	5,366	2,999	-	8,364	
8	ED	Extremely Dry	6	6,744	4,846	-	11,591	
9	ED	Extremely Dry	6	3,932	1,275	-	5,207	
10	ED	Extremely Dry	6	3,429	1,275	-	4,704	
11	BN	Below Normal	6	3,813	1,275	-	5,088	
12	ED	Extremely Dry	6	4,080	1,275	-	5,355	
13	ED	Extremely Dry	6	4,080	1,275	-	5,355	
14	ED	Extremely Dry	6	4,080	1,275	-	5,355	
15	AN	Above Normal	3	5,366	2,999	-	8,364	
16	AN	Above Normal	2	8,748	7,158	-	15,906	X
17	ED	Extremely Dry	6	7,301	5,302	-	12,602	
18	VW	Very Wet	3	5,366	2,999	-	8,364	
19	BN	Below Normal	4	7,224	5,911	-	13,135	
20	BN	Below Normal	5	5,335	3,562	-	8,897	
21	ED	Extremely Dry	6	4,620	1,444	-	6,063	
22	BN	Below Normal	6	4,080	1,275	-	5,355	
23	BN	Below Normal	6	4,080	1,275	-	5,355	
24	BN	Below Normal	6	4,080	1,275	-	5,355	
25	BN	Below Normal	6	4,080	1,275	-	5,355	
26	ED	Extremely Dry	6	4,080	1,275	-	5,355	
27	VW	Very Wet	3	5,366	2,999	-	8,364	
28	AN	Above Normal	2	8,748	7,158	-	15,906	X
29	VW	Very Wet	1	9,549	7,812	-	17,361	X
30	AN	Above Normal	2	9,342	7,561	-	16,904	X
31	AN	Above Normal	2	8,967	7,337	-	16,304	X
32	VW	Very Wet	1	9,529	7,796	-	17,325	X
33	AN	Above Normal	2	9,177	7,508	-	16,686	X
34	AN	Above Normal	2	8,906	7,287	-	16,193	X
35	AN	Above Normal	2	8,936	7,311	-	16,247	X
36	BN	Below Normal	4	7,781	6,366	-	14,147	
37	AN	Above Normal	3	6,361	5,204	-	11,565	
38	BN	Below Normal	4	7,224	5,911	-	13,135	
39	BN	Below Normal	5	5,335	3,562	-	8,897	
40	VW	Very Wet	3	5,905	3,167	-	9,073	
41	AN	Above Normal	2	8,623	7,055	-	15,677	X
42	VW	Very Wet	1	9,570	7,828	-	17,397	X
43	AN	Above Normal	2	9,342	7,561	-	16,904	X
44	VW	Very Wet	1	9,549	7,812	-	17,361	X
45	BN	Below Normal	4	8,421	6,808	-	15,228	
46	AN	Above Normal	3	6,361	5,204	-	11,565	
47	VW	Very Wet	1	9,204	7,530	-	16,734	X
48	BN	Below Normal	4	8,720	6,446	-	15,165	
49	BN	Below Normal	5	5,371	3,389	-	8,760	
50	AN	Above Normal	3	5,905	3,167	-	9,073	
			Min	3,429	1,275	-	4,704	
			Max	9,570	7,828	-	17,397	
			Median	**6,361**	**4,724**	**-**	**11,267**	
			% of Median	56.5%	41.9%	0.0%		
			Average	**6,582**	**4,506**	**-**	**11,088**	
			% of Average	59.3%	40.7%	0.0%		

Notes:

Hydrologic Condition: Oct - Apr

Model starts after 3+ BN or ED

* Wet Year Algorithm (additional pumping occurs before May)

Table E-1. Run 1 Annual Pumping Summary (continued)

	Oct-Apr HC Description	HC Count	UY Total (af/y)	CH Total (af/y)	LY Total (af/y)	LSMR Total (af/y)
AVERAGES	ED	12	4,744	2,168	-	6,912
	BN	14	5,927	3,874	-	9,801
	AN	15	7,739	6,007	-	13,746
	VW	9	8,124	6,106	-	14,230
MEDIANS	ED	12	4,080	1,275	-	5,355
	BN	14	5,353	3,562	-	8,897
	AN	15	8,748	7,158	-	15,906
	VW	9	9,305	7,530	-	16,834

Average Monthly Pumping, Run 1

	Month	UY Total (af/m)	CH Total (af/m)	LY Total (af/m)	LSMR Total (af/m)
8%	Oct	512	353	0	865
8%	Nov	554	384	0	938
10%	Dec	641	445	0	1,086
11%	Jan	755	512	0	1,268
11%	Feb	736	493	0	1,229
10%	Mar	689	471	0	1,160
9%	Apr	565	385	0	950
7%	May	464	319	0	783
6%	Jun	386	265	0	651
6%	Jul	406	279	0	685
6%	Aug	366	250	0	616
8%	Sep	507	349	0	857
	Avg Anl	6,582	4,506	0	11,088

Table E-2. Run 1 Pumping Summaries
Lower Santa Margarita River Groundwater Model

		Bldg #	State ID #	Label	# mos Q	% of 600 mos	Orig Wells by Subbsn %	80% Utilization af/m	
1	UY	2673	10/4-7A2	7A2	600	100%	25%	142	
2	UY	26072	10/4-8D1	8D1	600	100%	21%	121	
3	UY	2671	10/4-7H2	7H2	600	100%	15%	82	
4	UY	PW-6	PW-6	PW-6	600	100%	19%	110	
5	UY	2603	10/4-7R2	7R2	600	100%	19%	110	
6	UY	UY-1	UY-1	UY-1	244	41%	-	110	
7	UY	UY-2	UY-2	UY-2	172	29%	-	110	
8	UY	UY-3	UY-3	UY-3	114	19%	-	110	
9	UY	UY-4	UY-4	UY-4	68	11%	-	110	
10	UY	UY-5	UY-5	UY-5	33	6%	-	110	
11	UY	UY-6	UY-6	UY-6	9	2%	-	110	
12	CH	2393	10/4-18E3	18E4	600	100%	14%	121	
13	CH	2373	10/4-18M4&5	18M5	600	100%	17%	153	
14	CH	2363	10/5-13R2	13R2	600	100%	15%	132	
15	CH	33925	10/5-23G4	23G4	**0**	**0%**	15%	**0**	backup
16	CH	2301	10/5-23J1	23J1	600	100%	19%	164	
17	CH	33924	10/5-23K2	23K2	**0**	**0%**	6%	**0**	backup
18	CH	33923	10/5-23K3	23K3	600	100%	15%	132	
19	CH	CH-1	CH-1	CH-1	85	14%	-	88	
20	CH	CH-2	CH-2	CH-2	47	8%	-	88	
21	CH	CH-3	CH-3	CH-3	13	2%	-	88	
								2187	

% Pumping in Subbasin

		Wet Year Algorithm			Dry Year Management			Max Pumping in Subbasin adding wells as needed				
		55%	45%	0%	80%	25%	0%					
mo	Anl %	UY	CH	LY	UY	CH	LY		UY	CH	LY	Total
OCT	7.9%	4.4%	3.6%	0.00%	6.3%	2.0%	0.00%	# exst wells	5	7	-	12
NOV	8.6%	4.7%	3.9%	0.00%	6.9%	2.2%	0.00%	af/m (80%)	564	833	-	1,397
DEC	10.0%	5.5%	4.5%	0.00%	8.0%	2.5%	0.00%	avg af/well	113	119	-	116
JAN	11.4%	6.3%	5.1%	0.00%	9.1%	2.9%	0.00%					
FEB	10.9%	6.0%	4.9%	0.00%	8.8%	2.7%	0.00%	1 adntl well	674	921	55	1,650
MAR	10.2%	5.6%	4.6%	0.00%	8.2%	2.5%	0.00%	2 adntl well	784	1,008	110	1,902
APR	8.3%	4.6%	3.7%	0.00%	6.6%	2.1%	0.00%	3 adntl well	893	1,096	164	2,154
MAY	7.1%	3.9%	3.2%	0.00%	5.7%	1.8%	0.00%	4 adntl well	1,003	1,184	219	2,406
JUN	5.9%	3.2%	2.7%	0.00%	4.7%	1.5%	0.00%	5 adntl well	1,112	1,271		
JUL	6.2%	3.4%	2.8%	0.00%	5.0%	1.6%	0.00%	6 adntl well	1,222			
AUG	5.6%	3.1%	2.5%	0.00%	4.5%	1.4%	0.00%	50-yr Avg	5,844	4,875	1,225	
SEP	7.8%	4.3%	3.5%	0.00%	6.2%	1.9%	0.00%	50-yr Med	5,705	5,330	1,161	

	median						
	UY af/m	CH af/m	LY af/m	Total af/m	Max Mo Pumping	cfs	new wells
ED	352	130	0	546	1,839	32	7
BN	415	268	0	612	2,068	36	9
AN	616	504	0	1,121	2,068	36	9
VW	625	511	0	1,136	2,125	37	9

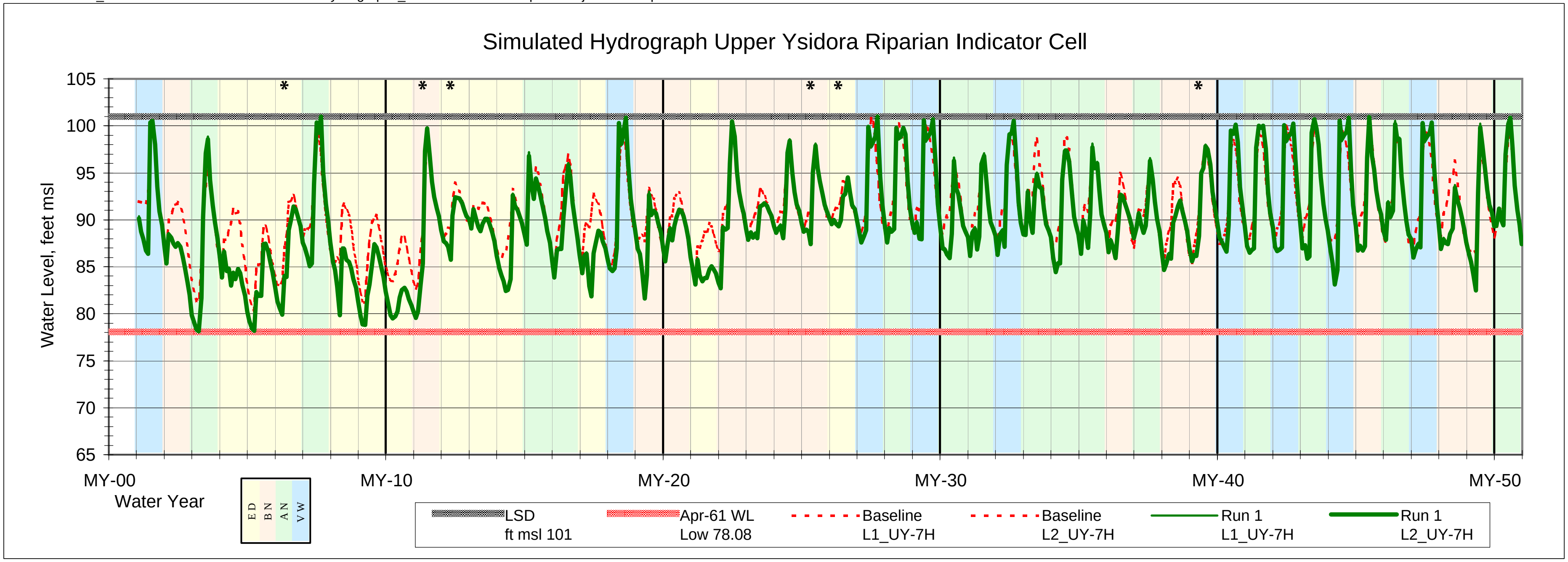
Wet Year Algorithm Monthly Counts

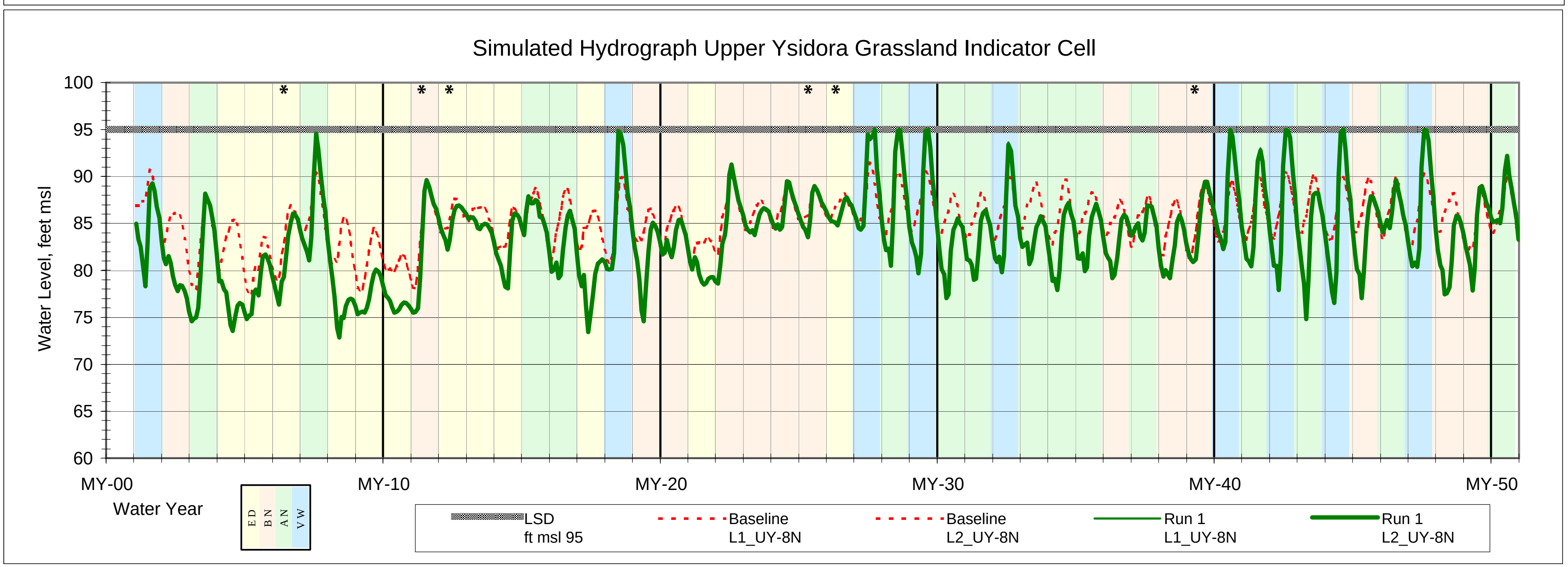
	2,000	4,000	Total	% of 50 yrs
Oct	-	-	-	0%
Nov	-	-	-	0%
Dec	1	-	1	2%
Jan	7	1	8	16%
Feb	7	4	11	22%
Mar	9	5	14	28%
Apr	9	5	14	28%
May	-	-	-	0%
	33	15	48	

		Table E-3. Run 1 Annual Pumping by Well										
	Building #:	2673	26072	2671	PW-6	2603	new	new	new	new	new	new
Max Annual Pumping		1,617	1,368	933	1,244	1,244	1,136	940	732	530	316	205
Potential w/ 80% Util		1,710	1,447	986	1,315	1,315	1,315	1,315	1,315	1,315	1,315	1,315
Potential Well Yield (gpm)		1,300	1,100	750	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
		UY	UY	UY	UY	UY	UY	UY	UY	UY	UY	UY
		10/4-7A2	10/4-8D1	10/4-7H2	PW-6	10/4-7R2	UY-1	UY-2	UY-3	UY-4	UY-5	UY-6
MY	HC	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)
1	VW	1,529	1,294	882	1,176	1,176	900	603	506	306	200	0
2	BN	1,387	1,174	800	1,067	1,067	716	504	407	100	0	0
3	AN	1,324	1,120	764	1,018	1,018	488	0	0	0	0	0
4	ED	1,266	1,071	731	974	974	716	504	407	100	0	0
5	ED	949	803	548	730	730	0	0	0	0	0	0
6	ED	1,030	871	594	792	792	0	0	0	0	0	0
7	AN	1,305	1,105	753	1,004	1,004	194	0	0	0	0	0
8	ED	1,266	1,071	731	974	974	716	504	407	100	0	0
9	ED	992	840	573	763	763	0	0	0	0	0	0
10	ED	866	732	499	666	666	0	0	0	0	0	0
11	BN	962	814	555	740	740	0	0	0	0	0	0
12	ED	1,030	871	594	792	792	0	0	0	0	0	0
13	ED	1,030	871	594	792	792	0	0	0	0	0	0
14	ED	1,030	871	594	792	792	0	0	0	0	0	0
15	AN	1,305	1,105	753	1,004	1,004	194	0	0	0	0	0
16	AN	1,588	1,344	916	1,221	1,221	917	712	412	314	103	0
17	ED	1,273	1,077	734	979	979	721	721	413	304	100	0
18	VW	1,305	1,105	753	1,004	1,004	194	0	0	0	0	0
19	BN	1,387	1,174	800	1,067	1,067	716	504	407	100	0	0
20	BN	1,273	1,077	734	979	979	294	0	0	0	0	0
21	ED	1,166	987	673	897	897	0	0	0	0	0	0
22	BN	1,030	871	594	792	792	0	0	0	0	0	0
23	BN	1,030	871	594	792	792	0	0	0	0	0	0
24	BN	1,030	871	594	792	792	0	0	0	0	0	0
25	BN	1,030	871	594	792	792	0	0	0	0	0	0
26	ED	1,030	871	594	792	792	0	0	0	0	0	0
27	VW	1,305	1,105	753	1,004	1,004	194	0	0	0	0	0
28	AN	1,588	1,344	916	1,221	1,221	917	712	412	314	103	0
29	VW	1,605	1,358	926	1,235	1,235	1,127	931	519	306	306	100
30	AN	1,600	1,354	923	1,231	1,231	927	825	622	420	209	102
31	AN	1,607	1,360	927	1,236	1,236	932	830	423	314	103	0
32	VW	1,617	1,368	933	1,244	1,244	1,136	940	528	315	206	0
33	AN	1,592	1,347	918	1,224	1,224	920	818	616	414	103	0
34	AN	1,599	1,353	922	1,230	1,230	926	824	416	307	100	0
35	AN	1,603	1,356	925	1,233	1,233	929	827	420	311	100	0
36	BN	1,394	1,179	804	1,072	1,072	721	721	413	304	100	0
37	AN	1,482	1,254	855	1,140	1,140	488	0	0	0	0	0
38	BN	1,387	1,174	800	1,067	1,067	716	504	407	100	0	0
39	BN	1,273	1,077	734	979	979	294	0	0	0	0	0
40	VW	1,442	1,220	832	1,109	1,109	194	0	0	0	0	0
41	AN	1,585	1,341	914	1,219	1,219	915	709	410	311	0	0
42	VW	1,608	1,361	928	1,237	1,237	1,129	933	521	308	308	205
43	AN	1,600	1,354	923	1,231	1,231	927	825	622	420	209	102
44	VW	1,605	1,358	926	1,235	1,235	1,127	931	519	306	306	100
45	BN	1,395	1,180	805	1,073	1,073	722	722	722	418	309	102
46	AN	1,482	1,254	855	1,140	1,140	488	0	0	0	0	0
47	VW	1,583	1,339	913	1,218	1,218	1,110	810	507	303	203	100
48	BN	1,433	1,212	827	1,102	1,102	732	732	732	530	316	102
49	BN	1,281	1,084	739	985	985	298	0	0	0	0	0
50	AN	1,442	1,220	832	1,109	1,109	194	0	0	0	0	0
	Min	866	732	499	666	666	0	0	0	0	0	0
	Max	1,617	1,368	933	1,244	1,244	1,136	940	732	530	316	205
	Median	1,356	1,147	782	1,043	1,043	488	0	0	0	0	0
	Average	1,330	1,126	768	1,023	1,023	497	353	235	141	68	18
		Average Monthly Well Production										
	Month	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)
	Oct	108	91	62	83	83	48	27	10	0	0	0
	Nov	112	95	65	86	86	49	49	11	0	0	0
	Dec	121	103	70	93	93	50	50	50	11	0	0
	Jan	127	108	73	98	98	61	49	49	49	35	10
	Feb	128	108	74	98	98	63	51	51	40	17	8
	Mar	120	102	69	93	93	60	49	49	39	16	0
	Apr	115	97	66	89	89	51	40	17	2	0	0
	May	103	87	59	79	79	47	10	0	0	0	0
	Jun	95	80	55	73	73	10	0	0	0	0	0
	Jul	100	84	58	77	77	10	0	0	0	0	0
	Aug	92	78	53	71	71	0	0	0	0	0	0
	Sep	109	92	63	84	84	49	28	0	0	0	0
Annual Total		1,330	1,126	768	1,023	1,023	497	353	235	141	68	18

		Table E-3. Run 1 Annual Pumping by Well (continued)									
	Building #:	2393	2373	2363	33925	2301	33924	33923	new	new	new
	Max Annual Pumping	1,244	1,583	1,357	0	1,696	0	1,357	413	330	170
	Potential w/ 80% Util	1,447	1,841	1,578	0	1,973	0	1,578	1,052	1,052	1,052
	Potential Well Yield (gpm)	1,100	1,400	1,200	0	1,500	0	1,200	800	800	800
		CH	CH	CH	CH	CH	CH	CH	CH	CH	CH
		10/4-18E3	10/4-18M4&5	10/5-13R2	10/5-23G4	10/5-23J1	10/5-23K2	10/5-23K3	CH-1	CH-2	CH-3
MY	HC	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)
1	VW	1,121	1,427	1,223	0	1,529	0	1,223	245	245	0
2	BN	988	1,257	1,078	0	1,347	0	1,078	163	0	0
3	AN	791	1,007	863	0	1,079	0	863	0	0	0
4	ED	712	906	777	0	971	0	777	83	0	0
5	ED	219	279	239	0	299	0	239	0	0	0
6	ED	219	279	239	0	299	0	239	0	0	0
7	AN	515	656	562	0	703	0	562	0	0	0
8	ED	805	1,024	878	0	1,098	0	878	163	0	0
9	ED	219	279	239	0	299	0	239	0	0	0
10	ED	219	279	239	0	299	0	239	0	0	0
11	BN	219	279	239	0	299	0	239	0	0	0
12	ED	219	279	239	0	299	0	239	0	0	0
13	ED	219	279	239	0	299	0	239	0	0	0
14	ED	219	279	239	0	299	0	239	0	0	0
15	AN	515	656	562	0	703	0	562	0	0	0
16	AN	1,158	1,474	1,264	0	1,579	0	1,264	252	167	0
17	ED	828	1,053	903	0	1,128	0	903	325	162	0
18	VW	515	656	562	0	703	0	562	0	0	0
19	BN	988	1,257	1,078	0	1,347	0	1,078	163	0	0
20	BN	612	779	668	0	835	0	668	0	0	0
21	ED	248	316	271	0	338	0	271	0	0	0
22	BN	219	279	239	0	299	0	239	0	0	0
23	BN	219	279	239	0	299	0	239	0	0	0
24	BN	219	279	239	0	299	0	239	0	0	0
25	BN	219	279	239	0	299	0	239	0	0	0
26	ED	219	279	239	0	299	0	239	0	0	0
27	VW	515	656	562	0	703	0	562	0	0	0
28	AN	1,158	1,474	1,264	0	1,579	0	1,264	252	167	0
29	VW	1,241	1,580	1,354	0	1,693	0	1,354	335	254	83
30	AN	1,187	1,510	1,295	0	1,618	0	1,295	410	247	166
31	AN	1,175	1,496	1,282	0	1,603	0	1,282	332	167	0
32	VW	1,239	1,577	1,352	0	1,690	0	1,352	333	252	0
33	AN	1,191	1,516	1,299	0	1,624	0	1,299	413	167	0
34	AN	1,168	1,487	1,274	0	1,593	0	1,274	327	162	0
35	AN	1,172	1,491	1,278	0	1,598	0	1,278	330	165	0
36	BN	1,010	1,286	1,102	0	1,378	0	1,102	325	162	0
37	AN	894	1,138	976	0	1,220	0	976	0	0	0
38	BN	988	1,257	1,078	0	1,347	0	1,078	163	0	0
39	BN	612	779	668	0	835	0	668	0	0	0
40	VW	544	693	594	0	742	0	594	0	0	0
41	AN	1,156	1,471	1,261	0	1,576	0	1,261	250	82	0
42	VW	1,244	1,583	1,357	0	1,696	0	1,357	336	256	170
43	AN	1,187	1,510	1,295	0	1,618	0	1,295	410	247	166
44	VW	1,241	1,580	1,354	0	1,693	0	1,354	335	254	83
45	BN	1,043	1,328	1,138	0	1,422	0	1,138	408	330	166
46	AN	894	1,138	976	0	1,220	0	976	0	0	0
47	VW	1,222	1,555	1,333	0	1,666	0	1,333	252	169	83
48	BN	996	1,267	1,086	0	1,358	0	1,086	406	247	166
49	BN	582	741	635	0	794	0	635	0	0	0
50	AN	544	693	594	0	742	0	594	0	0	0
	Min	219	279	239	0	299	0	239	0	0	0
	Max	1,244	1,583	1,357	0	1,696	0	1,357	413	330	170
	Median	798	1,016	871	0	1,088	0	871	0	0	0
	Average	737	938	804	0	1,005	0	804	140	78	22
		Average Monthly Well Production									
	Month	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)
	Oct	61	77	66	0	83	0	66	0	0	0
	Nov	65	82	71	0	88	0	71	8	0	0
	Dec	71	91	78	0	97	0	78	23	7	0
	Jan	76	97	83	0	104	0	83	40	29	9
	Feb	73	93	80	0	100	0	80	37	31	13
	Mar	73	93	80	0	100	0	80	32	12	0
	Apr	66	84	72	0	90	0	72	0	0	0
	May	55	70	60	0	75	0	60	0	0	0
	Jun	46	58	50	0	62	0	50	0	0	0
	Jul	48	61	52	0	65	0	52	0	0	0
	Aug	43	55	47	0	59	0	47	0	0	0
	Sep	60	76	66	0	82	0	66	0	0	0
	Annual Total	737	938	804	0	1,005	0	804	140	78	22

Y:\USBR_model\Run1 Basin Yield\POST\C.IC-hydrographs_Run 1-55-45+75-25split+wladj+PC3.xls / printed 9/22/2006



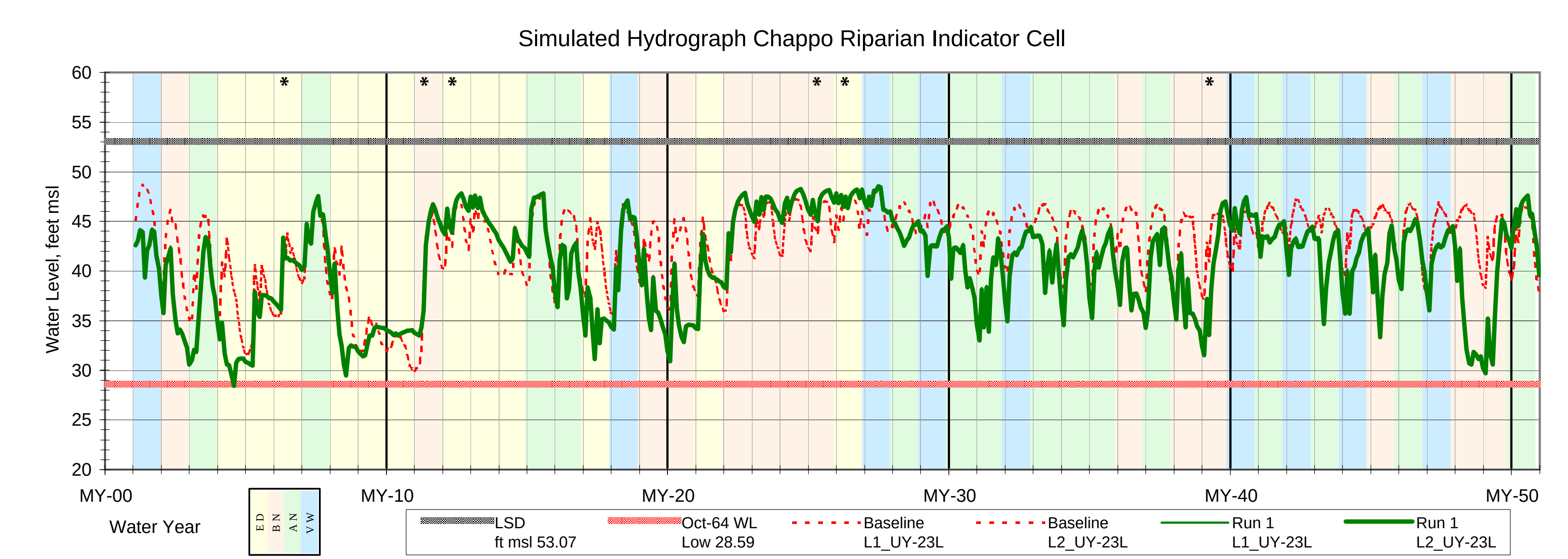


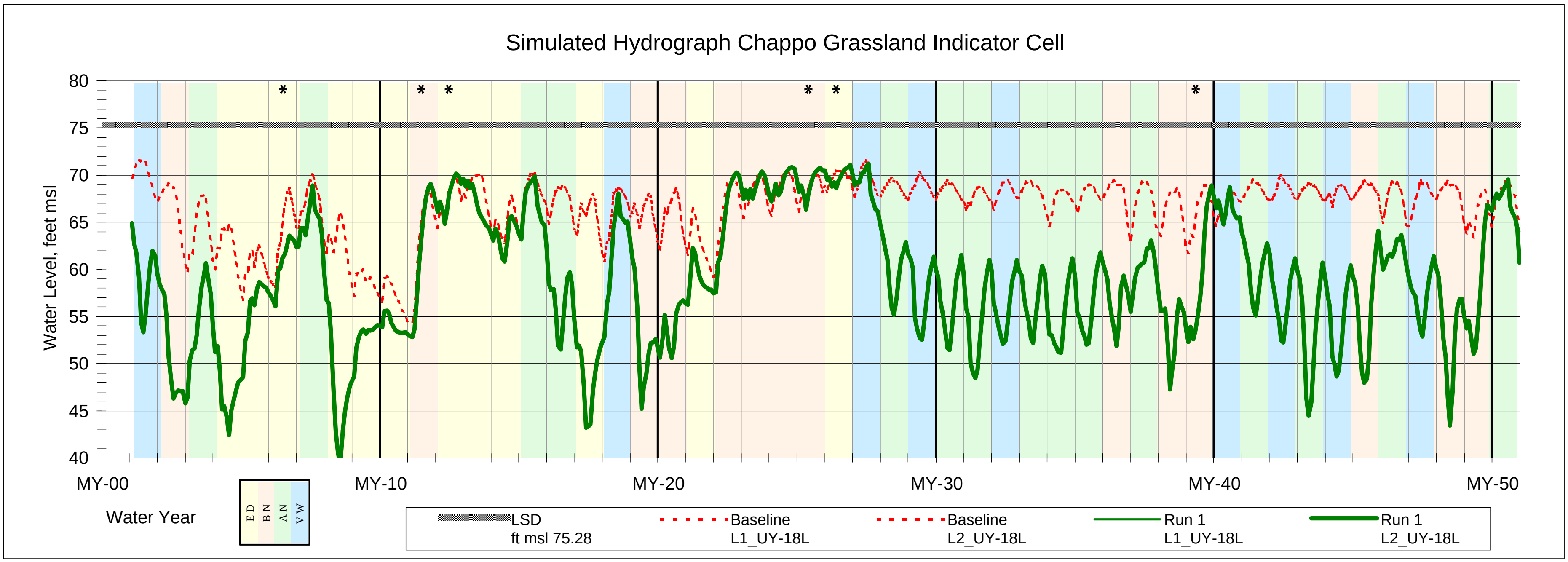
***** Emergency flows called upon during water years marked with an asterisk.

Layer 1 (L1) and Layer 2(L2) simulated groundwater levels are at similar elevations and the graph lines are printed on top of each other.

FIGURE E-1

Run 1 and Baseline Hydrographs



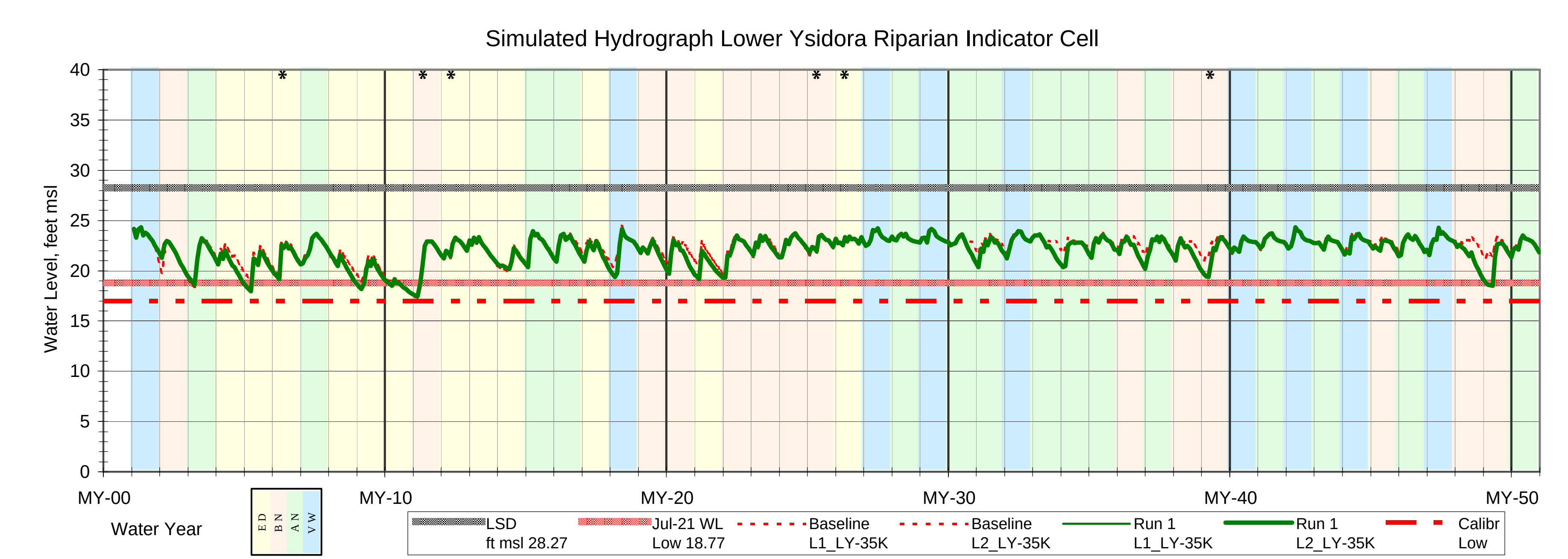


* Emergency flows called upon during water years marked with an asterisk.

Layer 1 (L1) and Layer 2(L2) simulated groundwater levels are at similar elevations and the graph lines are printed on top of each other.

FIGURE E-2

Run 1 and Baseline Hydrographs



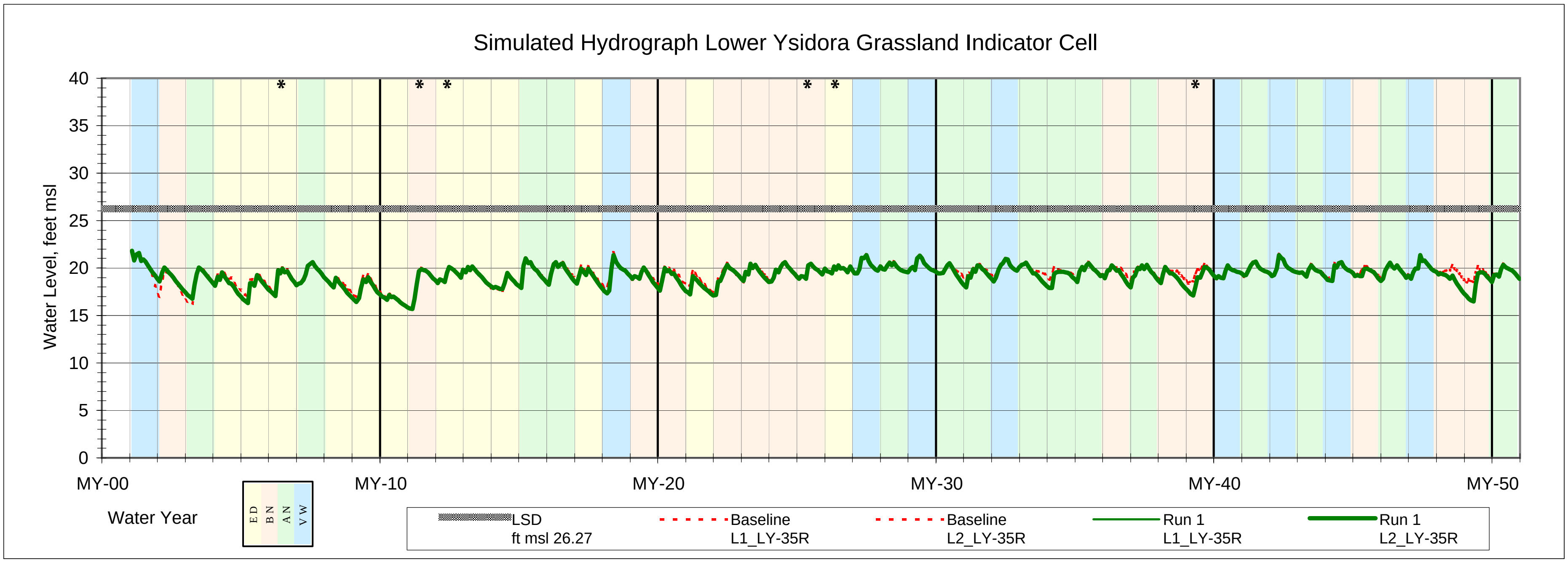
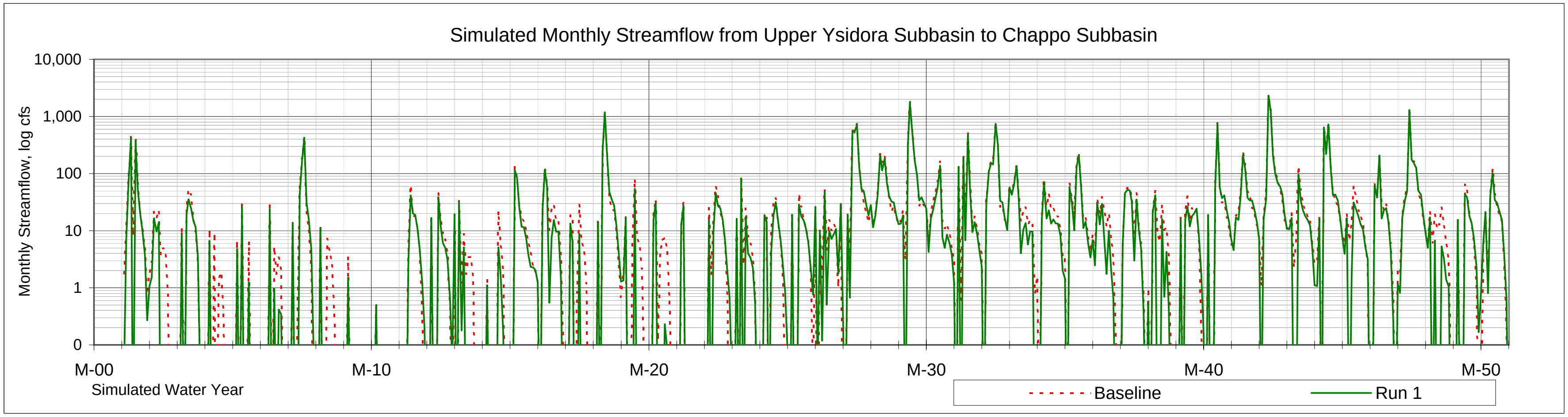
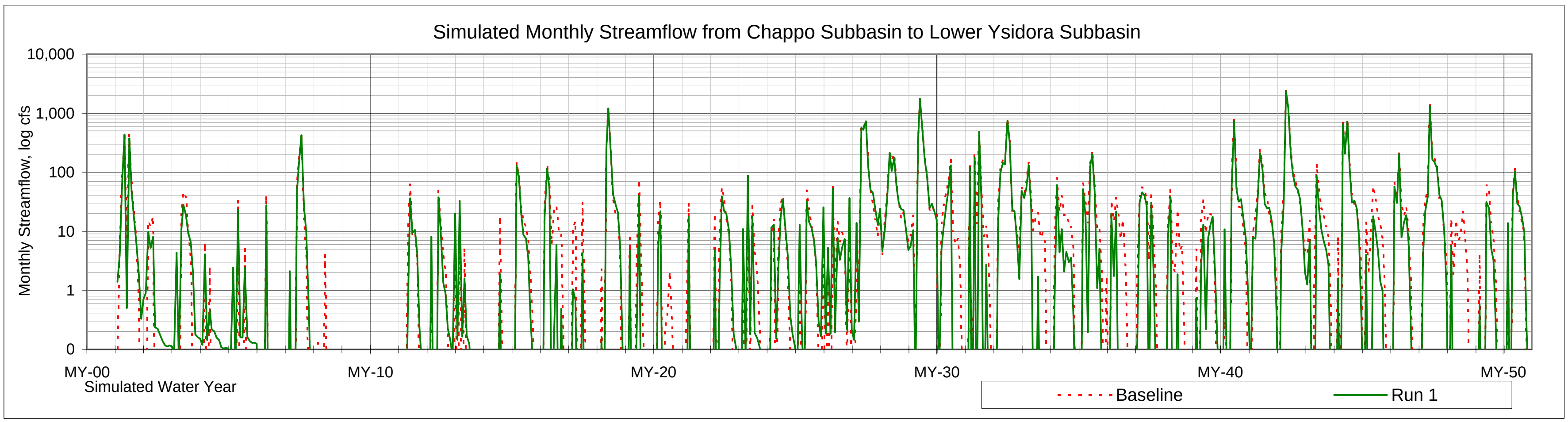


FIGURE E-3
Run1 and Baseline Hydrographs

***** Emergency flows called upon during water years marked with an asterisk.

Layer 1 (L1) and Layer 2(L2) simulated groundwater levels are at similar elevations and the graph lines are printed on top of each other.





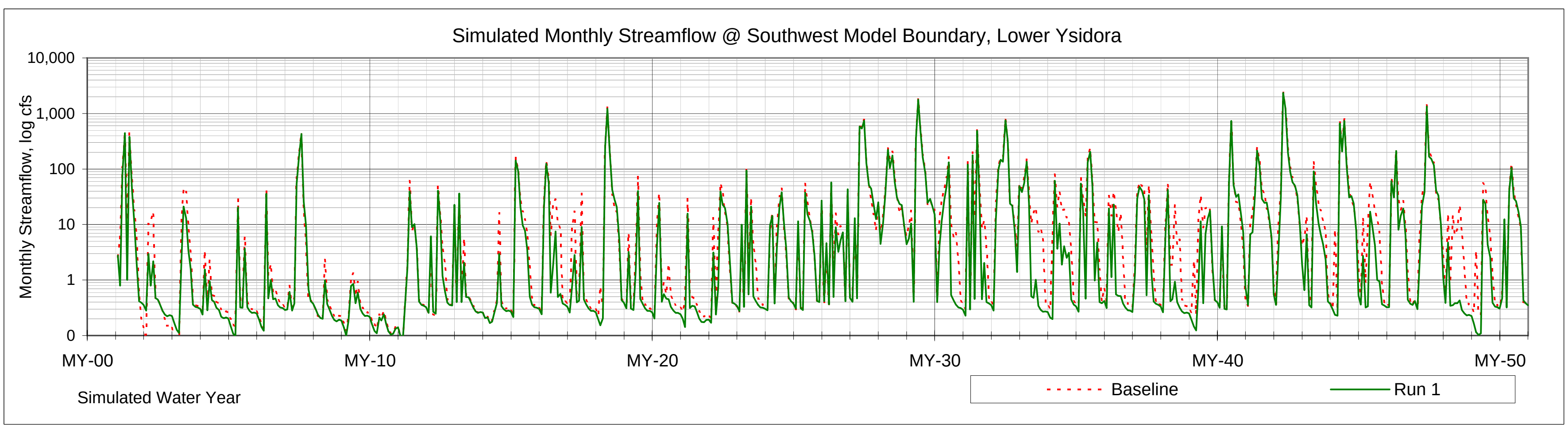


Figure E-4. Simulated Streamflow, Run 1 Basin Yield and Baseline

Table E-4. Run 1 Project Water Budget

Average Hydrologic Condition Water Budget (af/y)

% Time Exceedence	> 76%	76% to 50%	50% to 19%	< 19%
# Years	12	14	15	9
	Extremely Dry	Below Normal	Above Normal	Very Wet
Inflow:				
Santa Margarita River Inflow	7,400	13,300	32,300	127,100
Subsurface Underflow	1,000	900	900	800
Lake O'Neill Spill and Release	800	1,400	1,800	2,200
Fallbrook Creek	100	400	1,400	3,800
Minor Tributary Drainages	1,700	1,400	2,400	4,900
Areal Precipitation	500	500	700	1,600
Total Inflow:	11,500	17,900	39,500	140,400
Outflow:				
Santa Margarita River Outflow	1,900	3,600	20,600	120,000
Subsurface Underflow	100	100	100	100
Groundwater Pumping	6,900	9,800	13,800	14,300
Evapotranspiration	1,900	2,400	2,700	3,000
Diversions to Lake O'Neill	1,200	1,900	2,400	2,700
Total Outflow:	12,000	17,800	39,600	140,100
Net Simulated Change of Groundwater in Storage:	-500	100	-100	300
	-	-	-	-

Median Hydrologic Condition Water Budget (af/y)

% Time Exceedence	> 76%	76% to 50%	50% to 19%	< 19%
# Years	12	14	15	9
	Extremely Dry	Below Normal	Above Normal	Very Wet
Inflow:				
Santa Margarita River Inflow	6,800	13,200	28,800	120,000
Subsurface Underflow	1,000	900	900	800
Lake O'Neill Spill and Release	700	1,300	2,100	2,300
Fallbrook Creek	100	300	1,100	3,500
Minor Tributary Drainages	1,500	1,400	2,500	4,700
Areal Precipitation	400	300	500	1,500
Outflow:				
Santa Margarita River Outflow	1,000	3,200	15,700	109,900
Subsurface Underflow	100	100	100	100
Groundwater Pumping	5,400	8,900	15,900	16,900
Evapotranspiration	1,600	2,200	2,500	2,800
Diversions to Lake O'Neill	1,300	1,700	2,700	2,700
Net Simulated Change of Groundwater in Storage:	0	-100	-500	100

Average Subbasin Water Budget (af/y)

	Upper Ysidora	Chappo	Lower Ysidora	SMR Basin	
Inflow:					
Santa Margarita River Inflow	38,000	31,200	28,600	38,000	85%
Subsurface Underflow *	900	1,900	500	900	2%
Lake O'Neill Spill and Release	1,500	-	-	1,500	3%
Fallbrook Creek	1,200	-	-	1,200	3%
Minor Tributary Drainages	600	1,100	700	2,400	5%
Areal Precipitation	200	300	200	800	2%
Total Inflow:	42,400	34,500	30,000	44,800	
Outflow:					
Santa Margarita River Outflow	31,200	28,600	29,100	29,100	65%
Subsurface Underflow *	1,900	500	100	100	0%
Groundwater Pumping	6,600	4,500	0	11,100	25%
Evapotranspiration *	700	900	800	2,500	6%
Diversions to Lake O'Neill	2,000	-	-	2,000	4%
Total Outflow:	42,400	34,500	30,000	44,800	
Net Simulated Change of Groundwater in Storage: *	0	0	0	0	
	-	-	-	-	

Note: * Subbasin Medians are based on the last rate of the stress period
Values are rounded to the nearest 100 acre-feet, closest number adjusted to eliminate rounding error

Median Subbasin Water Budget (af/y)

	Upper Ysidora	Chappo	Lower Ysidora	SMR Basin
Inflow:				
Santa Margarita River Inflow	16,000	8,400	6,100	16,000
Subsurface Underflow *	900	2,000	500	900
Lake O'Neill Spill and Release	1,500	-	-	1,500
Fallbrook Creek	600	-	-	600
Minor Tributary Drainages	200	0	100	2,100
Areal Precipitation	8,400	0	6,582	500
Outflow:				
Santa Margarita River Outflow	8,400	6,100	6,500	6,500
Subsurface Underflow *	2,000	500	100	100
Groundwater Pumping	6,400	4,700	0	11,300
Evapotranspiration *	800	1,000	800	2,500
Diversions to Lake O'Neill	2,200	-	-	2,200
Net Simulated Change of Groundwater in Storage: *	0	0	0	-100

Note: The sum of median values does not reflect the change of groundwater in storage.
Median values are not cummulative.
* Subbasin Medians are based on the last rate of the stress period
Values are rounded to the nearest 100 acre-feet

Table E-5 Run 1 Annual Water budget
Lower Santa Margarita River Groundwater Model

Run 1 UY+CH Basin Yield

Annual Surface Water Budget

MY		SMR Flow In	LON Diversion	Ponds Diversion	Str Gain+ / Loss-	GAGE SMR @ UY->CH	Str Gain+ / Loss-	SMR @ CH->LY	Str Gain+ / Loss-	SMR Flow Out	LSMR Str Gain+ / Loss-
1	VW	66,394	2,364	9,462	-7,150	59,244	-2,008	57,236	1,824	59,060	-7,334
2	BN	8,737	1,531	3,425	-6,210	2,527	-2,111	415	110	525	-8,211
3	AN	15,652	1,063	6,435	-8,661	6,991	-4,295	2,696	-157	2,539	-13,113
4	ED	6,759	1,323	2,646	-6,366	393	-379	14	305	319	-6,440
5	ED	6,151	337	1,336	-4,181	1,970	-694	1,276	339	1,616	-4,535
6	ED	8,228	1,307	2,764	-6,635	1,593	102	1,695	761	2,457	-5,772
7	AN	46,769	1,151	10,205	-5,284	41,485	-1,659	39,826	756	40,582	-6,187
8	ED	6,750	1,291	3,474	-6,084	666	-662	5	208	212	-6,538
9	ED	4,840	786	1,820	-4,752	88	-85	3	253	256	-4,584
10	ED	3,399	393	1,216	-3,370	29	-29	-	108	108	-3,291
11	BN	13,724	1,569	6,768	-7,838	5,886	-2,359	3,527	277	3,804	-9,920
12	ED	11,055	1,665	3,801	-5,173	5,882	-1,351	4,531	401	4,932	-6,123
13	ED	4,963	577	1,797	-2,803	2,160	-83	2,077	422	2,499	-2,464
14	ED	5,802	412	2,946	-5,319	483	-371	112	238	350	-5,452
15	AN	21,921	2,747	6,133	-5,912	16,009	-615	15,394	1,345	16,739	-5,182
16	AN	23,865	2,344	7,509	-9,054	14,811	-2,899	11,911	1,144	13,056	-10,809
17	ED	10,105	1,979	3,961	-8,373	1,732	-1,367	366	592	957	-9,148
18	VW	105,552	2,415	13,044	-3,058	102,494	-2,175	100,319	1,457	101,776	-3,775
19	BN	13,124	2,317	4,573	-8,710	4,414	-1,615	2,799	120	2,919	-10,204
20	BN	8,950	1,265	3,583	-6,170	2,780	-1,147	1,633	335	1,968	-6,983
21	ED	7,739	1,831	1,408	-5,311	2,428	-1,368	1,060	64	1,124	-6,615
22	BN	14,802	1,515	8,296	-6,133	8,670	-2,791	5,879	-51	5,828	-8,974
23	BN	12,321	1,607	2,949	-4,623	7,697	-542	7,156	715	7,870	-4,450
24	BN	11,377	1,698	5,664	-4,660	6,717	-1,046	5,670	506	6,177	-5,200
25	BN	12,396	1,733	5,798	-4,863	7,533	-1,167	6,366	424	6,790	-5,606
26	ED	12,737	2,156	4,171	-5,024	7,712	-443	7,269	806	8,075	-4,662
27	VW	126,820	2,791	16,057	-486	126,334	635	126,969	2,200	129,169	2,349
28	AN	55,061	2,722	18,024	-8,176	46,885	-5,095	41,790	493	42,283	-12,778
29	VW	181,076	2,723	18,884	-5,563	175,513	-3,297	172,216	1,915	174,131	-6,944
30	AN	28,831	2,750	7,141	-10,220	18,612	-5,161	13,451	188	13,639	-15,192
31	AN	62,376	2,698	7,723	-7,742	54,634	-4,807	49,826	541	50,367	-12,008
32	VW	105,844	2,721	14,249	-6,293	99,550	-5,386	94,164	923	95,087	-10,757
33	AN	29,560	2,714	9,308	-9,595	19,965	-4,772	15,194	463	15,657	-13,903
34	AN	22,097	2,701	9,005	-10,493	11,604	-6,091	5,513	-149	5,364	-16,733
35	AN	39,296	2,235	8,776	-7,394	31,901	-5,192	26,709	627	27,335	-11,960
36	BN	14,221	2,155	4,939	-8,342	5,879	-3,256	2,623	209	2,832	-11,389
37	AN	19,246	1,923	5,782	-4,753	14,493	-3,878	10,615	482	11,097	-8,149
38	BN	12,659	1,726	4,895	-7,556	5,103	-2,185	2,918	329	3,247	-9,412
39	BN	16,158	2,439	8,958	-7,747	8,410	-5,064	3,346	-219	3,127	-13,031
40	VW	64,445	2,820	12,300	-4,598	59,847	-2,634	57,213	314	57,527	-6,918
41	AN	42,492	2,711	13,804	-9,183	33,309	-5,294	28,015	335	28,350	-14,141
42	VW	251,872	2,723	19,141	-5,350	246,522	-4,025	242,497	1,052	243,549	-8,323
43	AN	24,441	2,752	12,576	-10,867	13,575	-5,226	8,349	147	8,495	-15,946
44	VW	121,487	2,675	17,734	-7,852	113,635	-4,742	108,892	1,199	110,091	-11,396
45	BN	18,009	2,750	10,475	-10,488	7,522	-5,256	2,266	-65	2,201	-15,808
46	AN	29,997	2,137	9,291	-6,242	23,755	-3,005	20,750	664	21,414	-8,583
47	VW	120,008	2,717	18,548	-6,834	113,173	-4,579	108,594	1,328	109,922	-10,085
48	BN	13,181	2,745	7,070	-10,786	2,395	-2,052	343	150	494	-12,688
49	BN	15,897	1,871	7,458	-7,544	8,353	-4,499	3,854	-273	3,582	-12,315
50	AN	22,506	2,602	9,949	-6,062	16,444	-2,540	13,904	209	14,113	-8,393
	avg	38,034	2,004	7,945	**-6,638**	31,396	**-2,611**	28,785	**527**	29,312	**-8,722**
	med	16,027	2,155	7,106	-6,268	8,382	-2,272	6,122	370	6,483	-8,358
AVERAGES											
ED	12	7,377	1,171	2,612	(5,283)	2,095	(561)	1,534	375	1,909	-5,469
BN	14	13,254	1,923	6,061	(7,262)	5,992	(2,506)	3,485	183	3,669	-9,585
AN	15	32,274	2,350	9,444	(7,976)	24,298	(4,035)	20,263	473	20,735	-11,539
VW	9	127,055	2,661	15,491	(5,243)	121,812	(3,135)	118,678	1,357	120,035	-7,020
	50										
MEDIANS											
ED	12	6,755	1,299	2,705	(5,242)	1,663	(411)	713	322	1,041	-5,612
BN	14	13,152	1,729	5,731	(7,550)	6,302	(2,148)	3,132	180	3,187	-9,666
AN	15	28,831	2,698	9,005	(8,176)	18,612	(4,772)	15,194	482	15,657	-12,008
VW	9	120,008	2,721	16,057	(5,563)	113,173	(3,297)	108,594	1,328	109,922	-7,334
	50										

Table E-5 Run 1 Annual Water budget (continued)
Lower Santa Margarita River Groundwater Model
Annual Groundw ater Budget Model Run: Run 1 UY+CH Basin Yield

	INFLOW:					OUTFLOW:					
MY	Storage	Recharge	Stream Leakance	GHB	TOTAL GW IN	Storage	Wells	ET	Stream Leakance	GHB	TOTAL GW OUT
1	8,223	10,546	10,012	865	29,646	5,302	15,583	2,785	5,932	66	29,669
2	7,037	3,631	6,187	930	17,785	2,285	13,136	1,717	612	55	17,805
3	5,358	6,655	10,989	982	23,984	8,768	10,335	1,830	3,014	52	23,999
4	6,767	2,952	4,972	949	15,641	3,084	10,969	1,217	327	53	15,650
5	3,772	1,657	6,400	1,129	12,958	6,337	5,037	1,285	271	48	12,978
6	3,393	3,506	5,723	1,026	13,648	5,629	5,354	1,875	750	56	13,663
7	6,499	10,838	7,440	903	25,680	7,211	8,365	2,746	7,302	63	25,687
8	8,347	3,632	3,818	936	16,733	3,274	11,591	1,382	462	49	16,757
9	2,759	2,197	4,603	1,031	10,590	3,974	5,207	1,117	244	48	10,590
10	2,489	1,352	2,658	1,073	7,572	1,699	4,704	978	159	41	7,580
11	3,457	7,252	9,036	943	20,688	8,953	5,087	2,207	4,401	51	20,699
12	2,952	4,084	6,683	911	14,630	4,183	5,356	2,901	2,146	58	14,643
13	3,933	2,043	3,675	924	10,575	1,478	5,354	2,781	925	59	10,597
14	3,597	3,292	4,433	968	12,291	4,006	5,356	2,144	748	52	12,306
15	5,147	7,208	6,511	878	19,744	4,594	8,363	2,893	3,845	66	19,760
16	6,334	8,152	11,719	882	27,087	5,351	15,907	2,346	3,430	65	27,098
17	6,692	4,298	8,219	913	20,121	5,225	12,603	1,596	654	58	20,136
18	6,458	14,245	9,754	856	31,313	10,106	8,363	2,603	10,186	64	31,322
19	7,766	4,770	7,362	903	20,802	4,527	13,136	1,860	1,249	57	20,828
20	4,624	3,972	6,637	910	16,142	4,529	8,896	1,635	1,033	56	16,149
21	3,281	1,699	5,549	976	11,504	3,512	6,063	1,641	257	49	11,523
22	4,279	8,664	7,867	887	21,697	8,026	5,356	2,771	5,500	58	21,711
23	3,088	3,427	5,774	909	13,198	3,062	5,356	2,989	1,752	60	13,219
24	3,441	6,139	6,400	881	16,861	3,896	5,354	3,166	4,394	64	16,873
25	3,561	6,387	6,152	884	16,984	4,100	5,356	3,166	4,316	63	17,001
26	2,874	4,603	6,189	884	14,550	2,622	5,356	3,251	3,264	67	14,559
27	6,758	17,289	7,355	838	32,241	6,412	8,363	3,395	14,011	75	32,256
28	6,625	18,391	11,304	824	37,144	5,971	15,909	3,000	12,213	69	37,162
29	6,864	19,915	12,091	817	39,688	6,671	17,539	2,890	12,523	74	39,697
30	5,498	7,365	12,612	875	26,350	3,882	17,172	2,422	2,828	62	26,366
31	5,815	8,180	13,095	877	27,966	6,240	16,299	2,202	3,173	62	27,975
32	6,171	15,014	13,935	845	35,964	7,202	17,332	2,631	8,744	70	35,979
33	5,595	9,522	11,478	865	27,461	4,066	16,690	2,537	4,130	63	27,484
34	4,954	9,229	13,636	877	28,696	5,436	16,185	2,360	4,646	58	28,685
35	5,025	9,206	13,269	870	28,370	5,572	16,253	2,493	4,006	64	28,388
36	5,505	5,211	10,308	893	21,917	3,740	14,141	2,135	1,862	61	21,938
37	4,624	6,221	10,514	884	22,243	5,312	11,570	2,505	2,789	64	22,240
38	6,132	5,165	9,206	898	21,400	4,649	13,131	1,869	1,699	57	21,405
39	4,024	9,114	10,101	875	24,114	7,606	8,907	2,362	5,202	55	24,132
40	5,948	12,489	7,759	868	27,064	6,063	9,068	3,012	8,866	61	27,070
41	5,650	14,141	12,144	849	32,785	5,197	15,680	2,888	8,946	65	32,777
42	7,002	19,972	12,557	822	40,354	6,956	17,769	2,819	12,757	70	40,370
43	7,518	12,741	11,754	852	32,865	6,522	17,172	2,486	6,648	62	32,891
44	7,727	18,411	13,085	838	40,062	8,453	17,539	2,509	11,499	65	40,065
45	6,887	10,629	11,226	863	29,605	6,336	15,496	2,376	5,351	60	29,619
46	5,303	9,711	9,229	859	25,101	5,028	11,570	2,702	5,744	64	25,107
47	6,336	19,490	12,879	826	39,532	7,415	16,919	2,734	12,385	71	39,525
48	7,094	7,254	8,035	875	23,258	3,788	15,427	1,816	2,215	57	23,303
49	5,303	7,622	9,527	900	23,352	8,425	8,770	2,022	4,123	50	23,390
50	5,900	10,308	7,254	859	24,320	5,303	9,068	3,010	6,857	62	24,300
avg	5,408	8,396	8,782	900	23,485	5,360	11,110	2,361	4,608	60	23,499
med	5,550	7,309	8,627	883	23,305	5,303	11,270	2,490	3,926	61	23,347
AVERAGES											
ED	4,238	2,943	5,244	977	13,401	3,752	6,912	1,847	851	53	13,415
BN	5,157	6,374	8,130	896	20,557	5,280	9,825	2,292	3,122	57	20,577
AN	5,723	9,858	10,863	876	27,320	5,630	13,769	2,561	5,305	63	27,328
VW	6,832	16,375	11,048	842	35,096	7,175	14,275	2,820	10,767	68	35,106
MEDIANS											
ED	3,495	3,122	5,261	959	13,303	3,743	5,356	1,618	558	53	13,321
BN	4,963	6,263	7,951	895	21,101	4,528	8,902	2,171	3,169	57	21,116
AN	5,595	9,229	11,478	875	27,087	5,351	15,907	2,505	4,130	63	27,098
VW	6,758	17,289	12,091	838	35,964	6,956	16,919	2,785	11,499	70	35,979

Table E-5 Run 1 Annual Water budget (continued)				
Lower Santa Margarita River Groundwater Model				
MY	NET Storage	NET Str Lknc	In-Out	**% bal**
1	-2,921	-4,080	-23.6	-0.08%
2	-4,752	-5,575	-20.0	-0.11%
3	3,409	-7,974	-15.2	-0.06%
4	-3,683	-4,645	-9.3	-0.06%
5	2,565	-6,129	-19.5	-0.15%
6	2,236	-4,973	-15.3	-0.11%
7	712	-138	-6.6	-0.03%
8	-5,073	-3,356	-24.8	-0.15%
9	1,214	-4,359	0.4	0.00%
10	-790	-2,500	-8.0	-0.11%
11	5,496	-4,635	-11.3	-0.05%
12	1,230	-4,536	-13.3	-0.09%
13	-2,454	-2,750	-22.2	-0.21%
14	409	-3,685	-15.9	-0.13%
15	-553	-2,665	-16.6	-0.08%
16	-983	-8,290	-11.7	-0.04%
17	-1,467	-7,564	-15.1	-0.08%
18	3,648	432	-8.7	-0.03%
19	-3,239	-6,113	-26.1	-0.13%
20	-94	-5,604	-7.3	-0.04%
21	232	-5,292	-18.9	-0.16%
22	3,747	-2,367	-14.0	-0.06%
23	-25	-4,022	-21.4	-0.16%
24	455	-2,006	-11.6	-0.07%
25	539	-1,837	-17.3	-0.10%
26	-253	-2,925	-9.4	-0.06%
27	-347	6,655	-15.0	-0.05%
28	-654	909	-18.2	-0.05%
29	-193	432	-9.6	-0.02%
30	-1,616	-9,784	-16.3	-0.06%
31	425	-9,922	-9.0	-0.03%
32	1,031	-5,191	-14.7	-0.04%
33	-1,529	-7,348	-23.5	-0.09%
34	482	-8,990	11.2	0.04%
35	546	-9,263	-18.3	-0.06%
36	-1,765	-8,446	-21.5	-0.10%
37	689	-7,725	2.8	0.01%
38	-1,483	-7,507	-4.2	-0.02%
39	3,581	-4,899	-18.3	-0.08%
40	115	1,107	-6.0	-0.02%
41	-452	-3,198	8.0	0.02%
42	-46	200	-16.8	-0.04%
43	-996	-5,106	-25.7	-0.08%
44	725	-1,586	-3.0	-0.01%
45	-551	-5,875	-14.2	-0.05%
46	-275	-3,485	-6.2	-0.02%
47	1,079	-494	7.1	0.02%
48	-3,306	-5,820	-45.5	-0.20%
49	3,122	-5,404	-38.6	-0.16%
50	-597	-397	20.7	0.09%
avg	-48	-4,174	-13.1	-0.07%
med	-70	-4,585	-14.8	-0.06%
AVERAGES				
ED	-486	-4,393	-14.3	-0.11%
BN	123	-5,008	-19.4	-0.10%
AN	-93	-5,558	-8.3	-0.03%
VW	344	-281	-10.0	-0.03%
MEDIANS				
ED	-10	-4,447	-15.2	-0.11%
BN	-60	-5,489	-17.8	-0.09%
AN	-452	-7,348	-11.7	-0.04%
VW	115	200	-9.6	-0.03%

Table E-6 Run 1 50-Year Average Monthly Water Budget

Lower Santa Margarita River Groundwater Model — Run 1 UY+CH Basin Yield

Modflow Volumetric Budget Output and Streamflow — 6/25/06

Avg AF/M	SMR Flow In	Diversion	Str Gain+ / Loss-	SMR @ UY->CH	Str Gain+ / Loss-	SMR @ CH->LY	Str Gain+ / Loss-	SMR Flow Out	LSMR Str Gain+ / Loss-
Oct	526	325	-385	141	-80	60	20	80	-446
Nov	1,299	660	37	1,336	-493	843	-4	839	-461
Dec	1,969	530	-745	1,224	-167	1,058	54	1,112	-857
Jan	8,364	840	-1,082	7,282	-121	7,161	140	7,301	-1,063
Feb	10,263	2,062	-1,756	8,507	-131	8,376	119	8,495	-1,768
Mar	8,849	2,257	-1,359	7,490	-267	7,223	106	7,329	-1,520
Apr	3,159	1,482	-594	2,565	-316	2,249	40	2,289	-871
May	1,345	953	-269	1,076	-326	750	5	755	-590
Jun	756	583	-6	750	-281	469	2	471	-285
Jul	499	133	-22	477	-207	270	8	278	-221
Aug	458	62	-183	275	-120	155	19	174	-284
Sep	547	60	-274	274	-103	171	19	190	-357
Avg Monthly	3,169	829	-553	2,616	-218	2,399	44	2,443	-727
Med Monthly	1,322	622	-329	1,150	-187	796	20	797	-525
Avg Total=Anl	38,034	9,948	-6,638	31,396	-2,611	28,785	527	29,312	-8,722

Lower Santa Margarita River Groundwater Model

Modflow Volumetric Budget Output

Average Monthly Water Budget

	INFLOW:					**OUTFLOW:**									
Avg AF/M	Storage	Recharge	Stream Leakance	GHB	TOTAL IN	Storage	Wells	ET	Stream Leakance	GHB	TOTAL OUT	NET Storage	NET Str Lknc	In-Out	% bal
Oct	613	46	393	81	1,133	50	867	168	44	8	1,138	-563	-348	-4.7	-0.42%
Nov	162	638	1,234	79	2,113	925	937	172	67	8	2,109	763	-1,167	4.0	0.19%
Dec	534	156	848	80	1,618	260	1,087	188	79	7	1,621	-275	-769	-2.8	-0.17%
Jan	388	365	1,227	79	2,059	501	1,276	190	85	5	2,058	112	-1,142	1.0	0.05%
Feb	296	1,930	896	75	3,197	1,427	1,241	184	345	0	3,197	1,131	-551	-0.2	-0.01%
Mar	163	2,315	950	74	3,502	1,176	1,161	216	946	1	3,498	1,012	-4	3.6	0.10%
Apr	354	1,529	787	67	2,737	482	950	218	1,080	9	2,739	128	293	-2.2	-0.08%
May	494	1,016	621	69	2,201	252	781	227	930	10	2,200	-242	309	1.5	0.07%
Jun	680	317	525	68	1,590	147	654	215	572	7	1,594	-533	47	-4.2	-0.26%
Jul	650	64	448	73	1,236	63	684	211	278	4	1,241	-587	-170	-4.7	-0.38%
Aug	489	10	405	78	982	48	616	197	122	0	984	-441	-283	-1.7	-0.17%
Sep	582	10	449	77	1,118	27	856	176	61	1	1,120	-555	-388	-2.8	-0.25%
Avg Monthly	451	700	732	75	1,957	447	926	197	384	5	1,958	-4	-348	-1.1	-0.11%
Med Monthly	492	341	704	76	1,838	256	902	194	200	6	1,839	-258	-316	-2.0	-0.13%
Avg Total=Anl	5,408	8,396	8,782	900	23,485	5,360	11,110	2,361	4,608	60	23,499	-48	-4,174	-13.1	

Table E-7. Run 1A Annual Pumping Summary
Lower Santa Margarita River Groundwater Model

Hydrologic Condition

HC	Cnt	Oct to Apr Strflw
VW	9	Very Wet > 56,164
AN	15	Above Normal > 13,600
BN	14	Below Normal < 13,600
ED	12	Extremely Dry < 5,840
	50	

Pumping Condition

PC	HC	Q Adjst	Anl Q	Cnt	
1	2+ AN @ VW	4,000	18,100	5	10%
2	2+ AN @ AN	2,000	16,100	9	18%
3	Standard	500	14,600	10	20%
4	1st BN	-4,000	10,100	6	12%
5	2ndBN, 70/30 split	-7,600	6,400	3	6%
6	3+BN/all ED	-8,640	5,360	17	34%
				50	100%

MY	HC	Oct-Apr HC descrip	May-Apr Pumping Condition	CWRMA Emg Water (af/y)	UY Total (af/y)	CH Total (af/y)	LY Total (af/y)	LSMR Total (af/y)	+Q *
1	VW	Very Wet	3	0	8,571	7,012	0	15,583	
2	BN	Below Normal	4	0	7,224	5,911	0	13,135	
3	AN	Above Normal	3	0	5,704	4,901	0	10,605	
4	ED	Extremely Dry	6	0	6,744	3,639	0	10,383	
5	ED	Extremely Dry	6	603	3,851	1,046	0	4,896	
6	ED	Extremely Dry	6	400	4,055	1,275	0	5,330	
7	AN	Above Normal	3	0	5,366	2,999	0	8,364	
8	ED	Extremely Dry	6	0	6,744	4,773	0	11,518	
9	ED	Extremely Dry	6	600	4,080	1,275	0	5,355	
10	ED	Extremely Dry	6	2,055	4,080	1,275	0	5,355	
11	BN	Below Normal	6	591	4,080	1,275	0	5,355	
12	ED	Extremely Dry	6	0	4,080	1,275	0	5,355	
13	ED	Extremely Dry	6	0	4,080	1,275	0	5,355	
14	ED	Extremely Dry	6	0	4,080	1,275	0	5,355	
15	AN	Above Normal	3	0	5,366	2,999	0	8,364	
16	AN	Above Normal	2	0	8,748	7,158	0	15,906	X
17	ED	Extremely Dry	6	0	7,301	5,302	0	12,602	
18	VW	Very Wet	3	0	5,366	2,999	0	8,364	
19	BN	Below Normal	4	0	7,224	5,911	0	13,135	
20	BN	Below Normal	5	0	5,335	3,562	0	8,897	
21	ED	Extremely Dry	6	0	4,620	1,444	0	6,063	
22	BN	Below Normal	6	0	4,080	1,275	0	5,355	
23	BN	Below Normal	6	0	4,080	1,275	0	5,355	
24	BN	Below Normal	6	0	4,080	1,275	0	5,355	
25	BN	Below Normal	6	0	4,080	1,275	0	5,355	
26	ED	Extremely Dry	6	0	4,080	1,275	0	5,355	
27	VW	Very Wet	3	0	5,366	2,999	0	8,364	
28	AN	Above Normal	2	0	8,748	7,158	0	15,906	X
29	VW	Very Wet	1	0	9,649	7,895	0	17,544	X
30	AN	Above Normal	2	0	9,354	7,653	0	17,007	X
31	AN	Above Normal	2	0	9,059	7,412	0	16,471	X
32	VW	Very Wet	1	0	9,529	7,796	0	17,325	X
33	AN	Above Normal	2	0	9,177	7,508	0	16,686	X
34	AN	Above Normal	2	0	8,906	7,287	0	16,193	X
35	AN	Above Normal	2	0	8,936	7,311	0	16,247	X
36	BN	Below Normal	4	0	7,781	6,366	0	14,147	
37	AN	Above Normal	3	0	6,361	5,204	0	11,565	
38	BN	Below Normal	4	0	7,224	5,911	0	13,135	
39	BN	Below Normal	5	0	5,335	3,562	0	8,897	
40	VW	Very Wet	3	0	5,905	3,167	0	9,073	
41	AN	Above Normal	2	0	8,623	7,055	0	15,677	X
42	VW	Very Wet	1	0	9,775	7,998	0	17,773	X
43	AN	Above Normal	2	0	9,444	7,727	0	17,171	X
44	VW	Very Wet	1	0	9,649	7,895	0	17,544	X
45	BN	Below Normal	4	0	8,523	6,973	0	15,496	
46	AN	Above Normal	3	0	6,361	5,204	0	11,565	
47	VW	Very Wet	1	0	9,305	7,613	0	16,917	X
48	BN	Below Normal	4	0	8,523	6,923	0	15,445	
49	BN	Below Normal	5	0	5,335	3,461	0	8,796	
50	AN	Above Normal	3	0	5,905	3,167	0	9,073	
			Min	0	3,851	1,046	0	4,896	
			Max	2,055	9,775	7,998	0	17,773	
			Median	**0**	**6,361**	**4,837**	**0**	**11,061**	
			% of Median	0%	58%	44%	0%		
			Average	**85**	**6,597**	**4,524**	**0**	**11,121**	
			% of Average	1%	59%	41%	0%		

Notes:
Hydrologic Condition: Oct - Apr
Model starts after 3+ BN or ED

*Wet Year Algorithm (additional pumping occurs before May)

Table E-7. Run 1A Annual Pumping Summary (continued)

	Oct-Apr HC Description	HC Count	CWRMA Emg Water (af/y)	UY Total (af/y)	CH Total (af/y)	LY Total (af/y)	LSMR Total (af/y)
AVERAGES	ED	12	305	4,816	2,094	-	6,910
	BN	14	42	5,922	3,925	-	9,847
	AN	15	-	7,737	6,049	-	13,787
	VW	9	-	8,124	6,153	-	14,277
MEDIANS	ED	12	-	4,080	1,275	-	5,355
	BN	14	-	5,335	3,562	-	8,897
	AN	15	-	8,748	7,158	-	15,906
	VW	9	-	9,305	7,613	-	16,917

Average Monthly Pumping, Run 1A

	Month	CWRMA Emg Water (af/m)	UY Total (af/m)	CH Total (af/m)	LY Total (af/m)	LSMR Total (af/m)
8%	Oct	16	515	353	0	867
8%	Nov	20	557	384	0	941
10%	Dec	20	647	446	0	1,093
11%	Jan	2	748	518	0	1,231
11%	Feb	2	729	506	0	1,220
10%	Mar	2	690	474	0	1,147
9%	Apr	2	564	385	0	949
7%	May	4	464	318	0	781
6%	Jun	4	386	264	0	650
6%	Jul	4	406	278	0	683
6%	Aug	4	365	250	0	616
8%	Sep	4	509	348	0	857
	Avg Anl	85	6,579	4,524	0	11,038

Table E-8. Run 1A Pumping Summaries
Lower Santa Margarita River Groundwater Model

		Bldg #	State ID #	Label	# mos Q	% of 600 mos	Orig Wells by Subbsn %	80% Utilization af/m	
1	UY	2673	10/4-7A2	7A2	600	100%	25%	142	
2	UY	26072	10/4-8D1	8D1	600	100%	21%	121	
3	UY	2671	10/4-7H2	7H2	600	100%	15%	82	
4	UY	PW-6	PW-6	PW-6	600	100%	19%	110	
5	UY	2603	10/4-7R2	7R2	600	100%	19%	110	
6	UY	UY-1	UY-1	UY-1	244	41%	0%	110	
7	UY	UY-2	UY-2	UY-2	172	29%	0%	110	
8	UY	UY-3	UY-3	UY-3	115	19%	0%	110	
9	UY	UY-4	UY-4	UY-4	67	11%	0%	110	
10	UY	UY-5	UY-5	UY-5	32	5%	0%	110	
11	UY	UY-6	UY-6	UY-6	9	2%	0%	110	
12	CH	2393	10/4-18E3	18E4	600	100%	14%	121	
13	CH	2373	10/4-18M4&5	18M5	600	100%	18%	153	
14	CH	2363	10/5-13R2	13R2	600	100%	16%	132	
15	CH	33925	10/5-23G4	23G4	**0**	**0%**	16%	**0**	backup
16	CH	2301	10/5-23J1	23J1	600	100%	20%	164	
17	CH	33924	10/5-23K2	23K2	**0**	**0%**	6%	**0**	backup
18	CH	33923	10/5-23K3	23K3	600	100%	16%	132	
19	CH	CH-1	CH-1	CH-1	24	4%	0%	88	
20	CH	CH-2	CH-2	CH-2	5	1%	0%	88	
21	CH	CH-3	CH-3	CH-3	**0**	**0%**	0%	88	
22	CH	CH-4	CH-4	CH-4	600	100%	0%	132	Replaced 23G4
23	CH	CH-5	CH-5	CH-5	**0**	**0%**	0%	88	

% Pumping in Subbasin

		Wet Year Algorithm			Dry Year Management			Max Pumping in Subbasin adding wells as needed				
		55%	45%	0%	76%	24%	0%					
mo	Anl %	UY	CH	LY	UY	CH	LY		UY	CH	LY	Total
OCT	7.9%	4.4%	3.6%	0.00%	6.0%	1.9%	0.00%	# exst wells	5	7	-	12
NOV	8.6%	4.7%	3.9%	0.00%	6.5%	2.1%	0.00%	af/m (80%)	564	833	-	1,397
DEC	10.0%	5.5%	4.5%	0.00%	7.6%	2.4%	0.00%	avg af/well	113	119	-	116
JAN	11.4%	6.3%	5.1%	0.00%	8.7%	2.7%	0.00%					
FEB	10.9%	6.0%	4.9%	0.00%	8.3%	2.6%	0.00%	1 adntl well	674	921	55	1,650
MAR	10.2%	5.6%	4.6%	0.00%	7.7%	2.4%	0.00%	2 adntl well	784	1,008	110	1,902
APR	8.3%	4.6%	3.7%	0.00%	6.3%	2.0%	0.00%	3 adntl well	893	1,096	164	2,154
MAY	7.1%	3.9%	3.2%	0.00%	5.4%	1.7%	0.00%	4 adntl well	1,003	1,184	219	2,406
JUN	5.9%	3.2%	2.7%	0.00%	4.5%	1.4%	0.00%	5 adntl well	1,112	1,271		2,384
JUL	6.2%	3.4%	2.8%	0.00%	4.7%	1.5%	0.00%	6 adntl well	1,222			1,222
AUG	5.6%	3.1%	2.5%	0.00%	4.2%	1.3%	0.00%	50-yr Avg	5,844	4,875	1,225	
SEP	7.8%	4.3%	3.5%	0.00%	5.9%	1.9%	0.00%	50-yr Med	5,705	5,330	1,161	

median

	UY af/m	CH af/m	LY af/m	Total af/m	Max Mo Pumping	cfs	new wells
ED	385	130	0	546	1,839	32	6
BN	412	268	0	612	2,068	36	9
AN	616	504	0	1,121	2,068	36	9
VW	625	511	0	1,136	2,125	37	9

Wet Year Algorithm Monthly Counts

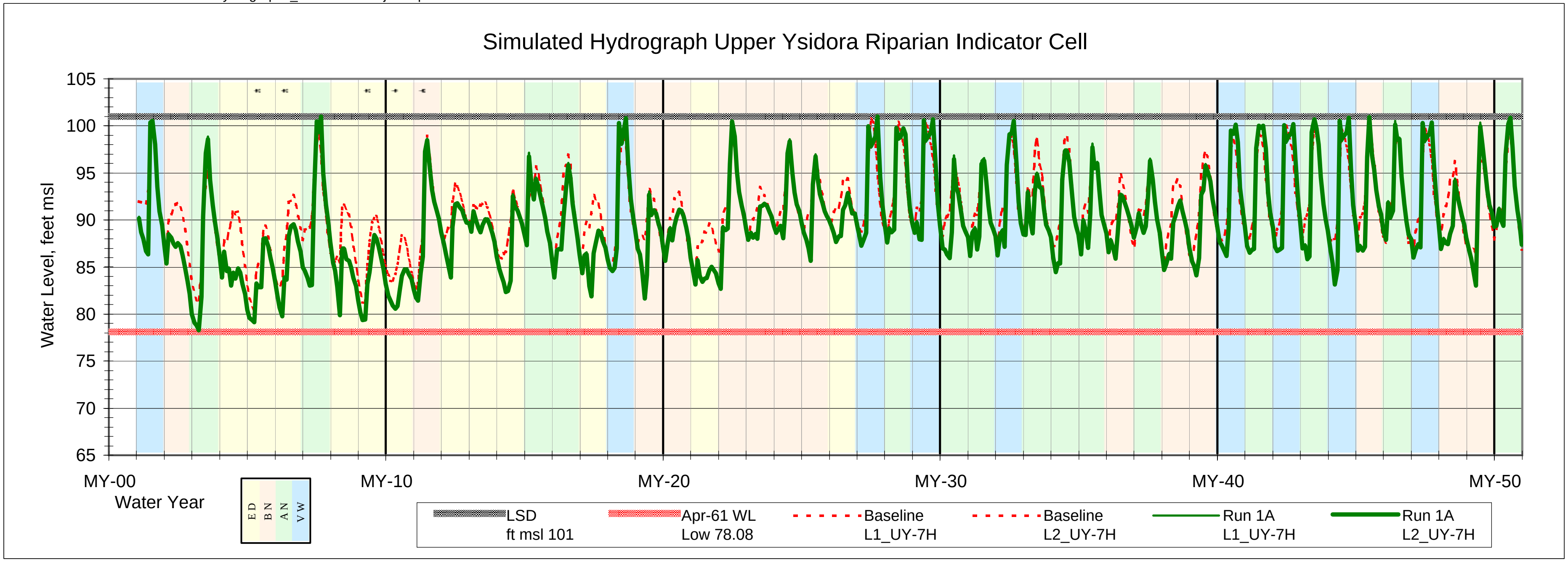
	2,000	4,000	Total	% of 50 yrs
Oct	-	-	-	0%
Nov	-	-	-	0%
Dec	1	-	1	2%
Jan	7	1	8	16%
Feb	8	4	12	24%
Mar	9	5	14	28%
Apr	8	6	14	28%
May	-	-	-	0%
	33	16	49	

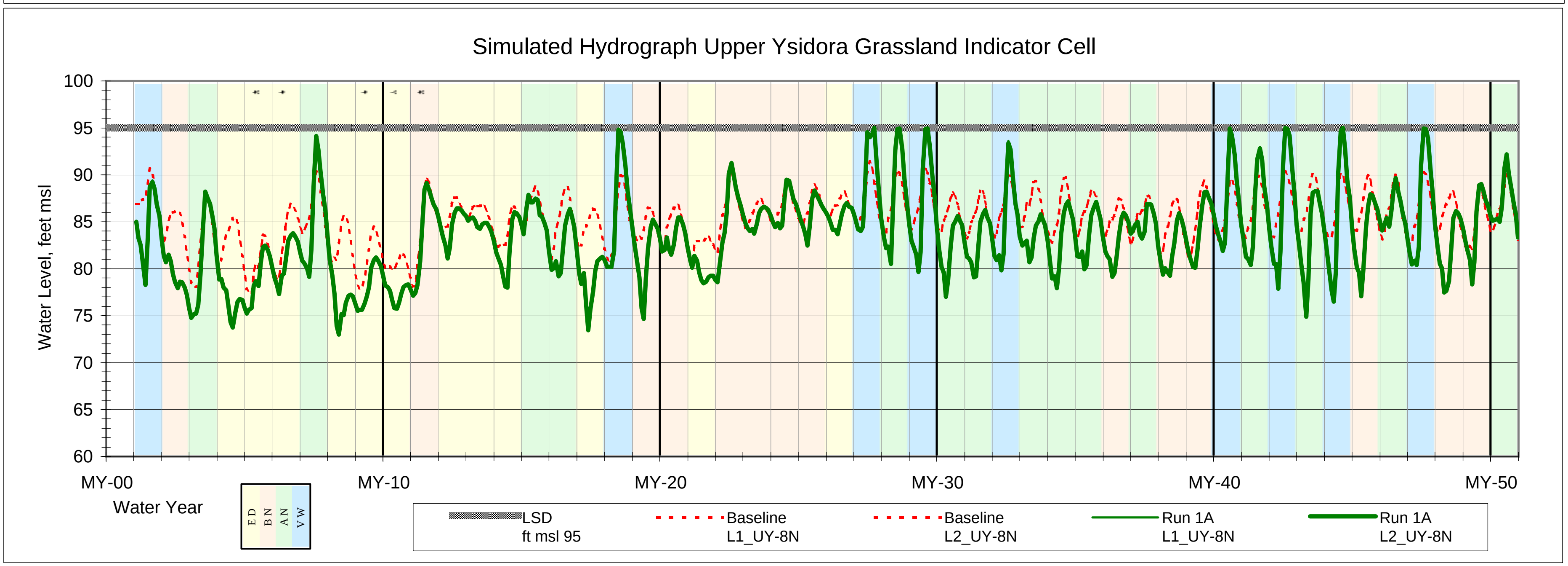
Table E-9. Run 1A Annual Pumping by Well

	Building #:	2673	26072	2671	PW-6	2603	new	new	new	new
	Max Annual Pumping	1,617	1,368	933	1,244	1,244	1,136	940	732	530
	Potential w/ 80% Util	1,710	1,447	986	1,315	1,315	1,315	1,315	1,315	1,315
	Potential Well Yield (gpm)	1,300	1,100	750	1,000	1,000	1,000	1,000	1,000	1,000
		UY	UY	UY	UY	UY	UY	UY	UY	UY
		10/4-7A2	10/4-8D1	10/4-7H2	PW-6	10/4-7R2	UY-1	UY-2	UY-3	UY-4
MY	HC	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)
1	VW	1,529	1,294	882	1,176	1,176	900	603	506	306
2	BN	1,387	1,174	800	1,067	1,067	716	504	407	100
3	AN	1,317	1,114	760	1,013	1,013	488	0	0	0
4	ED	1,266	1,071	731	974	974	716	504	407	100
5	ED	972	822	561	748	748	0	0	0	0
6	ED	1,023	866	590	787	787	0	0	0	0
7	AN	1,305	1,105	753	1,004	1,004	194	0	0	0
8	ED	1,266	1,071	731	974	974	716	504	407	100
9	ED	1,030	871	594	792	792	0	0	0	0
10	ED	1,030	871	594	792	792	0	0	0	0
11	BN	1,030	871	594	792	792	0	0	0	0
12	ED	1,030	871	594	792	792	0	0	0	0
13	ED	1,030	871	594	792	792	0	0	0	0
14	ED	1,030	871	594	792	792	0	0	0	0
15	AN	1,305	1,105	753	1,004	1,004	194	0	0	0
16	AN	1,588	1,344	916	1,221	1,221	917	712	412	314
17	ED	1,273	1,077	734	979	979	721	721	413	304
18	VW	1,305	1,105	753	1,004	1,004	194	0	0	0
19	BN	1,387	1,174	800	1,067	1,067	716	504	407	100
20	BN	1,273	1,077	734	979	979	294	0	0	0
21	ED	1,166	987	673	897	897	0	0	0	0
22	BN	1,030	871	594	792	792	0	0	0	0
23	BN	1,030	871	594	792	792	0	0	0	0
24	BN	1,030	871	594	792	792	0	0	0	0
25	BN	1,030	871	594	792	792	0	0	0	0
26	ED	1,030	871	594	792	792	0	0	0	0
27	VW	1,305	1,105	753	1,004	1,004	194	0	0	0
28	AN	1,588	1,344	916	1,221	1,221	917	712	412	314
29	VW	1,605	1,358	926	1,235	1,235	1,127	931	519	306
30	AN	1,603	1,356	925	1,233	1,233	929	827	624	422
31	AN	1,605	1,358	926	1,234	1,234	930	828	527	314
32	VW	1,617	1,368	933	1,244	1,244	1,136	940	528	315
33	AN	1,592	1,347	918	1,224	1,224	920	818	616	414
34	AN	1,599	1,353	922	1,230	1,230	926	824	416	307
35	AN	1,603	1,356	925	1,233	1,233	929	827	420	311
36	BN	1,394	1,179	804	1,072	1,072	721	721	413	304
37	AN	1,482	1,254	855	1,140	1,140	488	0	0	0
38	BN	1,387	1,174	800	1,067	1,067	716	504	407	100
39	BN	1,273	1,077	734	979	979	294	0	0	0
40	VW	1,442	1,220	832	1,109	1,109	194	0	0	0
41	AN	1,585	1,341	914	1,219	1,219	915	709	410	311
42	VW	1,608	1,361	928	1,237	1,237	1,129	933	521	308
43	AN	1,600	1,354	923	1,231	1,231	927	825	622	420
44	VW	1,605	1,358	926	1,235	1,235	1,127	931	519	306
45	BN	1,395	1,180	805	1,073	1,073	722	722	722	418
46	AN	1,482	1,254	855	1,140	1,140	488	0	0	0
47	VW	1,583	1,339	913	1,218	1,218	1,110	810	507	303
48	BN	1,395	1,180	805	1,073	1,073	722	722	722	418
49	BN	1,273	1,077	734	979	979	294	0	0	0
50	AN	1,442	1,220	832	1,109	1,109	194	0	0	0
	Min	972	822	561	748	748	0	0	0	0
	Max	1,617	1,368	933	1,244	1,244	1,136	940	722	422
	Median	1,352	1,144	780	1,040	1,040	488	0	0	0
	Average	1,335	1,130	770	1,027	1,027	496	353	237	138
		Average Monthly Well Production								
	Month	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)
	Oct	108	92	63	83	83	48	27	10	0
	Nov	113	96	65	87	87	49	49	11	0
	Dec	123	104	71	94	94	50	50	50	11
	Jan	128	108	74	98	98	61	49	49	49
	Feb	128	109	74	99	99	63	51	51	40
	Mar	121	102	70	93	93	60	49	49	39
	Apr	115	97	66	88	88	51	40	19	0
	May	103	87	59	79	79	47	10	0	0
	Jun	95	80	55	73	73	10	0	0	0
	Jul	100	84	58	77	77	10	0	0	0
	Aug	92	78	53	71	71	0	0	0	0
	Sep	109	92	63	84	84	49	28	0	0
Annual Total		1,335	1,130	770	1,027	1,027	496	353	237	138

		Table E-9. Run 1A Annual Pumping by Well (continued)									
	Building #:	2393	2373	2363	33925	2301	33924	33923	new	new	new
	Max Annual Pumping	1,244	1,583	1,357	0	1,696	0	1,357	413	330	1,210
	Potential w/ 80% Util	1,447	1,841	1,578	0	1,973	0	1,578	1,052	1,052	1,052
	Potential Well Yield (gpm)	1,100	1,400	1,200	0	1,500	0	1,200	800	800	1,200
		CH	CH	CH	CH	CH	CH	CH	CH	CH	CH
		10/4-18E3	10/4-18M4&5	10/5-13R2	10/5-23G4	10/5-23J1	10/5-23K2	10/5-23K3	CH-1	CH-2	CH-4
MY	HC	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)
1	VW	1,015	1,292	1,107	0	1,384	0	1,107	0	0	1,107
2	BN	856	1,089	933	0	1,167	0	933	0	0	933
3	AN	709	903	774	0	967	0	774	0	0	774
4	ED	527	670	575	0	718	0	575	0	0	575
5	ED	151	193	165	0	206	0	165	0	0	165
6	ED	185	235	201	0	252	0	201	0	0	201
7	AN	434	552	473	0	592	0	473	0	0	473
8	ED	691	879	754	0	942	0	754	0	0	754
9	ED	185	235	201	0	252	0	201	0	0	201
10	ED	185	235	201	0	252	0	201	0	0	201
11	BN	185	235	201	0	252	0	201	0	0	201
12	ED	185	235	201	0	252	0	201	0	0	201
13	ED	185	235	201	0	252	0	201	0	0	201
14	ED	185	235	201	0	252	0	201	0	0	201
15	AN	434	552	473	0	592	0	473	0	0	473
16	AN	1,024	1,304	1,117	0	1,397	0	1,117	81	0	1,117
17	ED	767	977	837	0	1,046	0	837	0	0	837
18	VW	434	552	473	0	592	0	473	0	0	473
19	BN	856	1,089	933	0	1,167	0	933	0	0	933
20	BN	516	656	562	0	703	0	562	0	0	562
21	ED	209	266	228	0	285	0	228	0	0	228
22	BN	185	235	201	0	252	0	201	0	0	201
23	BN	185	235	201	0	252	0	201	0	0	201
24	BN	185	235	201	0	252	0	201	0	0	201
25	BN	185	235	201	0	252	0	201	0	0	201
26	ED	185	235	201	0	252	0	201	0	0	201
27	VW	434	552	473	0	592	0	473	0	0	473
28	AN	1,024	1,304	1,117	0	1,397	0	1,117	81	0	1,117
29	VW	1,107	1,408	1,207	0	1,509	0	1,207	250	0	1,207
30	AN	1,084	1,380	1,183	0	1,479	0	1,183	81	81	1,183
31	AN	1,061	1,350	1,157	0	1,447	0	1,157	81	0	1,157
32	VW	1,105	1,406	1,205	0	1,507	0	1,205	163	0	1,205
33	AN	1,075	1,368	1,173	0	1,466	0	1,173	81	0	1,173
34	AN	1,055	1,342	1,151	0	1,438	0	1,151	0	0	1,151
35	AN	1,058	1,347	1,154	0	1,443	0	1,154	0	0	1,154
36	BN	921	1,173	1,005	0	1,256	0	1,005	0	0	1,005
37	AN	753	959	822	0	1,027	0	822	0	0	822
38	BN	856	1,089	933	0	1,167	0	933	0	0	933
39	BN	516	656	562	0	703	0	562	0	0	562
40	VW	458	583	500	0	625	0	500	0	0	500
41	AN	1,021	1,300	1,114	0	1,392	0	1,114	0	0	1,114
42	VW	1,109	1,412	1,210	0	1,512	0	1,210	252	83	1,210
43	AN	1,083	1,378	1,181	0	1,476	0	1,181	166	81	1,181
44	VW	1,107	1,408	1,207	0	1,509	0	1,207	250	0	1,207
45	BN	974	1,239	1,062	0	1,328	0	1,062	166	81	1,062
46	AN	753	959	822	0	1,027	0	822	0	0	822
47	VW	1,077	1,371	1,175	0	1,469	0	1,175	169	0	1,175
48	BN	966	1,230	1,054	0	1,318	0	1,054	166	81	1,054
49	BN	501	638	546	0	683	0	546	0	0	546
50	AN	458	583	500	0	625	0	500	0	0	500
	Min	151	193	165	0	206	0	165	0	0	165
	Max	1,109	1,412	1,210	0	1,512	0	1,210	252	83	1,210
	Median	700	891	764	0	955	0	764	0	0	764
	Average	648	825	707	0	883	0	707	40	8	707
		Average Monthly Well Production									
	Month	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)
	Oct	51	65	56	0	70	0	56	0	0	56
	Nov	56	71	61	0	76	0	61	0	0	61
	Dec	65	82	70	0	88	0	70	0	0	70
	Jan	71	90	77	0	97	0	77	20	8	77
	Feb	71	91	78	0	97	0	78	12	0	78
	Mar	67	86	73	0	92	0	73	8	0	73
	Apr	56	71	61	0	76	0	61	0	0	61
	May	46	59	50	0	63	0	50	0	0	50
	Jun	38	49	42	0	52	0	42	0	0	42
	Jul	40	51	44	0	55	0	44	0	0	44
	Aug	36	46	40	0	49	0	40	0	0	40
	Sep	50	64	55	0	69	0	55	0	0	55
	Annual Total	648	825	707	0	883	0	707	40	8	707

C:\CPEN\Run1 A\POST\C.IC-hydrographs_Run1A+WLAdj.xls / printed 9/18/2006





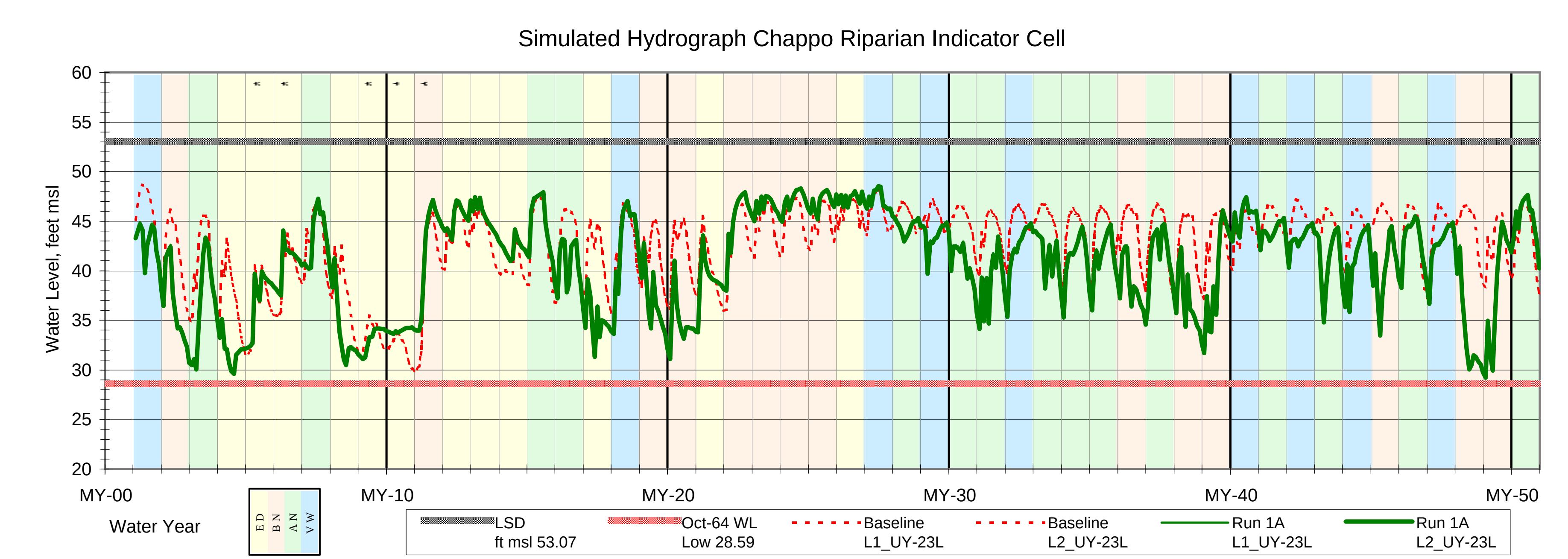
***** Emergency flows called upon during water years marked with an asterisk.

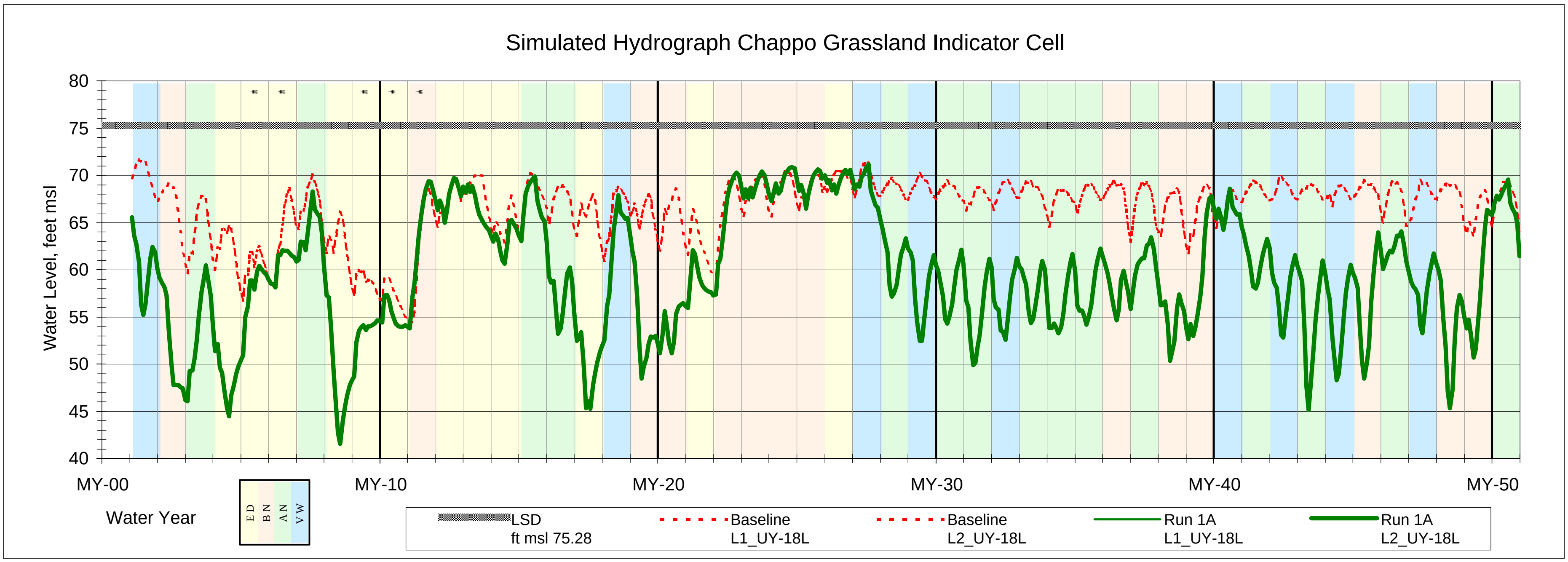
Layer 1 (L1) and Layer 2(L2) simulated groundwater levels are at similar elevations and the graph lines are printed on top of each other.

FIGURE E-5

Run 1A and Baseline Hydrographs

C:\CPEN\Run1 A\POST\C.IC-hydrographs_Run1A+WLAdj.xls / printed 9/18/2006



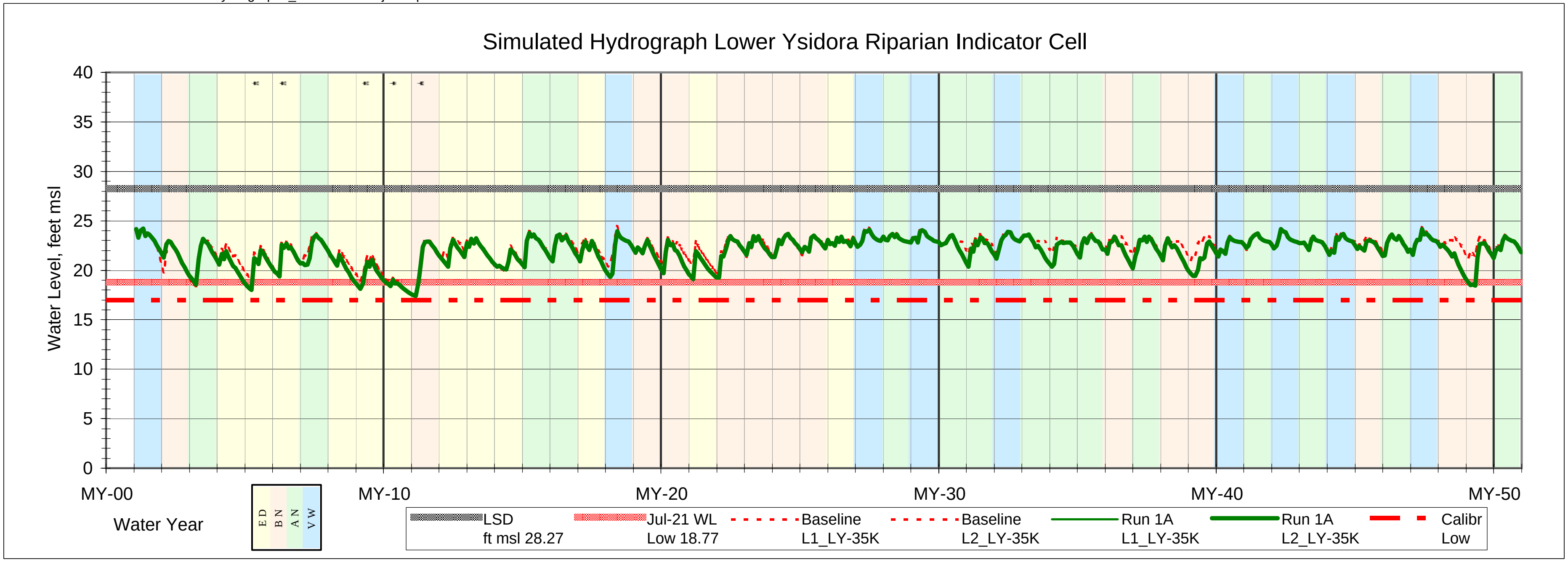


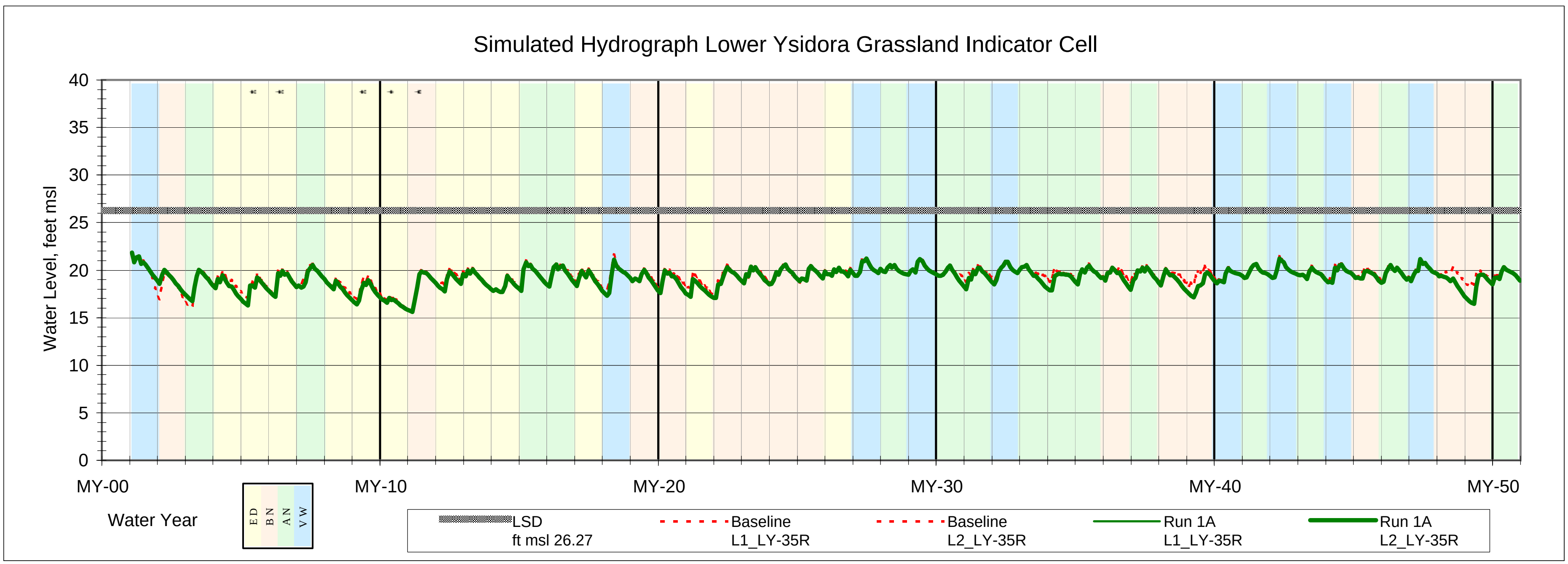
***** Emergency flows called upon during water years marked with an asterisk.

Layer 1 (L1) and Layer 2(L2) simulated groundwater levels are at similar elevations and the graph lines are printed on top of each other.

FIGURE E-6

Run 1A and Baseline Hydrographs





***** Emergency flows called upon during water years marked with an asterisk.

Layer 1 (L1) and Layer 2(L2) simulated groundwater levels are at similar elevations and the graph lines are printed on top of each other.

FIGURE E-7

Run 1A and Baseline Hydrographs

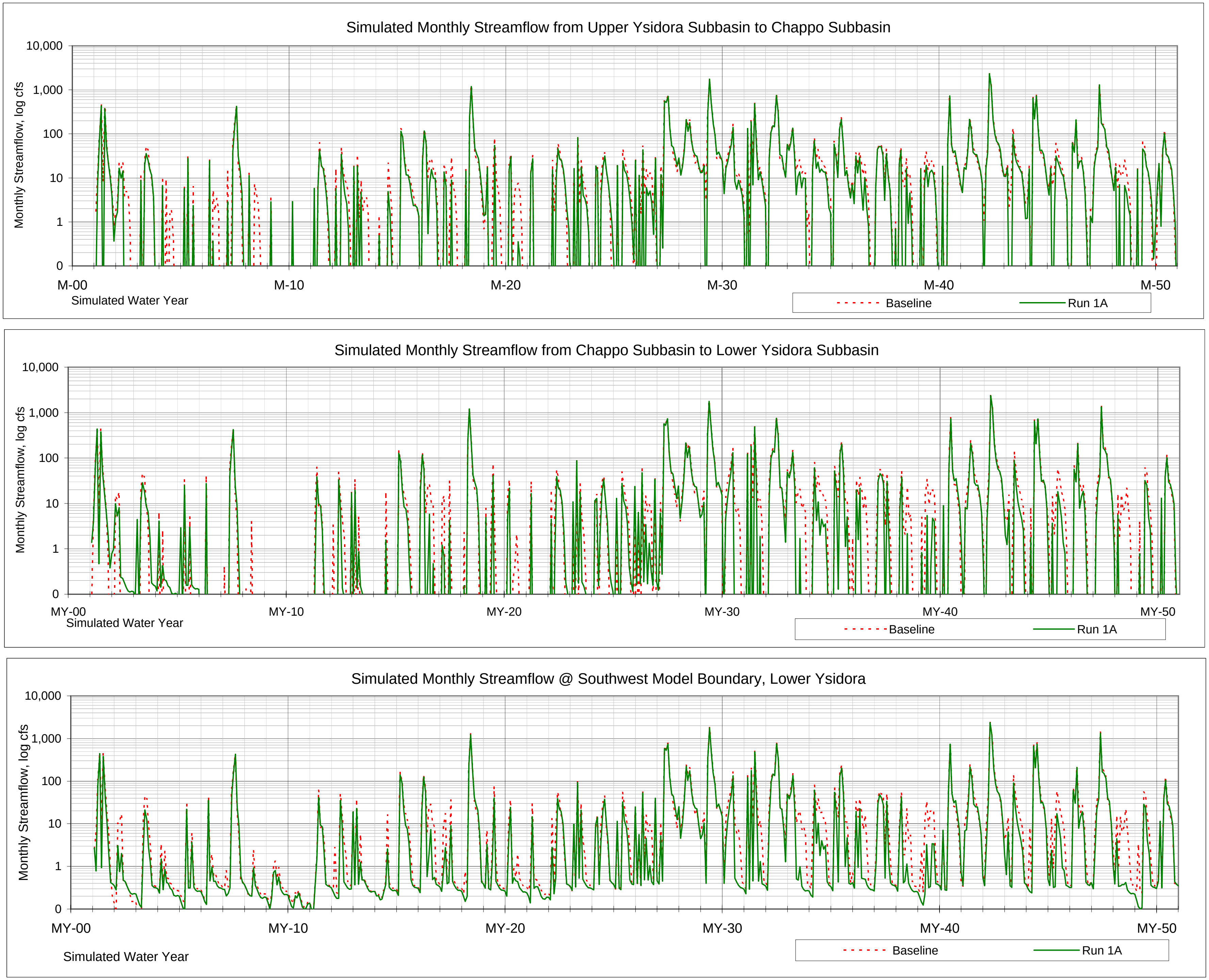


Figure E-8. Simulated Streamflow, Run 1A and Baseline

Table E-10 Run 1 A

Average Hydrologic Condition Water Budget (af/y)

% Time Exceedence	*> 76%*	*76% to 50%*	*50% to 19%*	*< 19%*
# Years	*12*	*14*	*15*	*9*
	Extremely Dry	Below Normal	Above Normal	Very Wet
Inflow:				
Santa Margarita River Inflow	7,100	12,800	32,300	127,100
Subsurface Underflow	1,000	900	900	800
Lake O'Neill Spill and Release	700	1,400	1,800	2,200
Fallbrook Creek	100	400	1,400	3,800
Minor Tributary Drainages	1,700	1,400	2,400	4,900
Areal Precipitation	500	500	700	1,600
Total Inflow:	11,100	17,400	39,500	140,400
Outflow:				
Santa Margarita River Outflow	1,600	3,400	20,700	119,900
Subsurface Underflow	100	100	100	100
Groundwater Pumping	6,900	9,800	13,800	14,300
Evapotranspiration	1,900	2,300	2,600	3,000
Diversions to Lake O'Neill	1,100	1,800	2,400	2,700
Total Outflow:	11,600	17,400	39,600	140,000
Net Simulated Change of Groundwater in Storage:	-500	0	-100	400
Fallbrook Diversions	2,000	4,000	5,600	7,200
	-	-	-	-

Median Hydrologic Condition Water Budget (af/y)

% Time Exceedence	*> 76%*	*76% to 50%*	*50% to 19%*	*< 19%*
# Years	*12*	*14*	*15*	*9*
	Extremely Dry	Below Normal	Above Normal	Very Wet
Inflow:				
Santa Margarita River Inflow	6,800	12,900	28,800	120,000
Subsurface Underflow	1,000	900	900	800
Lake O'Neill Spill and Release	700	1,300	2,100	2,300
Fallbrook Creek	100	300	1,100	3,500
Minor Tributary Drainages	1,500	1,400	2,500	4,700
Areal Precipitation	400	300	500	1,500
Outflow:				
Santa Margarita River Outflow	1,000	3,100	15,600	109,700
Subsurface Underflow	100	100	100	100
Groundwater Pumping	5,400	8,900	15,900	16,900
Evapotranspiration	1,600	2,100	2,500	2,800
Diversions to Lake O'Neill	1,000	1,700	2,700	2,700
Net Simulated Change of Groundwater in Storage:	100	-100	-500	600
Fallbrook Diversions	1,900	3,700	5,300	7,200

Average Subbasin Water Budget (af/y)

	Upper Ysidora	Chappo	Lower Ysidora	SMR Basin	
Inflow:					
Santa Margarita River Inflow	37,800	31,200	28,500	37,800	85%
Subsurface Underflow *	900	1,800	500	900	2%
Lake O'Neill Spill and Release	1,500	-	-	1,500	3%
Fallbrook Creek	1,200	-	-	1,200	3%
Minor Tributary Drainages	600	1,100	700	2,400	5%
Areal Precipitation	200	300	200	800	2%
Total Inflow:	42,200	34,400	29,900	44,600	
Outflow:					
Santa Margarita River Outflow	31,200	28,500	29,100	29,100	65%
Subsurface Underflow *	1,800	500	100	100	0%
Groundwater Pumping	6,600	4,500	0	11,100	25%
Evapotranspiration *	700	900	800	2,400	5%
Diversions to Lake O'Neill	1,900	-	-	1,900	4%
Total Outflow:	42,200	34,400	30,000	44,600	
Net Simulated Change of Groundwater in Storage: *	0	0	-100	0	
	-	-	-	-	

Note: * Subbasin Averages are based on the last rate of the stress period
Values are rounded to the nearest 100 acre-feet, closest number adjusted to eliminate rounding error

Median Subbasin Water Budget (af/y)

	Upper Ysidora	Chappo	Lower Ysidora	SMR Basin
Inflow:				
Santa Margarita River Inflow	15,800	8,100	5,700	15,800
Subsurface Underflow *	900	1,900	500	900
Lake O'Neill Spill and Release	1,500	-	-	1,500
Fallbrook Creek	600	-	-	600
Minor Tributary Drainages	200	0	100	2,100
Areal Precipitation	8,200	0	6,597	500
Outflow:				
Santa Margarita River Outflow	8,100	5,700	5,900	5,900
Subsurface Underflow *	1,900	500	100	100
Groundwater Pumping	6,400	4,800	0	11,100
Evapotranspiration *	700	1,000	800	2,500
Diversions to Lake O'Neill	2,100	-	-	2,100
Net Simulated Change of Groundwater in Storage: *	0	0	0	-100

Note: The sum of median values does not reflect the change of groundwater in storage.
Median values are not cummulative.
* Subbasin Medians are based on the last rate of the stress period
Values are rounded to the nearest 100 acre-feet

Table E-11 Run 1A Annual Water budget

Lower Santa Margarita River Groundwater Model — Run 1A

Modflow Volumetric Budget Output and Streamflow — 9/18/06

Annual Surface Water Budget

MY		SMR Flow In	LON Diversion	Ponds Diversion	Str Gain+ / Loss-	GAGE SMR @ UY->CH	Str Gain+ / Loss-	SMR @ CH->LY	Str Gain+ / Loss-	SMR Flow Out	LSMR Str Gain+ / Loss-
1	VW	66,394	2,364	9,462	-7,115	59,279	-2,083	57,196	1,780	58,976	-7,417
2	BN	8,737	1,531	3,426	-6,173	2,563	-2,152	411	104	516	-8,221
3	AN	15,652	1,063	6,435	-8,641	7,011	-4,399	2,612	-170	2,442	-13,211
4	ED	6,759	1,323	2,646	-6,362	396	-384	12	293	306	-6,453
5	ED	6,753	569	1,449	-4,565	2,188	-819	1,370	327	1,697	-5,056
6	ED	6,281	635	1,799	-4,772	1,509	173	1,682	728	2,410	-3,871
7	AN	46,769	1,151	10,115	-6,399	40,370	-1,514	38,856	740	39,596	-7,173
8	ED	6,750	1,291	3,474	-6,080	670	-669	2	205	207	-6,544
9	ED	5,440	964	1,900	-5,270	170	-170	0	244	244	-5,196
10	ED	5,459	1,093	1,874	-5,287	171	-171	-	105	105	-5,353
11	BN	12,033	949	5,657	-6,055	5,977	-2,514	3,463	258	3,721	-8,312
12	ED	9,246	821	2,845	-4,895	4,351	-1,048	3,303	475	3,778	-5,468
13	ED	4,963	577	1,797	-3,565	1,399	-158	1,241	400	1,641	-3,323
14	ED	5,802	412	2,946	-5,381	421	-328	93	228	321	-5,481
15	AN	21,921	2,748	6,132	-5,954	15,967	-819	15,148	1,255	16,402	-5,519
16	AN	23,865	2,344	7,510	-9,007	14,858	-2,965	11,893	1,118	13,011	-10,854
17	ED	10,105	1,979	3,961	-8,351	1,754	-1,379	375	579	954	-9,151
18	VW	105,552	2,415	13,044	-3,146	102,405	-2,390	100,015	1,417	101,432	-4,120
19	BN	13,124	2,317	4,573	-8,676	4,448	-1,630	2,818	115	2,934	-10,190
20	BN	8,950	1,263	3,584	-6,140	2,810	-1,175	1,635	318	1,953	-6,997
21	ED	7,739	1,831	1,408	-5,322	2,417	-1,408	1,009	41	1,050	-6,689
22	BN	14,802	1,514	8,297	-6,147	8,655	-2,869	5,786	-64	5,722	-9,080
23	BN	12,321	1,607	2,949	-4,636	7,685	-589	7,095	687	7,782	-4,539
24	BN	11,377	1,699	5,663	-4,662	6,715	-1,090	5,625	480	6,105	-5,272
25	BN	10,296	944	4,518	-3,967	6,329	-1,115	5,215	398	5,612	-4,684
26	ED	10,316	1,278	2,692	-4,175	6,141	-408	5,733	798	6,531	-3,785
27	VW	126,820	2,935	15,927	-1,164	125,656	460	126,116	2,107	128,222	1,402
28	AN	55,061	2,721	18,024	-8,099	46,962	-5,161	41,801	475	42,276	-12,785
29	VW	181,076	2,721	18,886	-5,520	175,556	-3,432	172,124	1,878	174,002	-7,074
30	AN	28,831	2,749	7,142	-9,953	18,878	-5,417	13,461	202	13,663	-15,169
31	AN	62,376	2,697	7,724	-7,761	54,615	-4,836	49,778	542	50,320	-12,055
32	VW	105,844	2,720	14,250	-6,263	99,581	-5,560	94,020	898	94,919	-10,925
33	AN	29,560	2,714	9,309	-9,514	20,046	-4,891	15,155	455	15,610	-13,950
34	AN	22,097	2,702	9,005	-10,393	11,704	-6,208	5,496	-160	5,336	-16,761
35	AN	39,296	2,235	8,776	-7,291	32,005	-5,329	26,676	591	27,268	-12,028
36	BN	14,221	2,155	4,939	-8,268	5,953	-3,360	2,592	204	2,797	-11,424
37	AN	19,246	1,923	5,782	-4,694	14,552	-3,976	10,575	463	11,038	-8,207
38	BN	12,659	1,727	4,895	-7,491	5,168	-2,224	2,943	319	3,262	-9,397
39	BN	13,137	1,982	6,536	-7,541	5,596	-4,695	901	-162	739	-12,398
40	VW	64,445	2,819	12,302	-4,710	59,734	-2,847	56,887	246	57,133	-7,311
41	AN	42,492	2,711	13,804	-9,054	33,438	-5,423	28,014	314	28,328	-14,163
42	VW	251,872	2,723	19,141	-5,239	246,632	-4,199	242,433	1,039	243,472	-8,399
43	AN	24,441	2,751	12,576	-10,729	13,712	-5,348	8,364	136	8,500	-15,941
44	VW	121,487	2,676	17,733	-7,802	113,686	-4,869	108,816	1,189	110,006	-11,481
45	BN	18,009	2,748	10,476	-10,378	7,631	-5,350	2,282	-74	2,208	-15,802
46	AN	29,997	2,138	9,291	-6,207	23,790	-3,138	20,653	637	21,289	-8,708
47	VW	120,008	2,716	18,549	-6,751	113,256	-4,754	108,503	1,231	109,734	-10,274
48	BN	13,181	2,744	7,071	-10,530	2,651	-2,322	329	146	475	-12,707
49	BN	15,897	1,871	7,458	-7,436	8,461	-4,576	3,885	-291	3,594	-12,303
50	AN	22,506	2,607	9,944	-6,056	16,450	-2,679	13,771	180	13,951	-8,555
	avg	37,839	1,943	7,794	**-6,592**	31,247	**-2,684**	28,563	**508**	29,072	**-8,767**
	med	15,775	2,060	6,804	-6,190	8,073	-2,452	5,679	363	5,913	-8,356
AVERAGES											
ED	12	7,134	1,064	2,399	(5,335)	1,799	(564)	1,235	369	1,604	-5,531
BN	14	12,767	1,789	5,717	(7,007)	5,760	(2,547)	3,213	174	3,387	-9,380
AN	15	32,274	2,350	9,438	(7,983)	24,290	(4,140)	20,150	452	20,602	-11,672
VW	9	127,055	2,676	15,477	(5,301)	121,754	(3,297)	118,457	1,310	119,766	-7,289
	50										
MEDIANS											
ED	12	6,752	1,029	2,273	(5,279)	1,454	(396)	692	310	1,002	-5,410
BN	14	12,891	1,713	5,298	(6,805)	5,965	(2,273)	2,881	175	3,098	-9,239
AN	15	28,831	2,697	9,005	(8,099)	18,878	(4,836)	15,148	463	15,610	-12,055
VW	9	120,008	2,720	15,927	(5,520)	113,256	(3,432)	108,503	1,231	109,734	-7,417
	50										

Table E-11 Run 1A Annual Water budget (continued)
Lower Santa Margarita River Groundwater Model
Modflow Volumetric Budget Output

Annual Groundwater Budget Model Run: Run 1A

MY	INFLOW: Storage	Recharge	Stream Leakance	GHB	TOTAL GW IN	OUTFLOW: Storage	Wells	ET	Stream Leakance	GHB	TOTAL GW OUT
1	8,301	10,438	9,986	866	29,591	5,269	15,583	2,778	5,919	65	29,614
2	6,990	3,618	6,176	931	17,714	2,228	13,136	1,705	611	55	17,734
3	5,526	6,640	11,058	981	24,204	8,788	10,604	1,766	3,011	52	24,221
4	6,433	2,929	4,943	950	15,254	3,297	10,383	1,210	318	53	15,261
5	3,609	1,742	6,579	1,080	13,011	6,382	4,897	1,427	275	48	13,030
6	3,565	2,482	5,161	1,060	12,268	4,584	5,331	1,871	438	56	12,279
7	6,263	10,790	7,548	917	25,518	7,564	8,363	2,557	6,978	62	25,524
8	8,223	3,620	3,797	936	16,577	3,209	11,517	1,368	458	49	16,602
9	2,514	2,247	4,989	996	10,746	3,965	5,356	1,139	239	47	10,745
10	2,250	1,988	3,466	994	8,698	2,103	5,356	1,053	157	40	8,709
11	3,476	6,107	9,167	913	19,662	8,145	5,354	2,296	3,829	50	19,674
12	3,180	3,118	6,400	932	13,629	4,135	5,356	2,700	1,402	53	13,646
13	3,893	2,032	3,714	926	10,565	1,644	5,354	2,716	813	58	10,584
14	3,581	3,269	4,364	969	12,184	3,976	5,356	2,098	719	51	12,200
15	5,124	7,094	6,612	879	19,708	4,633	8,365	2,872	3,797	65	19,732
16	6,387	8,097	11,685	882	27,051	5,321	15,904	2,337	3,427	64	27,054
17	6,685	4,275	8,186	913	20,059	5,179	12,603	1,582	652	57	20,074
18	6,412	14,112	9,890	857	31,270	10,149	8,363	2,564	10,145	62	31,284
19	7,762	4,757	7,332	903	20,754	4,486	13,136	1,848	1,253	57	20,780
20	4,646	3,942	6,602	910	16,101	4,506	8,896	1,618	1,031	56	16,107
21	3,264	1,669	5,567	976	11,477	3,538	6,065	1,600	248	48	11,499
22	4,279	8,646	7,927	887	21,739	8,113	5,354	2,746	5,480	58	21,750
23	3,088	3,384	5,783	910	13,164	3,060	5,356	2,971	1,736	60	13,182
24	3,441	6,107	6,419	881	16,848	3,907	5,354	3,154	4,387	63	16,865
25	3,609	5,064	6,263	900	15,836	4,004	5,356	3,083	3,352	62	15,857
26	2,945	3,115	6,393	900	13,354	2,649	5,356	3,131	2,167	65	13,369
27	6,733	17,055	7,479	843	32,110	6,522	8,363	3,356	13,806	74	32,121
28	6,641	18,363	11,297	824	37,126	5,957	15,902	2,984	12,229	68	37,141
29	6,935	19,819	12,121	820	39,695	6,701	17,539	2,872	12,514	73	39,699
30	5,347	7,348	12,615	875	26,185	3,841	17,011	2,429	2,865	62	26,207
31	5,884	8,150	13,010	877	27,920	6,125	16,483	2,181	3,101	61	27,952
32	6,228	14,959	14,027	847	36,061	7,326	17,309	2,608	8,733	69	36,045
33	5,537	9,506	11,524	865	27,433	4,045	16,690	2,521	4,130	62	27,447
34	4,936	9,219	13,636	875	28,666	5,416	16,208	2,346	4,658	57	28,685
35	5,034	9,183	13,269	872	28,359	5,574	16,230	2,477	4,006	64	28,351
36	5,482	5,188	10,331	893	21,894	3,730	14,164	2,119	1,857	60	21,931
37	4,630	6,175	10,537	882	22,225	5,324	11,547	2,486	2,792	63	22,212
38	6,143	5,142	9,160	900	21,345	4,621	13,154	1,850	1,703	57	21,386
39	4,224	6,703	10,078	895	21,901	7,433	8,884	2,094	3,409	52	21,872
40	5,884	12,466	8,012	870	27,231	6,437	9,068	2,927	8,765	60	27,257
41	5,615	14,118	12,144	852	32,730	5,147	15,680	2,872	8,962	65	32,726
42	6,979	19,904	12,580	822	40,285	6,892	17,769	2,803	12,759	69	40,292
43	7,557	12,718	11,754	852	32,881	6,540	17,172	2,456	6,664	62	32,895
44	7,798	18,343	13,108	840	40,090	8,503	17,562	2,486	11,501	65	40,118
45	6,933	10,629	11,180	861	29,603	6,382	15,496	2,342	5,351	60	29,630
46	5,303	9,688	9,298	859	25,147	5,096	11,547	2,670	5,748	63	25,125
47	6,313	19,399	12,902	829	39,442	7,369	16,919	2,720	12,374	70	39,453
48	7,208	7,231	8,150	875	23,464	3,880	15,450	1,800	2,316	56	23,502
49	5,395	7,599	9,527	898	23,418	8,471	8,792	1,972	4,151	50	23,436
50	5,900	10,285	7,369	859	24,412	5,441	9,091	2,975	6,841	62	24,410
avg	5,402	8,209	8,822	899	23,332	5,352	11,122	2,331	4,482	59	23,345
med	5,531	7,163	8,673	885	22,821	5,224	11,061	2,467	3,418	60	22,824
AVERAGES											
ED	4,179	2,707	5,297	969	13,152	3,722	6,911	1,825	657	52	13,166
BN	5,191	6,008	8,150	897	20,246	5,212	9,849	2,257	2,890	57	20,265
AN	5,712	9,825	10,890	877	27,304	5,654	13,787	2,529	5,281	62	27,312
VW	6,843	16,277	11,123	844	35,086	7,241	14,275	2,791	10,724	68	35,098
MEDIANS											
ED	3,573	2,705	5,075	959	12,639	3,751	5,356	1,591	448	52	12,654
BN	5,021	5,647	8,038	899	21,050	4,496	8,890	2,106	2,834	57	21,083
AN	5,537	9,219	11,524	875	27,051	5,416	15,902	2,486	4,130	62	27,054
VW	6,733	17,055	12,121	843	36,061	6,892	16,919	2,778	11,501	69	36,045

Table E-11 Run 1A Annual Water budget (continued)
Lower Santa Margarita River Groundwater Model
Modflow Volumetric Budget Output

Annual Groundwater Budget

MY	NET Storage	NET Str Lknc	In-Out	% bal
1	-3,032	-4,067	-23.0	-0.08%
2	-4,762	-5,565	-19.6	-0.11%
3	3,262	-8,046	-16.9	-0.07%
4	-3,136	-4,624	-7.1	-0.05%
5	2,774	-6,304	-19.0	-0.15%
6	1,019	-4,723	-11.0	-0.09%
7	1,302	-570	-6.7	-0.03%
8	-5,014	-3,339	-25.1	-0.15%
9	1,451	-4,750	0.7	0.01%
10	-147	-3,310	-10.4	-0.12%
11	4,669	-5,338	-11.3	-0.06%
12	955	-4,998	-16.4	-0.12%
13	-2,250	-2,902	-18.3	-0.17%
14	395	-3,646	-16.5	-0.14%
15	-491	-2,815	-23.4	-0.12%
16	-1,065	-8,258	-3.8	-0.01%
17	-1,506	-7,534	-14.5	-0.07%
18	3,737	255	-13.6	-0.04%
19	-3,276	-6,079	-25.6	-0.12%
20	-140	-5,572	-6.5	-0.04%
21	273	-5,319	-22.5	-0.20%
22	3,834	-2,447	-11.0	-0.05%
23	-28	-4,047	-17.9	-0.14%
24	466	-2,032	-17.9	-0.11%
25	395	-2,911	-20.8	-0.13%
26	-296	-4,226	-14.8	-0.11%
27	-211	6,327	-11.6	-0.04%
28	-684	932	-15.6	-0.04%
29	-234	393	-4.3	-0.01%
30	-1,506	-9,750	-22.8	-0.09%
31	241	-9,908	-31.4	-0.11%
32	1,097	-5,294	15.8	0.04%
33	-1,492	-7,394	-13.9	-0.05%
34	480	-8,978	-18.3	-0.06%
35	539	-9,263	7.4	0.03%
36	-1,752	-8,473	-37.1	-0.17%
37	693	-7,746	12.3	0.06%
38	-1,522	-7,456	-40.7	-0.19%
39	3,209	-6,669	28.4	0.13%
40	553	753	-25.6	-0.09%
41	-468	-3,182	3.7	0.01%
42	-87	179	-6.9	-0.02%
43	-1,017	-5,090	-13.8	-0.04%
44	705	-1,607	-28.0	-0.07%
45	-551	-5,829	-27.5	-0.09%
46	-207	-3,549	21.6	0.09%
47	1,056	-528	-10.8	-0.03%
48	-3,329	-5,833	-37.9	-0.16%
49	3,076	-5,376	-17.4	-0.07%
50	-459	-528	2.8	0.01%
avg	-50	-4,341	-13.3	-0.07%
med	-114	-4,737	-15.2	-0.07%
AVERAGES				
ED	-457	-4,640	-14.6	-0.11%
BN	21	-5,259	-18.8	-0.09%
AN	-58	-5,610	-7.9	-0.03%
VW	398	-399	-12.0	-0.04%
MEDIANS				
ED	63	-4,674	-15.6	-0.12%
BN	-84	-5,569	-18.8	-0.11%
AN	-459	-7,394	-13.8	-0.04%
VW	553	179	-11.6	-0.04%

Table E-12 Run 1A 50-Year Average Monthly Water Budget

Lower Santa Margarita River Groundwater Model — Run 1A

Modflow Volumetric Budget Output and Streamflow — 9/18/06

<u>Average Monthly Water Budget</u>

Avg AF/M	SMR Flow In	Diversion	Str Gain+ / Loss-	SMR @ UY->CH	Str Gain+ / Loss-	SMR @ CH->LY	Str Gain+ / Loss-	SMR Flow Out	LSMR Str Gain+ / Loss-
Oct	542	329	-399	143	-83	60	20	80	-462
Nov	1,265	622	39	1,304	-502	802	-3	799	-466
Dec	1,938	496	-712	1,225	-173	1,052	52	1,104	-834
Jan	8,344	823	-1,072	7,272	-133	7,139	138	7,277	-1,066
Feb	10,247	2,047	-1,760	8,487	-143	8,344	111	8,454	-1,792
Mar	8,827	2,236	-1,357	7,470	-269	7,201	101	7,302	-1,526
Apr	3,137	1,461	-586	2,552	-328	2,223	40	2,263	-874
May	1,308	918	-250	1,059	-334	724	3	727	-581
Jun	720	549	0	720	-283	437	3	440	-280
Jul	498	130	-26	472	-206	266	9	275	-224
Aug	462	64	-190	272	-122	150	19	169	-293
Sep	551	63	-279	272	-108	165	18	183	-369
Avg Monthly	3,153	811	-549	2,604	-224	2,380	42	2,423	-731
Med Monthly	1,286	585	-339	1,142	-190	763	19	763	-524
Avg Total=Anl	37,839	9,737	-6,592	31,247	-2,684	28,563	508	29,072	-8,767

Lower Santa Margarita River Groundwater Model

Modflow Volumetric Budget Output

<u>Average Monthly Water Budget</u>

	INFLOW:					OUTFLOW:									
Avg AF/M	Storage	Recharge	Stream Leakance	GHB	TOTAL IN	Storage	Wells	ET	Stream Leakance	GHB	TOTAL OUT	NET Storage	NET Str Lknc	In-Out	% bal
Oct	607	44	403	81	1,135	55	869	166	42	8	1,141	-552	-360	-5.7	-0.50%
Nov	164	601	1,244	79	2,087	901	941	170	65	8	2,085	737	-1,179	2.0	0.10%
Dec	538	145	851	80	1,614	254	1,094	184	76	7	1,616	-284	-775	-1.8	-0.11%
Jan	390	338	1,230	78	2,037	486	1,276	188	82	5	2,036	96	-1,149	1.0	0.05%
Feb	304	1,909	911	76	3,199	1,442	1,244	182	331	-	3,198	1,138	-580	1.4	0.04%
Mar	166	2,288	947	74	3,475	1,172	1,163	213	924	1	3,472	1,005	-23	2.9	0.08%
Apr	352	1,509	785	68	2,714	485	949	216	1,058	8	2,716	133	273	-2.1	-0.08%
May	495	983	623	69	2,170	250	783	224	905	9	2,172	-245	282	-1.8	-0.08%
Jun	676	308	519	68	1,571	152	649	213	554	7	1,574	-524	35	-3.5	-0.22%
Jul	647	64	446	73	1,231	69	684	208	269	4	1,234	-578	-177	-3.0	-0.24%
Aug	483	10	407	78	978	52	615	193	118	0	979	-431	-289	-1.0	-0.10%
Sep	580	10	456	76	1,122	35	856	174	58	1	1,124	-545	-398	-1.7	-0.15%
Avg Monthly	450	684	735	75	1,944	446	927	194	373	5	1,945	-4	-362	-1.1	-0.10%
Med Monthly	489	323	704	76	1,825	252	905	190	194	6	1,826	-265	-325	-1.8	-0.09%
Avg Total=Anl	5,402	8,209	8,822	899	23,332	5,352	11,122	2,331	4,482	59	23,345	-50	-4,341	-13.3	

Attachment F

Run 2 (3-Basin) Model Results

Table F-1. Run 2 Annual Pumping Summary
Lower Santa Margarita River Groundwater Model

Hydrologic Condition

HC	Cnt	Oct to Apr Strflw
VW	9	Very Wet > 56,164
AN	15	Above Normal > 13,600
BN	14	Below Normal < 13,600
ED	12	Extremely Dry < 5,840
	50	

Pumping Condition

PC	HC	Q Adjst	Anl Q	Cnt	
1	2+ AN @ VW	4,000	18,500	5	10%
2	2+ AN @ AN	2,000	16,500	9	18%
3	Standard	0	14,500	10	20%
4	1st BN	-4,000	10,500	6	12%
5	2ndBN, 70/30 split	-8,000	6,500	3	6%
6	3+BN/all ED	-9,000	5,500	17	34%
				50	100%

MY	HC	Oct-Apr HC descrip	May-Apr Pumping Condition	UY Total (af/y)	CH Total (af/y)	LY Total (af/y)	LSMR Total (af/y)	+Q
1	VW	Very Wet	3	8,628	7,059	628	16,315	
2	BN	Below Normal	4	7,259	5,939	495	13,693	
3	AN	Above Normal	3	5,744	4,685	360	10,790	
4	ED	Extremely Dry	6	6,811	4,087	391	11,289	
5	ED	Extremely Dry	6	4,023	1,375	40	5,438	
6	ED	Extremely Dry	6	4,400	1,375	55	5,830	
7	AN	Above Normal	3	5,564	3,051	226	8,841	
8	ED	Extremely Dry	6	6,811	4,849	391	12,051	
9	ED	Extremely Dry	6	4,240	1,375	40	5,655	
10	ED	Extremely Dry	6	3,542	1,375	33	4,949	
11	BN	Below Normal	6	4,024	1,375	46	5,445	
12	ED	Extremely Dry	6	4,400	1,375	55	5,830	
13	ED	Extremely Dry	6	4,400	1,375	55	5,830	
14	ED	Extremely Dry	6	4,400	1,375	55	5,830	
15	AN	Above Normal	3	5,564	3,051	226	8,841	
16	AN	Above Normal	2	8,783	7,186	639	16,607	X
17	ED	Extremely Dry	6	7,553	5,456	463	13,472	
18	VW	Very Wet	3	5,564	3,051	226	8,841	
19	BN	Below Normal	4	7,259	5,939	528	13,726	
20	BN	Below Normal	5	5,588	3,716	304	9,608	
21	ED	Extremely Dry	6	4,940	1,544	62	6,545	
22	BN	Below Normal	6	4,400	1,375	55	5,830	
23	BN	Below Normal	6	4,400	1,375	55	5,830	
24	BN	Below Normal	6	4,400	1,375	55	5,830	
25	BN	Below Normal	6	4,400	1,375	55	5,830	
26	ED	Extremely Dry	6	4,400	1,375	55	5,830	
27	VW	Very Wet	3	5,564	3,051	226	8,841	
28	AN	Above Normal	2	8,783	7,186	639	16,607	X
29	VW	Very Wet	1	9,657	7,983	710	18,350	X
30	AN	Above Normal	2	9,409	7,865	699	17,974	X
31	AN	Above Normal	2	9,075	7,425	660	17,160	X
32	VW	Very Wet	1	9,637	7,885	701	18,222	X
33	AN	Above Normal	2	9,257	7,574	673	17,504	X
34	AN	Above Normal	2	9,075	7,425	660	17,160	X
35	AN	Above Normal	2	9,075	7,425	660	17,160	X
36	BN	Below Normal	4	8,001	6,546	582	15,129	
37	AN	Above Normal	3	6,491	5,311	472	12,274	
38	BN	Below Normal	4	7,259	5,939	528	13,726	
39	BN	Below Normal	5	5,588	3,716	304	9,608	
40	VW	Very Wet	3	6,103	3,220	233	9,556	
41	AN	Above Normal	2	8,657	7,083	630	16,370	X
42	VW	Very Wet	1	9,679	8,086	719	18,483	X
43	AN	Above Normal	2	9,409	7,865	699	17,974	X
44	VW	Very Wet	1	9,657	7,983	710	18,350	X
45	BN	Below Normal	4	8,539	7,153	636	16,328	
46	AN	Above Normal	3	6,491	5,311	472	12,274	
47	VW	Very Wet	1	9,239	7,641	679	17,559	X
48	BN	Below Normal	4	8,846	6,676	529	16,051	
49	BN	Below Normal	5	5,625	3,431	145	9,201	
50	AN	Above Normal	3	6,103	3,220	233	9,556	
			Min	3,542	1,375	33	4,949	
			Max	9,679	8,086	719	18,483	
			Median	**6,491**	**4,767**	**391**	**11,670**	
			% of Median	55.6%	40.8%	3.4%		
			Average	**6,734**	**4,610**	**376**	**11,720**	
			% of Average	57.5%	39.3%	3.2%		

Notes:
Hydrologic Condition: Oct - Apr
Model starts after 3+ BN or ED

Table F-1. Run 2 Annual Pumping Summary (continued)

	Oct-Apr HC Description	HC Count	UY Total (af/y)	CH Total (af/y)	LY Total (af/y)	LSMR Total (af/y)
AVERAGES	ED	12	4,744	2,168	-	6,912
	BN	14	5,912	3,874	-	9,786
	AN	15	7,725	6,007	-	13,733
	VW	9	8,068	6,106	-	14,174
MEDIANS	ED	12	4,080	1,275	-	5,355
	BN	14	5,353	3,562	-	8,897
	AN	15	8,748	7,158	-	15,906
	VW	9	9,204	7,530	-	16,734

Average Monthly Pumping

	Month	UY Total (af/m)	CH Total (af/m)	LY Total (af/m)	LSMR Total (af/m)
8%	Oct	526	359	29	914
8%	Nov	568	393	31	992
10%	Dec	660	455	36	1,151
11%	Jan	765	530	43	1,338
11%	Feb	739	514	43	1,296
10%	Mar	705	478	40	1,223
9%	Apr	578	387	33	997
7%	May	479	326	27	832
6%	Jun	398	272	22	691
6%	Jul	418	286	23	727
6%	Aug	377	256	21	653
8%	Sep	522	355	28	906
	Avg Anl	6,734	4,610	376	11,720

Table F-2. Run 2 Pumping Summaries
Lower Santa Margarita River Groundwater Model

		Bldg #	State ID #	Label	# mos Q	% of 600 mos	Orig Wells by Subbsn %	80% Utilization af/m	
1	UY	2673	10/4-7A2	7A2	600	100%	25%	142	
2	UY	26072	10/4-8D1	8D1	600	100%	21%	121	
3	UY	2671	10/4-7H2	7H2	600	100%	15%	82	
4	UY	PW-6	PW-6	PW-6	600	100%	19%	110	
5	UY	2603	10/4-7R2	7R2	600	100%	19%	110	
6	UY	UY-1	UY-1	UY-1	260	43%	0%	110	
7	UY	UY-2	UY-2	UY-2	173	29%	0%	110	
8	UY	UY-3	UY-3	UY-3	119	20%	0%	110	
9	UY	UY-4	UY-4	UY-4	77	13%	0%	110	
10	UY	UY-5	UY-5	UY-5	37	6%	0%	110	
11	UY	UY-6	UY-6	UY-6	13	2%	0%	110	
12	CH	2393	10/4-18E3	18E4	600	100%	14%	121	
13	CH	2373	10/4-18M4&5	18M5	600	100%	17%	153	
14	CH	2363	10/5-13R2	13R2	600	100%	15%	132	
15	CH	33925	10/5-23G4	23G4	**0**	**0%**	15%	**0**	backup
16	CH	2301	10/5-23J1	23J1	600	100%	19%	164	
17	CH	33924	10/5-23K2	23K2	**0**	**0%**	6%	**0**	backup
18	CH	33923	10/5-23K3	23K3	600	100%	15%	132	
19	CH	CH-1	CH-1	CH-1	85	14%	0%	88	
20	CH	CH-2	CH-2	CH-2	47	8%	0%	88	
21	CH	CH-3	CH-3	CH-3	13	2%	0%	88	
22	LY	LY-1	LY-1	LY-1	564	94%	0%	55	
23	LY	LY-2	LY-2	LY-2	139	23%	0%	55	

% Pumping in Subbasin

		Wet Year Algorithm			Dry Year Management							
		53%	43%	4%	75%	24%	1%	Max Pumping in Subbasin adding wells as needed				
mo	Anl %	UY	CH	LY	UY	CH	LY		UY	CH	LY	Total
OCT	7.9%	4.4%	3.6%	0.32%	6.3%	2.0%	0.08%	# exst wells	5	7	-	12
NOV	8.6%	4.7%	3.9%	0.34%	6.9%	2.2%	0.09%	af/m (75%)	564	833	-	1,397
DEC	10.0%	5.5%	4.5%	0.40%	8.0%	2.5%	0.10%	avg af/well	113	119	-	116
JAN	11.4%	6.3%	5.1%	0.46%	9.1%	2.9%	0.11%					
FEB	10.9%	6.0%	4.9%	0.44%	8.8%	2.7%	0.11%	1 adntl well	674	921	55	1,650
MAR	10.2%	5.6%	4.6%	0.41%	8.2%	2.5%	0.10%	2 adntl well	784	1,008	110	1,902
APR	8.3%	4.6%	3.7%	0.33%	6.6%	2.1%	0.08%	3 adntl well	893	1,096	164	2,154
MAY	7.1%	3.9%	3.2%	0.28%	5.7%	1.8%	0.07%	4 adntl well	1,003	1,184	219	2,406
JUN	5.9%	3.2%	2.7%	0.24%	4.7%	1.5%	0.06%	5 adntl well	1,112	1,271		2,384
JUL	6.2%	3.4%	2.8%	0.25%	5.0%	1.6%	0.06%	6 adntl well	1,222			1,222
AUG	5.6%	3.1%	2.5%	0.22%	4.5%	1.4%	0.06%	50-yr Avg	5,844	4,875	1,225	
SEP	7.8%	4.3%	3.5%	0.31%	6.2%	1.9%	0.08%	50-yr Med	5,705	5,330	1,161	

	median						
	UY af/m	CH af/m	LY af/m	Total af/m	Max Mo Pumping	cfs	new wells
ED	379	140	6	591	1,960	34	9
BN	445	279	15	666	2,198	38	11
AN	621	508	45	1,173	2,198	38	11
VW	631	516	46	1,193	2,198	38	11

Wet Year Algorithm Monthly Counts

	2,000	4,000	Total	% of 50 yrs
Oct	-	-	-	0%
Nov	-	-	-	0%
Dec	1	-	1	2%
Jan	7	1	8	16%
Feb	7	4	11	22%
Mar	9	5	14	28%
Apr	9	5	14	28%
May	-	-	-	0%
	33	15	48	

		Table F-3. Run 2 Annual Pumping by Well										
	Building #:	2673	26072	2671	PW-6	2603	new	new	new	new	new	new
Max Annual Pumping		1,617	1,368	933	1,244	1,244	1,136	940	732	530	316	205
Potential w/ 80% Util		1,710	1,447	986	1,315	1,315	1,315	1,315	1,315	1,315	1,315	1,315
Potential Well Yield (gpm)		1,300	1,100	750	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
		UY	UY	UY	UY	UY	UY	UY	UY	UY	UY	UY
		10/4-7A2	10/4-8D1	10/4-7H2	PW-6	10/4-7R2	UY-1	UY-2	UY-3	UY-4	UY-5	UY-6
MY	HC	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)
1	VW	1,534	1,298	885	1,180	1,180	907	611	515	313	204	0
2	BN	1,399	1,184	807	1,076	1,076	711	501	405	100	0	0
3	AN	1,324	1,120	764	1,019	1,019	499	0	0	0	0	0
4	ED	1,286	1,088	742	989	989	711	501	405	100	0	0
5	ED	1,015	859	586	781	781	0	0	0	0	0	0
6	ED	1,111	940	641	854	854	0	0	0	0	0	0
7	AN	1,356	1,147	782	1,043	1,043	193	0	0	0	0	0
8	ED	1,286	1,088	742	989	989	711	501	405	100	0	0
9	ED	1,070	906	617	823	823	0	0	0	0	0	0
10	ED	894	756	516	688	688	0	0	0	0	0	0
11	BN	1,016	859	586	781	781	0	0	0	0	0	0
12	ED	1,111	940	641	854	854	0	0	0	0	0	0
13	ED	1,111	940	641	854	854	0	0	0	0	0	0
14	ED	1,111	940	641	854	854	0	0	0	0	0	0
15	AN	1,356	1,147	782	1,043	1,043	193	0	0	0	0	0
16	AN	1,598	1,352	922	1,229	1,229	918	710	410	312	102	0
17	ED	1,306	1,105	754	1,005	1,005	727	727	411	411	102	0
18	VW	1,356	1,147	782	1,043	1,043	193	0	0	0	0	0
19	BN	1,399	1,184	807	1,076	1,076	711	501	405	100	0	0
20	BN	1,310	1,108	756	1,007	1,007	400	0	0	0	0	0
21	ED	1,199	1,015	692	922	922	189	0	0	0	0	0
22	BN	1,111	940	641	854	854	0	0	0	0	0	0
23	BN	1,111	940	641	854	854	0	0	0	0	0	0
24	BN	1,111	940	641	854	854	0	0	0	0	0	0
25	BN	1,111	940	641	854	854	0	0	0	0	0	0
26	ED	1,111	940	641	854	854	0	0	0	0	0	0
27	VW	1,356	1,147	782	1,043	1,043	193	0	0	0	0	0
28	AN	1,598	1,352	922	1,229	1,229	918	710	410	312	102	0
29	VW	1,570	1,329	906	1,208	1,208	1,208	915	605	404	304	0
30	AN	1,603	1,356	925	1,233	1,233	921	817	612	406	305	0
31	AN	1,614	1,366	931	1,242	1,242	930	826	411	411	102	0
32	VW	1,582	1,338	913	1,217	1,217	1,217	924	613	412	204	0
33	AN	1,610	1,362	929	1,238	1,238	927	822	618	411	102	0
34	AN	1,614	1,366	931	1,242	1,242	930	826	411	411	102	0
35	AN	1,614	1,366	931	1,242	1,242	930	826	411	411	102	0
36	BN	1,419	1,201	819	1,092	1,092	727	727	411	411	102	0
37	AN	1,489	1,260	859	1,145	1,145	593	0	0	0	0	0
38	BN	1,399	1,184	807	1,076	1,076	711	501	405	100	0	0
39	BN	1,310	1,108	756	1,007	1,007	400	0	0	0	0	0
40	VW	1,444	1,222	833	1,111	1,111	382	0	0	0	0	0
41	AN	1,595	1,349	920	1,227	1,227	915	708	407	309	0	0
42	VW	1,573	1,331	908	1,210	1,210	1,210	918	607	406	306	0
43	AN	1,603	1,356	925	1,233	1,233	921	817	612	406	305	0
44	VW	1,570	1,329	906	1,208	1,208	1,208	915	605	404	304	0
45	BN	1,407	1,190	812	1,082	1,082	717	717	717	407	407	0
46	AN	1,489	1,260	859	1,145	1,145	593	0	0	0	0	0
47	VW	1,551	1,312	895	1,193	1,193	1,193	798	601	302	202	0
48	BN	1,446	1,223	834	1,112	1,112	728	728	728	521	414	0
49	BN	1,298	1,098	749	998	998	388	95	0	0	0	0
50	AN	1,444	1,222	833	1,111	1,111	382	0	0	0	0	0
	Min	894	756	516	688	688	0	0	0	0	0	0
	Max	1,614	1,366	931	1,242	1,242	1,217	924	728	521	414	0
	Median	1,377	1,166	795	1,060	1,060	593	48	0	0	0	0
	Average	1,358	1,149	783	1,045	1,045	526	353	243	158	75	0

Average Monthly Well Production

	Month	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)
	Oct	111	94	64	85	85	49	28	10	0	0	0
	Nov	116	98	67	89	89	50	50	11	0	0	0
	Dec	119	101	69	92	92	57	48	48	28	8	0
	Jan	130	110	75	100	100	67	51	49	49	35	0
	Feb	130	110	75	100	100	68	51	51	40	16	0
	Mar	124	105	72	96	96	60	49	49	39	16	0
	Apr	118	100	68	91	91	51	40	17	2	0	0
	May	106	90	61	82	82	47	10	0	0	0	0
	Jun	98	83	57	75	75	10	0	0	0	0	0
	Jul	103	87	59	79	79	10	0	0	0	0	0
	Aug	93	78	53	71	71	9	0	0	0	0	0
	Sep	110	93	64	85	85	48	27	10	0	0	0
	Annual Total	1,358	1,149	783	1,045	1,045	526	353	243	158	75	0

		Table F-3. Run 2 Annual Pumping by Well (continued)											
	Building #:	2393	2373	2363	33925	2301	33924	33923	new	new	new	new	new
	Max Annual Pumping	1,244	1,583	1,357	0	1,696	0	1,357	413	330	170	479	250
	Potential w/ 80% Util	1,447	1,841	1,578	0	1,973	0	1,578	1,052	1,052	1,052	658	658
	Potential Well Yield (gpm)	1,100	1,400	1,200	0	1,500	0	1,200	800	800	800	500	500
		CH	CH	CH	CH	CH	CH	CH	CH	CH	CH	LY	LY
		10/4-18E3	10/4-18M4&5	10/5-13R2	10/5-23G4	10/5-23J1	10/5-23K2	10/5-23K3	CH-1	CH-2	CH-3	LY-1	LY-2
MY	HC	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)
1	VW	1,127	1,434	1,230	0	1,537	0	1,230	251	251	0	456	171
2	BN	993	1,264	1,083	0	1,354	0	1,083	162	0	0	372	124
3	AN	805	1,025	878	0	1,098	0	878	0	0	0	360	0
4	ED	688	876	751	0	938	0	751	83	0	0	268	124
5	ED	236	301	258	0	322	0	258	0	0	0	40	0
6	ED	236	301	258	0	322	0	258	0	0	0	55	0
7	AN	524	667	572	0	715	0	572	0	0	0	226	0
8	ED	805	1,025	879	0	1,098	0	879	162	0	0	268	124
9	ED	236	301	258	0	322	0	258	0	0	0	40	0
10	ED	236	301	258	0	322	0	258	0	0	0	33	0
11	BN	236	301	258	0	322	0	258	0	0	0	46	0
12	ED	236	301	258	0	322	0	258	0	0	0	55	0
13	ED	236	301	258	0	322	0	258	0	0	0	55	0
14	ED	236	301	258	0	322	0	258	0	0	0	55	0
15	AN	524	667	572	0	715	0	572	0	0	0	226	0
16	AN	1,164	1,481	1,269	0	1,587	0	1,269	250	166	0	475	164
17	ED	852	1,084	929	0	1,162	0	929	333	166	0	267	196
18	VW	524	667	572	0	715	0	572	0	0	0	226	0
19	BN	993	1,264	1,083	0	1,354	0	1,083	162	0	0	404	124
20	BN	639	813	697	0	871	0	697	0	0	0	304	0
21	ED	265	338	289	0	362	0	289	0	0	0	62	0
22	BN	236	301	258	0	322	0	258	0	0	0	55	0
23	BN	236	301	258	0	322	0	258	0	0	0	55	0
24	BN	236	301	258	0	322	0	258	0	0	0	55	0
25	BN	236	301	258	0	322	0	258	0	0	0	55	0
26	ED	236	301	258	0	322	0	258	0	0	0	55	0
27	VW	524	667	572	0	715	0	572	0	0	0	226	0
28	AN	1,164	1,481	1,269	0	1,587	0	1,269	250	166	0	475	164
29	VW	1,257	1,600	1,371	0	1,714	0	1,371	335	253	83	473	237
30	AN	1,208	1,537	1,318	0	1,647	0	1,318	417	253	169	457	242
31	AN	1,190	1,515	1,299	0	1,623	0	1,299	333	166	0	464	196
32	VW	1,255	1,597	1,369	0	1,711	0	1,369	334	251	0	468	233
33	AN	1,202	1,530	1,312	0	1,640	0	1,312	413	166	0	444	229
34	AN	1,190	1,515	1,299	0	1,623	0	1,299	333	166	0	464	196
35	AN	1,190	1,515	1,299	0	1,623	0	1,299	333	166	0	464	196
36	BN	1,039	1,323	1,134	0	1,417	0	1,134	333	166	0	385	196
37	AN	913	1,162	996	0	1,245	0	996	0	0	0	472	0
38	BN	993	1,264	1,083	0	1,354	0	1,083	162	0	0	404	124
39	BN	639	813	697	0	871	0	697	0	0	0	304	0
40	VW	553	704	604	0	755	0	604	0	0	0	233	0
41	AN	1,161	1,477	1,266	0	1,583	0	1,266	248	81	0	470	159
42	VW	1,259	1,602	1,374	0	1,717	0	1,374	337	254	169	477	242
43	AN	1,208	1,537	1,318	0	1,647	0	1,318	417	253	169	457	242
44	VW	1,257	1,600	1,371	0	1,714	0	1,371	335	253	83	473	237
45	BN	1,071	1,363	1,168	0	1,460	0	1,168	417	338	169	386	250
46	AN	913	1,162	996	0	1,245	0	996	0	0	0	472	0
47	VW	1,227	1,562	1,339	0	1,673	0	1,339	251	168	83	479	200
48	BN	1,004	1,277	1,095	0	1,369	0	1,095	415	253	169	279	250
49	BN	590	751	643	0	804	0	643	0	0	0	145	0
50	AN	553	704	604	0	755	0	604	0	0	0	233	0
	Min	236	301	258	0	322	0	258	0	0	0	33	0
	Max	1,259	1,602	1,374	0	1,717	0	1,374	417	338	169	479	250
	Median	805	1,025	879	0	1,098	0	879	0	0	0	292	0
	Average	751	955	819	0	1,024	0	819	141	79	22	283	92
Average Monthly W													
	Month	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)
	Oct	62	79	67	0	84	0	67	0	0	0	26	3
	Nov	66	84	72	0	90	0	72	8	0	0	23	8
	Dec	73	93	80	0	100	0	80	23	7	0	21	15
	Jan	78	99	85	0	106	0	85	41	29	9	25	18
	Feb	74	95	81	0	101	0	81	37	31	13	26	18
	Mar	75	95	81	0	102	0	81	32	12	0	24	16
	Apr	66	85	73	0	91	0	73	0	0	0	22	11
	May	56	71	61	0	76	0	61	0	0	0	27	0
	Jun	47	59	51	0	64	0	51	0	0	0	22	0
	Jul	49	62	54	0	67	0	54	0	0	0	23	0
	Aug	44	56	48	0	60	0	48	0	0	0	21	0
	Sep	61	78	67	0	83	0	67	0	0	0	25	3
	Annual Total	751	955	819	0	1,024	0	819	141	79	22	283	92

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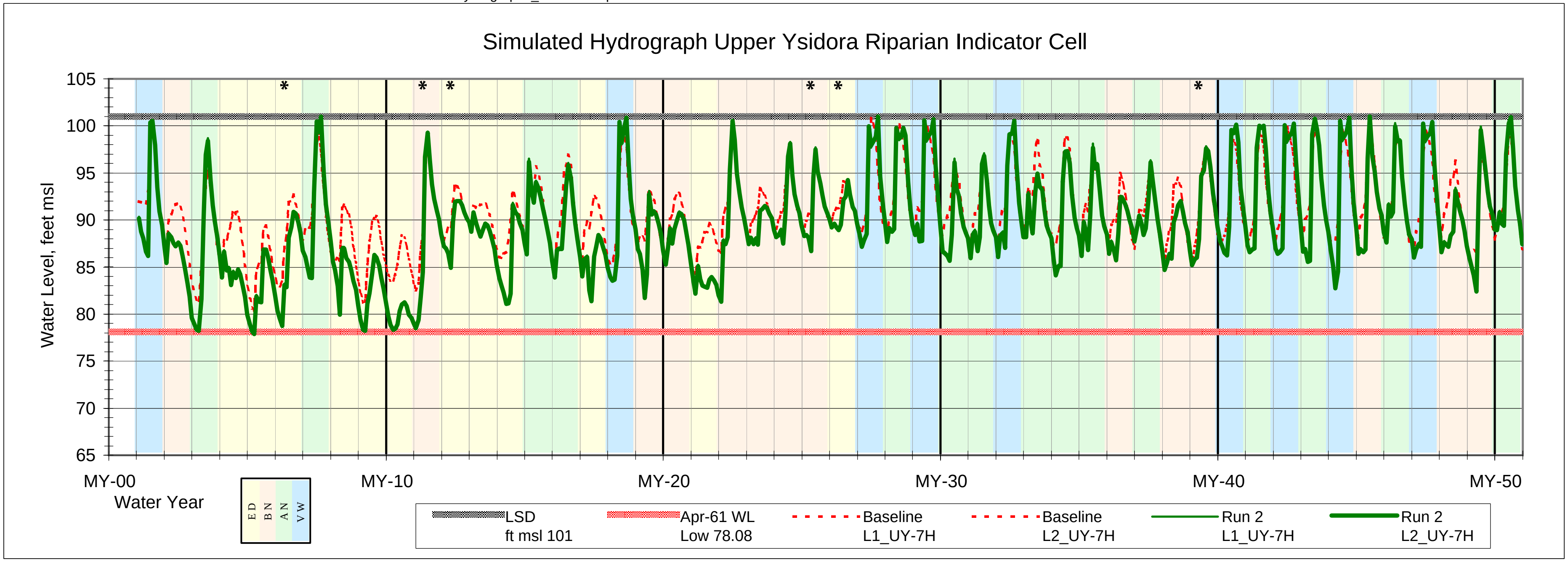

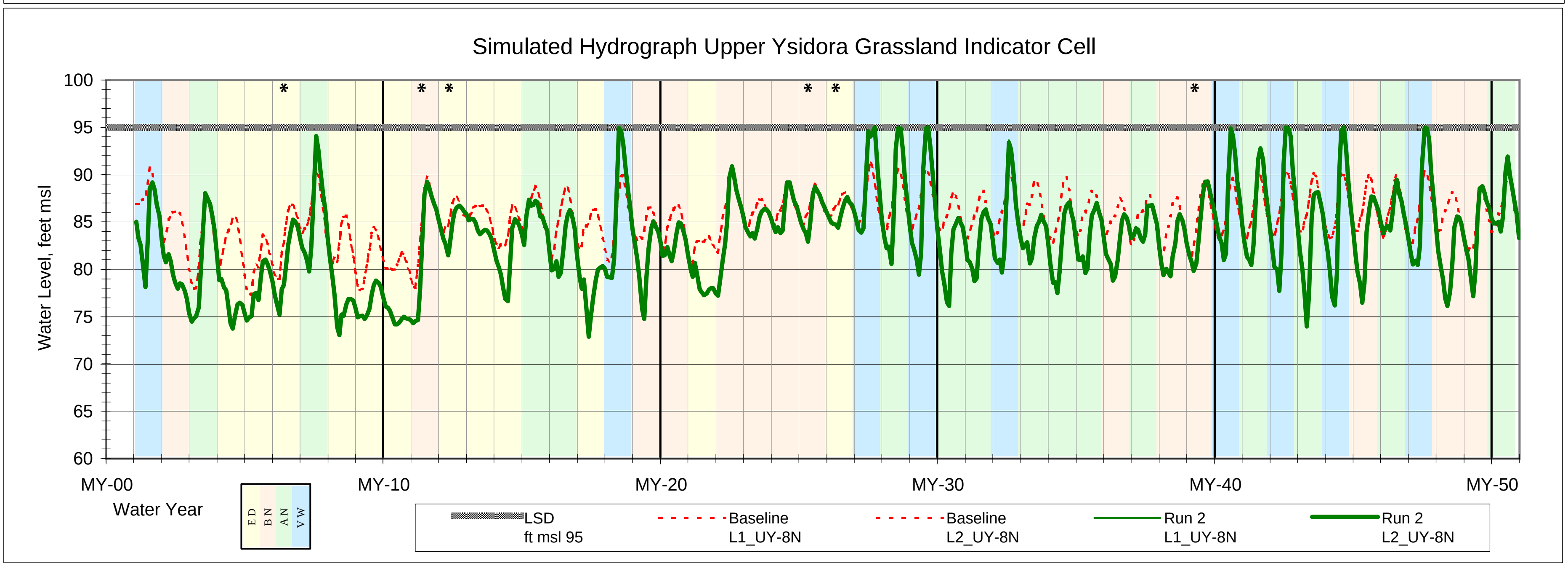

***** Emergency flows called upon during water years marked with an asterisk.

Layer 1 (L1) and Layer 2(L2) simulated groundwater levels are at similar elevations and the graph lines are printed on top of each other.

FIGURE F-1

Run 2 Three Subbasins and Baseline Hydrographs

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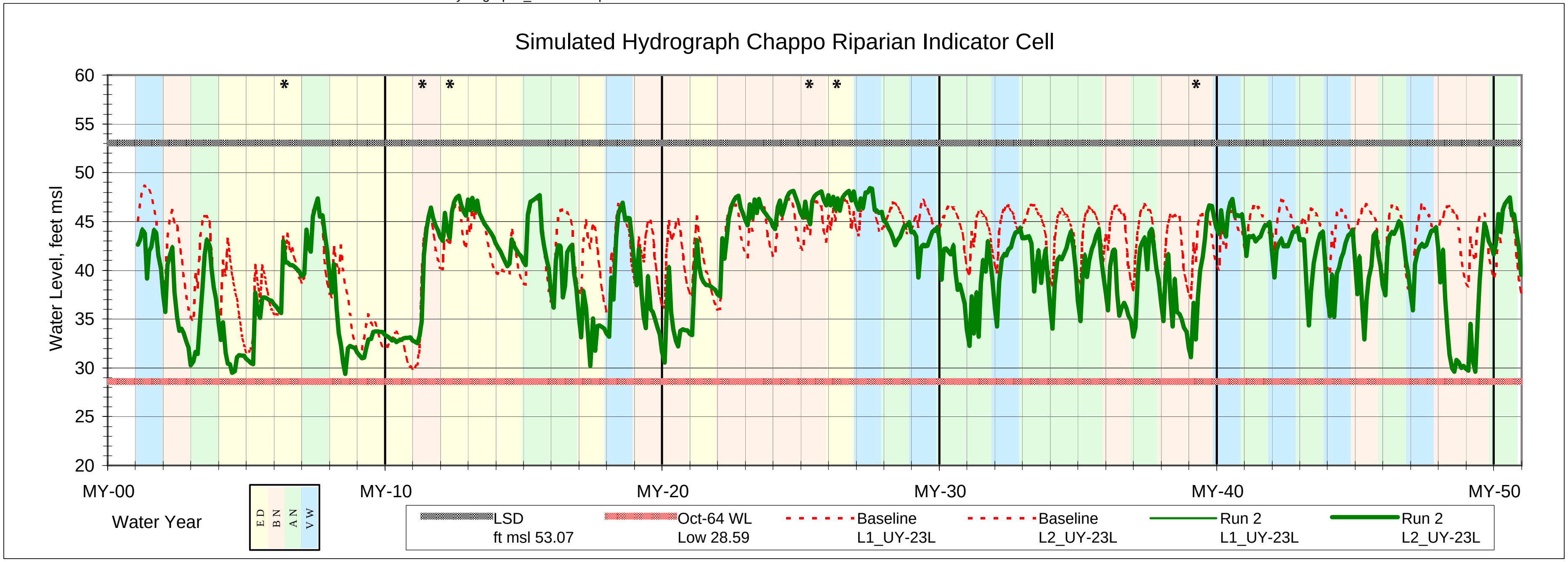
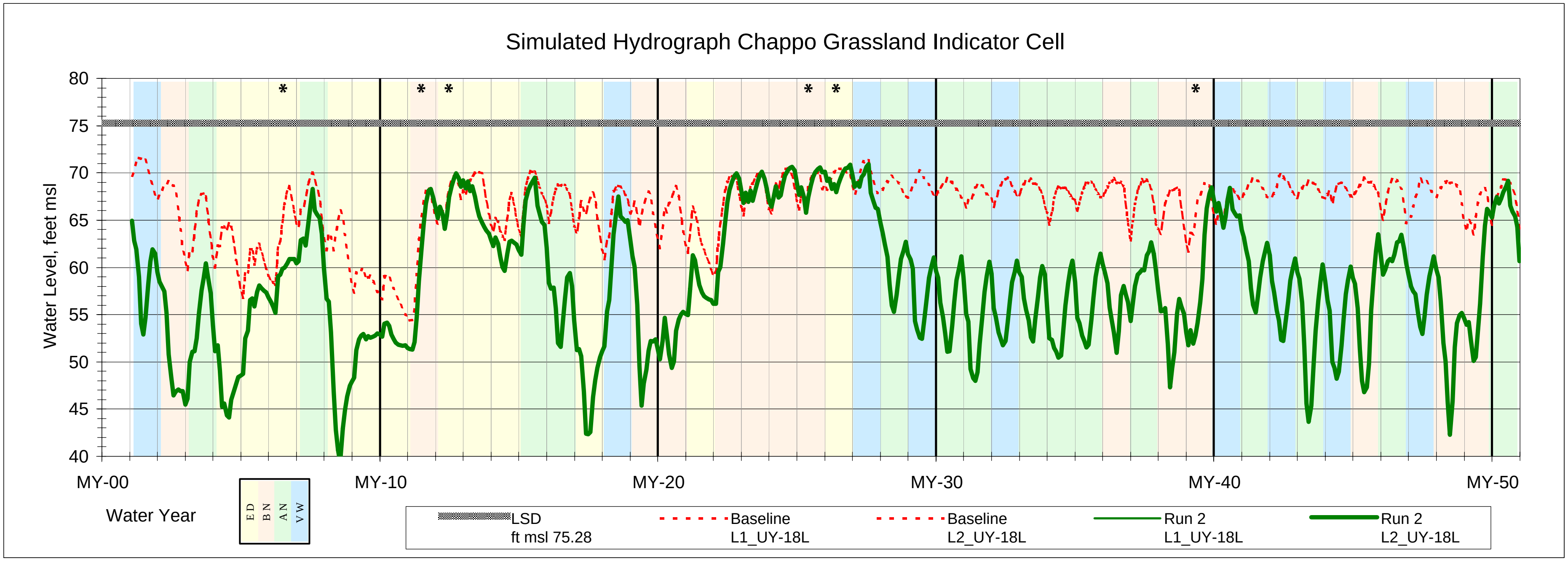


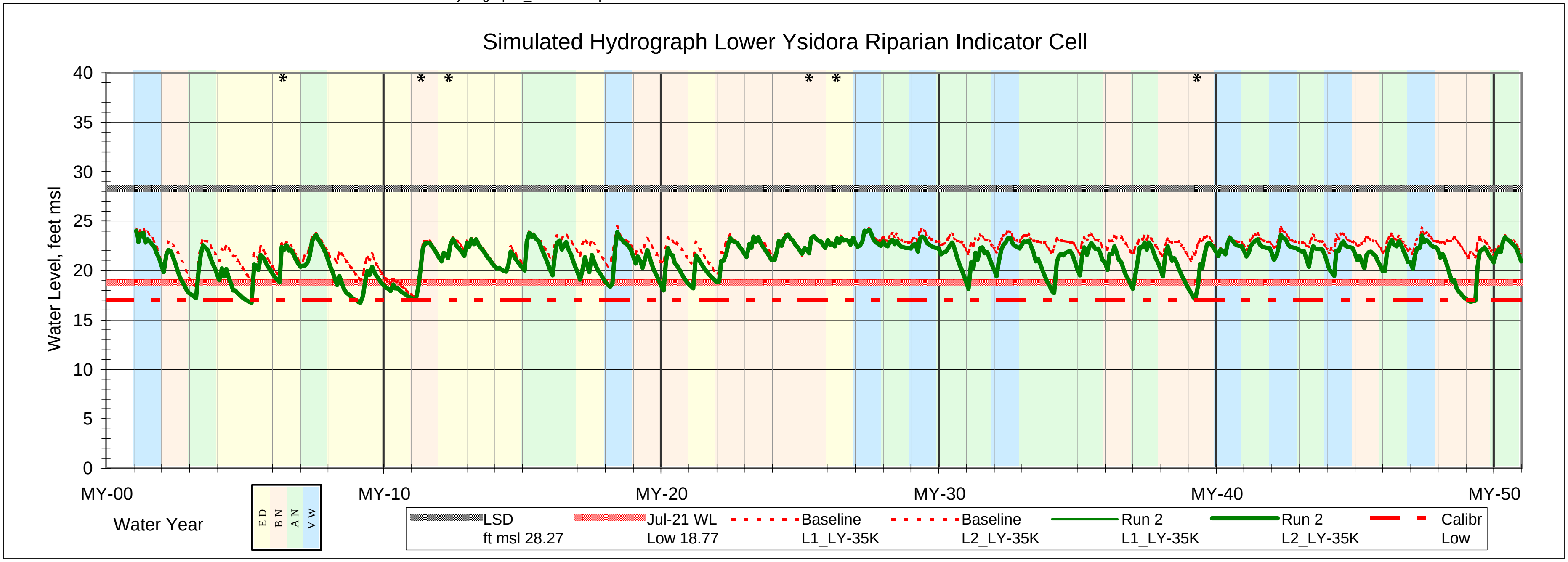


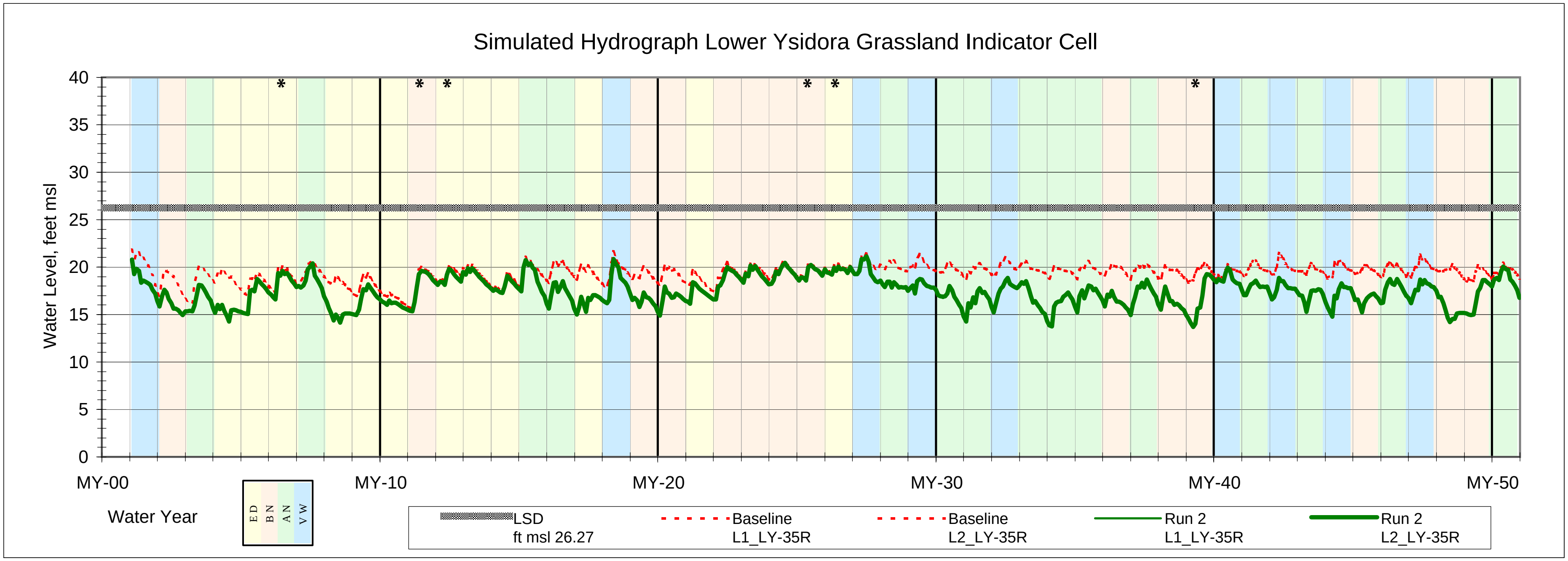
***** Emergency flows called upon during water years marked with an asterisk.

Layer 1 (L1) and Layer 2(L2) simulated groundwater levels are at similar elevations and the graph lines are printed on top of each other.

Run 2 Three Subbasins and Baseline Hydrographs

FIGURE F-2





* Emergency flows called upon during water years marked with an asterisk.

Layer 1 (L1) and Layer 2(L2) simulated groundwater levels are at similar elevations and the graph lines are printed on top of each other.

FIGURE F-3

Run 2 Three Subbasins and Baseline Hydrographs

Figure F-4. Simulated Streamflow, Run 2 Three Basin and Baseline

Table F-4. Run 2 Water Budget Summary Table

Average Hydrologic Condition Water Budget (af/y)

% Time Exceedence	*> 76%*	*76% to 50%*	*50% to 19%*	*< 19%*
# Years	*12*	*14*	*15*	*9*
	Extremely Dry	Below Normal	Above Normal	Very Wet
Inflow:				
Santa Margarita River Inflow	7,400	13,300	32,300	127,100
Subsurface Underflow	1,000	900	900	800
Lake O'Neill Spill and Release	800	1,400	1,800	2,200
Fallbrook Creek	100	400	1,400	3,800
Minor Tributary Drainages	1,700	1,400	2,400	4,900
Areal Precipitation	500	500	700	1,600
Total Inflow:	11,500	17,900	39,500	140,400
Outflow:				
Santa Margarita River Outflow	1,700	3,100	20,000	119,300
Subsurface Underflow	0	0	100	100
Groundwater Pumping	7,400	10,200	14,500	15,000
Evapotranspiration	1,800	2,300	2,500	2,900
Diversions to Lake O'Neill	1,200	1,900	2,400	2,700
Total Outflow:	12,100	17,500	39,500	140,000
	-600	400	0	400
	-	-	-	-

Median Hydrologic Condition Water Budget (af/y)

% Time Exceedence	*> 76%*	*76% to 50%*	*50% to 19%*	*< 19%*
	12	*14*	*15*	*9*
	Extremely Dry	Below Normal	Above Normal	Very Wet
Inflow:				
Santa Margarita River Inflow	6,800	13,200	28,800	120,000
Subsurface Underflow	1,000	900	900	800
Lake O'Neill Spill and Release	700	1,300	2,100	2,300
Fallbrook Creek	100	300	1,100	3,500
Minor Tributary Drainages	1,500	1,400	2,500	4,700
Areal Precipitation	400	300	500	1,500
Outflow:				
Santa Margarita River Outflow	700	2,800	15,200	109,300
Subsurface Underflow	0	0	100	100
Groundwater Pumping	5,800	9,600	16,600	17,700
Evapotranspiration	1,400	2,100	2,300	2,700
Diversions to Lake O'Neill	1,300	1,700	2,700	2,700
	-100	-100	-200	200

Average Subbasin Water Budget (af/y)

	Upper Ysidora	Chappo	Lower Ysidora	SMR Basin	
Inflow:					
Santa Margarita River Inflow	38,000	31,200	28,300	38,000	85%
Subsurface Underflow *	900	1,900	500	900	2%
Lake O'Neill Spill and Release	1,500	-	-	1,500	3%
Fallbrook Creek	1,200	-	-	1,200	3%
Minor Tributary Drainages	600	1,100	700	2,400	5%
Areal Precipitation	200	300	200	800	2%
Total Inflow:	42,400	34,500	29,700	44,800	
Outflow:					
Santa Margarita River Outflow	31,200	28,300	28,800	28,800	64%
Subsurface Underflow *	1,900	500	0	100	0%
Groundwater Pumping	6,800	4,600	400	11,700	26%
Evapotranspiration *	700	900	700	2,300	5%
Diversions to Lake O'Neill	2,000	-	-	2,000	4%
Total Outflow:	42,600	34,300	29,900	44,900	
Net Simulated Change of Groundwater in Storage:					
Net Simulated Change of Groundwater in Storage: *					
	-200	200	-200	-100	
	-	-	-	-	

Note: * Subbasin Medians are based on the last rate of the stress period
Values are rounded to the nearest 100 acre-feet, closest number adjusted to eliminate rounding error

Median Subbasin Water Budget (af/y)

	Upper Ysidora	Chappo	Lower Ysidora	SMR Basin
Inflow:				
Santa Margarita River Inflow	16,000	8,400	5,600	16,000
Subsurface Underflow *	900	2,000	500	900
Lake O'Neill Spill and Release	1,500	0	0	1,500
Fallbrook Creek	600	0	0	600
Minor Tributary Drainages	200	0	100	2,100
Areal Precipitation	8,400	0	6,761	500
Outflow:				
Santa Margarita River Outflow	8,400	5,600	6,000	6,000
Subsurface Underflow *	2,000	500	0	100
Groundwater Pumping	6,500	4,800	400	11,700
Evapotranspiration *	800	900	700	2,300
Diversions to Lake O'Neill	2,200	0	0	2,200
Net Simulated Change of Groundwater in Storage:				
Net Simulated Change of Groundwater in Storage: *				
	0	0	0	-100

Note: The sum of median values does not reflect the change of groundwater in storage.
Median values are not cummulative.
* Subbasin Medians are based on the last rate of the stress period
Values are rounded to the nearest 100 acre-feet

Table F-5 Run 2 Annual Water Budget Summary Table
Lower Santa Margarita River Groundwater Model
Modflow Volumetric Budget Output and Streamflow

Run 2 UY+CH+LY Basin Yield
6/25/06

Annual Surface Water Budget

MY		SMR Flow In	LON Diversion	Ponds Diversion	Str Gain+ / Loss-	GAGE SMR @ UY->CH	Str Gain+ / Loss-	SMR @ CH->LY	Str Gain+ / Loss-	SMR Flow Out	LSMR Str Gain+ / Loss-
1	VW	66,394	2,364	9,462	-7,150	59,244	-2,099	57,145	1,440	58,586	-7,808
2	BN	8,737	1,531	3,425	-6,210	2,527	-2,101	426	-160	266	-8,471
3	AN	15,652	1,063	6,435	-8,661	6,991	-4,496	2,495	-513	1,981	-13,671
4	ED	6,759	1,323	2,646	-6,366	393	-380	12	129	141	-6,618
5	ED	6,151	337	1,336	-4,181	1,970	-737	1,232	208	1,440	-4,711
6	ED	8,228	1,307	2,764	-6,635	1,593	-43	1,550	704	2,254	-5,974
7	AN	46,769	1,151	10,205	-5,284	41,485	-2,307	39,178	652	39,830	-6,939
8	ED	6,750	1,291	3,474	-6,084	666	-663	3	89	93	-6,657
9	ED	4,840	786	1,820	-4,752	88	-85	3	171	174	-4,666
10	ED	3,399	393	1,216	-3,370	29	-29	-	90	90	-3,309
11	BN	13,724	1,569	6,768	-7,838	5,886	-3,050	2,836	211	3,047	-10,677
12	ED	11,055	1,665	3,801	-5,173	5,882	-1,866	4,016	381	4,397	-6,658
13	ED	4,963	577	1,797	-2,803	2,160	-223	1,937	390	2,327	-2,636
14	ED	5,802	412	2,946	-5,319	483	-434	49	215	264	-5,538
15	AN	21,921	2,747	6,133	-5,912	16,009	-1,285	14,724	1,262	15,986	-5,935
16	AN	23,865	2,344	7,509	-9,054	14,811	-2,911	11,900	698	12,599	-11,266
17	ED	10,105	1,979	3,961	-8,373	1,732	-1,422	310	237	547	-9,558
18	BN	8,950	1,265	3,583	-6,170	2,780	-1,210	1,570	86	1,655	-7,295
19	ED	7,739	1,831	1,408	-5,311	2,428	-1,519	909	-19	889	-6,850
20	BN	14,802	1,515	8,296	-6,133	8,670	-3,482	5,188	-102	5,085	-9,717
21	BN	12,321	1,607	2,949	-4,623	7,697	-802	6,895	686	7,581	-4,739
22	BN	11,377	1,698	5,664	-4,660	6,717	-1,512	5,205	448	5,653	-5,724
23	BN	12,396	1,733	5,798	-4,863	7,533	-1,595	5,938	375	6,313	-6,083
24	ED	12,737	2,156	4,171	-5,024	7,712	-813	6,900	760	7,660	-5,077
25	VW	126,820	2,791	16,057	-486	126,334	312	126,646	2,055	128,701	1,881
26	AN	55,061	2,722	18,024	-8,176	46,885	-5,118	41,767	-22	41,746	-13,315
27	VW	181,076	2,723	18,884	-5,563	175,513	-3,461	172,052	1,423	173,475	-7,601
28	AN	28,831	2,750	7,141	-10,220	18,612	-5,347	13,265	-206	13,059	-15,772
29	AN	62,376	2,698	7,723	-7,742	54,634	-4,967	49,667	0	49,667	-12,709
30	VW	105,844	2,721	14,249	-6,293	99,550	-5,654	93,896	249	94,145	-11,699
31	AN	29,560	2,714	9,308	-9,595	19,965	-4,872	15,094	133	15,226	-14,334
32	AN	22,097	2,701	9,005	-10,493	11,604	-6,371	5,233	-714	4,519	-17,578
33	AN	39,296	2,235	8,776	-7,394	31,901	-5,422	26,479	83	26,562	-12,733
34	BN	14,221	2,155	4,939	-8,342	5,879	-3,396	2,483	-124	2,358	-11,862
35	AN	19,246	1,923	5,782	-4,753	14,493	-4,306	10,187	66	10,253	-8,993
36	BN	12,659	1,726	4,895	-7,556	5,103	-2,194	2,909	16	2,925	-9,734
37	BN	16,158	2,439	8,958	-7,747	8,410	-5,414	2,997	-558	2,439	-13,719
38	VW	64,445	2,820	12,300	-4,598	59,847	-2,983	56,863	158	57,021	-7,424
39	AN	42,492	2,711	13,804	-9,183	33,309	-5,299	28,010	-159	27,851	-14,641
40	VW	251,872	2,723	19,141	-5,350	246,522	-4,151	242,371	530	242,901	-8,970
41	VW	105,552	2,415	13,044	-3,058	102,494	-2,757	99,737	1,302	101,039	-4,512
42	BN	13,124	2,317	4,573	-8,710	4,414	-1,604	2,809	-169	2,641	-10,483
43	AN	24,441	2,752	12,576	-10,867	13,575	-5,470	8,105	-370	7,735	-16,706
44	VW	121,487	2,675	17,734	-7,852	113,635	-4,939	108,696	617	109,313	-12,174
45	BN	18,009	2,750	10,475	-10,488	7,522	-5,496	2,026	-485	1,541	-16,468
46	AN	29,997	2,137	9,291	-6,242	23,755	-3,375	20,380	260	20,640	-9,357
47	VW	120,008	2,717	18,548	-6,834	113,173	-4,609	108,564	705	109,269	-10,738
48	BN	13,181	2,745	7,070	-10,786	2,395	-2,073	322	-48	274	-12,907
49	BN	15,897	1,871	7,458	-7,544	8,353	-4,887	3,466	-651	2,815	-13,082
50	AN	22,506	2,602	9,949	-6,062	16,444	-3,028	13,415	65	13,480	-9,026
	avg	38,034	2,004	7,945	**-6,638**	31,396	**-2,839**	28,557	**252**	28,809	**-9,225**
	med	16,027	2,155	7,106	-6,268	8,382	-2,834	5,586	145	5,983	-9,009
AVERAGES											
ED	12	7,377	1,171	2,612	(5,283)	2,095	(685)	1,410	280	1,690	-5,688
BN	14	13,264	1,892	6,175	(7,151)	6,113	(2,862)	3,251	-24	3,227	-10,037
AN	15	32,274	2,350	9,444	(7,976)	24,298	(4,305)	19,993	82	20,076	-12,198
VW	9	127,055	2,661	15,491	(5,243)	121,812	(3,371)	118,441	942	119,383	-7,672
	50										
MEDIANS											
ED	12	6,755	1,299	2,705	(5,242)	1,663	(549)	610	212	718	-5,756
BN	14	13,181	1,726	5,798	(7,544)	6,717	(2,194)	2,909	-48	2,815	-9,734
AN	15	28,831	2,698	9,005	(8,176)	18,612	(4,872)	14,724	65	15,226	-12,733
VW	9	120,008	2,721	16,057	(5,563)	113,173	(3,461)	108,564	705	109,269	-7,808
	50										

Table F-5 Run 2 Annual Water Budget Summary Table (continued)

Lower Santa Margarita River Groundwater Model

Modflow Volumetric Budget Output

Annual Groundwater Budget — Model Run: Run 2 UY+CH+LY Basin Yield

	INFLOW:					**OUTFLOW:**					
MY	Storage	Recharge	Stream Leakance	GHB	TOTAL GW IN	Storage	Wells	ET	Stream Leakance	GHB	TOTAL GW OUT
1	8,410	10,546	10,037	867	29,860	5,329	16,315	2,695	5,485	59	29,884
2	7,237	3,631	6,189	938	17,994	2,345	13,694	1,582	355	41	18,017
3	5,360	6,655	11,120	987	24,122	8,841	10,790	1,706	2,763	40	24,139
4	6,658	2,952	4,972	959	15,541	3,019	11,288	1,055	150	34	15,546
5	3,893	1,657	6,481	1,137	13,168	6,295	5,438	1,201	216	40	13,191
6	3,558	3,506	5,680	1,037	13,780	5,622	5,831	1,749	533	54	13,789
7	6,575	10,838	7,759	910	26,082	7,652	8,841	2,621	6,916	59	26,088
8	8,469	3,632	3,811	947	16,858	3,242	12,050	1,224	337	31	16,883
9	2,872	2,197	4,607	1,042	10,718	3,848	5,657	997	176	37	10,714
10	2,509	1,352	2,656	1,096	7,614	1,632	4,949	867	143	37	7,628
11	3,499	7,252	9,272	953	20,976	9,343	5,443	2,084	4,071	48	20,990
12	3,152	4,084	6,832	915	14,983	4,527	5,831	2,798	1,786	55	14,997
13	4,185	2,043	3,662	928	10,817	1,520	5,829	2,691	740	57	10,837
14	3,753	3,292	4,272	979	12,297	3,939	5,831	1,983	500	50	12,304
15	5,181	7,208	6,827	882	20,099	5,007	8,841	2,789	3,423	63	20,123
16	6,561	8,152	11,770	885	27,368	5,468	16,607	2,225	3,019	53	27,372
17	6,988	4,298	8,303	921	20,510	5,292	13,471	1,391	331	41	20,526
18	4,888	3,972	6,657	916	16,432	4,575	9,610	1,472	742	43	16,441
19	3,485	1,699	5,728	985	11,896	3,632	6,545	1,490	204	44	11,915
20	4,353	8,664	8,209	893	22,119	8,508	5,829	2,647	5,096	56	22,136
21	3,326	3,427	5,792	912	13,458	3,219	5,831	2,888	1,478	59	13,475
22	3,574	6,139	6,609	883	17,205	4,151	5,831	3,095	4,079	63	17,218
23	3,694	6,387	6,306	887	17,273	4,295	5,831	3,111	3,992	62	17,291
24	3,042	4,603	6,304	884	14,832	2,773	5,829	3,207	2,964	66	14,838
25	6,825	17,289	7,500	840	32,454	6,520	8,848	3,347	13,689	73	32,477
26	6,669	18,391	11,419	824	37,303	5,941	16,598	2,918	11,793	62	37,312
27	6,951	19,915	12,307	820	39,993	6,722	18,457	2,780	11,983	65	40,008
28	5,810	7,365	12,757	882	26,814	3,951	18,182	2,261	2,392	50	26,836
29	6,136	8,180	13,377	882	28,574	6,609	17,149	2,011	2,759	46	28,575
30	6,226	15,014	14,394	845	36,478	7,438	18,228	2,498	8,269	58	36,491
31	5,822	9,522	11,524	872	27,741	4,082	17,493	2,388	3,737	50	27,750
32	5,216	9,229	14,050	882	29,376	5,776	17,172	2,185	4,229	40	29,402
33	5,280	9,206	13,567	875	28,928	5,845	17,149	2,337	3,528	51	28,910
34	5,882	5,211	10,354	898	22,344	3,854	15,129	1,912	1,428	43	22,366
35	4,729	6,221	10,927	888	22,766	5,735	12,282	2,337	2,351	52	22,756
36	6,348	5,165	9,252	904	21,669	4,764	13,728	1,719	1,423	43	21,677
37	4,236	9,114	10,399	882	24,630	7,978	9,596	2,195	4,819	39	24,626
38	6,070	12,489	7,966	868	27,392	6,283	9,573	2,943	8,581	58	27,439
39	5,730	14,141	12,236	852	32,959	5,191	16,368	2,803	8,540	58	32,959
40	7,073	19,972	12,833	824	40,702	7,013	18,687	2,704	12,261	60	40,726
41	6,465	14,245	10,163	860	31,732	10,519	8,841	2,493	9,835	58	31,745
42	7,971	4,770	7,376	910	21,027	4,566	13,726	1,729	985	45	21,050
43	7,847	12,741	12,006	856	33,450	6,779	18,182	2,344	6,129	51	33,485
44	7,943	18,411	13,430	840	40,624	8,701	18,434	2,358	11,024	51	40,568
45	7,254	10,629	11,341	868	30,092	6,543	16,529	2,188	4,823	46	30,128
46	5,326	9,711	9,573	863	25,473	5,257	12,282	2,573	5,319	55	25,486
47	6,405	19,490	13,017	826	39,738	7,484	17,654	2,626	11,912	61	39,737
48	7,484	7,254	7,966	888	23,593	3,811	16,253	1,593	1,896	36	23,590
49	5,326	7,622	9,734	902	23,584	8,701	9,206	1,871	3,820	38	23,635
50	5,969	10,308	7,461	861	24,598	5,533	9,573	2,927	6,527	59	24,618
avg	5,564	8,396	8,936	905	23,801	5,513	11,747	2,232	4,271	51	23,814
med	5,816	7,309	8,778	886	23,588	5,399	11,669	2,337	3,476	51	23,613
AVERAGES											
ED	4,380	2,943	5,276	986	13,585	3,778	7,379	1,721	673	45	13,597
BN	5,161	6,497	8,314	902	20,875	5,545	10,193	2,181	2,925	47	20,892
AN	5,881	9,858	11,092	880	27,710	5,844	14,500	2,428	4,895	53	27,721
VW	6,930	16,375	11,294	843	35,442	7,334	15,004	2,716	10,338	60	35,453
MEDIANS											
ED	3,656	3,122	5,326	969	13,474	3,740	5,831	1,441	334	43	13,490
BN	4,888	6,387	8,209	898	21,669	4,575	9,596	2,084	3,820	43	21,677
AN	5,810	9,229	11,524	882	27,368	5,735	16,598	2,344	3,737	52	27,372
VW	6,825	17,289	12,307	840	36,478	7,013	17,654	2,695	11,024	59	36,491

(continued)
Lower Santa Margarita River Groundwater Model
Modflow Volumetric Budget Output
Annual Groundwater Budget

MY	NET Storage	NET Str Lknc	In-Out	% bal
1	-3,081	-4,552	-24.2	-0.08%
2	-4,892	-5,834	-22.5	-0.13%
3	3,481	-8,357	-17.5	-0.07%
4	-3,640	-4,823	-4.4	-0.03%
5	2,401	-6,264	-22.4	-0.17%
6	2,064	-5,147	-9.1	-0.07%
7	1,077	-843	-6.3	-0.02%
8	-5,227	-3,474	-25.3	-0.15%
9	976	-4,432	4.3	0.04%
10	-877	-2,513	-14.3	-0.19%
11	5,845	-5,201	-13.8	-0.07%
12	1,375	-5,046	-13.8	-0.09%
13	-2,665	-2,922	-19.2	-0.18%
14	186	-3,772	-7.3	-0.06%
15	-174	-3,404	-23.6	-0.12%
16	-1,093	-8,751	-3.8	-0.01%
17	-1,697	-7,973	-15.7	-0.08%
18	-312	-5,916	-9.2	-0.06%
19	147	-5,523	-18.5	-0.16%
20	4,155	-3,113	-16.9	-0.08%
21	-108	-4,314	-16.7	-0.12%
22	576	-2,530	-12.9	-0.08%
23	601	-2,314	-18.2	-0.11%
24	-269	-3,340	-6.1	-0.04%
25	-305	6,189	-22.5	-0.07%
26	-728	374	-9.3	-0.02%
27	-230	-324	-14.9	-0.04%
28	-1,860	-10,365	-22.5	-0.08%
29	473	-10,618	-0.1	0.00%
30	1,212	-6,125	-12.5	-0.03%
31	-1,740	-7,787	-9.0	-0.03%
32	560	-9,821	-26.2	-0.09%
33	565	-10,039	17.6	0.06%
34	-2,027	-8,926	-22.5	-0.10%
35	1,006	-8,577	9.9	0.04%
36	-1,584	-7,828	-8.2	-0.04%
37	3,742	-5,581	4.6	0.02%
38	213	615	-46.9	-0.17%
39	-539	-3,696	-0.1	0.00%
40	-60	-572	-23.3	-0.06%
41	4,054	-328	-12.6	-0.04%
42	-3,404	-6,391	-23.7	-0.11%
43	-1,067	-5,877	-34.6	-0.10%
44	758	-2,406	56.7	0.14%
45	-712	-6,517	-36.5	-0.12%
46	-69	-4,254	-13.5	-0.05%
47	1,079	-1,104	1.4	0.00%
48	-3,673	-6,070	2.8	0.01%
49	3,375	-5,914	-51.7	-0.22%
50	-436	-934	-19.5	-0.08%
avg	-51	-4,665	-13.1	-0.07%
med	-88	-4,934	-14.0	-0.07%
AVERAGES				
ED	-602	-4,602	-12.6	-0.10%
BN	384	-5,389	-17.1	-0.08%
AN	-36	-6,197	-10.6	-0.04%
VW	405	-956	-11.0	-0.04%
MEDIANS				
ED	-61	-4,627	-14.0	-0.08%
BN	-108	-5,834	-16.7	-0.08%
AN	-174	-7,787	-9.3	-0.03%
VW	213	-572	-14.9	-0.04%

Table F-6. Run 2 50-Year Average Monthly Water Budget

Lower Santa Margarita River Groundwater Model — Run 2 UY+CH+LY Basin Yield

Modflow Volumetric Budget Output and Streamflow — 6/25/06

Average Monthly Water Budget

Avg AF/M	SMR Flow In	Diversion	Str Gain+ / Loss-	SMR @ UY->CH	Str Gain+ / Loss-	SMR @ CH->LY	Str Gain+ / Loss-	SMR Flow Out	LSMR Str Gain+ / Loss-
Oct	526	325	-385	141	-82	59	11	70	-455
Nov	1,299	660	37	1,336	-524	812	-39	773	-526
Dec	1,969	530	-745	1,224	-185	1,040	26	1,066	-903
Jan	8,364	840	-1,082	7,282	-150	7,132	107	7,239	-1,124
Feb	10,263	2,062	-1,756	8,507	-169	8,338	83	8,422	-1,842
Mar	8,849	2,257	-1,359	7,490	-303	7,186	66	7,252	-1,596
Apr	3,159	1,482	-594	2,565	-346	2,219	11	2,230	-929
May	1,345	953	-269	1,076	-347	729	-13	716	-629
Jun	756	583	-6	750	-293	457	-14	443	-313
Jul	499	133	-22	477	-212	265	-4	261	-238
Aug	458	62	-183	275	-123	152	8	160	-298
Sep	547	60	-274	274	-106	167	10	177	-371
Avg Monthly	3,169	829	-553	2,616	-237	2,380	21	2,401	-769
Med Monthly	1,322	622	-329	1,150	-198	771	10	744	-578
Avg Total=Anl	38,034	9,948	-6,638	31,396	-2,839	28,557	252	28,809	-9,225

Lower Santa Margarita River Groundwater Model

Modflow Volumetric Budget Output

Average Monthly Water Budget

	INFLOW:					OUTFLOW:									
Avg AF/M	Storage	Recharge	Stream Leakance	GHB	TOTAL IN	Storage	Wells	ET	Stream Leakance	GHB	TOTAL OUT	NET Storage	NET Str Lknc	In-Out	% bal
Oct	639	46	388	81	1,155	49	914	157	30	7	1,157	-590	-358	-2.9	-0.25%
Nov	171	638	1,279	80	2,168	957	993	162	48	7	2,167	786	-1,232	1.1	0.05%
Dec	556	156	870	80	1,662	277	1,150	176	55	6	1,665	-279	-816	-2.4	-0.14%
Jan	405	365	1,261	79	2,109	518	1,348	179	59	4	2,109	113	-1,202	0.3	0.01%
Feb	313	1,930	933	77	3,253	1,454	1,314	173	311	-	3,252	1,141	-622	0.2	0.01%
Mar	173	2,315	977	75	3,540	1,209	1,221	204	901	0	3,536	1,036	-76	4.2	0.12%
Apr	356	1,529	803	68	2,755	505	999	208	1,038	8	2,757	148	235	-1.9	-0.07%
May	499	1,016	620	69	2,204	257	830	216	891	9	2,202	-242	272	1.2	0.05%
Jun	684	317	519	68	1,587	149	692	205	540	6	1,592	-534	21	-4.5	-0.28%
Jul	662	64	441	73	1,241	64	727	200	252	3	1,245	-598	-190	-4.2	-0.33%
Aug	499	10	397	78	985	45	654	186	102	0	988	-454	-295	-2.8	-0.29%
Sep	607	10	448	77	1,143	28	905	165	45	1	1,144	-579	-403	-1.3	-0.12%
Avg Monthly	464	700	745	75	1,983	459	979	186	356	4	1,984	-4	-389	-1.1	-0.10%
Med Monthly	499	341	711	77	1,886	267	953	182	177	5	1,887	-260	-326	-1.6	-0.09%
Avg Total=Anl	5,564	8,396	8,936	905	23,801	5,513	11,747	2,232	4,271	51	23,814	-51	-4,665	-13.1	

Attachment G

Run 3 (Mitigation) Model Results

Table G-1. Run 3 Annual Pumping Summary
Lower Santa Margarita River Groundwater Model

Hydrologic Condition

HC	Cnt	Oct to Apr Strflw
VW	9	Very Wet > 56,164
AN	15	Above Normal > 13,600
BN	14	Below Normal < 13,600
ED	12	Extremely Dry < 5,840
	50	

Pumping Condition

PC	HC	Q Adjst	Anl Q	Cnt	
1	2+ AN @ VW	4,000	19,000	5	10%
2	2+ AN @ AN	2,000	17,500	9	18%
3	Standard	500	15,500	10	20%
4	1st BN	-4,000	11,000	6	12%
5	2ndBN, 70/30 split	-8,000	7,000	3	6%
6	3+BN/all ED	-9,000	6,000	17	34%
				50	100%

MY	HC	Oct-Apr HC descrip	May-Apr Pumping Condition	UY Total (af/y)	CH Total (af/y)	LY Total (af/y)	LSMR Total (af/y)	+Q
1	VW	Very Wet	3	9,127	7,468	-	16,595	
2	BN	Below Normal	4	7,719	6,316	-	14,035	
3	AN	Above Normal	3	6,073	4,954	-	11,027	
4	ED	Extremely Dry	6	7,312	4,379	-	11,691	
5	ED	Extremely Dry	6	4,388	1,500	-	5,888	
6	ED	Extremely Dry	6	4,800	1,500	-	6,300	
7	AN	Above Normal	3	6,013	3,282	-	9,295	
8	ED	Extremely Dry	6	7,312	5,193	-	12,505	
9	ED	Extremely Dry	6	4,625	1,500	-	6,125	
10	ED	Extremely Dry	6	3,864	1,500	-	5,364	
11	BN	Below Normal	6	4,390	1,500	-	5,890	
12	ED	Extremely Dry	6	4,800	1,500	-	6,300	
13	ED	Extremely Dry	6	4,800	1,500	-	6,300	
14	ED	Extremely Dry	6	4,800	1,500	-	6,300	
15	AN	Above Normal	3	6,013	3,282	-	9,295	
16	AN	Above Normal	2	9,344	7,728	-	17,071	X
17	ED	Extremely Dry	6	8,054	5,800	-	13,854	
18	VW	Very Wet	3	6,013	3,282	-	9,295	
19	BN	Below Normal	4	7,719	6,316	-	14,035	
20	BN	Below Normal	5	5,904	3,908	-	9,812	
21	ED	Extremely Dry	6	5,340	1,669	-	7,008	
22	BN	Below Normal	6	4,800	1,500	-	6,300	
23	BN	Below Normal	6	4,800	1,500	-	6,300	
24	BN	Below Normal	6	4,800	1,500	-	6,300	
25	BN	Below Normal	6	4,800	1,500	-	6,300	
26	ED	Extremely Dry	6	4,800	1,500	-	6,300	
27	VW	Very Wet	3	6,013	3,282	-	9,295	
28	AN	Above Normal	2	9,344	7,728	-	17,071	X
29	VW	Very Wet	1	10,042	8,385	-	18,428	X
30	AN	Above Normal	2	9,870	8,247	-	18,117	X
31	AN	Above Normal	2	9,636	7,967	-	17,603	X
32	VW	Very Wet	1	10,057	8,312	-	18,369	X
33	AN	Above Normal	2	9,800	8,101	-	17,901	X
34	AN	Above Normal	2	9,676	7,917	-	17,593	X
35	AN	Above Normal	2	9,706	7,941	-	17,647	X
36	BN	Below Normal	4	8,461	6,923	-	15,384	
37	AN	Above Normal	3	6,856	5,609	-	12,465	
38	BN	Below Normal	4	7,719	6,316	-	14,035	
39	BN	Below Normal	5	5,904	3,908	-	9,812	
40	VW	Very Wet	3	6,552	3,451	-	10,003	
41	AN	Above Normal	2	9,288	7,599	-	16,887	X
42	VW	Very Wet	1	10,128	8,463	-	18,591	X
43	AN	Above Normal	2	9,870	8,247	-	18,117	X
44	VW	Very Wet	1	10,042	8,385	-	18,428	X
45	BN	Below Normal	4	8,808	7,378	-	16,186	
46	AN	Above Normal	3	6,856	5,609	-	12,465	
47	VW	Very Wet	1	9,694	8,018	-	17,712	X
48	BN	Below Normal	4	9,024	6,883	-	15,907	
49	BN	Below Normal	5	5,942	3,610	-	9,552	
50	AN	Above Normal	3	6,552	3,451	-	10,003	
			Min	3,864	1,500	-	5,364	
			Max	10,128	8,463	-	18,591	
			Median	**6,856**	**5,073**	**-**	**12,078**	
			% of Median	56.8%	42.0%	0.0%		
			Average	**7,165**	**4,896**	**-**	**12,061**	
			% of Average	59.4%	40.6%	0.0%		

Notes:
Hydrologic Condition: Oct - Apr
Model starts after 3+ BN or ED

Table G-1. Run 3 Annual Pumping Summary (continued)

	Oct-Apr HC Description	HC Count	UY Total (af/y)	CH Total (af/y)	LY Total (af/y)	LSMR Total (af/y)
AVERAGES	ED	12	5,408	2,420	-	7,828
	BN	14	6,485	4,218	-	10,703
	AN	15	8,326	6,511	-	14,837
	VW	9	8,630	6,561	-	15,190
MEDIANS	ED	12	4,800	1,500	-	6,300
	BN	14	5,923	3,908	-	9,812
	AN	15	9,344	7,728	-	17,071
	VW	9	9,694	8,018	-	17,712

Average Monthly Pumping

	Month	UY Total (af/m)	CH Total (af/m)	LY Total (af/m)	LSMR Total (af/m)
8%	Oct	560	380	0	940
8%	Nov	604	416	0	1,020
10%	Dec	703	482	0	1,185
11%	Jan	804	565	0	1,369
11%	Feb	790	548	0	1,337
10%	Mar	753	510	0	1,263
9%	Apr	619	413	0	1,032
7%	May	509	345	0	854
6%	Jun	423	287	0	711
6%	Jul	445	302	0	747
6%	Aug	400	271	0	672
8%	Sep	555	376	0	931
	Avg Anl	7,165	4,896	0	12,061

Table G-2. Run 3 Pumping Summaries
Lower Santa Margarita River Groundwater Model

		Bldg #	State ID #	Label	# mos Q	% of 600 mos	Orig Wells by Subbsn %	80% Utilization af/m	
1	UY	2673	10/4-7A2	7A2	600	100%	25%	142	
2	UY	26072	10/4-8D1	8D1	600	100%	21%	121	
3	UY	2671	10/4-7H2	7H2	600	100%	15%	82	
4	UY	PW-6	PW-6	PW-6	600	100%	19%	110	
5	UY	2603	10/4-7R2	7R2	600	100%	19%	110	
6	UY	UY-1	UY-1	UY-1	281	47%	0%	110	
7	UY	UY-2	UY-2	UY-2	202	34%	0%	110	
8	UY	UY-3	UY-3	UY-3	139	23%	0%	110	
9	UY	UY-4	UY-4	UY-4	87	15%	0%	110	
10	UY	UY-5	UY-5	UY-5	58	10%	0%	110	
11	UY	UY-6	UY-6	UY-6	21	4%	0%	110	
12	CH	2393	10/4-18E3	18E4	600	100%	14%	121	
13	CH	2373	10/4-18M4&5	18M5	600	100%	17%	153	
14	CH	2363	10/5-13R2	13R2	600	100%	15%	132	
15	CH	33925	10/5-23G4	23G4	**0**	**0%**	15%	**0**	backup
16	CH	2301	10/5-23J1	23J1	600	100%	19%	164	
17	CH	33924	10/5-23K2	23K2	**0**	**0%**	6%	**0**	backup
18	CH	33923	10/5-23K3	23K3	600	100%	15%	132	
19	CH	CH-1	CH-1	CH-1	96	16%	0%	88	
20	CH	CH-2	CH-2	CH-2	75	13%	0%	88	
21	CH	CH-3	CH-3	CH-3	37	6%	0%	88	
22	CH	CH-4	CH-4	CH-4	5	1%	0%	88	

% Pumping in Subbasin

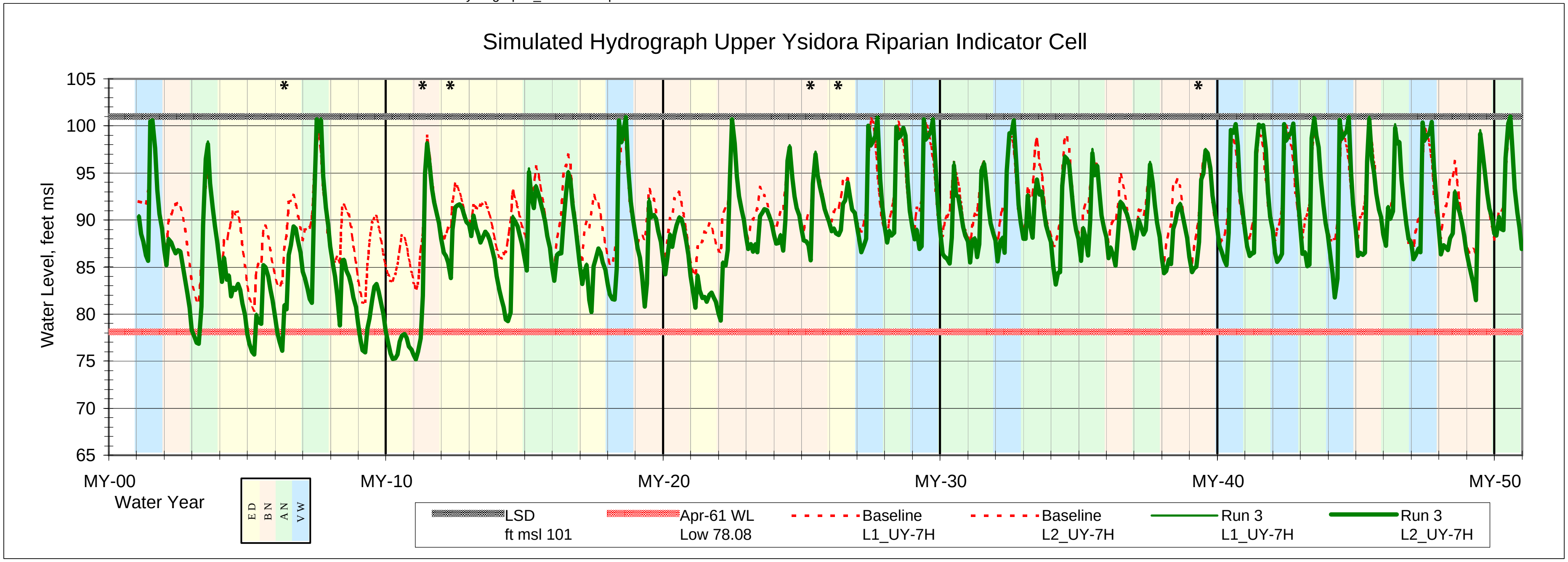
		Wet Year Algorithm			Dry Year Management			Max Pumping in Subbasin adding wells as needed				
		55%	45%	0%	76%	24%	0%					
mo	Anl %	UY	CH	LY	UY	CH	LY		UY	CH	LY	Total
OCT	7.9%	4.4%	3.6%	0.00%	6.3%	2.0%	0.00%	# exst wells	5	7	-	12
NOV	8.6%	4.7%	3.9%	0.00%	6.9%	2.2%	0.00%	af/m (75%)	564	833	-	1,397
DEC	10.0%	5.5%	4.5%	0.00%	8.0%	2.5%	0.00%	avg af/well	113	119	-	116
JAN	11.4%	6.3%	5.1%	0.00%	9.1%	2.9%	0.00%					
FEB	10.9%	6.0%	4.9%	0.00%	8.8%	2.7%	0.00%	1 adntl well	674	921	55	1,650
MAR	10.2%	5.6%	4.6%	0.00%	8.2%	2.5%	0.00%	2 adntl well	784	1,008	110	1,902
APR	8.3%	4.6%	3.7%	0.00%	6.6%	2.1%	0.00%	3 adntl well	893	1,096	164	2,154
MAY	7.1%	3.9%	3.2%	0.00%	5.7%	1.8%	0.00%	4 adntl well	1,003	1,184	219	2,406
JUN	5.9%	3.2%	2.7%	0.00%	4.7%	1.5%	0.00%	5 adntl well	1,112	1,271		2,384
JUL	6.2%	3.4%	2.8%	0.00%	5.0%	1.6%	0.00%	6 adntl well	1,222			1,222
AUG	5.6%	3.1%	2.5%	0.00%	4.5%	1.4%	0.00%	50-yr Avg	5,844	4,875	1,225	
SEP	7.8%	4.3%	3.5%	0.00%	6.2%	1.9%	0.00%	50-yr Med	5,705	5,330	1,161	

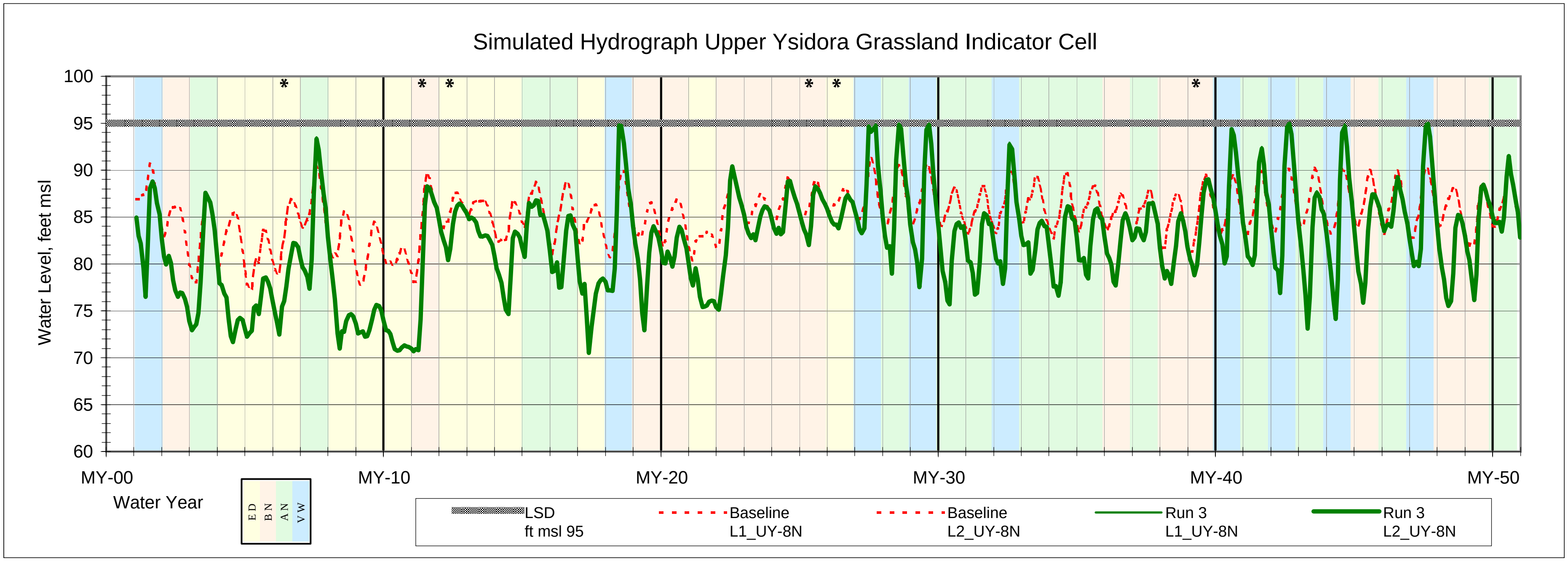
	median						
	UY af/m	CH af/m	LY af/m	Total af/m	Max Mo Pumping	cfs	new wells
ED	414	153	0	631	1,999	35	8
BN	475	292	0	690	2,171	38	10
AN	663	542	0	1,205	2,171	38	10
VW	663	543	0	1,206	2,228	39	10

		Table G-3. Run 3 Annual Pumping by Well										
	Building #:	2673	26072	2671	PW-6	2603	new	new	new	new	new	new
Max Annual Pumping		1,617	1,368	933	1,244	1,244	1,136	940	732	530	316	205
Potential w/ 80% Util		1,710	1,447	986	1,315	1,315	1,315	1,315	1,315	1,315	1,315	1,315
Potential Well Yield (gpm)		1,300	1,100	750	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
		UY	UY	UY	UY	UY	UY	UY	UY	UY	UY	UY
		10/4-7A2	10/4-8D1	10/4-7H2	PW-6	10/4-7R2	UY-1	UY-2	UY-3	UY-4	UY-5	UY-6
MY	HC	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)
1	VW	1,592	1,347	918	1,225	1,225	932	726	528	317	317	0
2	BN	1,428	1,209	824	1,099	1,099	716	716	420	208	0	0
3	AN	1,380	1,167	796	1,061	1,061	511	97	0	0	0	0
4	ED	1,326	1,122	765	1,020	1,020	716	716	420	208	0	0
5	ED	1,108	937	639	852	852	0	0	0	0	0	0
6	ED	1,212	1,025	699	932	932	0	0	0	0	0	0
7	AN	1,466	1,240	846	1,127	1,127	206	0	0	0	0	0
8	ED	1,326	1,122	765	1,020	1,020	716	716	420	208	0	0
9	ED	1,168	988	674	898	898	0	0	0	0	0	0
10	ED	975	825	563	750	750	0	0	0	0	0	0
11	BN	1,108	938	639	852	852	0	0	0	0	0	0
12	ED	1,212	1,025	699	932	932	0	0	0	0	0	0
13	ED	1,212	1,025	699	932	932	0	0	0	0	0	0
14	ED	1,212	1,025	699	932	932	0	0	0	0	0	0
15	AN	1,466	1,240	846	1,127	1,127	206	0	0	0	0	0
16	AN	1,566	1,325	903	1,205	1,205	1,100	911	513	308	308	101
17	ED	1,345	1,138	776	1,035	1,035	732	732	625	425	212	0
18	VW	1,466	1,240	846	1,127	1,127	206	0	0	0	0	0
19	BN	1,428	1,209	824	1,099	1,099	716	716	420	208	0	0
20	BN	1,364	1,154	787	1,049	1,049	403	97	0	0	0	0
21	ED	1,273	1,077	734	979	979	297	0	0	0	0	0
22	BN	1,212	1,025	699	932	932	0	0	0	0	0	0
23	BN	1,212	1,025	699	932	932	0	0	0	0	0	0
24	BN	1,212	1,025	699	932	932	0	0	0	0	0	0
25	BN	1,212	1,025	699	932	932	0	0	0	0	0	0
26	ED	1,212	1,025	699	932	932	0	0	0	0	0	0
27	VW	1,466	1,240	846	1,127	1,127	206	0	0	0	0	0
28	AN	1,566	1,325	903	1,205	1,205	1,100	911	513	308	308	101
29	VW	1,614	1,366	931	1,242	1,242	1,242	941	731	420	314	207
30	AN	1,569	1,328	905	1,207	1,207	1,103	914	713	511	412	210
31	AN	1,581	1,338	912	1,216	1,216	1,112	923	616	413	308	101
32	VW	1,616	1,367	932	1,243	1,243	1,243	943	732	421	316	101
33	AN	1,574	1,332	908	1,211	1,211	1,107	917	717	515	308	101
34	AN	1,586	1,342	915	1,220	1,220	1,116	927	620	417	312	0
35	AN	1,590	1,346	918	1,223	1,223	1,119	930	623	420	315	0
36	BN	1,448	1,225	835	1,114	1,114	732	732	625	425	212	0
37	AN	1,552	1,314	896	1,194	1,194	609	97	0	0	0	0
38	BN	1,428	1,209	824	1,099	1,099	716	716	420	208	0	0
39	BN	1,364	1,154	787	1,049	1,049	403	97	0	0	0	0
40	VW	1,527	1,292	881	1,175	1,175	503	0	0	0	0	0
41	AN	1,573	1,331	907	1,210	1,210	1,105	916	518	313	206	0
42	VW	1,625	1,375	938	1,250	1,250	1,250	950	739	428	323	215
43	AN	1,569	1,328	905	1,207	1,207	1,103	914	713	511	412	210
44	VW	1,614	1,366	931	1,242	1,242	1,242	941	731	420	314	207
45	BN	1,439	1,218	830	1,107	1,107	725	725	725	516	418	210
46	AN	1,552	1,314	896	1,194	1,194	609	97	0	0	0	0
47	VW	1,605	1,358	926	1,235	1,235	1,235	934	633	319	213	105
48	BN	1,452	1,229	838	1,117	1,117	714	714	714	613	514	312
49	BN	1,372	1,161	792	1,055	1,055	407	100	0	0	0	0
50	AN	1,527	1,292	881	1,175	1,175	503	0	0	0	0	0
	Min	975	825	563	750	750	0	0	0	0	0	0
	Max	1,625	1,375	938	1,250	1,250	1,250	950	739	613	514	312
	Median	1,444	1,221	833	1,110	1,110	609	98	0	0	0	0
	Average	1,410	1,193	813	1,085	1,085	573	415	289	181	121	44
Average Monthly Well Production												
	Month	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)
	Oct	114	97	66	88	88	48	48	10	0	0	0
	Nov	118	100	68	91	91	49	49	28	10	10	0
	Dec	127	108	73	98	98	60	50	50	29	29	8
	Jan	135	114	78	104	104	69	62	51	51	51	36
	Feb	134	113	77	103	103	69	50	50	50	50	40
	Mar	129	109	74	99	99	67	50	50	39	39	35
	Apr	120	102	69	93	93	49	49	39	2	2	2
	May	110	93	63	84	84	47	28	0	0	0	0
	Jun	100	85	58	77	77	27	0	0	0	0	0
	Jul	105	89	61	81	81	28	0	0	0	0	0
	Aug	99	84	57	76	76	9	0	0	0	0	0
	Sep	118	100	68	91	91	50	29	10	0	0	0
	Annual Total	1,410	1,193	813	1,085	1,085	573	415	289	181	181	121

		Table G-3. Run 3 Annual Pumping by Well (continued)										
	Building #:	2393	2373	2363	33925	2301	33924	33923	new	new	new	new
	Max Annual Pumping	1,244	1,583	1,357	0	1,696	0	1,357	413	330	170	84
	Potential w/ 80% Util	1,447	1,841	1,578	0	1,973	0	1,578	1,052	1,052	1,052	1,052
	Potential Well Yield (gpm)	1,100	1,400	1,200	0	1,500	0	1,200	800	800	800	800
		CH	CH	CH	CH	CH	CH	CH	CH	CH	CH	CH
		10/4-18E3	10/4-18M4&5	10/5-13R2	10/5-23G4	10/5-23J1	10/5-23K2	10/5-23K3	CH-1	CH-2	CH-3	CH-4
MY	HC	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)
1	VW	1,168	1,487	1,274	0	1,593	0	1,274	334	255	82	0
2	BN	1,030	1,311	1,124	0	1,405	0	1,124	244	80	0	0
3	AN	851	1,084	929	0	1,161	0	929	0	0	0	0
4	ED	725	923	791	0	989	0	791	80	80	0	0
5	ED	258	328	281	0	352	0	281	0	0	0	0
6	ED	258	328	281	0	352	0	281	0	0	0	0
7	AN	564	718	615	0	769	0	615	0	0	0	0
8	ED	837	1,065	913	0	1,141	0	913	244	80	0	0
9	ED	258	328	281	0	352	0	281	0	0	0	0
10	ED	258	328	281	0	352	0	281	0	0	0	0
11	BN	258	328	281	0	352	0	281	0	0	0	0
12	ED	258	328	281	0	352	0	281	0	0	0	0
13	ED	258	328	281	0	352	0	281	0	0	0	0
14	ED	258	328	281	0	352	0	281	0	0	0	0
15	AN	564	718	615	0	769	0	615	0	0	0	0
16	AN	1,215	1,546	1,325	0	1,657	0	1,325	247	247	165	0
17	ED	870	1,108	949	0	1,187	0	949	327	327	82	0
18	VW	564	718	615	0	769	0	615	0	0	0	0
19	BN	1,030	1,311	1,124	0	1,405	0	1,124	244	80	0	0
20	BN	672	855	733	0	916	0	733	0	0	0	0
21	ED	287	365	313	0	391	0	313	0	0	0	0
22	BN	258	328	281	0	352	0	281	0	0	0	0
23	BN	258	328	281	0	352	0	281	0	0	0	0
24	BN	258	328	281	0	352	0	281	0	0	0	0
25	BN	258	328	281	0	352	0	281	0	0	0	0
26	ED	258	328	281	0	352	0	281	0	0	0	0
27	VW	564	718	615	0	769	0	615	0	0	0	0
28	AN	1,215	1,546	1,325	0	1,657	0	1,325	247	247	165	0
29	VW	1,270	1,616	1,385	0	1,732	0	1,385	413	332	253	0
30	AN	1,246	1,585	1,359	0	1,699	0	1,359	417	335	166	81
31	AN	1,229	1,564	1,341	0	1,676	0	1,341	326	326	165	0
32	VW	1,261	1,604	1,375	0	1,719	0	1,375	406	325	246	0
33	AN	1,237	1,574	1,350	0	1,687	0	1,350	410	329	165	0
34	AN	1,233	1,570	1,345	0	1,682	0	1,345	330	330	82	0
35	AN	1,226	1,560	1,337	0	1,671	0	1,337	324	324	162	0
36	BN	1,063	1,353	1,160	0	1,450	0	1,160	327	327	82	0
37	AN	964	1,227	1,052	0	1,315	0	1,052	0	0	0	0
38	BN	1,030	1,311	1,124	0	1,405	0	1,124	244	80	0	0
39	BN	672	855	733	0	916	0	733	0	0	0	0
40	VW	593	755	647	0	809	0	647	0	0	0	0
41	AN	1,209	1,538	1,319	0	1,648	0	1,319	243	243	81	0
42	VW	1,269	1,615	1,384	0	1,731	0	1,384	412	331	252	84
43	AN	1,246	1,585	1,359	0	1,699	0	1,359	417	335	166	81
44	VW	1,270	1,616	1,385	0	1,732	0	1,385	413	332	253	0
45	BN	1,081	1,376	1,180	0	1,474	0	1,180	500	339	166	81
46	AN	964	1,227	1,052	0	1,315	0	1,052	0	0	0	0
47	VW	1,250	1,591	1,363	0	1,704	0	1,363	329	248	169	0
48	BN	1,025	1,305	1,118	0	1,398	0	1,118	418	252	166	81
49	BN	620	790	677	0	846	0	677	0	0	0	0
50	AN	593	755	647	0	809	0	647	0	0	0	0
	Min	258	328	281	0	352	0	281	0	0	0	0
	Max	1,270	1,616	1,385	0	1,732	0	1,385	500	339	253	84
	Median	844	1,074	921	0	1,151	0	921	0	0	0	0
	Average	781	994	852	0	1,065	0	852	158	124	61	8
Average Monthly W												
	Month	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)
	Oct	65	83	71	0	89	0	71	0	0	0	0
	Nov	70	89	76	0	96	0	76	8	0	0	0
	Dec	75	96	82	0	102	0	82	23	23	0	0
	Jan	77	98	84	0	105	0	84	39	39	28	8
	Feb	78	99	85	0	106	0	85	39	32	25	0
	Mar	75	95	81	0	102	0	81	38	30	8	0
	Apr	69	88	75	0	94	0	75	11	0	0	0
	May	59	76	65	0	81	0	65	0	0	0	0
	Jun	49	63	54	0	67	0	54	0	0	0	0
	Jul	52	66	57	0	71	0	57	0	0	0	0
	Aug	47	59	51	0	64	0	51	0	0	0	0
	Sep	65	82	71	0	88	0	71	0	0	0	0
	Annual Total	781	994	852	0	1,065	0	852	158	124	61	8

I:\DATA\2148\Tech Memos\TechMemo2.2\Attachments\G.Run3\C.IC-hydrographs_Run 3.xls / printed 1/11/2007





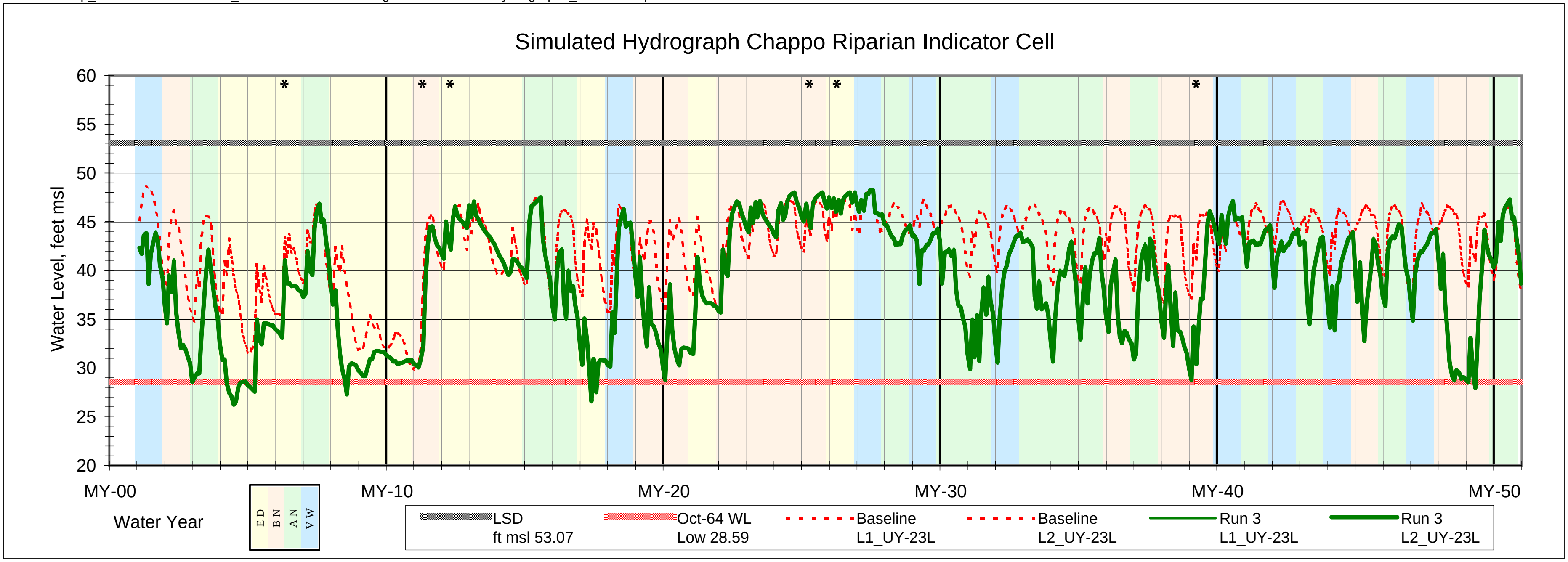
***** Emergency flows called upon during water years marked with an asterisk.

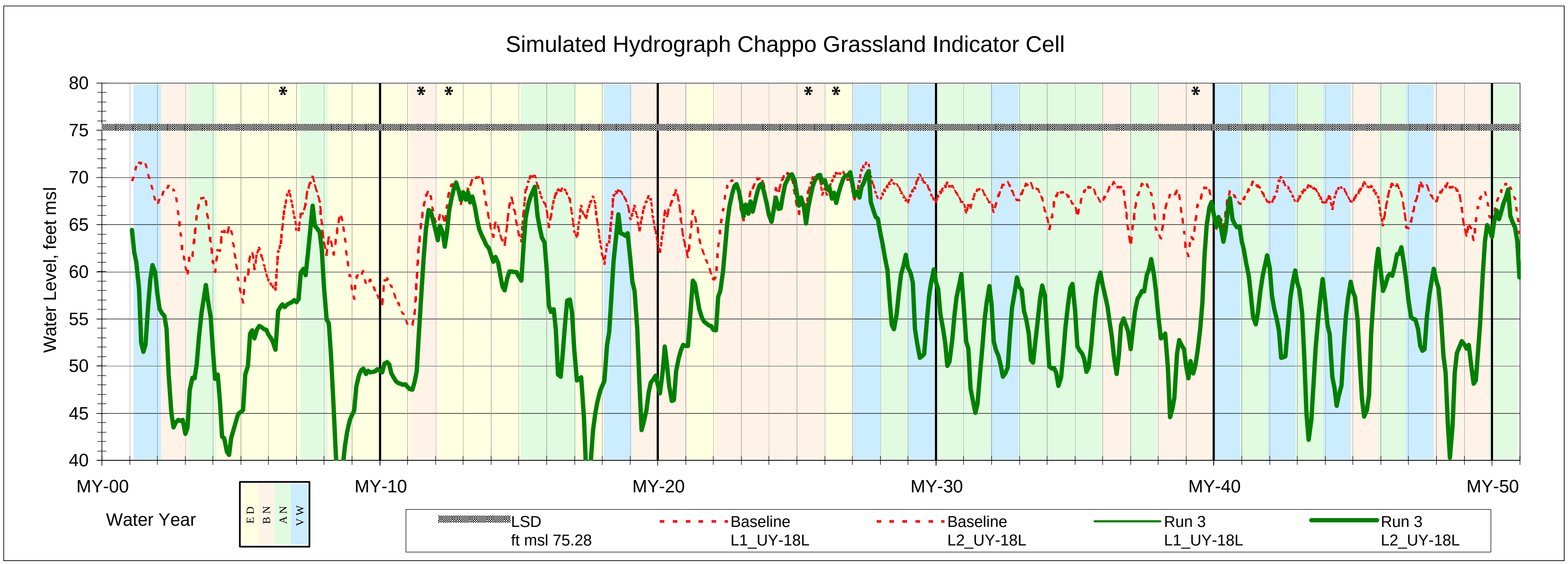
Layer 1 (L1) and Layer 2(L2) simulated groundwater levels are at similar elevations and the graph lines are printed on top of each other.

FIGURE G-1

Run 3 Habitat Mitigation and Baseline Hydrographs

D:\Camp_Pendleton\SMR\USBR_model\Run3 Habitat Mitigation\POST\C.IC-hydrographs_Run 3.xls / printed 7/5/2006



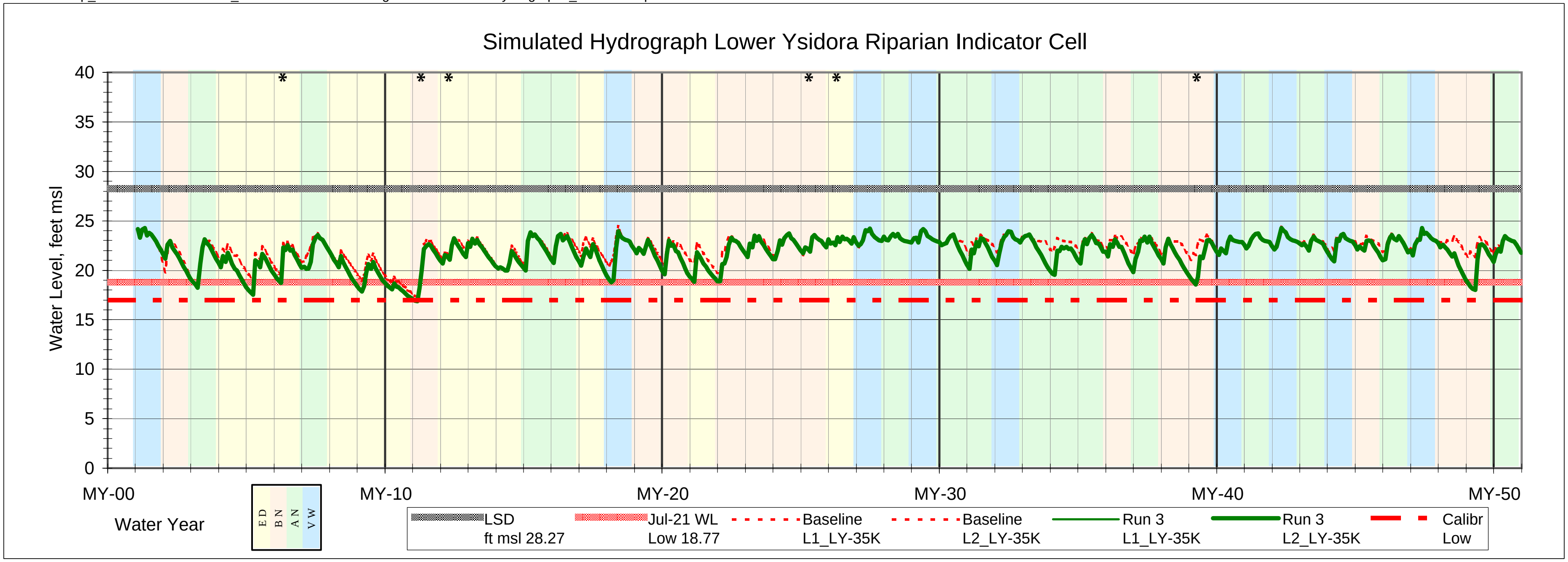


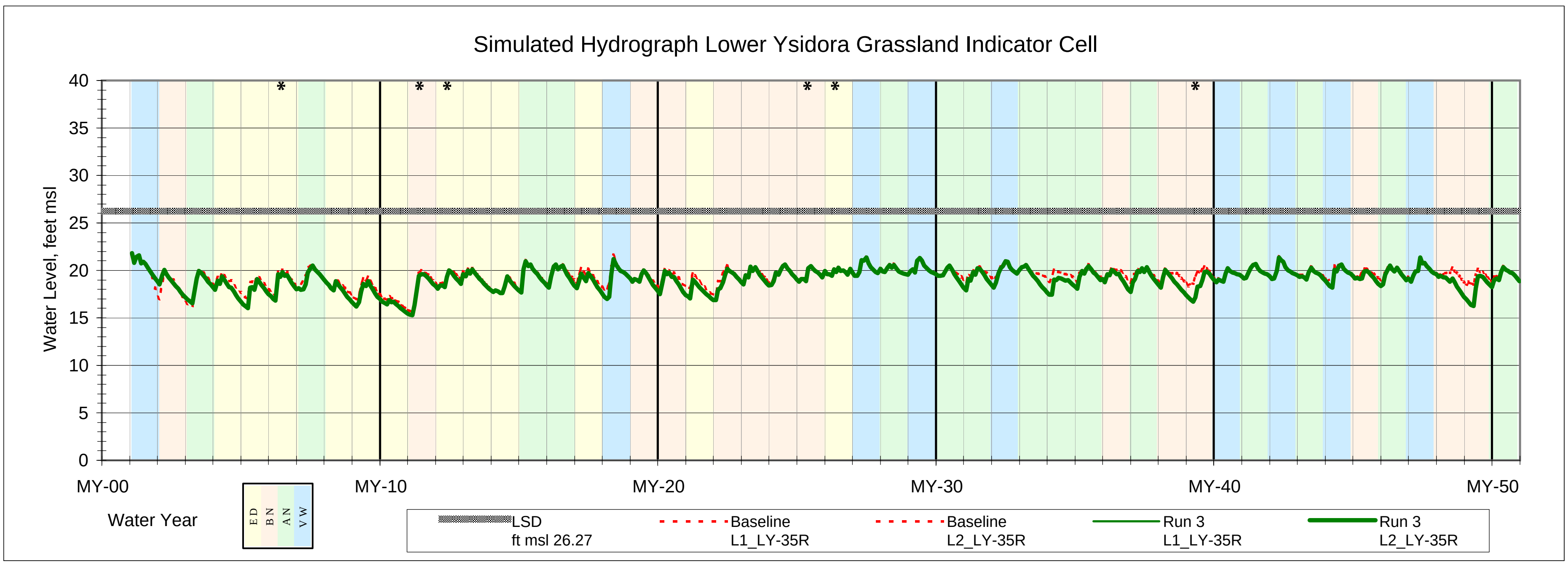
***** Emergency flows called upon during water years marked with an asterisk.

Layer 1 (L1) and Layer 2(L2) simulated groundwater levels are at similar elevations and the graph lines are printed on top of each other.

FIGURE G-2

Run 3 Habitat Mitigation and Baseline Hydrographs





***** Emergency flows called upon during water years marked with an asterisk.

Layer 1 (L1) and Layer 2(L2) simulated groundwater levels are at similar elevations and the graph lines are printed on top of each other.

FIGURE G-3

Run 3 Habitat Mitigation and Baseline Hydrographs

Figure G-4. Simulated Streamflow; Run 3 Habitat Mitigation and Baseline

Table G-4 Run 3 Habitat Mitigation

Average Hydrologic Condition Water Budget (af/y)

% Time Exceedence	*> 76%*	*76% to 50%*	*50% to 19%*	*< 19%*
# Years	*12*	*14*	*15*	*9*
	Extremely Dry	Below Normal	Above Normal	Very Wet
Inflow:				
Santa Margarita River Inflow	7,400	13,300	32,300	127,100
Subsurface Underflow	1,000	900	900	800
Lake O'Neill Spill and Release	800	1,400	1,800	2,200
Fallbrook Creek	100	400	1,400	3,800
Minor Tributary Drainages	1,700	1,400	2,400	4,900
Areal Precipitation	500	500	700	1,600
Total Inflow:	11,500	17,900	39,500	140,400
Outflow:				
Santa Margarita River Outflow	1,500	2,900	19,600	118,800
Subsurface Underflow	100	100	100	100
Groundwater Pumping	7,800	10,700	14,900	15,300
Evapotranspiration	1,700	2,200	2,500	2,900
Diversions to Lake O'Neill	1,200	1,900	2,400	2,700
Total Outflow:	12,300	17,800	39,500	139,800
Net Simulated Change of Groundwater in Storage:	-800	100	0	600
	-	-	-	-

Median Hydrologic Condition Water Budget (af/y)

% Time Exceedence	*> 76%*	*76% to 50%*	*50% to 19%*	*< 19%*
# Years	*12*	*14*	*15*	*9*
	Extremely Dry	Below Normal	Above Normal	Very Wet
Inflow:				
Santa Margarita River Inflow	6,800	13,200	28,800	120,000
Subsurface Underflow	1,000	900	900	800
Lake O'Neill Spill and Release	700	1,300	2,100	2,300
Fallbrook Creek	100	300	1,100	3,500
Minor Tributary Drainages	1,500	1,400	2,500	4,700
Areal Precipitation	400	300	500	1,500
Outflow:				
Santa Margarita River Outflow	700	2,500	15,100	108,900
Subsurface Underflow	100	100	100	100
Groundwater Pumping	6,300	9,800	17,200	17,800
Evapotranspiration	1,300	1,800	2,300	2,700
Diversions to Lake O'Neill	1,300	1,700	2,700	2,700
Net Simulated Change of Groundwater in Storage:	-200	-300	-100	400

Average Subbasin Water Budget (af/y)

	Upper Ysidora	Chappo	Lower Ysidora	SMR Basin	
Inflow:					
Santa Margarita River Inflow	38,000	30,700	28,000	38,000	85%
Subsurface Underflow *	900	2,000	400	900	2%
Lake O'Neill Spill and Release	1,500	0	0	1,500	3%
Fallbrook Creek	1,200	0	0	1,200	3%
Minor Tributary Drainages	600	1,100	700	2,400	5%
Areal Precipitation	200	300	200	800	2%
Total Inflow:	42,400	34,100	29,300	44,800	
Outflow:					
Santa Margarita River Outflow	30,700	28,000	28,500	28,400	63%
Subsurface Underflow *	2,000	400	100	100	0%
Groundwater Pumping	7,200	4,900	0	12,100	27%
Evapotranspiration *	700	800	800	2,300	5%
Diversions to Lake O'Neill	2,000	0	0	2,000	4%
Total Outflow:	42,600		29,400	44,900	
Net Simulated Change of Groundwater in Storage: *	0	0	0	-100	
				-	

Note: * Subbasin Medians are based on the last rate of the stress period
Values are rounded to the nearest 100 acre-feet, closest number adjusted to eliminate rounding error

Median Subbasin Water Budget (af/y)

	Upper Ysidora	Chappo	Lower Ysidora	SMR Basin
Inflow:				
Santa Margarita River Inflow	16,000	7,400	5,000	16,000
Subsurface Underflow *	900	2,100	400	900
Lake O'Neill Spill and Release	1,500	0	0	1,500
Fallbrook Creek	600	0	0	600
Minor Tributary Drainages	200	0	100	2,100
Areal Precipitation	8,400	0	7,209	500
Outflow:				
Santa Margarita River Outflow	7,400	5,000	5,500	5,500
Subsurface Underflow *	2,100	400	100	100
Groundwater Pumping	6,900	5,100	0	12,100
Evapotranspiration *	700	800	800	2,300
Diversions to Lake O'Neill	2,200	0	0	2,200
Net Simulated Change of Groundwater in Storage: *	0	0	0	-100

Note: The sum of median values does not reflect the change of groundwater in storage.
Median values are not cummulative.
* Subbasin Medians are based on the last rate of the stress period
Values are rounded to the nearest 100 acre-feet

Table G-5 Run 3 Annual Water budget

Lower Santa Margarita River Groundwater Model — Run 3 Habitat Mitigation

Annual Surface Water Budget

MY		SMR Flow In	LON Diversion	Ponds Diversion	Str Gain+ / Loss-	GAGE SMR @ UY->CH	Str Gain+ / Loss-	SMR @ CH->LY	Str Gain+ / Loss-	SMR Flow Out	LSMR Str Gain+ / Loss-
1	VW	66,394	2,364	9,462	-7,724	58,669	-2,001	56,668	1,853	58,521	-7,872
2	BN	8,737	1,531	3,425	-6,465	2,272	-2,092	179	145	324	-8,413
3	AN	15,652	1,063	6,435	-9,309	6,343	-4,325	2,019	-173	1,846	-13,806
4	ED	6,759	1,323	2,646	-6,457	302	-291	11	288	299	-6,460
5	ED	6,151	337	1,336	-4,459	1,692	-579	1,114	308	1,422	-4,729
6	ED	8,228	1,307	2,764	-7,061	1,168	162	1,329	718	2,047	-6,181
7	AN	46,769	1,151	10,205	-6,615	40,154	-2,148	38,006	731	38,737	-8,032
8	ED	6,750	1,291	3,474	-6,141	610	-608	2	205	206	-6,544
9	ED	4,840	786	1,820	-4,805	35	-32	3	240	243	-4,598
10	ED	3,399	393	1,216	-3,399	-	0	-	101	101	-3,298
11	BN	13,724	1,569	6,768	-9,389	4,335	-2,453	1,882	267	2,149	-11,575
12	ED	11,055	1,665	3,801	-6,051	5,004	-1,633	3,371	399	3,770	-7,285
13	ED	4,963	577	1,797	-3,040	1,924	-125	1,799	430	2,228	-2,735
14	ED	5,802	412	2,946	-5,736	66	-33	33	244	277	-5,525
15	AN	21,921	2,747	6,133	-7,145	14,776	-958	13,818	1,316	15,134	-6,787
16	AN	23,865	2,344	7,509	-9,848	14,017	-2,753	11,264	1,155	12,419	-11,446
17	ED	10,105	1,979	3,961	-8,743	1,362	-1,172	190	574	764	-9,341
18	VW	105,552	2,415	13,044	-4,393	101,159	-2,763	98,396	1,484	99,879	-5,672
19	BN	13,124	2,317	4,573	-8,919	4,204	-1,632	2,572	111	2,683	-10,440
20	BN	8,950	1,265	3,583	-6,451	2,499	-1,152	1,348	320	1,668	-7,283
21	ED	7,739	1,831	1,408	-5,680	2,059	-1,368	691	34	725	-7,014
22	BN	14,802	1,515	8,296	-7,521	7,282	-3,063	4,218	-49	4,169	-10,633
23	BN	12,321	1,607	2,949	-5,314	7,007	-450	6,557	714	7,271	-5,050
24	BN	11,377	1,698	5,664	-5,473	5,904	-1,298	4,607	487	5,094	-6,283
25	BN	12,396	1,733	5,798	-5,649	6,747	-1,345	5,403	422	5,824	-6,572
26	ED	12,737	2,156	4,171	-5,717	7,020	-585	6,435	801	7,236	-5,501
27	VW	126,820	2,791	16,057	-1,200	125,620	403	126,023	2,203	128,226	1,406
28	AN	55,061	2,722	18,024	-8,952	46,109	-5,415	40,694	478	41,172	-13,889
29	VW	181,076	2,723	18,884	-6,299	174,777	-3,622	171,156	1,939	173,095	-7,981
30	AN	28,831	2,750	7,141	-10,941	17,890	-4,876	13,014	207	13,221	-15,610
31	AN	62,376	2,698	7,723	-8,799	53,576	-4,508	49,069	524	49,593	-12,783
32	VW	105,844	2,721	14,249	-7,256	98,587	-6,082	92,505	857	93,362	-12,481
33	AN	29,560	2,714	9,308	-10,356	19,204	-4,471	14,734	514	15,248	-14,313
34	AN	22,097	2,701	9,005	-11,526	10,571	-6,428	4,143	-116	4,027	-18,070
35	AN	39,296	2,235	8,776	-8,411	30,884	-5,347	25,537	559	26,096	-13,199
36	BN	14,221	2,155	4,939	-9,061	5,159	-3,029	2,130	198	2,329	-11,892
37	AN	19,246	1,923	5,782	-5,577	13,668	-4,159	9,510	461	9,971	-9,274
38	BN	12,659	1,726	4,895	-8,014	4,645	-2,097	2,548	361	2,910	-9,749
39	BN	16,158	2,439	8,958	-8,585	7,573	-5,312	2,261	-237	2,024	-14,133
40	VW	64,445	2,820	12,300	-5,354	59,091	-2,982	56,109	293	56,402	-8,042
41	AN	42,492	2,711	13,804	-9,876	32,615	-5,614	27,001	327	27,328	-15,163
42	VW	251,872	2,723	19,141	-6,162	245,710	-4,345	241,365	1,330	242,695	-9,177
43	AN	24,441	2,752	12,576	-11,560	12,881	-5,345	7,536	163	7,698	-16,743
44	VW	121,487	2,675	17,734	-8,747	112,741	-4,950	107,790	1,198	108,988	-12,499
45	BN	18,009	2,750	10,475	-11,124	6,885	-5,143	1,742	-18	1,725	-16,285
46	AN	29,997	2,137	9,291	-6,852	23,145	-3,283	19,862	626	20,489	-9,509
47	VW	120,008	2,717	18,548	-7,491	112,517	-4,869	107,648	1,273	108,921	-11,087
48	BN	13,181	2,745	7,070	-11,272	1,910	-1,624	285	145	431	-12,751
49	BN	15,897	1,871	7,458	-8,307	7,590	-4,464	3,127	-251	2,875	-13,022
50	AN	22,506	2,602	9,949	-6,817	15,689	-2,893	12,796	164	12,960	-9,546
	avg	38,034	2,004	7,945	**-7,321**	30,713	**-2,703**	28,010	**526**	28,536	**-9,497**
	med	16,027	2,155	7,106	-7,103	7,427	-2,603	5,005	380	5,459	-9,308
AVERAGES											
ED	12	7,377	1,171	2,612	(5,607)	1,770	(522)	1,248	362	1,610	-5,768
BN	14	13,254	1,923	6,061	(7,967)	5,287	(2,511)	2,776	187	2,963	-10,291
AN	15	32,274	2,350	9,444	(8,839)	23,435	(4,168)	19,267	462	19,729	-12,545
VW	9	127,055	2,661	15,491	(6,069)	120,986	(3,468)	117,518	1,381	118,899	-8,156
	50										
MEDIANS											
ED	12	6,755	1,299	2,705	(5,726)	1,265	(435)	441	298	744	-5,853
BN	14	13,152	1,729	5,731	(8,160)	5,532	(2,095)	2,404	172	2,506	-10,537
AN	15	28,831	2,698	9,005	(8,952)	17,890	(4,471)	13,818	478	15,134	-13,199
VW	9	120,008	2,721	16,057	(6,299)	112,517	(3,622)	107,648	1,330	108,921	-8,042
	50										

Table G-5 Run 3 Annual Water budget (continued)
Lower Santa Margarita River Groundwater Model
Annual Groundw ater Budget Model Run: Run 3 Habitat Mitigation

	INFLOW:					OUTFLOW:					
MY	Storage	Recharge	Stream Leakance	GHB	TOTAL GW IN	Storage	Wells	ET	Stream Leakance	GHB	TOTAL GW OUT
1	8,773	10,546	10,305	866	30,490	5,467	16,595	2,711	5,674	66	30,513
2	7,637	3,631	6,284	936	18,487	2,350	14,036	1,560	508	54	18,509
3	5,597	6,655	11,365	995	24,612	9,221	11,026	1,633	2,699	50	24,629
4	7,123	2,952	4,961	958	15,994	2,896	11,690	1,073	296	52	16,007
5	4,135	1,657	6,579	1,168	13,539	6,335	5,891	1,032	254	47	13,559
6	3,705	3,506	5,799	1,062	14,072	5,849	6,299	1,464	419	55	14,087
7	6,600	10,838	8,551	921	26,911	8,604	9,295	2,429	6,496	61	26,885
8	9,075	3,632	3,765	944	17,415	3,239	12,505	1,247	403	49	17,442
9	3,122	2,197	4,601	1,071	10,991	3,673	6,125	913	228	47	10,986
10	2,681	1,352	2,658	1,150	7,842	1,575	5,365	729	152	39	7,860
11	3,595	7,252	9,743	979	21,569	10,349	5,888	1,840	3,454	48	21,579
12	3,356	4,084	7,206	919	15,566	5,101	6,299	2,615	1,507	55	15,577
13	4,426	2,043	3,680	932	11,081	1,524	6,299	2,564	657	58	11,104
14	3,923	3,292	4,160	994	12,369	3,820	6,302	1,809	400	51	12,382
15	5,253	7,208	7,298	886	20,645	5,565	9,293	2,700	3,037	65	20,660
16	6,983	8,152	12,144	884	28,163	5,590	17,174	2,135	3,219	64	28,182
17	7,332	4,298	8,255	920	20,805	5,103	13,854	1,311	496	56	20,821
18	6,481	14,245	11,063	868	32,656	11,421	9,295	2,355	9,529	63	32,664
19	8,370	4,770	7,495	905	21,541	4,607	14,034	1,719	1,146	56	21,562
20	5,145	3,972	6,765	916	16,797	4,637	9,812	1,442	863	56	16,810
21	3,770	1,699	5,930	998	12,396	3,799	7,009	1,322	241	48	12,419
22	4,458	8,664	8,737	902	22,761	9,240	6,299	2,477	4,708	56	22,781
23	3,588	3,427	5,916	915	13,847	3,425	6,302	2,789	1,292	60	13,868
24	3,726	6,139	6,908	885	17,657	4,458	6,299	3,023	3,820	63	17,664
25	3,843	6,387	6,524	888	17,642	4,516	6,302	3,065	3,719	63	17,664
26	3,216	4,603	6,497	886	15,202	2,941	6,295	3,170	2,734	67	15,207
27	6,910	17,289	7,766	843	32,808	6,655	9,298	3,336	13,464	75	32,827
28	6,752	18,391	12,000	824	37,966	6,003	17,172	2,936	11,800	69	37,980
29	7,025	19,915	12,771	820	40,530	6,857	18,641	2,821	12,156	74	40,549
30	6,047	7,365	12,899	877	27,188	3,845	18,320	2,282	2,688	62	27,197
31	6,465	8,180	13,567	879	29,091	6,586	17,700	1,866	2,890	61	29,103
32	6,286	15,014	15,312	847	37,459	8,115	18,480	2,431	8,370	69	37,466
33	6,196	9,522	11,639	865	28,223	3,999	17,998	2,314	3,871	61	28,243
34	5,466	9,229	14,440	879	30,014	6,191	17,608	2,073	4,114	52	30,039
35	5,585	9,206	14,118	872	29,782	6,187	17,631	2,268	3,643	63	29,792
36	6,125	5,211	10,560	895	22,792	3,919	15,381	1,843	1,584	59	22,786
37	4,899	6,221	11,341	886	23,347	6,061	12,466	2,264	2,491	63	23,343
38	6,669	5,165	9,366	902	22,103	4,828	14,050	1,667	1,527	55	22,126
39	4,360	9,114	10,698	879	25,051	8,411	9,803	2,087	4,692	52	25,045
40	6,159	12,489	8,402	870	27,920	6,596	10,009	2,893	8,391	61	27,949
41	5,803	14,141	12,810	852	33,607	5,246	16,873	2,805	8,595	65	33,584
42	7,110	19,972	13,246	824	41,152	7,149	18,825	2,741	12,422	69	41,206
43	7,966	12,741	12,167	854	33,728	6,703	18,320	2,390	6,256	61	33,730
44	8,012	18,411	13,820	840	41,084	8,907	18,641	2,374	11,102	64	41,088
45	7,392	10,629	11,341	863	30,225	6,566	16,391	2,229	4,991	59	30,236
46	5,487	9,711	9,848	861	25,907	5,395	12,466	2,571	5,429	63	25,924
47	6,382	19,490	13,567	829	40,269	7,645	17,815	2,649	12,091	71	40,270
48	7,713	7,254	7,943	877	23,788	3,788	16,230	1,708	2,045	57	23,829
49	5,601	7,622	9,780	904	23,907	8,838	9,550	1,809	3,659	49	23,905
50	6,107	10,285	7,828	861	25,080	5,900	9,986	2,860	6,302	61	25,110
avg	5,769	8,395	9,208	909	24,281	5,714	12,105	2,167	4,251	59	24,295
med	6,077	7,309	9,052	886	23,848	5,577	12,078	2,275	3,336	60	23,867
AVERAGES											
ED	4,655	2,943	5,341	1,000	13,939	3,821	7,828	1,604	649	52	13,954
BN	5,587	6,374	8,433	903	21,298	5,709	10,741	2,090	2,715	56	21,312
AN	6,080	9,856	11,468	880	28,284	6,073	14,888	2,368	4,902	61	28,293
VW	7,015	16,375	11,806	845	36,041	7,646	15,289	2,701	10,355	68	36,059
MEDIANS											
ED	3,846	3,122	5,380	976	13,805	3,736	6,299	1,317	401	52	13,823
BN	5,373	6,263	8,340	902	21,836	4,622	9,807	1,842	2,750	56	21,852
AN	6,047	9,229	12,000	877	28,163	6,003	17,172	2,314	3,871	62	28,182
VW	6,910	17,289	12,771	843	37,459	7,149	17,815	2,711	11,102	69	37,466

Table G-5 Run 3 Annual Water budget (continued)

Lower Santa Margarita River Groundwater Model

Annual Groundw ater Budget

MY	NET Storage	NET Str Lknc	In-Out	% bal
1	-3,306	-4,631	-23.1	-0.08%
2	-5,287	-5,776	-22.1	-0.12%
3	3,624	-8,667	-16.9	-0.07%
4	-4,227	-4,665	-13.6	-0.08%
5	2,201	-6,326	-19.5	-0.14%
6	2,144	-5,379	-14.8	-0.10%
7	2,004	-2,056	25.5	0.09%
8	-5,836	-3,362	-26.6	-0.15%
9	551	-4,372	4.6	0.04%
10	-1,107	-2,507	-17.8	-0.23%
11	6,754	-6,289	-9.8	-0.05%
12	1,745	-5,699	-11.5	-0.07%
13	-2,902	-3,022	-22.6	-0.20%
14	-103	-3,760	-12.2	-0.10%
15	312	-4,261	-14.5	-0.07%
16	-1,393	-8,926	-18.4	-0.07%
17	-2,229	-7,759	-15.6	-0.07%
18	4,940	-1,534	-7.5	-0.02%
19	-3,763	-6,350	-21.4	-0.10%
20	-507	-5,902	-12.2	-0.07%
21	30	-5,689	-23.0	-0.19%
22	4,782	-4,029	-20.1	-0.09%
23	-163	-4,624	-21.6	-0.16%
24	732	-3,088	-6.9	-0.04%
25	673	-2,805	-21.7	-0.12%
26	-275	-3,763	-4.6	-0.03%
27	-255	5,698	-19.6	-0.06%
28	-748	-200	-13.6	-0.04%
29	-168	-615	-18.8	-0.05%
30	-2,202	-10,211	-9.4	-0.03%
31	122	-10,677	-12.6	-0.04%
32	1,830	-6,942	-6.9	-0.02%
33	-2,197	-7,769	-19.9	-0.07%
34	725	-10,326	-24.9	-0.08%
35	601	-10,475	-9.8	-0.03%
36	-2,206	-8,976	5.4	0.02%
37	1,162	-8,850	3.7	0.02%
38	-1,841	-7,840	-22.8	-0.10%
39	4,052	-6,006	5.3	0.02%
40	436	-11	-28.4	-0.10%
41	-558	-4,215	22.0	0.07%
42	39	-824	-53.3	-0.13%
43	-1,263	-5,911	-1.6	0.00%
44	895	-2,718	-4.4	-0.01%
45	-826	-6,350	-10.6	-0.03%
46	-92	-4,419	-17.0	-0.07%
47	1,263	-1,476	-1.8	0.00%
48	-3,926	-5,898	-40.6	-0.17%
49	3,237	-6,120	1.8	0.01%
50	-207	-1,527	-29.2	-0.12%
avg	-55	-4,958	-13.5	-0.07%
med	-98	-5,022	-14.7	-0.07%
AVERAGES				
ED	-834	-4,692	-14.8	-0.11%
BN	122	-5,718	-14.1	-0.07%
AN	-7	-6,566	-9.1	-0.03%
VW	630	-1,450	-18.2	-0.05%
MEDIANS				
ED	-189	-4,518	-15.2	-0.10%
BN	-335	-5,954	-16.1	-0.08%
AN	-92	-7,769	-13.6	-0.04%
VW	436	-1,476	-18.8	-0.05%

Table G-6 Run 3 50-Year Average Monthly Water budget

Lower Santa Margarita River Groundwater Model — Run 3 Habitat Mitigation

Modflow Volumetric Budget Output and Streamflow — 6/25/06

Average Monthly Water Budget

Avg AF/M	SMR Flow In	Diversion	Str Gain+ / Loss-	SMR @ UY->CH	Str Gain+ / Loss-	SMR @ CH->LY	Str Gain+ / Loss-	SMR Flow Out	LSMR Str Gain+ / Loss-
Oct	526	325	-397	128	-73	55	20	75	-451
Nov	1,299	661	-30	1,269	-514	755	-3	752	-548
Dec	1,969	530	-793	1,176	-186	990	51	1,041	-928
Jan	8,364	840	-1,172	7,191	-132	7,060	143	7,202	-1,161
Feb	10,263	2,062	-1,844	8,419	-160	8,260	112	8,372	-1,891
Mar	8,849	2,257	-1,461	7,388	-289	7,099	105	7,204	-1,645
Apr	3,159	1,482	-677	2,482	-338	2,144	40	2,184	-976
May	1,345	953	-338	1,007	-327	680	9	689	-656
Jun	756	583	-54	702	-281	421	4	425	-331
Jul	499	133	-55	443	-195	248	9	258	-241
Aug	458	62	-205	253	-112	141	19	159	-298
Sep	547	60	-294	253	-96	157	18	175	-372
Avg Monthly	3,169	829	-610	2,559	-225	2,334	44	2,378	-791
Med Monthly	1,322	622	-368	1,092	-191	718	19	720	-602
Avg Total=Anl	38,034	9,949	-7,321	30,713	-2,703	28,010	526	28,536	-9,497

Lower Santa Margarita River Groundwater Model

Modflow Volumetric Budget Output

Average Monthly Water Budget

	INFLOW:					OUTFLOW:									
Avg AF/M	Storage	Recharge	Stream Leakance	GHB	TOTAL IN	Storage	Wells	ET	Stream Leakance	GHB	TOTAL OUT	NET Storage	NET Str Lknc	In-Out	% bal
Oct	664	46	392	82	1,184	50	941	152	37	8	1,188	-614	-355	-4.1	-0.34%
Nov	183	639	1,309	80	2,212	969	1,020	156	55	8	2,209	786	-1,254	2.4	0.11%
Dec	576	156	906	81	1,719	292	1,186	170	65	7	1,720	-284	-841	-1.0	-0.06%
Jan	430	365	1,316	79	2,190	546	1,391	173	73	5	2,188	116	-1,243	2.0	0.09%
Feb	339	1,929	990	76	3,334	1,500	1,354	169	313	0	3,336	1,161	-678	-1.9	-0.06%
Mar	186	2,315	1,016	74	3,591	1,237	1,266	200	888	1	3,591	1,051	-128	0.3	0.01%
Apr	370	1,529	832	68	2,800	535	1,031	203	1,019	8	2,797	165	187	3.0	0.11%
May	501	1,017	630	69	2,217	270	854	211	874	9	2,217	-232	244	0.0	0.00%
Jun	693	316	526	68	1,604	163	712	200	529	7	1,609	-531	3	-5.1	-0.32%
Jul	680	65	440	74	1,259	69	748	194	247	4	1,261	-611	-193	-2.7	-0.21%
Aug	515	10	398	78	1,001	51	671	180	102	0	1,004	-464	-297	-2.5	-0.25%
Sep	631	10	452	77	1,170	33	931	160	49	1	1,174	-599	-402	-4.0	-0.34%
Avg Monthly	481	700	767	76	2,023	476	1,009	181	354	5	2,025	-5	-413	-1.1	-0.10%
Med Monthly	508	341	731	77	1,955	281	980	176	174	6	1,954	-258	-326	-1.4	-0.06%
Avg Total=Anl	5,769	8,395	9,208	909	24,281	5,714	12,105	2,167	4,251	59	24,295	-55	-4,958	-13.5	

Attachment H

Run 4 (No-CWRMA) Model Results

Table H-1. Run 4 Annual Pumping Summary
Lower Santa Margarita River Groundwater Model

Hydrologic Condition			Pumping Condition					
HC	Cnt	Oct to Apr Strflw	PC	HC	Q Adjst	Anl Q	Cnt	
VW	9	Very Wet > 56,164	1	2+ AN @ VW	4,000	15,000	5	10%
AN	15	Above Normal > 13,600	2	2+ AN @ AN	2,000	13,000	9	18%
BN	14	Below Normal < 13,600	3	Standard	500	11,500	10	20%
ED	12	Extremely Dry < 5,840	4	1st BN	-2,000	9,000	6	12%
	50		5	2ndBN, 70/30 split	-5,000	6,000	3	6%
			6	3+BN/all ED	-6,000	5,000	17	34%
							50	100%

MY	HC	Oct-Apr HC descrip	May-Apr Pumping Condition	UY Total (af/y)	CH Total (af/y)	LY Total (af/y)	LSMR Total (af/y)	+Q
1	VW	Very Wet	3	6,866	5,617	-	12,483	
2	BN	Below Normal	4	5,711	4,809	-	10,520	
3	AN	Above Normal	3	4,622	4,416	-	9,038	
4	ED	Extremely Dry	6	5,405	3,979	-	9,384	
5	ED	Extremely Dry	6	3,320	1,500	-	4,820	
6	ED	Extremely Dry	6	3,500	1,500	-	5,000	
7	AN	Above Normal	3	4,420	2,696	-	7,116	
8	ED	Extremely Dry	6	5,183	3,979	-	9,162	
9	ED	Extremely Dry	6	2,348	1,500	-	3,848	
10	ED	Extremely Dry	6	2,250	1,500	-	3,750	
11	BN	Below Normal	6	2,770	1,500	-	4,270	
12	ED	Extremely Dry	6	3,500	1,500	-	5,000	
13	ED	Extremely Dry	6	3,500	1,500	-	5,000	
14	ED	Extremely Dry	6	3,500	1,500	-	5,000	
15	AN	Above Normal	3	4,420	2,696	-	7,116	
16	AN	Above Normal	2	7,043	5,763	-	12,806	X
17	ED	Extremely Dry	6	5,962	4,434	-	10,396	
18	VW	Very Wet	3	4,420	2,696	-	7,116	
19	BN	Below Normal	4	5,877	4,809	-	10,686	
20	BN	Below Normal	5	4,706	3,318	-	8,023	
21	ED	Extremely Dry	6	3,925	1,702	-	5,627	
22	BN	Below Normal	6	3,447	1,500	-	4,947	
23	BN	Below Normal	6	3,500	1,500	-	5,000	
24	BN	Below Normal	6	3,500	1,500	-	5,000	
25	BN	Below Normal	6	3,500	1,500	-	5,000	
26	ED	Extremely Dry	6	3,500	1,500	-	5,000	
27	VW	Very Wet	3	4,420	2,696	-	7,116	
28	AN	Above Normal	2	7,043	5,763	-	12,806	X
29	VW	Very Wet	1	7,944	6,500	-	14,444	X
30	AN	Above Normal	2	7,739	6,332	-	14,071	X
31	AN	Above Normal	2	7,262	5,942	-	13,204	X
32	VW	Very Wet	1	7,824	6,401	-	14,225	X
33	AN	Above Normal	2	7,472	6,113	-	13,586	X
34	AN	Above Normal	2	7,201	5,892	-	13,093	X
35	AN	Above Normal	2	7,231	5,916	-	13,147	X
36	BN	Below Normal	4	6,434	5,264	-	11,698	
37	AN	Above Normal	3	5,398	4,416	-	9,814	
38	BN	Below Normal	4	5,877	4,809	-	10,686	
39	BN	Below Normal	5	4,706	3,318	-	8,023	
40	VW	Very Wet	3	4,892	2,899	-	7,790	
41	AN	Above Normal	2	6,918	5,660	-	12,577	X
42	VW	Very Wet	1	8,070	6,603	-	14,673	X
43	AN	Above Normal	2	7,739	6,332	-	14,071	X
44	VW	Very Wet	1	7,944	6,500	-	14,444	X
45	BN	Below Normal	4	7,176	5,871	-	13,047	
46	AN	Above Normal	3	5,398	4,416	-	9,814	
47	VW	Very Wet	1	7,600	6,218	-	13,817	X
48	BN	Below Normal	4	7,176	5,871	-	13,047	
49	BN	Below Normal	5	4,706	3,074	-	7,779	
50	AN	Above Normal	3	4,892	2,899	-	7,790	
			Min	2,250	1,500	-	3,750	
Notes:			Max	8,070	6,603	-	14,673	
Hydrologic Condition: Oct - Apr			**Median**	**5,290**	**4,197**	**-**	**9,273**	
Model starts after 3+ BN or ED			% of Median	57.1%	45.3%	0.0%		
			Average	**5,395**	**3,922**	**-**	**9,317**	
			% of Average	57.9%	42.1%	0.0%		

Table H-1. Run 4 Annual Pumping Summary (continued)

	Oct-Apr HC Description	HC Count	UY Total (af/y)	CH Total (af/y)	LY Total (af/y)	LSMR Total (af/y)
AVERAGES	ED	12	3,824	2,174	-	5,999
	BN	14	4,935	3,474	-	8,409
	AN	15	6,320	5,017	-	11,337
	VW	9	6,664	5,126	-	11,790
MEDIANS	ED	12	3,500	1,500	-	5,000
	BN	14	4,706	3,318	-	8,023
	AN	15	7,043	5,763	-	12,806
	VW	9	7,600	6,218	-	13,817

Average Monthly Pumping

	Month	UY Total (af/m)	CH Total (af/m)	LY Total (af/m)	LSMR Total (af/m)
8%	Oct	415	306	0	721
8%	Nov	450	333	0	783
10%	Dec	520	386	0	906
11%	Jan	613	447	0	1,060
11%	Feb	612	442	0	1,054
10%	Mar	572	413	0	985
9%	Apr	467	337	0	803
7%	May	383	274	0	657
6%	Jun	319	228	0	547
6%	Jul	334	240	0	574
6%	Aug	301	216	0	517
8%	Sep	410	301	0	711
	Avg Anl	5,395	3,922	0	9,317

Table H-2. Run R Pumping Summaries
Lower Santa Margarita River Groundwater Model

		Bldg #	State ID #	Label	# mos Q	% of 600 mos	Orig Wells by Subbsn %	80% Utilization af/m	
1	UY	2673	10/4-7A2	7A2	600	100%	25%	142	
2	UY	26072	10/4-8D1	8D1	600	100%	21%	121	
3	UY	2671	10/4-7H2	7H2	600	100%	15%	82	
4	UY	PW-6	PW-6	PW-6	600	100%	19%	110	
5	UY	2603	10/4-7R2	7R2	600	100%	19%	110	
6	UY	UY-1	UY-1	UY-1	153	26%	0%	110	
7	UY	UY-2	UY-2	UY-2	89	15%	0%	110	
8	UY	UY-3	UY-3	UY-3	37	6%	0%	110	
9	UY	UY-4	UY-4	UY-4	13	2%	0%	110	
10	CH	2393	10/4-18E3	18E4	600	100%	14%	121	
11	CH	2373	10/4-18M4&5	18M5	600	100%	18%	153	
12	CH	2363	10/5-13R2	13R2	600	100%	16%	132	
13	CH	33925	10/5-23G4	23G4	**0**	**0%**	0%	**0**	backup
14	CH	2301	10/5-23J1	23J1	600	100%	20%	164	
15	CH	33924	10/5-23K2	23K2	**0**	**0%**	0%	**0**	backup
16	CH	33923	10/5-23K3	23K3	600	100%	16%	132	
17	CH	CH-1	CH-1	CH-1	18	3%	0%	88	
18	CH	CH-2	CH-2	CH-2	1	0%	0%	88	

% Pumping in Subbasin

		Wet Year Algorithm			Dry Year Management							
		55%	45%	0%	70%	30%	0%	Max Pumping in Subbasin adding wells as needed				
mo	Anl %	UY	CH	LY	UY	CH	LY		UY	CH	LY	Total
OCT	7.9%	4.4%	3.6%	0.00%	5.6%	2.4%	0.00%	# exst wells	5	7	-	12
NOV	8.6%	4.7%	3.9%	0.00%	6.0%	2.6%	0.00%	af/m (80%)	564	833	-	1,397
DEC	10.0%	5.5%	4.5%	0.00%	7.0%	3.0%	0.00%	avg af/well	113	119	-	116
JAN	11.4%	6.3%	5.1%	0.00%	8.0%	3.4%	0.00%					
FEB	10.9%	6.0%	4.9%	0.00%	7.7%	3.3%	0.00%	1 adntl well	674	921	55	1,650
MAR	10.2%	5.6%	4.6%	0.00%	7.1%	3.1%	0.00%	2 adntl well	784	1,008	110	1,902
APR	8.3%	4.6%	3.7%	0.00%	5.8%	2.5%	0.00%	3 adntl well	893	1,096	164	2,154
MAY	7.1%	3.9%	3.2%	0.00%	5.0%	2.1%	0.00%	4 adntl well	1,003	1,184	219	2,406
JUN	5.9%	3.2%	2.7%	0.00%	4.1%	1.8%	0.00%	5 adntl well	1,112	1,271		2,384
JUL	6.2%	3.4%	2.8%	0.00%	4.3%	1.9%	0.00%	6 adntl well	1,222			1,222
AUG	5.6%	3.1%	2.5%	0.00%	3.9%	1.7%	0.00%	50-yr Avg	5,319	3,812	-	
SEP	7.8%	4.3%	3.5%	0.00%	5.4%	2.3%	0.00%	50-yr Med	4,802	3,736	-	

	median						
	UY af/m	CH af/m	LY af/m	Total af/m	Max Mo Pumping	cfs	new wells
ED	307	153	0	502	1,485	26	3
BN	351	239	0	553	1,714	30	5
AN	499	408	0	907	1,714	30	5
VW	512	419	0	930	1,771	31	6

		Table H-3. Run 4 Annual Pumping by Well								
	Building #:	2673	26072	2671	PW-6	2603	new	new	new	new
	Max Annual Pumping	1,557	1,318	898	1,198	1,198	906	602	406	208
	Potential w/ 80% Util	1,710	1,447	986	1,315	1,315	1,315	1,315	1,315	1,315
	Potential Well Yield (gpm)	1,300	1,100	750	1,000	1,000	1,000	1,000	1,000	1,000
		UY	UY	UY	UY	UY	UY	UY	UY	UY
		10/4-7A2	10/4-8D1	10/4-7H2	PW-6	10/4-7R2	UY-1	UY-2	UY-3	UY-4
MY	HC	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)
1	VW	1,449	1,226	836	1,115	1,115	512	409	203	0
2	BN	1,289	1,091	744	992	992	406	198	0	0
3	AN	1,144	968	660	880	880	92	0	0	0
4	ED	1,212	1,026	699	932	932	406	198	0	0
5	ED	838	709	483	645	645	0	0	0	0
6	ED	883	748	510	680	680	0	0	0	0
7	AN	1,116	944	644	858	858	0	0	0	0
8	ED	1,156	978	667	889	889	406	198	0	0
9	ED	593	501	342	456	456	0	0	0	0
10	ED	568	481	328	437	437	0	0	0	0
11	BN	699	592	403	538	538	0	0	0	0
12	ED	883	748	510	680	680	0	0	0	0
13	ED	883	748	510	680	680	0	0	0	0
14	ED	883	748	510	680	680	0	0	0	0
15	AN	1,116	944	644	858	858	0	0	0	0
16	AN	1,519	1,285	876	1,168	1,168	513	310	204	0
17	ED	1,199	1,014	692	922	922	701	412	100	0
18	VW	1,116	944	644	858	858	0	0	0	0
19	BN	1,331	1,126	768	1,024	1,024	406	198	0	0
20	BN	1,165	985	672	896	896	92	0	0	0
21	ED	991	838	572	762	762	0	0	0	0
22	BN	870	736	502	669	669	0	0	0	0
23	BN	883	748	510	680	680	0	0	0	0
24	BN	883	748	510	680	680	0	0	0	0
25	BN	883	748	510	680	680	0	0	0	0
26	ED	883	748	510	680	680	0	0	0	0
27	VW	1,116	944	644	858	858	0	0	0	0
28	AN	1,519	1,285	876	1,168	1,168	513	310	204	0
29	VW	1,543	1,306	890	1,187	1,187	904	512	313	102
30	AN	1,517	1,284	875	1,167	1,167	715	508	303	202
31	AN	1,501	1,270	866	1,155	1,155	703	410	204	0
32	VW	1,540	1,303	889	1,185	1,185	902	510	310	0
33	AN	1,523	1,289	879	1,172	1,172	720	513	204	0
34	AN	1,509	1,276	870	1,160	1,160	709	416	100	0
35	AN	1,496	1,266	863	1,151	1,151	699	406	200	0
36	BN	1,318	1,115	760	1,014	1,014	701	412	100	0
37	AN	1,339	1,133	773	1,030	1,030	92	0	0	0
38	BN	1,331	1,126	768	1,024	1,024	406	198	0	0
39	BN	1,165	985	672	896	896	92	0	0	0
40	VW	1,235	1,045	712	950	950	0	0	0	0
41	AN	1,515	1,282	874	1,165	1,165	510	307	100	0
42	VW	1,546	1,308	892	1,190	1,190	906	514	315	208
43	AN	1,517	1,284	875	1,167	1,167	715	508	303	202
44	VW	1,543	1,306	890	1,187	1,187	904	512	313	102
45	BN	1,327	1,123	766	1,021	1,021	708	602	406	202
46	AN	1,339	1,133	773	1,030	1,030	92	0	0	0
47	VW	1,557	1,318	898	1,198	1,198	711	409	209	102
48	BN	1,327	1,123	766	1,021	1,021	708	602	406	202
49	BN	1,165	985	672	896	896	92	0	0	0
50	AN	1,235	1,045	712	950	950	0	0	0	0
	Min	568	481	328	437	437	0	0	0	0
	Max	1,557	1,318	898	1,198	1,198	906	602	406	208
	Median	1,223	1,035	706	941	941	92	0	0	0
	Average	1,203	1,018	694	926	926	321	191	90	26

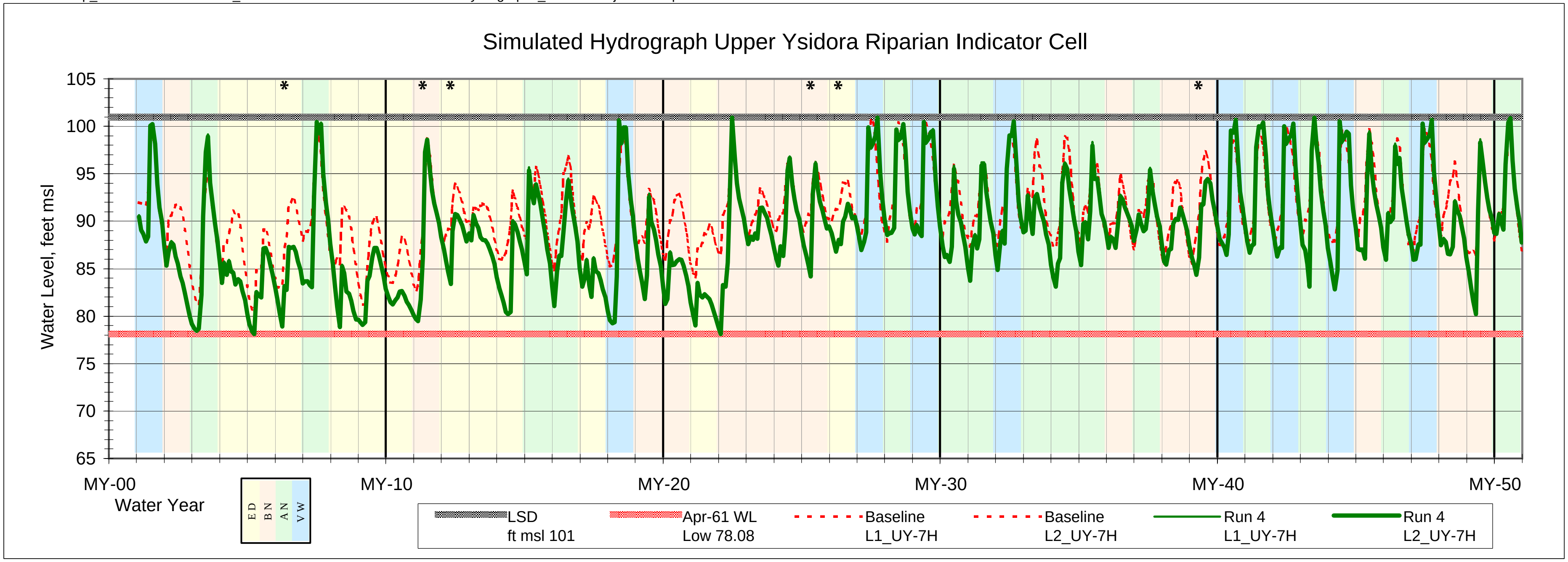
Average Monthly Well Production

	Month	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)
	Oct	98	83	56	75	75	27	0	0	0
	Nov	104	88	60	80	80	28	10	0	0
	Dec	110	93	63	84	84	49	28	8	0
	Jan	116	98	67	89	89	60	49	35	10
	Feb	118	100	68	91	91	48	48	30	16
	Mar	117	99	68	90	90	50	40	17	0
	Apr	104	88	60	80	80	38	16	0	0
	May	94	80	54	72	72	10	0	0	0
	Jun	81	68	46	62	62	0	0	0	0
	Jul	84	71	49	65	65	0	0	0	0
	Aug	76	64	44	59	59	0	0	0	0
	Sep	101	85	58	78	78	10	0	0	0
	Annual Total	1,203	1,018	694	926	926	321	191	90	26

Table H-3. Run 4 Annual Pumping by Well

	Building #:	2393	2373	2363	33925	2301	33924	33923	new	new
	Max Annual Pumping	1,089	1,386	1,188	0	1,485	0	1,188	244	80
	Potential w/ 80% Util	1,447	1,841	1,578	0	1,973	0	1,578	1,052	1,052
	Potential Well Yield (gpm)	1,100	1,400	1,200	0	1,500	0	1,200	800	800
		CH	CH	CH	CH	CH	CH	CH	CH	CH
		10/4-18E3	10/4-18M4&5	10/5-13R2	10/5-23G4	10/5-23J1	10/5-23K2	10/5-23K3	CH-1	CH-2
MY	HC	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)
1	VW	965	1,229	1,053	0	1,317	0	1,053	0	0
2	BN	827	1,052	902	0	1,127	0	902	0	0
3	AN	759	966	828	0	1,035	0	828	0	0
4	ED	684	870	746	0	933	0	746	0	0
5	ED	258	328	281	0	352	0	281	0	0
6	ED	258	328	281	0	352	0	281	0	0
7	AN	463	590	506	0	632	0	506	0	0
8	ED	684	870	746	0	933	0	746	0	0
9	ED	258	328	281	0	352	0	281	0	0
10	ED	258	328	281	0	352	0	281	0	0
11	BN	258	328	281	0	352	0	281	0	0
12	ED	258	328	281	0	352	0	281	0	0
13	ED	258	328	281	0	352	0	281	0	0
14	ED	258	328	281	0	352	0	281	0	0
15	AN	463	590	506	0	632	0	506	0	0
16	AN	990	1,261	1,080	0	1,351	0	1,080	0	0
17	ED	762	970	831	0	1,039	0	831	0	0
18	VW	463	590	506	0	632	0	506	0	0
19	BN	827	1,052	902	0	1,127	0	902	0	0
20	BN	570	726	622	0	778	0	622	0	0
21	ED	293	372	319	0	399	0	319	0	0
22	BN	258	328	281	0	352	0	281	0	0
23	BN	258	328	281	0	352	0	281	0	0
24	BN	258	328	281	0	352	0	281	0	0
25	BN	258	328	281	0	352	0	281	0	0
26	ED	258	328	281	0	352	0	281	0	0
27	VW	463	590	506	0	632	0	506	0	0
28	AN	990	1,261	1,080	0	1,351	0	1,080	0	0
29	VW	1,089	1,386	1,188	0	1,485	0	1,188	164	0
30	AN	1,059	1,348	1,156	0	1,445	0	1,156	168	0
31	AN	1,021	1,300	1,114	0	1,393	0	1,114	0	0
32	VW	1,087	1,383	1,185	0	1,482	0	1,185	79	0
33	AN	1,051	1,337	1,146	0	1,433	0	1,146	0	0
34	AN	1,013	1,289	1,105	0	1,381	0	1,105	0	0
35	AN	1,017	1,294	1,109	0	1,387	0	1,109	0	0
36	BN	905	1,152	987	0	1,234	0	987	0	0
37	AN	759	966	828	0	1,035	0	828	0	0
38	BN	827	1,052	902	0	1,127	0	902	0	0
39	BN	570	726	622	0	778	0	622	0	0
40	VW	498	634	543	0	679	0	543	0	0
41	AN	973	1,238	1,061	0	1,327	0	1,061	0	0
42	VW	1,079	1,374	1,177	0	1,472	0	1,177	244	80
43	AN	1,059	1,348	1,156	0	1,445	0	1,156	168	0
44	VW	1,089	1,386	1,188	0	1,485	0	1,188	164	0
45	BN	980	1,248	1,069	0	1,337	0	1,069	168	0
46	AN	759	966	828	0	1,035	0	828	0	0
47	VW	1,041	1,324	1,135	0	1,419	0	1,135	164	0
48	BN	980	1,248	1,069	0	1,337	0	1,069	168	0
49	BN	528	672	576	0	720	0	576	0	0
50	AN	498	634	543	0	679	0	543	0	0
	Min	258	328	281	0	352	0	281	0	0
	Max	1,089	1,386	1,188	0	1,485	0	1,188	244	80
	Median	721	918	787	0	984	0	787	0	0
	Average	669	851	730	0	912	0	730	30	2
Average Monthly W										
	Month	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)
	Oct	53	67	57	0	72	0	57	0	0
	Nov	57	73	62	0	78	0	62	0	0
	Dec	66	84	72	0	91	0	72	0	0
	Jan	75	96	82	0	102	0	82	8	2
	Feb	74	94	80	0	100	0	80	13	0
	Mar	70	89	76	0	95	0	76	8	0
	Apr	58	74	63	0	79	0	63	0	0
	May	47	60	51	0	64	0	51	0	0
	Jun	39	50	43	0	53	0	43	0	0
	Jul	41	52	45	0	56	0	45	0	0
	Aug	37	47	40	0	51	0	40	0	0
	Sep	52	66	56	0	71	0	56	0	0
Annual Total		669	851	730	0	912	0	730	30	2

D:\Camp_Pendleton\SMR\USBR_model\Run4 no CWRMA\POST\C.IC-hydrographs_Run 4 w adj WL.xls / printed 7/5/2006



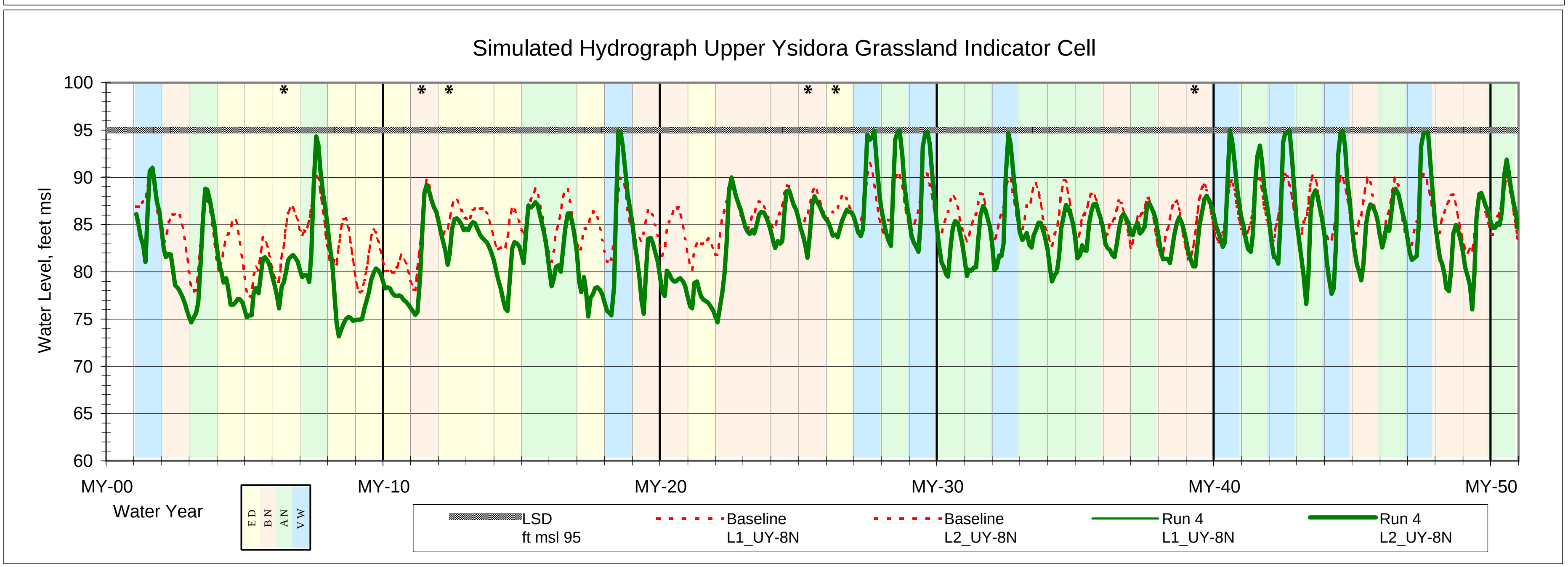
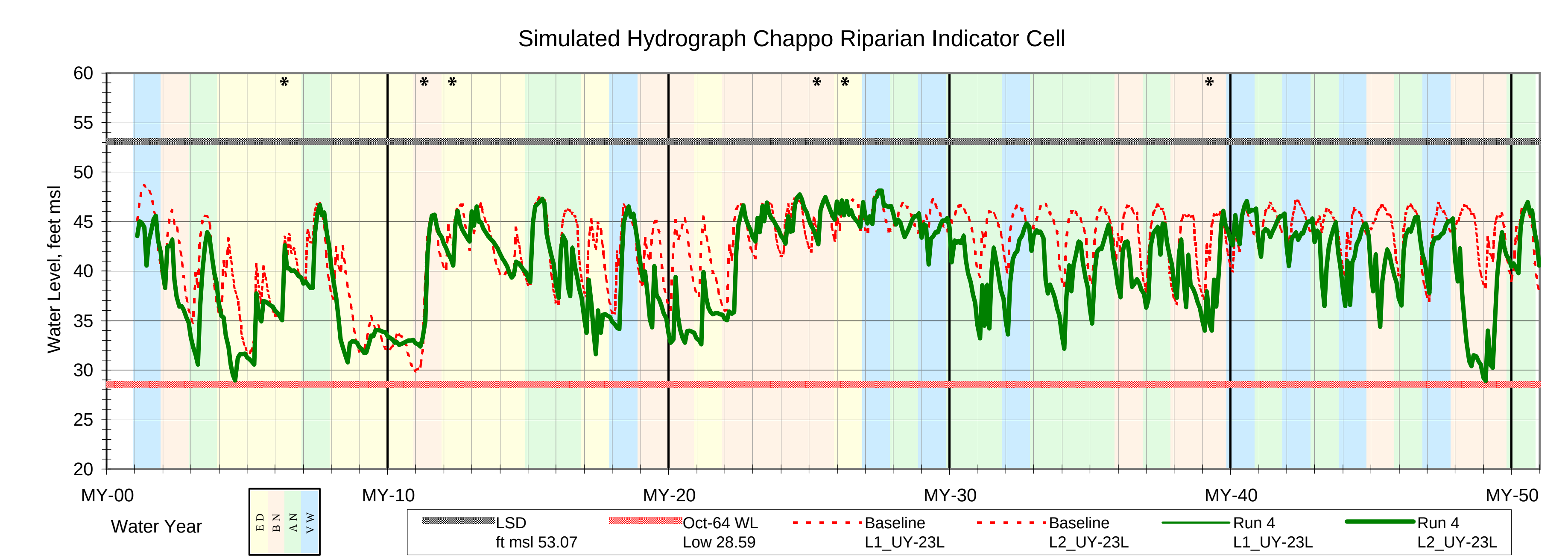


FIGURE H-1
Run 4 No CWRMA and Baseline Hydrographs

***** Emergency flows called upon during water years marked with an asterisk.
Layer 1 (L1) and Layer 2(L2) simulated groundwater levels are at similar elevations and the graph lines are printed on top of each other.

D:\Camp_Pendleton\SMR\USBR_model\Run4 no CWRMA\POST\C.IC-hydrographs_Run 4 w adj WL.xls / printed 7/5/2006



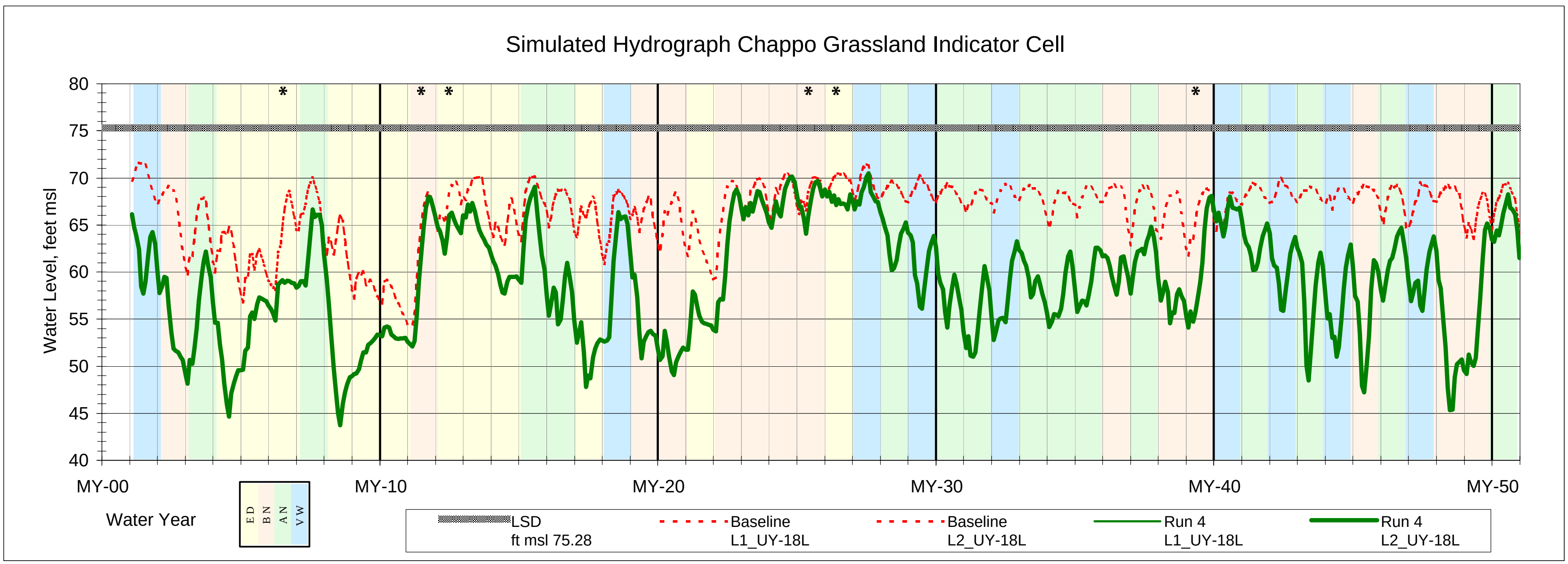
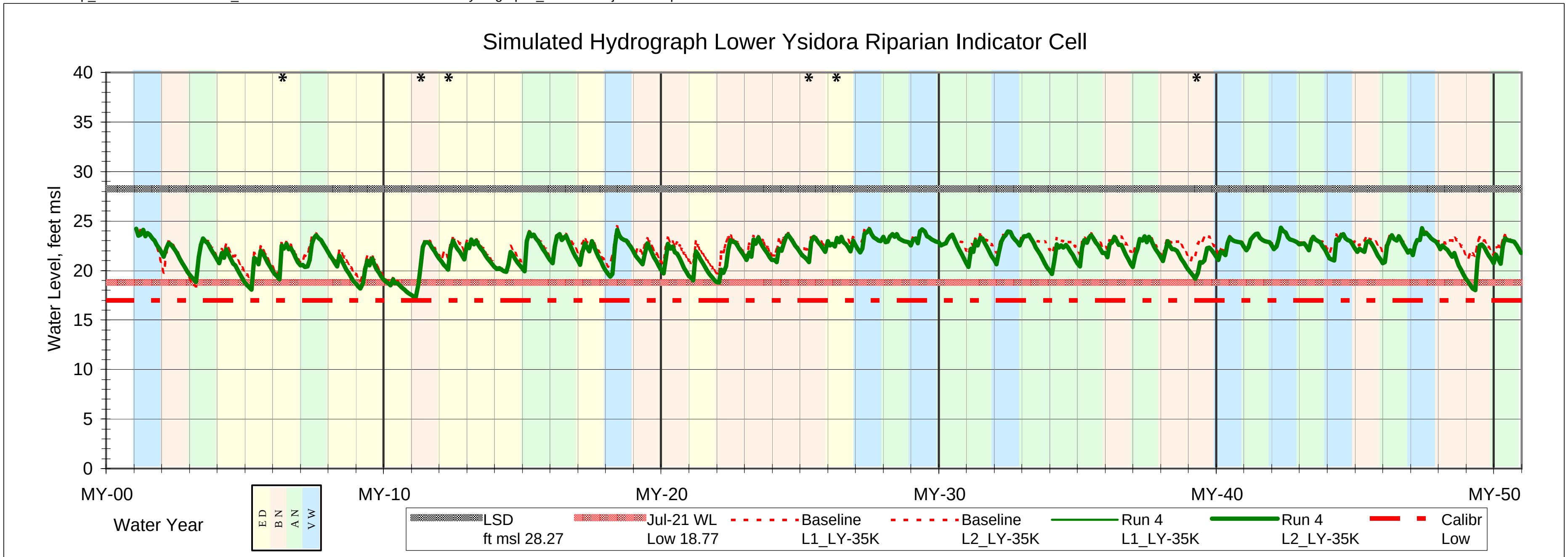
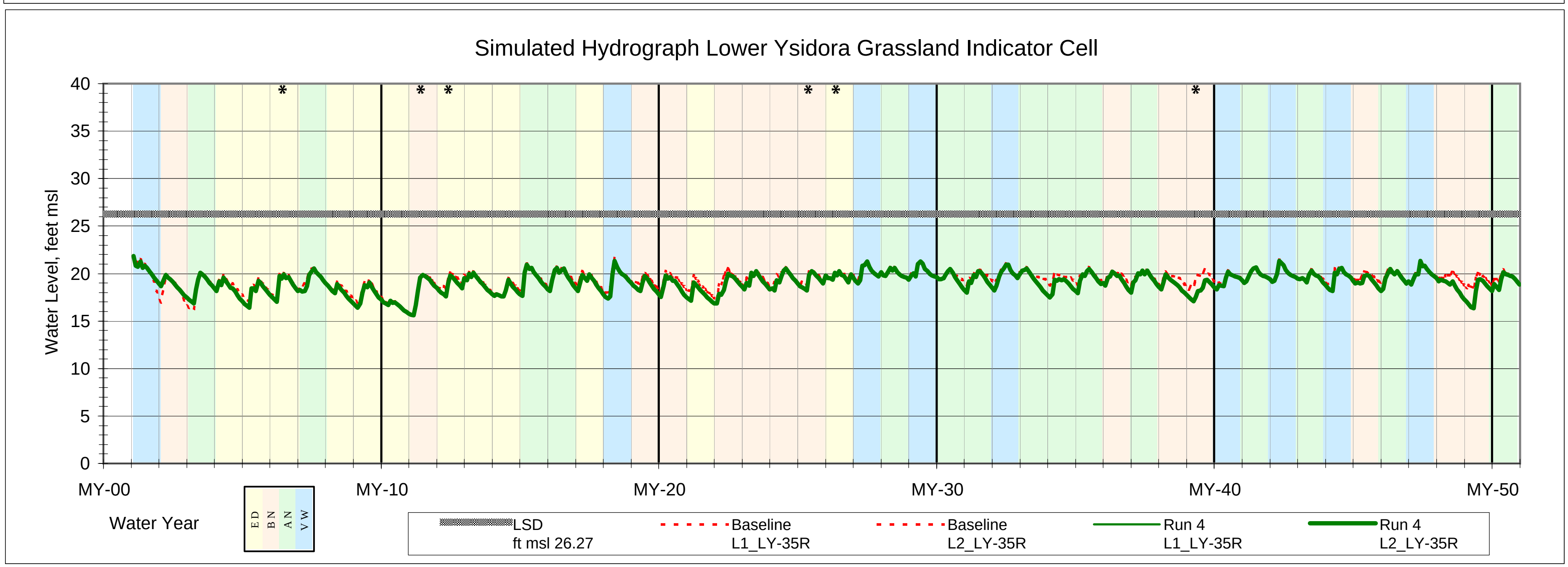


FIGURE H-2
Run 4 No CWRMA and Baseline Hydrographs

***** Emergency flows called upon during water years marked with an asterisk.

Layer 1 (L1) and Layer 2(L2) simulated groundwater levels are at similar elevations and the graph lines are printed on top of each other.



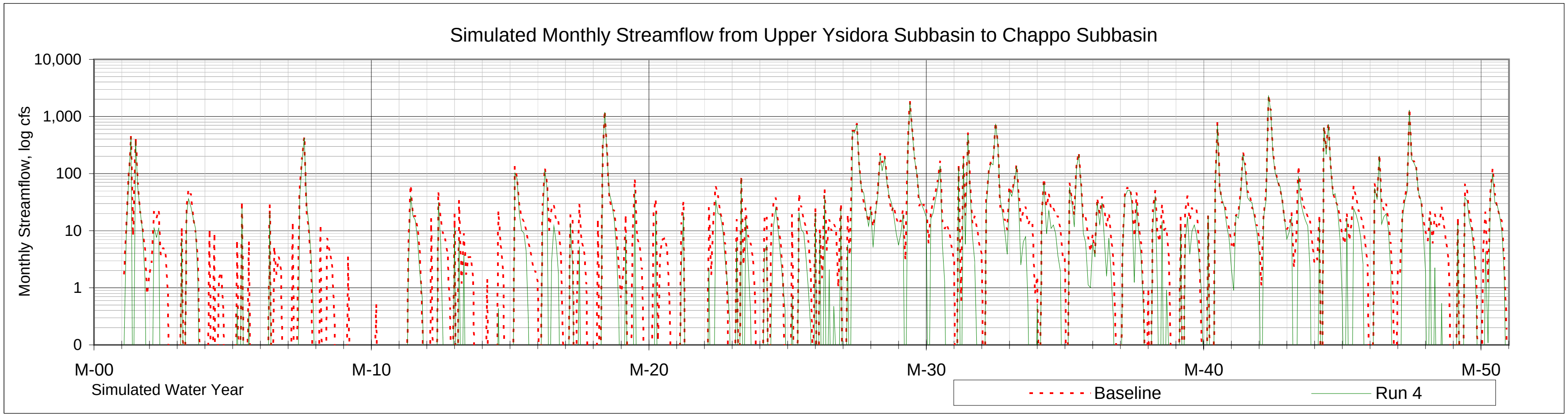


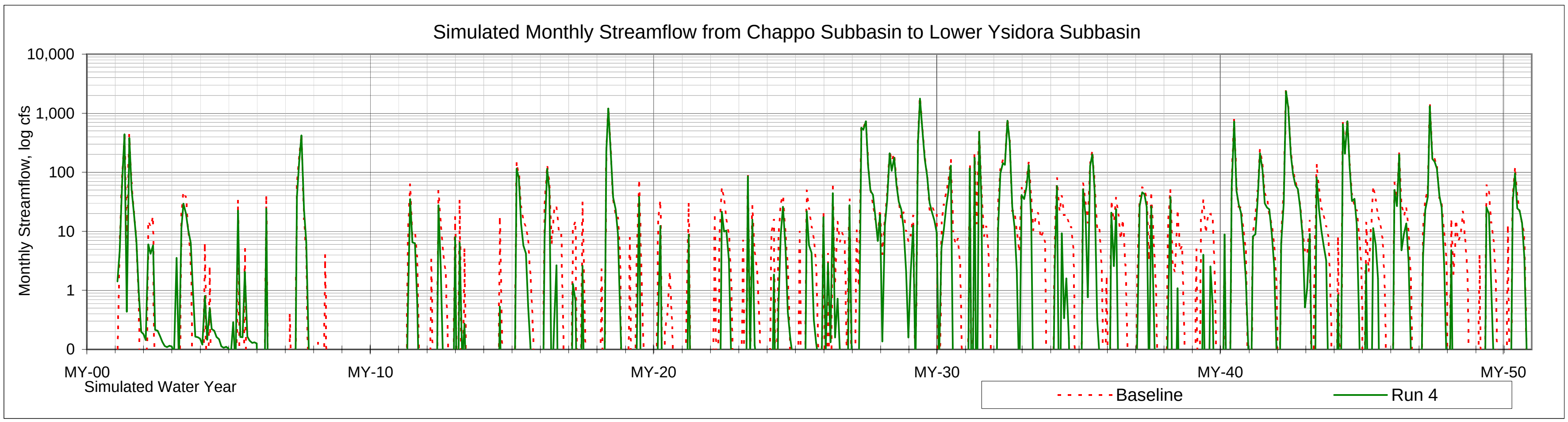
***** Emergency flows called upon during water years marked with an asterisk.

Layer 1 (L1) and Layer 2(L2) simulated groundwater levels are at similar elevations and the graph lines are printed on top of each other.

FIGURE H-3

Run 4 No CWRMA and Baseline Hydrographs





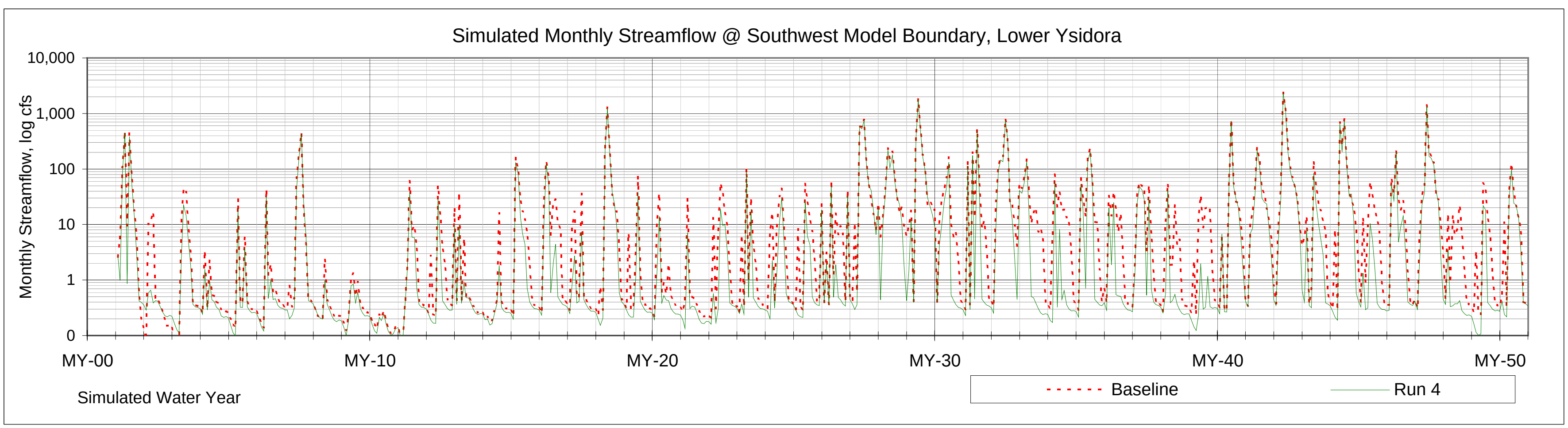


Figure H-4. Simulated Streamflow; Run 4 No CWRMA Flow and Baseline

Table H-4 Run 4 No CWRMA Flows Water Budget

Average Hydrologic Condition Water Budget (af/y)

% Time Exceedence	*> 76%*	*76% to 50%*	*50% to 19%*	*< 19%*
# Years	*12*	*14*	*15*	*9*
	Extremely Dry	Below Normal	Above Normal	Very Wet
Inflow:				
Santa Margarita River Inflow	4,900	9,800	28,800	124,000
Subsurface Underflow	1,100	1,000	900	900
Lake O'Neill Spill and Release	300	700	1,200	1,700
Fallbrook Creek	100	400	1,400	3,800
Minor Tributary Drainages	1,700	1,400	2,400	4,900
Areal Precipitation	500	500	700	1,600
Total Inflow:	8,600	13,800	35,400	136,900
Outflow:				
Santa Margarita River Outflow	1,300	2,100	19,600	118,700
Subsurface Underflow	100	100	100	100
Groundwater Pumping	6,000	8,400	11,300	11,800
Evapotranspiration	1,700	2,200	2,600	3,000
Diversions to Lake O'Neill	400	1,000	1,800	2,400
Total Outflow:	9,500	13,800	35,400	136,000
Net Simulated Change of Groundwater in Storage:	-900	0	0	900
	-	-	-	-

Median Hydrologic Condition Water Budget (af/y)

% Time Exceedence	*> 76%*	*76% to 50%*	*50% to 19%*	*< 19%*
# Years	*12*	*14*	*15*	*9*
	Extremely Dry	Below Normal	Above Normal	Very Wet
Inflow:				
Santa Margarita River Inflow	5,100	10,000	23,800	116,700
Subsurface Underflow	1,100	1,000	900	900
Lake O'Neill Spill and Release	200	700	1,300	2,300
Fallbrook Creek	100	300	1,100	3,500
Minor Tributary Drainages	1,500	1,400	2,500	4,700
Areal Precipitation	400	300	500	1,500
Outflow:				
Santa Margarita River Outflow	700	2,600	14,500	109,200
Subsurface Underflow	100	100	100	100
Groundwater Pumping	5,000	8,000	12,800	13,800
Evapotranspiration	1,400	2,100	2,500	2,900
Diversions to Lake O'Neill	400	900	1,700	2,700
Net Simulated Change of Groundwater in Storage:	-300	-700	300	700

Average Subbasin Water Budget (af/y)

	Upper Ysidora	Chappo	Lower Ysidora	SMR Basin	
Inflow:					
Santa Margarita River Inflow	34,900	29,800	27,700	34,900	85%
Subsurface Underflow *	900	1,800	500	1,000	2%
Lake O'Neill Spill and Release	1,000	0	0	1,000	2%
Fallbrook Creek	1,200	0	0	1,200	3%
Minor Tributary Drainages	600	1,100	700	2,400	6%
Areal Precipitation	200	300	200	800	2%
Total Inflow:	38,800	33,000	29,100	41,300	
Outflow:					
Santa Margarita River Outflow	29,800	27,700	28,300	28,300	69%
Subsurface Underflow *	1,800	500	100	100	0%
Groundwater Pumping	5,400	3,900	0	9,300	23%
Evapotranspiration *	700	900	800	2,300	6%
Diversions to Lake O'Neill	1,300	0	0	1,300	3%
Total Outflow:	39,000		29,200	41,300	
Net Simulated Change of Groundwater in Storage: *	0	0	0	0	
				-	

Note: * Subbasin Medians are based on the last rate of the stress period
Values are rounded to the nearest 100 acre-feet, closest number adjusted to eliminate rounding error

Median Subbasin Water Budget (af/y)

	Upper Ysidora	Chappo	Lower Ysidora	SMR Basin
Inflow:				
Santa Margarita River Inflow	12,700	6,700	3,700	12,700
Subsurface Underflow *	900	1,800	500	900
Lake O'Neill Spill and Release	800	0	0	800
Fallbrook Creek	600	0	0	600
Minor Tributary Drainages	200	0	100	2,100
Areal Precipitation	6,900	0	5,395	500
Outflow:				
Santa Margarita River Outflow	6,700	3,700	3,800	3,800
Subsurface Underflow *	1,800	500	100	100
Groundwater Pumping	5,300	4,200	0	9,300
Evapotranspiration *	700	900	800	2,400
Diversions to Lake O'Neill	1,300	0	0	1,300
Net Simulated Change of Groundwater in Storage: *	0	0	0	0

Note: The sum of median values does not reflect the change of groundwater in storage.
Median values are not cummulative.
* Subbasin Medians are based on the last rate of the stress period
Values are rounded to the nearest 100 acre-feet

Table H-5 Run 4 Annual Water budget

Lower Santa Margarita River Groundwater Model

Modflow Volumetric Budget Output and Streamflow

Run 4 No CWRMA Flows

6/25/06

Annual Surface Water Budget

MY		SMR Flow In	LON Diversion	Ponds Diversion	Str Gain+ / Loss-	GAGE SMR @ UY->CH	Str Gain+ / Loss-	SMR @ CH->LY	Str Gain+ / Loss-	SMR Flow Out	LSMR Str Gain+ / Loss-
1	VW	64,601	1,340	9,099	-4,641	59,960	-1,393	58,567	1,725	60,292	-4,309
2	BN	6,497	1,394	1,620	-4,657	1,840	-1,738	102	155	257	-6,240
3	AN	14,060	617	5,968	-7,158	6,902	-3,936	2,966	-137	2,829	-11,230
4	ED	5,177	916	1,751	-5,172	4	12	16	309	325	-4,851
5	ED	5,591	259	1,040	-3,984	1,606	-386	1,220	347	1,568	-4,023
6	ED	4,971	450	1,317	-3,665	1,306	186	1,492	752	2,244	-2,727
7	AN	44,743	352	9,724	-4,942	39,802	-1,521	38,281	729	39,010	-5,733
8	ED	3,439	215	2,195	-3,439	-	3	3	206	209	-3,230
9	ED	4,066	664	1,599	-4,066	-	3	3	254	257	-3,809
10	ED	1,963	88	292	-1,963	-	0	-	108	108	-1,855
11	BN	10,622	486	5,196	-5,570	5,052	-2,259	2,793	299	3,093	-7,529
12	ED	6,837	180	1,615	-4,029	2,808	-651	2,157	456	2,613	-4,223
13	ED	3,288	197	949	-2,657	631	-233	398	431	829	-2,459
14	ED	4,126	82	2,184	-4,100	26	6	32	241	272	-3,854
15	AN	18,239	1,593	4,674	-4,592	13,647	-453	13,194	1,326	14,520	-3,720
16	AN	20,357	1,684	5,227	-7,833	12,524	-1,783	10,741	1,157	11,898	-8,459
17	ED	5,632	511	1,781	-4,342	1,289	-1,013	277	570	847	-4,785
18	VW	102,111	1,061	11,971	-3,780	98,331	-1,294	97,037	1,321	98,358	-3,753
19	BN	8,782	558	2,883	-5,085	3,697	-1,324	2,373	152	2,525	-6,257
20	BN	6,647	923	1,967	-5,359	1,288	-519	769	373	1,142	-5,506
21	ED	5,309	940	710	-3,954	1,356	-817	539	46	585	-4,724
22	BN	12,136	949	6,703	-6,828	5,308	-2,695	2,614	-30	2,583	-9,553
23	BN	9,797	697	2,017	-3,154	6,643	-426	6,217	724	6,941	-2,856
24	BN	7,605	409	3,948	-3,858	3,748	-1,158	2,590	537	3,127	-4,478
25	BN	7,904	303	3,601	-3,988	3,916	-983	2,933	466	3,399	-4,505
26	ED	8,111	823	1,550	-3,418	4,693	-30	4,663	845	5,508	-2,603
27	VW	124,823	2,899	15,712	-978	123,845	460	124,305	2,193	126,498	1,675
28	AN	50,500	2,692	15,859	-6,117	44,383	-4,098	40,285	526	40,812	-9,688
29	VW	177,904	2,692	17,240	-3,471	174,433	-2,510	171,923	1,948	173,871	-4,033
30	AN	23,839	2,068	4,298	-7,589	16,250	-3,092	13,158	209	13,368	-10,471
31	AN	58,310	1,559	6,178	-5,991	52,318	-3,187	49,131	598	49,729	-8,580
32	VW	102,823	2,464	13,435	-5,262	97,561	-4,931	92,630	885	93,515	-9,308
33	AN	24,218	2,216	6,166	-7,097	17,121	-2,566	14,555	511	15,066	-9,152
34	AN	18,034	2,189	6,873	-8,692	9,342	-4,953	4,389	-120	4,268	-13,765
35	AN	36,737	1,684	7,366	-5,866	30,871	-4,313	26,558	579	27,137	-9,600
36	BN	11,612	1,334	3,811	-5,773	5,838	-2,994	2,844	183	3,027	-8,585
37	AN	16,723	971	4,603	-3,403	13,320	-3,227	10,093	524	10,617	-6,106
38	BN	10,190	1,167	3,428	-6,006	4,183	-1,755	2,428	378	2,807	-7,383
39	BN	11,489	1,790	5,258	-7,060	4,429	-4,018	410	-74	336	-11,153
40	VW	60,884	2,538	10,564	-3,978	56,905	-2,526	54,379	243	54,623	-6,261
41	AN	39,059	2,712	11,915	-7,182	31,877	-4,375	27,502	311	27,813	-11,246
42	VW	248,376	2,709	17,872	-2,627	245,749	-3,095	242,653	1,084	243,737	-4,638
43	AN	19,921	2,723	9,476	-8,337	11,584	-3,881	7,703	186	7,889	-12,032
44	VW	118,050	2,725	16,194	-6,201	111,849	-3,601	108,248	1,258	109,505	-8,545
45	BN	12,877	1,561	7,353	-7,954	4,923	-3,655	1,268	-6	1,262	-11,615
46	AN	27,175	1,736	7,544	-5,554	21,620	-2,935	18,686	609	19,295	-7,880
47	VW	116,687	2,753	17,321	-5,341	111,346	-3,580	107,766	1,388	109,154	-7,533
48	BN	9,064	1,699	4,419	-7,883	1,182	-899	282	134	416	-8,648
49	BN	12,569	288	6,156	-5,754	6,815	-4,065	2,750	-220	2,529	-10,040
50	AN	20,000	1,716	8,540	-6,342	13,658	-2,460	11,198	178	11,376	-8,624
	avg	34,889	1,331	6,383	**-5,134**	29,756	**-2,013**	27,742	**537**	28,280	**-6,610**
	med	12,723	1,250	5,212	-5,129	6,729	-1,769	3,677	405	3,834	-6,248
AVERAGES											
ED	12	4,876	444	1,415	(3,732)	1,143	(243)	900	380	1,280	-3,595
BN	14	9,842	968	4,169	(5,638)	4,204	(2,035)	2,169	219	2,389	-7,453
AN	15	28,794	1,767	7,627	(6,446)	22,348	(3,119)	19,229	479	19,708	-9,086
VW	9	124,029	2,353	14,379	(4,031)	119,998	(2,497)	117,501	1,338	118,839	-5,189
	50										
MEDIANS											
ED	12	5,074	355	1,574	(3,969)	960	(15)	337	328	707	-3,831
BN	14	9,993	936	3,879	(5,662)	4,306	(1,746)	2,509	169	2,556	-7,456
AN	15	23,839	1,716	6,873	(6,342)	16,250	(3,187)	13,194	524	14,520	-9,152
VW	9	116,687	2,692	15,712	(3,978)	111,346	(2,526)	107,766	1,321	109,154	-4,638
	50										

Table H-5 Run 4 Annual Water budget (continued)

Lower Santa Margarita River Groundwater Model

Modflow Volumetric Budget Output

Annual Groundw ater Budget Model Run: Run 4 No CWRMA Flows

	INFLOW:					OUTFLOW:					
MY	Storage	Recharge	Stream Leakance	GHB	TOTAL GW IN	Storage	Wells	ET	Stream Leakance	GHB	TOTAL GW OUT
1	7,777	9,857	8,395	875	26,904	5,040	12,483	2,919	6,421	63	26,927
2	6,465	1,840	5,405	1,000	14,710	1,995	10,520	1,761	396	54	14,726
3	5,458	6,202	9,938	1,021	22,619	8,607	9,038	1,890	3,042	52	22,630
4	6,174	2,065	4,226	1,013	13,478	2,484	9,385	1,242	322	53	13,486
5	3,710	1,366	5,992	1,167	12,235	5,868	4,819	1,246	273	49	12,254
6	3,815	2,082	4,573	1,191	11,662	4,612	5,000	1,603	402	56	11,673
7	5,953	10,356	7,528	954	24,790	8,290	7,117	2,441	6,888	62	24,798
8	7,886	2,367	1,745	1,122	13,119	2,404	9,162	1,253	272	49	13,139
9	2,128	1,981	3,632	1,161	8,902	3,666	3,848	1,095	247	48	8,903
10	2,080	438	2,351	1,124	5,993	1,129	3,751	933	158	41	6,012
11	3,581	5,698	8,441	1,014	18,734	8,724	4,270	2,056	3,649	50	18,749
12	3,632	1,921	5,964	1,002	12,520	4,516	5,000	2,350	619	53	12,538
13	4,137	1,203	3,446	1,000	9,786	1,667	5,000	2,453	639	58	9,816
14	3,666	2,544	3,235	1,068	10,512	3,418	5,000	1,738	321	51	10,528
15	5,918	5,774	5,677	951	18,320	5,723	7,114	2,629	2,801	65	18,331
16	6,116	5,891	10,360	948	23,315	5,911	12,808	2,220	2,316	64	23,319
17	6,433	2,146	7,020	1,015	16,614	4,263	10,395	1,472	450	57	16,637
18	6,556	13,186	8,955	929	29,627	10,891	7,117	2,383	9,185	63	29,638
19	7,883	3,108	5,324	998	17,313	4,208	10,686	1,729	659	54	17,336
20	4,635	2,374	5,500	1,028	13,537	3,756	8,023	1,348	374	55	13,556
21	3,669	1,019	4,720	1,139	10,547	3,434	5,627	1,214	243	48	10,567
22	4,153	7,087	8,255	998	20,493	9,389	4,947	2,211	3,903	55	20,505
23	3,871	2,514	4,860	972	12,217	3,331	5,000	2,686	1,162	57	12,236
24	3,685	4,440	6,393	976	15,494	4,667	5,000	2,833	2,941	61	15,502
25	4,084	4,219	5,767	996	15,067	4,784	5,000	2,796	2,452	60	15,092
26	3,393	2,011	5,921	939	12,264	2,966	5,000	2,881	1,373	65	12,284
27	6,465	16,949	7,296	861	31,570	7,144	7,114	3,276	13,967	72	31,574
28	6,338	16,256	9,835	833	33,262	5,604	12,805	3,111	11,694	68	33,282
29	6,566	18,299	10,659	824	36,348	6,520	14,444	3,033	12,293	73	36,363
30	6,260	4,552	9,614	898	21,325	3,003	14,073	2,369	1,839	62	21,346
31	5,985	6,655	10,723	893	24,256	6,430	13,200	2,043	2,532	61	24,267
32	5,925	14,206	13,230	852	34,213	8,464	14,233	2,606	8,852	69	34,224
33	5,838	6,407	8,235	884	21,364	2,881	13,590	2,369	2,489	61	21,390
34	4,821	7,124	11,520	900	24,364	5,778	13,085	2,156	3,294	54	24,368
35	4,373	7,828	11,731	879	24,812	5,719	13,154	2,493	3,409	62	24,837
36	4,681	4,091	9,091	900	18,763	3,219	11,685	2,275	1,517	60	18,756
37	4,141	5,048	9,504	891	19,584	4,851	9,826	2,592	2,273	64	19,605
38	5,172	3,708	7,805	909	17,594	3,841	10,675	2,011	1,006	55	17,587
39	3,866	5,455	9,022	904	19,247	6,400	8,035	2,124	2,658	50	19,267
40	5,643	10,771	7,736	879	25,030	6,276	7,782	2,927	7,984	59	25,029
41	5,147	12,259	10,813	861	29,079	4,915	12,580	2,957	8,593	65	29,110
42	6,717	18,733	11,226	831	37,507	6,731	14,669	2,948	13,076	70	37,494
43	7,895	9,688	9,527	870	27,980	6,042	14,073	2,532	5,292	62	28,000
44	7,796	16,896	11,593	852	37,137	8,923	14,440	2,537	11,178	64	37,141
45	7,392	7,530	8,655	891	24,467	5,675	13,062	2,195	3,535	57	24,525
46	4,936	7,989	8,999	891	22,815	5,900	9,803	2,601	4,428	63	22,795
47	6,451	18,274	11,341	836	36,901	7,668	13,820	2,835	12,528	70	36,921
48	7,805	4,614	5,739	898	19,056	3,237	13,039	1,708	1,031	56	19,071
49	5,188	6,336	8,930	937	21,391	8,701	7,782	1,811	3,067	48	21,410
50	5,487	8,907	6,979	872	22,245	5,739	7,805	2,753	5,930	59	22,286
avg	5,355	6,845	7,669	953	20,822	5,308	9,318	2,233	3,919	59	20,837
med	5,472	5,736	8,020	933	20,039	5,322	9,273	2,360	2,595	59	20,055
AVERAGES											
ED	4,227	1,762	4,402	1,078	11,469	3,369	5,999	1,623	443	52	11,486
BN	5,176	4,501	7,085	959	17,720	5,138	8,409	2,110	2,025	55	17,737
AN	5,644	8,062	9,399	903	24,009	5,693	11,338	2,477	4,455	62	24,024
VW	6,655	15,241	10,048	860	32,804	7,517	11,789	2,829	10,609	67	32,812
MEDIANS											
ED	3,689	1,996	4,400	1,095	11,948	3,426	5,000	1,362	322	52	11,963
BN	4,658	4,330	7,099	974	18,164	4,438	8,029	2,090	1,985	55	18,168
AN	5,838	7,124	9,614	891	23,315	5,739	12,805	2,493	3,294	62	23,319
VW	6,556	16,896	10,659	852	34,213	7,144	13,820	2,919	11,178	69	34,224

Table H-5 Run 4 Annual Water budget (continued)

Lower Santa Margarita River Groundwater Model

Modflow Volumetric Budget Output

Annual Groundw ater Budget

MY	NET Storage	NET Str Lknc	In-Out	% bal
1	-2,737	-1,974	-22.8	-0.08%
2	-4,470	-5,008	-16.5	-0.11%
3	3,149	-6,896	-11.4	-0.05%
4	-3,690	-3,904	-8.3	-0.06%
5	2,158	-5,718	-19.4	-0.16%
6	797	-4,171	-10.9	-0.09%
7	2,337	-639	-7.7	-0.03%
8	-5,482	-1,473	-19.7	-0.15%
9	1,538	-3,385	-1.1	-0.01%
10	-950	-2,192	-19.4	-0.32%
11	5,142	-4,792	-14.6	-0.08%
12	884	-5,345	-18.5	-0.15%
13	-2,470	-2,807	-30.6	-0.31%
14	-248	-2,913	-16.1	-0.15%
15	-195	-2,876	-11.4	-0.06%
16	-204	-8,044	-4.8	-0.02%
17	-2,169	-6,570	-22.7	-0.14%
18	4,334	230	-11.0	-0.04%
19	-3,675	-4,665	-22.3	-0.13%
20	-879	-5,126	-18.8	-0.14%
21	-234	-4,477	-20.3	-0.19%
22	5,236	-4,353	-12.5	-0.06%
23	-539	-3,698	-19.4	-0.16%
24	983	-3,453	-8.3	-0.05%
25	700	-3,315	-25.4	-0.17%
26	-427	-4,548	-20.9	-0.17%
27	680	6,671	-3.5	-0.01%
28	-735	1,860	-20.2	-0.06%
29	-46	1,635	-15.9	-0.04%
30	-3,258	-7,775	-20.9	-0.10%
31	445	-8,191	-10.5	-0.04%
32	2,539	-4,378	-11.3	-0.03%
33	-2,957	-5,746	-26.7	-0.12%
34	957	-8,225	-3.6	-0.01%
35	1,345	-8,322	-25.3	-0.10%
36	-1,462	-7,573	6.7	0.04%
37	709	-7,231	-20.1	-0.10%
38	-1,331	-6,800	6.8	0.04%
39	2,534	-6,364	-20.0	-0.10%
40	634	248	0.5	0.00%
41	-232	-2,220	-30.3	-0.10%
42	14	1,850	13.1	0.03%
43	-1,853	-4,236	-20.2	-0.07%
44	1,127	-416	-3.9	-0.01%
45	-1,717	-5,119	-57.2	-0.23%
46	964	-4,571	20.0	0.09%
47	1,217	1,187	-20.0	-0.05%
48	-4,568	-4,708	-14.7	-0.08%
49	3,512	-5,863	-18.4	-0.09%
50	253	-1,049	-41.1	-0.18%
avg	-47	-3,749	-15.0	-0.09%
med	-16	-4,365	-17.4	-0.08%
AVERAGES				
ED	-858	-3,959	-17.3	-0.16%
BN	-38	-5,060	-16.8	-0.09%
AN	48	-4,944	-15.6	-0.07%
VW	862	561	-8.3	-0.03%
MEDIANS				
ED	-337	-4,038	-19.4	-0.15%
BN	-709	-4,900	-17.4	-0.09%
AN	253	-5,746	-20.1	-0.06%
VW	680	248	-11.0	-0.03%

Table H-6 Run 4 50-Year Average Monthly Water Budget

Lower Santa Margarita River Groundwater Model — Run 4 No CWRMA Flows

Modflow Volumetric Budget Output and Streamflow — 6/25/06

Average Monthly Water Budget

Avg AF/M	SMR Flow In	Diversion	Str Gain+ / Loss-	SMR @ UY->CH	Str Gain+ / Loss-	SMR @ CH->LY	Str Gain+ / Loss-	SMR Flow Out	LSMR Str Gain+ / Loss-
Oct	346	184	-256	90	-43	48	19	67	-279
Nov	1,077	469	-65	1,011	-365	646	14	660	-417
Dec	1,741	330	-577	1,164	-159	1,005	49	1,054	-687
Jan	8,024	575	-868	7,157	-93	7,064	138	7,201	-823
Feb	10,022	1,832	-1,618	8,403	-147	8,257	108	8,365	-1,657
Mar	8,577	2,005	-1,200	7,377	-247	7,129	99	7,229	-1,348
Apr	2,851	1,198	-389	2,462	-277	2,185	43	2,228	-623
May	1,019	657	-68	951	-265	687	9	695	-324
Jun	436	308	103	539	-176	363	9	372	-64
Jul	239	85	32	271	-108	163	12	175	-64
Aug	223	33	-71	152	-70	82	20	102	-122
Sep	335	39	-157	178	-64	115	19	133	-202
Avg Monthly	2,907	643	-428	2,480	-168	2,312	45	2,357	-551
Med Monthly	1,048	399	-207	981	-153	666	20	677	-370
Avg Total=Anl	34,889	7,715	-5,134	29,756	-2,013	27,742	537	28,280	-6,610

Lower Santa Margarita River Groundwater Model

Modflow Volumetric Budget Output

Average Monthly Water Budget

	INFLOW:					OUTFLOW:									
Avg AF/M	Storage	Recharge	Stream Leakance	GHB	TOTAL IN	Storage	Wells	ET	Stream Leakance	GHB	TOTAL OUT	NET Storage	NET Str Lknc	In-Out	% bal
Oct	570	45	278	89	981	59	721	157	39	8	984.0175849	-511	-238	-2.9	-0.29%
Nov	180	471	1,056	85	1,792	794	783	159	47	8	1790.759679	614	-1,009	1.7	0.09%
Dec	424	124	862	85	1,495	350	906	174	60	7	1496.608039	-73	-802	-1.7	-0.11%
Jan	327	193	1,242	82	1,844	534	1,061	179	65	5	1844.146148	207	-1,177	-0.1	-0.01%
Feb	269	1,706	922	78	2,975	1,480	1,054	177	264	0	2974.832874	1,211	-658	0.4	0.01%
Mar	176	2,067	905	76	3,224	1,204	984	210	822	1	3221.726905	1,028	-82	1.9	0.06%
Apr	401	1,278	705	70	2,453	467	804	213	962	8	2454.08719	66	257	-0.8	-0.03%
May	570	729	520	71	1,889	209	657	219	798	9	1891.905969	-361	278	-2.9	-0.15%
Jun	693	186	366	71	1,315	89	547	204	472	7	1318.041598	-604	106	-2.9	-0.22%
Jul	657	30	267	78	1,032	33	574	196	229	4	1036.009596	-624	-39	-3.5	-0.34%
Aug	501	6	247	85	839	35	517	182	106	0	840.1162994	-466	-141	-0.8	-0.09%
Sep	588	10	298	85	981	54	711	163	55	1	984.3596878	-534	-243	-3.4	-0.34%
Avg Monthly	446	570	639	79	1,735	442	776	186	327	5	1736.384298	-4	-312	-1.3	-0.12%
Med Monthly	462	190	612	80	1,644	279	752	181	167	6	1643.683859	-217	-190	-1.3	-0.10%
Avg Total=Anl	5,355	6,845	7,669	953	20,822	5,308	9,318	2,233	3,919	59	20836.61157	-47	-3,749	-15.0	

Attachment I

Run 5 (Title 22) Model Results

Table I-1. Run 5 Annual Pumping Summary
Lower Santa Margarita River Groundwater Model

Hydrologic Condition			Pumping Condition					
HC	Cnt	Oct to Apr Strflw	PC	HC	Q Adjst	Anl Q	Cnt	
VW	9	Very Wet > 56,164	1	2+ AN @ VW	4,000	19,100	5	10%
AN	15	Above Normal > 13,600	2	2+ AN @ AN	2,000	17,100	9	18%
BN	14	Below Normal < 13,600	3	Standard	0	15,100	10	20%
ED	12	Extremely Dry < 5,840	4	1st BN	-4,000	11,100	6	12%
	50		5	2ndBN, 70/30 split	-8,000	7,100	3	6%
			6	3+BN/all ED	-9,000	6,100	17	34%
							50	100%

MY	HC	Oct-Apr HC descrip	May-Apr Pumping Condition	UY Total (af/y)	CH Total (af/y)	LY Total (af/y)	LSMR Total (af/y)	+Q
1	VW	Very Wet	3	7,492	7,329	1,466	16,288	
2	BN	Below Normal	4	6,347	6,209	1,242	13,798	
3	AN	Above Normal	3	5,705	5,581	1,116	12,402	
4	ED	Extremely Dry	6	5,876	4,440	1,214	11,531	
5	ED	Extremely Dry	6	3,660	1,434	915	6,009	
6	ED	Extremely Dry	6	3,660	1,525	915	6,100	
7	AN	Above Normal	3	4,730	3,240	1,060	9,030	
8	ED	Extremely Dry	6	5,876	5,080	1,214	12,170	
9	ED	Extremely Dry	6	3,660	1,525	915	6,100	
10	ED	Extremely Dry	6	3,660	1,525	915	6,100	
11	BN	Below Normal	6	3,660	1,525	915	6,100	
12	ED	Extremely Dry	6	3,660	1,525	915	6,100	
13	ED	Extremely Dry	6	3,660	1,525	915	6,100	
14	ED	Extremely Dry	6	3,660	1,525	915	6,100	
15	AN	Above Normal	3	4,730	3,240	1,060	9,030	
16	AN	Above Normal	2	7,622	7,456	1,491	16,569	X
17	ED	Extremely Dry	6	6,497	5,687	1,336	13,519	
18	VW	Very Wet	3	4,730	3,240	1,060	9,030	
19	BN	Below Normal	4	6,347	6,209	1,242	13,798	
20	BN	Below Normal	5	4,831	3,947	1,020	9,798	
21	ED	Extremely Dry	6	4,065	1,694	1,016	6,774	
22	BN	Below Normal	6	3,660	1,525	915	6,100	
23	BN	Below Normal	6	3,660	1,525	915	6,100	
24	BN	Below Normal	6	3,660	1,525	915	6,100	
25	BN	Below Normal	6	3,660	1,525	915	6,100	
26	ED	Extremely Dry	6	3,660	1,525	915	6,100	
27	VW	Very Wet	3	4,730	3,240	1,060	9,030	
28	AN	Above Normal	2	7,622	7,456	1,491	16,569	X
29	VW	Very Wet	1	8,436	8,253	1,651	18,340	X
30	AN	Above Normal	2	8,316	8,135	1,627	18,079	X
31	AN	Above Normal	2	7,866	7,695	1,539	17,100	X
32	VW	Very Wet	1	8,336	8,155	1,631	18,121	X
33	AN	Above Normal	2	8,018	7,844	1,569	17,431	X
34	AN	Above Normal	2	7,866	7,695	1,539	17,100	X
35	AN	Above Normal	2	7,866	7,695	1,539	17,100	X
36	BN	Below Normal	4	6,968	6,816	1,363	15,147	
37	AN	Above Normal	3	5,705	5,581	1,116	12,402	
38	BN	Below Normal	4	6,347	6,209	1,242	13,798	
39	BN	Below Normal	5	4,831	3,947	1,020	9,798	
40	VW	Very Wet	3	5,134	3,409	1,161	9,704	
41	AN	Above Normal	2	7,516	7,353	1,471	16,340	X
42	VW	Very Wet	1	8,542	8,356	1,671	18,569	X
43	AN	Above Normal	2	8,316	8,135	1,627	18,079	X
44	VW	Very Wet	1	8,436	8,253	1,651	18,340	X
45	BN	Below Normal	4	7,588	7,423	1,485	16,496	
46	AN	Above Normal	3	5,705	5,581	1,116	12,402	
47	VW	Very Wet	1	8,087	7,911	1,582	17,580	X
48	BN	Below Normal	4	7,588	7,423	1,485	16,496	
49	BN	Below Normal	5	4,831	3,947	1,020	9,798	
50	AN	Above Normal	3	5,134	3,409	1,161	9,704	

		UY Total	CH Total	LY Total	LSMR Total
	Min	3,660	1,434	915	6,009
Notes:	Max	8,542	8,356	1,671	18,569
Hydrologic Condition: Oct - Apr	**Median**	**5,705**	**5,330**	**1,161**	**12,286**
Model starts after 3+ BN or ED	% of Median	46.4%	43.4%	9.4%	
	Average	**5,844**	**4,860**	**1,225**	**11,929**
	% of Average	49.0%	40.7%	10.3%	

Table I-1. Run 5 Annual Pumping Summary (continued)

	Oct-Apr HC Description	HC Count	UY Total (af/y)	CH Total (af/y)	LY Total (af/y)	LSMR Total (af/y)
AVERAGES	ED	12	4,300	2,417	1,008	7,725
	BN	14	5,284	4,268	1,121	10,673
	AN	15	6,848	6,406	1,368	14,622
	VW	9	7,103	6,461	1,437	15,000
MEDIANS	ED	12	3,660	1,525	915	6,100
	BN	14	4,831	3,947	1,020	9,798
	AN	15	7,622	7,456	1,491	16,569
	VW	9	8,087	7,911	1,582	17,580

Average Monthly Pumping

	Month	UY Total (af/m)	CH Total (af/m)	LY Total (af/m)	LSMR Total (af/m)
8%	Oct	460	383	96	940
8%	Nov	499	416	105	1,020
10%	Dec	579	481	121	1,182
11%	Jan	669	557	140	1,365
11%	Feb	651	544	136	1,331
10%	Mar	606	499	127	1,232
9%	Apr	494	408	103	1,005
7%	May	411	342	86	839
6%	Jun	342	285	72	698
6%	Jul	359	299	75	734
6%	Aug	324	270	68	661
8%	Sep	451	376	95	921
	Avg Anl	5,844	4,860	1,225	11,929

Table I-2. Run 5 Pumping Summaries
Lower Santa Margarita River Groundwater Model

		Bldg #	State ID #	Label	# mos Q	% of 600 mos	Orig Wells by Subbsn %	80% Utilization af/m	
1	UY	2673	10/4-7A2	7A2	600	100%	25%	142	
2	UY	26072	10/4-8D1	8D1	600	100%	21%	121	
3	UY	2671	10/4-7H2	7H2	600	100%	15%	82	
4	UY	PW-6	PW-6	PW-6	600	100%	19%	110	
5	UY	2603	10/4-7R2	7R2	600	100%	19%	110	
6	UY	UY-1	UY-1	UY-1	183	31%	0%	110	
7	UY	UY-2	UY-2	UY-2	128	21%	0%	110	
8	UY	UY-3	UY-3	UY-3	76	13%	0%	110	
9	UY	UY-4	UY-4	UY-4	33	6%	0%	110	
10	UY	UY-5	UY-5	UY-5	5	1%	0%	110	
11	CH	2393	10/4-18E3	18E4	600	100%	14%	121	
12	CH	2373	10/4-18M4&5	18M5	600	100%	18%	153	
13	CH	2363	10/5-13R2	13R2	600	100%	16%	132	
14	CH	33925	10/5-23G4	23G4	**0**	**0%**	0%	**0**	backup
15	CH	2301	10/5-23J1	23J1	600	100%	20%	164	
16	CH	33924	10/5-23K2	23K2	**0**	**0%**	0%	**0**	backup
17	CH	33923	10/5-23K3	23K3	600	100%	16%	132	
18	CH	CH-1	CH-1	CH-1	48	8%	0%	88	
19	CH	CH-2	CH-2	CH-2	13	2%	0%	88	
20	CH	CH-4	CH-4	CH-4	600	100%	16%	132	Replaced 23G4
21	LY	LY-1	LY-1	LY-1	600	100%	0%	55	
22	LY	LY-2	LY-2	LY-2	566	94%	0%	55	
23	LY	LY-3	LY-3	LY-3	189	32%	0	55	
24	LY	LY-4	LY-4	LY-4	48	8%	0	55	

% Pumping in Subbasin

		Wet Year Algorithm			Dry Year Management			Max Pumping in Subbasin adding wells as needed				
		46%	45%	9%	60%	25%	15%					
mo	Anl %	UY	CH	LY	UY	CH	LY		UY	CH	LY	Total
OCT	7.9%	3.7%	3.6%	0.71%	4.8%	2.0%	1.19%	# exst wells	5	7	-	12
NOV	8.6%	4.0%	3.9%	0.78%	5.2%	2.2%	1.29%	af/m (75%)	564	833	-	1,397
DEC	10.0%	4.6%	4.5%	0.90%	6.0%	2.5%	1.50%	avg af/well	113	119	-	116
JAN	11.4%	5.3%	5.1%	1.03%	6.9%	2.9%	1.71%					
FEB	10.9%	5.0%	4.9%	0.99%	6.6%	2.7%	1.64%	1 adntl well	674	921	55	1,650
MAR	10.2%	4.7%	4.6%	0.92%	6.1%	2.5%	1.53%	2 adntl well	784	1,008	110	1,902
APR	8.3%	3.8%	3.7%	0.75%	5.0%	2.1%	1.25%	3 adntl well	893	1,096	164	2,154
MAY	7.1%	3.3%	3.2%	0.64%	4.3%	1.8%	1.06%	4 adntl well	1,003	1,184	219	2,406
JUN	5.9%	2.7%	2.7%	0.53%	3.5%	1.5%	0.88%	5 adntl well	1,112	1,271		2,384
JUL	6.2%	2.9%	2.8%	0.56%	3.7%	1.6%	0.93%	6 adntl well	1,222			1,222
AUG	5.6%	2.6%	2.5%	0.50%	3.4%	1.4%	0.84%	50-yr Avg	5,844	4,875	1,225	
SEP	7.8%	3.6%	3.5%	0.70%	4.7%	1.9%	1.17%	50-yr Med	5,705	5,330	1,161	

	median						
	UY af/m	CH af/m	LY af/m	Total af/m	Max Mo Pumping	cfs	new wells
ED	358	155	79	620	1,954	34	10
BN	370	294	79	688	2,182	38	12
AN	541	529	107	1,175	2,182	38	12
VW	545	533	108	1,184	2,182	38	12

Wet Year Algorithm Monthly Counts

	2,000	4,000	Total	% of 50 yrs
Oct	-	-	-	0%
Nov	-	-	-	0%
Dec	1	-	1	2%
Jan	7	1	8	16%
Feb	7	4	11	22%
Mar	9	5	14	28%
Apr	9	5	14	28%
May	-	-	-	0%
	33	15	48	

Table I-3. Run 5 Annual Pumping by Well

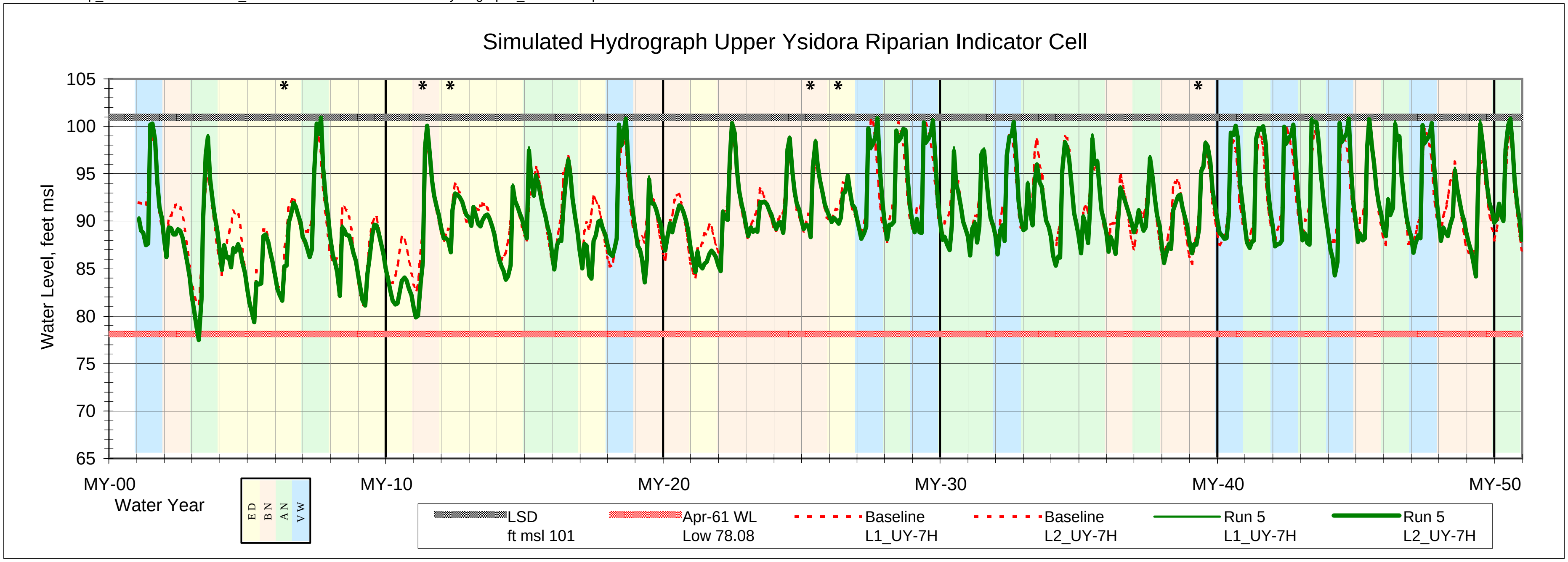
	Building #:	2673	26072	2671	PW-6	2603	new	new	new	new	new
	Max Annual Pumping	1,617	1,368	933	1,244	1,244	1,136	940	732	530	316
	Potential w/ 80% Util	1,710	1,447	986	1,315	1,315	1,315	1,315	1,315	1,315	1,315
	Potential Well Yield (gpm)	1,300	1,100	750	1,000	1,000	1,000	1,000	1,000	1,000	1,000
		UY	UY	UY	UY	UY	UY	UY	UY	UY	UY
		10/4-7A2	10/4-8D1	10/4-7H2	PW-6	10/4-7R2	UY-1	UY-2	UY-3	UY-4	UY-5
MY	HC	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)
1	VW	1,488	1,259	858	1,145	1,145	599	501	302	196	0
2	BN	1,327	1,123	766	1,021	1,021	591	400	97	0	0
3	AN	1,416	1,198	817	1,089	1,089	95	0	0	0	0
4	ED	1,209	1,023	697	930	930	591	400	97	0	0
5	ED	924	782	533	711	711	0	0	0	0	0
6	ED	924	782	533	711	711	0	0	0	0	0
7	AN	1,194	1,010	689	918	918	0	0	0	0	0
8	ED	1,209	1,023	697	930	930	591	400	97	0	0
9	ED	924	782	533	711	711	0	0	0	0	0
10	ED	924	782	533	711	711	0	0	0	0	0
11	BN	924	782	533	711	711	0	0	0	0	0
12	ED	924	782	533	711	711	0	0	0	0	0
13	ED	924	782	533	711	711	0	0	0	0	0
14	ED	924	782	533	711	711	0	0	0	0	0
15	AN	1,194	1,010	689	918	918	0	0	0	0	0
16	AN	1,545	1,307	891	1,188	1,188	703	400	302	98	0
17	ED	1,213	1,026	700	933	933	702	494	399	98	0
18	VW	1,194	1,010	689	918	918	0	0	0	0	0
19	BN	1,327	1,123	766	1,021	1,021	591	400	97	0	0
20	BN	1,195	1,012	690	920	920	95	0	0	0	0
21	ED	1,026	868	592	789	789	0	0	0	0	0
22	BN	924	782	533	711	711	0	0	0	0	0
23	BN	924	782	533	711	711	0	0	0	0	0
24	BN	924	782	533	711	711	0	0	0	0	0
25	BN	924	782	533	711	711	0	0	0	0	0
26	ED	924	782	533	711	711	0	0	0	0	0
27	VW	1,194	1,010	689	918	918	0	0	0	0	0
28	AN	1,545	1,307	891	1,188	1,188	703	400	302	98	0
29	VW	1,553	1,314	896	1,195	1,195	893	690	398	301	0
30	AN	1,557	1,318	898	1,198	1,198	820	614	410	204	99
31	AN	1,533	1,297	885	1,179	1,179	801	494	399	98	0
32	VW	1,554	1,315	897	1,195	1,195	894	691	399	196	0
33	AN	1,542	1,305	890	1,186	1,186	808	602	399	98	0
34	AN	1,533	1,297	885	1,179	1,179	801	494	399	98	0
35	AN	1,533	1,297	885	1,179	1,179	801	494	399	98	0
36	BN	1,332	1,127	768	1,024	1,024	702	494	399	98	0
37	AN	1,416	1,198	817	1,089	1,089	95	0	0	0	0
38	BN	1,327	1,123	766	1,021	1,021	591	400	97	0	0
39	BN	1,195	1,012	690	920	920	95	0	0	0	0
40	VW	1,296	1,097	748	997	997	0	0	0	0	0
41	AN	1,543	1,306	890	1,187	1,187	702	399	301	0	0
42	VW	1,554	1,315	897	1,196	1,196	894	691	399	302	99
43	AN	1,557	1,318	898	1,198	1,198	820	614	410	204	99
44	VW	1,553	1,314	896	1,195	1,195	893	690	398	301	0
45	BN	1,350	1,142	779	1,038	1,038	715	715	410	302	99
46	AN	1,416	1,198	817	1,089	1,089	95	0	0	0	0
47	VW	1,564	1,323	902	1,203	1,203	794	595	300	203	0
48	BN	1,350	1,142	779	1,038	1,038	715	715	410	302	99
49	BN	1,195	1,012	690	920	920	95	0	0	0	0
50	AN	1,296	1,097	748	997	997	0	0	0	0	0
	Min	924	782	533	711	711	0	0	0	0	0
	Max	1,564	1,323	902	1,203	1,203	894	715	410	302	99
	Median	1,296	1,097	748	997	997	95	0	0	0	0
	Average	1,261	1,067	727	970	970	366	256	152	66	10

Average Monthly Well Production

	Month	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)
	Oct	107	90	61	82	82	28	10	0	0	0
	Nov	107	91	62	82	82	47	28	0	0	0
	Dec	115	97	66	89	89	47	47	28	0	0
	Jan	119	101	69	92	92	58	47	47	33	10
	Feb	124	105	72	96	96	51	51	40	17	0
	Mar	116	98	67	89	89	47	47	37	16	0
	Apr	108	91	62	83	83	49	16	0	0	0
	May	101	86	58	78	78	10	0	0	0	0
	Jun	86	73	50	66	66	0	0	0	0	0
	Jul	91	77	52	70	70	0	0	0	0	0
	Aug	82	69	47	63	63	0	0	0	0	0
	Sep	105	88	60	80	80	27	10	0	0	0
Annual Total		1,261	1,067	727	970	970	366	256	152	66	10

		Table I-3. Run 5 Annual Pumping by Well (continued)													
	Building #:	2393	2373	2363	33925	2301	33924	33923	new	new	new	new	new	new	new
Max Annual Pumping		1,244	1,583	1,357	0	1,696	0	1,357	413	330	330	566	566	409	183
Potential w/ 80% Util		1,447	1,841	1,578	0	1,973	0	1,578	1,052	1,052	1,052	658	658	658	658
Potential Well Yield (gpm)		1,100	1,400	1,200	0	1,500	0	1,200	800	800	800	500	500	500	500
		CH	CH	CH	CH	CH	CH	CH	CH	CH	CH	LY	LY	LY	LY
		10/4-18E3	10/4-18M4&5	10/5-13R2	10/5-23G4	10/5-23J1	10/5-23K2	10/5-23K3	CH-1	CH-2	CH-4	LY-1	LY-2	LY-3	LY-4
MY	HC	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)
1	VW	1,025	1,305	1,118	0	1,398	0	1,118	247	0	1,118	537	537	262	130
2	BN	899	1,144	980	0	1,225	0	980	0	0	980	486	486	270	0
3	AN	808	1,028	881	0	1,101	0	881	0	0	881	539	539	38	0
4	ED	643	818	701	0	876	0	701	0	0	701	525	420	270	0
5	ED	207	264	226	0	283	0	226	0	0	226	510	405	0	0
6	ED	221	281	241	0	301	0	241	0	0	241	510	405	0	0
7	AN	469	597	512	0	640	0	512	0	0	512	530	530	0	0
8	ED	735	936	802	0	1,003	0	802	0	0	802	525	420	270	0
9	ED	221	281	241	0	301	0	241	0	0	241	510	405	0	0
10	ED	221	281	241	0	301	0	241	0	0	241	510	405	0	0
11	BN	221	281	241	0	301	0	241	0	0	241	510	405	0	0
12	ED	221	281	241	0	301	0	241	0	0	241	510	405	0	0
13	ED	221	281	241	0	301	0	241	0	0	241	510	405	0	0
14	ED	221	281	241	0	301	0	241	0	0	241	510	405	0	0
15	AN	469	597	512	0	640	0	512	0	0	512	530	530	0	0
16	AN	1,055	1,343	1,151	0	1,439	0	1,151	164	0	1,151	550	550	305	86
17	ED	799	1,017	872	0	1,090	0	872	164	0	872	519	414	317	86
18	VW	469	597	512	0	640	0	512	0	0	512	530	530	0	0
19	BN	899	1,144	980	0	1,225	0	980	0	0	980	486	486	270	0
20	BN	571	727	623	0	779	0	623	0	0	623	491	491	38	0
21	ED	245	312	267	0	334	0	267	0	0	267	521	416	79	0
22	BN	221	281	241	0	301	0	241	0	0	241	510	405	0	0
23	BN	221	281	241	0	301	0	241	0	0	241	510	405	0	0
24	BN	221	281	241	0	301	0	241	0	0	241	510	405	0	0
25	BN	221	281	241	0	301	0	241	0	0	241	510	405	0	0
26	ED	221	281	241	0	301	0	241	0	0	241	510	405	0	0
27	VW	469	597	512	0	640	0	512	0	0	512	530	530	0	0
28	AN	1,055	1,343	1,151	0	1,439	0	1,151	164	0	1,151	550	550	305	86
29	VW	1,147	1,459	1,251	0	1,564	0	1,251	249	82	1,251	556	556	404	135
30	AN	1,117	1,422	1,219	0	1,523	0	1,219	249	167	1,219	559	559	369	139
31	AN	1,090	1,387	1,189	0	1,486	0	1,189	164	0	1,189	548	548	357	86
32	VW	1,144	1,457	1,248	0	1,561	0	1,248	247	0	1,248	551	551	399	130
33	AN	1,112	1,415	1,213	0	1,516	0	1,213	164	0	1,213	558	558	367	86
34	AN	1,090	1,387	1,189	0	1,486	0	1,189	164	0	1,189	548	548	357	86
35	AN	1,090	1,387	1,189	0	1,486	0	1,189	164	0	1,189	548	548	357	86
36	BN	963	1,225	1,050	0	1,313	0	1,050	164	0	1,050	480	480	317	86
37	AN	808	1,028	881	0	1,101	0	881	0	0	881	539	539	38	0
38	BN	899	1,144	980	0	1,225	0	980	0	0	980	486	486	270	0
39	BN	571	727	623	0	779	0	623	0	0	623	491	491	38	0
40	VW	493	628	538	0	673	0	538	0	0	538	541	541	79	0
41	AN	1,053	1,340	1,148	0	1,435	0	1,148	80	0	1,148	558	558	313	42
42	VW	1,149	1,462	1,253	0	1,567	0	1,253	251	167	1,253	561	561	409	140
43	AN	1,117	1,422	1,219	0	1,523	0	1,219	249	167	1,219	559	559	369	139
44	VW	1,147	1,459	1,251	0	1,564	0	1,251	249	82	1,251	556	556	404	135
45	BN	1,002	1,275	1,093	0	1,366	0	1,093	333	167	1,093	488	488	325	183
46	AN	808	1,028	881	0	1,101	0	881	0	0	881	539	539	38	0
47	VW	1,109	1,412	1,210	0	1,513	0	1,210	165	82	1,210	566	566	360	91
48	BN	1,002	1,275	1,093	0	1,366	0	1,093	333	167	1,093	488	488	325	183
49	BN	571	727	623	0	779	0	623	0	0	623	491	491	38	0
50	AN	493	628	538	0	673	0	538	0	0	538	541	541	79	0
	Min	207	264	226	0	283	0	226	0	0	226	480	405	0	0
	Max	1,149	1,462	1,253	0	1,567	0	1,253	333	167	1,253	566	566	409	183
	Median	767	977	837	0	1,046	0	837	0	0	837	525	491	79	0
	Average	689	877	751	0	939	0	751	79	22	751	525	489	169	43
Average Monthly W															
	Month	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)
	Oct	55	71	60	0	76	0	60	0	0	60	42	42	12	0
	Nov	60	77	66	0	82	0	66	0	0	66	42	42	21	0
	Dec	69	87	75	0	94	0	75	7	0	75	48	48	23	3
	Jan	75	96	82	0	103	0	82	29	9	82	47	47	30	15
	Feb	72	92	79	0	99	0	79	31	13	79	48	48	24	17
	Mar	70	89	77	0	96	0	77	13	0	77	48	48	23	7
	Apr	59	75	64	0	80	0	64	0	0	64	41	41	21	0
	May	50	63	54	0	68	0	54	0	0	54	41	41	4	0
	Jun	41	52	45	0	56	0	45	0	0	45	45	27	0	0
	Jul	43	55	47	0	59	0	47	0	0	47	38	38	0	0
	Aug	39	50	43	0	53	0	43	0	0	43	43	25	0	0
	Sep	54	69	59	0	74	0	59	0	0	59	41	41	12	0
	Annual Total	689	877	751	0	939	0	751	79	22	751	525	489	169	43

D:\Camp_Pendleton\SMR\USBR_model\Run5 Title 22\POST\C.IC-hydrographs_Run 5.xls / printed 7/5/2006



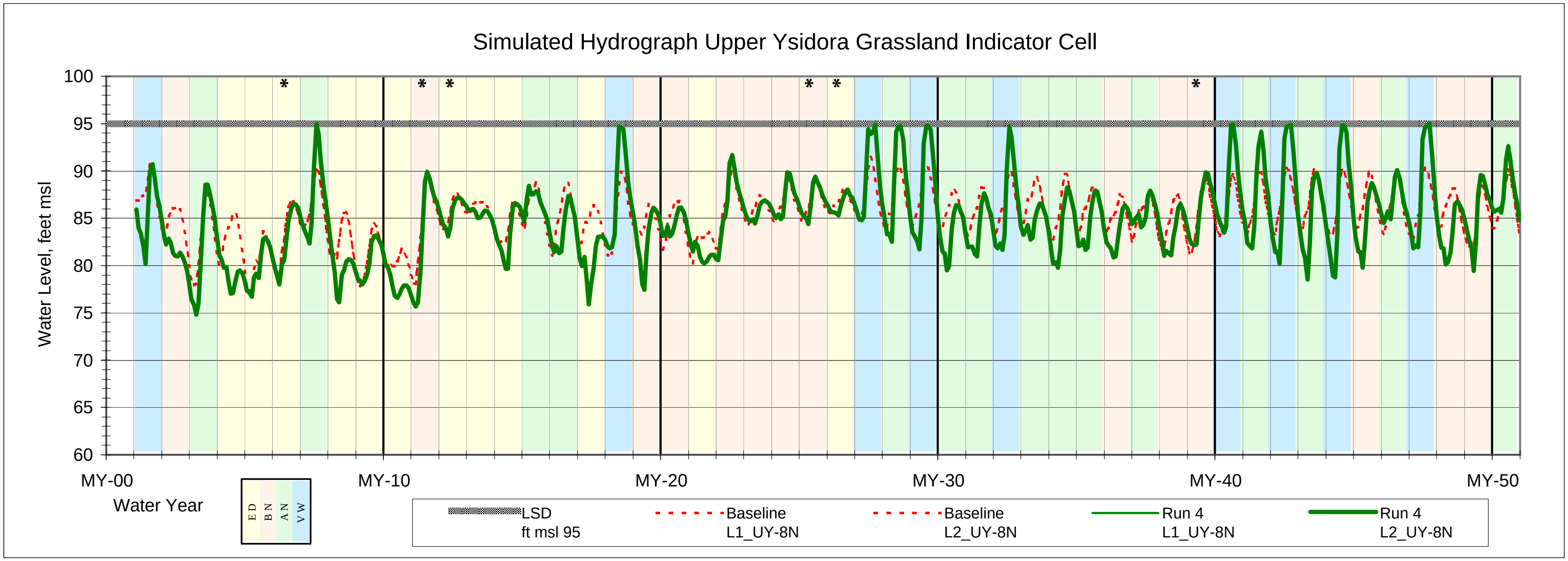
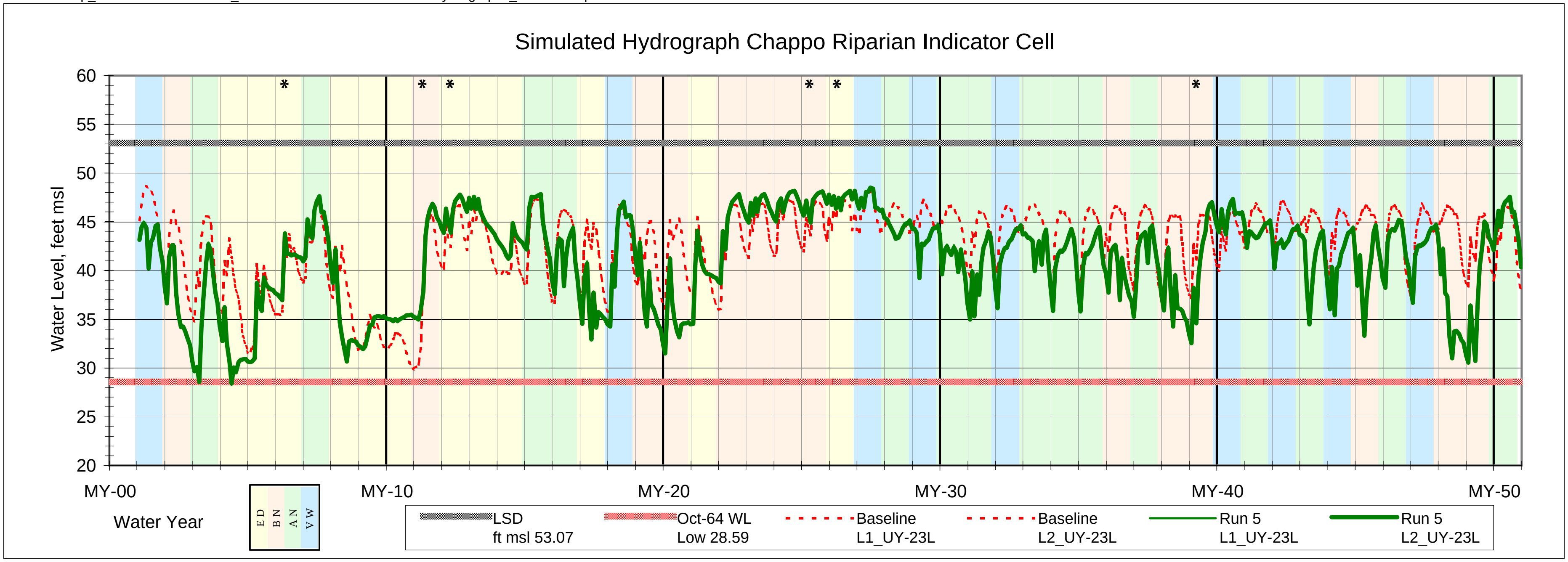
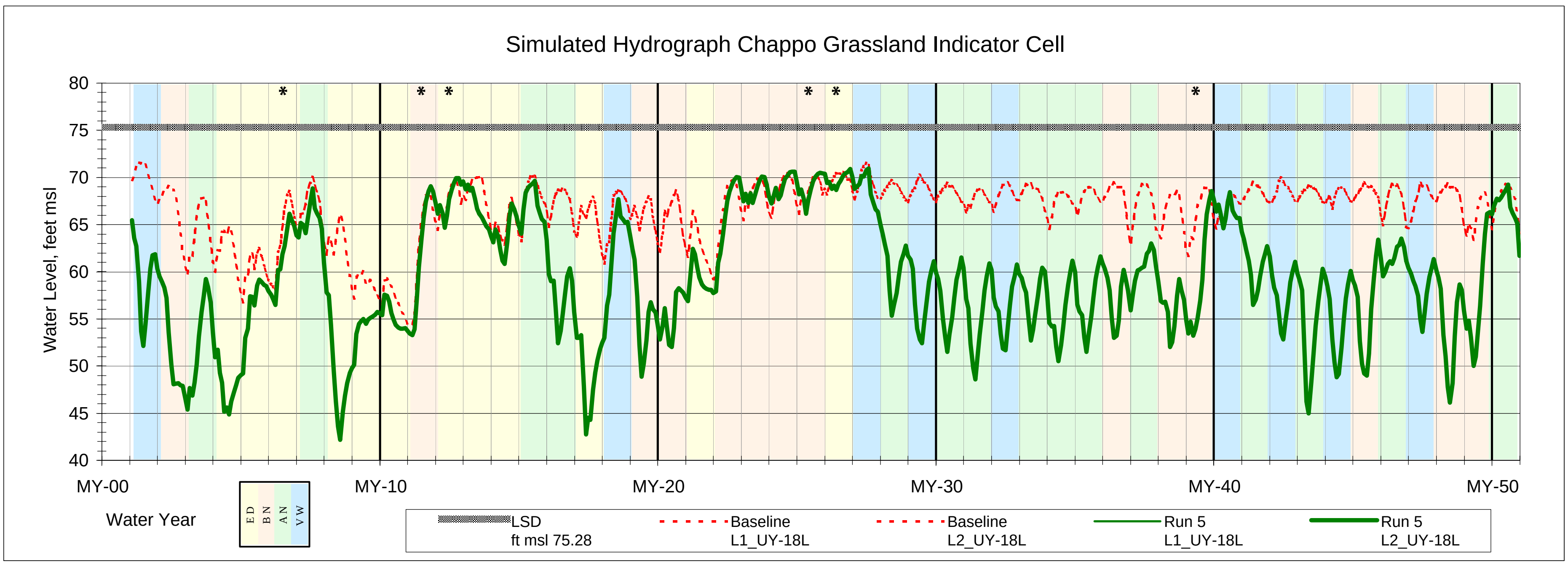


FIGURE I-1
Run 5 Title 22 Water in LY and Baseline Hydrographs

* Emergency flows called upon during water years marked with an asterisk.
Layer 1 (L1) and Layer 2(L2) simulated groundwater levels are at similar elevations and the graph lines are printed on top of each other.

D:\Camp_Pendleton\SMR\USBR_model\Run5 Title 22\POST\C.IC-hydrographs_Run 5.xls / printed 7/5/2006



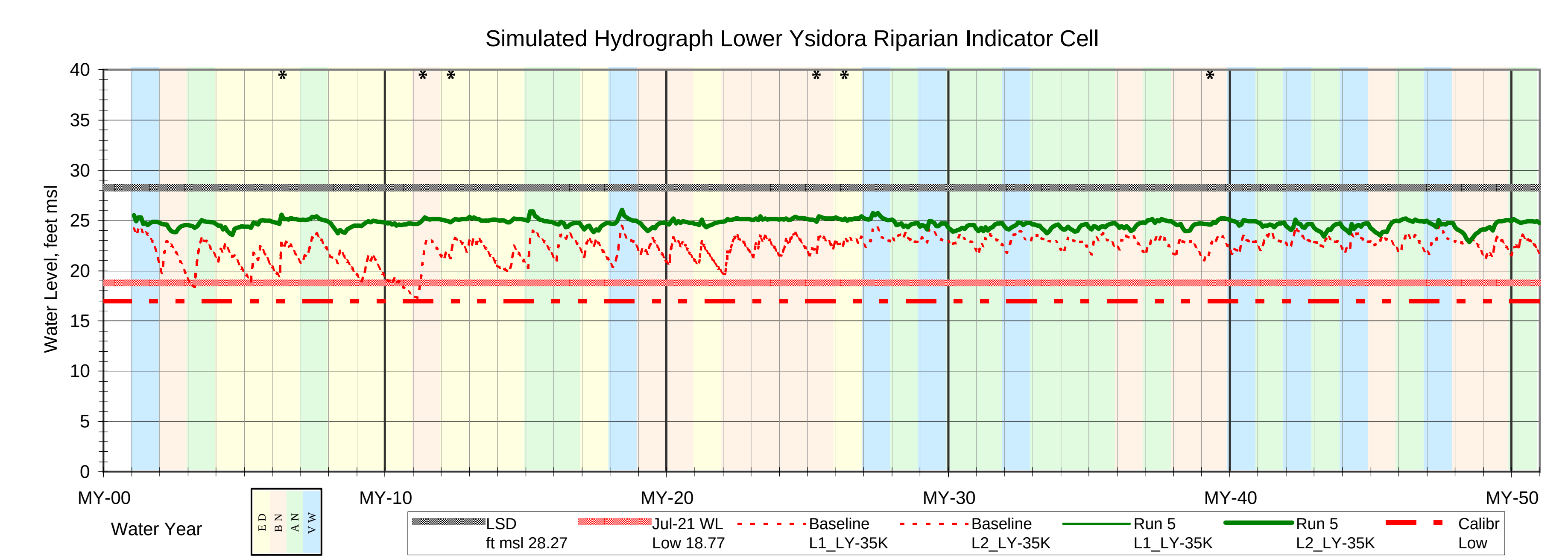


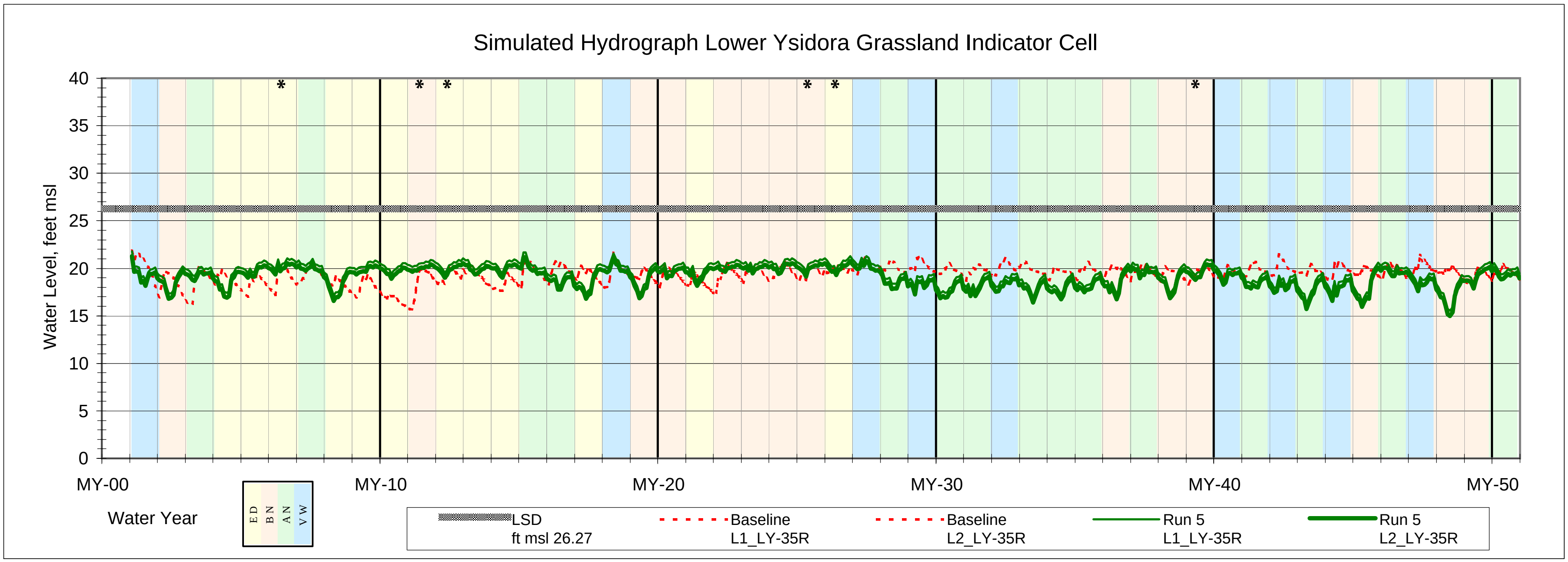
***** Emergency flows called upon during water years marked with an asterisk.

Layer 1 (L1) and Layer 2(L2) simulated groundwater levels are at similar elevations and the graph lines are printed on top of each other.

FIGURE I-2

Run 5 Title 22 Water in LY and Baseline Hydrographs



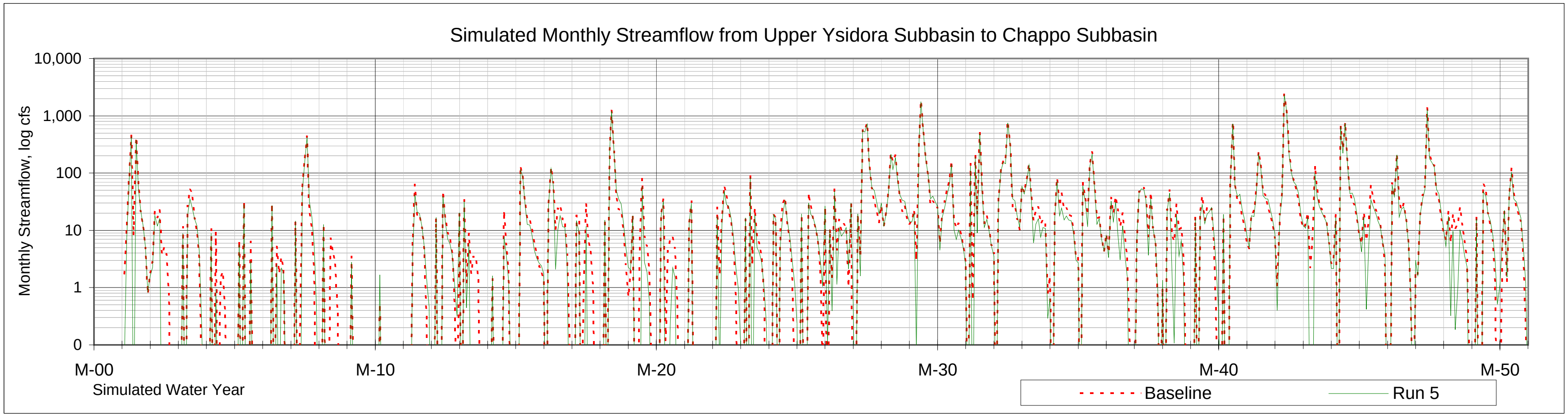


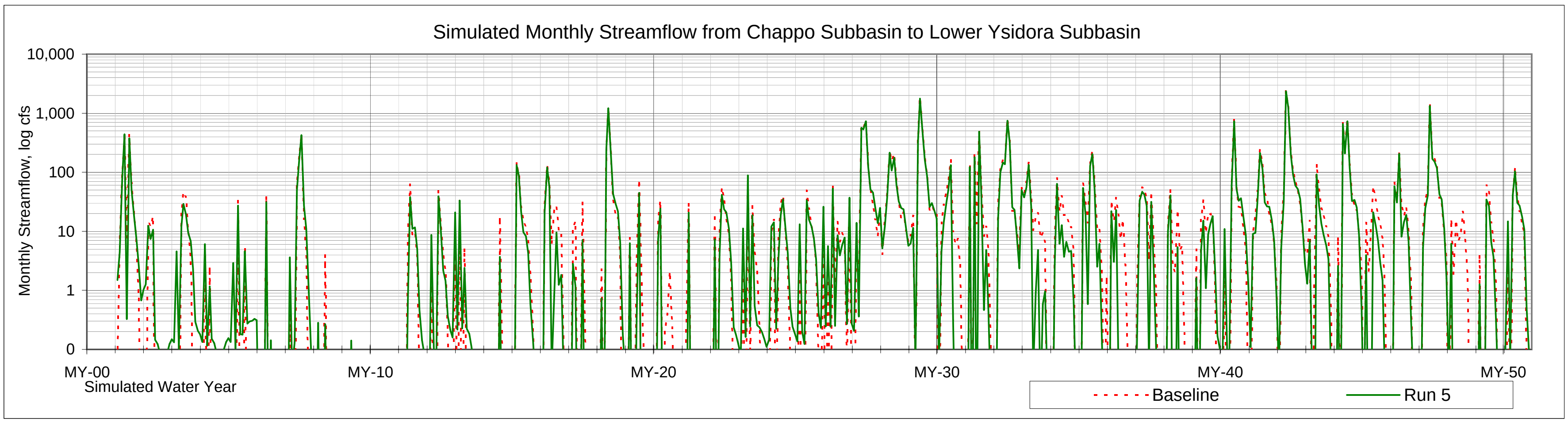
* Emergency flows called upon during water years marked with an asterisk.

Layer 1 (L1) and Layer 2(L2) simulated groundwater levels are at similar elevations and the graph lines are printed on top of each other.

FIGURE I-3

Run 5 Title 22 Water in LY and Baseline Hydrographs





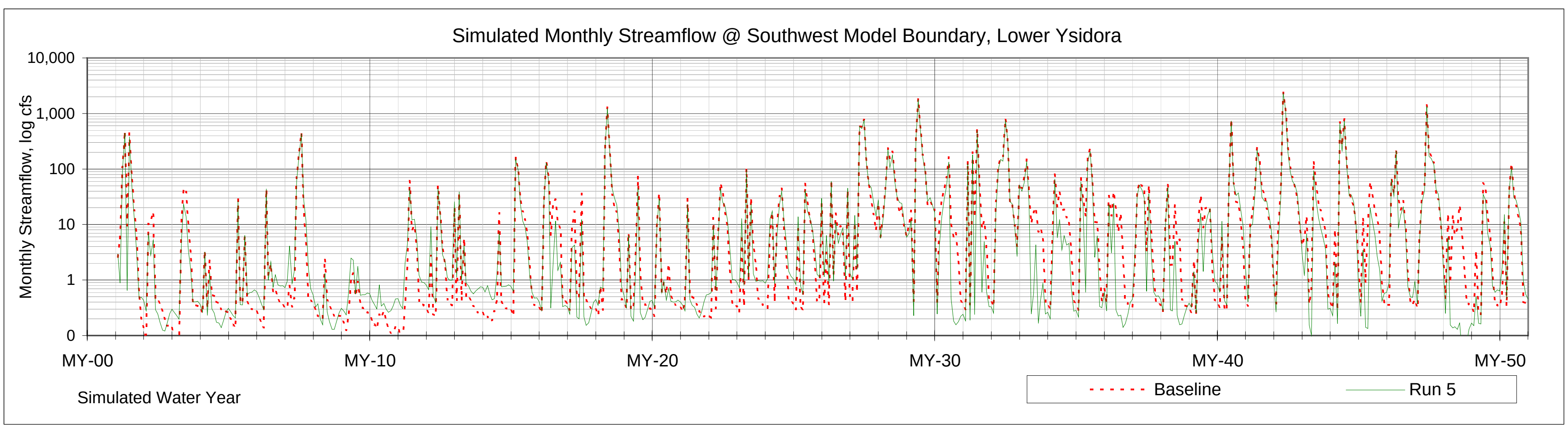


Figure I-4. Simulated Streamflow, Run 5 Title 22 Water in LY and Baseline

Table I-4, Run 5 Title 22 Water in Lower Ysidora Subbasin

Average Hydrologic Condition Water Budget (af/y)

% Time Exceedence	> 76%	76% to 50%	50% to 19%	< 19%
# Years	12	14	15	9
	Extremely Dry	Below Normal	Above Normal	Very Wet
Inflow:				
Santa Margarita River Inflow	7,400	13,300	32,300	127,100
Subsurface Underflow	1,000	900	900	800
Lake O'Neill Spill and Release	800	1,400	1,800	2,200
Fallbrook Creek	100	400	1,400	3,800
Title 22 Water	1,800	1,800	1,800	1,800
Minor Tributary Drainages	1,700	1,400	2,400	4,900
Areal Precipitation	500	500	700	1,600
Total Inflow:	13,300	19,700	41,300	142,200
Outflow:				
Santa Margarita River Outflow	2,400	4,400	21,500	121,200
Subsurface Underflow	100	100	100	100
Groundwater Pumping	7,700	10,700	14,600	15,000
Evapotranspiration	2,200	2,500	2,800	3,000
Diversions to Lake O'Neill	1,200	1,900	2,400	2,700
Total Outflow:	13,600	19,600	41,400	142,000
Net Simulated Change of Groundwater in Storage:	-300	100	-100	200
	-	-	-	-

Median Hydrologic Condition Water Budget (af/y)

% Time Exceedence	> 76%	76% to 50%	50% to 19%	< 19%
# Years	12	14	15	9
	Extremely Dry	Below Normal	Above Normal	Very Wet
Inflow:				
Santa Margarita River Inflow	6,800	13,200	28,800	120,000
Subsurface Underflow	900	900	900	800
Lake O'Neill Spill and Release	700	1,300	2,100	2,300
Fallbrook Creek	100	300	1,100	3,500
Title 22 Water	1,800	1,800	1,800	1,800
Minor Tributary Drainages	1,500	1,400	2,500	4,700
Areal Precipitation	400	300	500	1,500
Outflow:				
Santa Margarita River Outflow	1,500	4,100	16,200	111,200
Subsurface Underflow	100	100	100	100
Groundwater Pumping	6,100	9,800	16,600	17,600
Evapotranspiration	1,900	2,300	2,600	2,800
Diversions to Lake O'Neill	1,300	1,700	2,700	2,700
Net Simulated Change of Groundwater in Storage:	100	0	-500	0

Average Subbasin Water Budget (af/y)

	Upper Ysidora	Chappo	Lower Ysidora	SMR Basin	
Inflow:					
Santa Margarita River Inflow	38,000	31,900	28,900	38,000	82%
Subsurface Underflow *	900	1,900	500	900	2%
Lake O'Neill Spill and Release	1,500	-	-	1,500	3%
Fallbrook Creek	1,200	-	-	1,200	3%
Title 22 Water	-	-	1,800	1,800	4%
Minor Tributary Drainages	600	1,100	700	2,400	5%
Areal Precipitation	200	300	200	800	2%
Total Inflow:	42,400	35,200	32,100	46,600	
Outflow:					
Santa Margarita River Outflow	31,900	28,900	29,900	30,000	64%
Subsurface Underflow *	1,900	500	100	100	0%
Groundwater Pumping	5,800	4,900	1,200	11,900	26%
Evapotranspiration *	800	1,000	800	2,600	6%
Diversions to Lake O'Neill	2,000	-	-	2,000	4%
Total Outflow:	42,400	35,300	32,000	46,600	
Net Simulated Change of Groundwater in Storage: *	0	-100	100	0	
	-	-	-	-	

Note: * Subbasin Averages are based on the last rate of the stress period
Values are rounded to the nearest 100 acre-feet, closest number adjusted to eliminate rounding error

Median Subbasin Water Budget (af/y)

	Upper Ysidora	Chappo	Lower Ysidora	SMR Basin
Inflow:				
Santa Margarita River Inflow	16,000	9,000	6,600	16,000
Subsurface Underflow *	900	2,000	500	900
Lake O'Neill Spill and Release	1,500	-	-	1,500
Fallbrook Creek	600	-	-	600
Title 22 Water	-	-	1,800.00	1,800
Minor Tributary Drainages	200	0	100	2,100
Areal Precipitation	10,200	0	5,844	500
Outflow:				
Santa Margarita River Outflow	9,000	6,600	7,600	7,600
Subsurface Underflow *	2,000	500	100	100
Groundwater Pumping	5,700	5,300	1,200	12,300
Evapotranspiration *	800	1,000	800	2,500
Diversions to Lake O'Neill	2,200	-	-	2,200
Net Simulated Change of Groundwater in Storage: *	0	0	0	-100

Note: The sum of median values does not reflect the change of groundwater in storage.
Median values are not cummulative.
* Subbasin Medians are based on the last rate of the stress period
Values are rounded to the nearest 100 acre-feet

Table I-5 Run 5 Annual Water budget Summary

Lower Santa Margarita River Groundwater Model

Modflow Volumetric Budget Output and Streamflow

Run 5 Title 22 Water in LY

6/22/06

Annual Surface Water Budget

MY		SMR Flow In	LON Diversion	Ponds Diversion	Str Gain+ / Loss-	GAGE SMR @ UY->CH	Str Gain+ / Loss-	SMR @ CH->LY	Str Gain+ / Loss-	SMR Flow Out	LSMR Str Gain+ / Loss-
1	VW	66,394	2,364	9,462	-6,203	60,190	-1,920	58,271	2,074	60,344	-6,050
2	BN	8,737	1,531	3,425	-5,799	2,938	-2,167	771	253	1,024	-7,713
3	AN	15,652	1,063	6,435	-8,574	7,078	-4,510	2,568	340	2,908	-12,744
4	ED	6,759	1,323	2,646	-6,172	587	-531	56	359	416	-6,343
5	ED	6,151	337	1,336	-3,923	2,228	-813	1,416	868	2,283	-3,868
6	ED	8,228	1,307	2,764	-6,167	2,061	-137	1,925	1,315	3,240	-4,989
7	AN	46,769	1,151	10,205	-4,709	42,060	-1,572	40,488	1,420	41,908	-4,861
8	ED	6,750	1,291	3,474	-6,000	750	-719	32	193	225	-6,525
9	ED	4,840	786	1,820	-4,675	165	-156	9	648	656	-4,184
10	ED	3,399	393	1,216	-3,299	100	-100	-	287	287	-3,113
11	BN	13,724	1,569	6,768	-7,567	6,158	-2,280	3,878	1,118	4,995	-8,729
12	ED	11,055	1,665	3,801	-4,767	6,287	-1,396	4,891	1,150	6,041	-5,014
13	ED	4,963	577	1,797	-2,683	2,280	-83	2,197	840	3,037	-1,926
14	ED	5,802	412	2,946	-4,944	858	-639	219	701	920	-4,882
15	AN	21,921	2,747	6,133	-5,343	16,578	-678	15,900	1,953	17,852	-4,069
16	AN	23,865	2,344	7,509	-7,944	15,921	-3,062	12,858	1,338	14,197	-9,668
17	ED	10,105	1,979	3,961	-7,947	2,159	-1,485	674	705	1,379	-8,726
18	VW	105,552	2,415	13,044	-2,291	103,260	-2,158	101,102	2,086	103,189	-2,363
19	BN	13,124	2,317	4,573	-8,038	5,085	-1,929	3,156	259	3,415	-9,708
20	BN	8,950	1,265	3,583	-5,691	3,260	-1,329	1,930	756	2,686	-6,264
21	ED	7,739	1,831	1,408	-5,104	2,635	-1,362	1,273	382	1,655	-6,083
22	BN	14,802	1,515	8,296	-5,439	9,364	-2,793	6,571	778	7,349	-7,453
23	BN	12,321	1,607	2,949	-4,262	8,058	-662	7,397	1,289	8,686	-3,635
24	BN	11,377	1,698	5,664	-4,263	7,114	-1,102	6,012	1,252	7,265	-4,112
25	BN	12,396	1,733	5,798	-4,476	7,920	-1,232	6,688	1,167	7,855	-4,541
26	ED	12,737	2,156	4,171	-4,650	8,087	-554	7,532	1,501	9,033	-3,704
27	VW	126,820	2,791	16,057	101	126,921	566	127,487	2,867	130,355	3,535
28	AN	55,061	2,722	18,024	-7,054	48,007	-5,199	42,808	756	43,564	-11,497
29	VW	181,076	2,723	18,884	-4,407	176,669	-3,486	173,182	2,083	175,265	-5,811
30	AN	28,831	2,750	7,141	-9,022	19,810	-5,932	13,878	88	13,966	-14,865
31	AN	62,376	2,698	7,723	-6,651	55,725	-5,038	50,686	719	51,405	-10,970
32	VW	105,844	2,721	14,249	-5,176	100,667	-5,397	95,270	1,146	96,416	-9,427
33	AN	29,560	2,714	9,308	-8,500	21,060	-5,272	15,788	365	16,152	-13,408
34	AN	22,097	2,701	9,005	-9,434	12,663	-6,283	6,381	60	6,441	-15,656
35	AN	39,296	2,235	8,776	-6,345	32,951	-5,481	27,470	745	28,215	-11,080
36	BN	14,221	2,155	4,939	-7,615	6,606	-3,723	2,883	279	3,162	-11,058
37	AN	19,246	1,923	5,782	-4,188	15,058	-4,080	10,977	1,087	12,064	-7,182
38	BN	12,659	1,726	4,895	-6,596	6,063	-2,642	3,421	526	3,948	-8,711
39	BN	16,158	2,439	8,958	-7,165	8,992	-5,132	3,861	442	4,302	-11,855
40	VW	64,445	2,820	12,300	-3,914	60,531	-2,674	57,856	831	58,687	-5,757
41	AN	42,492	2,711	13,804	-8,065	34,427	-5,423	29,004	605	29,610	-12,882
42	VW	251,872	2,723	19,141	-3,912	247,960	-4,519	243,441	1,158	244,599	-7,273
43	AN	24,441	2,752	12,576	-9,749	14,693	-5,524	9,169	150	9,319	-15,122
44	VW	121,487	2,675	17,734	-6,696	114,791	-4,911	109,880	1,329	111,209	-10,279
45	BN	18,009	2,750	10,475	-9,510	8,500	-5,612	2,888	-59	2,829	-15,181
46	AN	29,997	2,137	9,291	-5,721	24,276	-3,370	20,906	1,218	22,124	-7,874
47	VW	120,008	2,717	18,548	-5,501	114,507	-4,793	109,714	1,642	111,355	-8,652
48	BN	13,181	2,745	7,070	-9,762	3,419	-3,052	367	68	435	-12,746
49	BN	15,897	1,871	7,458	-6,964	8,933	-4,590	4,343	257	4,600	-11,297
50	AN	22,506	2,602	9,949	-5,425	17,080	-2,717	14,363	737	15,100	-7,406
	avg	38,034	2,004	7,945	**-5,964**	32,070	**-2,793**	29,277	**883**	30,159	**-7,874**
	med	16,027	2,155	7,106	-5,760	8,963	-2,658	6,630	756	7,602	-7,430
AVERAGES											
ED	12	7,377	1,171	2,612	(5,028)	2,350	(665)	1,685	746	2,431	-4,946
BN	14	13,254	1,923	6,061	(6,653)	6,601	(2,732)	3,869	599	4,468	-8,786
AN	15	32,274	2,350	9,444	(7,115)	25,159	(4,276)	20,883	772	21,655	-10,619
VW	9	127,055	2,661	15,491	(4,222)	122,833	(3,255)	119,578	1,691	121,269	-5,786
	50										
MEDIANS											
ED	12	6,755	1,299	2,705	(4,856)	2,110	(597)	973	703	1,517	-4,935
BN	14	13,152	1,729	5,731	(6,780)	6,860	(2,461)	3,641	484	4,125	-8,720
AN	15	28,831	2,698	9,005	(7,054)	19,810	(5,038)	15,788	737	16,152	-11,080
VW	9	120,008	2,721	16,057	(4,407)	114,507	(3,486)	109,714	1,642	111,209	-6,050
	50										

Table I-5 Run 5 Annual Water budget Summary (continued)

Lower Santa Margarita River Groundwater Model

Modflow Volumetric Budget Output

Annual Groundwater Budget Model Run: Run 5 Title 22 Water in LY

	INFLOW:					**OUTFLOW:**					
MY	Storage	Recharge	Stream Leakance	GHB	TOTAL GW IN	Storage	Wells	ET	Stream Leakance	GHB	TOTAL GW OUT
1	7,916	12,350	9,947	864	31,077	5,282	16,288	2,840	6,627	59	31,097
2	6,388	5,430	6,211	923	18,951	2,113	13,797	1,874	1,133	50	18,968
3	5,809	8,453	11,361	968	26,591	8,505	12,404	1,891	3,753	56	26,608
4	6,093	4,752	5,342	937	17,124	3,334	11,529	1,422	791	50	17,126
5	3,613	3,460	6,573	1,096	14,742	5,993	6,010	1,597	1,106	57	14,763
6	3,113	5,305	6,228	1,011	15,657	5,278	6,100	2,195	2,032	65	15,669
7	6,208	12,635	7,353	897	27,093	6,534	9,029	2,937	8,537	66	27,102
8	7,580	5,432	4,467	924	18,404	3,432	12,172	1,652	1,123	47	18,426
9	2,500	4,001	5,119	994	12,615	3,760	6,100	1,533	1,157	60	12,610
10	2,697	3,150	3,359	1,033	10,239	1,618	6,100	1,437	1,038	58	10,251
11	3,411	9,050	8,958	935	22,354	8,219	6,100	2,475	5,507	63	22,363
12	2,693	5,884	6,683	907	16,166	3,728	6,102	3,039	3,253	60	16,182
13	3,508	3,850	4,231	920	12,509	1,423	6,100	2,927	2,016	62	12,528
14	3,356	5,090	5,250	954	14,650	3,907	6,100	2,459	2,133	63	14,661
15	4,750	9,006	6,591	875	21,222	4,050	9,029	3,058	5,046	68	21,250
16	5,861	9,952	11,331	879	28,024	4,745	16,568	2,493	4,164	61	28,031
17	6,175	6,102	8,326	910	21,514	5,002	13,522	1,775	1,180	52	21,531
18	6,201	16,042	9,559	848	32,651	9,424	9,029	2,766	11,371	67	32,657
19	7,091	6,570	7,725	900	22,287	4,337	13,797	2,018	2,105	54	22,310
20	4,180	5,769	6,853	904	17,707	4,036	9,798	1,860	1,967	61	17,722
21	2,821	3,501	5,852	959	13,133	3,292	6,775	1,938	1,086	57	13,147
22	4,121	10,466	7,631	878	23,096	7,208	6,100	2,957	6,781	64	23,110
23	2,753	5,225	6,116	906	14,999	2,824	6,100	3,129	2,902	62	15,017
24	3,269	7,936	6,389	879	18,473	3,584	6,100	3,276	5,466	65	18,490
25	3,370	8,191	6,224	880	18,664	3,811	6,102	3,269	5,441	64	18,687
26	2,702	6,403	6,182	884	16,171	2,470	6,097	3,324	4,213	65	16,169
27	6,641	19,089	7,179	836	33,744	6,214	9,022	3,453	15,000	71	33,760
28	6,687	20,188	10,815	824	38,515	5,909	16,575	3,000	12,998	60	38,542
29	6,860	21,715	11,706	817	41,097	6,632	18,343	2,865	13,209	63	41,112
30	4,984	9,160	12,748	877	27,769	3,900	18,090	2,489	3,276	50	27,805
31	5,443	9,986	12,702	877	29,008	5,686	17,080	2,339	3,815	54	28,975
32	6,224	16,804	13,269	845	37,142	6,905	18,136	2,665	9,415	62	37,183
33	5,090	11,341	11,662	865	28,958	4,050	17,424	2,626	4,814	54	28,968
34	4,805	11,019	13,246	877	29,947	5,039	17,103	2,433	5,315	53	29,943
35	4,777	11,019	12,971	870	29,637	5,333	17,103	2,534	4,628	57	29,655
36	5,186	7,002	10,560	893	23,641	3,760	15,152	2,270	2,417	53	23,652
37	4,224	8,012	10,399	882	23,517	4,798	12,397	2,624	3,659	63	23,541
38	5,574	6,956	9,320	898	22,748	4,366	13,797	2,029	2,500	54	22,747
39	3,822	10,927	9,986	868	25,604	6,931	9,803	2,548	6,274	60	25,616
40	5,716	14,279	7,668	863	28,526	5,764	9,688	3,085	9,929	59	28,525
41	5,537	15,932	11,639	852	33,960	4,982	16,345	2,906	9,695	58	33,986
42	6,892	21,786	12,190	822	41,690	6,768	18,572	2,812	13,480	60	41,692
43	7,245	14,555	11,662	852	34,314	6,352	18,067	2,456	7,376	51	34,302
44	7,652	20,202	12,764	838	41,455	8,285	18,343	2,514	12,275	56	41,473
45	6,540	12,443	11,364	863	31,210	6,159	16,506	2,399	6,129	50	31,244
46	4,888	11,501	9,435	859	26,683	4,835	12,397	2,762	6,657	63	26,713
47	6,290	21,281	12,259	824	40,654	7,025	17,585	2,771	13,223	64	40,668
48	6,680	9,068	8,792	882	25,422	4,086	16,483	1,921	2,870	35	25,396
49	5,211	9,412	9,458	893	24,975	7,851	9,803	2,215	5,096	51	25,017
50	5,556	12,098	7,369	856	25,879	5,073	9,711	3,097	7,966	61	25,908
avg	5,134	10,196	8,820	894	25,044	5,092	11,929	2,499	5,479	58	25,058
med	5,327	9,114	8,875	880	25,199	4,992	12,284	2,524	4,721	60	25,206
AVERAGES											
ED	3,904	4,744	5,634	961	15,244	3,603	7,725	2,108	1,760	58	15,255
BN	4,828	8,175	8,256	893	22,152	4,949	10,674	2,446	4,042	56	22,167
AN	5,458	11,657	10,752	874	28,741	5,319	14,621	2,643	6,113	58	28,755
VW	6,710	18,172	10,727	840	36,448	6,922	15,000	2,864	11,614	62	36,463
MEDIANS											
ED	3,235	4,921	5,597	946	15,200	3,580	6,100	1,856	1,169	59	15,216
BN	4,683	8,064	8,259	893	22,551	4,211	9,803	2,335	3,999	57	22,555
AN	5,443	11,019	11,361	875	28,024	5,039	16,568	2,624	5,046	58	28,031
VW	6,641	19,089	11,706	838	37,142	6,768	17,585	2,812	12,275	62	37,183

Table I-5 Run 5 Annual Water budget Summary (continued)					
Lower Santa Margarita River Groundwater Model					
Modflow Volumetric Budget Output					
Annual Groundwater Budget					
MY	NET Storage	NET Str Lknc	In-Out	**% bal**	
1	-2,633	-3,320	-20.1	-0.06%	
2	-4,274	-5,078	-16.0	-0.08%	
3	2,696	-7,607	-17.6	-0.07%	
4	-2,759	-4,551	-1.6	-0.01%	
5	2,379	-5,467	-21.0	-0.14%	
6	2,165	-4,197	-11.5	-0.07%	
7	326	1,184	-8.9	-0.03%	
8	-4,148	-3,345	-21.9	-0.12%	
9	1,260	-3,962	5.1	0.04%	
10	-1,079	-2,321	-12.0	-0.12%	
11	4,807	-3,450	-9.4	-0.04%	
12	1,035	-3,430	-16.3	-0.10%	
13	-2,084	-2,215	-18.8	-0.15%	
14	551	-3,118	-10.6	-0.07%	
15	-700	-1,545	-28.3	-0.13%	
16	-1,116	-7,167	-7.5	-0.03%	
17	-1,173	-7,146	-16.7	-0.08%	
18	3,223	1,811	-6.2	-0.02%	
19	-2,755	-5,620	-23.7	-0.11%	
20	-145	-4,885	-15.6	-0.09%	
21	471	-4,766	-14.0	-0.11%	
22	3,088	-849	-14.6	-0.06%	
23	71	-3,214	-17.7	-0.12%	
24	315	-923	-17.1	-0.09%	
25	441	-783	-22.4	-0.12%	
26	-232	-1,970	1.8	0.01%	
27	-427	7,821	-16.0	-0.05%	
28	-778	2,183	-27.5	-0.07%	
29	-227	1,504	-15.1	-0.04%	
30	-1,084	-9,472	-36.7	-0.13%	
31	243	-8,887	33.0	0.11%	
32	682	-3,854	-41.0	-0.11%	
33	-1,040	-6,848	-10.0	-0.03%	
34	234	-7,932	4.7	0.02%	
35	556	-8,343	-17.8	-0.06%	
36	-1,426	-8,143	-11.5	-0.05%	
37	574	-6,740	-24.0	-0.10%	
38	-1,208	-6,820	1.3	0.01%	
39	3,108	-3,712	-11.9	-0.05%	
40	48	2,261	0.9	0.00%	
41	-556	-1,944	-25.5	-0.07%	
42	-124	1,290	-2.5	-0.01%	
43	-893	-4,286	11.2	0.03%	
44	634	-489	-17.4	-0.04%	
45	-381	-5,234	-33.7	-0.11%	
46	-53	-2,778	-30.5	-0.11%	
47	735	964	-13.5	-0.03%	
48	-2,594	-5,923	26.6	0.10%	
49	2,640	-4,362	-42.2	-0.17%	
50	-482	597	-28.5	-0.11%	
avg	-42	-3,342	-13.8	-0.06%	
med	-88	-3,581	-15.8	-0.07%	
AVERAGES					
ED	-301	-3,874	-11.4	-0.08%	
BN	121	-4,214	-14.9	-0.07%	
AN	-138	-4,639	-14.3	-0.05%	
VW	212	888	-14.6	-0.04%	
MEDIANS					
ED	119	-3,696	-13.0	-0.09%	
BN	-37	-4,624	-15.8	-0.09%	
AN	-482	-6,740	-17.8	-0.07%	
VW	48	1,290	-15.1	-0.04%	

Table I-6 50-Year Average Monthly Water Budget

Lower Santa Margarita River Groundwater Model

Run 5 Title 22 Water in LY

Modflow Volumetric Budget Output and Streamflow

6/22/06

Atreamflow

Avg AF/M	SMR Flow In	Diversion	Str Gain+ / Loss-	SMR @ UY->CH	Str Gain+ / Loss-	SMR @ CH->LY	Str Gain+ / Loss-	SMR Flow Out	LSMR Str Gain+ / Loss-
Oct	526	325	-372	153	-90	64	35	99	-427
Nov	1,299	661	97	1,396	-497	899	73	972	-327
Dec	1,969	530	-692	1,277	-165	1,112	95	1,206	-763
Jan	8,364	840	-1,002	7,361	-140	7,221	188	7,409	-955
Feb	10,263	2,062	-1,692	8,572	-134	8,438	148	8,585	-1,678
Mar	8,849	2,257	-1,264	7,585	-278	7,306	124	7,430	-1,419
Apr	3,159	1,482	-505	2,654	-339	2,314	66	2,380	-779
May	1,345	953	-195	1,150	-359	791	26	817	-528
Jun	756	583	48	804	-305	500	23	523	-233
Jul	499	133	16	515	-228	286	26	313	-186
Aug	458	62	-157	301	-136	166	39	205	-253
Sep	547	60	-246	302	-122	180	40	220	-328
Avg Monthly	3,169	829	-497	2,672	-233	2,440	74	2,513	-656
Med Monthly	1,322	622	-309	1,214	-197	845	53	895	-477
Avg Total=Anl	38,034	9,949	-5,964	32,070	-2,793	29,277	883	30,159	-7,874

Lower Santa Margarita River Groundwater Model

Modflow Volumetric Budget Output

Groundwater Model

	INFLOW:					**OUTFLOW:**						OUT-IN	OUT-IN		
Avg AF/M	Storage	Recharge	Stream Leakance	GHB	TOTAL IN	Storage	Wells	ET	Stream Leakance	GHB	TOTAL OUT	NET Storage	NET Str Lknc	In-Out	% bal
Oct	572	199	441	81	1,293	50	940	186	111	9	1,296	-523	-330	-3.0	-0.23%
Nov	161	787	1,160	78	2,186	839	1,020	188	128	9	2,183	677	-1,032	2.7	0.12%
Dec	524	309	824	79	1,736	209	1,181	201	136	8	1,735	-315	-688	1.4	0.08%
Jan	377	516	1,162	78	2,133	436	1,365	201	130	5	2,138	59	-1,031	-4.5	-0.21%
Feb	294	2,069	864	75	3,303	1,380	1,333	190	399	0	3,302	1,086	-465	0.9	0.03%
Mar	150	2,468	925	74	3,617	1,137	1,232	221	1,024	0	3,614	987	98	2.8	0.08%
Apr	333	1,676	780	67	2,856	457	1,005	224	1,162	8	2,855	124	382	0.8	0.03%
May	476	1,168	646	69	2,358	262	838	234	1,016	9	2,359	-214	370	-0.6	-0.03%
Jun	651	465	558	68	1,743	157	699	225	659	6	1,746	-494	101	-3.1	-0.18%
Jul	610	219	505	73	1,407	79	735	224	367	4	1,409	-531	-138	-2.2	-0.15%
Aug	442	162	461	77	1,142	61	660	212	210	0	1,144	-380	-251	-2.6	-0.23%
Sep	543	157	494	76	1,271	25	922	193	136	1	1,277	-518	-358	-6.2	-0.49%
Avg Monthly	428	850	735	74	2,087	424	994	208	457	5	2,088	-3	-278	-1.2	-0.10%
Med Monthly	459	491	713	76	1,938	236	973	207	289	6	1,942	-264	-290	-1.4	-0.09%
Avg Total=Anl	5,134	10,196	8,820	894	25,044	5,092	11,929	2,499	5,479	58	25,058	-42	-3,342	-13.8	

Attachment J

Run 6R (Alternative 2) Model Results

Table J-1. Run 6R Annual Pumping Summary
Lower Santa Margarita River Groundwater Model

Hydrologic Condition

HC	Cnt	Oct to Apr Strflw
VW	9	Very Wet > 56,164
AN	15	Above Normal > 13,600
BN	14	Below Normal < 13,600
ED	12	Extremely Dry < 5,840
	50	

Pumping Condition

PC	HC	Q Adjst	Anl Q	Cnt	
1	2+ AN @ VW	4,000	18,100	5	10%
2	2+ AN @ AN	500	14,600	9	18%
3	Standard	0	14,100	10	20%
4	1st BN	-4,000	10,100	6	12%
5	2ndBN, 70/30 split	-8,000	6,100	3	6%
6	3+BN/all ED	-9,000	5,100	17	34%
				50	100%

MY	HC	Oct-Apr HC descrip	May-Apr Pumping Condition	Fallbrook Diversion (af/y)	UY Total (af/y)	CH Total (af/y)	LY Total (af/y)	LSMR Total (af/y)	+Q*
1	VW	Very Wet	3	3,534	8,224	6,728	-	14,952	
2	BN	Below Normal	4	0	7,309	5,102	-	12,410	
3	AN	Above Normal	3	1,731	5,866	3,768	-	9,635	
4	ED	Extremely Dry	6	0	6,476	3,504	-	9,980	
5	ED	Extremely Dry	6	0	3,523	1,140	-	4,663	
6	ED	Extremely Dry	6	0	3,825	1,275	-	5,100	
7	AN	Above Normal	3	3,480	5,104	2,925	-	8,030	
8	ED	Extremely Dry	6	0	6,476	4,437	-	10,913	
9	ED	Extremely Dry	6	31	3,799	1,275	-	5,074	
10	ED	Extremely Dry	6	0	3,782	1,275	-	5,057	
11	BN	Below Normal	6	2,375	3,651	1,275	-	4,926	
12	ED	Extremely Dry	6	198	3,825	1,275	-	5,100	
13	ED	Extremely Dry	6	0	3,825	1,275	-	5,100	
14	ED	Extremely Dry	6	0	3,825	1,275	-	5,100	
15	AN	Above Normal	3	2,988	5,104	2,925	-	8,030	
16	AN	Above Normal	2	3,389	7,957	6,510	-	14,467	X
17	ED	Extremely Dry	6	0	6,661	4,638	-	11,300	
18	VW	Very Wet	3	6,192	5,104	2,925	-	8,030	
19	BN	Below Normal	4	782	7,696	5,102	-	12,798	
20	BN	Below Normal	5	0	6,598	2,199	-	8,798	
21	ED	Extremely Dry	6	0	4,331	1,444	-	5,774	
22	BN	Below Normal	6	2,507	3,825	1,275	-	5,100	
23	BN	Below Normal	6	0	3,825	1,275	-	5,100	
24	BN	Below Normal	6	1,035	3,825	1,275	-	5,100	
25	BN	Below Normal	6	2,204	3,825	1,275	-	5,100	
26	ED	Extremely Dry	6	674	3,825	1,275	-	5,100	
27	VW	Very Wet	3	8,666	5,104	2,925	-	8,030	
28	AN	Above Normal	2	9,419	7,957	6,510	-	14,467	X
29	VW	Very Wet	1	10,872	9,224	7,547	-	16,770	X
30	AN	Above Normal	2	4,560	8,761	7,168	-	15,930	X
31	AN	Above Normal	2	4,944	8,190	6,628	-	14,818	X
32	VW	Very Wet	1	7,267	9,013	7,145	-	16,158	X
33	AN	Above Normal	2	5,713	8,349	6,611	-	14,960	X
34	AN	Above Normal	2	5,598	7,776	5,836	-	13,612	X
35	AN	Above Normal	2	5,009	8,030	6,247	-	14,277	X
36	BN	Below Normal	4	1,563	7,882	5,170	-	13,052	
37	AN	Above Normal	3	1,974	7,634	3,768	-	11,402	
38	BN	Below Normal	4	356	7,696	5,102	-	12,798	
39	BN	Below Normal	5	4,526	6,598	2,199	-	8,798	
40	VW	Very Wet	3	6,970	5,610	3,094	-	8,704	
41	AN	Above Normal	2	7,809	7,926	6,485	-	14,410	X
42	VW	Very Wet	1	9,536	9,443	7,726	-	17,170	X
43	AN	Above Normal	2	6,861	8,972	7,341	-	16,313	X
44	VW	Very Wet	1	8,849	9,224	7,243	-	16,466	X
45	BN	Below Normal	4	4,888	9,180	6,019	-	15,199	
46	AN	Above Normal	3	4,125	7,634	3,768	-	11,402	
47	VW	Very Wet	1	9,413	9,119	7,461	-	16,580	X
48	BN	Below Normal	4	2,817	9,180	5,088	-	14,268	
49	BN	Below Normal	5	2,861	5,286	2,013	-	7,299	
50	AN	Above Normal	3	4,391	5,610	3,094	-	8,704	

		Fallbrook Diversion	UY Total	CH Total	LY Total	LSMR Total
	Min	0	3,523	1,140	-	4,663
Notes:	Max	10,872	9,443	7,726	-	17,170
Hydrologic Condition: Oct - Apr	**Median**	**2,839**	**6,598**	**3,768**	**-**	**10,446**
Model starts after 3+ BN or ED	% of Median	27.2%	63.2%	36.1%	0.0%	
	Average	**3,402**	**6,430**	**4,017**	**-**	**10,446**
	% of Average	32.6%	61.5%	38.5%	0.0%	

* Wet Year Algorithm (additional pumping occuring before May)

Table J-1. Run 6R Annual Pumping Summary (continued)

	Oct-Apr HC Description	HC Count	Fallbrook Diversion (af/y)	UYTotal (af/y)	CH Total (af/y)	LY Total (af/y)	LSMR Total (af/y)
AVERAGES	ED	12	75	4,514	2,007	-	6,522
	BN	14	1,851	6,170	3,169	-	9,339
	AN	15	4,799	7,391	5,306	-	12,697
	VW	9	7,922	7,785	5,866	-	13,651
MEDIANS	ED	12	-	3,825	1,275	-	5,100
	BN	14	1,883	6,598	2,199	-	8,798
	AN	15	4,560	7,926	6,247	-	14,277
	VW	9	8,666	9,013	7,145	-	16,158
		Average Monthly Pumping					
		Month	Fallbrook Diversion	UY Total	CH Total	LY Total	LSMR Total
	8%	Oct	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)
	8%	Nov	0	498	303	0	801
	10%	Dec	0	533	352	0	885
	11%	Jan	0	624	401	0	1,025
	11%	Feb	0	707	458	0	1,164
	10%	Mar	152	705	446	0	1,151
	9%	Apr	698	659	417	0	1,076
	7%	May	771	553	338	0	891
	6%	Jun	671	459	287	0	746
	6%	Jul	428	382	237	0	618
	6%	Aug	263	402	249	0	651
	8%	Sep	216	495	305	0	801
		Avg Anl	3,402	6,378	4,017	0	10,395

Table J-2. Run 6R Pumping Summaries
Lower Santa Margarita River Groundwater Model

		Bldg #	State ID #	Label	# mos Q	% of 600 mos	Orig Wells by Subbsn %	80% Utilization af/m	
1	UY	2673	10/4-7A2	7A2	600	100%	25%	142	
2	UY	26072	10/4-8D1	8D1	600	100%	21%	121	
3	UY	2671	10/4-7H2	7H2	600	100%	15%	82	
4	UY	PW-6	PW-6	PW-6	600	100%	19%	110	
5	UY	2603	10/4-7R2	7R2	600	100%	19%	110	
6	UY	UY-1	UY-1	UY-1	254	42%	0%	110	
7	UY	UY-2	UY-2	UY-2	153	26%	0%	110	
8	UY	UY-3	UY-3	UY-3	115	19%	0%	110	
9	UY	UY-4	UY-4	UY-4	36	6%	0%	110	
10	UY	UY-5	UY-5	UY-5	20	3%	0%	110	
11	UY	UY-6	UY-6	UY-6	5	1%	0%	110	
12	CH	2393	10/4-18E3	18E4	599	100%	14%	121	
13	CH	2373	10/4-18M4&5	18M5	599	100%	18%	153	
14	CH	2363	10/5-13R2	13R2	599	100%	16%	132	
15	CH	33925	10/5-23G4	R23G4	**0**	**0%**	6%	**0**	Backup
16	CH	2301	10/5-23J1	23J1	599	100%	20%	164	
17	CH	33924	10/5-23K2	23K2	**0**	**0%**	6%	**0**	Backup
18	CH	33923	10/5-23K3	23K3	599	100%	0%	132	
19	CH	CH-1	CH-1	CH-1	10	2%	0%	88	
20	CH	CH-2	CH-2	CH-2	4	1%	0%	88	
21	CH	CH-3	CH-3	CH-3	**0**	**0%**	0%	88	
22	CH	CH-4	CH-4	CH-4	599	100%	16%	132	Replaced 23G4

% Pumping in Subbasin

		Wet Year Algorithm			Dry Year Management		
		55%	45%	0%	75%	25%	0%
mo	Anl %	UY	CH	LY	UY	CH	LY
OCT	7.9%	4.4%	3.6%	0.00%	6.0%	2.0%	0.00%
NOV	8.6%	4.7%	3.9%	0.00%	6.5%	2.2%	0.00%
DEC	10.0%	5.5%	4.5%	0.00%	7.5%	2.5%	0.00%
JAN	11.4%	6.3%	5.1%	0.00%	8.6%	2.9%	0.00%
FEB	10.9%	6.0%	4.9%	0.00%	8.2%	2.7%	0.00%
MAR	10.2%	5.6%	4.6%	0.00%	7.6%	2.5%	0.00%
APR	8.3%	4.6%	3.7%	0.00%	6.2%	2.1%	0.00%
MAY	7.1%	3.9%	3.2%	0.00%	5.3%	1.8%	0.00%
JUN	5.9%	3.2%	2.7%	0.00%	4.4%	1.5%	0.00%
JUL	6.2%	3.4%	2.8%	0.00%	4.7%	1.6%	0.00%
AUG	5.6%	3.1%	2.5%	0.00%	4.2%	1.4%	0.00%
SEP	7.8%	4.3%	3.5%	0.00%	5.8%	1.9%	0.00%

Max Pumping in Subbasin adding wells as needed

	UY	CH	LY	Total
# exst wells	5	7	-	12
af/m (75%)	564	833	-	1,397
avg af/well	113	119	-	116
1 adntl well	674	921	55	1,650
2 adntl well	784	1,008	110	1,902
3 adntl well	893	1,096	164	2,154
4 adntl well	1,003	1,184	219	2,406
5 adntl well	1,112	1,271		2,384
6 adntl well	1,222			1,222
50-yr Avg	5,844	4,875	1,225	
50-yr Med	5,705	5,330	1,161	

median

	UY af/m	CH af/m	LY af/m	Total af/m	Max Mo Pumping	cfs	new wells
ED	390	128	0	520	1,668	29	5
BN	437	146	0	583	2,068	36	9
AN	603	407	0	1,021	2,068	36	9
VW	617	503	0	1,119	2,068	36	9

Wet Year Algorithm Monthly Counts

	500	4,000	Total	% of 50 yrs
Oct	-	-	-	0%
Nov	-	-	-	0%
Dec	1	-	1	2%
Jan	7	1	8	16%
Feb	8	4	12	24%
Mar	9	5	14	28%
Apr	8	6	14	28%
May	-	-	-	0%
	33	16	49	

		Table J-3. Run 6R Annual Pumping by Well										
	Building #:	2673	26072	2671	PW-6	2603	new	new	new	new	new	new
	Max Annual Pumping	1,619	1,370	934	1,246	1,246	1,138	813	722	418	309	102
	Potential w/ 80% Util	1,710	1,447	986	1,315	1,315	1,315	1,315	1,315	1,315	1,315	1,315
	Potential Well Yield (gpm)	1,300	1,100	750	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
		UY	UY	UY	UY	UY	UY	UY	UY	UY	UY	UY
		10/4-7A2	10/4-8D1	10/4-7H2	PW-6	10/4-7R2	UY-1	UY-2	UY-3	UY-4	UY-5	UY-6
MY	HC	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)
1	VW	1,558	1,318	899	1,198	1,198	825	518	410	200	100	0
2	BN	1,476	1,249	852	1,136	1,136	732	419	310	0	0	0
3	AN	1,299	1,099	749	999	999	410	210	102	0	0	0
4	ED	1,266	1,071	730	974	974	732	419	310	0	0	0
5	ED	889	752	513	684	684	0	0	0	0	0	0
6	ED	966	817	557	743	743	0	0	0	0	0	0
7	AN	1,264	1,069	729	972	972	98	0	0	0	0	0
8	ED	1,266	1,071	730	974	974	732	419	310	0	0	0
9	ED	959	811	553	738	738	0	0	0	0	0	0
10	ED	955	808	551	734	734	0	0	0	0	0	0
11	BN	922	780	532	709	709	0	0	0	0	0	0
12	ED	966	817	557	743	743	0	0	0	0	0	0
13	ED	966	817	557	743	743	0	0	0	0	0	0
14	ED	966	817	557	743	743	0	0	0	0	0	0
15	AN	1,264	1,069	729	972	972	98	0	0	0	0	0
16	AN	1,566	1,325	903	1,204	1,204	929	417	309	100	0	0
17	ED	1,245	1,054	718	958	958	716	504	407	100	0	0
22	ED	1,264	1,069	729	972	972	98	0	0	0	0	0
19	BN	1,550	1,311	894	1,192	1,192	828	419	310	0	0	0
20	BN	1,323	1,119	763	1,017	1,017	728	422	208	0	0	0
21	ED	1,093	925	631	841	841	0	0	0	0	0	0
22	BN	966	817	557	743	743	0	0	0	0	0	0
23	BN	966	817	557	743	743	0	0	0	0	0	0
24	BN	966	817	557	743	743	0	0	0	0	0	0
25	BN	966	817	557	743	743	0	0	0	0	0	0
26	ED	966	817	557	743	743	0	0	0	0	0	0
27	VW	1,264	1,069	729	972	972	98	0	0	0	0	0
28	AN	1,566	1,325	903	1,204	1,204	929	417	309	100	0	0
29	VW	1,585	1,341	914	1,219	1,219	1,111	812	508	308	207	0
30	AN	1,560	1,320	900	1,200	1,200	924	622	622	211	102	102
31	AN	1,533	1,297	884	1,179	1,179	903	606	509	100	0	0
32	VW	1,585	1,341	915	1,220	1,220	1,112	812	508	200	100	0
33	AN	1,544	1,307	891	1,188	1,188	912	609	609	100	0	0
34	AN	1,527	1,292	881	1,174	1,174	814	407	407	100	0	0
35	AN	1,542	1,305	890	1,186	1,186	910	504	407	100	0	0
36	BN	1,529	1,294	882	1,176	1,176	812	504	407	100	0	0
37	AN	1,559	1,319	900	1,199	1,199	826	422	208	0	0	0
38	BN	1,550	1,311	894	1,192	1,192	828	419	310	0	0	0
39	BN	1,323	1,119	763	1,017	1,017	728	422	208	0	0	0
40	VW	1,391	1,177	803	1,070	1,070	98	0	0	0	0	0
41	AN	1,577	1,334	910	1,213	1,213	937	426	317	0	0	0
42	VW	1,587	1,343	916	1,221	1,221	1,113	813	510	309	309	102
43	AN	1,559	1,319	900	1,199	1,199	924	621	621	318	209	102
44	VW	1,585	1,341	914	1,219	1,219	1,111	812	508	308	207	0
45	BN	1,537	1,300	887	1,182	1,182	818	722	722	418	309	102
46	AN	1,559	1,319	900	1,199	1,199	826	422	208	0	0	0
47	VW	1,619	1,370	934	1,246	1,246	1,138	733	418	207	207	0
48	BN	1,537	1,300	887	1,182	1,182	818	722	722	418	309	102
49	BN	1,177	996	679	905	905	312	210	102	0	0	0
50	AN	1,391	1,177	803	1,070	1,070	98	0	0	0	0	0
	Min	889	752	513	684	684	0	0	0	0	0	0
	Max	1,619	1,370	934	1,246	1,246	1,138	813	722	418	309	102
	Median	1,357	1,148	783	1,044	1,044	730	418	208	0	0	0
	Average	1,321	1,117	762	1,016	1,016	521	316	236	74	41	10
		Average Monthly Well Production										
	Month	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)
	Oct	107	90	62	82	82	56	10	10	0	0	0
	Nov	111	94	64	85	85	56	26	11	0	0	0
	Dec	118	100	68	91	91	59	59	28	9	0	0
	Jan	126	107	73	97	97	58	58	58	34	10	10
	Feb	126	107	73	97	97	64	64	64	15	15	0
	Mar	120	101	69	92	92	61	61	48	16	16	0
	Apr	115	97	66	88	88	63	18	18	0	0	0
	May	107	90	62	82	82	27	10	0	0	0	0
	Jun	94	80	54	72	72	10	0	0	0	0	0
	Jul	99	84	57	76	76	10	0	0	0	0	0
	Aug	91	77	53	70	70	0	0	0	0	0	0
	Sep	108	91	62	83	83	58	11	0	0	0	0
Annual Total		1,321	1,117	762	1,016	1,016	521	316	236	74	41	10

		Table J-3. Run 6R Annual Pumping by Well (continued)									
	Building #:	2393	2373	2363	33925	2301	33924	33923	new	new	33925
Max Annual Pumping		1,083	1,378	1,181	0	1,476	0	1,181	166	81	0
Potential w/ 80% Util		1,447	1,841	1,578	1,578	1,973	0	1,578	1,052	1,052	1,578
Potential Well Yield (gpm)		1,100	1,400	1,200	1,200	1,500	0	1,200	800	800	1,200
		CH	CH	CH	CH	CH	CH	CH	CH	CH	CH
		10/4-18E3	10/4-18M4&5	10/5-13R2	10/5-23G4	10/5-23J1	10/5-23K2	10/5-23K3	CH-1	CH-2	CH-4
MY	HC	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)
1	VW	974	1,239	1,062	0	1,328	0	1,062	0	0	1,062
2	BN	738	940	806	0	1,007	0	806	0	0	806
3	AN	545	694	595	0	744	0	595	0	0	595
4	ED	507	645	553	0	692	0	553	0	0	553
5	ED	165	210	180	0	225	0	180	0	0	180
6	ED	185	235	201	0	252	0	201	0	0	201
7	AN	423	539	462	0	577	0	462	0	0	462
8	ED	642	817	701	0	876	0	701	0	0	701
9	ED	185	235	201	0	252	0	201	0	0	201
10	ED	185	235	201	0	252	0	201	0	0	201
11	BN	185	235	201	0	252	0	201	0	0	201
12	ED	185	235	201	0	252	0	201	0	0	201
13	ED	185	235	201	0	252	0	201	0	0	201
14	ED	185	235	201	0	252	0	201	0	0	201
15	AN	423	539	462	0	577	0	462	0	0	462
16	AN	942	1,199	1,028	0	1,285	0	1,028	0	0	1,028
17	ED	671	854	732	0	915	0	732	0	0	732
22	ED	423	539	462	0	577	0	462	0	0	462
19	BN	738	940	806	0	1,007	0	806	0	0	806
20	BN	318	405	347	0	434	0	347	0	0	347
21	ED	209	266	228	0	285	0	228	0	0	228
22	BN	185	235	201	0	252	0	201	0	0	201
23	BN	185	235	201	0	252	0	201	0	0	201
24	BN	185	235	201	0	252	0	201	0	0	201
25	BN	185	235	201	0	252	0	201	0	0	201
26	ED	185	235	201	0	252	0	201	0	0	201
27	VW	423	539	462	0	577	0	462	0	0	462
28	AN	942	1,199	1,028	0	1,285	0	1,028	0	0	1,028
29	VW	1,080	1,375	1,178	0	1,473	0	1,178	85	0	1,178
30	AN	1,014	1,291	1,106	0	1,383	0	1,106	81	81	1,106
31	AN	959	1,221	1,046	0	1,308	0	1,046	0	0	1,046
32	VW	1,034	1,316	1,128	0	1,410	0	1,128	0	0	1,128
33	AN	957	1,218	1,044	0	1,305	0	1,044	0	0	1,044
34	AN	845	1,075	921	0	1,152	0	921	0	0	921
35	AN	904	1,151	986	0	1,233	0	986	0	0	986
36	BN	748	952	816	0	1,020	0	816	0	0	816
37	AN	545	694	595	0	744	0	595	0	0	595
38	BN	738	940	806	0	1,007	0	806	0	0	806
39	BN	318	405	347	0	434	0	347	0	0	347
40	VW	448	570	489	0	611	0	489	0	0	489
41	AN	939	1,195	1,024	0	1,280	0	1,024	0	0	1,024
42	VW	1,083	1,378	1,181	0	1,476	0	1,181	166	81	1,181
43	AN	1,027	1,307	1,120	0	1,400	0	1,120	166	81	1,120
44	VW	1,036	1,319	1,130	0	1,413	0	1,130	85	0	1,130
45	BN	859	1,093	937	0	1,171	0	937	85	0	937
46	AN	545	694	595	0	744	0	595	0	0	595
47	VW	1,068	1,359	1,165	0	1,456	0	1,165	85	0	1,165
48	BN	713	907	778	0	972	0	778	81	81	778
49	BN	291	371	318	0	397	0	318	0	0	318
50	AN	448	570	489	0	611	0	489	0	0	489
	Min	165	210	180	0	225	0	180	0	0	180
	Max	1,083	1,378	1,181	0	1,476	0	1,181	166	81	1,181
	Median	545	694	595	0	744	0	595	0	0	595
	Average	578	736	631	0	788	0	631	17	6	631
		Average Monthly Well Production									
	Month	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)
	Oct	44	56	48	0	60	0	48	0	0	48
	Nov	51	65	56	0	69	0	56	0	0	56
	Dec	58	74	63	0	79	0	63	0	0	63
	Jan	64	82	70	0	88	0	70	6	6	70
	Feb	63	80	69	0	86	0	69	10	0	69
	Mar	60	77	66	0	82	0	66	0	0	66
	Apr	49	62	53	0	67	0	53	0	0	53
	May	42	53	45	0	57	0	45	0	0	45
	Jun	34	44	37	0	47	0	37	0	0	37
	Jul	36	46	39	0	49	0	39	0	0	39
	Aug	32	41	35	0	44	0	35	0	0	35
	Sep	44	56	48	0	60	0	48	0	0	48
Annual Total		578	736	631	0	788	0	631	17	6	631

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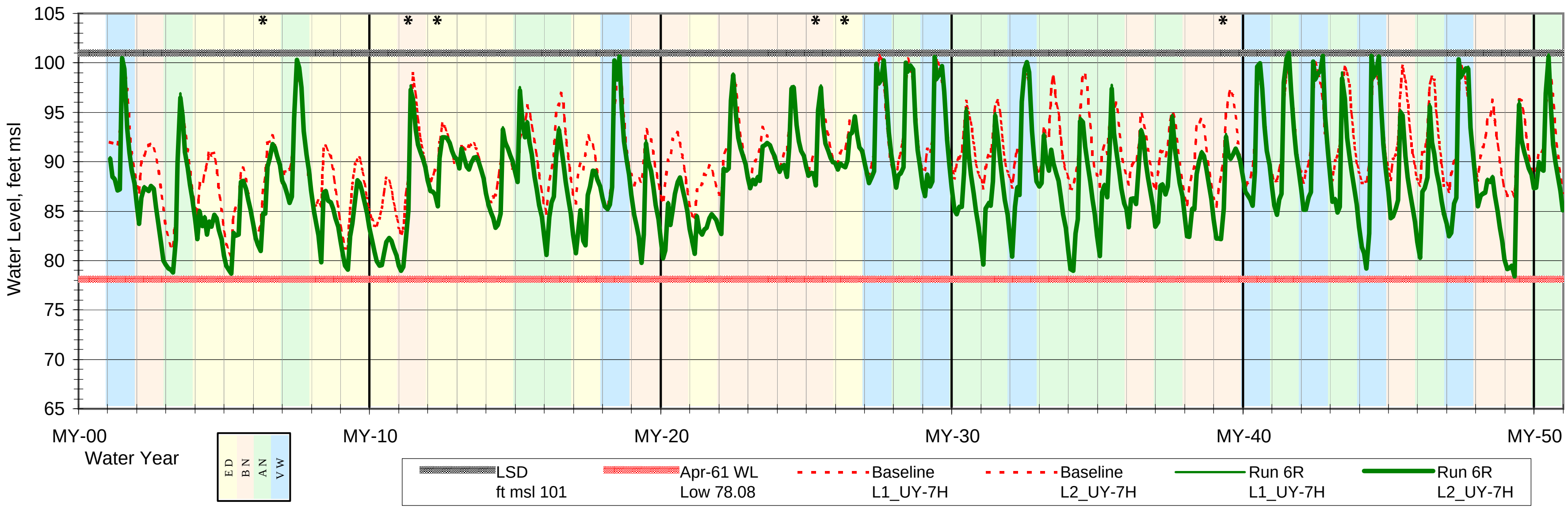
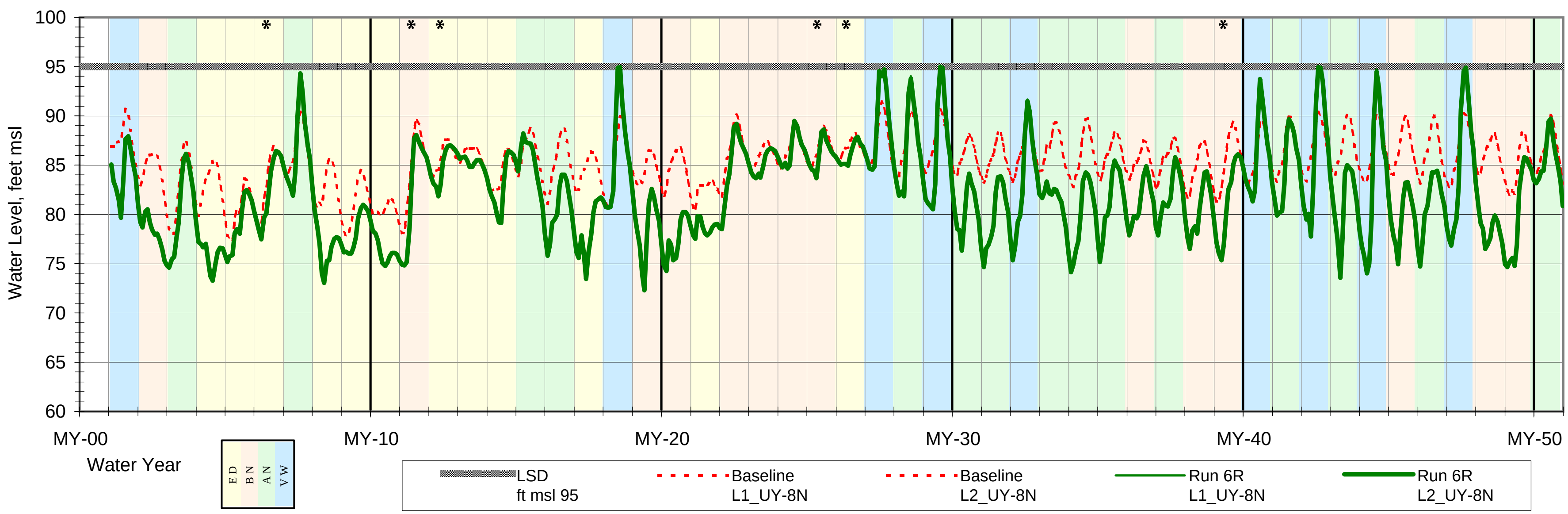
Simulated Hydrograph Upper Ysidora Riparian Indicator Cell



Simulated Hydrograph Upper Ysidora Grassland Indicator Cell



***** Emergency flows called upon during water years marked with an asterisk.

Layer 1 (L1) and Layer 2(L2) simulated groundwater levels are at similar elevations and the graph lines are printed on top of each other.

FIGURE J-1
Run 6 R and Baseline Hydrographs

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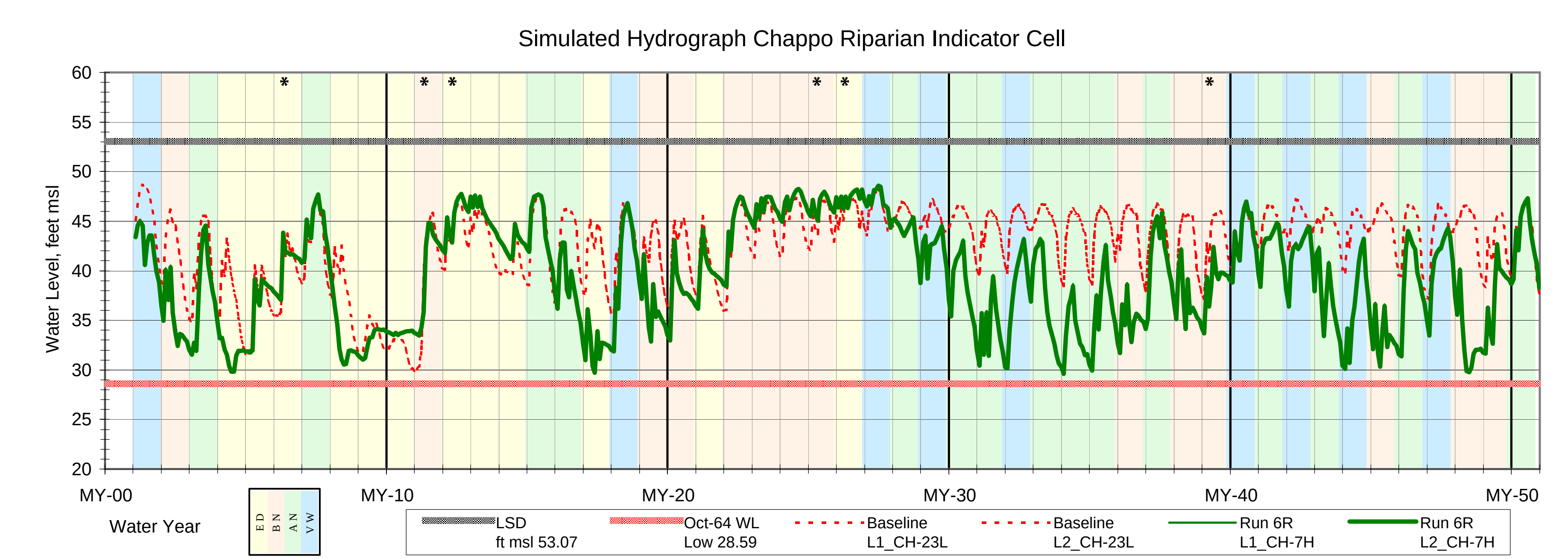
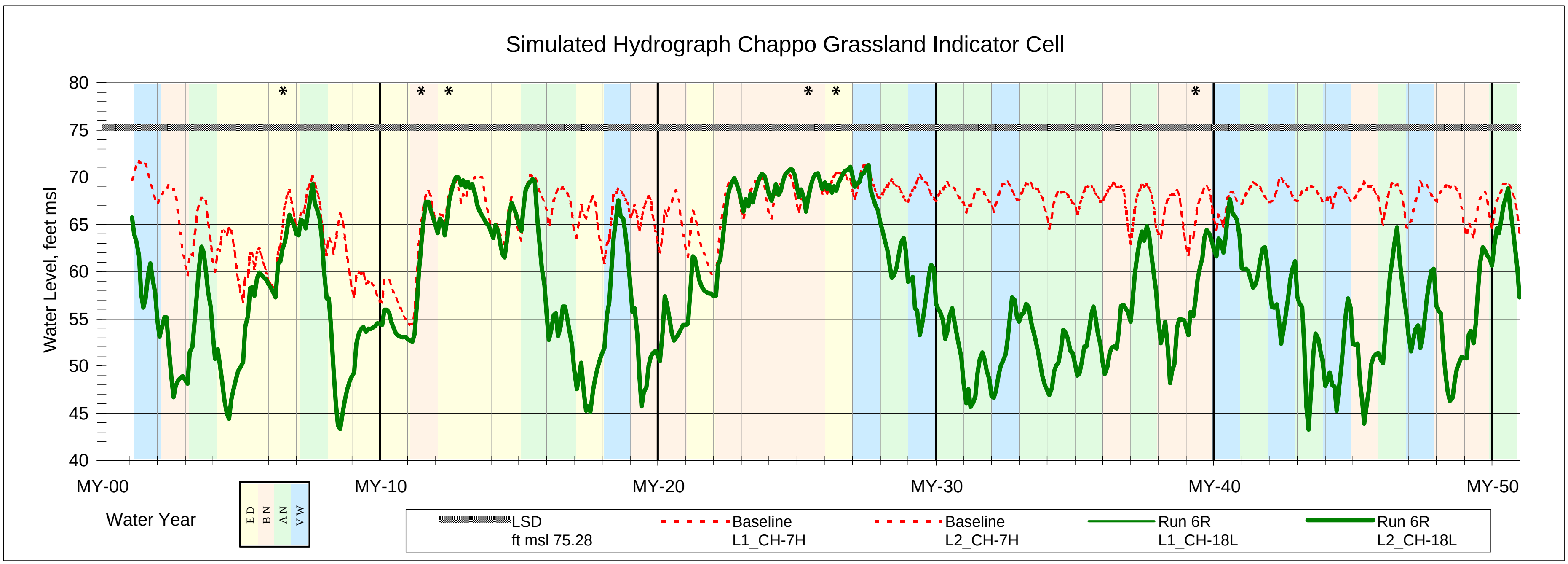




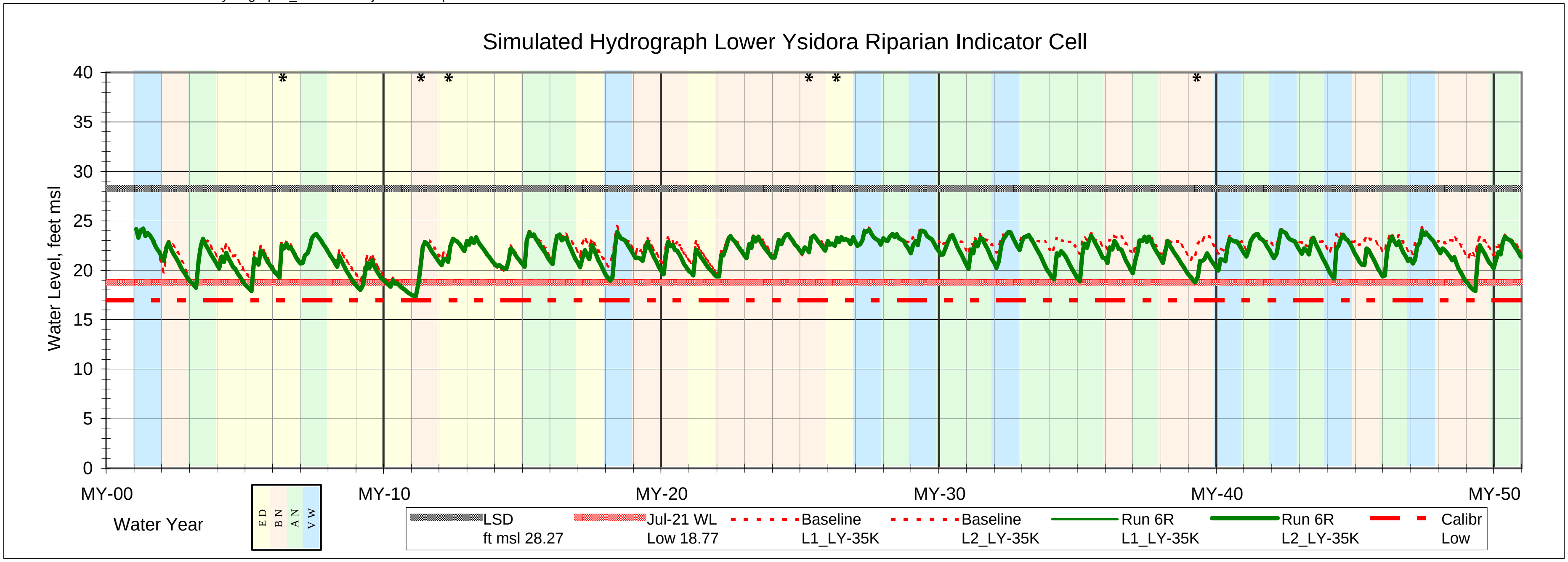
***** Emergency flows called upon during water years marked with an asterisk.

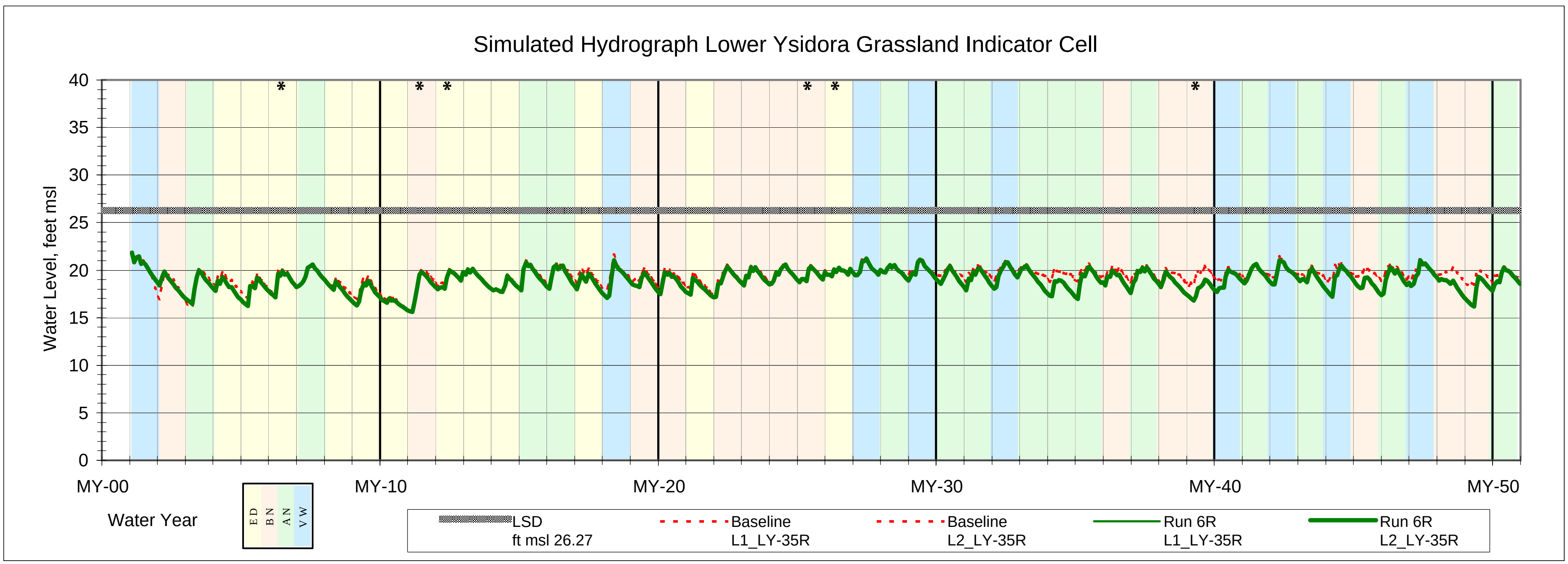
Layer 1 (L1) and Layer 2(L2) simulated groundwater levels are at similar elevations and the graph lines are printed on top of each other.

FIGURE J-2

Run 6 R and Baseline Hydrographs

C:\CPEN\Run6 R\POST\C.IC-hydrographs_Run 6RWAdjWater.xls / printed 9/19/2006





* Emergency flows called upon during water years marked with an asterisk.

Layer 1 (L1) and Layer 2(L2) simulated groundwater levels are at similar elevations and the graph lines are printed on top of each other.

FIGURE J-3

Run 6 R and Baseline Hydrographs

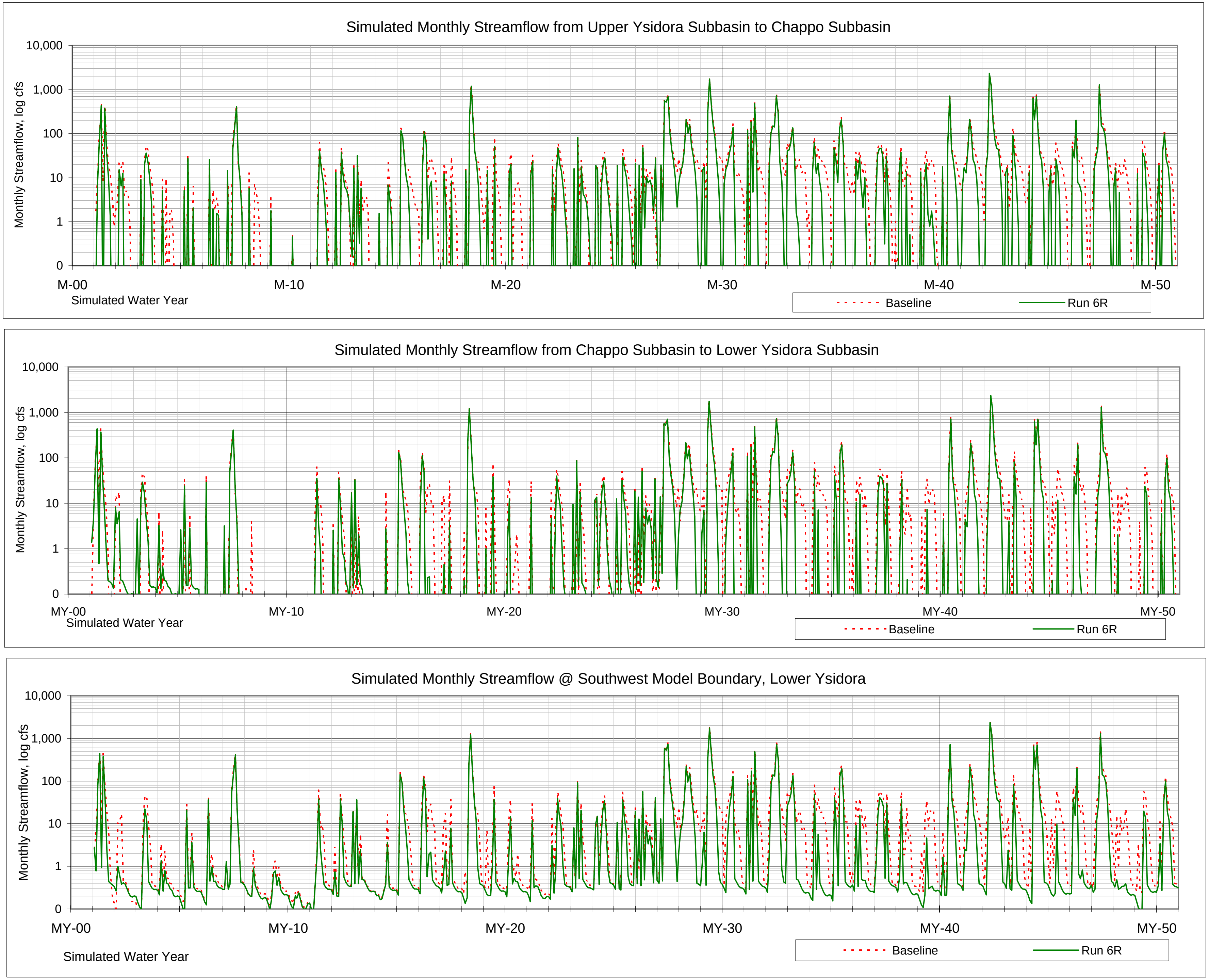
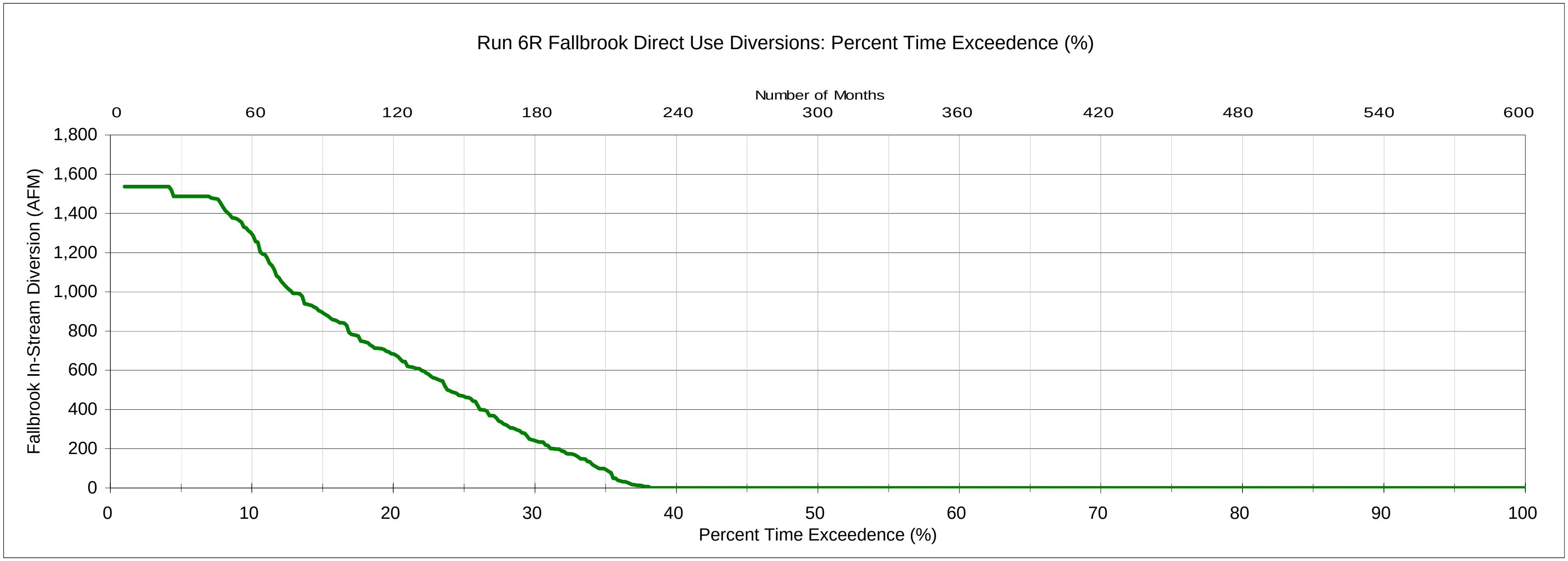


Figure J-4. Simulated Streamflow, Run 6R Alt 2 and Baseline



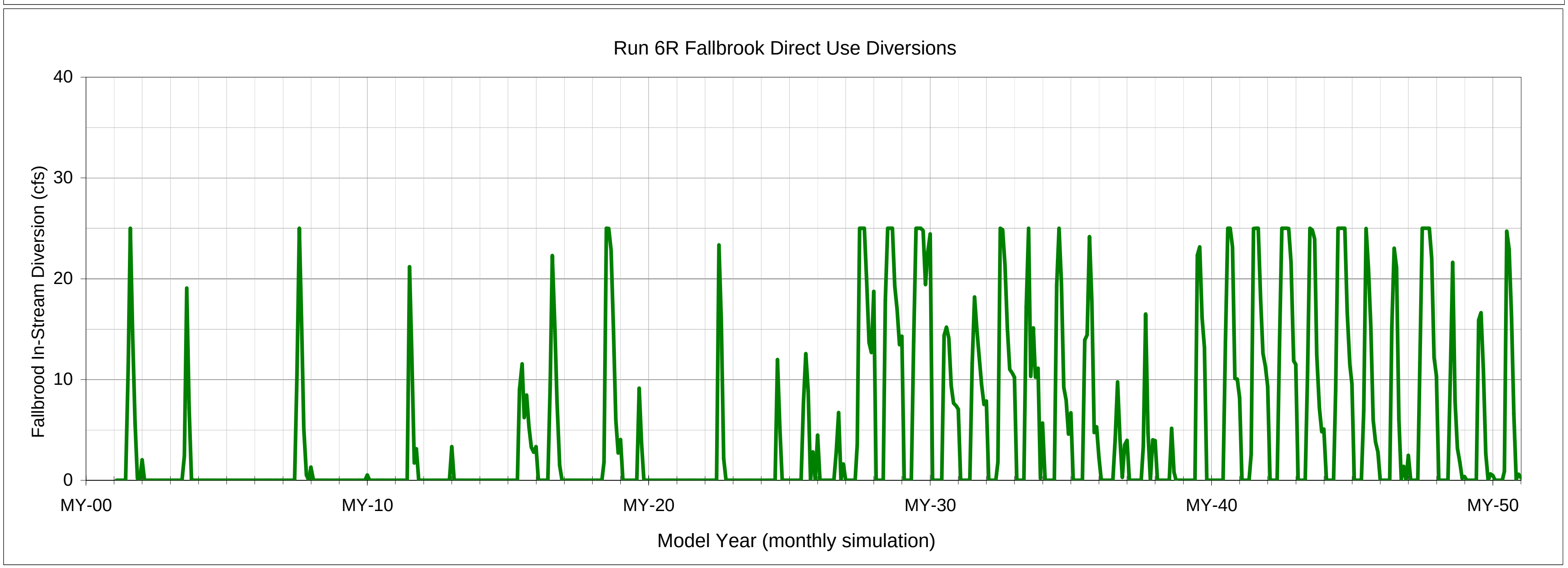


FIGURE J-5. Run 6R Fallbrook Direct Use Diversion

Table J-4 Run 6R Fallbrook Diversion

Average Hydrologic Condition Water Budget (af/y)

% Time Exceedence	*> 76%*	*76% to 50%*	*50% to 19%*	*< 19%*
# Years	*12*	*14*	*15*	*9*
	Extremely Dry	Below Normal	Above Normal	Very Wet
Inflow:				
Santa Margarita River Inflow	7,300	11,400	27,500	119,200
Subsurface Underflow	1,000	900	900	900
Lake O'Neill Spill and Release	800	1,200	1,400	1,600
Fallbrook Creek	100	400	1,400	3,800
Minor Tributary Drainages	1,700	1,400	2,400	4,900
Areal Precipitation	500	500	700	1,600
Total Inflow:	11,400	15,800	34,300	132,000
Outflow:				
Santa Margarita River Outflow	1,900	2,500	18,100	112,700
Subsurface Underflow	100	100	100	100
Groundwater Pumping	6,500	9,300	12,700	13,700
Evapotranspiration	1,900	2,100	2,200	2,700
Diversions to Lake O'Neill	1,100	1,700	1,800	2,200
Total Outflow:	11,500	15,700	34,900	131,400
Net Simulated Change of Groundwater in Storage:	-100	100	-600	600
Fallbrook Diversions	100	1,900	4,800	7,900
	-	-	-	-

Median Hydrologic Condition Water Budget (af/y)

% Time Exceedence	*> 76%*	*76% to 50%*	*50% to 19%*	*< 19%*
# Years	*12*	*14*	*15*	*9*
	Extremely Dry	Below Normal	Above Normal	Very Wet
Inflow:				
Santa Margarita River Inflow	6,800	12,000	23,800	110,600
Subsurface Underflow	1,000	900	900	900
Lake O'Neill Spill and Release	700	1,200	1,400	1,400
Fallbrook Creek	100	300	1,100	3,500
Minor Tributary Drainages	1,500	1,400	2,500	4,700
Areal Precipitation	400	300	500	1,500
Outflow:				
Santa Margarita River Outflow	900	2,300	14,900	100,200
Subsurface Underflow	100	100	100	100
Groundwater Pumping	5,100	8,800	14,300	16,200
Evapotranspiration	1,500	1,700	2,000	2,600
Diversions to Lake O'Neill	1,300	1,600	1,900	2,000
Net Simulated Change of Groundwater in Storage:	300	300	-400	500
Fallbrook Diversions	0	1,900	4,600	8,700

Average Subbasin Water Budget (af/y)

	Upper Ysidora	Chappo	Lower Ysidora	SMR Basin	
Inflow:					
Santa Margarita River Inflow	34,600	28,300	26,200	34,600	84%
Subsurface Underflow *	900	1,800	400	900	2%
Lake O'Neill Spill and Release	1,200	-	-	1,200	3%
Fallbrook Creek	1,200	-	-	1,200	3%
Minor Tributary Drainages	600	1,100	700	2,400	6%
Areal Precipitation	200	300	200	800	2%
Total Inflow:	38,700	31,500	27,500	41,100	
Outflow:					
Santa Margarita River Outflow	28,300	26,200	26,700	26,800	65%
Subsurface Underflow *	1,800	400	100	100	0%
Groundwater Pumping	6,400	4,000	0	10,400	25%
Evapotranspiration *	600	800	800	2,200	5%
Diversions to Lake O'Neill	1,700	-	-	1,700	4%
Total Outflow:	38,800	31,400	27,600	41,200	
Net Simulated Change of Groundwater in Storage: *	-100	100	-100	-100	
Fallbrook Diversions				3,400	8%
	-	-	-	-	

Note: * Subbasin Averages are based on the last rate of the stress period
Values are rounded to the nearest 100 acre-feet, closest number adjusted to eliminate rounding error

Median Subbasin Water Budget (af/y)

	Upper Ysidora	Chappo	Lower Ysidora	SMR Basin
Inflow:				
Santa Margarita River Inflow	13,100	7,000	5,000	13,100
Subsurface Underflow *	900	1,800	400	900
Lake O'Neill Spill and Release	1,200	-	-	1,200
Fallbrook Creek	600	-	-	600
Minor Tributary Drainages	200	0	100	2,100
Areal Precipitation	6,700	0	6,430	500
Outflow:				
Santa Margarita River Outflow	7,000	5,000	5,400	5,400
Subsurface Underflow *	1,800	400	100	100
Groundwater Pumping	6,600	3,800	0	10,400
Evapotranspiration *	600	700	800	2,000
Diversions to Lake O'Neill	1,700	-	-	1,700
Net Simulated Change of Groundwater in Storage: *	0	0	0	200
Fallbrook Diversions				2,800

Note: The sum of median values does not reflect the change of groundwater in storage.
Median values are not cummulative.
* Subbasin Medians are based on the last rate of the stress period
Values are rounded to the nearest 100 acre-feet

Table J-5 Run 6R Annual Water budget

Lower Santa Margarita River Groundwater Model

Modflow Volumetric Budget Output and Streamflow

Run 6R Fallbrook Diversion

9/12/06

Annual Surface Water Budget

MY		SMR Flow In	LON Diversion	Ponds Diversion	Str Gain+ / Loss-	GAGE SMR @ UY->CH	Str Gain+ / Loss-	SMR @ CH->LY	Str Gain+ / Loss-	SMR Flow Out	LSMR Str Gain+ / Loss-
1	VW	62,843	1,889	7,162	-5,992	56,851	-1,191	55,659	1,806	57,465	-5,377
2	BN	8,737	1,531	3,426	-6,675	2,062	-1,933	129	136	265	-8,472
3	AN	13,917	1,057	4,838	-8,128	5,789	-3,373	2,416	-137	2,279	-11,638
4	ED	6,759	1,323	2,646	-6,453	306	-295	11	276	288	-6,471
5	ED	6,151	337	1,336	-4,064	2,087	-769	1,318	323	1,641	-4,510
6	ED	8,228	1,307	2,764	-6,350	1,878	-114	1,764	722	2,487	-5,742
7	AN	43,266	736	8,763	-4,227	39,039	-1,372	37,667	717	38,384	-4,881
8	ED	6,750	1,291	3,474	-6,416	334	-334	-	202	202	-6,548
9	ED	4,809	754	1,820	-4,704	105	-105	0	239	239	-4,570
10	ED	3,399	393	1,216	-3,373	27	-27	-	105	105	-3,295
11	BN	11,350	1,382	4,579	-7,384	3,966	-1,735	2,231	328	2,559	-8,791
12	ED	10,855	1,665	3,801	-5,372	5,484	-1,722	3,761	343	4,104	-6,751
13	ED	4,963	577	1,797	-2,732	2,231	-110	2,121	411	2,532	-2,431
14	ED	5,802	412	2,946	-5,065	737	-575	162	226	387	-5,415
15	AN	18,936	1,861	4,032	-4,325	14,610	253	14,864	1,280	16,143	-2,792
16	AN	20,476	1,908	4,606	-8,256	12,220	-1,673	10,547	1,119	11,666	-8,810
17	ED	10,105	1,979	3,961	-8,767	1,338	-1,073	265	558	824	-9,281
18	VW	99,501	1,252	9,778	-2,004	97,497	-1,758	95,740	1,508	97,247	-2,253
19	BN	12,341	2,098	4,010	-8,315	4,026	-1,634	2,392	98	2,490	-9,851
20	BN	8,950	1,263	3,584	-6,993	1,957	-1,095	862	329	1,191	-7,759
21	ED	7,739	1,831	1,408	-5,649	2,090	-1,274	816	67	883	-6,855
22	BN	12,300	1,514	5,906	-5,679	6,621	-2,516	4,105	0	4,105	-8,195
23	BN	12,321	1,607	2,949	-4,636	7,685	-770	6,915	659	7,573	-4,747
24	BN	10,344	1,699	4,727	-4,269	6,076	-966	5,109	502	5,612	-4,733
25	BN	10,196	1,492	4,034	-4,332	5,865	-1,012	4,853	405	5,258	-4,939
26	ED	12,059	1,748	4,004	-4,155	7,904	-591	7,314	776	8,089	-3,970
27	VW	118,143	1,893	14,131	-401	117,742	635	118,378	2,151	120,529	2,385
28	AN	45,638	2,500	14,034	-6,645	38,994	-3,727	35,267	598	35,864	-9,774
29	VW	170,421	3,016	16,710	-5,342	165,079	-2,754	162,325	1,891	164,216	-6,205
30	AN	24,231	2,278	4,537	-7,723	16,508	-4,046	12,462	81	12,543	-11,688
31	AN	57,429	1,788	5,160	-7,012	50,417	-2,626	47,791	529	48,320	-9,109
32	VW	98,613	1,825	11,968	-7,370	91,243	-5,328	85,915	800	86,715	-11,899
33	AN	23,843	2,163	5,286	-6,986	16,857	-2,392	14,465	460	14,925	-8,918
34	AN	16,495	1,741	5,124	-9,170	7,325	-3,791	3,534	-34	3,499	-12,995
35	AN	34,288	1,200	5,862	-6,703	27,586	-3,578	24,007	406	24,413	-9,875
36	BN	12,655	1,586	4,096	-7,860	4,795	-3,195	1,600	122	1,722	-10,933
37	AN	17,275	1,163	4,620	-5,858	11,417	-2,736	8,681	452	9,133	-8,142
38	BN	12,307	1,903	4,413	-8,335	3,972	-1,897	2,074	383	2,457	-9,849
39	BN	11,639	1,723	5,247	-8,944	2,695	-2,290	405	12	417	-11,222
40	VW	57,458	1,962	9,189	-4,477	52,982	-2,430	50,551	226	50,777	-6,681
41	AN	34,663	2,096	10,084	-8,173	26,490	-4,463	22,027	342	22,369	-12,294
42	VW	242,480	2,656	18,246	-5,561	236,919	-3,855	233,064	1,400	234,464	-8,016
43	AN	17,534	2,652	7,479	-8,795	8,738	-3,179	5,559	232	5,791	-11,742
44	VW	112,607	2,562	15,079	-8,307	104,300	-3,892	100,409	1,089	101,498	-11,109
45	BN	13,115	2,242	6,541	-9,488	3,626	-2,946	680	45	725	-12,390
46	AN	25,872	1,984	5,436	-8,042	17,831	-2,530	15,301	538	15,839	-10,034
47	VW	110,621	2,640	16,829	-7,417	103,204	-4,259	98,945	1,286	100,231	-10,390
48	BN	10,363	2,500	4,681	-8,709	1,654	-1,534	120	97	217	-10,146
49	BN	13,038	1,646	4,877	-8,176	4,862	-2,590	2,272	-168	2,103	-10,934
50	AN	18,166	2,156	6,232	-5,846	12,320	-2,392	9,928	138	10,066	-8,100
	avg	34,640	1,696	6,189	**-6,313**	28,327	**-1,991**	26,336	**521**	26,857	**-7,783**
	med	13,076	1,744	4,704	-6,549	6,973	-1,827	4,981	363	5,435	-8,168
AVERAGES											
ED	12	7,302	1,135	2,598	(5,258)	2,043	(582)	1,461	354	1,815	-5,487
BN	14	11,404	1,727	4,505	(7,128)	4,276	(1,865)	2,411	211	2,621	-8,783
AN	15	27,469	1,819	6,406	(7,059)	20,409	(2,775)	17,634	448	18,082	-9,386
VW	9	119,187	2,188	13,232	(5,208)	113,980	(2,759)	111,221	1,351	112,571	-6,616
	50										
MEDIANS											
ED	12	6,755	1,299	2,705	(5,218)	1,608	(455)	541	299	854	-5,578
BN	14	11,970	1,626	4,496	(7,622)	3,999	(1,816)	2,153	129	2,280	-9,320
AN	15	23,843	1,908	5,286	(7,012)	16,508	(2,736)	14,465	452	14,925	-9,774
VW	9	110,621	1,962	14,131	(5,561)	103,204	(2,754)	98,945	1,400	100,231	-6,681
	50										

Table J-5 Run 6R Annual Water budget (continued)
Lower Santa Margarita River Groundwater Model
Modflow Volumetric Budget Output

Annual Groundwater Budget Model Run: Run 6R Fallbrook Diversion

	INFLOW:					**OUTFLOW:**					
MY	Storage	Recharge	Stream Leakance	GHB	TOTAL GW IN	Storage	Wells	ET	Stream Leakance	GHB	TOTAL GW OUT
1	8,822	8,177	8,663	878	26,541	4,591	14,952	2,669	4,291	65	26,566
2	6,348	3,618	6,254	941	17,161	2,758	12,410	1,494	462	53	17,177
3	5,557	5,074	9,835	1,000	21,466	8,316	9,635	1,734	1,752	49	21,486
4	6,141	2,928	4,929	958	14,956	3,478	9,979	1,163	294	52	14,966
5	3,625	1,633	6,338	1,123	12,719	6,383	4,663	1,372	270	48	12,736
6	3,329	3,430	5,748	1,019	13,526	5,487	5,101	1,976	921	55	13,541
7	6,605	9,380	7,016	908	23,908	6,671	8,030	2,756	6,396	63	23,916
8	7,759	3,620	3,439	940	15,758	3,072	10,911	1,309	444	48	15,783
9	2,700	2,169	4,566	1,023	10,458	3,990	5,073	1,116	230	47	10,456
10	2,730	1,343	2,615	1,069	7,757	1,554	5,057	961	156	40	7,769
11	3,324	5,051	8,320	964	17,658	8,212	4,927	1,986	2,502	49	17,675
12	2,785	4,063	7,045	917	14,811	4,826	5,101	2,761	2,080	55	14,823
13	3,776	2,032	3,730	922	10,461	1,501	5,099	2,791	1,031	59	10,480
14	3,522	3,267	4,543	961	12,293	4,027	5,101	2,197	930	52	12,306
15	6,600	5,030	5,200	902	17,732	4,073	8,028	2,707	2,881	64	17,752
16	6,713	5,239	10,801	915	23,667	5,363	14,467	1,970	1,814	63	23,676
17	5,606	4,277	8,205	927	19,015	5,767	11,299	1,361	542	56	19,025
18	7,498	10,900	8,838	872	28,108	10,119	8,030	2,365	7,551	61	28,126
19	8,200	4,215	6,990	925	20,331	5,041	12,798	1,584	882	53	20,359
20	4,562	3,942	6,935	935	16,373	5,344	8,797	1,586	604	55	16,387
21	3,079	1,667	5,751	994	11,490	3,788	5,776	1,637	262	49	11,511
22	3,852	6,286	7,505	904	18,546	7,174	5,099	2,668	3,561	57	18,558
23	2,925	3,384	6,003	914	13,226	3,414	5,101	2,929	1,745	59	13,248
24	3,483	5,193	6,286	887	15,848	3,712	5,099	3,131	3,859	63	15,864
25	3,744	4,601	6,116	899	15,360	4,160	5,101	3,035	3,026	62	15,383
26	2,792	4,419	6,302	888	14,401	2,821	5,099	3,200	3,209	66	14,395
27	6,915	15,287	7,275	845	30,321	6,361	8,030	3,347	12,532	74	30,344
28	7,275	14,433	9,438	840	31,986	5,248	14,467	2,874	9,348	67	32,005
29	8,136	17,695	11,267	833	37,932	7,713	16,758	2,658	10,730	70	37,931
30	6,974	4,796	10,585	907	23,262	3,845	15,932	1,979	1,455	59	23,270
31	7,110	5,634	11,157	918	24,819	6,758	14,830	1,584	1,612	60	24,845
32	6,224	12,713	15,087	870	34,894	9,851	16,162	2,105	6,724	67	34,908
33	6,965	5,537	8,242	898	21,641	2,867	14,945	1,921	1,860	60	21,654
34	5,682	5,390	11,134	932	23,138	6,244	13,613	1,437	1,809	50	23,154
35	5,909	6,329	12,443	907	25,588	7,456	14,279	1,804	1,983	59	25,583
36	5,668	4,366	10,376	911	21,322	5,262	13,062	1,628	1,359	57	21,368
37	5,388	5,053	10,721	904	22,066	6,628	11,387	2,300	1,676	62	22,053
38	6,260	4,665	9,022	914	20,861	5,085	12,810	1,687	1,240	54	20,876
39	4,148	5,445	7,920	914	18,427	6,623	8,792	1,795	1,180	48	18,438
40	6,683	9,424	7,530	888	24,525	7,142	8,701	2,578	6,051	56	24,528
41	5,813	10,445	11,157	872	28,287	5,200	14,417	2,601	6,026	62	28,306
42	7,530	19,008	12,213	833	39,584	7,819	17,172	2,585	11,961	66	39,602
43	9,378	7,713	8,976	884	26,951	5,868	16,299	1,871	2,835	57	26,930
44	8,586	15,725	12,856	875	38,042	10,560	16,483	1,915	9,056	60	38,074
45	7,645	6,749	8,770	900	24,063	5,234	15,197	1,472	2,133	51	24,087
46	5,877	5,877	10,537	911	23,202	7,943	11,410	1,997	1,811	59	23,220
47	7,002	17,723	12,925	845	38,494	8,632	16,575	2,436	10,797	67	38,506
48	6,979	4,890	6,772	904	19,545	2,847	14,256	1,451	921	54	19,528
49	4,086	5,073	8,058	960	18,177	7,943	7,300	1,616	1,318	46	18,224
50	6,129	6,612	7,277	888	20,907	5,877	8,701	2,594	3,662	59	20,892
avg	5,689	6,630	8,194	919	21,432	5,613	10,446	2,094	3,235	57	21,446
med	6,019	5,074	7,989	910	20,884	5,354	10,445	1,978	1,812	58	20,884
AVERAGES											
ED	3,987	2,904	5,268	979	13,137	3,891	6,522	1,820	864	52	13,149
BN	5,087	4,820	7,523	919	18,350	5,201	9,339	2,004	1,771	54	18,369
AN	6,532	6,836	9,635	906	23,908	5,890	12,696	2,142	3,128	60	23,916
VW	7,488	14,073	10,739	860	33,160	8,088	13,651	2,517	8,855	65	33,176
MEDIANS											
ED	3,425	3,098	5,339	960	13,122	3,889	5,101	1,504	493	52	13,138
BN	4,355	4,777	7,247	914	18,302	5,160	8,795	1,657	1,338	54	18,331
AN	6,600	5,634	10,537	907	23,262	5,877	14,279	1,979	1,860	60	23,270
VW	7,498	15,287	11,267	870	34,894	7,819	16,162	2,578	9,056	66	34,908

Table J-5 Run 6R Annual Water budget (continued)				
Lower Santa Margarita River Groundwater Model				
Modflow Volumetric Budget Output				
Annual Groundwater Budget				
MY	NET Storage	NET Str Lknc	In-Out	**% bal**
1	-4,231	-4,373	-25.9	-0.10%
2	-3,590	-5,792	-15.5	-0.09%
3	2,759	-8,083	-19.9	-0.09%
4	-2,663	-4,635	-10.0	-0.07%
5	2,758	-6,068	-16.8	-0.13%
6	2,158	-4,827	-14.4	-0.11%
7	67	-620	-7.7	-0.03%
8	-4,688	-2,995	-25.2	-0.16%
9	1,290	-4,336	2.0	0.02%
10	-1,175	-2,459	-11.9	-0.15%
11	4,888	-5,818	-16.1	-0.09%
12	2,041	-4,965	-11.9	-0.08%
13	-2,275	-2,700	-19.5	-0.19%
14	505	-3,613	-13.2	-0.11%
15	-2,528	-2,319	-20.0	-0.11%
16	-1,350	-8,988	-9.4	-0.04%
17	161	-7,663	-9.6	-0.05%
18	2,622	-1,288	-18.0	-0.06%
19	-3,159	-6,109	-27.7	-0.14%
20	783	-6,331	-13.5	-0.08%
21	709	-5,489	-20.8	-0.18%
22	3,322	-3,944	-12.4	-0.07%
23	489	-4,258	-21.6	-0.16%
24	230	-2,427	-16.2	-0.10%
25	416	-3,090	-23.2	-0.15%
26	30	-3,092	5.4	0.04%
27	-553	5,257	-23.0	-0.08%
28	-2,027	-90	-19.0	-0.06%
29	-422	-537	0.9	0.00%
30	-3,129	-9,130	-8.1	-0.03%
31	-351	-9,545	-25.9	-0.10%
32	3,627	-8,363	-13.8	-0.04%
33	-4,098	-6,382	-12.2	-0.06%
34	562	-9,325	-15.7	-0.07%
35	1,547	-10,459	5.2	0.02%
36	-406	-9,017	-45.6	-0.21%
37	1,240	-9,045	13.3	0.06%
38	-1,175	-7,782	-14.8	-0.07%
39	2,475	-6,740	-11.0	-0.06%
40	459	-1,478	-3.0	-0.01%
41	-613	-5,131	-18.5	-0.07%
42	289	-253	-17.4	-0.04%
43	-3,510	-6,141	21.1	0.08%
44	1,974	-3,799	-32.6	-0.09%
45	-2,410	-6,637	-23.9	-0.10%
46	2,066	-8,726	-17.9	-0.08%
47	1,630	-2,128	-12.4	-0.03%
48	-4,132	-5,852	17.4	0.09%
49	3,857	-6,740	-46.4	-0.25%
50	-253	-3,616	14.7	0.07%
avg	-76	-4,959	-13.6	-0.07%
med	195	-5,048	-15.1	-0.07%
AVERAGES				
ED	-96	-4,404	-12.2	-0.10%
BN	113	-5,753	-19.3	-0.11%
AN	-641	-6,507	-8.0	-0.03%
VW	599	-1,885	-16.1	-0.05%
MEDIANS				
ED	333	-4,485	-12.6	-0.11%
BN	323	-5,980	-16.2	-0.10%
AN	-351	-8,083	-12.2	-0.06%
VW	459	-1,478	-17.4	-0.04%

Table J-6 Run 6R 50-Year Average Monthly Water Budget

Lower Santa Margarita River Groundwater Model — Run 6R Fallbrook Diversion

Modflow Volumetric Budget Output and Streamflow — 9/12/06

Average Monthly Water Budget

Avg AF/M	SMR Flow In	Diversion	Str Gain+ / Loss-	SMR @ UY->CH	Str Gain+ / Loss-	SMR @ CH->LY	Str Gain+ / Loss-	SMR Flow Out	LSMR Str Gain+ / Loss-
Oct	526	325	-387	139	-86	53	17	70	-455
Nov	1,299	661	-100	1,199	-531	668	-10	658	-641
Dec	1,969	530	-845	1,124	-183	940	41	981	-988
Jan	8,364	840	-1,149	7,214	-148	7,066	137	7,204	-1,160
Feb	10,120	1,992	-1,746	8,374	-154	8,220	107	8,327	-1,793
Mar	8,147	1,850	-1,086	7,061	-254	6,807	100	6,908	-1,239
Apr	2,392	929	-311	2,081	-244	1,838	45	1,883	-509
May	674	370	-43	631	-180	451	13	463	-211
Jun	328	165	-48	280	-126	154	11	166	-163
Jul	236	81	-156	79	-61	19	16	34	-201
Aug	255	75	-211	44	-1	43	26	68	-186
Sep	331	67	-229	102	-25	77	19	96	-235
Avg Monthly	2,887	657	-526	2,361	-166	2,195	43	2,238	-649
Med Monthly	987	450	-270	877	-151	559	22	561	-482
Avg Total=Anl	34,640	7,884	-6,313	28,327	-1,991	26,336	521	26,857	-7,783

Lower Santa Margarita River Groundwater Model

Modflow Volumetric Budget Output

Average Monthly Water Budget

	INFLOW:					OUTFLOW:									
Avg AF/M	Storage	Recharge	Stream Leakance	GHB	TOTAL IN	Storage	Wells	ET	Stream Leakance	GHB	TOTAL OUT	NET Storage	NET Str Lknc	In-Out	% bal
Oct	538	45	414	83	1,081	97	801	141	35	8	1,082	-441	-379	-1.1	-0.11%
Nov	134	635	1,379	81	2,229	1,137	886	149	49	8	2,229	1,003	-1,330	0.4	0.02%
Dec	479	150	957	81	1,667	405	1,025	168	63	7	1,668	-73	-894	-1.0	-0.06%
Jan	319	346	1,300	79	2,044	606	1,184	174	73	5	2,043	287	-1,227	0.9	0.04%
Feb	270	1,874	941	76	3,161	1,507	1,166	174	311	-	3,157	1,237	-631	3.4	0.11%
Mar	233	1,962	932	74	3,202	1,097	1,093	206	809	1	3,205	863	-124	-2.3	-0.07%
Apr	513	1,037	702	68	2,320	405	890	205	810	8	2,319	-108	108	1.7	0.07%
May	717	453	452	71	1,693	177	747	207	557	9	1,697	-540	105	-4.6	-0.27%
Jun	669	95	347	70	1,181	81	617	187	290	6	1,183	-587	-56	-1.3	-0.11%
Jul	637	17	266	76	995	33	651	178	134	4	999	-604	-132	-4.3	-0.43%
Aug	527	6	220	80	833	24	585	162	65	0	836	-503	-155	-3.0	-0.36%
Sep	654	10	284	78	1,026	43	801	143	40	1	1,028	-611	-243	-2.4	-0.23%
Avg Monthly	474	553	683	77	1,786	468	871	174	270	5	1,787	-6	-413	-1.1	-0.12%
Med Monthly	520	248	577	77	1,680	291	843	174	103	6	1,682	-274	-199	-1.2	-0.09%
Avg Total=Anl	5,689	6,630	8,194	919	21,432	5,613	10,446	2,094	3,235	57	21,446	-76	-4,959	-13.6	

Attachment K

Run 7 (Mitigate 7-Year Drought) Model Results

Table K-1: Run 7, 7-Year Drought Management, Additional Water Supply								
		Run 7C		Run7F		CWRMA		SMR Strflw w/
		Additional	SMR	Additional	SMR	Emergency Flow		High Emg Flow
	SMR	Water Supply	Total	Water Supply	Total	Low Range	High Range	(Run 1)
MY	(AFY)	(AFY)	(AFY)	(AFY)	(AFY)	(AFY)	(AFY)	(AFY)
1	66,423			0	66,423	0	0	66,423
2	8,728			200	8,928	0	0	8,728
3	15,648			600	16,248	0	0	15,648
4	6,763	Initial Run		0	6,763	0	0	6,763
5	6,150	Optimizes Last		600	6,750	603	0	6,150
6	5,877	39-Years of		400	6,277	400	2,352	8,229
7	46,754	Groundwater Pumping.		0	46,754	0	0	46,754
8	6,745			200	6,945	0	0	6,745
9	4,839			600	5,439	600	0	4,839
10	3,399			2,400	5,799	2,055	0	3,399
11	11,448			600	12,048	591	2,281	13,729
12	9,245	0	9,245	0	9,245	0	1,813	11,058
13	4,968	0	4,968	0	4,968	0	0	4,968
14	5,799	800	6,599	800	6,599	0	0	5,799
15	21,918	0	21,918	0	21,918	0	0	21,918
16	23,856	0	23,856	0	23,856	0	0	23,856
17	10,104	0	10,104	0	10,104	0	0	10,104
18	105,468	600	106,068	600	106,068	0	0	105,468
19	13,128	0	13,128	0	13,128	0	0	13,128
20	8,943	200	9,143	200	9,143	0	0	8,943
21	7,737	400	8,137	400	8,137	0	0	7,737
22	14,799	200	14,999	200	14,999	0	0	14,799
23	12,324	0	12,324	0	12,324	0	0	12,324
24	11,385	0	11,385	0	11,385	0	0	11,385
25	10,298	0	10,298	0	10,298	0	2,093	12,391
26	10,317	0	10,317	0	10,317	0	2,417	12,735
27	126,848	0	126,848	0	126,848	0	0	126,848
28	55,087	0	55,087	0	55,087	0	0	55,087
29	181,131	0	181,131	0	181,131	0	0	181,131
30	28,809	0	28,809	0	28,809	0	0	28,809
31	62,362	0	62,362	0	62,362	0	0	62,362
32	105,857	0	105,857	0	105,857	0	0	105,857
33	29,591	0	29,591	0	29,591	0	0	29,591
34	22,091	0	22,091	0	22,091	0	0	22,091
35	39,332	0	39,332	0	39,332	0	0	39,332
36	14,229	0	14,229	0	14,229	0	0	14,229
37	19,248	0	19,248	0	19,248	0	0	19,248
38	12,653	0	12,653	0	12,653	0	0	12,653
39	13,138	0	13,138	0	13,138	0	3,030	16,168
40	64,398	0	64,398	0	64,398	0	0	64,398
41	42,484	0	42,484	0	42,484	0	0	42,484
42	251,832	0	251,832	0	251,832	0	0	251,832
43	24,418	0	24,418	0	24,418	0	0	24,418
44	121,462	0	121,462	0	121,462	0	0	121,462
45	18,009	0	18,009	0	18,009	0	0	18,009
46	30,001	0	30,001	0	30,001	0	0	30,001
47	120,226	0	120,226	0	120,226	0	0	120,226
48	13,178	0	13,178	0	13,178	0	0	13,178
49	15,901	0	15,901	0	15,901	0	0	15,901
50	22,536	0	22,536	0	22,536	0	0	22,536
average	37,758	56	43,777	156	37,914	85	280	38,037
median	15,774	0	21,918	0	16,074	0	0	16,034
Total Addtnl Water		2,200		7,800		4,249	13,986	
# of Years		5		13		5	6	

Table K-2 Run 7 Annual Pumping Summmary

LOWER SANTA MARGARITA RIVER GROUNDWATER MODEL

Hydrologic Condition

HC	Cnt	Oct to Apr Strflw
VW	9	Very Wet > 56,164
AN	15	Above Normal > 13,600
BN	14	Below Normal < 13,600
ED	12	Extremely Dry < 5,840
	50	

Pumping Condition

PC	HC	Q Adjst	Anl Q	Cnt
1	2+ AN @ VW	4,000	18,100	62
2	2+ AN @ AN	2,000	16,100	110
3	Standard	500	14,600	116
4	1st BN 70/30 Spli	0	14,100	72
5	2ndBN/1stED	-3,000	11,100	72
6	3+BN / 2+ED	-7,000	7,100	168

MY	WY	HC	Oct-Apr HC descrip	May-Apr Pumping Condition	Additional Water (af/y)	UY Total (af/y)	CH Total (af/y)	LY Total (af/y)	LSMR Total (af/y)	+Q*
1	1952	VW	Very Wet	3	-	8,571	7,012	-	15,583	
2	1953	BN	Below Normal	4	200	7,519	5,808	-	13,328	
3	1954	AN	Above Normal	3	600	6,496	4,021	-	10,517	
4	1955	ED	Extremely Dry	5	-	7,036	2,407	-	9,443	
5	1956	ED	Extremely Dry	6	600	4,200	1,800	-	6,000	
6	1957	ED	Extremely Dry	6	400	4,200	1,800	-	6,000	
7	1958	AN	Above Normal	3	-	5,589	3,450	-	9,039	
8	1959	ED	Extremely Dry	5	200	6,706	3,435	-	10,142	
9	1960	ED	Extremely Dry	6	600	4,200	1,800	-	6,000	
10	1961	ED	Extremely Dry	6	2,400	4,200	1,800	-	6,000	
11	1962	BN	Below Normal	6	600	4,677	1,800	-	6,477	
12	1963	ED	Extremely Dry	6	-	4,739	1,826	-	6,564	
13	1964	ED	Extremely Dry	6	-	4,970	2,130	-	7,100	
14	1965	ED	Extremely Dry	6	800	4,970	2,130	-	7,100	
15	1966	AN	Above Normal	3	-	5,966	3,575	-	9,541	X
16	1967	AN	Above Normal	2	-	8,748	7,158	-	15,906	
17	1968	ED	Extremely Dry	5	-	8,502	5,971	-	14,472	
18	1969	VW	Very Wet	3	600	7,855	4,385	-	12,239	
19	1970	BN	Below Normal	4	-	8,629	5,808	-	14,437	
20	1971	BN	Below Normal	5	200	7,339	3,937	-	11,276	
21	1972	ED	Extremely Dry	6	400	4,200	2,818	-	7,018	
22	1973	BN	Below Normal	6	200	4,765	2,130	-	6,895	
23	1974	BN	Below Normal	6	-	4,970	2,130	-	7,100	
24	1975	BN	Below Normal	6	-	4,970	2,130	-	7,100	
25	1976	BN	Below Normal	6	-	4,970	2,130	-	7,100	
26	1977	ED	Extremely Dry	6	-	4,970	2,130	-	7,100	
27	1978	VW	Very Wet	3	-	5,966	3,575	-	9,541	X
28	1979	AN	Above Normal	2	-	8,748	7,158	-	15,906	X
29	1980	VW	Very Wet	1	-	9,649	7,895	-	17,544	X
30	1981	AN	Above Normal	2	-	9,354	7,653	-	17,007	X
31	1982	AN	Above Normal	2	-	9,059	7,412	-	16,471	X
32	1983	VW	Very Wet	1	-	9,529	7,796	-	17,325	X
33	1984	AN	Above Normal	2	-	9,177	7,508	-	16,686	X
34	1985	AN	Above Normal	2	-	8,906	7,287	-	16,193	X
35	1986	AN	Above Normal	2	-	8,936	7,311	-	16,247	
36	1987	BN	Below Normal	4	-	9,185	6,264	-	15,449	
37	1988	AN	Above Normal	3	-	9,271	4,992	-	14,263	
38	1989	BN	Below Normal	4	-	8,629	5,808	-	14,437	
39	1990	BN	Below Normal	5	-	7,032	3,937	-	10,969	
40	1991	VW	Very Wet	3	-	7,447	4,385	-	11,831	X
41	1992	AN	Above Normal	2	-	8,623	7,055	-	15,677	X
42	1993	VW	Very Wet	1	-	9,775	7,998	-	17,773	X
43	1994	AN	Above Normal	2	-	9,354	7,653	-	17,007	X
44	1995	VW	Very Wet	1	-	9,649	7,895	-	17,544	X
45	1996	BN	Below Normal	4	-	9,775	6,746	-	16,520	
46	1997	AN	Above Normal	3	-	9,271	4,992	-	14,263	X
47	1998	VW	Very Wet	1	-	9,305	7,613	-	16,917	
48	1999	BN	Below Normal	4	-	9,927	6,682	-	16,609	
49	2000	BN	Below Normal	5	-	7,542	3,684	-	11,226	
50	2001	AN	Above Normal	3	-	7,855	4,385	-	12,239	

		Additional Water (af/y)	UY Total (af/y)	CH Total (af/y)	LY Total (af/y)	LSMR Total (af/y)
	Min	-	4,200	1,800	-	6,000
	Max	2,400	9,927	7,998	-	17,773
	Median	**-**	**7,698**	**4,385**	**-**	**12,239**
	% of Median	0.0%	62.9%	35.8%	0.0%	
	Average	**156**	**7,318**	**4,784**	**-**	**12,103**
39 Year Stats	Median	-	8,629	5,808	-	14,437
	Average	56	7,757	5,233	-	12,990

Notes:

Hydrologic Condition: Oct - Apr

Model starts after 3+ BN or ED

*Wet Year Algorithm (additional pumping occurs before May)

Table K-2 Run 7 Annual Pumping Summmary (continued)

Annual Average

ED	12	450	5,241	2,504	-	7,745
BN	14	86	7,138	4,214	-	11,352
AN	15	40	8,357	6,107	-	14,464
VW	9	67	8,638	6,506	-	15,144

Annual Median

ED	12	300	4,854	2,130	-	7,059
BN	14	-	7,429	3,937	-	11,251
AN	15	-	8,906	7,158	-	15,906
VW	9	-	9,305	7,613	-	16,917

Average Monthly Pumping

	Month	Additional Water (af/m)	UY Total (af/m)	CH Total (af/m)	LY Total (af/m)	LSMR Total (af/m)
8%	Oct	32	561	372	-	933
8%	Nov	32	598	406	-	1,005
10%	Dec	32	706	471	-	1,177
11%	Jan	12	801	543	-	1,344
11%	Feb	8	822	530	-	1,351
11%	Mar	8	782	496	-	1,278
9%	Apr	4	639	406	-	1,045
7%	May	4	541	343	-	883
6%	Jun	4	441	285	-	726
6%	Jul	4	453	300	-	752
6%	Aug	4	408	266	-	673
8%	Sep	12	568	367	-	935
	Avg Anl	156	7,318	4,784	-	12,103

Table K-3. Run 7 Pumping Summaries
Lower Santa Margarita River Groundwater Model

		Bldg #	State ID #	Label	# mos Q	% of 600 mos	Orig Wells by Subbsn %	80% Utilization af/m	
1	UY	2673	10/4-7A2	7A2	600	100%	25%	142	
2	UY	26072	10/4-8D1	8D1	600	100%	21%	121	
3	UY	2671	10/4-7H2	7H2	600	100%	15%	82	
4	UY	PW-6	PW-6	PW-6	600	100%	19%	110	
5	UY	2603	10/4-7R2	7R2	600	100%	19%	110	
6	UY	UY-1	UY-1	UY-1	307	51%	0%	110	
7	UY	UY-2	UY-2	UY-2	222	37%	0%	110	
8	UY	UY-3	UY-3	UY-3	147	25%	0%	110	
9	UY	UY-4	UY-4	UY-4	84	14%	0%	110	
10	UY	UY-5	UY-5	UY-5	44	7%	0%	110	
11	UY	UY-6	UY-6	UY-6	12	2%	0%	110	
12	CH	2393	10/4-18E3	18E4	600	100%	14%	121	
13	CH	2373	10/4-18M4&5	18M5	600	100%	18%	153	
14	CH	2363	10/5-13R2	13R2	600	100%	16%	132	
15	CH	33925	10/5-23G4	R23G4	0	0%	0%	**0**	backup
16	CH	2301	10/5-23J1	23J1	600	100%	20%	164	
17	CH	33924	10/5-23K2	23K2	**0**	**0%**	0%	**0**	backup
18	CH	33923	10/5-23K3	23K3	600	100%	16%	132	
19	CH	CH-1	CH-1	CH-1	23	4%	0%	88	
20	CH	CH-2	CH-2	CH-2	5	1%	0%	88	
21	CH	CH-3	CH-3	CH-3	**0**	**0%**	0%	88	
22	CH	CH-4	CH-4	CH-4	600	100%	15%	132	Replaced 23G4

% Pumping in Subbasin

		Wet Year Algorithm			Dry Year Management			Max Pumping in Subbasin adding wells as needed				
		55%	45%	0%	70%	30%	0%					
mo	Anl %	UY	CH	LY	UY	CH	LY		UY	CH	LY	Total
OCT	7.9%	4.4%	3.6%	0.00%	5.6%	2.4%	0.00%	# exst wells	5	7	-	12
NOV	8.6%	4.7%	3.9%	0.00%	6.0%	2.6%	0.00%	af/m (80%)	564	833	-	1,397
DEC	10.0%	5.5%	4.5%	0.00%	7.0%	3.0%	0.00%	avg af/well	113	119	-	116
JAN	11.4%	6.3%	5.1%	0.00%	8.0%	3.4%	0.00%					
FEB	10.9%	6.0%	4.9%	0.00%	7.7%	3.3%	0.00%	1 adntl well	674	921	55	1,650
MAR	10.2%	5.6%	4.6%	0.00%	7.1%	3.1%	0.00%	2 adntl well	784	1,008	110	1,902
APR	8.3%	4.6%	3.7%	0.00%	5.8%	2.5%	0.00%	3 adntl well	893	1,096	164	2,154
MAY	7.1%	3.9%	3.2%	0.00%	5.0%	2.1%	0.00%	4 adntl well	1,003	1,184	219	2,406
JUN	5.9%	3.2%	2.7%	0.00%	4.1%	1.8%	0.00%	5 adntl well	1,112	1,271		2,384
JUL	6.2%	3.4%	2.8%	0.00%	4.3%	1.9%	0.00%	6 adntl well	1,222			1,222
AUG	5.6%	3.1%	2.5%	0.00%	3.9%	1.7%	0.00%	50-yr Avg	5,844	4,875	1,225	
SEP	7.8%	4.3%	3.5%	0.00%	5.4%	2.3%	0.00%	50-yr Med	5,705	5,330	1,161	

	median						
	UY af/m	CH af/m	LY af/m	Total af/m	Max Mo Pumping	cfs	new wells
ED	480	206	0	687	1,839	32	6
BN	551	249	0	811	2,068	36	9
AN	658	466	0	1,141	2,068	36	9
VW	703	511	0	1,158	2,125	37	9

Wet Year Algorithm Monthly Counts

	500	4,000	Total	% of 50 yrs
Oct	-	-	-	0%
Nov	-	-	-	0%
Dec	1	-	1	2%
Jan	7	1	8	16%
Feb	8	4	12	24%
Mar	9	5	14	28%
Apr	8	6	14	28%
May	-	-	-	0%
	33	16	49	

Table K-4. Run7 Annual Pumping by Well

	Building #:	2673	26072	2671	PW-6	2603	new	new	new	new	new	new
	Max Annual Pumping	1,617	1,368	933	1,244	1,244	1,136	940	722	422	309	205
	Potential w/ 80% Util	1,710	1,447	986	1,315	1,315	1,315	1,315	1,315	1,315	1,315	1,315
	Potential Well Yield (gpm)	1,300	1,100	750	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
		UY	UY	UY	UY	UY	UY	UY	UY	UY	UY	UY
		10/4-7A2	10/4-8D1	10/4-7H2	PW-6	10/4-7R2	UY-1	UY-2	UY-3	UY-4	UY-5	UY-6
MY	HC	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)
1	VW	1,529	1,294	882	1,176	1,176	900	603	506	306	200	0
2	BN	1,389	1,175	801	1,068	1,068	909	602	407	100	0	0
3	AN	1,389	1,176	802	1,069	1,069	394	200	200	99	99	0
4	ED	1,340	1,134	773	1,031	1,031	716	504	407	100	0	0
5	ED	1,060	897	612	816	816	0	0	0	0	0	0
6	ED	1,060	897	612	816	816	0	0	0	0	0	0
7	AN	1,362	1,152	786	1,048	1,048	194	0	0	0	0	0
8	ED	1,358	1,149	783	1,045	1,045	616	404	307	0	0	0
9	ED	1,060	897	612	816	816	0	0	0	0	0	0
10	ED	1,060	897	612	816	816	0	0	0	0	0	0
11	BN	1,181	999	681	908	0	0	0	0	0	0	0
12	ED	1,196	1,012	690	920	920	0	0	0	0	0	0
13	ED	1,231	1,042	710	947	947	92	0	0	0	0	0
14	ED	1,231	1,042	710	947	947	92	0	0	0	0	0
15	AN	1,434	1,213	827	1,103	1,103	286	0	0	0	0	0
16	AN	1,588	1,344	916	1,221	1,221	917	712	412	314	103	0
17	ED	1,551	1,312	895	1,193	1,193	819	721	413	304	100	0
18	VW	1,564	1,324	902	1,203	1,203	928	419	310	0	0	0
19	BN	1,589	1,345	917	1,223	1,223	1,116	709	407	100	0	0
20	BN	1,255	1,062	724	965	965	515	515	515	415	307	101
21	ED	1,060	897	612	816	816	0	0	0	0	0	0
22	BN	1,180	998	681	907	907	92	0	0	0	0	0
23	BN	1,231	1,042	710	947	947	92	0	0	0	0	0
24	BN	1,231	1,042	710	947	947	92	0	0	0	0	0
25	BN	1,231	1,042	710	947	947	92	0	0	0	0	0
26	ED	1,231	1,042	710	947	947	92	0	0	0	0	0
27	VW	1,434	1,213	827	1,103	1,103	286	0	0	0	0	0
28	AN	1,588	1,344	916	1,221	1,221	917	712	412	314	103	0
29	VW	1,605	1,358	926	1,235	1,235	1,127	931	519	306	306	100
30	AN	1,603	1,356	925	1,233	1,233	929	827	624	422	102	102
31	AN	1,605	1,358	926	1,234	1,234	930	828	527	314	103	0
32	VW	1,617	1,368	933	1,244	1,244	1,136	940	528	315	206	0
33	AN	1,592	1,347	918	1,224	1,224	920	818	616	414	103	0
34	AN	1,599	1,353	922	1,230	1,230	926	824	416	307	100	0
35	AN	1,603	1,356	925	1,233	1,233	929	827	420	311	100	0
36	BN	1,596	1,350	921	1,227	1,227	1,120	926	413	304	100	0
37	AN	1,559	1,319	899	1,199	1,199	923	729	620	415	307	101
38	BN	1,589	1,345	917	1,223	1,223	1,116	709	407	100	0	0
39	BN	1,415	1,197	816	1,088	1,088	405	306	306	206	206	0
40	VW	1,544	1,306	891	1,188	1,188	819	310	202	0	0	0
41	AN	1,585	1,341	914	1,219	1,219	915	709	410	311	0	0
42	VW	1,608	1,361	928	1,237	1,237	1,129	933	521	308	308	205
43	AN	1,603	1,356	925	1,233	1,233	929	827	624	422	102	102
44	VW	1,605	1,358	926	1,235	1,235	1,127	931	519	306	306	100
45	BN	1,605	1,358	926	1,235	1,235	1,128	934	622	420	209	102
46	AN	1,559	1,319	899	1,199	1,199	923	729	620	415	307	101
47	VW	1,583	1,339	913	1,218	1,218	1,110	810	507	303	203	100
48	BN	1,597	1,351	921	1,228	1,228	1,121	927	722	418	309	102
49	BN	1,488	1,259	858	1,145	1,145	514	416	306	206	206	0
50	AN	1,564	1,324	902	1,203	1,203	928	419	310	0	0	0
	Min	1,060	897	612	816	816	0	0	0	0	0	0
	Max	1,617	1,368	933	1,244	1,244	1,136	940	722	422	309	205
	Median	1,536	1,300	886	1,182	1,182	860	510	407	100	0	0
	Average	1,427	1,207	823	1,097	1,097	625	454	301	171	90	24

Average Monthly Well Production

	Month	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)
	Oct	115	98	67	89	89	61	34	10	0	0	0
	Nov	119	100	69	91	91	60	53	15	0	0	0
	Dec	128	108	74	98	98	63	63	57	17	0	0
	Jan	127	108	73	98	98	74	57	57	53	41	16
	Feb	135	114	78	104	104	68	68	68	51	23	8
	Mar	128	108	74	98	98	66	66	66	50	26	0
	Apr	124	105	71	95	95	69	52	29	0	0	0
	May	116	98	67	89	89	58	22	0	0	0	0
	Jun	106	90	61	82	82	21	0	0	0	0	0
	Jul	109	92	63	84	84	20	0	0	0	0	0
	Aug	103	87	59	79	79	0	0	0	0	0	0
	Sep	117	99	68	90	90	65	39	0	0	0	0
	Annual Total	1,427	1,207	823	1,097	1,097	625	454	301	171	90	24

					backup		backup				
	Building #:	2393	2373	2363	2363	2301	33924	33923	new	new	new
Max Annual Pumping		1,109	1,412	1,210	0	1,512	0	1,210	252	83	1,210
Potential w/ 80% Util		1,447	1,841	1,578	0	1,973	0	1,578	1,052	1,052	1,052
Potential Well Yield (gpm)		1,100	1,400	1,200	0	1,500	0	1,200	800	800	800
		CH	CH	CH	CH	CH	CH	CH	CH	CH	CH
		10/4-18E4	10/4-18M4&5	10/5-13R2	10/5-23G4	10/5-23J1	10/5-23K2	10/5-23K3	CH-1	CH-2	CH-4
MY	HC	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)
1	VW	1,015	1,292	1,107	0	1,384	0	1,107	0	0	1,107
2	BN	841	1,070	917	0	1,146	0	917	0	0	917
3	AN	582	741	635	0	794	0	635	0	0	635
4	ED	348	443	380	0	475	0	380	0	0	380
5	ED	261	332	284	0	355	0	284	0	0	284
6	ED	261	332	284	0	355	0	284	0	0	284
7	AN	499	636	545	0	681	0	545	0	0	545
8	ED	497	633	542	0	678	0	542	0	0	542
9	ED	261	332	284	0	355	0	284	0	0	284
10	ED	261	332	284	0	355	0	284	0	0	284
11	BN	261	332	284	0	355	0	284	0	0	284
12	ED	264	336	288	0	360	0	288	0	0	288
13	ED	308	392	336	0	420	0	336	0	0	336
14	ED	308	392	336	0	420	0	336	0	0	336
15	AN	517	659	565	0	706	0	565	0	0	565
16	AN	1,024	1,304	1,117	0	1,397	0	1,117	81	0	1,117
17	ED	864	1,100	943	0	1,178	0	943	0	0	943
18	VW	635	808	692	0	865	0	692	0	0	692
19	BN	841	1,070	917	0	1,146	0	917	0	0	917
20	BN	570	725	622	0	777	0	622	0	0	622
21	ED	408	519	445	0	556	0	445	0	0	445
22	BN	308	392	336	0	420	0	336	0	0	336
23	BN	308	392	336	0	420	0	336	0	0	336
24	BN	308	392	336	0	420	0	336	0	0	336
25	BN	308	392	336	0	420	0	336	0	0	336
26	ED	308	392	336	0	420	0	336	0	0	336
27	VW	517	659	565	0	706	0	565	0	0	565
28	AN	1,024	1,304	1,117	0	1,397	0	1,117	81	0	1,117
29	VW	1,107	1,408	1,207	0	1,509	0	1,207	250	0	1,207
30	AN	1,084	1,380	1,183	0	1,479	0	1,183	81	81	1,183
31	AN	1,061	1,350	1,157	0	1,447	0	1,157	81	0	1,157
32	VW	1,105	1,406	1,205	0	1,507	0	1,205	163	0	1,205
33	AN	1,075	1,368	1,173	0	1,466	0	1,173	81	0	1,173
34	AN	1,055	1,342	1,151	0	1,438	0	1,151	0	0	1,151
35	AN	1,058	1,347	1,154	0	1,443	0	1,154	0	0	1,154
36	BN	907	1,154	989	0	1,236	0	989	0	0	989
37	AN	722	920	788	0	985	0	788	0	0	788
38	BN	841	1,070	917	0	1,146	0	917	0	0	917
39	BN	570	725	622	0	777	0	622	0	0	622
40	VW	635	808	692	0	865	0	692	0	0	692
41	AN	1,021	1,300	1,114	0	1,392	0	1,114	0	0	1,114
42	VW	1,109	1,412	1,210	0	1,512	0	1,210	252	83	1,210
43	AN	1,084	1,380	1,183	0	1,479	0	1,183	81	81	1,183
44	VW	1,107	1,408	1,207	0	1,509	0	1,207	250	0	1,207
45	BN	941	1,197	1,026	0	1,283	0	1,026	166	81	1,026
46	AN	722	920	788	0	985	0	788	0	0	788
47	VW	1,077	1,371	1,175	0	1,469	0	1,175	169	0	1,175
48	BN	931	1,185	1,016	0	1,270	0	1,016	166	81	1,016
49	BN	533	679	582	0	727	0	582	0	0	582
50	AN	635	808	692	0	865	0	692	0	0	692
	Min	261	332	284	0	355	0	284	0	0	284
	Max	1,109	1,412	1,210	0	1,512	0	1,210	252	83	1,210
	Median	635	808	692	0	865	0	692	0	0	692
	Average	686	873	748	0	935	0	748	38	8	748
	Month	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)
	Oct	54	68	59	0	73	0	59	0	0	59
	Nov	59	75	64	0	80	0	64	0	0	64
	Dec	68	87	74	0	93	0	74	0	0	74
	Jan	75	95	81	0	102	0	81	20	8	81
	Feb	75	96	82	0	102	0	82	10	0	82
	Mar	71	90	77	0	96	0	77	8	0	77
	Apr	59	75	64	0	80	0	64	0	0	64
	May	50	63	54	0	68	0	54	0	0	54
	Jun	41	53	45	0	56	0	45	0	0	45
	Jul	43	55	47	0	59	0	47	0	0	47
	Aug	38	49	42	0	52	0	42	0	0	42
	Sep	53	68	58	0	72	0	58	0	0	58
Annual Total		686	873	748	0	935	0	748	38	8	748

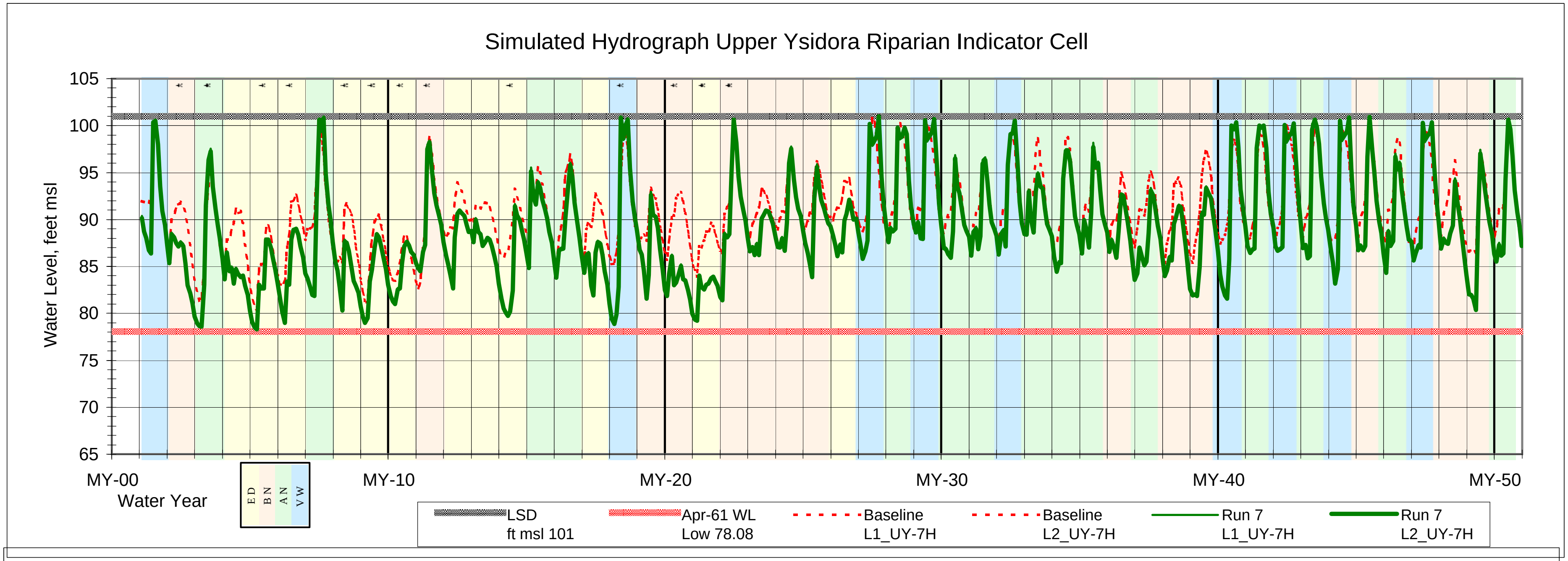
Table K-4. Run7 Annual Pumping by Well

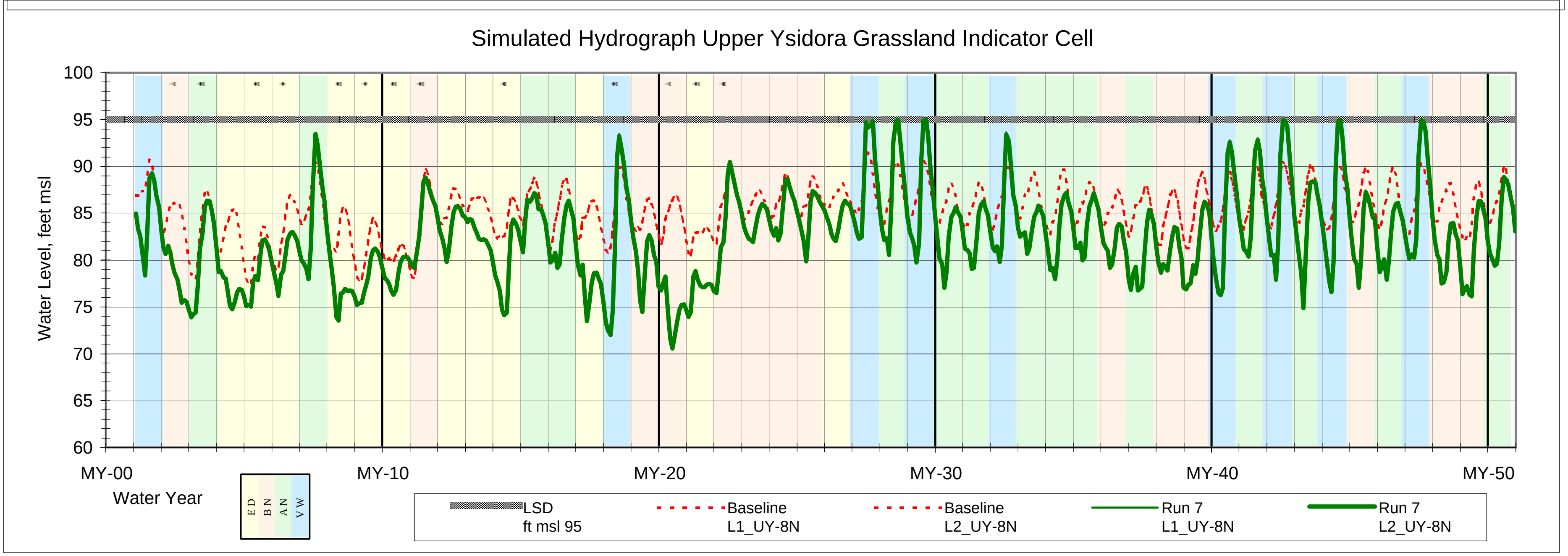
	Building #:	2673	26072	2671	PW-6	2603	new	new	new	new	new	new
	Max Annual Pumping	1,617	1,368	933	1,244	1,244	1,136	940	722	422	309	205
	Potential w/ 80% Util	1,710	1,447	986	1,315	1,315	1,315	1,315	1,315	1,315	1,315	1,315
	Potential Well Yield (gpm)	1,300	1,100	750	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
		UY	UY	UY	UY	UY	UY	UY	UY	UY	UY	UY
		10/4-7A2	10/4-8D1	10/4-7H2	PW-6	10/4-7R2	UY-1	UY-2	UY-3	UY-4	UY-5	UY-6
MY	HC	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)
1	VW	1,529	1,294	882	1,176	1,176	900	603	506	306	200	0
2	BN	1,389	1,175	801	1,068	1,068	909	602	407	100	0	0
3	AN	1,389	1,176	802	1,069	1,069	394	200	200	99	99	0
4	ED	1,340	1,134	773	1,031	1,031	716	504	407	100	0	0
5	ED	1,060	897	612	816	816	0	0	0	0	0	0
6	ED	1,060	897	612	816	816	0	0	0	0	0	0
7	AN	1,362	1,152	786	1,048	1,048	194	0	0	0	0	0
8	ED	1,358	1,149	783	1,045	1,045	616	404	307	0	0	0
9	ED	1,060	897	612	816	816	0	0	0	0	0	0
10	ED	1,060	897	612	816	816	0	0	0	0	0	0
11	BN	1,181	999	681	908	908	0	0	0	0	0	0
12	ED	1,196	1,012	690	920	920	0	0	0	0	0	0
13	ED	1,231	1,042	710	947	947	92	0	0	0	0	0
14	ED	1,231	1,042	710	947	947	92	0	0	0	0	0
15	AN	1,434	1,213	827	1,103	1,103	286	0	0	0	0	0
16	AN	1,588	1,344	916	1,221	1,221	917	712	412	314	103	0
17	ED	1,551	1,312	895	1,193	1,193	819	721	413	304	100	0
18	VW	1,564	1,324	902	1,203	1,203	928	419	310	0	0	0
19	BN	1,589	1,345	917	1,223	1,223	1,116	709	407	100	0	0
20	BN	1,255	1,062	724	965	965	515	515	515	415	307	101
21	ED	1,060	897	612	816	816	0	0	0	0	0	0
22	BN	1,180	998	681	907	907	92	0	0	0	0	0
23	BN	1,231	1,042	710	947	947	92	0	0	0	0	0
24	BN	1,231	1,042	710	947	947	92	0	0	0	0	0
25	BN	1,231	1,042	710	947	947	92	0	0	0	0	0
26	ED	1,231	1,042	710	947	947	92	0	0	0	0	0
27	VW	1,434	1,213	827	1,103	1,103	286	0	0	0	0	0
28	AN	1,588	1,344	916	1,221	1,221	917	712	412	314	103	0
29	VW	1,605	1,358	926	1,235	1,235	1,127	931	519	306	306	100
30	AN	1,603	1,356	925	1,233	1,233	929	827	624	422	102	102
31	AN	1,605	1,358	926	1,234	1,234	930	828	527	314	103	0
32	VW	1,617	1,368	933	1,244	1,244	1,136	940	528	315	206	0
33	AN	1,592	1,347	918	1,224	1,224	920	818	616	414	103	0
34	AN	1,599	1,353	922	1,230	1,230	926	824	416	307	100	0
35	AN	1,603	1,356	925	1,233	1,233	929	827	420	311	100	0
36	BN	1,596	1,350	921	1,227	1,227	1,120	926	413	304	100	0
37	AN	1,559	1,319	899	1,199	1,199	923	729	620	415	307	101
38	BN	1,589	1,345	917	1,223	1,223	1,116	709	407	100	0	0
39	BN	1,415	1,197	816	1,088	1,088	405	306	306	206	206	0
40	VW	1,544	1,306	891	1,188	1,188	819	310	202	0	0	0
41	AN	1,585	1,341	914	1,219	1,219	915	709	410	311	0	0
42	VW	1,608	1,361	928	1,237	1,237	1,129	933	521	308	308	205
43	AN	1,603	1,356	925	1,233	1,233	929	827	624	422	102	102
44	VW	1,605	1,358	926	1,235	1,235	1,127	931	519	306	306	100
45	BN	1,605	1,358	926	1,235	1,235	1,128	934	622	420	209	102
46	AN	1,559	1,319	899	1,199	1,199	923	729	620	415	307	101
47	VW	1,583	1,339	913	1,218	1,218	1,110	810	507	303	203	100
48	BN	1,597	1,351	921	1,228	1,228	1,121	927	722	418	309	102
49	BN	1,488	1,259	858	1,145	1,145	514	416	306	206	206	0
50	AN	1,564	1,324	902	1,203	1,203	928	419	310	0	0	0
	Min	1,060	897	612	816	816	0	0	0	0	0	0
	Max	1,617	1,368	933	1,244	1,244	1,136	940	722	422	309	205
	Median	1,536	1,300	886	1,182	1,182	860	510	407	100	0	0
	Average	1,427	1,207	823	1,097	1,097	625	454	301	171	90	24

Average Monthly Well Production

	Month	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)
	Oct	115	98	67	89	89	61	34	10	0	0	0
	Nov	119	100	69	91	91	60	53	15	0	0	0
	Dec	128	108	74	98	98	63	63	57	17	0	0
	Jan	127	108	73	98	98	74	57	57	53	41	16
	Feb	135	114	78	104	104	68	68	68	51	23	8
	Mar	128	108	74	98	98	66	66	66	50	26	0
	Apr	124	105	71	95	95	69	52	29	0	0	0
	May	116	98	67	89	89	58	22	0	0	0	0
	Jun	106	90	61	82	82	21	0	0	0	0	0
	Jul	109	92	63	84	84	20	0	0	0	0	0
	Aug	103	87	59	79	79	0	0	0	0	0	0
	Sep	117	99	68	90	90	65	39	0	0	0	0
	Annual Total	1,427	1,207	823	1,097	1,097	625	454	301	171	90	24

					backup		backup				
	Building #:	2393	2373	2363	2363	2301	33924	33923	new	new	new
Max Annual Pumping		1,109	1,412	1,210	0	1,512	0	1,210	252	83	1,210
Potential w/ 80% Util		1,447	1,841	1,578	0	1,973	0	1,578	1,052	1,052	1,052
Potential Well Yield (gpm)		1,100	1,400	1,200	0	1,500	0	1,200	800	800	800
		CH	CH	CH	CH	CH	CH	CH	CH	CH	CH
		10/4-18E4	10/4-18M4&5	10/5-13R2	10/5-23G4	10/5-23J1	10/5-23K2	10/5-23K3	CH-1	CH-2	CH-4
MY	HC	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)
1	VW	1,015	1,292	1,107	0	1,384	0	1,107	0	0	1,107
2	BN	841	1,070	917	0	1,146	0	917	0	0	917
3	AN	582	741	635	0	794	0	635	0	0	635
4	ED	348	443	380	0	475	0	380	0	0	380
5	ED	261	332	284	0	355	0	284	0	0	284
6	ED	261	332	284	0	355	0	284	0	0	284
7	AN	499	636	545	0	681	0	545	0	0	545
8	ED	497	633	542	0	678	0	542	0	0	542
9	ED	261	332	284	0	355	0	284	0	0	284
10	ED	261	332	284	0	355	0	284	0	0	284
11	BN	261	332	284	0	355	0	284	0	0	284
12	ED	264	336	288	0	360	0	288	0	0	288
13	ED	308	392	336	0	420	0	336	0	0	336
14	ED	308	392	336	0	420	0	336	0	0	336
15	AN	517	659	565	0	706	0	565	0	0	565
16	AN	1,024	1,304	1,117	0	1,397	0	1,117	81	0	1,117
17	ED	864	1,100	943	0	1,178	0	943	0	0	943
18	VW	635	808	692	0	865	0	692	0	0	692
19	BN	841	1,070	917	0	1,146	0	917	0	0	917
20	BN	570	725	622	0	777	0	622	0	0	622
21	ED	408	519	445	0	556	0	445	0	0	445
22	BN	308	392	336	0	420	0	336	0	0	336
23	BN	308	392	336	0	420	0	336	0	0	336
24	BN	308	392	336	0	420	0	336	0	0	336
25	BN	308	392	336	0	420	0	336	0	0	336
26	ED	308	392	336	0	420	0	336	0	0	336
27	VW	517	659	565	0	706	0	565	0	0	565
28	AN	1,024	1,304	1,117	0	1,397	0	1,117	81	0	1,117
29	VW	1,107	1,408	1,207	0	1,509	0	1,207	250	0	1,207
30	AN	1,084	1,380	1,183	0	1,479	0	1,183	81	81	1,183
31	AN	1,061	1,350	1,157	0	1,447	0	1,157	81	0	1,157
32	VW	1,105	1,406	1,205	0	1,507	0	1,205	163	0	1,205
33	AN	1,075	1,368	1,173	0	1,466	0	1,173	81	0	1,173
34	AN	1,055	1,342	1,151	0	1,438	0	1,151	0	0	1,151
35	AN	1,058	1,347	1,154	0	1,443	0	1,154	0	0	1,154
36	BN	907	1,154	989	0	1,236	0	989	0	0	989
37	AN	722	920	788	0	985	0	788	0	0	788
38	BN	841	1,070	917	0	1,146	0	917	0	0	917
39	BN	570	725	622	0	777	0	622	0	0	622
40	VW	635	808	692	0	865	0	692	0	0	692
41	AN	1,021	1,300	1,114	0	1,392	0	1,114	0	0	1,114
42	VW	1,109	1,412	1,210	0	1,512	0	1,210	252	83	1,210
43	AN	1,084	1,380	1,183	0	1,479	0	1,183	81	81	1,183
44	VW	1,107	1,408	1,207	0	1,509	0	1,207	250	0	1,207
45	BN	941	1,197	1,026	0	1,283	0	1,026	166	81	1,026
46	AN	722	920	788	0	985	0	788	0	0	788
47	VW	1,077	1,371	1,175	0	1,469	0	1,175	169	0	1,175
48	BN	931	1,185	1,016	0	1,270	0	1,016	166	81	1,016
49	BN	533	679	582	0	727	0	582	0	0	582
50	AN	635	808	692	0	865	0	692	0	0	692
	Min	261	332	284	0	355	0	284	0	0	284
	Max	1,109	1,412	1,210	0	1,512	0	1,210	252	83	1,210
	Median	635	808	692	0	865	0	692	0	0	692
	Average	686	873	748	0	935	0	748	38	8	748
	Month	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)
	Oct	54	68	59	0	73	0	59	0	0	59
	Nov	59	75	64	0	80	0	64	0	0	64
	Dec	68	87	74	0	93	0	74	0	0	74
	Jan	75	95	81	0	102	0	81	20	8	81
	Feb	75	96	82	0	102	0	82	10	0	82
	Mar	71	90	77	0	96	0	77	8	0	77
	Apr	59	75	64	0	80	0	64	0	0	64
	May	50	63	54	0	68	0	54	0	0	54
	Jun	41	53	45	0	56	0	45	0	0	45
	Jul	43	55	47	0	59	0	47	0	0	47
	Aug	38	49	42	0	52	0	42	0	0	42
	Sep	53	68	58	0	72	0	58	0	0	58
Annual Total		686	873	748	0	935	0	748	38	8	748

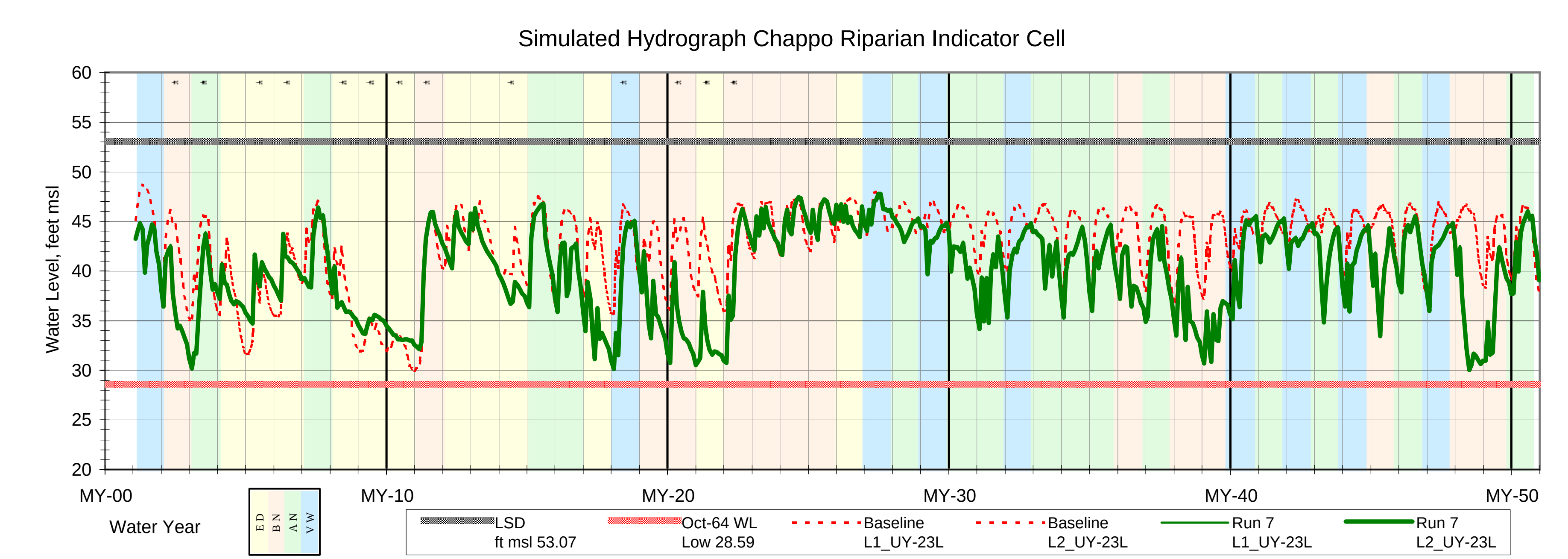


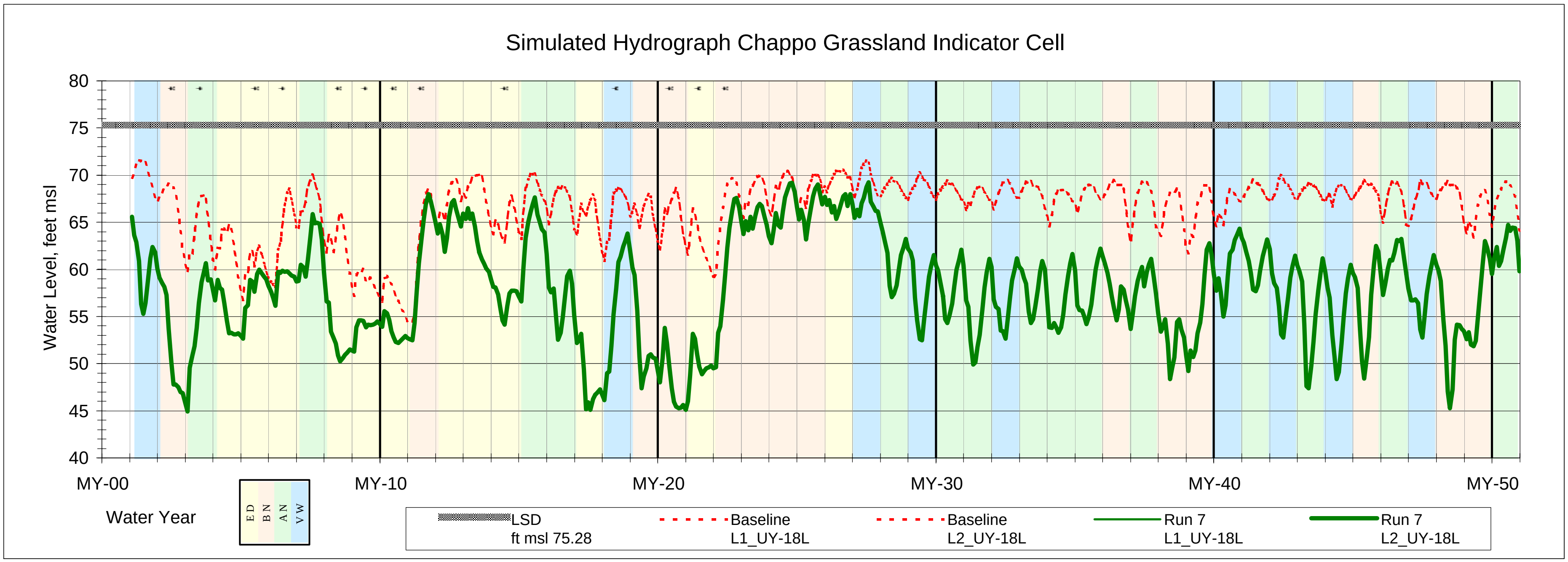


Emergency Water Called on Years Marked With *

Layer 1 (L1) and Layer 2(L2) simulated groundwater levels are at similar elevations and the graph lines are printed on top of each other.

FIGURE K-2
Run 7 With 7-Yr Drought and Emergency Water Hydrographs



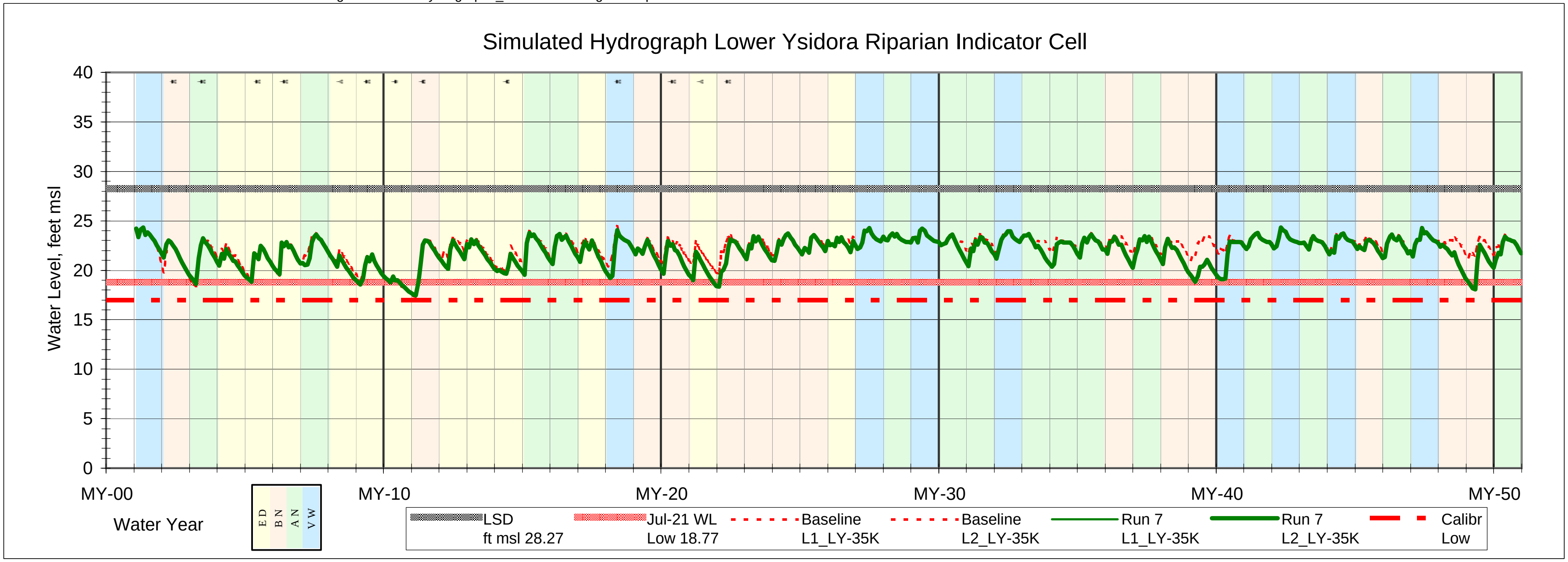


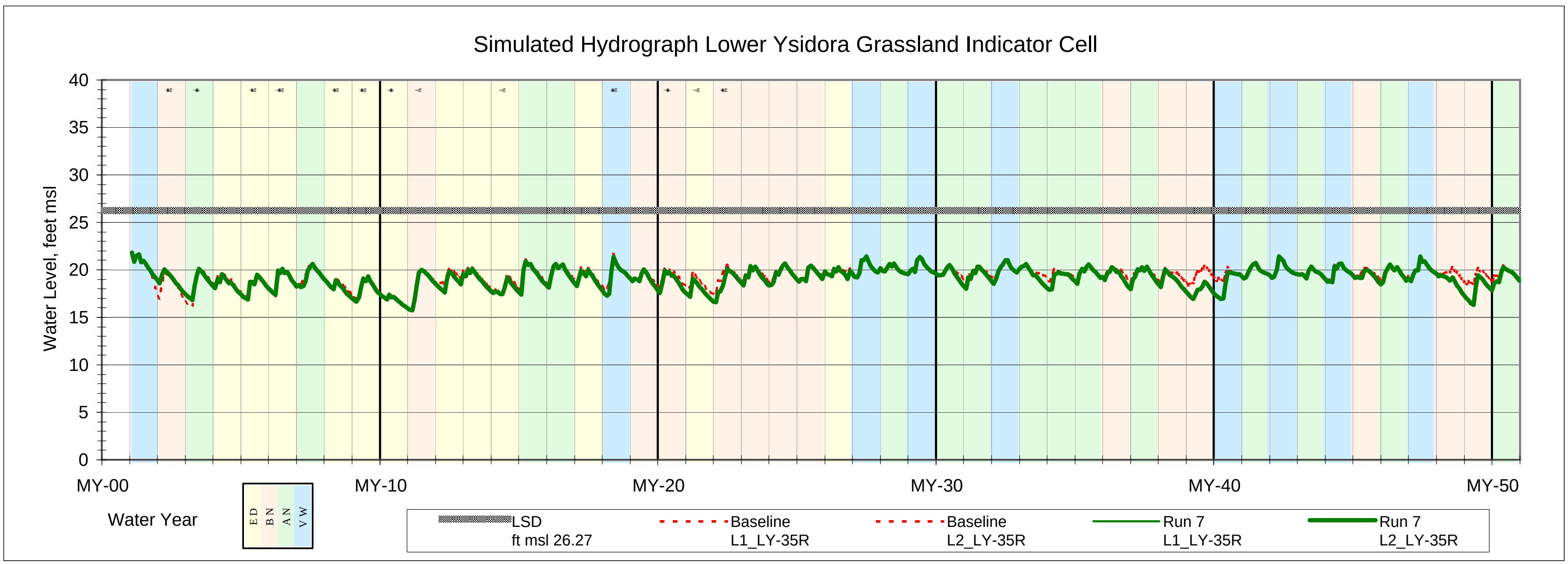
Emergency Water Called on Years Marked With *

Layer 1 (L1) and Layer 2(L2) simulated groundwater levels are at similar elevations and the graph lines are printed on top of each other.

Run 7 With 7-Yr Drought and Emergency Water Hydrographs

FIGURE K-3



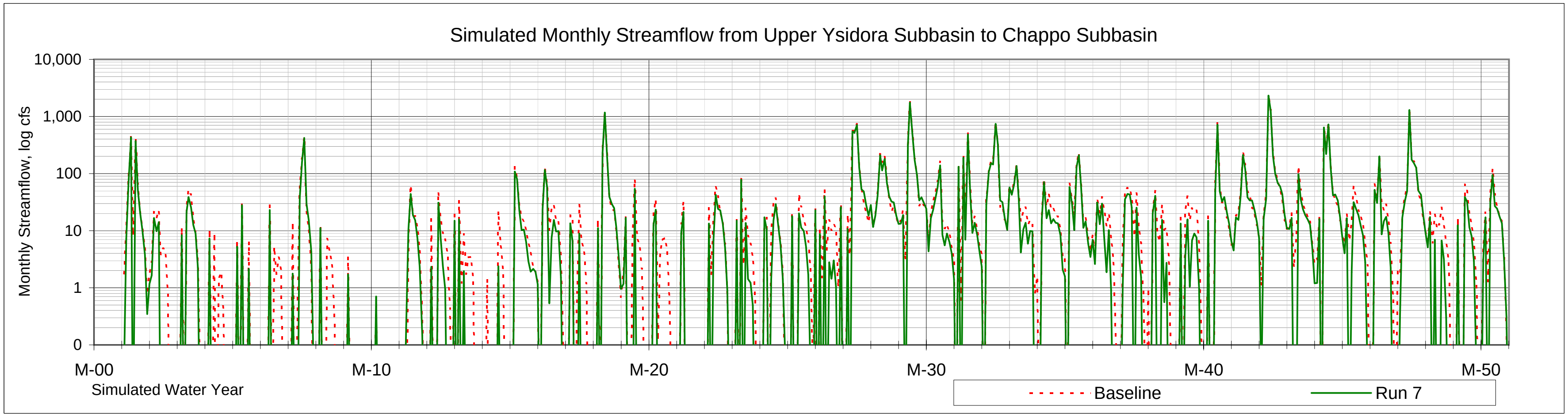


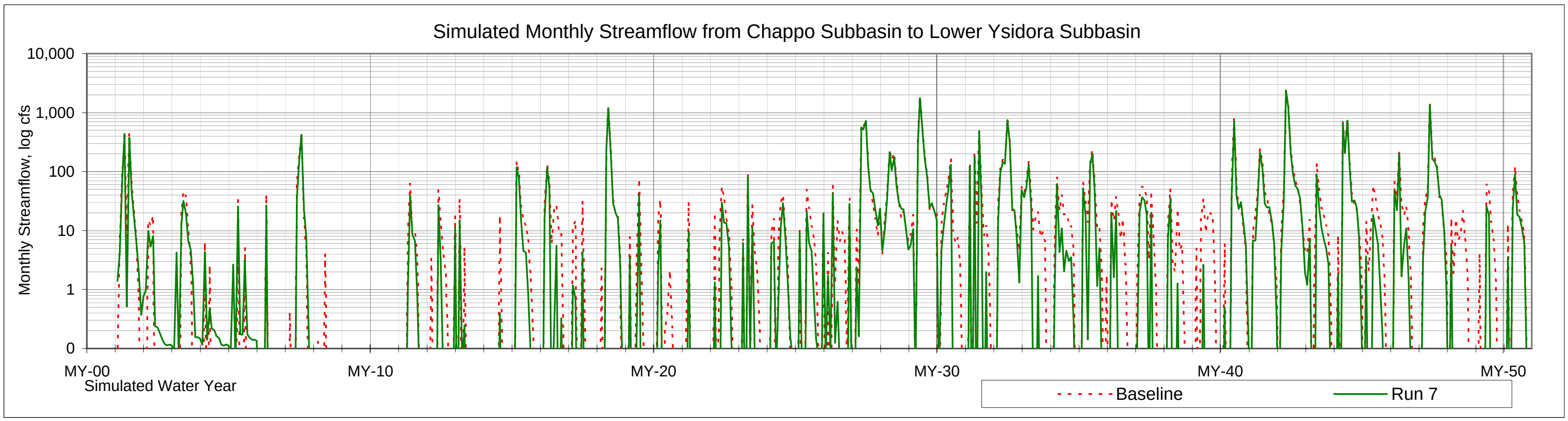
Emergency Water Called on Years Marked With *

Layer 1 (L1) and Layer 2(L2) simulated groundwater levels are at similar elevations and the graph lines are printed on top of each other.

Run 7 With 7-Yr Drought and Emergency Water Hydrographs

FIGURE K-4





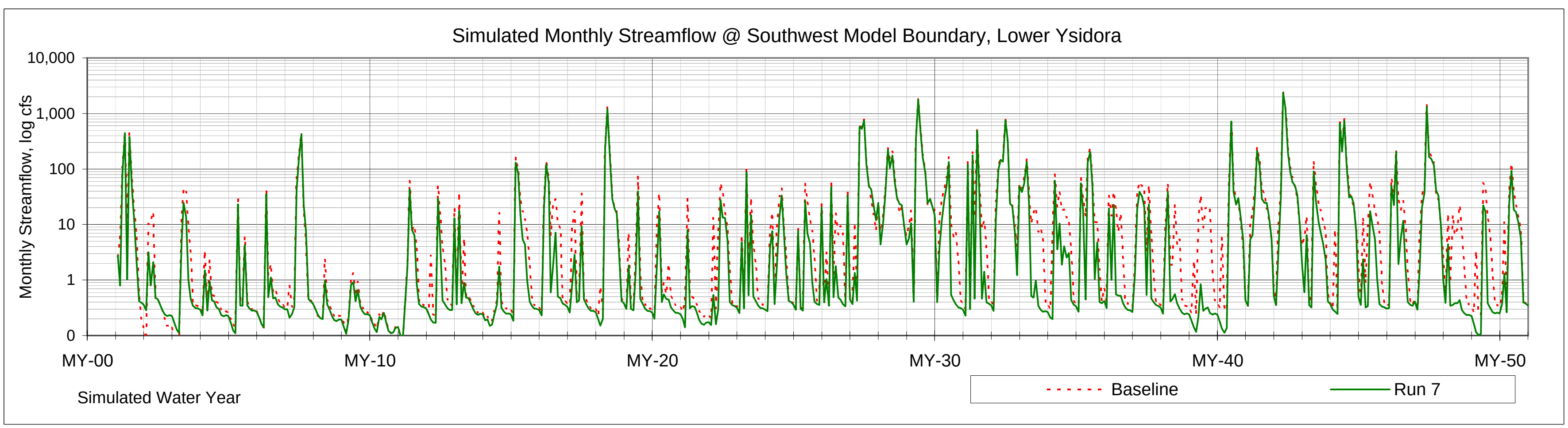


Figure K-5. Simulated Streamflow, Run 7 7-Yr Mtgt Drought

Table K-5. Run 7 Mitigate 7-Year Drought Water Budget (50-Year)

Average Hydrologic Condition Water Budget (af/y)

% Time Exceedence	*> 76%*	*76% to 50%*	*50% to 19%*	*< 19%*
# Years	*12*	*14*	*15*	*9*
	Extremely Dry	Below Normal	Above Normal	Very Wet
Inflow:				
Santa Margarita River Inflow	7,300	12,800	32,300	127,100
Subsurface Underflow	1,000	900	900	800
Lake O'Neill Spill and Release	600	1,400	1,800	2,200
Fallbrook Creek	100	400	1,400	3,800
Minor Tributary Drainages	1,700	1,400	2,400	4,900
Areal Precipitation	500	500	700	1,600
Total Inflow:	11,200	17,400	39,500	140,400
Outflow:				
Santa Margarita River Outflow	1,300	2,600	19,700	118,800
Subsurface Underflow	100	100	100	100
Groundwater Pumping	7,800	11,300	14,400	15,100
Evapotranspiration	1,700	2,100	2,600	2,800
Diversions to Lake O'Neill	1,000	1,800	2,400	2,700
Total Outflow:	11,900	17,900	39,200	139,500
Net Simulated Change of Groundwater in Storage:	-700	-500	300	900
	-	-	-	-

Median Hydrologic Condition Water Budget (af/y)

% Time Exceedence	*> 76%*	*76% to 50%*	*50% to 19%*	*< 19%*
# Years	*12*	*14*	*15*	*9*
	Extremely Dry	Below Normal	Above Normal	Very Wet
Inflow:				
Santa Margarita River Inflow	6,800	12,900	28,800	120,000
Subsurface Underflow	1,000	900	900	800
Lake O'Neill Spill and Release	600	1,300	2,100	2,300
Fallbrook Creek	100	300	1,100	3,500
Minor Tributary Drainages	1,500	1,400	2,500	4,700
Areal Precipitation	400	300	500	1,500
Outflow:				
Santa Margarita River Outflow	800	2,800	14,600	109,600
Subsurface Underflow	100	100	100	100
Groundwater Pumping	7,100	11,100	15,900	16,900
Evapotranspiration	1,500	1,900	2,500	2,700
Diversions to Lake O'Neill	800	1,700	2,700	2,700
Net Simulated Change of Groundwater in Storage:	100	-800	500	600

Average Subbasin Water Budget (af/y)

	Upper Ysidora	Chappo	Lower Ysidora	SMR Basin	
Inflow:					
Santa Margarita River Inflow	37,900	30,600	28,000	37,900	85%
Subsurface Underflow *	900	1,900	400	900	2%
Lake O'Neill Spill and Release	1,500	-	-	1,500	3%
Fallbrook Creek	1,200	-	-	1,200	3%
Minor Tributary Drainages	600	1,100	700	2,400	5%
Areal Precipitation	200	300	200	800	2%
Total Inflow:	42,300	33,900	29,300	44,700	
Outflow:					
Santa Margarita River Outflow	30,600	28,000	28,400	28,400	63%
Subsurface Underflow *	1,800	400	100	100	0%
Groundwater Pumping	7,300	4,800	0	12,100	27%
Evapotranspiration *	700	800	800	2,300	5%
Diversions to Lake O'Neill	1,900	-	-	1,900	4%
Total Outflow:	42,300	34,000	29,300	44,800	
Net Simulated Change of Groundwater in Storage: *	0	-100	0	-100	
	-	-	-	-	

Note: * Subbasin Medians are based on the last rate of the stress period
Values are rounded to the nearest 100 acre-feet, closest number adjusted to eliminate rounding error

Median Subbasin Water Budget (af/y)

	Upper Ysidora	Chappo	Lower Ysidora	SMR Basin
Inflow:				
Santa Margarita River Inflow	16,100	7,100	4,100	16,100
Subsurface Underflow *	900	1,900	500	900
Lake O'Neill Spill and Release	1,500	-	-	1,500
Fallbrook Creek	600	-	-	600
Minor Tributary Drainages	600	1,100	700	2,100
Areal Precipitation	100	200	200	500
Outflow:				
Santa Margarita River Outflow	7,100	4,100	4,800	4,800
Subsurface Underflow *	1,900	500	100	100
Groundwater Pumping	7,700	4,400	0	12,000
Evapotranspiration *	700	900	800	2,300
Diversions to Lake O'Neill	2,100	-	-	2,100
Net Simulated Change of Groundwater in Storage: *	0	0	0	300

Note: The sum of median values does not reflect the change of groundwater in storage.
Median values are not cummulative.
* Subbasin Medians are based on the last rate of the stress period
Values are rounded to the nearest 100 acre-feet

Table K-6 Run 7 Mtgt 7-Yr Drought Annual Water budget

Lower Santa Margarita River Groundwater Model

Run 7 Mtgt. 7-Yr Drought

Annual Surface Water Budget

MY		SMR Flow In	LON Diversion	Ponds Diversion	Str Gain+ / Loss-	GAGE SMR @ UY->CH	Str Gain+ / Loss-	SMR @ CH->LY	Str Gain+ / Loss-	SMR Flow Out	LSMR Str Gain+ / Loss-
1	VW	66,394	2,364	9,462	-7,075	59,318	-1,977	57,342	1,825	59,167	-7,227
2	BN	8,937	1,531	3,425	-6,374	2,563	-2,145	418	114	532	-8,405
3	AN	16,252	1,063	6,435	-9,311	6,941	-4,113	2,829	-128	2,700	-13,552
4	ED	6,759	1,323	2,646	-6,327	432	-407	26	295	321	-6,438
5	ED	6,751	337	1,336	-4,601	2,150	-735	1,415	410	1,825	-4,926
6	ED	6,281	609	1,779	-4,867	1,415	228	1,642	797	2,440	-3,841
7	AN	46,769	1,151	10,215	-6,964	39,804	-1,843	37,961	759	38,721	-8,048
8	ED	6,949	1,291	3,474	-6,288	662	-656	5	205	211	-6,739
9	ED	5,440	786	1,820	-5,338	102	-99	3	271	274	-5,166
10	ED	5,803	393	1,216	-5,761	42	-42	-	114	114	-5,689
11	BN	12,039	624	5,486	-6,294	5,745	-2,525	3,221	309	3,529	-8,510
12	ED	9,246	821	2,845	-5,854	3,391	-1,043	2,348	457	2,805	-6,441
13	ED	4,963	577	1,797	-3,903	1,060	-180	880	434	1,315	-3,649
14	ED	6,600	412	2,946	-6,459	141	-117	24	239	262	-6,338
15	AN	21,921	2,747	6,133	-7,001	14,920	-1,638	13,282	1,291	14,574	-7,347
16	AN	23,865	2,344	7,509	-9,046	14,819	-3,080	11,739	1,139	12,879	-10,986
17	ED	10,105	1,979	3,961	-8,351	1,754	-1,375	380	590	970	-9,135
18	VW	106,149	2,415	13,044	-6,898	99,250	-3,281	95,970	1,575	97,545	-8,604
19	BN	13,124	2,317	4,573	-8,727	4,397	-1,681	2,715	107	2,823	-10,301
20	BN	9,150	1,265	3,583	-6,972	2,178	-1,134	1,045	341	1,386	-7,765
21	ED	8,139	1,831	1,408	-6,290	1,849	-1,256	593	44	637	-7,502
22	BN	15,002	1,515	8,296	-7,420	7,582	-3,871	3,711	-98	3,613	-11,389
23	BN	12,321	1,607	2,949	-5,594	6,726	-684	6,042	702	6,744	-5,577
24	BN	11,377	1,698	5,664	-5,815	5,562	-1,813	3,749	495	4,244	-7,133
25	BN	10,296	944	4,518	-5,013	5,283	-1,657	3,626	435	4,062	-6,235
26	ED	10,316	1,278	2,692	-5,251	5,065	-572	4,493	859	5,352	-4,964
27	VW	126,820	2,935	15,927	-1,962	124,858	-248	124,610	2,204	126,814	-6
28	AN	55,061	2,722	18,024	-8,116	46,945	-5,165	41,781	486	42,266	-12,795
29	VW	181,076	2,723	18,884	-5,421	175,655	-3,446	172,209	1,954	174,163	-6,913
30	AN	28,831	2,750	7,141	-9,941	18,890	-5,424	13,466	218	13,684	-15,147
31	AN	62,376	2,698	7,723	-7,735	54,640	-4,821	49,820	578	50,398	-11,978
32	VW	105,844	2,721	14,249	-6,253	99,591	-5,483	94,107	957	95,064	-10,779
33	AN	29,560	2,714	9,308	-9,507	20,054	-4,885	15,168	465	15,633	-13,927
34	AN	22,097	2,701	9,005	-10,383	11,714	-6,192	5,522	-143	5,379	-16,718
35	AN	39,296	2,235	8,776	-7,277	32,019	-5,308	26,710	638	27,349	-11,947
36	BN	14,221	2,155	4,939	-8,391	5,830	-3,226	2,603	211	2,814	-11,407
37	AN	19,246	1,923	5,782	-8,426	10,820	-3,052	7,768	523	8,292	-10,954
38	BN	12,659	1,726	4,895	-7,818	4,841	-2,165	2,675	304	2,980	-9,679
39	BN	13,137	1,982	6,536	-9,727	3,410	-3,265	145	57	202	-12,936
40	VW	64,445	2,820	12,300	-7,134	57,310	-4,566	52,744	107	52,851	-11,593
41	AN	42,492	2,711	13,804	-9,100	33,392	-5,585	27,807	330	28,137	-14,355
42	VW	251,872	2,723	19,141	-5,100	246,772	-4,270	242,502	1,077	243,580	-8,292
43	AN	24,441	2,752	12,576	-10,606	13,835	-5,326	8,509	150	8,659	-15,782
44	VW	121,487	2,675	17,734	-7,771	113,716	-4,772	108,944	1,230	110,174	-11,313
45	BN	18,009	2,750	10,475	-10,848	7,161	-4,841	2,320	-33	2,287	-15,722
46	AN	29,997	2,137	9,291	-9,580	20,417	-2,893	17,524	665	18,189	-11,808
47	VW	120,008	2,717	18,548	-6,891	113,117	-4,805	108,312	1,328	109,641	-10,367
48	BN	13,181	2,745	7,070	-10,810	2,372	-2,048	323	150	474	-12,708
49	BN	15,897	1,871	7,458	-9,610	6,287	-3,670	2,617	-154	2,463	-13,434
50	AN	22,506	2,602	9,949	-8,858	13,647	-3,824	9,823	107	9,930	-12,575
	avg	37,910	1,914	7,775	**-7,301**	30,609	**-2,740**	27,869	**540**	28,409	**-9,501**
	med	16,075	2,060	6,803	-7,038	7,051	-2,709	4,121	422	4,798	-9,407
AVERAGES											
ED	12	7,279	970	2,327	(5,774)	1,505	(521)	984	393	1,377	-5,902
BN	14	12,811	1,766	5,705	(7,815)	4,996	(2,481)	2,515	210	2,725	-10,086
AN	15	32,314	2,350	9,445	(8,790)	23,524	(4,210)	19,314	472	19,786	-12,528
VW	9	127,121	2,677	15,476	(6,056)	121,065	(3,650)	117,416	1,362	118,778	-8,344
	50										
MEDIANS											
ED	12	6,755	803	2,233	(5,808)	1,237	(489)	486	353	803	-6,013
BN	14	12,891	1,712	5,212	(7,619)	5,423	(2,155)	2,646	181	2,818	-9,990
AN	15	28,831	2,698	9,005	(9,046)	18,890	(4,821)	13,466	486	14,574	-12,575
VW	9	120,008	2,721	15,927	(6,891)	113,117	(4,270)	108,312	1,328	109,641	-8,604
	50										

Table K-6 Run 7 Mtgt 7-Yr Drought Annual Water budget (continued)
Lower Santa Margarita River Groundwater Model

Annual Groundw ater Budget Model Run: Run 7 Mtgt. 7-Yr Drought

	INFLOW:					**OUTFLOW:**					
MY	Storage	Recharge	Stream Leakance	GHB	TOTAL GW IN	Storage	Wells	ET	Stream Leakance	GHB	TOTAL GW OUT
1	8,302	10,541	9,937	865	29,643	5,258	15,583	2,790	5,969	66	29,666
2	7,046	3,628	6,388	932	17,994	2,317	13,329	1,695	619	55	18,016
3	4,772	6,653	11,180	931	23,537	8,414	10,517	1,800	2,767	52	23,549
4	5,459	2,949	4,979	951	14,339	3,007	9,444	1,515	338	53	14,357
5	4,109	1,655	6,834	1,072	13,671	5,758	5,999	1,567	314	50	13,689
6	4,006	2,537	5,186	1,063	12,792	4,500	6,001	1,784	467	57	12,809
7	6,205	10,831	8,056	933	26,024	7,865	9,038	2,408	6,657	62	26,031
8	6,878	3,629	4,082	936	15,525	2,833	10,682	1,459	529	49	15,552
9	2,734	2,195	5,216	993	11,137	3,556	6,001	1,259	273	49	11,139
10	2,112	1,350	5,057	972	9,492	2,190	6,001	1,107	164	42	9,504
11	3,666	5,976	9,052	895	19,589	7,293	6,476	2,180	3,597	51	19,597
12	3,703	3,143	6,781	940	14,567	4,683	6,563	2,364	922	53	14,586
13	4,851	2,036	3,804	937	11,628	1,641	7,101	2,295	555	58	11,651
14	4,066	3,290	5,048	981	13,385	4,178	7,101	1,556	507	50	13,393
15	5,014	7,202	7,948	885	21,048	6,015	9,291	2,569	3,124	64	21,063
16	6,336	8,150	11,892	882	27,259	5,592	15,904	2,282	3,427	64	27,270
17	7,723	4,295	8,198	916	21,132	4,454	14,472	1,517	643	58	21,144
18	6,373	14,238	13,095	867	34,572	11,483	12,241	2,206	8,593	63	34,586
19	8,664	4,768	7,397	906	21,734	4,364	14,438	1,717	1,187	57	21,762
20	5,909	3,969	6,924	938	17,740	4,545	11,274	1,343	537	56	17,756
21	3,354	1,697	6,419	979	12,448	4,036	7,018	1,120	241	48	12,463
22	4,610	8,659	9,506	889	23,665	9,768	6,896	2,236	4,720	55	23,675
23	4,011	3,425	6,274	917	14,626	3,786	7,101	2,576	1,125	59	14,646
24	4,022	6,134	7,560	887	18,602	4,984	7,101	2,849	3,618	63	18,614
25	4,302	5,122	7,151	907	17,482	4,894	7,098	2,833	2,608	62	17,496
26	3,910	3,140	6,814	907	14,770	3,354	7,094	2,794	1,476	64	14,782
27	6,768	17,146	8,485	845	33,244	7,241	9,550	3,186	13,216	73	33,267
28	6,596	18,384	11,350	824	37,153	5,973	15,909	2,980	12,243	69	37,174
29	6,954	19,908	12,087	817	39,766	6,722	17,539	2,879	12,560	74	39,773
30	5,349	7,362	12,633	877	26,221	3,848	17,011	2,433	2,879	62	26,233
31	5,886	8,177	13,017	877	27,957	6,125	16,460	2,188	3,129	62	27,964
32	6,251	15,011	14,004	845	36,111	7,346	17,332	2,610	8,767	70	36,126
33	5,542	9,516	11,524	865	27,447	4,054	16,690	2,523	4,141	63	27,471
34	4,940	9,233	13,636	875	28,685	5,416	16,185	2,351	4,669	58	28,678
35	5,034	9,206	13,269	870	28,379	5,581	16,253	2,479	4,024	64	28,402
36	6,478	5,211	10,239	895	22,824	3,485	15,450	2,071	1,756	61	22,822
37	5,156	6,198	12,397	895	24,646	6,263	14,256	2,202	1,887	64	24,671
38	7,018	5,165	9,343	902	22,429	4,702	14,440	1,667	1,559	56	22,423
39	4,706	6,703	9,320	916	21,646	7,029	10,973	1,531	2,098	48	21,680
40	6,090	12,489	10,996	886	30,461	8,825	11,823	2,330	7,433	54	30,465
41	5,480	14,141	12,374	852	32,847	5,312	15,680	2,831	8,951	65	32,838
42	6,997	19,972	12,557	822	40,349	6,931	17,769	2,808	12,794	69	40,370
43	7,514	12,741	11,685	852	32,792	6,543	17,011	2,468	6,733	62	32,817
44	7,828	18,411	13,062	838	40,140	8,471	17,539	2,495	11,534	65	40,104
45	7,759	10,629	10,790	863	30,041	6,221	16,529	2,284	5,014	59	30,108
46	5,556	9,711	10,950	868	27,084	6,015	14,256	2,495	4,252	63	27,081
47	6,244	19,490	13,154	829	39,718	7,622	16,919	2,688	12,392	71	39,692
48	7,966	7,231	8,012	877	24,086	3,558	16,621	1,754	2,167	57	24,157
49	5,647	7,622	9,206	916	23,391	8,035	10,950	1,685	2,695	47	23,413
50	5,854	10,285	9,986	870	26,995	6,749	9,366	2,562	5,402	60	24,139
avg	5,635	8,223	9,297	901	24,056	5,577	12,045	2,186	4,146	59	24,013
med	5,601	7,216	9,332	892	23,601	5,498	12,032	2,290	3,002	60	23,612
AVERAGES											
ED	4,409	2,660	5,702	971	13,741	3,682	7,790	1,695	536	53	13,756
BN	5,843	6,017	8,369	903	21,132	5,356	11,334	2,030	2,379	56	21,155
AN	5,682	9,853	11,460	877	27,872	5,984	14,255	2,438	4,952	62	27,692
VW	6,867	16,356	11,931	846	36,000	7,766	15,144	2,666	10,362	67	36,005
MEDIANS											
ED	4,036	2,743	5,201	962	13,528	3,796	7,056	1,537	487	52	13,541
BN	5,778	5,593	8,532	904	21,690	4,798	11,124	1,912	2,133	56	21,721
AN	5,542	9,233	11,685	875	27,259	6,015	15,904	2,468	4,141	63	27,270
VW	6,768	17,146	12,557	845	36,111	7,346	16,919	2,688	11,534	69	36,126

Table K-6 Run 7 Mtgt 7-Yr Drought Annual Water budget (continued)

Lower Santa Margarita River Groundwater Model

MY	NET Storage	NET Str Lknc	In-Out	**% bal**
1	-3,044	-3,967	-22.4	-0.08%
2	-4,729	-5,768	-21.5	-0.12%
3	3,643	-8,414	-12.2	-0.05%
4	-2,452	-4,642	-18.1	-0.13%
5	1,649	-6,520	-18.3	-0.13%
6	494	-4,719	-17.6	-0.14%
7	1,660	-1,398	-6.2	-0.02%
8	-4,045	-3,553	-26.8	-0.17%
9	822	-4,942	-1.4	-0.01%
10	78	-4,893	-11.9	-0.12%
11	3,627	-5,455	-8.6	-0.04%
12	980	-5,859	-18.5	-0.13%
13	-3,209	-3,249	-23.0	-0.20%
14	112	-4,541	-8.0	-0.06%
15	1,001	-4,823	-15.2	-0.07%
16	-744	-8,464	-11.4	-0.04%
17	-3,269	-7,555	-11.5	-0.05%
18	5,110	-4,502	-13.7	-0.04%
19	-4,300	-6,210	-27.9	-0.13%
20	-1,364	-6,387	-16.0	-0.09%
21	682	-6,178	-15.1	-0.12%
22	5,158	-4,787	-10.6	-0.04%
23	-225	-5,149	-19.5	-0.13%
24	962	-3,942	-12.1	-0.06%
25	592	-4,543	-13.8	-0.08%
26	-556	-5,337	-11.6	-0.08%
27	473	4,731	-22.8	-0.07%
28	-622	893	-20.5	-0.06%
29	-232	473	-7.3	-0.02%
30	-1,501	-9,754	-11.8	-0.04%
31	239	-9,888	-6.8	-0.02%
32	1,095	-5,236	-14.7	-0.04%
33	-1,488	-7,383	-23.6	-0.09%
34	475	-8,967	6.6	0.02%
35	546	-9,245	-22.9	-0.08%
36	-2,994	-8,483	1.4	0.01%
37	1,107	-10,510	-24.5	-0.10%
38	-2,316	-7,785	6.0	0.03%
39	2,323	-7,222	-33.9	-0.16%
40	2,734	-3,563	-3.4	-0.01%
41	-168	-3,423	8.3	0.03%
42	-67	236	-21.1	-0.05%
43	-971	-4,952	-25.7	-0.08%
44	643	-1,529	35.8	0.09%
45	-1,538	-5,776	-66.3	-0.22%
46	459	-6,699	3.4	0.01%
47	1,377	-762	25.7	0.06%
48	-4,408	-5,845	-70.7	-0.29%
49	2,388	-6,511	-22.0	-0.09%
50	895	-4,584	2,855.6	11.83%
avg	-58	-5,152	43.0	0.17%
med	349	-5,193	-14.2	-0.07%
AVERAGES				
ED	-726	-5,166	-15.2	-0.11%
BN	-487	-5,990	-22.5	-0.10%
AN	302	-6,507	179.5	0.75%
VW	899	-1,569	-4.9	-0.02%
MEDIANS				
ED	95	-4,918	-16.3	-0.13%
BN	-794	-5,810	-17.7	-0.09%
AN	459	-7,383	-11.8	-0.04%
VW	643	-1,529	-13.7	-0.04%

Table K-7 Run 7 Mtgt. 7-Yr Drought 50-Year Average Monthly Water Budget

Lower Santa Margarita River Groundwater Model — Run 7 Mtgt 7-Yr Drought

Modflow Volumetric Budget Output and Streamflow — 8/8/06

Avg AF/M	SMR Flow In	Diversion	Str Gain+ / Loss-	SMR @ UY->CH	Str Gain+ / Loss-	SMR @ CH->LY	Str Gain+ / Loss-	SMR Flow Out	LSMR Str Gain+ / Loss-
Oct	558	325	-426	132	-72	59	20	79	-479
Nov	1,277	611	-65	1,212	-513	699	-1	699	-578
Dec	1,950	483	-771	1,178	-186	993	53	1,045	-904
Jan	8,353	821	-1,142	7,211	-144	7,067	143	7,210	-1,143
Feb	10,253	2,045	-1,842	8,411	-173	8,237	114	8,352	-1,901
Mar	8,833	2,234	-1,451	7,382	-299	7,083	104	7,187	-1,646
Apr	3,139	1,458	-678	2,461	-337	2,124	45	2,169	-970
May	1,308	915	-325	983	-327	656	10	666	-642
Jun	720	547	-47	673	-267	406	6	412	-308
Jul	498	129	-52	446	-191	255	10	265	-233
Aug	462	62	-203	259	-121	139	18	156	-305
Sep	559	60	-298	261	-110	151	18	168	-391
Avg Monthly	3,159	807	-608	2,551	-228	2,322	45	2,367	-792
Med Monthly	1,293	579	-376	1,080	-188	677	19	682	-610
Avg Total=Anl	37,910	9,689	-7,301	30,609	-2,740	27,869	540	28,409	-9,501

Lower Santa Margarita River Groundwater Model

Modflow Volumetric Budget Output

Average Monthly Water Budget

	INFLOW:					**OUTFLOW:**									
Avg AF/M	Storage	Recharge	Stream Leakance	GHB	TOTAL IN	Storage	Wells	ET	Stream Leakance	GHB	TOTAL OUT	NET Storage	NET Str Lknc	In-Out	% bal
Oct	634	45	417	81	1,178	52	935	153	36	8	1,185	-582	-381	-6.3	-0.54%
Nov	171	597	1,336	79	2,182	956	1,004	158	53	8	2,179	785	-1,283	3.1	0.14%
Dec	553	154	931	80	1,717	296	1,176	172	65	7	1,716	-257	-866	0.5	0.03%
Jan	384	355	1,317	78	2,133	533	1,349	175	75	5	2,137	150	-1,242	-3.9	-0.18%
Feb	317	1,919	1,014	75	3,326	1,490	1,349	172	311	0	3,321	1,173	-703	4.3	0.13%
Mar	178	2,293	1,025	74	3,570	1,214	1,276	203	873	1	3,568	1,036	-152	2.1	0.06%
Apr	359	1,508	828	68	2,763	509	1,044	206	995	9	2,763	149	168	0.2	0.01%
May	504	976	626	69	2,174	228	884	213	844	9	2,178	-276	218	-4.0	-0.18%
Jun	705	303	505	68	1,581	141	726	200	508	7	1,581	-564	3	-0.4	-0.02%
Jul	687	58	426	73	1,245	60	751	194	239	4	1,248	-627	-187	-3.7	-0.30%
Aug	517	6	403	78	1,004	54	673	180	100	0	1,007	-462	-304	-3.2	-0.32%
Sep	627	9	470	77	1,182	42	934	161	47	1	1,185	-584	-423	-3.0	-0.25%
Avg Monthly	470	685	775	75	2,005	465	1,009	182	345	5	2,006	-5	-429	-1.2	-0.12%
Med Monthly	510	329	727	76	1,925	262	970	178	169	6	1,927	-266	-343	-1.7	-0.10%
Avg Total=Anl	5,635	8,223	9,297	901	24,056	5,577	12,103	2,186	4,146	59	24,071	-58	-5,152	-14.4	

Attachment L

Run 8 (Proposed Action) Model Results

Table L-1. Run 8 Annual Pumping Summary
Lower Santa Margarita River Groundwater Model

Hydrologic Condition

HC	Cnt	Oct to Apr Strflw
VW	9	Very Wet > 56,164
AN	15	Above Normal > 13,600
BN	14	Below Normal < 13,600
ED	12	Extremely Dry < 5,840
	50	

Pumping Condition

PC	HC	Q Adjst	Anl Q	Cnt	
1	2+ AN @ VW 60/40 split	3,300	17,400	5	10%
2	2+ AN @ AN	2,000	16,100	9	18%
3	Standard	500	14,600	10	20%
4	1st BN	-4,000	10,100	6	12%
5	2ndBN, 69/31 split	-7,380	6,720	3	6%
6	3+BN/all ED	-9,000	5,100	17	34%
				50	100%

MY	HC	Oct-Apr HC descrip	May-Apr Pumping Condition	Second Div to Fallbrook (af/y)	UY Total (af/y)	CH Total (af/y)	LY Total (af/y)	LSMR Total (af/y)	+Q*
1	VW	Very Wet	3	1,179	9,272	6,181	-	15,454	
2	BN	Below Normal	4	0	7,679	5,254	-	12,933	
3	AN	Above Normal	3	529	5,727	4,626	-	10,353	
4	ED	Extremely Dry	6	0	7,054	3,414	-	10,468	
5	ED	Extremely Dry	6	0	3,137	1,352	-	4,488	
6	ED	Extremely Dry	6	0	3,519	1,581	-	5,100	
7	AN	Above Normal	3	1,171	5,225	2,967	-	8,192	
8	ED	Extremely Dry	6	0	6,981	4,454	-	11,435	
9	ED	Extremely Dry	6	0	3,443	1,581	-	5,024	
10	ED	Extremely Dry	6	0	3,519	1,581	-	5,100	
11	BN	Below Normal	6	676	3,519	1,581	-	5,100	
12	ED	Extremely Dry	6	40	3,519	1,581	-	5,100	
13	ED	Extremely Dry	6	0	3,519	1,581	-	5,100	
14	ED	Extremely Dry	6	0	3,519	1,581	-	5,100	
15	AN	Above Normal	3	57	5,225	2,967	-	8,192	X
16	AN	Above Normal	2	1,149	9,543	6,362	-	15,906	
17	ED	Extremely Dry	6	0	7,661	4,858	-	12,519	
18	VW	Very Wet	3	1,864	5,225	2,967	-	8,192	
19	BN	Below Normal	4	58	7,881	5,254	-	13,135	
20	BN	Below Normal	5	0	5,597	3,403	-	9,000	
21	ED	Extremely Dry	6	0	4,273	1,920	-	6,193	
22	BN	Below Normal	6	864	3,519	1,581	-	5,100	
23	BN	Below Normal	6	0	3,519	1,581	-	5,100	
24	BN	Below Normal	6	182	3,519	1,581	-	5,100	
25	BN	Below Normal	6	218	3,519	1,581	-	5,100	
26	ED	Extremely Dry	6	47	3,519	1,581	-	5,100	
27	VW	Very Wet	3	3,355	5,225	2,967	-	8,192	X
28	AN	Above Normal	2	4,259	9,543	6,362	-	15,906	X
29	VW	Very Wet	1	4,376	10,266	6,844	-	17,110	X
30	AN	Above Normal	2	1,533	10,045	6,696	-	16,741	X
31	AN	Above Normal	2	1,671	9,847	6,565	-	16,412	X
32	VW	Very Wet	1	2,745	10,181	6,787	-	16,968	X
33	AN	Above Normal	2	1,661	9,942	6,628	-	16,570	X
34	AN	Above Normal	2	1,713	9,716	6,477	-	16,193	X
35	AN	Above Normal	2	1,262	9,748	6,499	-	16,247	
36	BN	Below Normal	4	19	8,488	5,659	-	14,147	
37	AN	Above Normal	3	522	6,939	4,626	-	11,565	
38	BN	Below Normal	4	259	7,881	5,254	-	13,135	
39	BN	Below Normal	5	1,705	5,597	3,403	-	9,000	
40	VW	Very Wet	3	2,551	5,979	3,306	-	9,285	X
41	AN	Above Normal	2	3,174	9,406	6,271	-	15,677	X
42	VW	Very Wet	1	4,093	10,355	6,904	-	17,259	X
43	AN	Above Normal	2	2,450	10,045	6,696	-	16,741	X
44	VW	Very Wet	1	3,977	10,266	6,844	-	17,110	X
45	BN	Below Normal	4	1,833	8,925	5,950	-	14,876	
46	AN	Above Normal	3	1,513	6,939	4,626	-	11,565	X
47	VW	Very Wet	1	4,032	9,890	6,593	-	16,483	
48	BN	Below Normal	4	863	9,014	6,010	-	15,024	
49	BN	Below Normal	5	969	5,597	3,403	-	9,000	
50	AN	Above Normal	3	1,756	5,979	3,306	-	9,285	
			Min	-	3,137	1,352	-	4,488	
			Max	4,376	10,355	6,904	-	17,259	
			Median	**864**	**6,939**	**4,540**	**-**	**10,951**	
			% of Median	7.9%	63.4%	41.5%	0.0%		
			Average	**1,207**	**6,769**	**4,193**	**-**	**10,962**	
			% of Average	11.0%	61.8%	38.2%	0.0%		

Notes:
Hydrologic Condition: Oct - Apr
Model starts after 3+ BN or ED

*Wet Year Algorithm (additional pumping occurs before May)

C:\LSMRGW Model\Run8\PRE\WEL_Run 8 report tables.XLS / printed 12/14/2006

Table L-1. Run 8 Annual Pumping Summary (continued)

	Oct-Apr HC Description	HC Count	Second Div to Fallbrook (af/y)	UY Total (af/y)	CH Total (af/y)	LY Total (af/y)	LSMR Total (af/y)
AVERAGES	ED	12	7	4,472	2,255	0	6,727
	BN	14	546	6,018	3,678	0	9,696
	AN	15	1,628	8,258	5,445	0	13,703
	VW	9	3,130	8,518	5,488	0	14,006
MEDIANS	ED	12	-	3,519	1,581	-	5,100
	BN	14	239	5,597	3,403	-	9,000
	AN	15	1,533	9,543	6,362	-	15,906
	VW	9	3,355	9,890	6,593	-	16,483

Average Monthly Pumping

	Month	Alt 2 Div (af/m)	UY Total (af/m)	CH Total (af/m)	LY Total (af/m)	LSMR Total (af/m)
8%	Oct	0	415	306	0	721
8%	Nov	400	450	333	0	783
10%	Dec	0	520	386	0	906
11%	Jan	0	613	447	0	1,060
11%	Feb	923	612	442	0	1,054
10%	Mar	1,088	572	413	0	985
9%	Apr	934	467	337	0	803
7%	May	740	383	274	0	657
6%	Jun	512	319	228	0	547
6%	Jul	0	334	240	0	574
6%	Aug	0	301	216	0	517
8%	Sep	0	410	301	0	711
	Avg Anl	4,598	5,395	3,922	0	9,317

Table L-2. Run 8 Pumping Summaries
Lower Santa Margarita River Groundwater Model

		Bldg #	State ID #	Label	# mos Q	% of 600 mos	Orig Wells by Subbsn %	80% Utilization af/m	
1	UY	2673	10/4-7A2	7A2	600	100%	25%	142	
2	UY	26072	10/4-8D1	8D1	600	100%	21%	121	
3	UY	2671	10/4-7H2	7H2	600	100%	15%	82	
4	UY	PW-6	PW-6	PW-6	600	100%	19%	110	
5	UY	2603	10/4-7R2	7R2	600	100%	19%	110	
6	UY	UY-1	UY-1	UY-1	271	45%	0%	110	
7	UY	UY-2	UY-2	UY-2	211	35%	0%	110	
8	UY	UY-3	UY-3	UY-3	139	23%	0%	110	
9	UY	UY-4	UY-4	UY-4	86	14%	0%	110	
10	UY	UY-5	UY-5	UY-5	57	10%	0%	110	
11	UY	UY-6	UY-6	UY-6	18	3%	0%	110	
12	CH	2393	10/4-18E3	18E4	600	100%	14%	121	
13	CH	2373	10/4-18M4&5	18M5	600	100%	18%	153	
14	CH	2363	10/5-13R2	13R2	600	100%	16%	132	
15	CH	33925	10/5-23G4	R23G4	**0**	**0%**	15%	**0**	backup
16	CH	2301	10/5-23J1	23J1	600	100%	20%	164	
17	CH	33924	10/5-23K2	23K2	**0**	**0%**	6%	**0**	backup
18	CH	33923	10/5-23K3	23K3	600	100%	16%	132	
19	CH	CH-4	CH-4	CH-4	600	100%	16%	132	Replace R23G4
20	CH	CH-1	CH-1	CH-1	**0**	**0%**	0%	88	

% Pumping in Subbasin

		Wet Year Algorithm			Dry Year Management			Max Pumping in Subbasin adding wells as needed				
		60%	40%	0%	69%	31%	0%					
mo	Anl %	UY	CH	LY	UY	CH	LY		UY	CH	LY	Total
OCT	7.9%	4.8%	3.2%	0.00%	5.5%	2.5%	0.00%	# exst wells	5	7	-	12
NOV	8.6%	5.2%	3.4%	0.00%	5.9%	2.7%	0.00%	af/m (80%)	564	833	-	1,397
DEC	10.0%	6.0%	4.0%	0.00%	6.9%	3.1%	0.00%	avg af/well	113	119	-	116
JAN	11.4%	6.9%	4.6%	0.00%	7.9%	3.5%	0.00%					
FEB	10.9%	6.6%	4.4%	0.00%	7.6%	3.4%	0.00%	1 adntl well	674	921	-	1,650
MAR	10.2%	6.1%	4.1%	0.00%	7.0%	3.2%	0.00%	2 adntl well	784	1,008	-	1,902
APR	8.3%	5.0%	3.3%	0.00%	5.7%	2.6%	0.00%	3 adntl well	893	1,096	-	2,154
MAY	7.1%	4.3%	2.8%	0.00%	4.9%	2.2%	0.00%	4 adntl well	1,003	1,184	-	2,406
JUN	5.9%	3.5%	2.4%	0.00%	4.1%	1.8%	0.00%	5 adntl well	1,112	1,271		2,384
JUL	6.2%	3.7%	2.5%	0.00%	4.3%	1.9%	0.00%	6 adntl well	1,222			1,222
AUG	5.6%	3.4%	2.2%	0.00%	3.9%	1.7%	0.00%	50-yr Avg	6,857	4,244	-	
SEP	7.8%	4.7%	3.1%	0.00%	5.4%	2.4%	0.00%	50-yr Med	6,939	4,540	-	

	median						
	UY af/m	CH af/m	LY af/m	Total af/m	Max Mo Pumping	cfs	new wells
ED	358	162	0	521	1,839	32	6
BN	380	238	0	595	1,988	35	7
AN	663	448	0	1,106	1,988	35	7
VW	682	454	0	1,136	2,045	36	7

Wet Year Algorithm Monthly Counts

	2,000	3,300	Total	% of 50 yrs
Oct	-	-	-	0%
Nov	-	-	-	0%
Dec	1	-	1	2%
Jan	7	1	8	16%
Feb	9	4	13	26%
Mar	10	5	15	30%
Apr	9	6	15	30%
May	-	-	-	0%
	36	16	52	

		Table L-3. Run 8 Annual Pumping by Well										
	Building #:	2673	26072	2671	PW-6	2603	new	new	new	new	new	new
	Max Annual Pumping	1,620	1,371	935	1,246	1,246	1,246	946	734	517	418	209
	Potential w/ 80% Util	1,710	1,447	986	1,315	1,315	1,315	1,315	1,315	1,315	1,315	1,315
	Potential Well Yield (gpm)	1,300	1,100	750	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
		UY	UY	UY	UY	UY	UY	UY	UY	UY	UY	UY
		10/4-7A2	10/4-8D1	10/4-7H2	PW-6	10/4-7R2	UY-1	UY-2	UY-3	UY-4	UY-5	UY-6
MY	HC	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)
1	VW	1,601	1,355	924	1,232	1,232	931	830	532	318	318	0
2	BN	1,404	1,188	810	1,080	1,080	736	736	432	214	0	0
3	AN	1,319	1,116	761	1,015	1,015	405	95	0	0	0	0
4	ED	1,246	1,054	719	958	958	736	736	432	214	0	0
5	ED	792	670	457	609	609	0	0	0	0	0	0
6	ED	888	752	512	683	683	0	0	0	0	0	0
7	AN	1,245	1,054	718	958	958	196	95	0	0	0	0
8	ED	1,236	1,046	713	951	951	728	728	424	206	0	0
9	ED	869	735	501	668	668	0	0	0	0	0	0
10	ED	888	752	512	683	683	0	0	0	0	0	0
11	BN	888	752	512	683	683	0	0	0	0	0	0
12	ED	888	752	512	683	683	0	0	0	0	0	0
13	ED	888	752	512	683	683	0	0	0	0	0	0
14	ED	888	752	512	683	683	0	0	0	0	0	0
15	AN	1,245	1,054	718	958	958	196	95	0	0	0	0
16	AN	1,582	1,339	913	1,217	1,217	1,112	922	519	310	310	102
17	ED	1,244	1,052	717	957	957	734	734	627	426	213	0
18	VW	1,245	1,054	718	958	958	196	95	0	0	0	0
19	BN	1,455	1,231	839	1,119	1,119	736	736	432	214	0	0
20	BN	1,286	1,088	742	990	990	404	97	0	0	0	0
21	ED	1,079	913	622	830	830	0	0	0	0	0	0
22	BN	888	752	512	683	683	0	0	0	0	0	0
23	BN	888	752	512	683	683	0	0	0	0	0	0
24	BN	888	752	512	683	683	0	0	0	0	0	0
25	BN	888	752	512	683	683	0	0	0	0	0	0
26	ED	888	752	512	683	683	0	0	0	0	0	0
27	VW	1,245	1,054	718	958	958	196	95	0	0	0	0
28	AN	1,582	1,339	913	1,217	1,217	1,112	922	519	310	310	102
29	VW	1,616	1,368	933	1,243	1,243	1,243	943	732	421	315	207
30	AN	1,579	1,336	911	1,215	1,215	1,110	920	719	516	418	107
31	AN	1,599	1,353	922	1,230	1,230	1,125	935	627	415	310	102
32	VW	1,619	1,370	934	1,245	1,245	1,245	945	734	423	317	102
33	AN	1,580	1,337	912	1,216	1,216	1,111	921	720	517	310	102
34	AN	1,593	1,348	919	1,225	1,225	1,121	931	622	419	313	0
35	AN	1,597	1,351	921	1,229	1,229	1,124	934	626	422	316	0
36	BN	1,452	1,229	838	1,117	1,117	734	734	627	426	213	0
37	AN	1,552	1,313	895	1,193	1,193	600	192	0	0	0	0
38	BN	1,455	1,231	839	1,119	1,119	736	736	432	214	0	0
39	BN	1,286	1,088	742	990	990	404	97	0	0	0	0
40	VW	1,436	1,215	828	1,104	1,104	196	95	0	0	0	0
41	AN	1,592	1,347	918	1,225	1,225	1,120	930	526	317	207	0
42	VW	1,615	1,366	932	1,242	1,242	1,242	942	731	449	350	242
43	AN	1,579	1,336	911	1,215	1,215	1,110	920	719	516	418	107
44	VW	1,616	1,368	933	1,243	1,243	1,243	943	732	421	315	207
45	BN	1,426	1,207	823	1,097	1,097	714	714	714	511	413	209
46	AN	1,552	1,313	895	1,193	1,193	600	192	0	0	0	0
47	VW	1,620	1,371	935	1,246	1,246	1,246	946	640	323	213	105
48	BN	1,439	1,218	830	1,107	1,107	724	724	724	516	417	209
49	BN	1,286	1,088	742	990	990	404	97	0	0	0	0
50	AN	1,436	1,215	828	1,104	1,104	196	95	0	0	0	0
	Min	792	670	457	609	609	0	0	0	0	0	0
	Max	1,620	1,371	935	1,246	1,246	1,246	946	734	517	418	242
	Median	1,362	1,152	786	1,047	1,047	600	192	0	0	0	0
	Average	1,299	1,100	750	1,000	1,000	555	436	291	181	120	38
		Average Monthly Well Production										
	Month	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)
	Oct	106	89	61	81	81	49	49	10	0	0	0
	Nov	109	93	63	84	84	49	49	28	10	0	0
	Dec	117	99	67	90	90	61	51	51	29	8	0
	Jan	124	105	71	95	95	61	61	51	51	36	26
	Feb	123	104	71	95	95	64	51	51	51	40	13
	Mar	119	101	69	92	92	62	50	50	39	35	0
	Apr	111	94	64	85	85	50	50	40	0	0	0
	May	102	86	59	78	78	48	28	0	0	0	0
	Jun	94	79	54	72	72	27	0	0	0	0	0
	Jul	98	83	57	76	76	28	0	0	0	0	0
	Aug	93	78	53	71	71	9	0	0	0	0	0
	Sep	105	88	60	80	80	48	48	10	0	0	0
	Annual Total	1,299	1,100	750	1,000	1,000	555	436	291	181	120	38

		Table L-3. Run 8 Annual Pumping by Well(continued)							
	Building #:	2393	2373	2363	33925	2301	33924	33923	new
	Max Annual Pumping	999	1,272	1,090	0	1,363	0	1,090	1,090
	Potential w/ 80% Util	1,447	1,841	1,578	1,578	1,973	0	1,578	1,052
	Potential Well Yield (gpm)	1,100	1,400	1,200	1,200	1,500	0	1,200	800
		CH	CH	CH	CH	CH	CH	CH	CH
		10/4-18E3	10/4-18M4&5	10/5-13R2	10/5-23G4	10/5-23J1	10/5-23K2	10/5-23K3	CH-4
MY	HC	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)
1	VW	895	1,139	976	0	1,220	0	976	976
2	BN	760	968	830	0	1,037	0	830	830
3	AN	670	852	730	0	913	0	730	730
4	ED	494	629	539	0	674	0	539	539
5	ED	196	249	213	0	267	0	213	213
6	ED	229	291	250	0	312	0	250	250
7	AN	429	547	469	0	586	0	469	469
8	ED	645	820	703	0	879	0	703	703
9	ED	229	291	250	0	312	0	250	250
10	ED	229	291	250	0	312	0	250	250
11	BN	229	291	250	0	312	0	250	250
12	ED	229	291	250	0	312	0	250	250
13	ED	229	291	250	0	312	0	250	250
14	ED	229	291	250	0	312	0	250	250
15	AN	429	547	469	0	586	0	469	469
16	AN	921	1,172	1,005	0	1,256	0	1,005	1,005
17	ED	703	895	767	0	959	0	767	767
18	VW	429	547	469	0	586	0	469	469
19	BN	760	968	830	0	1,037	0	830	830
20	BN	493	627	537	0	672	0	537	537
21	ED	278	354	303	0	379	0	303	303
22	BN	229	291	250	0	312	0	250	250
23	BN	229	291	250	0	312	0	250	250
24	BN	229	291	250	0	312	0	250	250
25	BN	229	291	250	0	312	0	250	250
26	ED	229	291	250	0	312	0	250	250
27	VW	429	547	469	0	586	0	469	469
28	AN	921	1,172	1,005	0	1,256	0	1,005	1,005
29	VW	991	1,261	1,081	0	1,351	0	1,081	1,081
30	AN	969	1,234	1,057	0	1,322	0	1,057	1,057
31	AN	950	1,209	1,037	0	1,296	0	1,037	1,037
32	VW	982	1,250	1,072	0	1,340	0	1,072	1,072
33	AN	959	1,221	1,047	0	1,308	0	1,047	1,047
34	AN	937	1,193	1,023	0	1,278	0	1,023	1,023
35	AN	941	1,197	1,026	0	1,283	0	1,026	1,026
36	BN	819	1,042	893	0	1,117	0	893	893
37	AN	670	852	730	0	913	0	730	730
38	BN	760	968	830	0	1,037	0	830	830
39	BN	493	627	537	0	672	0	537	537
40	VW	479	609	522	0	653	0	522	522
41	AN	908	1,155	990	0	1,238	0	990	990
42	VW	999	1,272	1,090	0	1,363	0	1,090	1,090
43	AN	969	1,234	1,057	0	1,322	0	1,057	1,057
44	VW	991	1,261	1,081	0	1,351	0	1,081	1,081
45	BN	861	1,096	940	0	1,174	0	940	940
46	AN	670	852	730	0	913	0	730	730
47	VW	954	1,215	1,041	0	1,301	0	1,041	1,041
48	BN	870	1,107	949	0	1,186	0	949	949
49	BN	493	627	537	0	672	0	537	537
50	AN	479	609	522	0	653	0	522	522
	Min	196	249	213	0	267	0	213	213
	Max	999	1,272	1,090	0	1,363	0	1,090	1,090
	Median	657	836	717	0	896	0	717	717
	Average	607	772	662	0	827	0	662	662
		Average Monthly Well Production							
	Month	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)
	Oct	48	61	52	52	65	0	52	52
	Nov	52	66	56	56	71	0	56	56
	Dec	60	77	66	66	82	0	66	66
	Jan	70	89	76	76	96	0	76	76
	Feb	67	86	74	74	92	0	74	74
	Mar	63	80	69	69	86	0	69	69
	Apr	51	65	56	56	70	0	56	56
	May	43	54	46	46	58	0	46	46
	Jun	35	45	39	39	48	0	39	39
	Jul	37	47	41	41	51	0	41	41
	Aug	33	43	37	37	46	0	37	37
	Sep	47	60	51	51	64	0	51	51
	Annual Total	607	772	662	662	827	0	662	662

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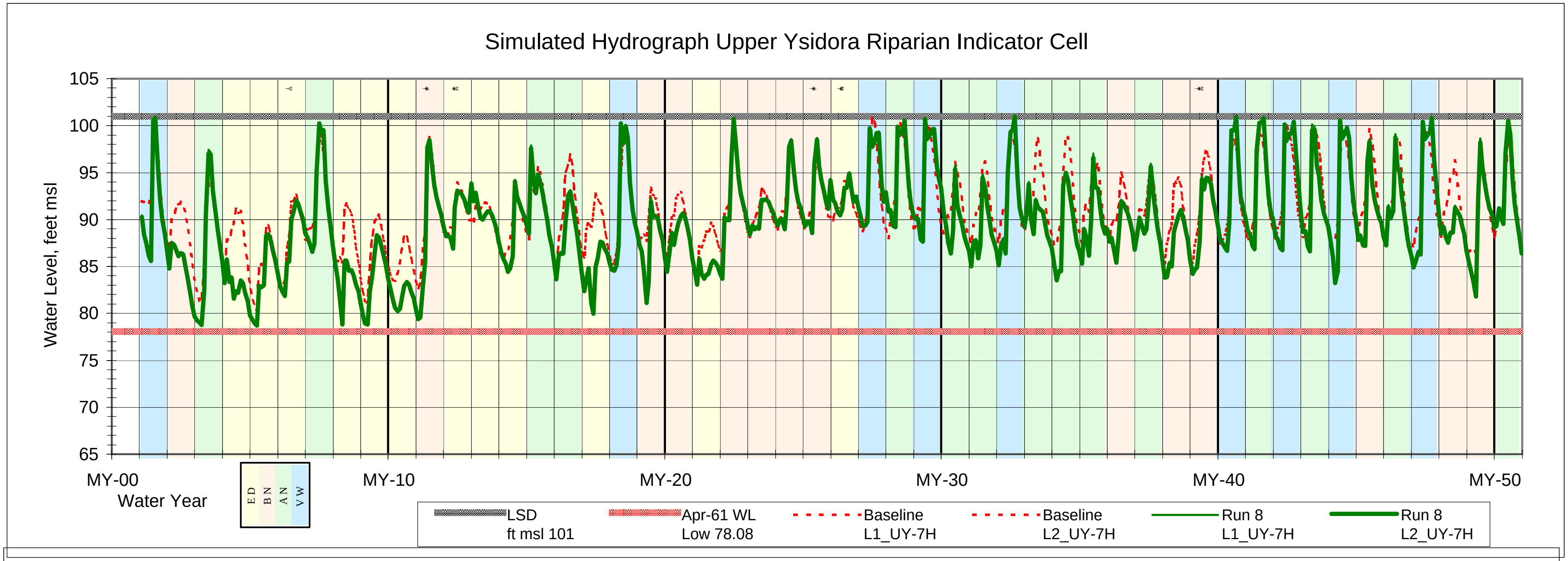
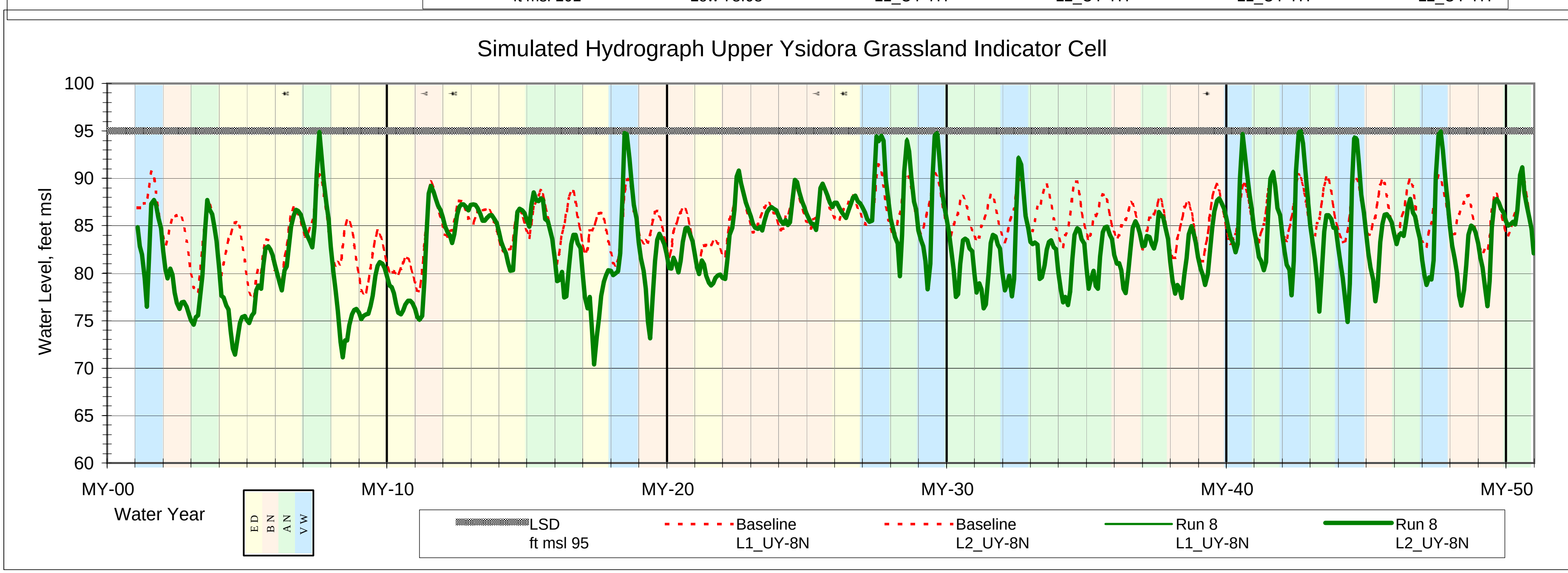
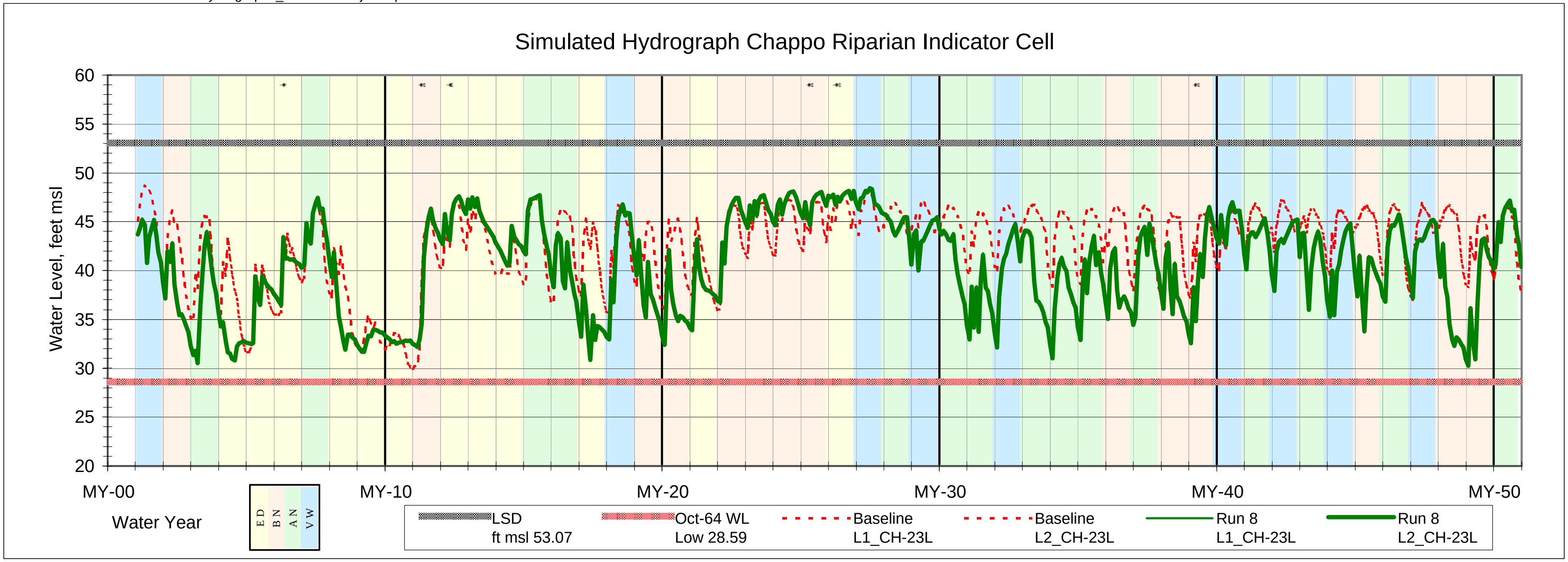


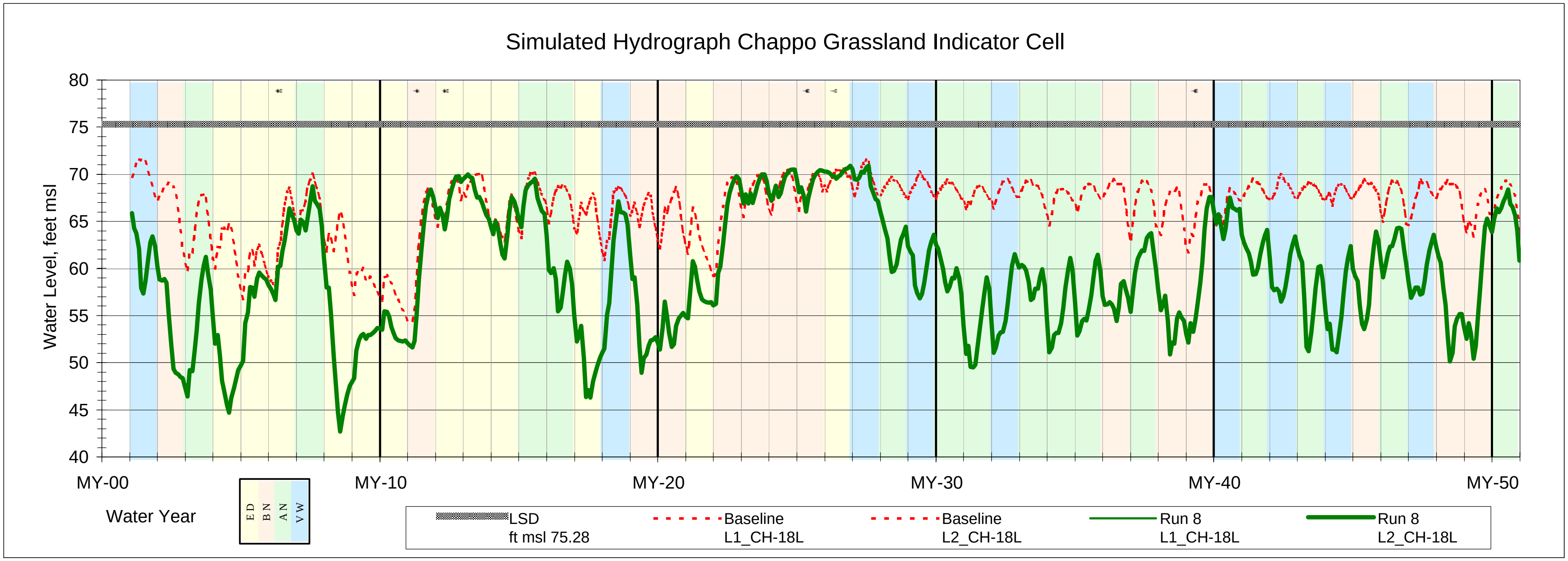


Emergency Water Called on Years Marked With *

Layer 1 (L1) and Layer 2(L2) simulated groundwater levels are at similar elevations and the graph lines are printed on top of each other.

FIGURE L-1
Run 8 Proposed Action





Emergency Water Called on Years Marked With *

Layer 1 (L1) and Layer 2(L2) simulated groundwater levels are at similar elevations and the graph lines are printed on top of each other.

FIGURE L-2
Run 8 Proposed Action

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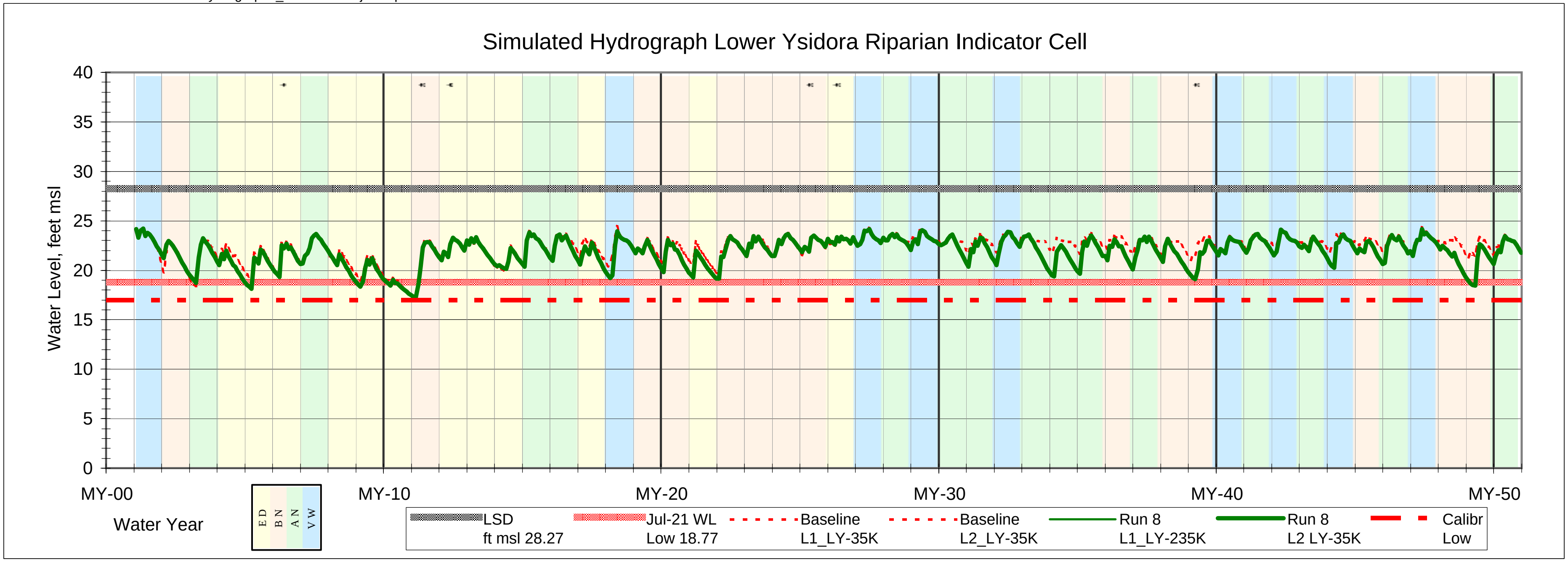
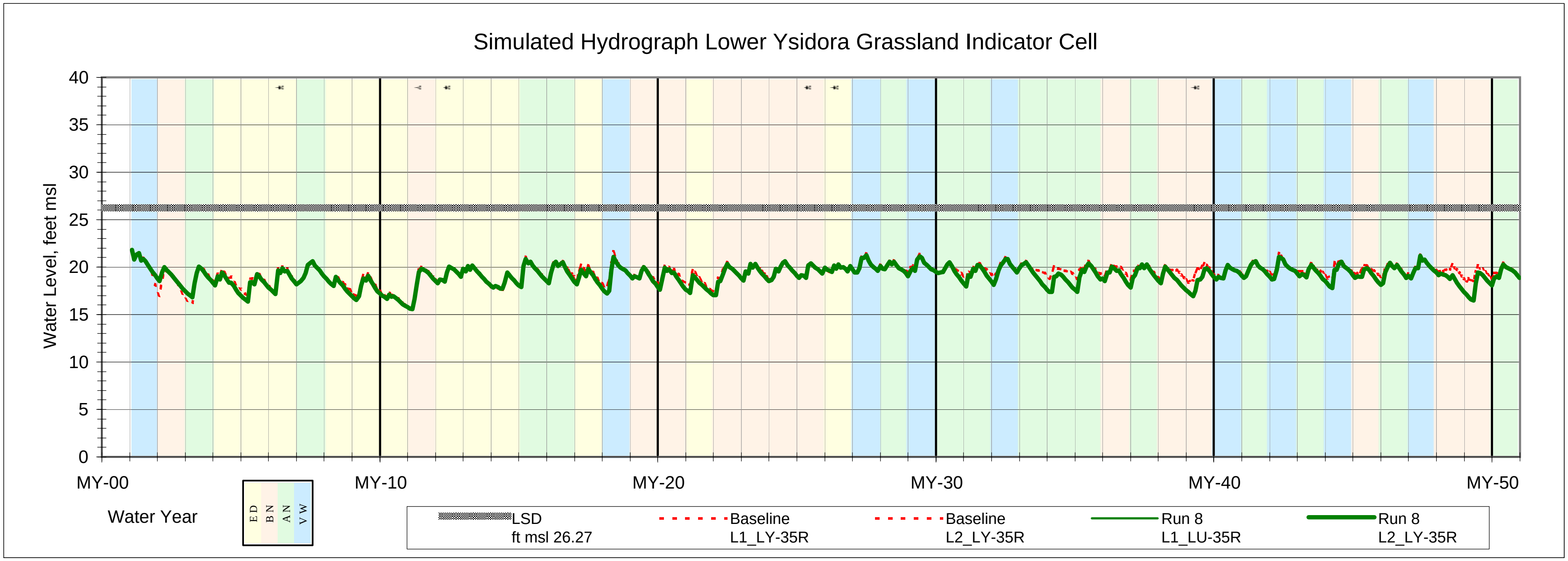
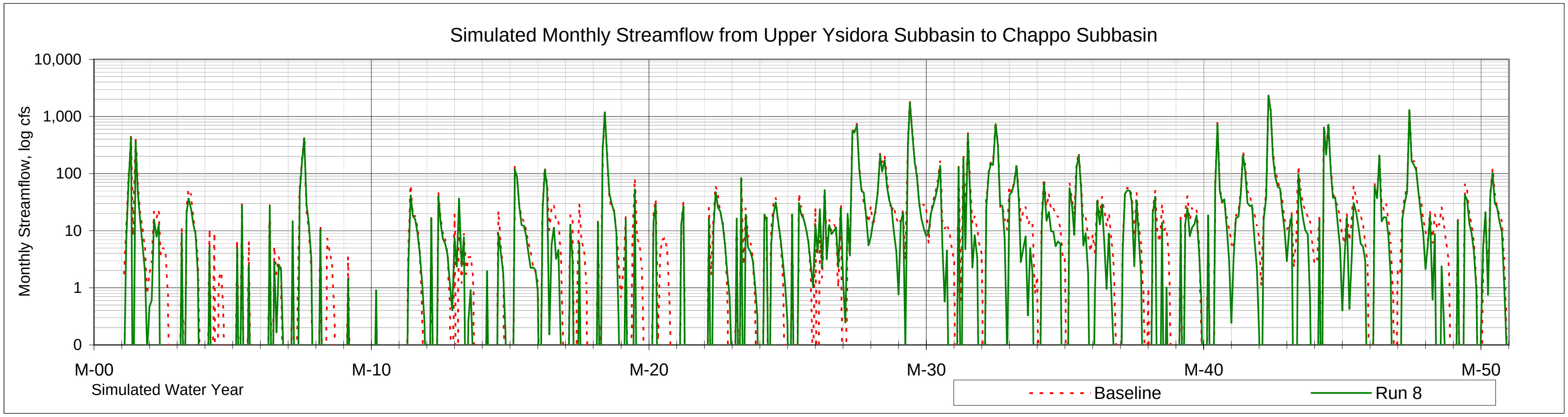


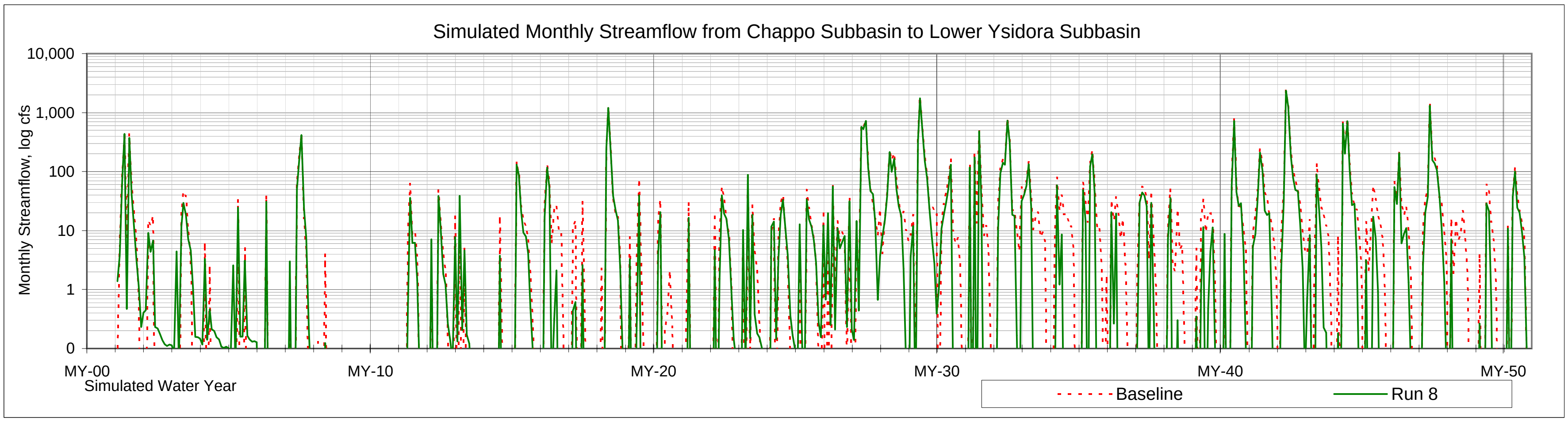


Emergency Water Called on Years Marked With *

Layer 1 (L1) and Layer 2(L2) simulated groundwater levels are at similar elevations and the graph lines are printed on top of each other.

FIGURE L-3
Run 8 Proposed Action





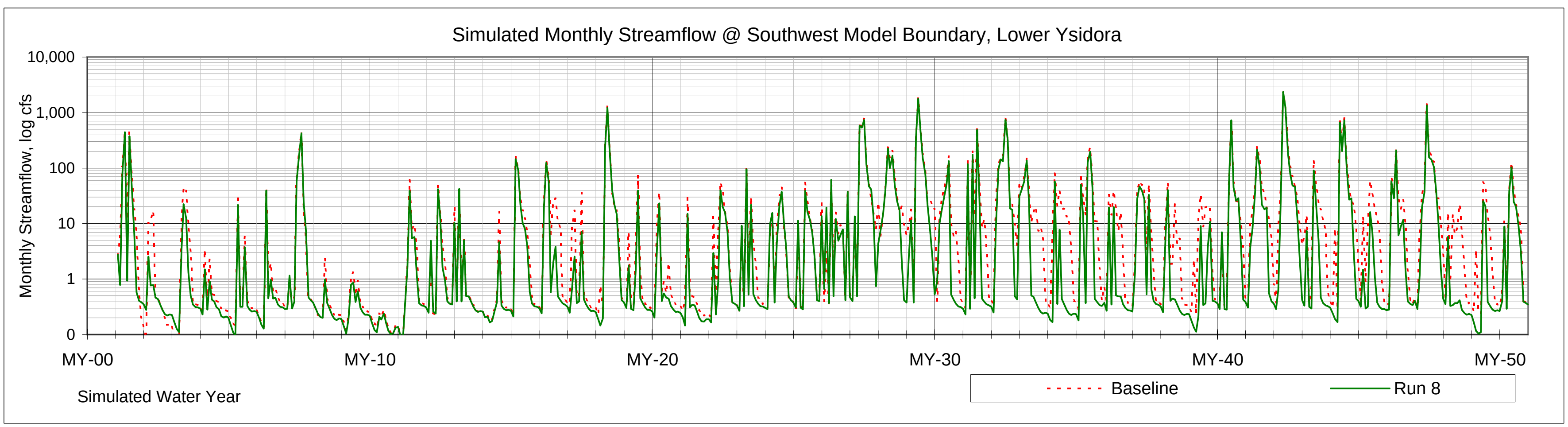


Figure L-4. Simulated Streamflow, Run 8 Proposed Action

Table L-4. Run 8 Proposed Action

Average Hydrologic Condition Water Budget (af/y)

% Time Exceedence	*> 76%*	*76% to 50%*	*50% to 19%*	*< 19%*
# Years	*12*	*14*	*15*	*9*
	Extremely Dry	Below Normal	Above Normal	Very Wet
Inflow:				
Santa Margarita River Inflow	7,400	13,300	32,300	127,100
Subsurface Underflow	1,000	900	900	800
Lake O'Neill Spill and Release	800	1,400	1,800	2,200
Fallbrook Creek	100	400	1,400	3,800
Minor Tributary Drainages	1,700	1,400	2,400	4,900
Areal Precipitation	500	500	700	1,600
Total Inflow:	11,500	17,900	39,500	140,400
Outflow:				
Santa Margarita River Outflow	2,000	3,200	19,800	116,600
Subsurface Underflow	100	100	100	100
Groundwater Pumping	6,700	9,700	13,700	14,000
Evapotranspiration	1,900	2,300	2,500	3,000
Diversions to Lake O'Neill	1,200	1,900	2,400	2,700
CPEN Direct Diversion	0	500	1,600	3,100
Total Outflow:	11,900	17,700	40,100	139,500
Net Simulated Change of Groundwater in Storage:	-400	200	-600	900
	-	-	-	-

Median Hydrologic Condition Water Budget (af/y)

% Time Exceedence	*> 76%*	*76% to 50%*	*50% to 19%*	*< 19%*
# Years	*12*	*14*	*15*	*9*
	Extremely Dry	Below Normal	Above Normal	Very Wet
Inflow:				
Santa Margarita River Inflow	6,800	13,200	28,800	120,000
Subsurface Underflow	1,000	900	900	800
Lake O'Neill Spill and Release	900	1,300	2,100	2,300
Fallbrook Creek	100	300	1,100	3,500
Minor Tributary Drainages	1,500	1,400	2,500	4,700
Areal Precipitation	400	300	500	1,500
Outflow:				
Santa Margarita River Outflow	900	2,800	16,100	105,500
Subsurface Underflow	100	100	100	100
Groundwater Pumping	5,100	9,000	15,900	16,500
Evapotranspiration	1,500	2,000	2,400	2,800
Diversions to Lake O'Neill	1,300	1,700	2,700	2,700
CPEN Direct Diversion	0	200	1,500	3,400
Net Simulated Change of Groundwater in Storage:	-200	0	-400	1,100

Average Subbasin Water Budget (af/y)

	Upper Ysidora	Chappo	Lower Ysidora	SMR Basin	
Inflow:					
Santa Margarita River Inflow	38,000	29,900	27,600	38,000	85%
Subsurface Underflow *	900	1,800	500	900	2%
Lake O'Neill Spill and Release	1,500	-	-	1,500	3%
Fallbrook Creek	1,200	-	-	1,200	3%
Minor Tributary Drainages	600	1,100	700	2,400	5%
Areal Precipitation	200	300	300	800	2%
Total Inflow:	42,400	33,100	29,100	44,800	
Outflow:					
Santa Margarita River Outflow	29,900	27,600	28,200	28,200	63%
Subsurface Underflow *	1,800	500	100	100	0%
Groundwater Pumping	6,800	4,200	0	11,000	24%
Evapotranspiration *	700	900	800	2,400	5%
Diversions to Lake O'Neill	2,000	-	-	2,000	4%
CPEN Direct Diversion	1,200	0	0	1,200	3%
Total Outflow:	42,400	33,200	29,100	44,900	
Net Simulated Change of Groundwater in Storage: *	0	-100	0	-100	
	-	-	-	-	

Median Subbasin Water Budget (af/y)

	Upper Ysidora	Chappo	Lower Ysidora	SMR Basin
Inflow:				
Santa Margarita River Inflow	16,000	8,200	5,700	16,000
Subsurface Underflow *	900	1,800	500	900
Lake O'Neill Spill and Release	1,500	-	-	1,500
Fallbrook Creek	600	-	-	600
Minor Tributary Drainages	600	1,100	700	2,100
Areal Precipitation	100	200	200	500
Outflow:				
Santa Margarita River Outflow	8,200	5,700	6,200	6,200
Subsurface Underflow *	1,800	500	100	100
Groundwater Pumping	6,900	4,500	0	11,000
Evapotranspiration *	700	900	800	2,300
Diversions to Lake O'Neill	2,100	-	-	2,100
CPEN Direct Diversion	864	0	0	864
Net Simulated Change of Groundwater in Storage: *	0	0	0	100

Note: * Subbasin Medians are based on the last rate of the stress period
Values are rounded to the nearest 100 acre-feet, closest number adjusted to eliminate rounding error

Note: The sum of median values does not reflect the change of groundwater in storage.
Median values are not cummulative.
* Subbasin Medians are based on the last rate of the stress period
Values are rounded to the nearest 100 acre-feet

Table L-5 Run 8 Annual Water budget
Lower Santa Margarita River Groundwater Model — Run 8 Proposed Action

Annual Surface Water Budget

MY		SMR Flow In	LON Diversion	Ponds Diversion	Str Gain+ / Loss-	GAGE SMR @ UY->CH	Str Gain+ / Loss-	SMR @ CH->LY	Str Gain+ / Loss-	Second Div to Fallbrook	SMR Flow Out	LSMR Str Gain+ / Loss-
1	VW	66,394	2,364	9,734	-8,562	57,832	-1,442	56,390	1,810	1,179	58,200	-8,194
2	BN	8,737	1,531	3,426	-6,490	2,247	-1,946	301	109	0	410	-8,327
3	AN	15,652	1,063	6,505	-8,982	6,671	-4,091	2,579	-135	529	2,444	-13,208
4	ED	6,759	1,323	2,646	-6,456	303	-289	14	297	0	311	-6,447
5	ED	6,151	337	1,336	-4,037	2,114	-773	1,341	346	0	1,688	-4,463
6	ED	8,228	1,307	2,764	-6,080	2,149	-252	1,897	758	0	2,655	-5,574
7	AN	46,769	1,151	10,874	-5,890	40,878	-1,592	39,287	712	1,171	39,999	-6,770
8	ED	6,750	1,291	3,474	-6,126	625	-618	7	206	0	212	-6,538
9	ED	4,840	786	1,820	-4,754	86	-83	3	256	0	259	-4,581
10	ED	3,399	393	1,216	-3,346	54	-54	-	107	0	107	-3,292
11	BN	13,724	1,569	6,768	-8,309	5,415	-2,554	2,862	266	676	3,128	-10,596
12	ED	11,055	1,665	4,794	-5,467	5,588	-1,704	3,884	369	40	4,253	-6,802
13	ED	4,963	577	1,797	-1,954	3,009	-389	2,620	417	0	3,037	-1,926
14	ED	5,802	412	2,946	-4,772	1,030	-808	221	226	0	448	-5,354
15	AN	21,921	2,748	6,132	-5,474	16,447	-670	15,778	1,330	57	17,108	-4,813
16	AN	23,865	2,344	7,510	-10,390	13,475	-1,862	11,612	1,161	1,149	12,773	-11,091
17	ED	10,105	1,979	3,961	-8,780	1,325	-1,101	224	580	0	803	-9,302
18	VW	105,552	2,415	14,062	-4,935	100,617	-2,084	98,533	1,366	1,864	99,899	-5,653
19	BN	13,124	2,317	4,573	-8,948	4,176	-1,531	2,645	118	58	2,763	-10,360
20	BN	8,950	1,263	3,584	-6,344	2,607	-1,101	1,505	344	0	1,849	-7,101
21	ED	7,739	1,831	1,408	-5,347	2,392	-1,385	1,006	64	0	1,071	-6,668
22	BN	14,802	1,514	8,379	-6,427	8,375	-3,127	5,248	-61	864	5,187	-9,616
23	BN	12,321	1,607	2,949	-4,214	8,107	-882	7,224	680	0	7,905	-4,416
24	BN	11,377	1,699	5,702	-4,317	7,060	-1,265	5,796	501	182	6,297	-5,080
25	BN	12,396	1,733	6,834	-5,305	7,091	-1,402	5,689	407	218	6,096	-6,300
26	ED	12,737	1,940	4,851	-3,345	9,391	-907	8,484	798	47	9,282	-3,455
27	VW	126,820	2,792	20,446	-4,283	122,537	545	123,082	2,198	3,355	125,280	-1,540
28	AN	55,061	2,721	22,011	-12,523	42,538	-4,076	38,462	589	4,259	39,051	-16,010
29	VW	181,076	2,721	24,937	-11,064	170,012	-3,130	166,882	1,858	4,376	168,741	-12,335
30	AN	28,831	2,749	8,575	-10,566	18,265	-3,674	14,591	191	1,533	14,782	-14,050
31	AN	62,376	2,697	9,046	-10,132	52,244	-3,412	48,832	590	1,671	49,422	-12,954
32	VW	105,844	2,720	17,416	-10,658	95,186	-5,210	89,976	860	2,745	90,836	-15,008
33	AN	29,560	2,714	10,298	-10,901	18,659	-3,095	15,564	492	1,661	16,056	-13,504
34	AN	22,097	2,702	9,761	-12,669	9,428	-5,296	4,132	-35	1,713	4,097	-18,000
35	AN	39,296	2,235	9,948	-9,824	29,472	-4,206	25,266	510	1,262	25,775	-13,520
36	BN	14,221	2,155	5,089	-8,649	5,572	-3,146	2,426	164	19	2,590	-11,630
37	AN	19,246	1,923	5,805	-5,563	13,682	-3,464	10,219	489	522	10,708	-8,538
38	BN	12,659	1,727	4,895	-8,160	4,499	-1,862	2,636	370	259	3,006	-9,653
39	BN	16,158	2,438	8,959	-9,735	6,422	-4,730	1,692	-165	1,705	1,526	-14,631
40	VW	64,445	2,819	14,567	-7,696	56,749	-2,429	54,320	337	2,551	54,657	-9,788
41	AN	42,492	2,711	16,680	-12,937	29,555	-4,476	25,079	366	3,174	25,446	-17,046
42	VW	251,872	2,723	24,391	-9,984	241,888	-3,729	238,159	1,091	4,093	239,249	-12,623
43	AN	24,441	2,751	13,939	-13,191	11,250	-4,079	7,171	220	2,450	7,390	-17,051
44	VW	121,487	2,676	21,790	-12,503	108,984	-3,961	105,023	1,193	3,977	106,216	-15,271
45	BN	18,009	2,748	10,810	-11,989	6,020	-4,342	1,677	-25	1,833	1,652	-16,357
46	AN	29,997	2,138	9,618	-7,967	22,031	-2,862	19,168	597	1,513	19,765	-10,232
47	VW	120,008	2,716	23,452	-11,900	108,107	-3,921	104,187	1,289	4,032	105,475	-14,532
48	BN	13,181	2,744	7,205	-11,004	2,177	-1,754	423	127	863	550	-12,632
49	BN	15,897	1,871	7,483	-8,817	7,080	-4,054	3,026	-171	969	2,855	-13,042
50	AN	22,506	2,607	10,077	-7,640	14,866	-2,870	11,996	141	1,756	12,137	-10,369
	avg	38,034	1,999	8,945	**-7,908**	30,126	**-2,343**	27,783	**526**	1,207	28,309	**-9,725**
	med	16,027	2,146	7,344	-8,064	8,241	-2,015	5,742	370	864	6,197	-9,720
AVERAGES												
ED	12	7,377	1,153	2,751	(5,039)	2,339	(697)	1,642	369	7	2,010	-5,367
BN	14	13,254	1,923	6,190	(7,765)	5,489	(2,407)	3,082	190	546	3,273	-9,981
AN	15	32,274	2,350	10,452	(9,643)	22,631	(3,315)	19,316	481	1,628	19,797	-12,477
VW	9	127,055	2,661	18,977	(9,065)	117,990	(2,818)	115,172	1,333	3,130	116,506	-10,549
	50											
MEDIANS												
ED	12	6,755	1,299	2,705	(5,060)	1,720	(695)	615	322	-	937	-5,464
BN	14	13,152	1,730	6,235	(8,234)	5,796	(1,904)	2,641	146	239	2,809	-10,006
AN	15	28,831	2,697	9,761	(10,132)	18,265	(3,464)	15,564	492	1,533	16,056	-13,208
VW	9	120,008	2,720	20,446	(9,984)	108,107	(3,130)	104,187	1,289	3,355	105,475	-12,335
	50											

Table L-5 Run 8 Annual Water budget (continued)
Lower Santa Margarita River Groundwater Model

Annual Groundw ater Budget Model Run: Run 8 Proposed Action

	INFLOW:					OUTFLOW:					
MY	Storage	Recharge	Stream Leakance	GHB	TOTAL GW IN	Storage	Wells	ET	Stream Leakance	GHB	TOTAL GW OUT
1	8,290	9,543	9,632	871	28,337	5,100	15,454	2,781	4,961	65	28,361
2	6,784	3,618	6,234	937	17,574	2,355	12,933	1,706	543	55	17,592
3	5,436	6,186	10,580	988	23,190	8,429	10,354	1,790	2,583	52	23,207
4	6,459	2,929	4,961	958	15,306	3,291	10,468	1,198	308	53	15,317
5	3,494	1,634	6,338	1,125	12,591	6,397	4,488	1,395	280	48	12,609
6	3,361	3,430	5,849	1,012	13,652	5,468	5,101	1,966	1,076	56	13,668
7	6,504	10,287	7,179	899	24,868	6,701	8,191	2,770	7,150	63	24,875
8	8,182	3,620	3,763	942	16,507	3,239	11,435	1,402	407	49	16,533
9	2,647	2,172	4,605	1,028	10,452	3,992	5,023	1,135	249	48	10,447
10	2,782	1,343	2,656	1,057	7,839	1,602	5,101	950	158	41	7,851
11	3,324	6,540	9,245	944	20,054	8,891	5,099	2,092	3,934	50	20,066
12	2,817	4,927	6,763	907	15,414	4,865	5,101	2,855	2,542	57	15,420
13	3,831	2,103	3,967	912	10,813	1,067	5,099	2,857	1,752	59	10,834
14	3,586	3,267	4,725	953	12,531	4,047	5,101	2,213	1,136	52	12,550
15	5,158	7,036	6,481	876	19,552	4,222	8,193	2,911	4,185	65	19,576
16	6,511	6,965	11,086	890	25,452	4,729	15,904	2,245	2,516	64	25,459
17	6,476	4,275	8,230	922	19,903	5,379	12,521	1,455	512	57	19,923
18	6,637	13,152	9,477	864	30,129	10,333	8,191	2,493	9,063	62	30,143
19	7,544	4,812	7,404	900	20,659	4,518	13,136	1,839	1,134	56	20,683
20	4,614	3,942	6,641	914	16,111	4,500	8,999	1,646	921	56	16,121
21	3,297	1,669	5,597	975	11,537	3,519	6,194	1,547	253	49	11,561
22	4,077	7,870	8,072	887	20,905	7,927	5,099	2,688	5,145	58	20,916
23	2,957	3,384	6,035	907	13,283	3,127	5,101	2,971	2,048	60	13,306
24	3,338	5,966	6,522	879	16,705	3,724	5,099	3,157	4,676	64	16,719
25	3,450	7,078	6,228	881	17,638	4,607	5,101	3,147	4,731	63	17,650
26	2,668	5,250	6,182	872	14,972	2,124	5,099	3,336	4,350	67	14,975
27	6,279	17,957	7,011	831	32,078	6,251	8,193	3,425	14,146	74	32,089
28	6,798	18,136	9,690	817	35,441	5,135	15,904	3,010	11,338	68	35,456
29	5,751	21,396	11,637	813	39,596	6,869	17,103	2,902	12,652	72	39,597
30	6,389	7,298	9,780	865	24,332	2,564	16,758	2,429	2,567	62	24,380
31	6,377	7,796	11,667	879	26,719	6,247	16,414	1,880	2,130	61	26,732
32	5,921	15,044	14,011	845	35,820	8,634	16,965	2,429	7,727	68	35,823
33	5,950	9,130	9,114	868	25,062	3,056	16,552	2,254	3,157	61	25,079
34	5,292	8,264	12,420	882	26,857	5,785	16,208	1,908	2,925	51	26,877
35	5,296	9,022	12,443	875	27,635	6,311	16,230	2,199	2,826	60	27,627
36	5,296	5,441	10,147	888	21,772	4,034	14,164	1,965	1,591	58	21,812
37	4,894	5,808	10,331	888	21,921	5,624	11,547	2,415	2,252	63	21,902
38	6,097	4,867	9,114	907	20,985	4,653	13,154	1,807	1,348	55	21,017
39	4,031	7,438	9,894	888	22,252	7,573	8,999	2,220	3,402	52	22,247
40	6,031	12,006	7,277	872	26,187	6,198	9,275	2,867	7,803	60	26,203
41	5,546	13,797	10,882	847	31,072	4,904	15,680	2,773	7,649	63	31,069
42	6,517	21,006	11,823	815	40,161	7,179	17,264	2,775	12,913	67	40,198
43	7,245	11,639	9,803	849	29,536	5,376	16,736	2,424	4,933	59	29,528
44	7,792	18,411	12,121	833	39,157	8,882	17,103	2,397	10,728	62	39,171
45	6,267	9,252	9,940	865	26,325	5,351	14,876	2,204	3,838	57	26,327
46	5,395	8,402	8,976	868	23,641	5,280	11,570	2,564	4,185	62	23,662
47	5,831	20,225	12,236	829	39,121	7,599	16,483	2,734	12,236	70	39,122
48	6,635	6,635	7,461	872	21,602	2,893	15,037	1,843	1,818	56	21,647
49	5,326	6,726	9,137	909	22,098	8,150	8,999	1,880	3,033	48	22,110
50	5,808	8,655	7,668	868	22,998	5,418	9,275	2,840	5,436	60	23,029
avg	5,340	8,147	8,381	899	22,767	5,282	10,961	2,294	4,185	59	22,781
med	5,649	7,001	8,603	884	22,010	5,208	10,952	2,326	2,979	59	22,006
AVERAGES											
ED	4,133	3,051	5,303	972	13,460	3,749	6,728	1,859	1,085	53	13,474
BN	4,982	5,969	8,005	899	19,854	5,164	9,700	2,226	2,726	56	19,872
AN	5,907	9,228	9,873	877	25,885	5,319	13,701	2,428	4,389	61	25,897
VW	6,561	16,527	10,581	841	34,509	7,449	14,003	2,756	10,248	67	34,523
MEDIANS											
ED	3,427	3,098	5,279	955	13,122	3,756	5,101	1,501	460	52	13,138
BN	4,955	6,253	7,766	894	20,782	4,563	8,999	2,028	2,540	56	20,800
AN	5,808	8,402	9,803	875	25,062	5,376	15,904	2,424	3,157	62	25,079
VW	6,279	17,957	11,637	833	35,820	7,179	16,483	2,775	10,728	67	35,823

Table L-5 Run 8 Annual Water budget (continued)					
Lower Santa Margarita River Groundwater Model					
MY	NET Storage	NET Str Lknc		In-Out	**% bal**
1	-3,191	-4,671		-24.2	-0.09%
2	-4,429	-5,691		-17.4	-0.10%
3	2,993	-7,997		-17.7	-0.08%
4	-3,168	-4,653		-11.5	-0.08%
5	2,903	-6,058		-17.8	-0.14%
6	2,107	-4,773		-15.2	-0.11%
7	197	-29		-7.2	-0.03%
8	-4,943	-3,355		-25.9	-0.16%
9	1,345	-4,356		4.7	0.04%
10	-1,180	-2,498		-12.6	-0.16%
11	5,567	-5,311		-11.9	-0.06%
12	2,048	-4,221		-6.0	-0.04%
13	-2,764	-2,215		-20.9	-0.19%
14	461	-3,588		-19.0	-0.15%
15	-937	-2,296		-24.1	-0.12%
16	-1,781	-8,570		-7.1	-0.03%
17	-1,097	-7,718		-20.3	-0.10%
18	3,696	-413		-13.6	-0.05%
19	-3,026	-6,270		-23.9	-0.12%
20	-115	-5,721		-10.1	-0.06%
21	223	-5,344		-24.4	-0.21%
22	3,850	-2,927		-11.4	-0.05%
23	170	-3,988		-23.3	-0.17%
24	386	-1,846		-13.5	-0.08%
25	1,157	-1,497		-12.8	-0.07%
26	-544	-1,832		-2.4	-0.02%
27	-28	7,135		-11.8	-0.04%
28	-1,662	1,648		-15.0	-0.04%
29	1,118	1,015		-0.7	0.00%
30	-3,825	-7,213		-48.1	-0.20%
31	-131	-9,536		-12.5	-0.05%
32	2,713	-6,283		-3.7	-0.01%
33	-2,895	-5,957		-17.2	-0.07%
34	494	-9,495		-19.4	-0.07%
35	1,015	-9,617		8.6	0.03%
36	-1,263	-8,556		-39.8	-0.18%
37	730	-8,079		19.6	0.09%
38	-1,444	-7,766		-32.2	-0.15%
39	3,542	-6,492		5.2	0.02%
40	168	526		-16.4	-0.06%
41	-643	-3,232		3.2	0.01%
42	661	1,090		-37.0	-0.09%
43	-1,869	-4,869		7.8	0.03%
44	1,090	-1,393		-13.8	-0.04%
45	-916	-6,102		-2.1	-0.01%
46	-115	-4,791		-20.7	-0.09%
47	1,768	0		-0.9	0.00%
48	-3,742	-5,643		-44.3	-0.20%
49	2,824	-6,104		-11.2	-0.05%
50	-390	-2,231		-30.5	-0.13%
avg	-57	-4,196		-14.4	-0.07%
med	70	-4,722		-13.7	-0.07%
AVERAGES					
ED	-384	-4,218		-14.3	-0.11%
BN	183	-5,279		-17.8	-0.09%
AN	-588	-5,484		-12.0	-0.05%
VW	888	-333		-13.6	-0.04%
MEDIANS					
ED	-161	-4,289		-16.5	-0.13%
BN	28	-5,706		-13.1	-0.08%
AN	-390	-5,957		-15.0	-0.05%
VW	1,090	0		-13.6	-0.04%

Table L-6 Run 8 Proposed Action Average Monthly Water Budget

Lower Santa Margarita River Groundwater Model

Modflow Volumetric Budget Output and Streamflow

Run 8 Proposed Action

9/19/06

Avg AF/M	SMR Flow In	Diversion	Str Gain+ / Loss-	SMR @ UY->CH	Str Gain+ / Loss-	SMR @ CH->LY	Str Gain+ / Loss-	SMR Flow Out	LSMR Str Gain+ / Loss-
Oct	526	323	-370	156	-88	68	17	85	-441
Nov	1,299	660	58	1,357	-506	851	-8	843	-456
Dec	1,969	530	-741	1,228	-178	1,049	49	1,099	-870
Jan	8,364	840	-1,070	7,294	-132	7,161	137	7,298	-1,065
Feb	10,263	2,092	-1,783	8,480	-140	8,340	114	8,454	-1,809
Mar	8,849	2,372	-1,523	7,326	-255	7,070	103	7,174	-1,675
Apr	3,159	1,576	-784	2,375	-308	2,067	43	2,110	-1,050
May	1,345	993	-463	882	-270	612	9	621	-724
Jun	756	587	-148	608	-234	375	7	382	-374
Jul	499	344	-284	215	-141	74	11	85	-413
Aug	458	285	-358	100	-52	48	24	72	-386
Sep	547	340	-442	105	-39	66	21	87	-460
Avg Monthly	3,169	912	-659	2,510	-195	2,315	44	2,359	-810
Med Monthly	1,322	624	-453	1,055	-160	732	22	732	-592
Avg Total=Anl	38,034	10,943	-7,908	30,126	-2,343	27,783	526	28,309	-9,725

Lower Santa Margarita River Groundwater Model

Modflow Volumetric Budget Output

Average Monthly Water Budget

	INFLOW:					OUTFLOW:									
Avg AF/M	Storage	Recharge	Stream Leakance	GHB	TOTAL IN	Storage	Wells	ET	Stream Leakance	GHB	TOTAL OUT	NET Storage	NET Str Lknc	In-Out	% bal
Oct	561	108	403	81	1,152	73	856	161	58	8	1,156	-487	-346	-3.8	-0.33%
Nov	142	642	1,260	78	2,122	930	928	168	85	8	2,119	788	-1,175	3.3	0.15%
Dec	541	150	870	79	1,640	285	1,079	184	87	7	1,642	-256	-783	-1.6	-0.10%
Jan	379	356	1,231	78	2,044	507	1,260	187	86	5	2,045	128	-1,146	-1.4	-0.07%
Feb	279	1,911	909	75	3,175	1,423	1,223	182	344	-	3,171	1,144	-566	3.5	0.11%
Mar	184	2,171	942	74	3,371	1,111	1,144	214	900	1	3,370	927	-42	1.3	0.04%
Apr	396	1,347	769	68	2,579	446	932	215	977	8	2,579	50	208	0.5	0.02%
May	565	803	564	70	2,001	223	772	222	777	9	2,003	-343	213	-2.1	-0.10%
Jun	643	239	474	69	1,424	134	642	207	439	7	1,430	-509	-35	-5.2	-0.37%
Jul	575	125	381	74	1,155	49	675	201	228	4	1,156	-527	-153	-1.5	-0.13%
Aug	470	120	286	78	953	39	606	186	127	0	959	-431	-159	-5.6	-0.59%
Sep	604	177	292	77	1,149	62	844	166	79	1	1,151	-542	-213	-1.8	-0.16%
Avg Monthly	445	679	698	75	1,897	440	913	191	349	5	1,898	-5	-350	-1.2	-0.13%
Med Monthly	505	297	666	76	1,821	254	892	187	177	6	1,515	-299	-186	-1.6	-0.10%
Avg Total=Anl	5,340	8,147	8,381	899	22,767	5,282	10,961	2,294	4,185	59	22,781	-57	-4,196	-14.4	

Table L-7. Run 8A Annual Pumping Summary
Lower Santa Margarita River Groundwater Model

Hydrologic Condition

HC	Cnt	Oct to Apr Strflw
VW	9	Very Wet > 56,164
AN	15	Above Normal > 13,600
BN	14	Below Normal < 13,600
ED	12	Extremely Dry < 5,840
	50	

Pumping Condition

PC	HC	Q Adjst	Anl Q	Cnt	
1	2+ AN @ VW 60/40 split	3,300	17,400	5	10%
2	2+ AN @ AN	2,000	16,100	9	18%
3	Standard	500	14,600	10	20%
4	1st BN	-4,000	10,100	6	12%
5	2ndBN, 69/31 split	-7,380	6,720	3	6%
6	3+BN/all ED	-9,000	5,100	17	34%
				50	100%

MY	HC	Oct-Apr HC descrip	May-Apr Pumping Condition	Second Div to Fallbrook (af/y)	UY Total (af/y)	CH Total (af/y)	LY Total (af/y)	LSMR Total (af/y)	+Q*
1	VW	Very Wet	3	1,179	9,272	6,181	-	15,454	
2	BN	Below Normal	4	0	7,679	5,254	-	12,933	
3	AN	Above Normal	3	529	5,727	4,626	-	10,353	
4	ED	Extremely Dry	6	0	7,054	3,761	-	10,815	
5	ED	Extremely Dry	6	0	3,213	1,428	-	4,641	
6	ED	Extremely Dry	6	0	3,519	1,581	-	5,100	
7	AN	Above Normal	3	1,171	5,225	2,967	-	8,192	
8	ED	Extremely Dry	6	0	6,981	4,454	-	11,435	
9	ED	Extremely Dry	6	0	3,519	1,581	-	5,100	
10	ED	Extremely Dry	6	0	3,519	1,581	-	5,100	
11	BN	Below Normal	6	307	3,519	1,581	-	5,100	
12	ED	Extremely Dry	6	0	3,519	1,581	-	5,100	
13	ED	Extremely Dry	6	0	3,519	1,581	-	5,100	
14	ED	Extremely Dry	6	0	3,519	1,581	-	5,100	
15	AN	Above Normal	3	57	5,225	2,967	-	8,192	X
16	AN	Above Normal	2	1,149	9,543	6,362	-	15,906	
17	ED	Extremely Dry	6	0	7,661	4,858	-	12,519	
18	VW	Very Wet	3	1,864	5,225	2,967	-	8,192	
19	BN	Below Normal	4	58	7,881	5,254	-	13,135	
20	BN	Below Normal	5	0	5,597	3,403	-	9,000	
21	ED	Extremely Dry	6	0	4,273	1,920	-	6,193	
22	BN	Below Normal	6	864	3,519	1,581	-	5,100	
23	BN	Below Normal	6	0	3,519	1,581	-	5,100	
24	BN	Below Normal	6	182	3,519	1,581	-	5,100	
25	BN	Below Normal	6	96	3,519	1,581	-	5,100	
26	ED	Extremely Dry	6	0	3,519	1,581	-	5,100	
27	VW	Very Wet	3	3,335	5,225	2,967	-	8,192	X
28	AN	Above Normal	2	4,259	9,543	6,362	-	15,906	X
29	VW	Very Wet	1	4,376	10,266	6,844	-	17,110	X
30	AN	Above Normal	2	1,533	10,045	6,696	-	16,741	X
31	AN	Above Normal	2	1,671	9,847	6,565	-	16,412	X
32	VW	Very Wet	1	2,745	10,181	6,787	-	16,968	X
33	AN	Above Normal	2	1,661	9,942	6,628	-	16,570	X
34	AN	Above Normal	2	1,713	9,716	6,477	-	16,193	X
35	AN	Above Normal	2	1,262	9,748	6,499	-	16,247	
36	BN	Below Normal	4	19	8,488	5,659	-	14,147	
37	AN	Above Normal	3	522	6,939	4,626	-	11,565	
38	BN	Below Normal	4	259	7,881	5,254	-	13,135	
39	BN	Below Normal	5	566	5,597	3,403	-	9,000	
40	VW	Very Wet	3	2,551	5,979	3,306	-	9,285	X
41	AN	Above Normal	2	3,174	9,406	6,271	-	15,677	X
42	VW	Very Wet	1	4,093	10,355	6,904	-	17,259	X
43	AN	Above Normal	2	2,450	10,045	6,696	-	16,741	X
44	VW	Very Wet	1	3,977	10,266	6,844	-	17,110	X
45	BN	Below Normal	4	1,833	8,925	5,950	-	14,876	
46	AN	Above Normal	3	1,513	6,939	4,626	-	11,565	X
47	VW	Very Wet	1	4,032	9,890	6,593	-	16,483	
48	BN	Below Normal	4	863	9,014	6,010	-	15,024	
49	BN	Below Normal	5	969	5,597	3,403	-	9,000	
50	AN	Above Normal	3	1,756	5,979	3,306	-	9,285	

	Second Div to Fallbrook (af/y)	UY Total (af/y)	CH Total (af/y)	LY Total (af/y)	LSMR Total (af/y)
Min	-	3,213	1,428	-	4,641
Max	4,376	10,355	6,904	-	17,259
Median	**714**	**6,939**	**4,540**	**-**	**11,125**
% of Median	6.4%	62.4%	40.8%	0.0%	
Average	**1,172**	**6,772**	**4,201**	**-**	**10,973**
% of Average	10.7%	61.7%	38.3%	0.0%	

Notes:
Hydrologic Condition: Oct - Apr
Model starts after 3+ BN or ED

*Wet Year Algorithm (additional pumping occurs before May)

Table L-7. Run 8A Annual Pumping Summary (continued)

	Oct-Apr HC Description	HC Count	Second Div to Fallbrook (af/y)	UY Total (af/y)	CH Total (af/y)	LY Total (af/y)	LSMR Total (af/y)
AVERAGES	ED	12	0	4,485	2,291	0	6,775
	BN	14	430	6,018	3,678	0	9,696
	AN	15	1,628	8,258	5,445	0	13,703
	VW	9	3,128	8,518	5,488	0	14,006
MEDIANS	ED	12	-	3,519	1,581	-	5,100
	BN	14	220	5,597	3,403	-	9,000
	AN	15	1,533	9,543	6,362	-	15,906
	VW	9	3,335	9,890	6,593	-	16,483

Average Monthly Pumping

	Month	Second Div to Fallbrook (af/m)	UY Total (af/m)	CH Total (af/m)	LY Total (af/m)	LSMR Total (af/m)
8%	Oct	0	526	330	0	856
8%	Nov	0	571	358	0	930
10%	Dec	0	665	416	0	1,081
11%	Jan	0	776	484	0	1,260
11%	Feb	53	758	467	0	1,225
10%	Mar	247	708	437	0	1,145
9%	Apr	287	579	356	0	935
7%	May	249	477	295	0	772
6%	Jun	58	397	245	0	642
6%	Jul	90	418	258	0	675
6%	Aug	99	376	232	0	608
8%	Sep	90	520	324	0	844
	Avg Anl	1,172	6,772	4,201	0	10,973

Table L-8. Run 8A Annual Pumping Summary
Lower Santa Margarita River Groundwater Model

		Bldg #	State ID #	Label	# mos Q	% of 600 mos	Orig Wells by Subbsn %	80% Utilization af/m	
1	UY	2673	10/4-7A2	7A2	600	100%	25%	142	
2	UY	26072	10/4-8D1	8D1	600	100%	21%	121	
3	UY	2671	10/4-7H2	7H2	600	100%	15%	82	
4	UY	PW-6	PW-6	PW-6	600	100%	19%	110	
5	UY	2603	10/4-7R2	7R2	600	100%	19%	110	
6	UY	UY-1	UY-1	UY-1	271	45%	0%	110	
7	UY	UY-2	UY-2	UY-2	211	35%	0%	110	
8	UY	UY-3	UY-3	UY-3	139	23%	0%	110	
9	UY	UY-4	UY-4	UY-4	86	14%	0%	110	
10	UY	UY-5	UY-5	UY-5	57	10%	0%	110	
11	UY	UY-6	UY-6	UY-6	18	3%	0%	110	
12	CH	2393	10/4-18E3	18E4	600	100%	14%	121	
13	CH	2373	10/4-18M4&5	18M5	600	100%	18%	153	
14	CH	2363	10/5-13R2	13R2	600	100%	16%	132	
15	CH	33925	10/5-23G4	R23G4	**0**	**0%**	15%	**0**	backup
16	CH	2301	10/5-23J1	23J1	600	100%	20%	164	
17	CH	33924	10/5-23K2	23K2	**0**	**0%**	6%	**0**	backup
18	CH	33923	10/5-23K3	23K3	600	100%	16%	132	
19	CH	CH-4	CH-4	CH-4	600	100%	16%	132	Repalce R23G4
20	CH	CH-2	CH-2	CH-1	**0**	**0%**	0%	88	

% Pumping in Subbasin

		Wet Year Algorithm			Dry Year Management			Max Pumping in Subbasin adding wells as needed				
		60%	40%	0%	69%	31%	0%					
mo	Anl %	UY	CH	LY	UY	CH	LY		UY	CH	LY	Total
OCT	7.9%	4.8%	3.2%	0.00%	5.5%	2.5%	0.00%	# exst wells	5	7	-	12
NOV	8.6%	5.2%	3.4%	0.00%	5.9%	2.7%	0.00%	af/m (80%)	564	833	-	1,397
DEC	10.0%	6.0%	4.0%	0.00%	6.9%	3.1%	0.00%	avg af/well	113	119	-	116
JAN	11.4%	6.9%	4.6%	0.00%	7.9%	3.5%	0.00%					
FEB	10.9%	6.6%	4.4%	0.00%	7.6%	3.4%	0.00%	1 adntl well	674	921	55	1,650
MAR	10.2%	6.1%	4.1%	0.00%	7.0%	3.2%	0.00%	2 adntl well	784	1,008	110	1,902
APR	8.3%	5.0%	3.3%	0.00%	5.7%	2.6%	0.00%	3 adntl well	893	1,096	164	2,154
MAY	7.1%	4.3%	2.8%	0.00%	4.9%	2.2%	0.00%	4 adntl well	1,003	1,184	219	2,406
JUN	5.9%	3.5%	2.4%	0.00%	4.1%	1.8%	0.00%	5 adntl well	1,112	1,271		2,384
JUL	6.2%	3.7%	2.5%	0.00%	4.3%	1.9%	0.00%	6 adntl well	1,222			1,222
AUG	5.6%	3.4%	2.2%	0.00%	3.9%	1.7%	0.00%	50-yr Avg	6,857	4,244	-	
SEP	7.8%	4.7%	3.1%	0.00%	5.4%	2.4%	0.00%	50-yr Med	6,939	4,540	-	

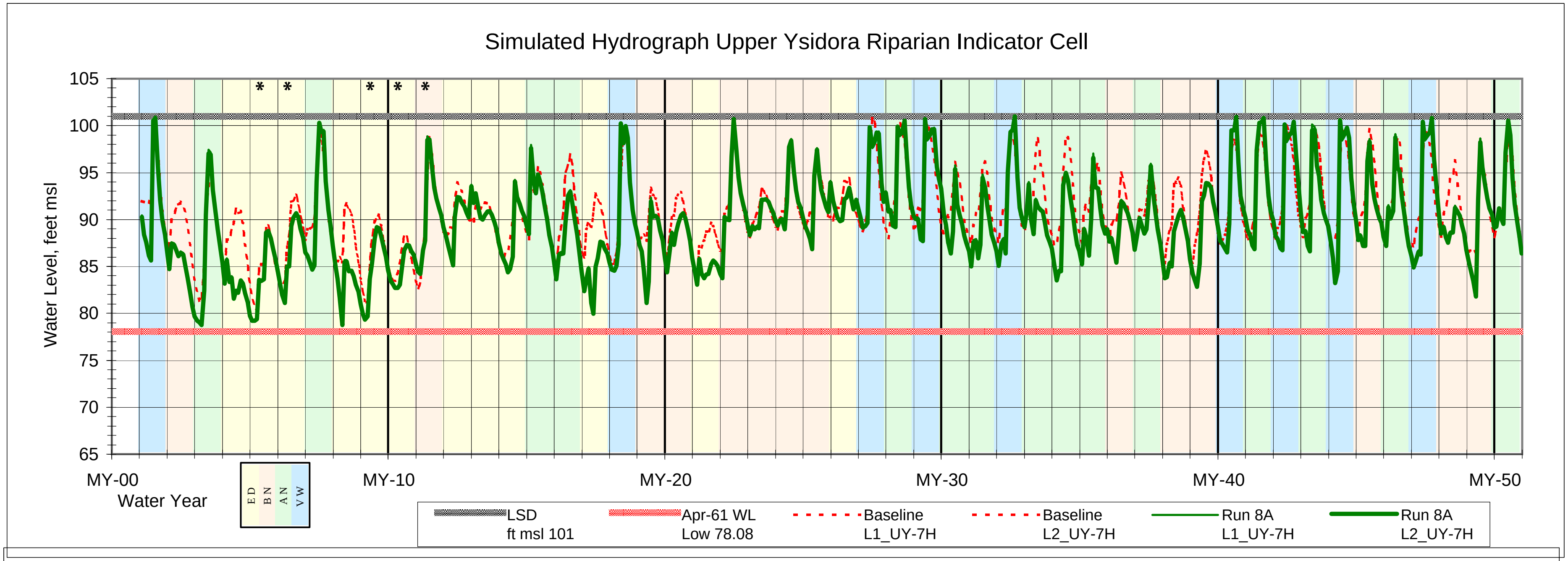
	median						
	UY af/m	CH af/m	LY af/m	Total af/m	Max Mo Pumping	cfs	new wells
ED	358	162	0	521	1,839	32	6
BN	380	238	0	595	1,988	35	7
AN	663	448	0	1,106	1,988	35	7
VW	682	454	0	1,136	2,045	36	7

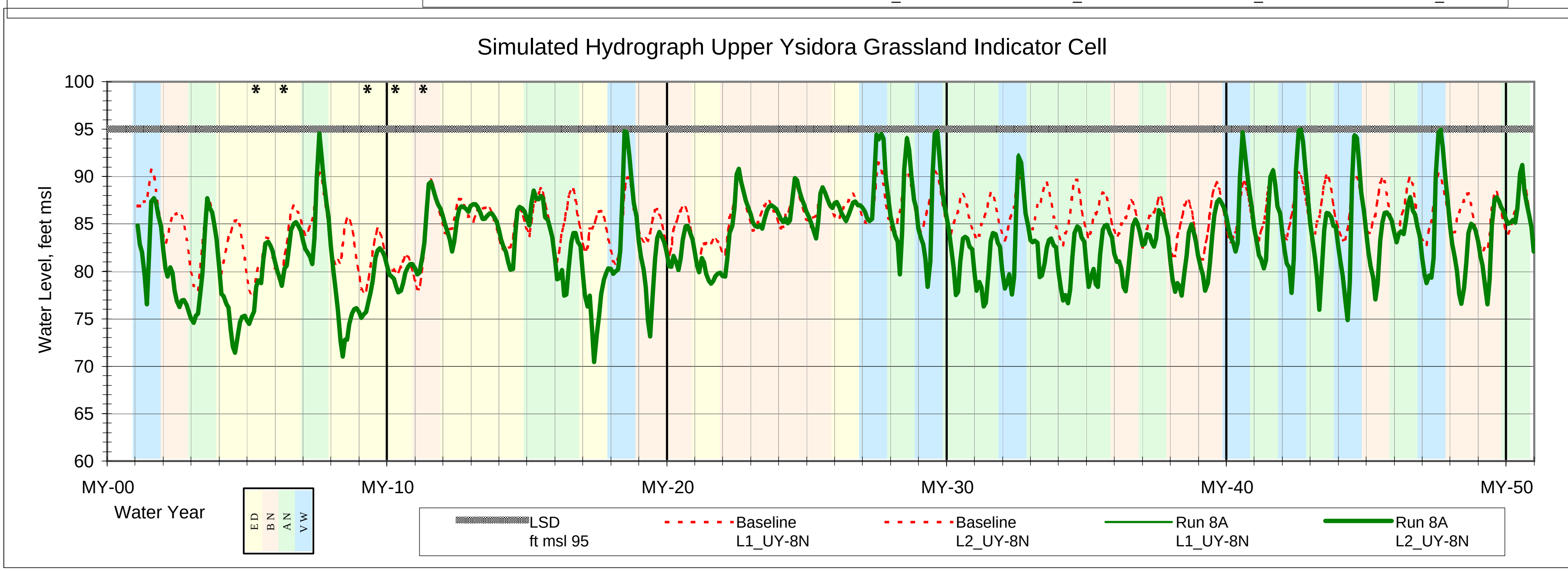
Wet Year Algorithm Monthly Counts

	2,000	3,300	Total	% of 50 yrs
Oct	-	-	-	0%
Nov	-	-	-	0%
Dec	1	-	1	2%
Jan	7	1	8	16%
Feb	9	4	13	26%
Mar	10	5	15	30%
Apr	9	6	15	30%
May	-	-	-	0%
	36	16	52	

		Table L-9. Run 8A Annual Pumping by Well										
	Building #:	2673	26072	2671	PW-6	2603	new	new	new	new	new	new
	Max Annual Pumping	1,620	1,371	935	1,246	1,246	1,246	946	734	517	418	242
	Potential w/ 80% Util	1,710	1,447	986	1,315	1,315	1,315	1,315	1,315	1,315	1,315	1,315
	Potential Well Yield (gpm)	1,300	1,100	750	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
		UY	UY	UY	UY	UY	UY	UY	UY	UY	UY	UY
		10/4-7A2	10/4-8D1	10/4-7H2	PW-6	10/4-7R2	UY-1	UY-2	UY-3	UY-4	UY-5	UY-6
MY	HC	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)
1	VW	1,601	1,355	924	1,232	1,232	931	830	532	318	318	0
2	BN	1,404	1,188	810	1,080	1,080	736	736	432	214	0	0
3	AN	1,319	1,116	761	1,015	1,015	405	95	0	0	0	0
4	ED	1,246	1,054	719	958	958	736	736	432	214	0	0
5	ED	811	686	468	624	624	0	0	0	0	0	0
6	ED	888	752	512	683	683	0	0	0	0	0	0
7	AN	1,245	1,054	718	958	958	196	95	0	0	0	0
8	ED	1,236	1,046	713	951	951	728	728	424	206	0	0
9	ED	888	752	512	683	683	0	0	0	0	0	0
10	ED	888	752	512	683	683	0	0	0	0	0	0
11	BN	888	752	512	683	683	0	0	0	0	0	0
12	ED	888	752	512	683	683	0	0	0	0	0	0
13	ED	888	752	512	683	683	0	0	0	0	0	0
14	ED	888	752	512	683	683	0	0	0	0	0	0
15	AN	1,245	1,054	718	958	958	196	95	0	0	0	0
16	AN	1,582	1,339	913	1,217	1,217	1,112	922	519	310	310	102
17	ED	1,244	1,052	717	957	957	734	734	627	426	213	0
18	VW	1,245	1,054	718	958	958	196	95	0	0	0	0
19	BN	1,455	1,231	839	1,119	1,119	736	736	432	214	0	0
20	BN	1,286	1,088	742	990	990	404	97	0	0	0	0
21	ED	1,079	913	622	830	830	0	0	0	0	0	0
22	BN	888	752	512	683	683	0	0	0	0	0	0
23	BN	888	752	512	683	683	0	0	0	0	0	0
24	BN	888	752	512	683	683	0	0	0	0	0	0
25	BN	888	752	512	683	683	0	0	0	0	0	0
26	ED	888	752	512	683	683	0	0	0	0	0	0
27	VW	1,245	1,054	718	958	958	196	95	0	0	0	0
28	AN	1,582	1,339	913	1,217	1,217	1,112	922	519	310	310	102
29	VW	1,616	1,368	933	1,243	1,243	1,243	943	732	421	315	207
30	AN	1,579	1,336	911	1,215	1,215	1,110	920	719	516	418	107
31	AN	1,599	1,353	922	1,230	1,230	1,125	935	627	415	310	102
32	VW	1,619	1,370	934	1,245	1,245	1,245	945	734	423	317	102
33	AN	1,580	1,337	912	1,216	1,216	1,111	921	720	517	310	102
34	AN	1,593	1,348	919	1,225	1,225	1,121	931	622	419	313	0
35	AN	1,597	1,351	921	1,229	1,229	1,124	934	626	422	316	0
36	BN	1,452	1,229	838	1,117	1,117	734	734	627	426	213	0
37	AN	1,552	1,313	895	1,193	1,193	600	192	0	0	0	0
38	BN	1,455	1,231	839	1,119	1,119	736	736	432	214	0	0
39	BN	1,286	1,088	742	990	990	404	97	0	0	0	0
40	VW	1,436	1,215	828	1,104	1,104	196	95	0	0	0	0
41	AN	1,592	1,347	918	1,225	1,225	1,120	930	526	317	207	0
42	VW	1,615	1,366	932	1,242	1,242	1,242	942	731	449	350	242
43	AN	1,579	1,336	911	1,215	1,215	1,110	920	719	516	418	107
44	VW	1,616	1,368	933	1,243	1,243	1,243	943	732	421	315	207
45	BN	1,426	1,207	823	1,097	1,097	714	714	714	511	413	209
46	AN	1,552	1,313	895	1,193	1,193	600	192	0	0	0	0
47	VW	1,620	1,371	935	1,246	1,246	1,246	946	640	323	213	105
48	BN	1,439	1,218	830	1,107	1,107	724	724	724	516	417	209
49	BN	1,286	1,088	742	990	990	404	97	0	0	0	0
50	AN	1,436	1,215	828	1,104	1,104	196	95	0	0	0	0
	Min	811	686	468	624	624	0	0	0	0	0	0
	Max	1,620	1,371	935	1,246	1,246	1,246	946	734	517	418	242
	Median	1,362	1,152	786	1,047	1,047	600	192	0	0	0	0
	Average	1,300	1,100	750	1,000	1,000	555	436	291	181	120	38
		Average Monthly Well Production										
	Month	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)
	Oct	106	89	61	81	81	49	49	10	0	0	0
	Nov	110	93	63	84	84	49	49	28	10	0	0
	Dec	117	99	68	90	90	61	51	51	29	8	0
	Jan	124	105	71	95	95	61	61	51	51	36	26
	Feb	123	104	71	95	95	64	51	51	51	40	13
	Mar	119	101	69	92	92	62	50	50	39	35	0
	Apr	111	94	64	85	85	50	50	40	0	0	0
	May	102	86	59	78	78	48	28	0	0	0	0
	Jun	94	79	54	72	72	27	0	0	0	0	0
	Jul	98	83	57	76	76	28	0	0	0	0	0
	Aug	93	78	53	71	71	9	0	0	0	0	0
	Sep	105	88	60	80	80	48	48	10	0	0	0
	Annual Total	1,300	1,100	750	1,000	1,000	555	436	291	181	120	38

		Table L-9. Run 8A Annual Pumping by Well(continued)								
	Building #:	2393	2373	2363	33925	2301	33924	33923	new	new
	Max Annual Pumping	999	1,272	1,090	1,090	1,363	0	1,090	1,090	0
	Potential w/ 80% Util	1,447	1,841	1,578	1,578	1,973	0	1,578	1,052	1,052
	Potential Well Yield (gpm)	1,100	1,400	1,200	1,200	1,500	0	1,200	800	800
		CH	CH	CH	CH	CH	CH	CH	CH	CH
		10/4-18E3	10/4-18M4&5	10/5-13R2	10/5-23G4	10/5-23J1	10/5-23K2	10/5-23K3	CH-4	CH-1
MY	HC	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)
1	VW	895	1,139	976	0	1,220	0	976	976	0
2	BN	760	968	830	0	1,037	0	830	830	0
3	AN	670	852	730	0	913	0	730	730	0
4	ED	544	693	594	0	742	0	594	594	0
5	ED	207	263	225	0	282	0	225	225	0
6	ED	229	291	250	0	312	0	250	250	0
7	AN	429	547	469	0	586	0	469	469	0
8	ED	645	820	703	0	879	0	703	703	0
9	ED	229	291	250	0	312	0	250	250	0
10	ED	229	291	250	0	312	0	250	250	0
11	BN	229	291	250	0	312	0	250	250	0
12	ED	229	291	250	0	312	0	250	250	0
13	ED	229	291	250	0	312	0	250	250	0
14	ED	229	291	250	0	312	0	250	250	0
15	AN	429	547	469	0	586	0	469	469	0
16	AN	921	1,172	1,005	0	1,256	0	1,005	1,005	0
17	ED	703	895	767	0	959	0	767	767	0
18	VW	429	547	469	0	586	0	469	469	0
19	BN	760	968	830	0	1,037	0	830	830	0
20	BN	493	627	537	0	672	0	537	537	0
21	ED	278	354	303	0	379	0	303	303	0
22	BN	229	291	250	0	312	0	250	250	0
23	BN	229	291	250	0	312	0	250	250	0
24	BN	229	291	250	0	312	0	250	250	0
25	BN	229	291	250	0	312	0	250	250	0
26	ED	229	291	250	0	312	0	250	250	0
27	VW	429	547	469	0	586	0	469	469	0
28	AN	921	1,172	1,005	0	1,256	0	1,005	1,005	0
29	VW	991	1,261	1,081	0	1,351	0	1,081	1,081	0
30	AN	969	1,234	1,057	0	1,322	0	1,057	1,057	0
31	AN	950	1,209	1,037	0	1,296	0	1,037	1,037	0
32	VW	982	1,250	1,072	0	1,340	0	1,072	1,072	0
33	AN	959	1,221	1,047	0	1,308	0	1,047	1,047	0
34	AN	937	1,193	1,023	0	1,278	0	1,023	1,023	0
35	AN	941	1,197	1,026	0	1,283	0	1,026	1,026	0
36	BN	819	1,042	893	0	1,117	0	893	893	0
37	AN	670	852	730	0	913	0	730	730	0
38	BN	760	968	830	0	1,037	0	830	830	0
39	BN	493	627	537	0	672	0	537	537	0
40	VW	479	609	522	0	653	0	522	522	0
41	AN	908	1,155	990	0	1,238	0	990	990	0
42	VW	999	1,272	1,090	0	1,363	0	1,090	1,090	0
43	AN	969	1,234	1,057	0	1,322	0	1,057	1,057	0
44	VW	991	1,261	1,081	0	1,351	0	1,081	1,081	0
45	BN	861	1,096	940	0	1,174	0	940	940	0
46	AN	670	852	730	0	913	0	730	730	0
47	VW	954	1,215	1,041	0	1,301	0	1,041	1,041	0
48	BN	870	1,107	949	0	1,186	0	949	949	0
49	BN	493	627	537	0	672	0	537	537	0
50	AN	479	609	522	0	653	0	522	522	0
	Min	207	263	225	0	282	0	225	225	0
	Max	999	1,272	1,090	0	1,363	0	1,090	1,090	0
	Median	657	836	717	0	896	0	717	717	0
	Average	608	774	663	0	829	0	663	663	0
		Average Monthly Well Production								
	Month	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)
	Oct	48	61	52	0	65	0	52	52	0
	Nov	52	66	57	0	71	0	57	57	0
	Dec	60	77	66	0	82	0	66	66	0
	Jan	70	89	76	0	96	0	76	76	0
	Feb	68	86	74	0	92	0	74	74	0
	Mar	63	80	69	0	86	0	69	69	0
	Apr	52	66	56	0	70	0	56	56	0
	May	43	54	47	0	58	0	47	47	0
	Jun	35	45	39	0	48	0	39	39	0
	Jul	37	47	41	0	51	0	41	41	0
	Aug	34	43	37	0	46	0	37	37	0
	Sep	47	60	51	51	64	0	51	51	0
Annual Total		608	774	663	0	829	0	663	663	0





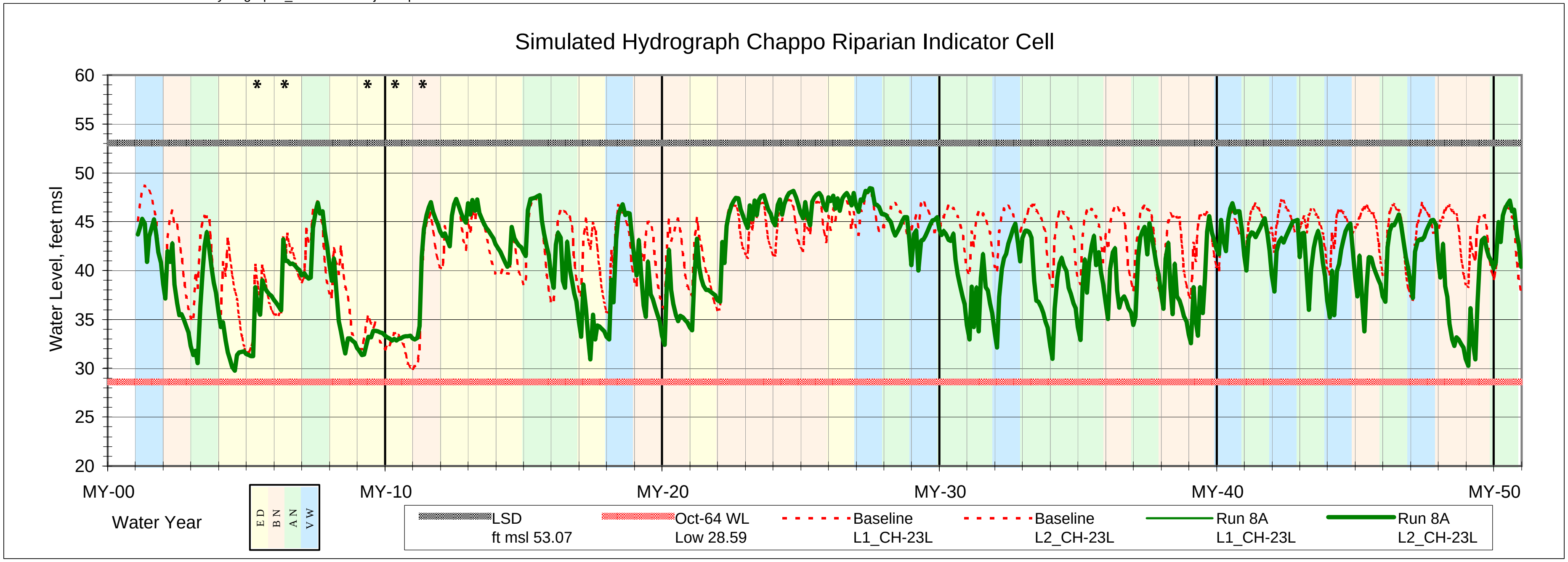
Emergency Water Called on Years Marked With *

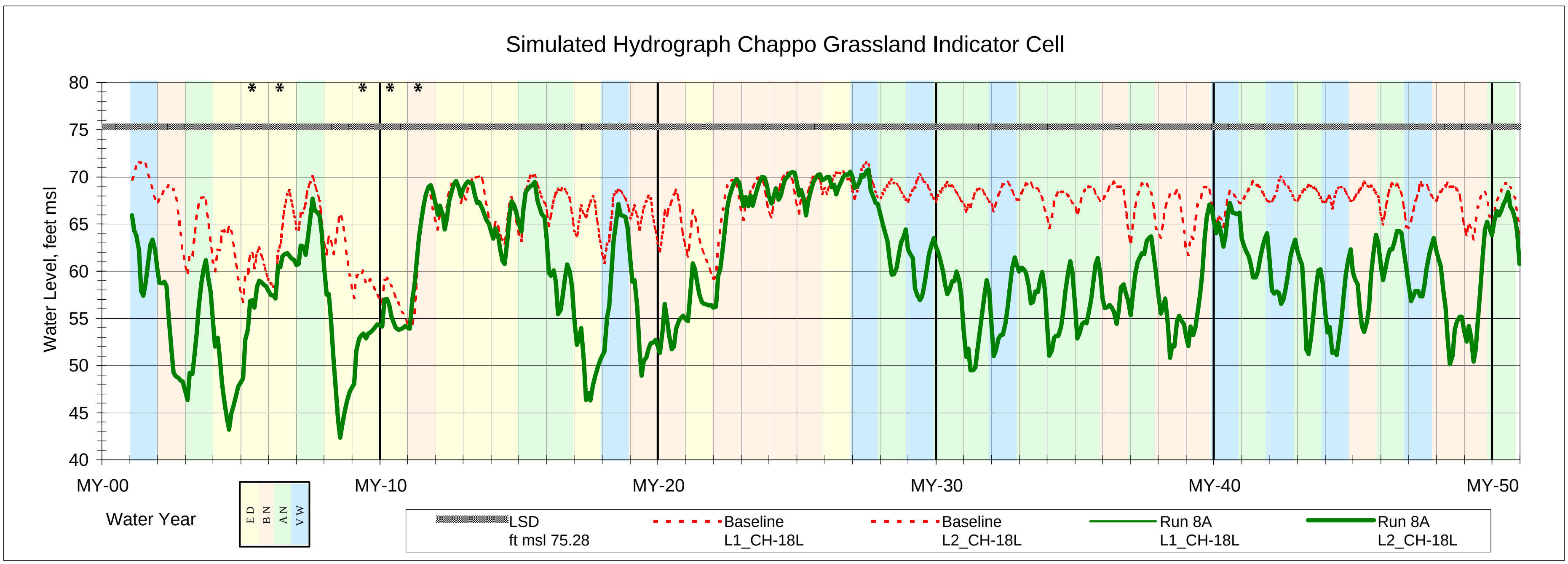
Layer 1 (L1) and Layer 2(L2) simulated groundwater levels are at similar elevations and the graph lines are printed on top of each other.

FIGURE L-5

Run 8A Proposed Action

C:\CPEN\Run8A\POST\C.IC-hydrographs_Run8A+WlAdj.xls / printed 9/20/2006



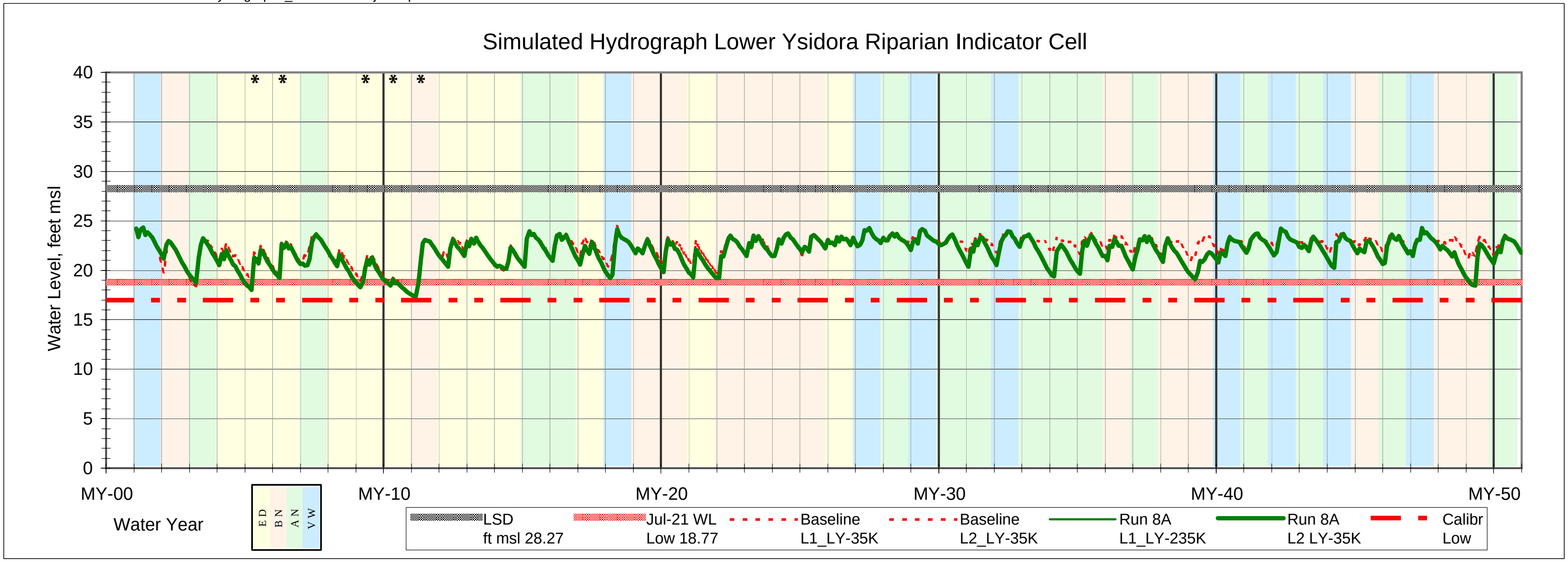


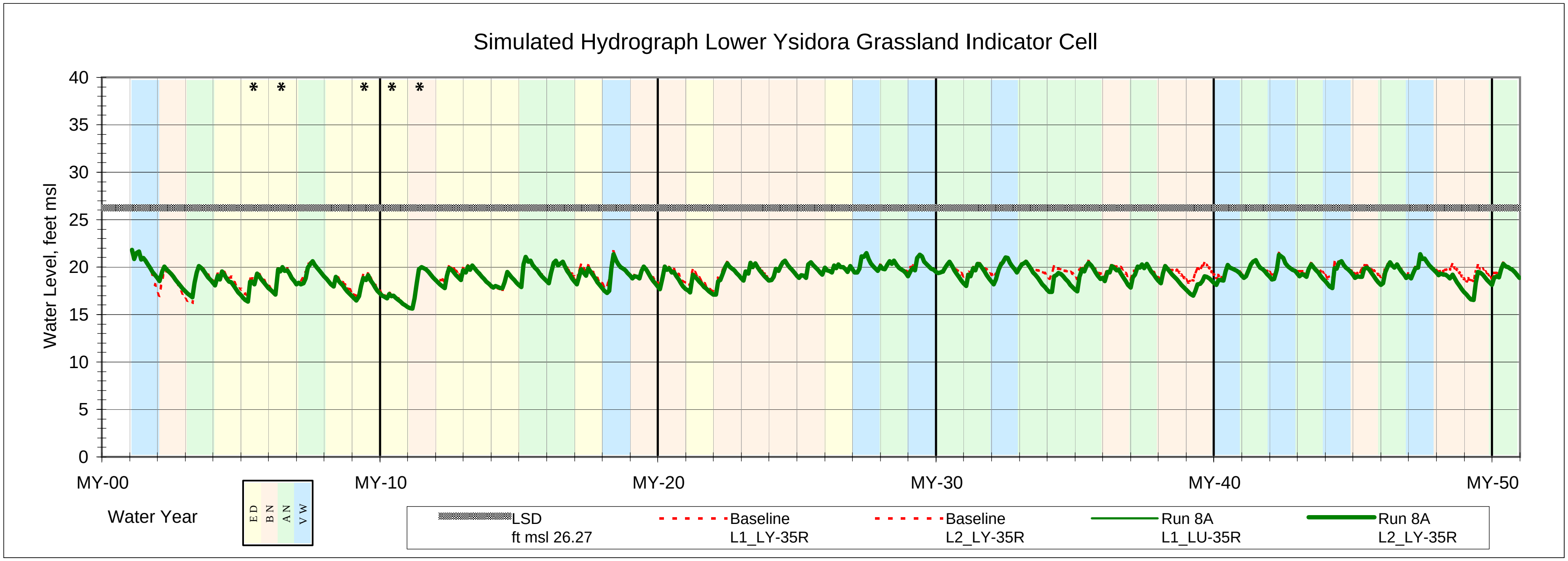
Emergency Water Called on Years Marked With *

Layer 1 (L1) and Layer 2(L2) simulated groundwater levels are at similar elevations and the graph lines are printed on top of each other.

FIGURE L-6
Run 8A Proposed Action

C:\CPEN\Run8A\POST\C.IC-hydrographs_Run8A+WlAdj.xls / printed 9/20/2006





Emergency Water Called on Years Marked With *

Layer 1 (L1) and Layer 2(L2) simulated groundwater levels are at similar elevations and the graph lines are printed on top of each other.

FIGURE L-7
Run 8A Proposed Action

Figure L-8. Simulated Streamflow, Run 8A Proposed Action

Table L-10. Run 8A Proposed Action

Average Hydrologic Condition Water Budget (af/y)

% Time Exceedence	> 76%	76% to 50%	50% to 19%	< 19%
# Years	12	14	15	9
	Extremely Dry	Below Normal	Above Normal	Very Wet
Inflow:				
Santa Margarita River Inflow	7,100	12,800	32,300	127,100
Subsurface Underflow	1,000	900	900	800
Lake O'Neill Spill and Release	700	1,400	1,800	2,200
Fallbrook Creek	100	400	1,400	3,800
Minor Tributary Drainages	1,700	1,400	2,400	4,900
Areal Precipitation	500	500	700	1,600
Total Inflow:	11,100	17,400	39,500	140,400
Outflow:				
Santa Margarita River Outflow	1,500	3,100	19,700	116,700
Subsurface Underflow	100	100	100	100
Groundwater Pumping	6,800	9,700	13,700	14,000
Evapotranspiration	1,900	2,300	2,500	2,900
Diversions to Lake O'Neill	1,100	1,800	2,400	2,700
CPEN Direct Diversion	0	400	1,600	3,100
Total Outflow:	11,400	17,400	40,000	139,500
Net Simulated Change of Groundwater in Storage:	-300	0	-500	900
	-	-	-	-

Median Hydrologic Condition Water Budget (af/y)

% Time Exceedence	> 76%	76% to 50%	50% to 19%	< 19%
# Years	12	14	15	9
	Extremely Dry	Below Normal	Above Normal	Very Wet
Inflow:				
Santa Margarita River Inflow	6,800	12,900	28,800	120,000
Subsurface Underflow	1,000	900	900	800
Lake O'Neill Spill and Release	700	1,300	2,100	2,300
Fallbrook Creek	100	300	1,100	3,500
Minor Tributary Drainages	1,500	1,400	2,500	4,700
Areal Precipitation	400	300	500	1,500
Outflow:				
Santa Margarita River Outflow	900	2,800	16,100	105,500
Subsurface Underflow	100	100	100	100
Groundwater Pumping	5,100	9,000	15,900	16,500
Evapotranspiration	1,500	2,000	2,400	2,800
Diversions to Lake O'Neill	1,000	1,700	2,700	2,700
CPEN Direct Diversion	0	200	1,500	3,300
Net Simulated Change of Groundwater in Storage:	100	0	-400	1,100

Average Subbasin Water Budget (af/y)

	Upper Ysidora	Chappo	Lower Ysidora	SMR Basin	
Inflow:					
Santa Margarita River Inflow	37,900	30,000	27,600	37,900	85%
Subsurface Underflow *	900	1,800	500	900	2%
Lake O'Neill Spill and Release	1,500	-	-	1,500	3%
Fallbrook Creek	1,200	-	-	1,200	3%
Minor Tributary Drainages	600	1,100	700	2,400	5%
Areal Precipitation	300	300	200	800	2%
Total Inflow:	42,400	33,200	29,000	44,700	
Outflow:					
Santa Margarita River Outflow	30,000	27,600	28,200	28,200	63%
Subsurface Underflow *	1,800	500	100	100	0%
Groundwater Pumping	6,800	4,200	0	11,000	25%
Evapotranspiration *	700	900	800	2,400	5%
Diversions to Lake O'Neill	1,900	-	-	1,900	4%
CPEN Direct Diversion	1,200	0	0	1,200	3%
Total Outflow:	42,400	33,200	29,100	44,800	
Net Simulated Change of Groundwater in Storage: *	0	0	-100	-100	
	-	-	-	-	

Note: * Subbasin Medians are based on the last rate of the stress period
Values are rounded to the nearest 100 acre-feet, closest number adjusted to eliminate rounding error

Median Subbasin Water Budget (af/y)

	Upper Ysidora	Chappo	Lower Ysidora	SMR Basin
Inflow:				
Santa Margarita River Inflow	15,800	7,600	5,500	15,800
Subsurface Underflow *	900	1,800	500	900
Lake O'Neill Spill and Release	1,500	-	-	1,500
Fallbrook Creek	600	-	-	600
Minor Tributary Drainages	600	1,100	700	2,100
Areal Precipitation	100	200	200	500
Outflow:				
Santa Margarita River Outflow	7,600	5,500	5,800	5,800
Subsurface Underflow *	1,800	500	100	100
Groundwater Pumping	6,900	4,500	0	11,100
Evapotranspiration *	700	900	800	2,400
Diversions to Lake O'Neill	2,100	-	-	2,100
CPEN Direct Diversion	714	0	0	714
Net Simulated Change of Groundwater in Storage: *	0	0	0	100

Note: The sum of median values does not reflect the change of groundwater in storage.
Median values are not cummulative.
* Subbasin Medians are based on the last rate of the stress period
Values are rounded to the nearest 100 acre-feet

Table L-11 Run 8A Annual Water budget
Lower Santa Margarita River Groundwater Model — Run 8A Proposed Action

Annual Surface Water Budget

MY		SMR Flow In	LON Diversion	Ponds Diversion	Str Gain+ / Loss-	GAGE SMR @ UY->CH	Str Gain+ / Loss-	SMR @ CH->LY	Str Gain+ / Loss-	Second Div to Fallbrook	SMR Flow Out	LSMR Str Gain+ / Loss-
1	VW	66,394	2,364	9,734	-8,533	57,861	-1,408	56,453	1,829	1,179	58,282	-8,112
2	BN	8,737	1,531	3,426	-6,492	2,244	-1,944	301	113	0	414	-8,323
3	AN	15,652	1,063	6,505	-8,977	6,675	-4,089	2,586	-129	529	2,457	-13,195
4	ED	6,759	1,323	2,646	-6,457	302	-288	14	302	0	316	-6,443
5	ED	6,753	569	1,449	-4,539	2,214	-835	1,379	347	0	1,726	-5,027
6	ED	6,281	635	1,799	-4,557	1,725	109	1,833	765	0	2,599	-3,683
7	AN	46,769	1,151	10,874	-7,011	39,758	-1,525	38,233	735	1,171	38,968	-7,801
8	ED	6,750	1,291	3,474	-6,135	616	-610	6	206	0	211	-6,539
9	ED	5,440	964	1,900	-5,280	161	-157	3	259	0	262	-5,178
10	ED	5,459	1,093	1,874	-5,253	206	-206	-	108	0	108	-5,350
11	BN	12,033	949	5,657	-5,428	6,605	-2,771	3,834	273	307	4,108	-7,925
12	ED	9,246	821	3,798	-5,123	4,123	-1,288	2,835	480	0	3,315	-5,930
13	ED	4,963	577	1,797	-2,717	2,247	-423	1,823	412	0	2,235	-2,728
14	ED	5,802	412	2,946	-4,826	976	-763	213	230	0	442	-5,360
15	AN	21,921	2,748	6,132	-5,460	16,461	-648	15,813	1,363	57	17,176	-4,745
16	AN	23,865	2,344	7,510	-10,379	13,486	-1,852	11,633	1,176	1,149	12,809	-11,056
CPEN D	ED	10,105	1,979	3,961	-8,779	1,326	CPEN Direct D	225	588	0	812	-9,293
18	VW	105,552	2,415	14,062	-4,911	100,640	-1,988	98,652	1,453	1,864	100,105	-5,447
19	BN	13,124	2,317	4,573	-8,947	4,177	-1,530	2,646	121	58	2,767	-10,356
20	BN	8,950	1,263	3,584	-6,342	2,609	-1,101	1,507	352	0	1,860	-7,091
21	ED	7,739	1,831	1,408	-5,344	2,394	-1,383	1,012	72	0	1,084	-6,655
22	BN	14,802	1,514	8,379	-6,417	8,386	-3,114	5,272	-45	864	5,226	-9,576
23	BN	12,321	1,607	2,949	-4,206	8,115	-876	7,239	691	0	7,930	-4,391
24	BN	11,377	1,699	5,702	-4,309	7,068	-1,252	5,815	516	182	6,332	-5,045
25	BN	10,296	944	5,554	-4,265	6,031	-1,301	4,730	440	96	5,170	-5,126
26	ED	10,316	1,278	3,157	-3,339	6,977	-738	6,239	809	0	7,047	-3,268
27	VW	126,820	2,935	20,296	-4,871	121,949	505	122,454	2,198	3,335	124,652	-2,168
28	AN	55,061	2,721	22,011	-12,512	42,549	-4,083	38,467	611	4,259	39,078	-15,983
29	VW	181,076	2,721	24,937	-11,034	170,042	-3,148	166,893	1,906	4,376	168,800	-12,276
30	AN	28,831	2,749	8,575	-10,557	18,274	-3,648	14,627	163	1,533	14,789	-14,042
31	AN	62,376	2,697	9,046	-10,125	52,251	-3,402	48,849	597	1,671	49,445	-12,930
32	VW	105,844	2,720	17,416	-10,640	95,204	-5,208	89,996	901	2,745	90,897	-14,947
33	AN	29,560	2,714	10,298	-10,898	18,662	-3,100	15,562	495	1,661	16,057	-13,503
34	AN	22,097	2,702	9,761	-12,663	9,434	-5,295	4,139	-29	1,713	4,110	-17,987
35	AN	39,296	2,235	9,948	-9,819	29,477	-4,200	25,277	537	1,262	25,814	-13,481
36	BN	14,221	2,155	5,089	-8,646	5,574	-3,150	2,424	172	19	2,597	-11,624
37	AN	19,246	1,923	5,805	-5,556	13,690	-3,452	10,238	499	522	10,737	-8,508
38	BN	12,659	1,727	4,895	-8,161	4,498	-1,862	2,637	375	259	3,012	-9,647
39	BN	13,137	1,982	6,536	-8,553	4,584	-4,253	331	-45	566	286	-12,851
40	VW	64,445	2,819	14,567	-7,744	56,701	-2,567	54,134	265	2,551	54,400	-10,045
41	AN	42,492	2,711	16,680	-12,924	29,567	-4,494	25,073	377	3,174	25,450	-17,041
42	VW	251,872	2,723	24,391	-9,920	241,952	-3,806	238,146	1,143	4,093	239,289	-12,583
CPEN D	AN	24,441	2,751	13,939	-13,188	11,253	CPEN Direct D	7,176	228	2,450	7,404	-17,037
44	VW	121,487	2,676	21,790	-12,488	109,000	-3,950	105,049	1,257	3,977	106,306	-15,181
45	BN	18,009	2,748	10,810	-11,991	6,018	-4,339	1,679	-20	1,833	1,659	-16,350
46	AN	29,997	2,138	9,618	-7,959	22,039	-2,865	19,174	617	1,513	19,791	-10,206
47	VW	120,008	2,716	23,452	-11,875	108,132	-3,929	104,203	1,329	4,032	105,532	-14,475
48	BN	13,181	2,744	7,205	-11,004	2,178	-1,758	420	129	863	549	-12,633
49	BN	15,897	1,871	7,483	-8,815	7,082	-4,052	3,030	-168	969	2,862	-13,035
50	AN	22,506	2,607	10,077	-7,636	14,870	-2,862	12,008	154	1,756	12,162	-10,344
	avg	37,839	1,943	8,789	**-7,872**	29,967	**-2,310**	27,646	**543**	1,172	28,189	**-9,650**
	med	15,775	2,060	6,871	-7,851	7,598	-1,966	5,543	394	714	5,779	-9,612
AVERAGES												
ED	12	7,134	1,064	2,517	(5,196)	1,939	(598)	1,298	381	-	1,680	-5,455
BN	14	12,767	1,789	5,846	(7,398)	5,369	(2,379)	2,990	207	430	3,198	-9,570
AN	15	32,274	2,350	10,452	(9,711)	22,563	(3,251)	19,257	493	1,628	19,750	-12,524
VW	9	127,055	2,676	18,961	(9,113)	117,942	(2,833)	115,109	1,365	3,128	116,474	-10,581
	50											
MEDIANS												
ED	12	6,752	1,029	2,273	(5,188)	1,525	(610)	618	324	-	948	-5,355
BN	14	12,891	1,713	5,605	(7,326)	5,796	(1,903)	2,642	151	220	2,814	-9,612
AN	15	28,831	2,697	9,761	(10,125)	18,274	(3,427)	15,562	499	1,533	16,057	-13,195
VW	9	120,008	2,720	20,296	(9,920)	108,132	(3,148)	104,203	1,329	3,335	105,532	-12,276
	50											

Table L-11 Run 8A Annual Water budget (continued)
Lower Santa Margarita River Groundwater Model

Annual Groundw ater Budget Model Run: Run 8A Proposed Action

	INFLOW:					OUTFLOW:					
MY	Storage	Recharge	Stream Leakance	GHB	TOTAL GW IN	Storage	Wells	ET	Stream Leakance	GHB	TOTAL GW OUT
1	8,300	9,646	9,576	870	28,392	5,096	15,454	2,792	5,008	66	28,416
2	6,793	3,629	6,237	938	17,596	2,370	12,933	1,707	550	55	17,614
3	5,448	6,199	10,579	988	23,214	8,439	10,354	1,792	2,593	52	23,229
4	6,724	2,949	4,963	958	15,594	3,236	10,815	1,188	315	53	15,606
5	3,402	1,766	6,596	1,080	12,844	6,534	4,640	1,355	286	48	12,863
6	3,457	2,553	5,161	1,044	12,215	4,731	5,101	1,829	511	56	12,228
7	6,299	10,331	7,314	916	24,860	7,282	8,193	2,525	6,805	62	24,868
8	8,159	3,629	3,756	943	16,487	3,255	11,435	1,370	402	49	16,511
9	2,378	2,273	5,037	993	10,681	4,096	5,099	1,173	266	48	10,682
10	2,133	1,993	3,480	974	8,579	2,199	5,101	1,092	159	41	8,593
11	3,338	5,838	9,040	902	19,119	7,612	5,099	2,336	4,028	51	19,126
12	3,049	4,008	6,334	926	14,317	4,663	5,101	2,719	1,796	54	14,332
13	3,822	2,105	3,981	913	10,821	1,219	5,099	2,810	1,654	59	10,841
14	3,579	3,290	4,690	953	12,512	4,052	5,101	2,192	1,129	52	12,527
15	5,195	7,144	6,453	876	19,668	4,291	8,191	2,913	4,229	66	19,689
16	6,522	7,016	11,077	889	25,504	4,747	15,907	2,252	2,544	64	25,514
17	6,481	4,295	8,232	923	19,931	5,388	12,518	1,458	521	57	19,942
18	6,687	13,278	9,410	862	30,238	10,374	8,193	2,505	9,121	63	30,256
19	7,551	4,823	7,408	900	20,682	4,532	13,136	1,841	1,141	56	20,706
20	4,626	3,969	6,646	913	16,154	4,520	8,999	1,653	939	57	16,168
21	3,308	1,697	5,592	974	11,571	3,540	6,191	1,554	259	49	11,594
22	4,091	7,886	8,049	886	20,912	7,911	5,101	2,693	5,158	58	20,921
23	2,973	3,425	6,033	907	13,338	3,152	5,101	2,973	2,071	60	13,357
24	3,359	5,994	6,508	878	16,739	3,737	5,099	3,159	4,697	64	16,756
25	3,496	5,987	6,251	895	16,629	4,548	5,099	3,085	3,854	63	16,649
26	2,913	3,646	6,412	888	13,859	2,339	5,101	3,230	3,127	66	13,864
27	6,297	17,918	7,073	831	32,119	6,405	8,191	3,409	14,050	74	32,129
28	6,802	18,159	9,681	817	35,459	5,140	15,904	3,010	11,354	68	35,477
29	5,776	21,485	11,596	810	39,667	6,894	17,103	2,909	12,691	72	39,668
30	6,396	7,314	9,784	868	24,362	2,576	16,758	2,431	2,576	62	24,403
31	6,389	7,824	11,669	879	26,761	6,263	16,414	1,885	2,156	61	26,778
32	5,953	15,096	13,974	845	35,868	8,657	16,965	2,433	7,757	69	35,881
33	5,960	9,148	9,137	868	25,112	3,069	16,552	2,254	3,166	61	25,102
34	5,298	8,260	12,420	882	26,860	5,794	16,208	1,910	2,936	52	26,900
35	5,303	9,068	12,443	872	27,686	6,315	16,253	2,202	2,844	61	27,676
36	5,301	5,441	10,147	888	21,777	4,040	14,141	1,967	1,602	59	21,810
37	4,910	5,831	10,331	888	21,961	5,638	11,570	2,420	2,270	63	21,962
38	6,104	4,913	9,091	907	21,015	4,665	13,131	1,811	1,359	55	21,022
39	4,054	6,152	9,780	904	20,891	7,229	8,999	1,981	2,645	49	20,903
40	5,992	12,006	7,484	872	26,354	6,497	9,275	2,803	7,741	58	26,374
41	5,553	13,820	10,882	847	31,102	4,927	15,680	2,771	7,661	64	31,101
42	6,545	21,120	11,800	813	40,278	7,215	17,264	2,780	12,945	67	40,271
43	7,257	11,639	9,780	852	29,527	5,388	16,736	2,424	4,945	59	29,552
44	7,821	18,457	12,098	833	39,210	8,898	17,126	2,401	10,755	62	39,243
45	6,267	9,275	9,940	863	26,345	5,374	14,876	2,202	3,845	57	26,354
46	5,418	8,425	8,953	868	23,664	5,280	11,547	2,567	4,199	62	23,655
47	5,854	20,317	12,190	829	39,190	7,622	16,483	2,739	12,277	70	39,191
48	6,635	6,635	7,484	872	21,625	2,893	15,037	1,846	1,827	56	21,658
49	5,326	6,749	9,137	907	22,119	8,173	8,999	1,885	3,044	48	22,149
50	5,854	8,678	7,668	868	23,067	5,441	9,275	2,840	5,450	61	23,066
avg	5,343	8,062	8,387	897	22,689	5,285	10,973	2,281	4,105	59	22,704
med	5,665	6,692	8,593	888	21,869	5,118	11,125	2,369	2,890	59	21,886
AVERAGES											
ED	4,117	2,850	5,353	964	13,284	3,771	6,775	1,831	869	53	13,299
BN	4,994	5,765	7,982	897	19,639	5,054	9,696	2,224	2,626	56	19,657
AN	5,907	9,257	9,878	879	25,920	5,373	13,703	2,413	4,382	61	25,932
VW	6,581	16,592	10,578	841	34,591	7,518	14,006	2,752	10,261	67	34,603
MEDIANS											
ED	3,430	2,751	5,099	955	12,678	3,796	5,101	1,506	457	53	12,695
BN	4,963	5,913	7,766	901	20,786	4,540	8,999	1,974	2,358	56	20,804
AN	5,854	8,425	9,784	872	25,112	5,388	15,904	2,424	3,166	62	25,102
VW	6,297	17,918	11,596	833	35,868	7,215	16,483	2,780	10,755	67	35,881

Table L-11 Run 8A Annual Water budget (continued)
Lower Santa Margarita River Groundwater Model

MY	NET Storage	NET Str Lknc		In-Out	**% bal**
1	-3,204	-4,568		-23.3	-0.08%
2	-4,423	-5,687		-17.4	-0.10%
3	2,990	-7,985		-15.3	-0.07%
4	-3,488	-4,649		-12.3	-0.08%
5	3,132	-6,310		-18.9	-0.15%
6	1,274	-4,650		-13.8	-0.11%
7	983	-509		-7.6	-0.03%
8	-4,904	-3,354		-24.4	-0.15%
9	1,717	-4,770		-0.6	-0.01%
10	67	-3,321		-13.3	-0.15%
11	4,275	-5,012		-7.7	-0.04%
12	1,614	-4,538		-15.3	-0.11%
13	-2,603	-2,326		-20.1	-0.19%
14	473	-3,561		-14.7	-0.12%
15	-904	-2,225		-20.8	-0.11%
16	-1,775	-8,533		-10.7	-0.04%
17	-1,093	-7,711		-11.3	-0.06%
18	3,687	-289		-18.2	-0.06%
19	-3,019	-6,267		-24.1	-0.12%
20	-106	-5,707		-13.1	-0.08%
21	232	-5,333		-23.0	-0.20%
22	3,820	-2,890		-9.6	-0.05%
23	179	-3,962		-19.1	-0.14%
24	379	-1,811		-16.7	-0.10%
25	1,051	-2,397		-20.1	-0.12%
26	-574	-3,285		-4.5	-0.03%
27	108	6,977		-10.0	-0.03%
28	-1,662	1,674		-17.5	-0.05%
29	1,118	1,095		-1.3	0.00%
30	-3,820	-7,208		-41.5	-0.17%
31	-126	-9,513		-17.6	-0.07%
32	2,704	-6,217		-13.4	-0.04%
33	-2,890	-5,971		10.1	0.04%
34	496	-9,483		-40.3	-0.15%
35	1,012	-9,598		10.4	0.04%
36	-1,260	-8,545		-33.3	-0.15%
37	728	-8,060		-1.5	-0.01%
38	-1,439	-7,732		-7.3	-0.03%
39	3,175	-7,135		-11.9	-0.06%
40	505	257		-19.3	-0.07%
41	-627	-3,221		0.7	0.00%
42	670	1,146		6.4	0.02%
43	-1,869	-4,835		-24.8	-0.08%
44	1,077	-1,343		-32.6	-0.08%
45	-893	-6,095		-9.0	-0.03%
46	-138	-4,754		8.7	0.04%
47	1,768	87		-1.4	0.00%
48	-3,742	-5,657		-33.1	-0.15%
49	2,847	-6,093		-29.8	-0.13%
50	-413	-2,218		1.1	0.00%
avg	-58	-4,282		-14.1	-0.07%
med	143	-4,702		-14.3	-0.07%
AVERAGES					
ED	-346	-4,484		-14.4	-0.11%
BN	60	-5,356		-18.0	-0.09%
AN	-534	-5,496		-11.1	-0.04%
VW	937	-317		-12.6	-0.04%
MEDIANS					
ED	149	-4,593		-14.3	-0.12%
BN	37	-5,697		-17.0	-0.10%
AN	-413	-5,971		-10.7	-0.04%
VW	1,077	87		-13.4	-0.04%

Table L-12 Run 8A Proposed Action Average Monthly Water Budget

Lower Santa Margarita River Groundwater Model — Run 8A Proposed Action

Modflow Volumetric Budget Output and Streamflow — 9/19/06

Avg AF/M	SMR Flow In	Diversion	Str Gain+ / Loss-	SMR @ UY->CH	Str Gain+ / Loss-	SMR @ CH->LY	Str Gain+ / Loss-	SMR Flow Out	LSMR Str Gain+ / Loss-
Oct	542	329	-388	154	-87	67	17	84	-458
Nov	1,265	621	43	1,307	-508	800	-4	796	-469
Dec	1,938	496	-712	1,225	-176	1,050	51	1,100	-837
Jan	8,344	823	-1,053	7,291	-134	7,157	137	7,294	-1,049
Feb	10,247	2,077	-1,786	8,461	-137	8,324	116	8,439	-1,807
Mar	8,827	2,351	-1,515	7,312	-250	7,062	106	7,169	-1,659
Apr	3,137	1,554	-772	2,365	-306	2,059	45	2,105	-1,033
May	1,308	958	-443	865	-267	598	11	609	-699
Jun	720	553	-141	579	-229	349	8	357	-363
Jul	498	341	-290	208	-136	72	12	84	-414
Aug	462	287	-366	96	-51	45	24	69	-393
Sep	551	341	-449	103	-40	62	20	82	-469
Avg Monthly	3,153	894	-656	2,497	-193	2,304	45	2,349	-804
Med Monthly	1,286	587	-446	1,045	-156	699	22	703	-584
Avg Total=Anl	CPEN Direct D	10,732	-7,872	29,967	-2,322	27,646	543	CPEN Direc	-9,650

Lower Santa Margarita River Groundwater Model

Modflow Volumetric Budget Output

Average Monthly Water Budget

	INFLOW:					OUTFLOW:									
Avg AF/M	Storage	Recharge	Stream Leakance	GHB	TOTAL IN	Storage	Wells	ET	Stream Leakance	GHB	TOTAL OUT	NET Storage	NET Str Lknc	In-Out	% bal
Oct	552	109	412	80	1,154	77	856	161	55	8	1,156	-476	-357	-2.7	-0.23%
Nov	143	614	1,272	78	2,106	917	930	167	83	8	2,104	774	-1,189	2.2	0.10%
Dec	539	154	869	79	1,640	286	1,081	182	85	7	1,643	-252	-784	-2.6	-0.16%
Jan	378	357	1,233	78	2,046	506	1,260	186	86	5	2,043	128	-1,147	2.3	0.11%
Feb	283	1,906	911	75	3,175	1,435	1,224	182	336	0	3,177	1,152	-575	-1.5	-0.05%
Mar	182	2,172	938	74	3,366	1,114	1,145	213	890	1	3,363	932	-48	3.0	0.09%
Apr	402	1,337	766	68	2,573	448	935	215	967	9	2,574	46	201	-0.8	-0.03%
May	574	776	557	69	1,977	213	772	221	761	9	1,977	-361	204	0.5	0.02%
Jun	643	226	470	69	1,407	131	642	206	425	7	1,410	-512	-45	-2.9	-0.21%
Jul	575	117	375	74	1,141	48	675	199	219	4	1,146	-527	-156	-5.0	-0.43%
Aug	471	117	286	78	952	42	610	185	121	0	957	-429	-165	-5.0	-0.52%
Sep	602	176	297	76	1,151	69	843	165	75	1	1,153	-533	-221	-1.6	-0.14%
Avg Monthly	445	672	699	75	1,891	440	914	190	342	5	1,892	-5	-357	-1.2	-0.12%
Med Monthly	505	291	662	76	1,809	250	893	185	170	6	1,810	-306	-193	-1.5	-0.09%
Avg Total=Anl	5,343	8,062	8,387	897	22,689	5,285	10,973	2,281	4,105	59	22,704	-58	-4,282	-14.1	

Table L-11 Run 8A Annual Water budget

Lower Santa Margarita River Groundwater Model — Run 8A Proposed Action

Annual Surface Water Budget

MY		SMR Flow In	LON Diversion	Ponds Diversion	Str Gain+ / Loss-	GAGE SMR @ UY->CH	Str Gain+ / Loss-	SMR @ CH->LY	Str Gain+ / Loss-	Second Div to Fallbrook	SMR Flow Out	LSMR Str Gain+ / Loss-
1	VW	66,394	2,364	9,734	-8,533	57,861	-1,408	56,453	1,829	1,179	58,282	-8,112
2	BN	8,737	1,531	3,426	-6,492	2,244	-1,944	301	113	0	414	-8,323
3	AN	15,652	1,063	6,505	-8,977	6,675	-4,089	2,586	-129	529	2,457	-13,195
4	ED	6,759	1,323	2,646	-6,457	302	-288	14	302	0	316	-6,443
5	ED	6,753	569	1,449	-4,539	2,214	-835	1,379	347	0	1,726	-5,027
6	ED	6,281	635	1,799	-4,557	1,725	109	1,833	765	0	2,599	-3,683
7	AN	46,769	1,151	10,874	-7,011	39,758	-1,525	38,233	735	1,171	38,968	-7,801
8	ED	6,750	1,291	3,474	-6,135	616	-610	6	206	0	211	-6,539
9	ED	5,440	964	1,900	-5,280	161	-157	3	259	0	262	-5,178
10	ED	5,459	1,093	1,874	-5,253	206	-206	-	108	0	108	-5,350
11	BN	12,033	949	5,657	-5,428	6,605	-2,771	3,834	273	307	4,108	-7,925
12	ED	9,246	821	3,798	-5,123	4,123	-1,288	2,835	480	0	3,315	-5,930
13	ED	4,963	577	1,797	-2,717	2,247	-423	1,823	412	0	2,235	-2,728
14	ED	5,802	412	2,946	-4,826	976	-763	213	230	0	442	-5,360
15	AN	21,921	2,748	6,132	-5,460	16,461	-648	15,813	1,363	57	17,176	-4,745
16	AN	23,865	2,344	7,510	-10,379	13,486	-1,852	11,633	1,176	1,149	12,809	-11,056
17	ED	10,105	1,979	3,961	-8,779	1,326	-1,101	225	588	0	812	-9,293
18	VW	105,552	2,415	14,062	-4,911	100,640	-1,988	98,652	1,453	1,864	100,105	-5,447
19	BN	13,124	2,317	4,573	-8,947	4,177	-1,530	2,646	121	58	2,767	-10,356
20	BN	8,950	1,263	3,584	-6,342	2,609	-1,101	1,507	352	0	1,860	-7,091
21	ED	7,739	1,831	1,408	-5,344	2,394	-1,383	1,012	72	0	1,084	-6,655
22	BN	14,802	1,514	8,379	-6,417	8,386	-3,114	5,272	-45	864	5,226	-9,576
23	BN	12,321	1,607	2,949	-4,206	8,115	-876	7,239	691	0	7,930	-4,391
24	BN	11,377	1,699	5,702	-4,309	7,068	-1,252	5,815	516	182	6,332	-5,045
25	BN	10,296	944	5,554	-4,265	6,031	-1,301	4,730	440	96	5,170	-5,126
26	ED	10,316	1,278	3,157	-3,339	6,977	-738	6,239	809	0	7,047	-3,268
27	VW	126,820	2,935	20,296	-4,871	121,949	505	122,454	2,198	3,335	124,652	-2,168
28	AN	55,061	2,721	22,011	-12,512	42,549	-4,083	38,467	611	4,259	39,078	-15,983
29	VW	181,076	2,721	24,937	-11,034	170,042	-3,148	166,893	1,906	4,376	168,800	-12,276
30	AN	28,831	2,749	8,575	-10,557	18,274	-3,648	14,627	163	1,533	14,789	-14,042
31	AN	62,376	2,697	9,046	-10,125	52,251	-3,402	48,849	597	1,671	49,445	-12,930
32	VW	105,844	2,720	17,416	-10,640	95,204	-5,208	89,996	901	2,745	90,897	-14,947
33	AN	29,560	2,714	10,298	-10,898	18,662	-3,100	15,562	495	1,661	16,057	-13,503
34	AN	22,097	2,702	9,761	-12,663	9,434	-5,295	4,139	-29	1,713	4,110	-17,987
35	AN	39,296	2,235	9,948	-9,819	29,477	-4,200	25,277	537	1,262	25,814	-13,481
36	BN	14,221	2,155	5,089	-8,646	5,574	-3,150	2,424	172	19	2,597	-11,624
37	AN	19,246	1,923	5,805	-5,556	13,690	-3,452	10,238	499	522	10,737	-8,508
38	BN	12,659	1,727	4,895	-8,161	4,498	-1,862	2,637	375	259	3,012	-9,647
39	BN	13,137	1,982	6,536	-8,553	4,584	-4,253	331	-45	566	286	-12,851
40	VW	64,445	2,819	14,567	-7,744	56,701	-2,567	54,134	265	2,551	54,400	-10,045
41	AN	42,492	2,711	16,680	-12,924	29,567	-4,494	25,073	377	3,174	25,450	-17,041
42	VW	251,872	2,723	24,391	-9,920	241,952	-3,806	238,146	1,143	4,093	239,289	-12,583
43	AN	24,441	2,751	13,939	-13,188	11,253	-4,077	7,176	228	2,450	7,404	-17,037
44	VW	121,487	2,676	21,790	-12,488	109,000	-3,950	105,049	1,257	3,977	106,306	-15,181
45	BN	18,009	2,748	10,810	-11,991	6,018	-4,339	1,679	-20	1,833	1,659	-16,350
46	AN	29,997	2,138	9,618	-7,959	22,039	-2,865	19,174	617	1,513	19,791	-10,206
47	VW	120,008	2,716	23,452	-11,875	108,132	-3,929	104,203	1,329	4,032	105,532	-14,475
48	BN	13,181	2,744	7,205	-11,004	2,178	-1,758	420	129	863	549	-12,633
49	BN	15,897	1,871	7,483	-8,815	7,082	-4,052	3,030	-168	969	2,862	-13,035
50	AN	22,506	2,607	10,077	-7,636	14,870	-2,862	12,008	154	1,756	12,162	-10,344
	avg	37,839	1,943	8,789	**-7,872**	29,967	**-2,322**	27,646	**543**	1,172	28,189	**-9,650**
	med	15,775	2,060	6,871	-7,851	7,598	-1,966	5,543	394	714	5,779	-9,612
AVERAGES												
ED	12	7,134	1,064	2,517	(5,196)	1,939	(640)	1,298	381	-	1,680	-5,455
BN	14	12,767	1,789	5,846	(7,398)	5,369	(2,379)	2,990	207	430	3,198	-9,570
AN	15	32,274	2,350	10,452	(9,711)	22,563	(3,306)	19,257	493	1,628	19,750	-12,524
VW	9	127,055	2,676	18,961	(9,113)	117,942	(2,833)	115,109	1,365	3,128	116,474	-10,581
	50											
MEDIANS												
ED	12	6,752	1,029	2,273	(5,188)	1,525	(674)	618	324	-	948	-5,355
BN	14	12,891	1,713	5,605	(7,326)	5,796	(1,903)	2,642	151	220	2,814	-9,612
AN	15	28,831	2,697	9,761	(10,125)	18,274	(3,452)	15,562	499	1,533	16,057	-13,195
VW	9	120,008	2,720	20,296	(9,920)	108,132	(3,148)	104,203	1,329	3,335	105,532	-12,276
	50											

Table L-11 Run 8A Annual Water budget (continued)

Lower Santa Margarita River Groundwater Model

Annual Groundw ater Budget Model Run: Run 8A Proposed Action

MY	INFLOW: Storage	Recharge	Stream Leakance	GHB	TOTAL GW IN	OUTFLOW: Storage	Wells	ET	Stream Leakance	GHB	TOTAL GW OUT
1	8,300	9,646	9,576	870	28,392	5,096	15,454	2,792	5,008	66	28,416
2	6,793	3,629	6,237	938	17,596	2,370	12,933	1,707	550	55	17,614
3	5,448	6,199	10,579	988	23,214	8,439	10,354	1,792	2,593	52	23,229
4	6,724	2,949	4,963	958	15,594	3,236	10,815	1,188	315	53	15,606
5	3,402	1,766	6,596	1,080	12,844	6,534	4,640	1,355	286	48	12,863
6	3,457	2,553	5,161	1,044	12,215	4,731	5,101	1,829	511	56	12,228
7	6,299	10,331	7,314	916	24,860	7,282	8,193	2,525	6,805	62	24,868
8	8,159	3,629	3,756	943	16,487	3,255	11,435	1,370	402	49	16,511
9	2,378	2,273	5,037	993	10,681	4,096	5,099	1,173	266	48	10,682
10	2,133	1,993	3,480	974	8,579	2,199	5,101	1,092	159	41	8,593
11	3,338	5,838	9,040	902	19,119	7,612	5,099	2,336	4,028	51	19,126
12	3,049	4,008	6,334	926	14,317	4,663	5,101	2,719	1,796	54	14,332
13	3,822	2,105	3,981	913	10,821	1,219	5,099	2,810	1,654	59	10,841
14	3,579	3,290	4,690	953	12,512	4,052	5,101	2,192	1,129	52	12,527
15	5,195	7,144	6,453	876	19,668	4,291	8,191	2,913	4,229	66	19,689
16	6,522	7,016	11,077	889	25,504	4,747	15,907	2,252	2,544	64	25,514
17	6,481	4,295	8,232	923	19,931	5,388	12,518	1,458	521	57	19,942
18	6,687	13,278	9,410	862	30,238	10,374	8,193	2,505	9,121	63	30,256
19	7,551	4,823	7,408	900	20,682	4,532	13,136	1,841	1,141	56	20,706
20	4,626	3,969	6,646	913	16,154	4,520	8,999	1,653	939	57	16,168
21	3,308	1,697	5,592	974	11,571	3,540	6,191	1,554	259	49	11,594
22	4,091	7,886	8,049	886	20,912	7,911	5,101	2,693	5,158	58	20,921
23	2,973	3,425	6,033	907	13,338	3,152	5,101	2,973	2,071	60	13,357
24	3,359	5,994	6,508	878	16,739	3,737	5,099	3,159	4,697	64	16,756
25	3,496	5,987	6,251	895	16,629	4,548	5,099	3,085	3,854	63	16,649
26	2,913	3,646	6,412	888	13,859	2,339	5,101	3,230	3,127	66	13,864
27	6,297	17,918	7,073	831	32,119	6,405	8,191	3,409	14,050	74	32,129
28	6,802	18,159	9,681	817	35,459	5,140	15,904	3,010	11,354	68	35,477
29	5,776	21,485	11,596	810	39,667	6,894	17,103	2,909	12,691	72	39,668
30	6,396	7,314	9,784	868	24,362	2,576	16,758	2,431	2,576	62	24,403
31	6,389	7,824	11,669	879	26,761	6,263	16,414	1,885	2,156	61	26,778
32	5,953	15,096	13,974	845	35,868	8,657	16,965	2,433	7,757	69	35,881
33	5,960	9,148	9,137	868	25,112	3,069	16,552	2,254	3,166	61	25,102
34	5,298	8,260	12,420	882	26,860	5,794	16,208	1,910	2,936	52	26,900
35	5,303	9,068	12,443	872	27,686	6,315	16,253	2,202	2,844	61	27,676
36	5,301	5,441	10,147	888	21,777	4,040	14,141	1,967	1,602	59	21,810
37	4,910	5,831	10,331	888	21,961	5,638	11,570	2,420	2,270	63	21,962
38	6,104	4,913	9,091	907	21,015	4,665	13,131	1,811	1,359	55	21,022
39	4,054	6,152	9,780	904	20,891	7,229	8,999	1,981	2,645	49	20,903
40	5,992	12,006	7,484	872	26,354	6,497	9,275	2,803	7,741	58	26,374
41	5,553	13,820	10,882	847	31,102	4,927	15,680	2,771	7,661	64	31,101
42	6,545	21,120	11,800	813	40,278	7,215	17,264	2,780	12,945	67	40,271
43	7,257	11,639	9,780	852	29,527	5,388	16,736	2,424	4,945	59	29,552
44	7,821	18,457	12,098	833	39,210	8,898	17,126	2,401	10,755	62	39,243
45	6,267	9,275	9,940	863	26,345	5,374	14,876	2,202	3,845	57	26,354
46	5,418	8,425	8,953	868	23,664	5,280	11,547	2,567	4,199	62	23,655
47	5,854	20,317	12,190	829	39,190	7,622	16,483	2,739	12,277	70	39,191
48	6,635	6,635	7,484	872	21,625	2,893	15,037	1,846	1,827	56	21,658
49	5,326	6,749	9,137	907	22,119	8,173	8,999	1,885	3,044	48	22,149
50	5,854	8,678	7,668	868	23,067	5,441	9,275	2,840	5,450	61	23,066
avg	5,343	8,062	8,387	897	22,689	5,285	10,973	2,281	4,105	59	22,704
med	5,665	6,692	8,593	888	21,869	5,118	11,125	2,369	2,890	59	21,886
AVERAGES											
ED	4,117	2,850	5,353	964	13,284	3,771	6,775	1,831	869	53	13,299
BN	4,994	5,765	7,982	897	19,639	5,054	9,696	2,224	2,626	56	19,657
AN	5,907	9,257	9,878	879	25,920	5,373	13,703	2,413	4,382	61	25,932
VW	6,581	16,592	10,578	841	34,591	7,518	14,006	2,752	10,261	67	34,603
MEDIANS											
ED	3,430	2,751	5,099	955	12,678	3,796	5,101	1,506	457	53	12,695
BN	4,963	5,913	7,766	901	20,786	4,540	8,999	1,974	2,358	56	20,804
AN	5,854	8,425	9,784	872	25,112	5,388	15,904	2,424	3,166	62	25,102
VW	6,297	17,918	11,596	833	35,868	7,215	16,483	2,780	10,755	67	35,881

Table L-11 Run 8A Annual Water budget (continued)
Lower Santa Margarita River Groundwater Model

MY	NET Storage	NET Str Lknc		In-Out	**% bal**
1	-3,204	-4,568		-23.3	-0.08%
2	-4,423	-5,687		-17.4	-0.10%
3	2,990	-7,985		-15.3	-0.07%
4	-3,488	-4,649		-12.3	-0.08%
5	3,132	-6,310		-18.9	-0.15%
6	1,274	-4,650		-13.8	-0.11%
7	983	-509		-7.6	-0.03%
8	-4,904	-3,354		-24.4	-0.15%
9	1,717	-4,770		-0.6	-0.01%
10	67	-3,321		-13.3	-0.15%
11	4,275	-5,012		-7.7	-0.04%
12	1,614	-4,538		-15.3	-0.11%
13	-2,603	-2,326		-20.1	-0.19%
14	473	-3,561		-14.7	-0.12%
15	-904	-2,225		-20.8	-0.11%
16	-1,775	-8,533		-10.7	-0.04%
17	-1,093	-7,711		-11.3	-0.06%
18	3,687	-289		-18.2	-0.06%
19	-3,019	-6,267		-24.1	-0.12%
20	-106	-5,707		-13.1	-0.08%
21	232	-5,333		-23.0	-0.20%
22	3,820	-2,890		-9.6	-0.05%
23	179	-3,962		-19.1	-0.14%
24	379	-1,811		-16.7	-0.10%
25	1,051	-2,397		-20.1	-0.12%
26	-574	-3,285		-4.5	-0.03%
27	108	6,977		-10.0	-0.03%
28	-1,662	1,674		-17.5	-0.05%
29	1,118	1,095		-1.3	0.00%
30	-3,820	-7,208		-41.5	-0.17%
31	-126	-9,513		-17.6	-0.07%
32	2,704	-6,217		-13.4	-0.04%
33	-2,890	-5,971		10.1	0.04%
34	496	-9,483		-40.3	-0.15%
35	1,012	-9,598		10.4	0.04%
36	-1,260	-8,545		-33.3	-0.15%
37	728	-8,060		-1.5	-0.01%
38	-1,439	-7,732		-7.3	-0.03%
39	3,175	-7,135		-11.9	-0.06%
40	505	257		-19.3	-0.07%
41	-627	-3,221		0.7	0.00%
42	670	1,146		6.4	0.02%
43	-1,869	-4,835		-24.8	-0.08%
44	1,077	-1,343		-32.6	-0.08%
45	-893	-6,095		-9.0	-0.03%
46	-138	-4,754		8.7	0.04%
47	1,768	87		-1.4	0.00%
48	-3,742	-5,657		-33.1	-0.15%
49	2,847	-6,093		-29.8	-0.13%
50	-413	-2,218		1.1	0.00%
avg	-58	-4,282		-14.1	-0.07%
med	143	-4,702		-14.3	-0.07%
AVERAGES					
ED	-346	-4,484		-14.4	-0.11%
BN	60	-5,356		-18.0	-0.09%
AN	-534	-5,496		-11.1	-0.04%
VW	937	-317		-12.6	-0.04%
MEDIANS					
ED	149	-4,593		-14.3	-0.12%
BN	37	-5,697		-17.0	-0.10%
AN	-413	-5,971		-10.7	-0.04%
VW	1,077	87		-13.4	-0.04%

Table L-12 Run 8A Proposed Action Average Monthly Water Budget

Lower Santa Margarita River Groundwater Model — Run 8A Proposed Action

Modflow Volumetric Budget Output and Streamflow — 9/19/06

Avg AF/M	SMR Flow In	Diversion	Str Gain+ / Loss-	SMR @ UY->CH	Str Gain+ / Loss-	SMR @ CH->LY	Str Gain+ / Loss-	SMR Flow Out	LSMR Str Gain+ / Loss-
Oct	542	329	-388	154	-87	67	17	84	-458
Nov	1,265	621	43	1,307	-508	800	-4	796	-469
Dec	1,938	496	-712	1,225	-176	1,050	51	1,100	-837
Jan	8,344	823	-1,053	7,291	-134	7,157	137	7,294	-1,049
Feb	10,247	2,077	-1,786	8,461	-137	8,324	116	8,439	-1,807
Mar	8,827	2,351	-1,515	7,312	-250	7,062	106	7,169	-1,659
Apr	3,137	1,554	-772	2,365	-306	2,059	45	2,105	-1,033
May	1,308	958	-443	865	-267	598	11	609	-699
Jun	720	553	-141	579	-229	349	8	357	-363
Jul	498	341	-290	208	-136	72	12	84	-414
Aug	462	287	-366	96	-51	45	24	69	-393
Sep	551	341	-449	103	-40	62	20	82	-469
Avg Monthly	3,153	894	-656	2,497	-193	2,304	45	2,349	-804
Med Monthly	1,286	587	-446	1,045	-156	699	22	703	-584
Avg Total=Anl	37,839	10,732	-7,872	29,967	-2,322	27,646	543	28,189	-9,650

Lower Santa Margarita River Groundwater Model

Modflow Volumetric Budget Output

Average Monthly Water Budget

	INFLOW:					**OUTFLOW:**									
Avg AF/M	Storage	Recharge	Stream Leakance	GHB	TOTAL IN	Storage	Wells	ET	Stream Leakance	GHB	TOTAL OUT	NET Storage	NET Str Lknc	In-Out	% bal
Oct	552	109	412	80	1,154	77	856	161	55	8	1,156	-476	-357	-2.7	-0.23%
Nov	143	614	1,272	78	2,106	917	930	167	83	8	2,104	774	-1,189	2.2	0.10%
Dec	539	154	869	79	1,640	286	1,081	182	85	7	1,643	-252	-784	-2.6	-0.16%
Jan	378	357	1,233	78	2,046	506	1,260	186	86	5	2,043	128	-1,147	2.3	0.11%
Feb	283	1,906	911	75	3,175	1,435	1,224	182	336	0	3,177	1,152	-575	-1.5	-0.05%
Mar	182	2,172	938	74	3,366	1,114	1,145	213	890	1	3,363	932	-48	3.0	0.09%
Apr	402	1,337	766	68	2,573	448	935	215	967	9	2,574	46	201	-0.8	-0.03%
May	574	776	557	69	1,977	213	772	221	761	9	1,977	-361	204	0.5	0.02%
Jun	643	226	470	69	1,407	131	642	206	425	7	1,410	-512	-45	-2.9	-0.21%
Jul	575	117	375	74	1,141	48	675	199	219	4	1,146	-527	-156	-5.0	-0.43%
Aug	471	117	286	78	952	42	610	185	121	0	957	-429	-165	-5.0	-0.52%
Sep	602	176	297	76	1,151	69	843	165	75	1	1,153	-533	-221	-1.6	-0.14%
Avg Monthly	445	672	699	75	1,891	440	914	190	342	5	1,892	-5	-357	-1.2	-0.12%
Med Monthly	505	291	662	76	1,809	250	893	185	170	6	1,810	-306	-193	-1.5	-0.09%
Avg Total=Anl	5,343	8,062	8,387	897	22,689	5,285	10,973	2,281	4,105	59	22,704	-58	-4,282	-14.1	

Attachment M

Run 9 (Maximize Chappo) Model Results

Table M-1 Run9 Annual Pumping Summary
LOWER SANTA MARGARITA RIVER GROUNDWATER MODEL

Hydrologic Condition			Pumping Condition		Run9 CH	Run9 Ch	Run9 UY & Ch		
HC	Cnt	**Oct to Apr Strflw**	PC	HC	Q Adjst	Anl Q	Anl Q	Cnt	
VW	9	Very Wet > 56,164	1	2+ AN @ VW	4,900	19,000	18,550	5	10%
AN	15	Above Normal > 13,600	2	2+ AN @ AN	2,900	17,000	16,550	9	18%
BN	14	Below Normal < 13,600	3	Standard	500	14,600	14,600	10	20%
ED	12	Extremely Dry < 5,840	4	1st BN	-3,000	11,100	10,600	6	12%
	50		5	2ndBN, 70/30 split	-5,000	9,555	7,137	3	6%
			6	3+BN/all ED	-9,000	5,355	5,177	17	34%
			*UY SAME AS RUN1!					50	100%

MY	WY	HC	Oct-Apr HC descrip	May-Apr Pumping Condition	UY Total (af/y)	CH Total (af/y)	LY Total (af/y)	LSMR Total (af/y)
1	1952	VW	Very Wet	3	8,571	7,657	-	16,227
2	1953	BN	Below Normal	4	7,224	6,270	-	13,495
3	1954	AN	Above Normal	3	5,733	5,223	-	10,956
4	1955	ED	Extremely Dry	6	6,744	3,690	-	10,434
5	1956	ED	Extremely Dry	6	3,761	1,410	-	5,171
6	1957	ED	Extremely Dry	6	4,080	1,607	-	5,687
7	1958	AN	Above Normal	3	5,366	3,365	-	8,730
8	1959	ED	Extremely Dry	6	6,744	4,982	-	11,726
9	1960	ED	Extremely Dry	6	3,932	1,607	-	5,538
10	1961	ED	Extremely Dry	6	3,429	1,607	-	5,035
11	1962	BN	Below Normal	6	3,813	1,607	-	5,419
12	1963	ED	Extremely Dry	6	4,080	1,607	-	5,687
13	1964	ED	Extremely Dry	6	4,080	1,607	-	5,687
14	1965	ED	Extremely Dry	6	4,080	1,607	-	5,687
15	1966	AN	Above Normal	3	5,366	3,365	-	8,730
16	1967	AN	Above Normal	2	8,748	7,952	-	16,700
17	1968	ED	Extremely Dry	6	7,301	5,655	-	12,955
18	1969	VW	Very Wet	3	5,366	3,365	-	8,730
19	1970	BN	Below Normal	4	7,224	6,461	-	13,686
20	1971	BN	Below Normal	5	5,335	4,527	-	9,862
21	1972	ED	Extremely Dry	6	4,620	2,456	-	7,076
22	1973	BN	Below Normal	6	4,080	1,607	-	5,687
23	1974	BN	Below Normal	6	4,080	1,607	-	5,687
24	1975	BN	Below Normal	6	4,080	1,607	-	5,687
25	1976	BN	Below Normal	6	4,080	1,607	-	5,687
26	1977	ED	Extremely Dry	6	4,080	1,607	-	5,687
27	1978	VW	Very Wet	3	5,366	3,365	-	8,730
28	1979	AN	Above Normal	2	8,748	7,952	-	16,700
29	1980	VW	Very Wet	1	9,649	8,853	-	18,503
30	1981	AN	Above Normal	2	9,444	8,674	-	18,119
31	1982	AN	Above Normal	2	8,967	8,258	-	17,226
32	1983	VW	Very Wet	1	9,529	8,748	-	18,277
33	1984	AN	Above Normal	2	9,177	8,441	-	17,618
34	1985	AN	Above Normal	2	8,906	8,204	-	17,110
35	1986	AN	Above Normal	2	8,936	8,231	-	17,167
36	1987	BN	Below Normal	4	7,781	7,238	-	15,019
37	1988	AN	Above Normal	3	6,361	5,875	-	12,235
38	1989	BN	Below Normal	4	7,224	6,461	-	13,686
39	1990	BN	Below Normal	5	5,335	4,527	-	9,862
40	1991	VW	Very Wet	3	5,905	4,215	-	10,120
41	1992	AN	Above Normal	2	8,623	7,793	-	16,415
42	1993	VW	Very Wet	1	9,775	8,963	-	18,738
43	1994	AN	Above Normal	2	9,444	8,674	-	18,119
44	1995	VW	Very Wet	1	9,649	8,853	-	18,503
45	1996	BN	Below Normal	4	8,523	7,886	-	16,408
46	1997	AN	Above Normal	3	6,361	5,875	-	12,235
47	1998	VW	Very Wet	1	9,305	8,388	-	17,693
48	1999	BN	Below Normal	4	8,822	6,384	-	15,206
49	2000	BN	Below Normal	5	5,371	3,594	-	8,965
50	2001	AN	Above Normal	3	5,905	4,215	-	10,120
				Min	3,429	1,410	-	5,035
Notes:				Max	9,570	8,963	-	18,738
Hydrologic Condition: Oct - Apr				**Median**	**6,361**	**5,102**	**-**	**11,341**
Model starts after 3+ BN or ED				% of Median	56.1%	45.0%	0.0%	
				Average	**6,564**	**5,106**	**-**	**11,688**
				% of Average	59.3%	43.7%	0.0%	

Table M-1 Run9 Annual Pumping Summary (continued)

Oct-Apr HC descrip	HC Count	UY Total (af/y)	CH Total (af/y)	LY Total (af/y)	LSMR Total (af/y)
AVERAGES					
ED	12	4,744	2,453	-	7,197
BN	14	5,927	4,384	-	10,311
AN	15	7,739	6,806	-	14,545
VW	9	8,124	6,934	-	15,058
MEDIANS					
ED	12	4,080	1,607	-	5,687
BN	14	5,353	4,527	-	9,862
AN	15	8,748	7,952	-	16,700
VW	9	9,305	8,388	-	17,693

Average Monthly Pumping, Run 9

	Month	UY Total (af/m)	CH Total (af/m)	LY Total (af/m)	LSMR Total (af/m)
8%	Oct	512	399	0	911
8%	Nov	554	433	0	987
10%	Dec	641	502	0	1,144
11%	Jan	755	587	0	1,342
11%	Feb	736	573	0	1,309
10%	Mar	689	535	0	1,224
9%	Apr	565	429	0	994
7%	May	464	360	0	824
6%	Jun	386	299	0	685
6%	Jul	406	315	0	720
6%	Aug	366	284	0	650
8%	Sep	507	391	0	898
	Avg Anl	6,582	5,106	0	11,688

Table M-2. Run 9 Pumping Summaries

LOWER SANTA MARGARITA RIVER GROUNDWATER MODEL

		Bldg #	State ID #	Label	# mos Q	% of 600 mos	Orig Wells by Subbsn %	80% Utilization af/m	
1	UY	2673	10/4-7A2	7A2	600	100%	25%	142	
2	UY	26072	10/4-8D1	8D1	600	100%	21%	121	
3	UY	2671	10/4-7H2	7H2	600	100%	15%	82	
4	UY	PW-6	PW-6	PW-6	600	100%	19%	110	
5	UY	2603	10/4-7R2	7R2	600	100%	19%	110	
6	UY	NEW	UY-1	UY-1	244	41%	**0%**	110	
7	UY	NEW	UY-2	UY-2	172	29%	**0%**	110	
8	UY	NEW	UY-3	UY-3	114	19%	**0%**	110	
9	UY	NEW	UY-4	UY-4	68	11%	**0%**	110	
	UY	NEW	UY-5	UY-5	33	6%	**0%**	110	
	UY	NEW	UY-6	UY-6	9	2%	**0%**	110	
10	CH	2393	10/4-18E3	18E4	571	95%	14%	110	
11	CH	2373	0/4-18M4&	18M5	600	100%	18%	110	
12	CH	2363	10/5-13R2	13R2	599	100%	16%	121	
13	CH	33925	10/5-23G4	R23G4	**0**	**0%**	**0%**	153	backup
14	CH	2301	10/5-23J1	23J1	600	100%	20%	132	
15	CH	2301	10/5-23K2	23K2	**0**	**0%**	**0%**	132	
16	CH	33923	10/5-23K3	23K3	571	95%	16%	132	backup
17	CH	CH-1	CH-1	CH-1	58	10%	**0%**	164	
18	CH	CH-2	CH-2	CH-2	33	6%	**0%**	132	
19	CH	CH-3	CH-3	CH-3	9	2%	**0%**	88	
20	CH	CH-4	CH-4	CH-4	572	95%	**0%**	153	Replaced 23G4

% Pumping in Subbas		Wet Year Subbasin Split			Dry Year Subbasin Split			Max Pumping in Subbasin adding wells as needed				
		70%	**30%**	**0%**	**52%**	**48%**	**0%**					
mo	Anl %	UY	CH	LY	UY	CH	LY		UY	CH	LY	Total
OCT	7.9%	5.6%	2.4%	0.00%	4.1%	3.8%	0.00%	# exst wells	5	7	-	12
NOV	8.6%	6.0%	2.6%	0.00%	4.5%	4.1%	0.00%	af/m (80%)	564	833	-	1,397
DEC	10.0%	7.0%	3.0%	0.00%	5.2%	4.8%	0.00%	avg af/well	113	119	-	116
JAN	11.4%	8.0%	3.4%	0.00%	5.9%	5.5%	0.00%					
FEB	10.9%	7.7%	3.3%	0.00%	5.7%	5.3%	0.00%	1 adntl well	674	921	55	1,650
MAR	10.2%	7.1%	3.1%	0.00%	5.3%	4.9%	0.00%	2 adntl well	784	1,008	110	1,902
APR	8.3%	5.8%	2.5%	0.00%	4.3%	4.0%	0.00%	3 adntl well	893	1,096	164	2,154
MAY	7.1%	5.0%	2.1%	0.00%	3.7%	3.4%	0.00%	4 adntl well	1,003	1,184	219	2,406
JUN	5.9%	4.1%	1.8%	0.00%	3.1%	2.8%	0.00%	5 adntl well	1,112	1,271		2,384
JUL	6.2%	4.3%	1.9%	0.00%	3.2%	3.0%	0.00%	6 adntl well	1,222			1,222
AUG	5.6%	3.9%	1.7%	0.00%	2.9%	2.7%	0.00%	50-yr Avg	5,844	4,875	1,225	
SEP	7.8%	5.4%	2.3%	0.00%	4.0%	3.7%	0.00%	50-yr Med	5,705	5,330	1,161	

median

	UY af/m	CH af/m	LY af/m	Total af/m	Max Mo Pumping	cfs	new wells
ED	352	176	0	580	1,944	34	8
BN	415	293	0	646	2,179	38	10
AN	616	545	0	1,170	2,179	38	10
VW	625	565	0	1,183	2,238	39	10

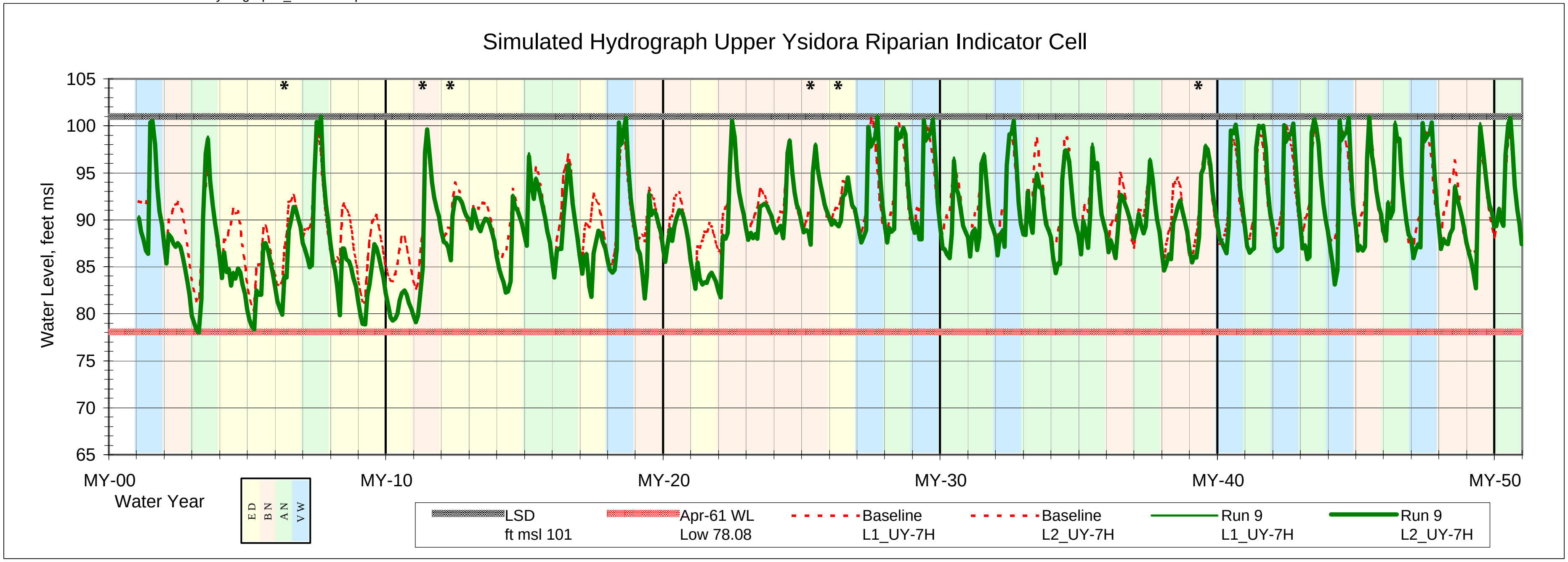
Wet Year Algorithm Monthly Counts

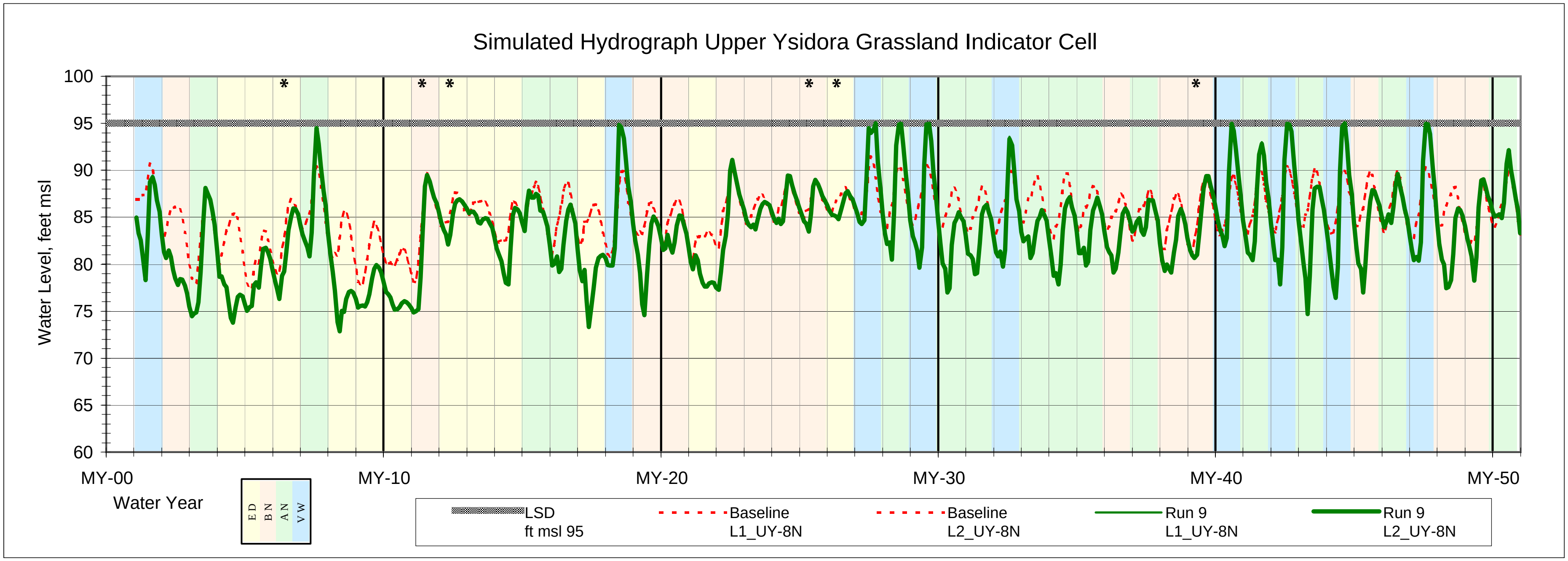
	2,900	4,900	Total	% of 50 yrs
Oct	-	-	-	0%
Nov	-	-	-	0%
Dec	1	-	1	2%
Jan	7	1	8	16%
Feb	7	4	11	22%
Mar	9	5	14	28%
Apr	9	5	14	28%
May	-	-	-	0%
	33	15	48	

			Table M-3 Run 9 Annual Pumping by Well										
		Building #:	2673	26072	2671	PW-6	2603	new	new	new	new	new	new
	Max Annual Pumping		1,617	1,368	933	1,244	1,244	1,136	940	732	530	316	205
	Potential w/ 80% Util		1,710	1,447	986	1,315	1,315	1,315	1,315	1,315	1,315	1,315	1,315
	Potential Well Yield (gpm)		1,300	1,100	750	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
				UY	UY	UY	UY	UY	UY	UY	UY	UY	UY
			10/4-7A2	10/4-8D1	10/4-7H2	PW-6	10/4-7R2	UY-1	UY-2	UY-3	UY-4	UY-5	UY-6
MY	WY	HC	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)
1	1952	VW	1,529	1,294	882	1,176	1,176	900	603	506	306	200	0
2	1953	BN	1,387	1,174	800	1,067	1,067	716	504	407	100	0	0
3	1954	AN	1,324	1,120	764	1,018	1,018	488	0	0	0	0	0
4	1955	ED	1,266	1,071	731	974	974	716	504	407	100	0	0
5	1956	ED	949	803	548	730	730	0	0	0	0	0	0
6	1957	ED	1,030	871	594	792	792	0	0	0	0	0	0
7	1958	AN	1,305	1,105	753	1,004	1,004	194	0	0	0	0	0
8	1959	ED	1,266	1,071	731	974	974	716	504	407	100	0	0
9	1960	ED	992	840	573	763	763	0	0	0	0	0	0
10	1961	ED	866	732	499	666	666	0	0	0	0	0	0
11	1962	BN	962	814	555	740	740	0	0	0	0	0	0
12	1963	ED	1,030	871	594	792	792	0	0	0	0	0	0
13	1964	ED	1,030	871	594	792	792	0	0	0	0	0	0
14	1965	ED	1,030	871	594	792	792	0	0	0	0	0	0
15	1966	AN	1,305	1,105	753	1,004	1,004	194	0	0	0	0	0
16	1967	AN	1,588	1,344	916	1,221	1,221	917	712	412	314	103	0
17	1968	ED	1,273	1,077	734	979	979	721	721	413	304	100	0
18	1969	VW	1,305	1,105	753	1,004	1,004	194	0	0	0	0	0
19	1970	BN	1,387	1,174	800	1,067	1,067	716	504	407	100	0	0
20	1971	BN	1,273	1,077	734	979	979	294	0	0	0	0	0
21	1972	ED	1,166	987	673	897	897	0	0	0	0	0	0
22	1973	BN	1,030	871	594	792	792	0	0	0	0	0	0
23	1974	BN	1,030	871	594	792	792	0	0	0	0	0	0
24	1975	BN	1,030	871	594	792	792	0	0	0	0	0	0
25	1976	BN	1,030	871	594	792	792	0	0	0	0	0	0
26	1977	ED	1,030	871	594	792	792	0	0	0	0	0	0
27	1978	VW	1,305	1,105	753	1,004	1,004	194	0	0	0	0	0
28	1979	AN	1,588	1,344	916	1,221	1,221	917	712	412	314	103	0
29	1980	VW	1,605	1,358	926	1,235	1,235	1,127	931	519	306	306	100
30	1981	AN	1,600	1,354	923	1,231	1,231	927	825	622	420	209	102
31	1982	AN	1,607	1,360	927	1,236	1,236	932	830	423	314	103	0
32	1983	VW	1,617	1,368	933	1,244	1,244	1,136	940	528	315	206	0
33	1984	AN	1,592	1,347	918	1,224	1,224	920	818	616	414	103	0
34	1985	AN	1,599	1,353	922	1,230	1,230	926	824	416	307	100	0
35	1986	AN	1,603	1,356	925	1,233	1,233	929	827	420	311	100	0
36	1987	BN	1,394	1,179	804	1,072	1,072	721	721	413	304	100	0
37	1988	AN	1,482	1,254	855	1,140	1,140	488	0	0	0	0	0
38	1989	BN	1,387	1,174	800	1,067	1,067	716	504	407	100	0	0
39	1990	BN	1,273	1,077	734	979	979	294	0	0	0	0	0
40	1991	VW	1,442	1,220	832	1,109	1,109	194	0	0	0	0	0
41	1992	AN	1,585	1,341	914	1,219	1,219	915	709	410	311	0	0
42	1993	VW	1,608	1,361	928	1,237	1,237	1,129	933	521	308	308	205
43	1994	AN	1,600	1,354	923	1,231	1,231	927	825	622	420	209	102
44	1995	VW	1,605	1,358	926	1,235	1,235	1,127	931	519	306	306	100
45	1996	BN	1,395	1,180	805	1,073	1,073	722	722	722	418	309	102
46	1997	AN	1,482	1,254	855	1,140	1,140	488	0	0	0	0	0
47	1998	VW	1,583	1,339	913	1,218	1,218	1,110	810	507	303	203	100
48	1999	BN	1,433	1,212	827	1,102	1,102	732	732	732	530	316	102
49	2000	BN	1,281	1,084	739	985	985	298	0	0	0	0	0
50	2001	AN	1,442	1,220	832	1,109	1,109	194	0	0	0	0	0
		Min	866	732	499	666	666	0	0	0	0	0	0
		Max	1,617	1,368	933	1,244	1,244	1,136	940	732	530	316	205
		Median	1,356	1,147	782	1,043	1,043	488	0	0	0	0	0
		Average	1,330	1,126	768	1,023	1,023	497	353	235	141	68	18
			Average Monthly Well Production										
		Month	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)
		Oct	108	91	62	83	83	48	27	10	0	0	0
		Nov	112	95	65	86	86	49	49	11	0	0	0
		Dec	121	103	70	93	93	50	50	50	11	0	0
		Jan	127	108	73	98	98	61	49	49	49	35	10
		Feb	128	108	74	98	98	63	51	51	40	17	8
		Mar	120	102	69	93	93	60	49	49	39	16	0
		Apr	115	97	66	89	89	51	40	17	2	0	0
		May	103	87	59	79	79	47	10	0	0	0	0
		Jun	95	80	55	73	73	10	0	0	0	0	0
		Jul	100	84	58	77	77	10	0	0	0	0	0
		Aug	92	78	53	71	71	0	0	0	0	0	0
		Sep	109	92	63	84	84	49	28	0	0	0	0
	Annual Total		1,330	1,126	768	1,023	1,023	497	353	235	141	68	18

			Table M-3 Run 9 Annual Pumping by Well										
	Building #:		2393	2373	2363	33925	2301	33924	33923	new	new	new	new
	Max Annual Pumping		316	1,205	1,534	1,315	0	1,644	0	1,315	339	251	168
	Potential w/ 80% Util		1,315	1,447	1,841	1,578	1,578	1,973	0	1,578	1,052	1,052	1,052
	Potential Well Yield (gpm)		1,000	1,100	1,400	1,200	1,200	1,500	0	1,200	800	800	800
			CH	CH	CH	CH	CH	CH	CH	CH	CH	CH	CH
			10/4-18E3	10/4-18M4&5	10/5-13R2	10/5-23G4	10/5-23J1	10/5-23K2	10/5-23K3	CH-1	CH-2	CH-3	CH-4
MY	WY	HC	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)
1	1952	VW	1,049	1,335	1,144	0	1,430	0	1,144	247	162	0	1,144
2	1953	BN	875	1,190	1,020	0	1,275	0	955	0	0	0	955
3	1954	AN	645	1,082	928	0	1,160	0	704	0	0	0	704
4	1955	ED	270	967	829	0	1,036	0	294	0	0	0	294
5	1956	ED	171	296	254	0	317	0	186	0	0	0	186
6	1957	ED	233	296	254	0	317	0	254	0	0	0	254
7	1958	AN	487	620	531	0	664	0	531	0	0	0	531
8	1959	ED	676	967	737	0	1,036	0	737	0	0	0	829
9	1960	ED	233	296	254	0	317	0	254	0	0	0	254
10	1961	ED	233	296	254	0	317	0	254	0	0	0	254
11	1962	BN	233	296	254	0	317	0	254	0	0	0	254
12	1963	ED	233	296	254	0	317	0	254	0	0	0	254
13	1964	ED	233	296	254	0	317	0	254	0	0	0	254
14	1965	ED	233	296	254	0	317	0	254	0	0	0	254
15	1966	AN	487	620	531	0	664	0	531	0	0	0	531
16	1967	AN	1,102	1,403	1,203	0	1,503	0	1,203	253	83	0	1,203
17	1968	ED	720	1,065	913	0	1,141	0	785	166	81	0	785
18	1969	VW	487	620	531	0	664	0	531	0	0	0	531
19	1970	BN	935	1,190	1,020	0	1,275	0	1,020	0	0	0	1,020
20	1971	BN	655	834	715	0	893	0	715	0	0	0	715
21	1972	ED	356	452	388	0	485	0	388	0	0	0	388
22	1973	BN	233	296	254	0	317	0	254	0	0	0	254
23	1974	BN	233	296	254	0	317	0	254	0	0	0	254
24	1975	BN	233	296	254	0	317	0	254	0	0	0	254
25	1976	BN	233	296	254	0	317	0	254	0	0	0	254
26	1977	ED	233	296	254	0	317	0	254	0	0	0	254
27	1978	VW	487	620	531	0	664	0	531	0	0	0	531
28	1979	AN	1,102	1,403	1,203	0	1,503	0	1,203	253	83	0	1,203
29	1980	VW	1,198	1,524	1,307	0	1,633	0	1,307	248	248	82	1,307
30	1981	AN	1,170	1,489	1,276	0	1,595	0	1,276	339	170	83	1,276
31	1982	AN	1,147	1,459	1,251	0	1,564	0	1,251	253	83	0	1,251
32	1983	VW	1,205	1,534	1,315	0	1,644	0	1,315	254	166	0	1,315
33	1984	AN	1,161	1,478	1,267	0	1,584	0	1,267	333	83	0	1,267
34	1985	AN	1,140	1,451	1,244	0	1,554	0	1,244	248	81	0	1,244
35	1986	AN	1,143	1,455	1,247	0	1,559	0	1,247	250	81	0	1,247
36	1987	BN	1,012	1,288	1,104	0	1,380	0	1,104	166	81	0	1,104
37	1988	AN	850	1,082	928	0	1,160	0	928	0	0	0	928
38	1989	BN	935	1,190	1,020	0	1,275	0	1,020	0	0	0	1,020
39	1990	BN	655	834	715	0	893	0	715	0	0	0	715
40	1991	VW	610	776	665	0	832	0	665	0	0	0	665
41	1992	AN	1,103	1,404	1,204	0	1,505	0	1,204	169	0	0	1,204
42	1993	VW	1,201	1,528	1,310	0	1,637	0	1,310	251	251	168	1,310
43	1994	AN	1,170	1,489	1,276	0	1,595	0	1,276	339	170	83	1,276
44	1995	VW	1,198	1,524	1,307	0	1,633	0	1,307	248	248	82	1,307
45	1996	BN	1,044	1,329	1,139	0	1,424	0	1,139	338	251	83	1,139
46	1997	AN	850	1,082	928	0	1,160	0	928	0	0	0	928
47	1998	VW	1,154	1,469	1,259	0	1,574	0	1,259	165	165	82	1,259
48	1999	BN	572	1,329	1,139	0	1,424	0	624	338	251	83	624
49	2000	BN	362	834	715	0	893	0	395	0	0	0	395
50	2001	AN	610	776	665	0	832	0	665	0	0	0	665
		Min	171	296	254	0	317	0	186	0	0	0	186
		Max	1,205	1,534	1,315	0	1,644	0	1,315	339	251	168	1,315
		Median	655	1,016	871	0	1,088	0	715	0	0	0	715
		Average	696	931	796	0	997	0	759	97	55	15	761
		Month	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)
		Oct	56	75	64	0	80	0	61	0	0	0	61
		Nov	61	82	70	0	87	0	67	0	0	0	67
		Dec	70	93	80	0	100	0	76	9	0	0	76
		Jan	73	99	84	0	106	0	80	28	28	8	80
		Feb	73	98	84	0	106	0	79	33	14	7	79
		Mar	69	94	80	0	100	0	75	28	13	0	75
		Apr	59	82	69	0	88	0	65	0	0	0	66
		May	51	67	58	0	72	0	56	0	0	0	56
		Jun	43	56	48	0	60	0	47	0	0	0	47
		Jul	45	59	50	0	63	0	49	0	0	0	49
		Aug	40	53	45	0	57	0	44	0	0	0	44
		Sep	55	74	63	0	79	0	60	0	0	0	60
	Annual Total		696	931	796	0	997	0	759	97	55	15	761

C:\CPEN\Run9\POST\C.IC-hydrographs_Run9.xls / printed 9/15/2006





***** Emergency flows called upon during water years marked with an asterisk.

Layer 1 (L1) and Layer 2(L2) simulated groundwater levels are at similar elevations and the graph lines are printed on top of each other.

FIGURE M-1 Run 9
Baseline Hydrographs

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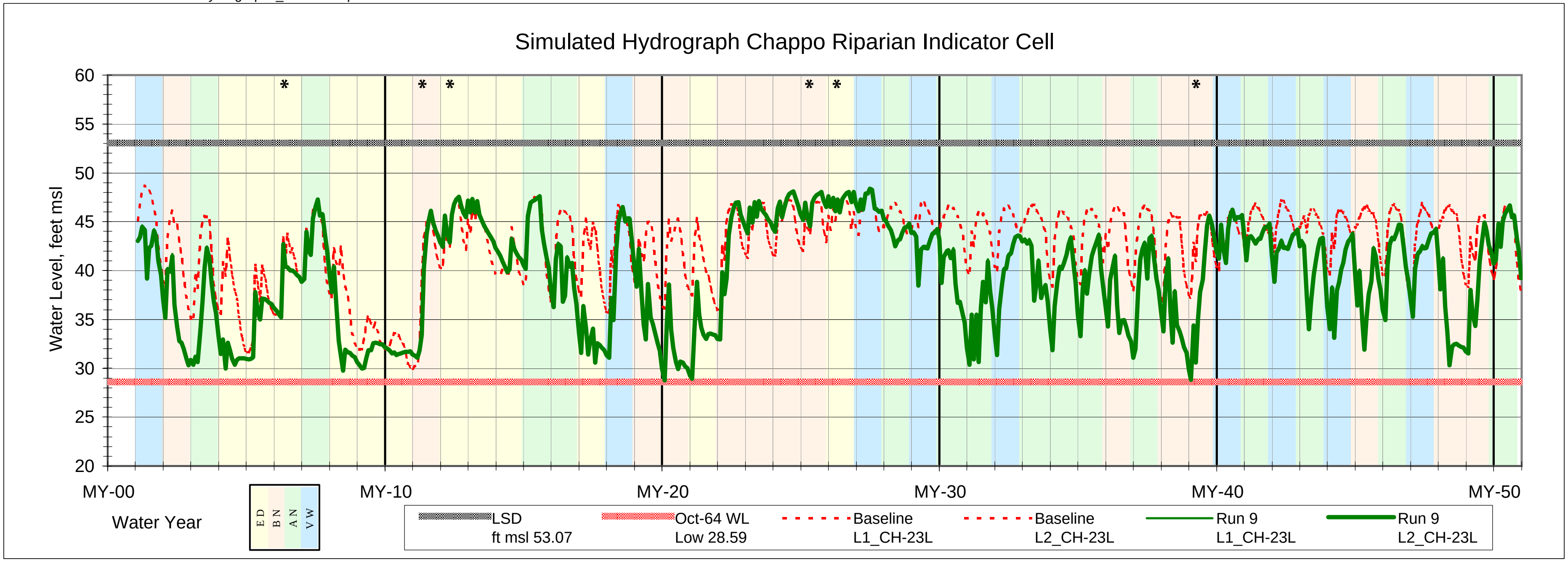

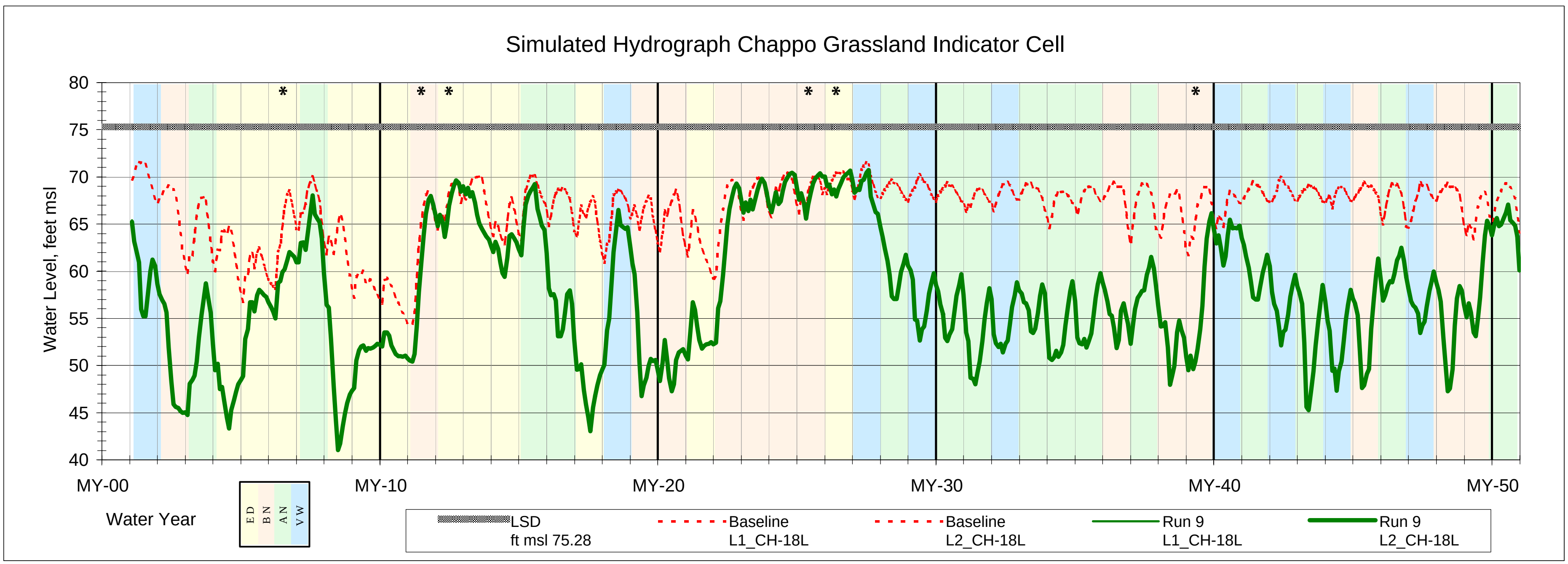

***** Emergency flows called upon during water years marked with an asterisk.

Layer 1 (L1) and Layer 2(L2) simulated groundwater levels are at similar elevations and the graph lines are printed on top of each other.

FIGURE M-2 Run 9
Baseline Hydrographs

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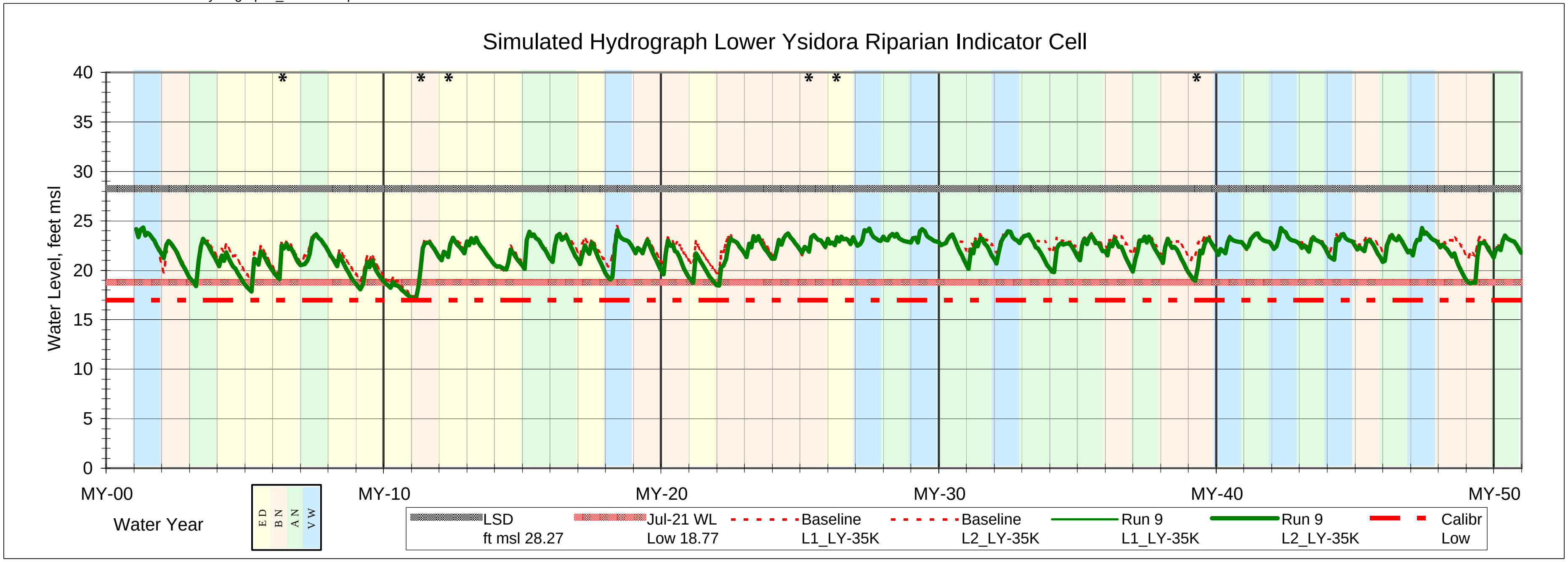

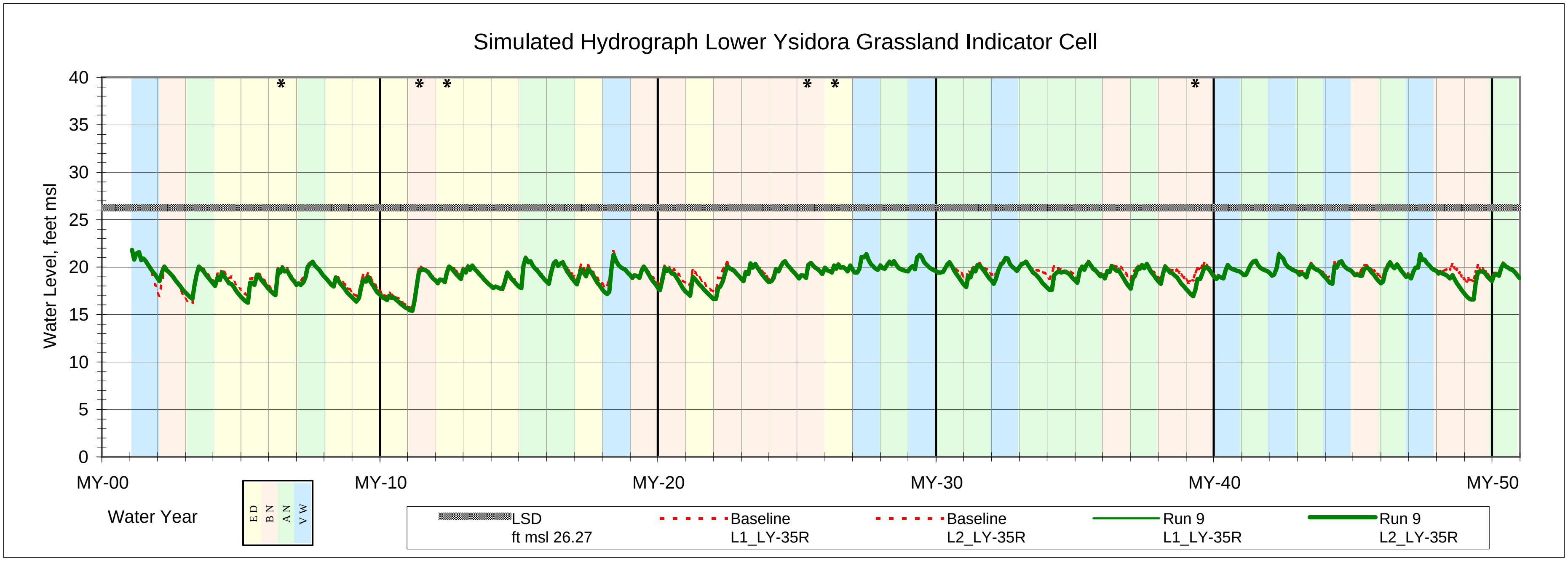

* Emergency flows called upon during water years marked with an asterisk.

Layer 1 (L1) and Layer 2(L2) simulated groundwater levels are at similar elevations and the graph lines are printed on top of each other.

FIGURE M-3 Run 9

Baseline Hydrographs

Figure M-4. Simulated Streamflow, Run 9 Basin Yield and Baseline

Table M-4. Run 9 Project Water Budget

Average Hydrologic Condition Water Budget (af/y)

% Time Exceedence	*> 76%*	*76% to 50%*	*50% to 19%*	*< 19%*
# Years	*12*	*14*	*15*	*9*
	Extremely Dry	Below Normal	Above Normal	Very Wet
Inflow:				
Santa Margarita River Inflow	7,400	13,300	32,300	127,100
Subsurface Underflow	1,000	900	900	800
Lake O'Neill Spill and Release	800	1,400	1,800	2,200
Fallbrook Creek	100	400	1,400	3,800
Minor Tributary Drainages	1,700	1,400	2,400	4,900
Areal Precipitation	500	500	700	1,600
Total Inflow:	11,500	17,900	39,500	140,400
Outflow:				
Santa Margarita River Outflow	1,700	3,300	20,100	119,100
Subsurface Underflow	100	100	100	100
Groundwater Pumping	7,200	10,300	14,500	15,100
Evapotranspiration	1,800	2,200	2,500	2,900
Diversions to Lake O'Neill	1,200	1,900	2,400	2,700
Total Outflow:	12,000	17,800	39,600	139,900
Net Simulated Change of Groundwater in Storage:	-500	100	-100	500
	-	-	-	-

Median Hydrologic Condition Water Budget (af/y)

% Time Exceedence	*> 76%*	*76% to 50%*	*50% to 19%*	*< 19%*
# Years	*12*	*14*	*15*	*9*
	Extremely Dry	Below Normal	Above Normal	Very Wet
Inflow:				
Santa Margarita River Inflow	6,800	13,200	28,800	120,000
Subsurface Underflow	1,000	900	900	800
Lake O'Neill Spill and Release	700	1,300	2,100	2,300
Fallbrook Creek	100	300	1,100	3,500
Minor Tributary Drainages	1,500	1,400	2,500	4,700
Areal Precipitation	400	300	500	1,500
Outflow:				
Santa Margarita River Outflow	900	3,000	15,300	109,200
Subsurface Underflow	100	100	100	100
Groundwater Pumping	5,700	9,900	16,700	17,700
Evapotranspiration	1,400	2,000	2,300	2,700
Diversions to Lake O'Neill	1,300	1,700	2,700	2,700
Net Simulated Change of Groundwater in Storage:	-200	-400	-400	600

Average Subbasin Water Budget (af/y)

	Upper Ysidora	Chappo	Lower Ysidora	SMR Basin	
Inflow:					
Santa Margarita River Inflow	38,000	31,100	28,200	38,000	85%
Subsurface Underflow *	900	2,000	400	900	2%
Lake O'Neill Spill and Release	1,500	-	-	1,500	3%
Fallbrook Creek	1,200	-	-	1,200	3%
Minor Tributary Drainages	600	1,100	700	2,400	5%
Areal Precipitation	200	300	300	800	2%
Total Inflow:	42,400	34,500	29,600	44,800	
Outflow:					
Santa Margarita River Outflow	31,100	28,200	28,800	28,800	64%
Subsurface Underflow *	2,000	400	100	100	0%
Groundwater Pumping	6,600	5,100	0	11,700	26%
Evapotranspiration *	700	800	800	2,300	5%
Diversions to Lake O'Neill	2,000	-	-	2,000	4%
Total Outflow:	42,400	34,500	29,700	44,900	
Net Simulated Change of Groundwater in Storage: *	0	0	-100	-100	
	-	-	-	-	

Note: * Subbasin Medians are based on the last rate of the stress period
Values are rounded to the nearest 100 acre-feet, closest number adjusted to eliminate rounding error

Median Subbasin Water Budget (af/y)

	Upper Ysidora	Chappo	Lower Ysidora	SMR Basin
Inflow:				
Santa Margarita River Inflow	16,000	8,200	5,700	16,000
Subsurface Underflow *	900	2,000	400	900
Lake O'Neill Spill and Release	1,500	-	-	1,500
Fallbrook Creek	600	-	-	600
Minor Tributary Drainages	200	0	100	2,100
Areal Precipitation	8,400	0	6,582	500
Outflow:				
Santa Margarita River Outflow	8,200	5,700	6,100	6,100
Subsurface Underflow *	2,000	400	100	100
Groundwater Pumping	6,400	5,100	0	11,300
Evapotranspiration *	800	800	800	2,300
Diversions to Lake O'Neill	2,200	-	-	2,200
Net Simulated Change of Groundwater in Storage: *	0	0	0	-100

Note: The sum of median values does not reflect the change of groundwater in storage.
Median values are not cummulative.
* Subbasin Medians are based on the last rate of the stress period
Values are rounded to the nearest 100 acre-feet

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Table M-5 Run 9 Annual Water budget

Lower Santa Margarita River Groundwater Model — Run 9

Annual Surface Water Budget

MY		SMR Flow In	LON Diversion	Ponds Diversion	Str Gain+ / Loss-	GAGE SMR @ UY->CH	Str Gain+ / Loss-	SMR @ CH->LY	Str Gain+ / Loss-	SMR Flow Out	LSMR Str Gain+ / Loss-
1	VW	66,394	2,364	9,462	-7,139	59,255	-2,186	57,069	1,829	58,898	-7,496
2	BN	8,737	1,531	3,425	-6,228	2,509	-2,215	294	105	399	-8,338
3	AN	15,652	1,063	6,435	-8,785	6,867	-4,450	2,417	-169	2,248	-13,404
4	ED	6,759	1,323	2,646	-6,385	374	-362	11	295	306	-6,453
5	ED	6,151	337	1,336	-4,148	2,003	-709	1,294	333	1,627	-4,524
6	ED	8,228	1,307	2,764	-6,679	1,549	112	1,661	752	2,413	-5,815
7	AN	46,769	1,151	10,205	-5,364	41,404	-1,992	39,412	762	40,175	-6,594
8	ED	6,750	1,291	3,474	-6,084	666	-663	4	207	211	-6,539
9	ED	4,840	786	1,820	-4,755	85	-82	3	248	251	-4,590
10	ED	3,399	393	1,216	-3,384	16	-16	-	104	104	-3,295
11	BN	13,724	1,569	6,768	-8,077	5,647	-2,647	3,000	248	3,248	-10,477
12	ED	11,055	1,665	3,801	-5,261	5,794	-1,699	4,095	411	4,506	-6,549
13	ED	4,963	577	1,797	-2,821	2,142	-172	1,971	421	2,392	-2,572
14	ED	5,802	412	2,946	-5,397	405	-335	70	238	308	-5,494
15	AN	21,921	2,747	6,133	-6,004	15,917	-955	14,962	1,322	16,284	-5,637
16	AN	23,865	2,344	7,509	-9,072	14,793	-3,089	11,704	1,170	12,874	-10,991
17	ED	10,105	1,979	3,961	-8,413	1,692	-1,364	328	574	902	-9,203
18	VW	105,552	2,415	13,044	-3,282	102,270	-2,723	99,547	1,476	101,023	-4,528
19	BN	13,124	2,317	4,573	-8,710	4,414	-1,667	2,746	116	2,863	-10,261
20	BN	8,950	1,265	3,583	-6,239	2,711	-1,152	1,559	317	1,876	-7,074
21	ED	7,739	1,831	1,408	-5,470	2,269	-1,407	861	23	884	-6,855
22	BN	14,802	1,515	8,296	-6,600	8,202	-3,602	4,600	-109	4,491	-10,311
23	BN	12,321	1,607	2,949	-4,693	7,627	-760	6,867	714	7,580	-4,740
24	BN	11,377	1,698	5,664	-4,720	6,657	-1,337	5,320	489	5,810	-5,567
25	BN	12,396	1,733	5,798	-4,915	7,481	-1,423	6,058	418	6,476	-5,920
26	ED	12,737	2,156	4,171	-5,068	7,669	-670	6,999	803	7,802	-4,935
27	VW	126,820	2,791	16,057	-500	126,320	368	126,688	2,167	128,855	2,035
28	AN	55,061	2,722	18,024	-8,182	46,879	-5,614	41,265	493	41,759	-13,302
29	VW	181,076	2,723	18,884	-5,596	175,480	-3,994	171,487	1,904	173,391	-7,685
30	AN	28,831	2,750	7,141	-10,218	18,613	-5,512	13,101	171	13,272	-15,559
31	AN	62,376	2,698	7,723	-7,938	54,437	-4,960	49,477	573	50,050	-12,325
32	VW	105,844	2,721	14,249	-6,478	99,366	-6,465	92,901	888	93,789	-12,055
33	AN	29,560	2,714	9,308	-9,650	19,910	-5,132	14,778	486	15,264	-14,296
34	AN	22,097	2,701	9,005	-10,661	11,436	-6,672	4,764	-168	4,596	-17,501
35	AN	39,296	2,235	8,776	-7,554	31,742	-5,717	26,025	563	26,588	-12,708
36	BN	14,221	2,155	4,939	-8,446	5,775	-3,497	2,278	205	2,482	-11,738
37	AN	19,246	1,923	5,782	-5,000	14,245	-4,455	9,790	461	10,251	-8,994
38	BN	12,659	1,726	4,895	-7,608	5,051	-2,266	2,785	304	3,089	-9,570
39	BN	16,158	2,439	8,958	-8,011	8,147	-5,600	2,547	-230	2,317	-13,840
40	VW	64,445	2,820	12,300	-4,859	59,585	-3,617	55,968	276	56,244	-8,200
41	AN	42,492	2,711	13,804	-9,203	33,289	-5,825	27,464	347	27,811	-14,681
42	VW	251,872	2,723	19,141	-5,365	246,507	-4,876	241,631	1,207	242,837	-9,035
43	AN	24,441	2,752	12,576	-10,904	13,537	-5,721	7,816	166	7,982	-16,459
44	VW	121,487	2,675	17,734	-8,009	113,478	-5,381	108,097	1,197	109,295	-12,193
45	BN	18,009	2,750	10,475	-10,573	7,437	-5,487	1,949	-30	1,920	-16,090
46	AN	29,997	2,137	9,291	-6,432	23,565	-3,767	19,798	601	20,399	-9,599
47	VW	120,008	2,717	18,548	-6,883	113,124	-5,238	107,886	1,348	109,234	-10,773
48	BN	13,181	2,745	7,070	-10,650	2,531	-2,295	237	143	380	-12,802
49	BN	15,897	1,871	7,458	-7,432	8,465	-4,436	4,029	-271	3,758	-12,139
50	AN	22,506	2,602	9,949	-6,244	16,262	-3,315	12,946	195	13,141	-9,365
	avg	38,034	2,004	7,945	**-6,722**	31,312	**-2,941**	28,371	**522**	28,893	**-9,141**
	med	16,027	2,155	7,106	-6,455	8,174	-2,685	5,689	379	6,143	-9,119
AVERAGES											
ED	12	7,377	1,171	2,612	(5,322)	2,055	(614)	1,441	367	1,809	-5,569
BN	14	13,254	1,923	6,061	(7,350)	5,904	(2,742)	3,162	173	3,335	-9,919
AN	15	32,274	2,350	9,444	(8,081)	24,193	(4,478)	19,715	465	20,179	-12,094
VW	9	127,055	2,661	15,491	(5,346)	121,710	(3,790)	117,919	1,366	119,285	-7,770
	50										
MEDIANS											
ED	12	6,755	1,299	2,705	(5,329)	1,621	(512)	595	314	893	-5,655
BN	14	13,152	1,729	5,731	(7,520)	6,216	(2,280)	2,766	174	2,976	-10,286
AN	15	28,831	2,698	9,005	(8,182)	18,613	(4,960)	14,778	486	15,264	-12,708
VW	9	120,008	2,721	16,057	(5,596)	113,124	(3,994)	107,886	1,348	109,234	-8,200
	50										

Table M-5 Run 9 Annual Water budget (continued)

Lower Santa Margarita River Groundwater Model

Annual Groundw ater Budget Model Run: Run 9 UY+CH Basin Yield

	INFLOW:					OUTFLOW:					
MY	Storage	Recharge	Stream Leakance	GHB	TOTAL GW IN	Storage	Wells	ET	Stream Leakance	GHB	TOTAL GW OUT
1	8,686	10,546	10,171	865	30,268	5,345	16,227	2,721	5,931	66	30,290
2	7,180	3,631	6,289	931	18,030	2,301	13,495	1,612	588	55	18,051
3	5,561	6,655	11,219	983	24,418	8,808	10,955	1,666	2,952	51	24,432
4	6,321	2,952	4,970	949	15,192	3,241	10,434	1,162	312	52	15,202
5	3,845	1,657	6,387	1,127	13,016	6,292	5,172	1,258	269	48	13,038
6	3,542	3,506	5,730	1,026	13,804	5,597	5,686	1,764	714	56	13,817
7	6,584	10,838	7,782	904	26,108	7,466	8,730	2,630	7,228	62	26,116
8	8,326	3,632	3,815	936	16,710	3,168	11,724	1,334	459	49	16,734
9	2,870	2,197	4,601	1,031	10,698	3,825	5,539	1,048	237	47	10,697
10	2,629	1,352	2,658	1,077	7,716	1,632	5,034	865	155	40	7,727
11	3,565	7,252	9,449	946	21,212	9,465	5,420	2,033	4,257	49	21,225
12	3,095	4,084	6,967	912	15,058	4,548	5,686	2,781	2,002	56	15,073
13	4,114	2,043	3,724	924	10,805	1,531	5,686	2,687	865	59	10,829
14	3,742	3,292	4,415	969	12,418	4,013	5,686	1,993	686	52	12,430
15	5,248	7,208	6,885	878	20,219	4,865	8,730	2,801	3,776	65	20,238
16	6,809	8,152	11,878	882	27,720	5,351	16,701	2,213	3,400	64	27,729
17	6,738	4,298	8,223	913	20,172	5,131	12,955	1,442	604	57	20,188
18	6,458	14,245	10,461	856	32,020	10,693	8,730	2,443	10,101	63	32,030
19	8,120	4,770	7,415	903	21,208	4,477	13,685	1,768	1,244	57	21,230
20	5,163	3,972	6,692	910	16,737	4,357	9,862	1,476	999	56	16,750
21	3,662	1,699	5,767	980	12,107	3,570	7,078	1,196	234	48	12,125
22	4,330	8,664	8,921	890	22,805	9,435	5,686	2,429	5,216	56	22,822
23	3,246	3,427	5,976	909	13,559	3,315	5,684	2,856	1,662	60	13,577
24	3,549	6,139	6,706	881	17,274	4,114	5,686	3,088	4,332	64	17,283
25	3,673	6,387	6,416	882	17,359	4,261	5,686	3,104	4,263	63	17,377
26	3,000	4,603	6,423	884	14,910	2,743	5,686	3,198	3,225	67	14,920
27	6,841	17,289	7,615	840	32,585	6,462	8,724	3,349	13,983	75	32,593
28	6,848	18,391	11,830	824	37,893	6,001	16,713	2,929	12,208	69	37,920
29	7,172	19,915	12,849	817	40,753	6,896	18,503	2,785	12,507	74	40,765
30	5,971	7,365	12,964	875	27,174	3,930	18,113	2,259	2,817	62	27,181
31	6,410	8,180	13,347	877	28,813	6,550	17,218	1,892	3,092	61	28,812
32	6,350	15,014	15,152	845	37,360	7,968	18,297	2,399	8,659	69	37,392
33	5,918	9,522	11,846	865	28,152	4,059	17,608	2,339	4,082	62	28,149
34	5,360	9,229	14,279	877	29,745	5,937	17,103	2,124	4,536	56	29,756
35	5,503	9,206	13,912	870	29,490	6,079	17,172	2,268	3,910	63	29,492
36	5,932	5,211	10,560	893	22,596	3,896	15,014	1,887	1,758	59	22,614
37	4,828	6,221	11,249	884	23,182	5,930	12,236	2,268	2,688	63	23,185
38	6,435	5,165	9,343	900	21,843	4,715	13,682	1,715	1,662	56	21,831
39	4,399	9,114	10,744	875	25,131	8,083	9,871	2,105	5,051	54	25,164
40	6,056	12,489	8,907	868	28,320	6,630	10,124	2,787	8,719	61	28,320
41	5,817	14,141	12,649	849	33,457	5,266	16,414	2,803	8,926	65	33,474
42	7,280	19,972	13,315	824	41,391	7,151	18,733	2,709	12,734	70	41,396
43	7,996	12,741	12,167	849	33,753	6,745	18,113	2,319	6,540	61	33,778
44	8,127	18,411	13,820	840	41,198	8,907	18,503	2,298	11,412	64	41,184
45	7,461	10,629	11,387	861	30,337	6,566	16,414	2,112	5,223	59	30,373
46	5,418	9,711	10,147	861	26,136	5,670	12,236	2,498	5,650	63	26,117
47	6,497	19,490	13,545	826	40,358	7,622	17,700	2,626	12,365	71	40,383
48	7,048	7,254	8,173	875	23,349	4,155	15,197	1,747	2,222	57	23,379
49	5,303	7,622	9,366	898	23,189	8,012	8,976	2,032	4,141	50	23,211
50	5,946	10,308	8,104	859	25,216	5,441	10,124	2,847	6,749	62	25,223
avg	5,619	8,396	9,144	900	24,059	5,564	11,689	2,213	4,547	59	24,072
med	5,925	7,309	9,132	882	23,269	5,396	11,340	2,268	3,843	60	23,295
AVERAGES											
ED	4,324	2,943	5,307	977	13,550	3,774	7,197	1,727	814	53	13,565
BN	5,386	6,374	8,388	897	21,045	5,511	10,311	2,140	3,044	57	21,063
AN	6,014	9,858	11,350	876	28,099	5,873	14,544	2,390	5,237	62	28,107
VW	7,052	16,375	11,759	842	36,028	7,519	15,060	2,680	10,712	68	36,039
MEDIANS											
ED	3,702	3,122	5,350	959	13,410	3,697	5,686	1,388	531	52	13,427
BN	5,233	6,263	8,547	895	21,528	4,417	9,867	2,032	3,182	56	21,530
AN	5,918	9,229	11,846	875	27,720	5,930	16,701	2,319	4,082	62	27,729
VW	6,841	17,289	12,849	840	37,360	7,151	17,700	2,709	11,412	69	37,392

Table M-5 Run 9 Annual Water budget (continued)					
Lower Santa Margarita River Groundwater Model					
MY	NET Storage	NET Str Lknc		In-Out	**% bal**
1	-3,341	-4,240		-22.7	-0.07%
2	-4,878	-5,701		-21.2	-0.12%
3	3,247	-8,267		-14.0	-0.06%
4	-3,080	-4,658		-9.3	-0.06%
5	2,446	-6,118		-21.8	-0.17%
6	2,055	-5,016		-12.6	-0.09%
7	882	-555		-7.6	-0.03%
8	-5,158	-3,357		-24.2	-0.14%
9	955	-4,363		0.6	0.01%
10	-996	-2,503		-10.8	-0.14%
11	5,900	-5,192		-13.0	-0.06%
12	1,453	-4,966		-15.5	-0.10%
13	-2,583	-2,858		-24.3	-0.22%
14	271	-3,728		-12.2	-0.10%
15	-383	-3,108		-18.1	-0.09%
16	-1,458	-8,478		-9.1	-0.03%
17	-1,607	-7,619		-16.0	-0.08%
18	4,236	-360		-10.3	-0.03%
19	-3,643	-6,171		-21.5	-0.10%
20	-806	-5,693		-13.3	-0.08%
21	-92	-5,533		-17.9	-0.15%
22	5,106	-3,705		-17.0	-0.07%
23	69	-4,314		-18.3	-0.13%
24	565	-2,374		-9.1	-0.05%
25	588	-2,153		-18.7	-0.11%
26	-257	-3,198		-9.3	-0.06%
27	-379	6,368		-8.1	-0.02%
28	-847	379		-27.4	-0.07%
29	-275	-342		-11.9	-0.03%
30	-2,041	-10,147		-7.0	-0.03%
31	140	-10,255		1.0	0.00%
32	1,618	-6,492		-32.3	-0.09%
33	-1,860	-7,764		2.5	0.01%
34	576	-9,743		-10.4	-0.03%
35	576	-10,002		-1.3	0.00%
36	-2,036	-8,802		-17.7	-0.08%
37	1,102	-8,561		-3.4	-0.01%
38	-1,719	-7,681		12.6	0.06%
39	3,685	-5,693		-33.3	-0.13%
40	574	-188		-0.9	0.00%
41	-551	-3,724		-17.0	-0.05%
42	-129	-581		-5.3	-0.01%
43	-1,251	-5,627		-24.3	-0.07%
44	781	-2,408		14.0	0.03%
45	-895	-6,164		-35.8	-0.12%
46	253	-4,497		19.7	0.08%
47	1,125	-1,180		-24.8	-0.06%
48	-2,893	-5,950		-29.2	-0.12%
49	2,709	-5,225		-22.3	-0.10%
50	-505	-1,354		-6.9	-0.03%
avg	-55	-4,597		-13.1	-0.06%
med	-110	-4,812		-13.1	-0.07%
AVERAGES					
ED	-549	-4,493		-14.4	-0.11%
BN	125	-5,344		-18.4	-0.09%
AN	-141	-6,114		-8.2	-0.03%
VW	468	-1,047		-11.4	-0.03%
MEDIANS					
ED	-174	-4,510		-14.0	-0.10%
BN	-368	-5,693		-18.5	-0.10%
AN	-383	-7,764		-7.6	-0.03%
VW	574	-581		-10.3	-0.03%

Table M-6 Run 9 50-Year Average Monthly Water Budget

Lower Santa Margarita River Groundwater Model

Modflow Volumetric Budget Output and Streamflow

Run 9

8/22/06

Avg AF/M	SMR Flow In	Diversion	Str Gain+ / Loss-	SMR @ UY->CH	Str Gain+ / Loss-	SMR @ CH->LY	Str Gain+ / Loss-	SMR Flow Out	LSMR Str Gain+ / Loss-
Oct	526	325	-388	137	-82	55	21	76	-450
Nov	1,299	660	22	1,322	-532	790	-7	783	-517
Dec	1,969	530	-752	1,217	-196	1,021	52	1,073	-896
Jan	8,364	840	-1,093	7,270	-154	7,117	138	7,255	-1,109
Feb	10,263	2,062	-1,766	8,498	-170	8,327	118	8,445	-1,819
Mar	8,849	2,257	-1,366	7,483	-308	7,175	102	7,277	-1,572
Apr	3,159	1,482	-599	2,560	-366	2,195	40	2,234	-925
May	1,345	953	-275	1,070	-364	706	7	713	-632
Jun	756	583	-12	744	-310	433	4	437	-319
Jul	499	133	-27	472	-222	250	9	259	-239
Aug	458	62	-188	270	-128	141	19	160	-297
Sep	547	60	-278	269	-108	161	19	180	-367
Avg Monthly	3,169	829	-560	2,609	-245	2,364	43	2,408	-762
Med Monthly	1,322	622	-333	1,144	-209	748	20	748	-574
Avg Total=Anl	38,034	9,948	-6,722	31,312	-2,941	28,371	522	28,893	-9,141

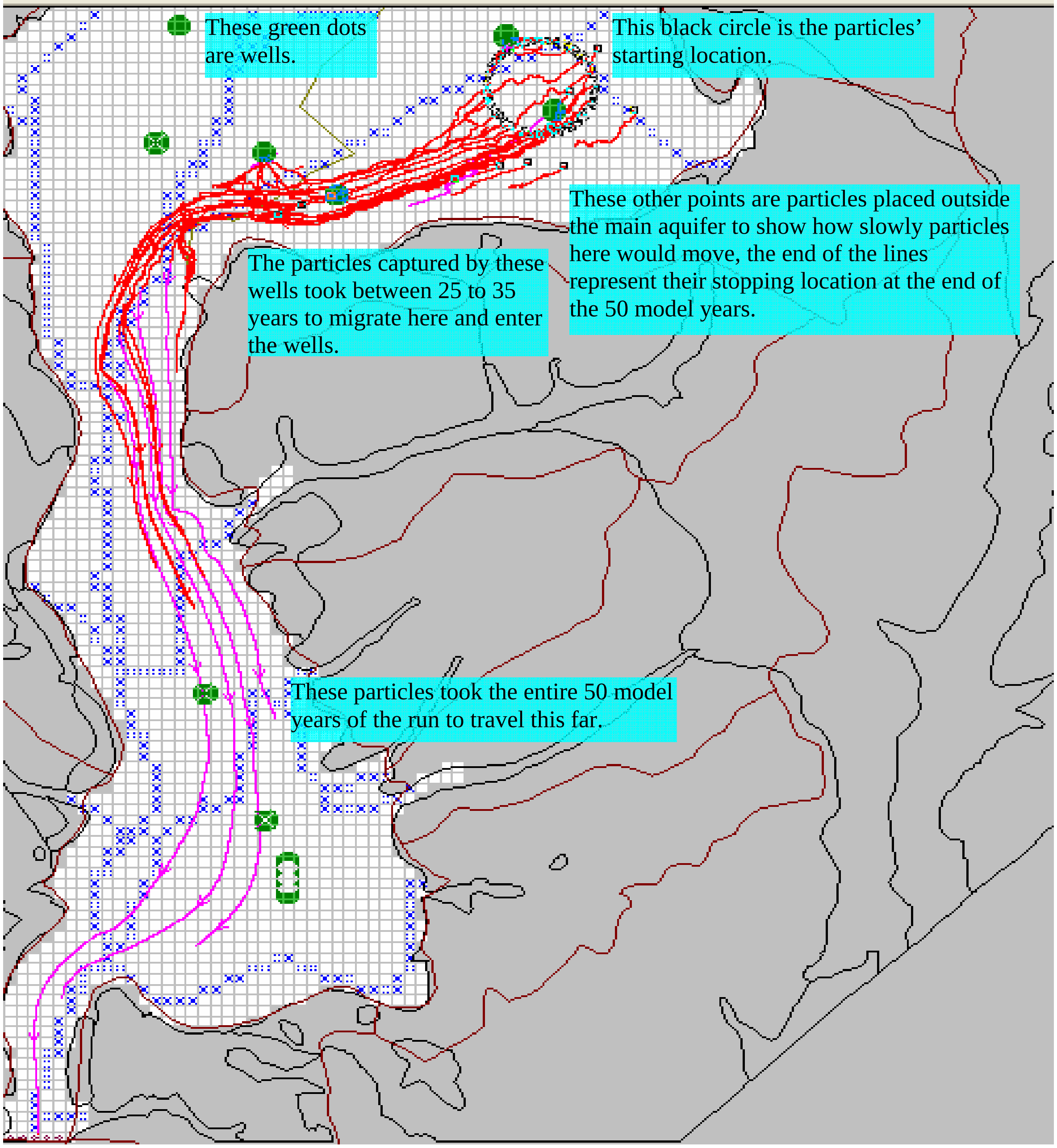
Lower Santa Margarita River Groundwater Model

Modflow Volumetric Budget Output

Average Monthly Water Budget

	INFLOW:					OUTFLOW:									
Avg AF/M	Storage	Recharge	Stream Leakance	GHB	TOTAL IN	Storage	Wells	ET	Stream Leakance	GHB	TOTAL OUT	NET Storage	NET Str Lknc	In-Out	% bal
Oct	641	46	392	81	1,160	48	912	155	41	8	1,165	-592	-351	-5.0	-0.43%
Nov	170	638	1,286	79	2,173	952	989	160	63	8	2,172	783	-1,223	1.4	0.06%
Dec	557	156	883	80	1,675	278	1,142	174	74	7	1,676	-279	-808	-0.2	-0.01%
Jan	419	365	1,269	78	2,131	526	1,343	177	81	5	2,132	107	-1,188	-1.6	-0.07%
Feb	327	1,930	946	75	3,278	1,456	1,307	173	339	0	3,275	1,129	-607	3.5	0.11%
Mar	179	2,315	992	74	3,560	1,191	1,225	203	940	1	3,559	1,012	-52	0.4	0.01%
Apr	353	1,529	837	68	2,786	503	995	207	1,074	8	2,787	150	237	-0.8	-0.03%
May	501	1,016	658	69	2,244	271	823	215	924	9	2,243	-230	266	1.2	0.05%
Jun	692	317	550	68	1,627	171	685	203	565	7	1,631	-521	15	-3.9	-0.24%
Jul	670	64	461	73	1,269	79	720	199	272	4	1,274	-591	-190	-4.6	-0.36%
Aug	505	10	413	77	1,007	57	649	184	117	0	1,007	-449	-296	-0.5	-0.05%
Sep	605	10	457	77	1,149	32	898	164	57	1	1,152	-573	-400	-3.0	-0.26%
Avg Monthly	468	700	762	75	2,005	464	974	184	379	5	2,006	-5	-383	-1.1	-0.10%
Med Monthly	503	341	747	76	1,903	275	950	180	195	6	1,904	-255	-323	-0.7	-0.04%
Avg Total=Anl	5,619	8,396	9,144	900	24,059	5,564	11,689	2,213	4,547	59	24,072	-55	-4,597	-13.1	

Figure M-5



STETSON ENGINEERS INC.

This is a figure of the MODPATH results for Run9. There were 20 particles placed in the circle noted and 5 particles placed outside the aquifer. The lines in red denote the particles captured in layer 1, the lines in pink denote the particles captured in layer 2.

Attachment N

Run 10 (Diversion By-Pass) Model Results

Table N-1. Preliminary Run 10 1cfs, 3cfs, 6cfs , 9cfs Bypass Basin Yield Pumping

LOWER SANTA MARGARITA RIVER GROUNDWATER MODEL

MY	HC	Oct-Apr HC descrip	May-Apr Pumping Condition	LSMR Total (af/y) **1cfs**	**3cfs**	**6cfs**	**9cfs**
1	VW	Very Wet	3	15,583	15,583	15,583	15,583
2	BN	Below Normal	4	13,135	13,135	13,135	13,135
3	AN	Above Normal	3	10,656	10,335	10,555	10,454
4	ED	Extremely Dry	6	10,577	10,970	10,047	10,047
5	ED	Extremely Dry	6	4,700	5,036	4,871	4,769
6	ED	Extremely Dry	6	5,250	5,355	5,355	5,355
7	AN	Above Normal	3	8,293	8,364	8,364	8,364
8	ED	Extremely Dry	6	11,557	11,591	11,299	11,299
9	ED	Extremely Dry	6	5,000	5,207	5,279	5,253
10	ED	Extremely Dry	6	5,000	4,704	5,100	4,973
11	BN	Below Normal	6	5,050	5,088	5,177	5,049
12	ED	Extremely Dry	6	5,250	5,355	5,355	5,355
13	ED	Extremely Dry	6	5,250	5,355	5,355	5,355
14	ED	Extremely Dry	6	5,250	5,355	5,355	5,355
15	AN	Above Normal	3	8,293	8,364	8,364	8,364
16	AN	Above Normal	2	15,906	15,906	15,906	15,906
17	ED	Extremely Dry	6	12,568	12,602	12,522	12,602
18	VW	Very Wet	3	8,293	8,364	8,364	8,364
19	BN	Below Normal	4	13,135	13,135	13,135	13,135
20	BN	Below Normal	5	8,863	8,897	8,897	8,897
21	ED	Extremely Dry	6	5,958	6,063	6,063	6,063
22	BN	Below Normal	6	5,250	5,355	5,355	5,355
23	BN	Below Normal	6	5,250	5,355	5,355	5,355
24	BN	Below Normal	6	5,250	5,355	5,355	5,355
25	BN	Below Normal	6	5,250	5,355	5,355	5,355
26	ED	Extremely Dry	6	5,250	5,355	5,355	5,355
27	VW	Very Wet	3	8,293	8,364	8,364	8,364
28	AN	Above Normal	2	15,906	15,906	15,906	15,906
29	VW	Very Wet	1	17,461	17,461	17,461	17,461
30	AN	Above Normal	2	17,006	17,006	17,006	17,006
31	AN	Above Normal	2	16,304	16,304	16,304	16,304
32	VW	Very Wet	1	17,325	17,325	17,325	17,325
33	AN	Above Normal	2	16,686	16,686	16,686	16,686
34	AN	Above Normal	2	16,193	16,193	16,193	16,193
35	AN	Above Normal	2	16,247	16,247	16,247	16,247
36	BN	Below Normal	4	14,147	14,147	14,147	14,147
37	AN	Above Normal	3	11,565	11,565	11,565	11,565
38	BN	Below Normal	4	13,135	13,135	13,135	13,135
39	BN	Below Normal	5	8,863	8,897	8,897	8,897
40	VW	Very Wet	3	9,002	9,073	9,073	9,073
41	AN	Above Normal	2	15,677	15,677	15,677	15,677
42	VW	Very Wet	1	17,603	17,603	17,603	17,603
43	AN	Above Normal	2	17,006	17,006	17,006	17,006
44	VW	Very Wet	1	17,461	17,461	17,461	17,461
45	BN	Below Normal	4	15,330	15,330	15,330	15,330
46	AN	Above Normal	3	11,565	11,565	11,565	11,565
47	VW	Very Wet	1	16,834	16,834	16,834	16,834
48	BN	Below Normal	4	14,947	15,267	14,897	15,240
49	BN	Below Normal	5	8,712	8,760	8,645	8,746
50	AN	Above Normal	3	9,002	9,073	9,073	9,073

			Min	4,700	4,704	4,871	4,769
Notes:			Max	17,603	17,603	17,603	17,603
Hydrologic Condition: Oct - Apr			**Median**	11,106	11,267	10,927	10,876
Model starts after 3+ BN or ED							
			Average	11,042	11,088	11,065	11,066
	AVERAGES	ED	12	6,801	6,912	6,830	6,815
		BN	14	9,737	9,801	9,773	9,795
		AN	15	13,754	13,746	13,761	13,754
		VW	9	14,206	14,230	14,230	14,230
	MEDIANS	ED	12	5,250	5,355	5,355	5,355
		BN	14	8,863	8,897	8,897	8,897
		AN	15	15,906	15,906	15,906	15,906
		VW	9	16,834	16,834	16,834	16,834

Table N-2. Run 10 1cfs, 3cfs, 6cfs , 9cfs Bypass Pumping Schedule by Pumping Condition
LOWER SANTA MARGARITA RIVER GROUNDWATER MODEL

Number of Months Water Level Management Initiated

	1cfs	3cfs	6cfs	9cfs
UY	12	24	15	17
CH	17	14	29	21
Total	27	27	36	33

HC	Cnt	**Oct to Apr Strflw**
VW	9	Very Wet > 56,164
AN	15	Above Normal > 13,600
BN	14	Below Normal < 13,600
ED	12	Extremely Dry < 5,840
	50	

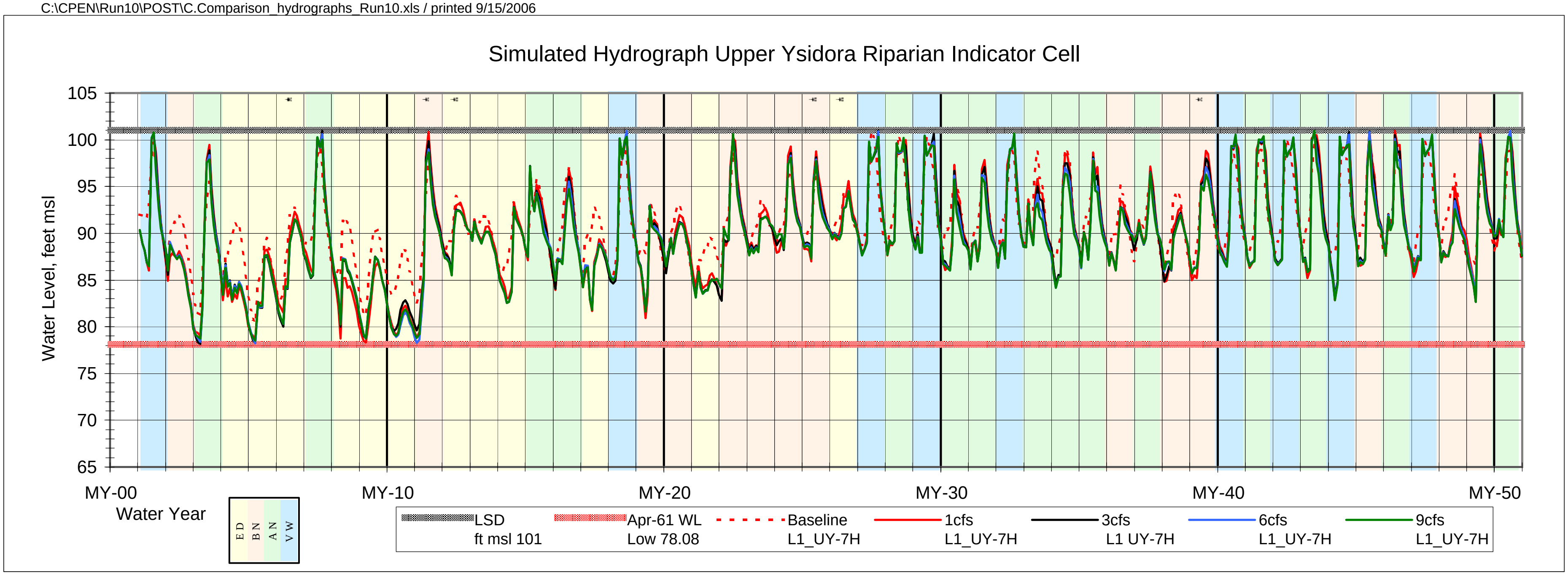
Pumping Condition

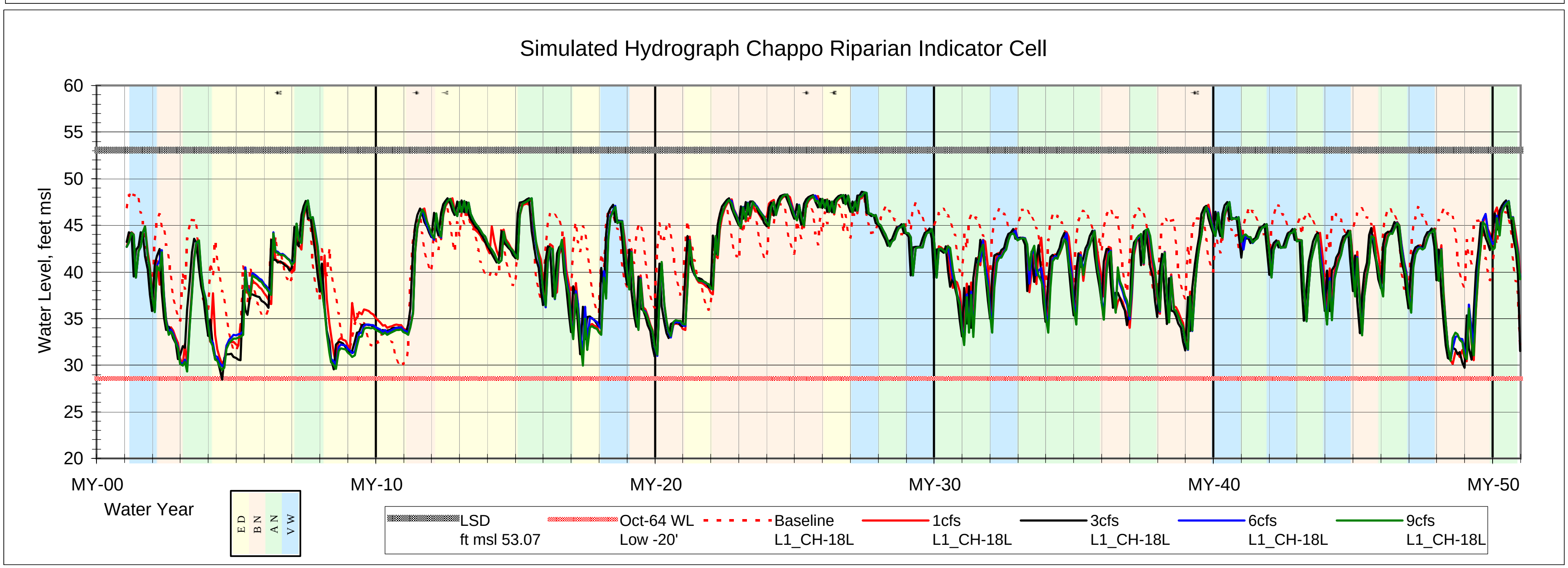
PC	HC	Q Adjst	Q Adjst	Q Adjst	Q Adjst	Cnt	
1	2+ AN @ VW	4,000	4,000	4,000	4,000	5	10%
2	2+ AN @ AN	2,000	2,000	2,000	2,000	9	18%
3	Standard	500	500	500	500	10	20%
4	1st BN	-4,000	-4,000	-4,000	-4,000	6	12%
5	2ndBN, 70/30 split	-7,800	-7,700	-7,700	-7,700	3	6%
6	3+BN/all ED	-8,850	-8,740	-8,740	-8,740	17	34%
PC	**HC**	**Anl Q**	**Anl Q**	**Anl Q**	**Anl Q**	**Cnt**	
1	2+ AN @ VW	18,100	18,100	18,100	18,100	5	10%
2	2+ AN @ AN	16,100	16,100	16,100	16,100	9	18%
3	Standard	14,600	14,600	14,600	14,600	10	20%
4	1st BN	10,100	10,100	10,100	10,100	6	12%
5	2ndBN, 70/30 split	6,300	6,400	6,400	6,400	3	6%
6	3+BN/all ED	5,250	5,360	5,360	5,360	17	34%
PC	**HC**	**%UY / %CH**	**%UY / %CH**	**%UY / %CH**	**%UY / %CH**	**Cnt**	
1	2+ AN @ VW	55 / 45	55 / 45	55 / 45	55 / 45	5	10%
2	2+ AN @ AN	55 / 45	55 / 45	55 / 45	55 / 45	9	18%
3	Standard	55 / 45	55 / 45	55 / 45	55 / 45	10	20%
4	1st BN	55 / 45	55 / 45	55 / 45	55 / 45	6	12%
5	2ndBN, 70/30 split	71 / 29	76 / 24	76 / 24	76 / 24	3	6%
6	3+BN/all ED	71 / 29	76 / 24	76 / 24	76 / 24	17	34%

Table N-3. Preliminary Run 10 1cfs, 3cfs, 6cfs , 9cfs Bypass Pumping Summaries
LOWER SANTA MARGARITA RIVER GROUNDWATER MODEL

					Orig Wells by Subbsn	80% Utilization	**1cfs**		**3cfs**		**6cfs**		**9cfs**	
		Bldg #	State ID #	Label	%	af/m	# mos Q	% of 600 mos	# mos Q	% of 600 mos	# mos Q	% of 600 mos	# mos Q	% of 600 mos
1	UY	2673	10/4-7A2	7A2	25%	142	600	100.0%	600	100.0%	600	100.0%	600	100.0%
2	UY	26072	10/4-8D1	8D1	21%	121	600	100.0%	600	100.0%	600	100.0%	600	100.0%
3	UY	2671	10/4-7H2	7H2	15%	82	600	100.0%	600	100.0%	600	100.0%	600	100.0%
4	UY	PW-6	PW-6	PW-6	19%	110	600	100.0%	600	100.0%	600	100.0%	600	100.0%
5	UY	2603	10/4-7R2	7R2	19%	110	600	100.0%	600	100.0%	600	100.0%	600	100.0%
6	UY	UY-1	UY-1	UY-1	-	110	244	40.7%	244	40.7%	244	40.7%	244	40.7%
7	UY	UY-2	UY-2	UY-2	-	110	172	28.7%	172	28.7%	172	28.7%	172	28.7%
8	UY	UY-3	UY-3	UY-3	-	110	114	19.0%	114	19.0%	114	19.0%	114	19.0%
9	UY	UY-4	UY-4	UY-4	-	110	67	11.2%	68	11.3%	67	11.2%	67	11.2%
10	UY	UY-5	UY-5	UY-5	-	110	33	5.5%	33	5.5%	33	5.5%	33	5.5%
11	UY	UY-6	UY-6	UY-6	-	110	9	1.5%	9	1.5%	9	1.5%	9	1.5%
12	CH	2393	10/4-18E3	18E4	14%	121	600	100.0%	600	100.0%	598	99.7%	598	99.7%
13	CH	2373	10/4-18M4&5	18M5	17%	153	600	100.0%	600	100.0%	598	99.7%	598	99.7%
14	CH	2363	10/5-13R2	13R2	15%	132	600	100.0%	600	100.0%	598	99.7%	598	99.7%
15	CH	33925	10/5-23G4	23G4	15%	**0**	0	0.0%	0	0.0%	0	0.0%	0	0.0%
16	CH	2301	10/5-23J1	23J1	19%	164	600	100.0%	600	100.0%	598	99.7%	598	99.7%
17	CH	33924	10/5-23K2	23K2	6%	**0**	0	0.0%	0	0.0%	0	0.0%	0	0.0%
18	CH	33923	10/5-23K3	23K3	15%	132	600	100.0%	600	100.0%	598	99.7%	598	99.7%
19	CH	CH-1	CH-1	CH-1	-	88	85	14.2%	85	14.2%	84	14.0%	84	14.0%
20	CH	CH-2	CH-2	CH-2	-	88	47	7.8%	47	7.8%	46	7.7%	47	7.8%
21	CH	CH-3	CH-3	CH-3	-	88	13	2.2%	13	2.2%	13	2.2%	13	2.2%

C:\CPEN\Run10\POST\C.Comparison_hydrographs_Run10.xls / printed 9/15/2006





Emergency Water Called on Years Marked With *

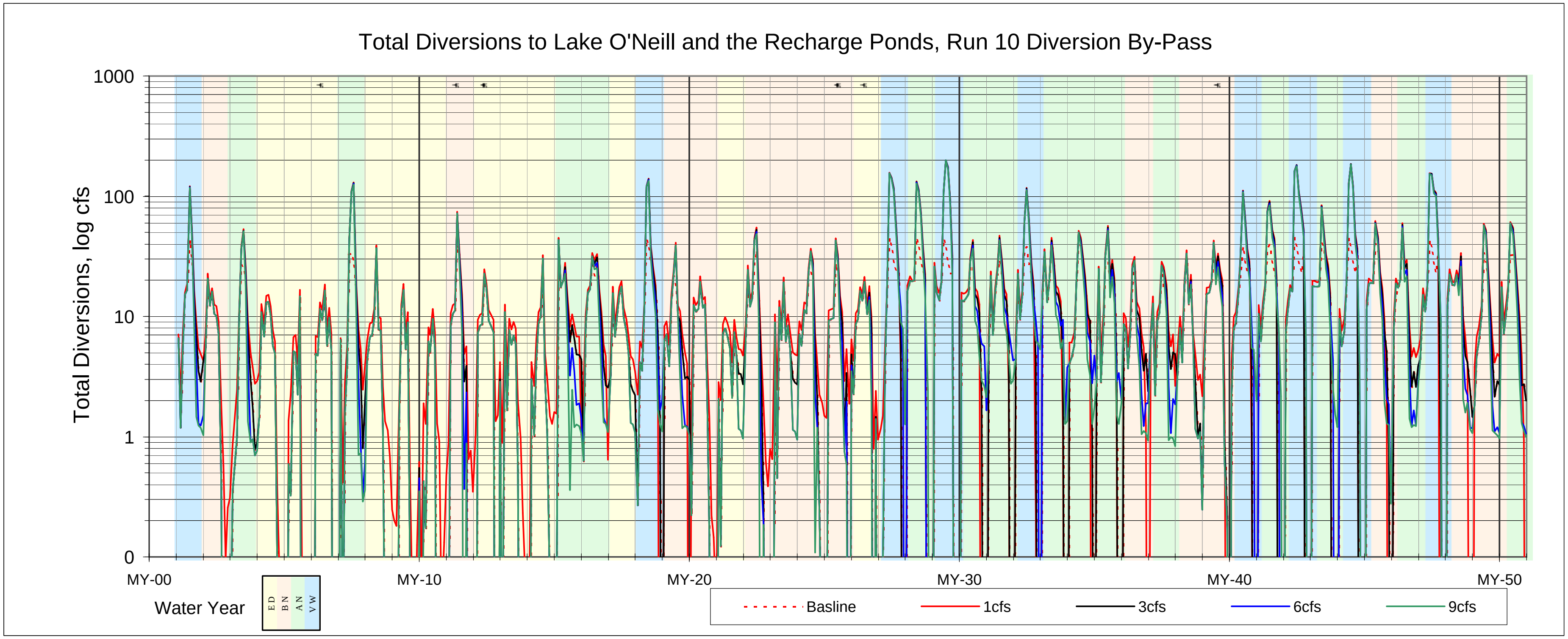
Layer 1 (L1) and Layer 2(L2) simulated groundwater levels are at similar elevations and the graph lines are printed on top of each other.

FIGURE N-1

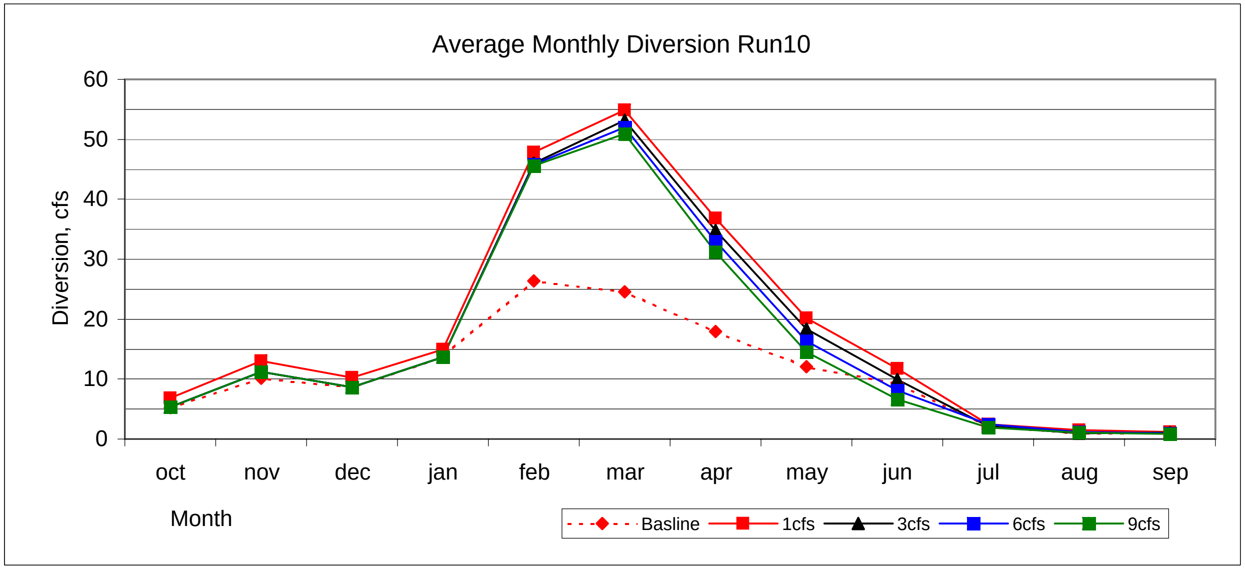
Run 10 Diversion By-Pass Comparison Hydrograph

Table N-4. Preliminary Run 10 1cfs, 3cfs, 6cfs , 9cfs Bypass Diversion Summaries
LOWER SANTA MARGARITA RIVER GROUNDWATER MODEL

	Total Diversion cfs				Aditional By-Pass cfs			
MY	1cfs	3cfs	6cfs	9cfs	1cfs	3cfs	6cfs	9cfs
1	263	246	229	219	-17	0	17	26
2	98	83	83	83	-15	0	0	0
3	158	137	128	122	-20	0	9	16
4	82	66	66	66	-15	0	0	0
5	38	28	28	28	-10	0	0	0
6	83	68	68	68	-15	0	0	0
7	339	321	309	301	-17	0	12	20
8	100	82	82	82	-19	0	0	0
9	53	44	44	44	-9	0	0	0
10	40	27	27	27	-13	0	0	0
11	173	156	146	139	-18	0	10	17
12	113	92	92	92	-21	0	0	0
13	55	40	40	40	-15	0	0	0
14	81	62	62	62	-19	0	0	0
15	168	154	131	117	-14	0	22	37
16	183	165	149	139	-18	0	16	26
17	122	99	95	95	-23	0	4	4
18	376	364	352	337	-12	0	12	26
19	143	125	114	110	-17	0	12	16
20	98	82	82	82	-17	0	0	0
21	75	53	47	47	-22	0	6	6
22	191	172	165	159	-19	0	8	13
23	97	75	70	70	-22	0	5	5
24	151	128	122	118	-23	0	6	10
25	156	133	123	113	-23	0	10	20
26	125	105	101	97	-20	0	4	8
27	526	515	514	506	-10	0	1	9
28	462	449	436	426	-13	0	13	23
29	693	680	672	664	-12	0	8	17
30	184	169	168	151	-15	0	0	17
31	192	179	180	162	-13	0	-1	17
32	354	342	342	334	-12	0	0	8
33	212	200	196	176	-12	0	5	24
34	208	197	189	170	-11	0	8	27
35	210	197	190	176	-14	0	7	21
36	132	119	104	97	-13	0	14	22
37	145	128	113	105	-17	0	15	23
38	133	112	109	108	-22	0	3	4
39	210	193	181	169	-17	0	12	23
40	317	303	302	293	-15	0	1	10
41	339	322	318	309	-16	0	4	13
42	641	629	625	614	-13	0	4	15
43	291	274	266	254	-17	0	8	20
44	570	556	549	539	-14	0	7	17
45	234	223	208	195	-12	0	14	28
46	213	193	177	167	-20	0	16	27
47	628	615	613	603	-13	0	2	12
48	177	164	151	142	-12	0	13	22
49	202	178	163	154	-23	0	15	24
50	242	227	211	200	-15	0	16	27
Average	221	205	199	191	-16	0	7	14
Median	180	165	150	141	-15	0	6	16
Min	38	27	27	27	-23	0	-1	0
Max	693	680	672	664	-9	0	22	37



Emergency Water Called on Years Marked With *; 3cfs By-Pass is Model Run 1



Run 10

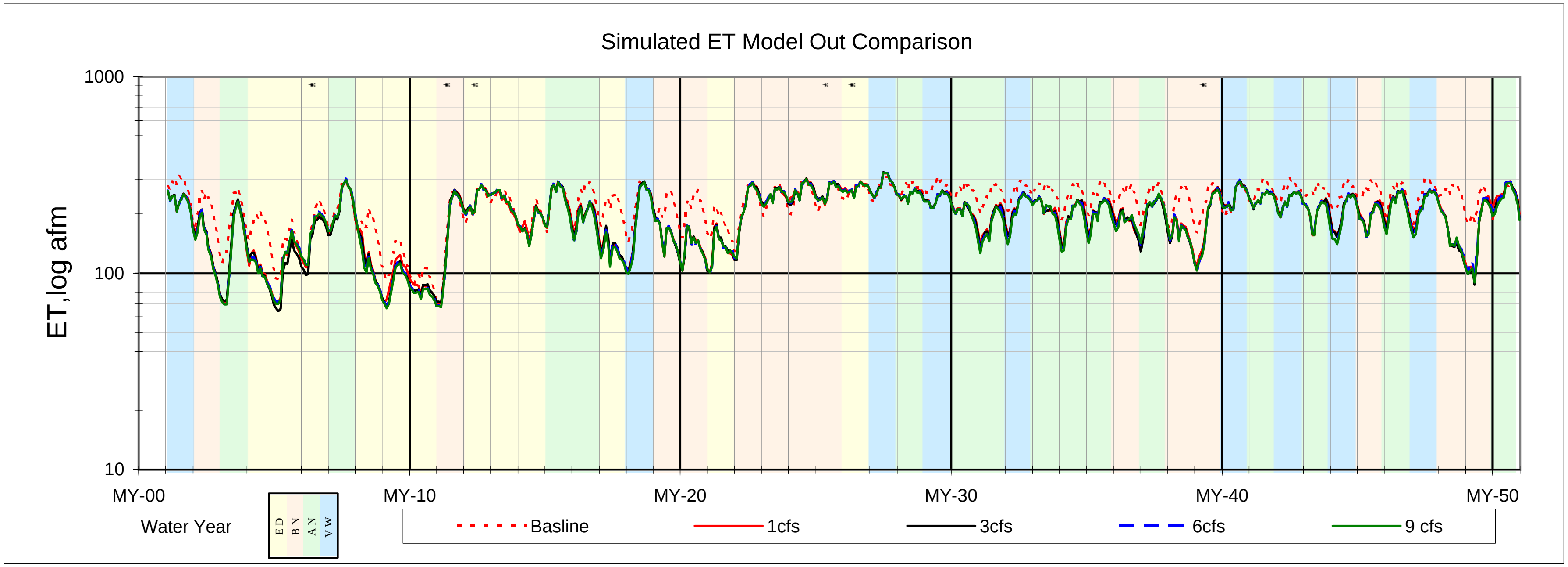
Number of Months Water Level Management Initiated

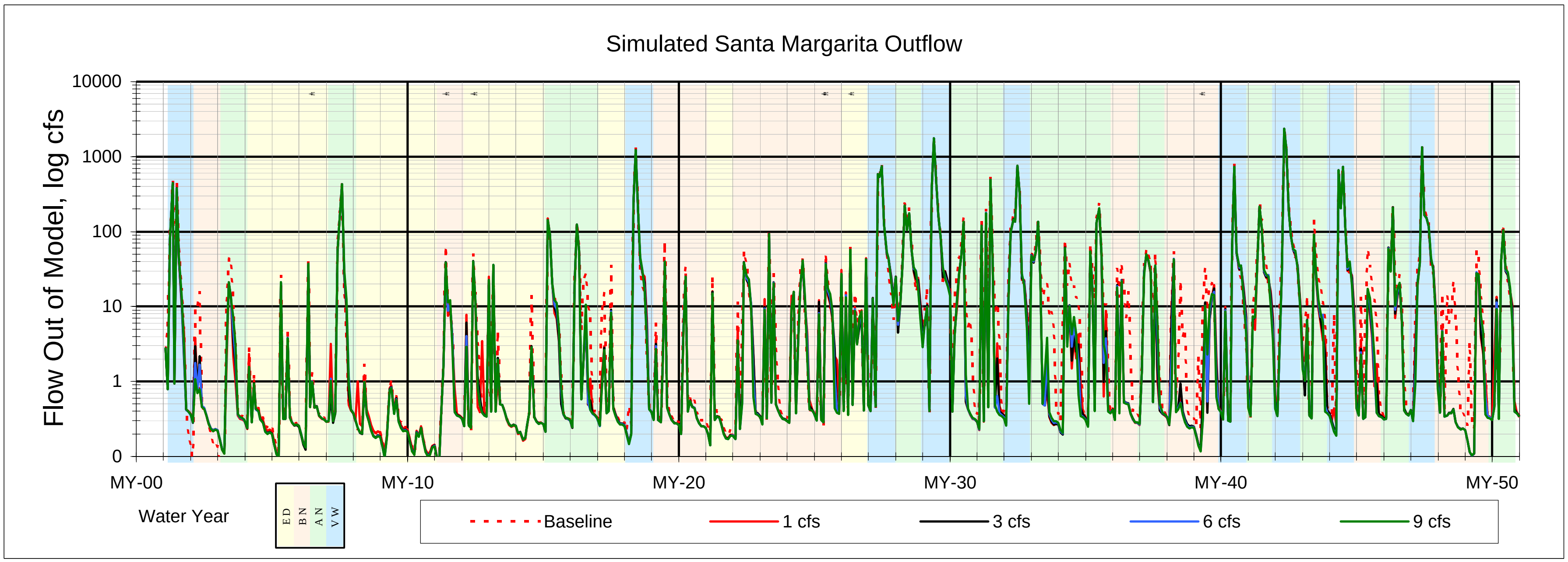
	1cfs	3cfs	6cfs	9cfs
UY	12	24	15	17
CH	17	14	29	21
Total	27	27	36	33

Table N-5. Preliminary Run 10 1cfs, 3cfs, 6cfs , 9cfs Bypass Et and Stream Outflow Summaries
LOWER SANTA MARGARITA RIVER GROUNDWATER MODEL

	ET afm				SMR OUT cfs			
MY	1cfs	3cfs	6cfs	9cfs	1cfs	3cfs	6cfs	9cfs
1	2,796	2,785	2,767	2,761	958	962	965	969
2	1,718	1,717	1,683	1,651	8	9	7	5
3	1,763	1,830	1,771	1,750	38	43	44	48
4	1,233	1,217	1,207	1,185	6	5	5	5
5	1,411	1,285	1,456	1,433	26	26	27	27
6	1,936	1,875	1,997	1,984	41	40	41	41
7	2,745	2,746	2,793	2,781	680	679	687	690
8	1,409	1,382	1,337	1,311	5	4	4	4
9	1,201	1,117	1,110	1,089	4	4	4	4
10	997	978	950	938	2	2	2	2
11	2,198	2,207	2,138	2,148	63	66	64	68
12	2,891	2,901	2,872	2,875	87	85	81	80
13	2,726	2,781	2,773	2,774	39	42	42	42
14	2,195	2,144	2,137	2,135	6	6	6	6
15	2,909	2,893	2,854	2,854	281	278	280	284
16	2,385	2,346	2,287	2,270	212	213	214	214
17	1,579	1,596	1,561	1,506	15	16	15	15
18	2,608	2,603	2,567	2,528	1,778	1,776	1,774	1,773
19	1,860	1,860	1,853	1,841	45	48	47	47
20	1,651	1,635	1,635	1,641	31	32	34	33
21	1,628	1,641	1,614	1,618	19	18	17	17
22	2,787	2,771	2,757	2,743	102	99	101	102
23	2,961	2,989	2,980	2,964	127	128	127	126
24	3,232	3,166	3,173	3,161	106	102	106	107
25	3,152	3,166	3,140	3,115	116	115	113	115
26	3,274	3,251	3,242	3,235	147	132	142	142
27	3,370	3,395	3,382	3,375	2,161	2,159	2,156	2,153
28	2,996	3,000	2,984	2,980	700	701	703	704
29	2,881	2,890	2,867	2,863	2,952	2,953	2,953	2,953
30	2,447	2,422	2,406	2,394	224	227	228	230
31	2,243	2,202	2,137	2,087	824	824	826	827
32	2,652	2,631	2,592	2,562	1,573	1,573	1,569	1,565
33	2,555	2,537	2,528	2,528	254	256	259	262
34	2,392	2,360	2,328	2,280	88	88	90	91
35	2,511	2,493	2,440	2,397	459	461	462	463
36	2,149	2,135	2,149	2,142	43	47	45	44
37	2,546	2,505	2,573	2,592	182	184	189	190
38	1,924	1,869	1,880	1,873	53	53	49	47
39	2,417	2,362	2,348	2,339	54	53	52	54
40	3,012	3,012	2,994	2,975	947	944	942	941
41	2,904	2,888	2,883	2,881	476	477	478	478
42	2,824	2,819	2,805	2,808	4,085	4,087	4,085	4,086
43	2,489	2,486	2,438	2,408	146	148	153	155
44	2,528	2,509	2,447	2,424	1,815	1,815	1,813	1,813
45	2,413	2,376	2,321	2,298	36	37	39	43
46	2,732	2,702	2,658	2,615	349	352	353	354
47	2,766	2,734	2,702	2,679	1,924	1,924	1,919	1,917
48	1,837	1,816	1,841	1,832	9	8	8	8
49	2,096	2,022	2,101	2,013	58	60	68	68
50	3,081	3,010	2,978	2,920	14,372	14,113	14,115	14,016
Average	2,380	2,361	2,349	2,331	774	770	770	769
Median	2,500	2,490	2,439	2,402	111	109	110	111
Min	997	978	950	938	2	2	2	2
Max	3,370	3,395	3,382	3,375	14,372	14,113	14,115	14,016

C:\CPEN\Run10\POST\C.Comparison_hydrographs_Run10.xls / printed 9/15/2006





Emergency Water Called on Years Marked With *; 3cfs By-Pass is Model Run 1

FIGURE N-3
Run 10 Diversion By-Pass ET and Streamflow Out Compariso

Attachment O

Run 11 (Two Direct Diversions) Model Results

Table O-1 Run 11 Annual Pumping and Direct Diversion Summary
LOWER SANTA MARGARITA RIVER GROUNDWATER MODEL

Hydrologic Condition

HC	Cnt	Oct to Apr Strflw
VW	9	Very Wet > 56,164
AN	15	Above Normal > 13,600
BN	14	Below Normal < 13,600
ED	12	Extremely Dry < 5,840
	50	

Pumping Condition

PC	HC	Q Adjst	Anl Q	# Years	
1	2+ AN @ VW	3,300	17,400	5	10%
2	2+ AN @ AN	2,000	16,100	9	18%
3	Standard	500	14,600	10	20%
4	1st BN	-4,000	10,100	6	12%
5	2ndBN, 70/30 split	-7,380	6,720	3	6%
6	3+BN/all ED	-9,000	5,100	17	34%

MY	HC	Oct-Apr HC descrip	May-Apr Pumping Condition	CPEN Direct DIV (af/y)	UY Total (af/y)	CH Total (af/y)	LY Total (af/y)	GW Total (af/y)	FPUD Direct DIV (af/y)	Total Basin Yield (af/y)
1	VW	Very Wet	3	1,179	9,272	6,181	-	15,454	1,459	18,091
2	BN	Below Normal	4	-	7,679	5,254	-	12,933	-	12,933
3	AN	Above Normal	3	529	5,727	4,626	-	10,353	593	11,475
4	ED	Extremely Dry	5	-	7,054	3,414	-	10,468	50	10,518
5	ED	Extremely Dry	6	-	3,137	1,352	-	4,488	149	4,637
6	ED	Extremely Dry	6	-	3,519	1,581	-	5,100	99	5,199
7	AN	Above Normal	3	1,171	5,225	2,967	-	8,192	1,922	11,285
8	ED	Extremely Dry	5	-	6,981	4,454	-	11,435	-	11,435
9	ED	Extremely Dry	6	-	3,443	1,581	-	5,024	-	5,024
10	ED	Extremely Dry	6	-	3,519	1,581	-	5,100	-	5,100
11	BN	Below Normal	6	676	3,519	1,581	-	5,100	298	6,074
12	ED	Extremely Dry	6	40	3,519	1,581	-	5,100	198	5,338
13	ED	Extremely Dry	6	-	3,519	1,581	-	5,100	98	5,198
14	ED	Extremely Dry	6	-	3,519	1,581	-	5,100	149	5,249
15	AN	Above Normal	3	57	5,225	2,967	-	8,192	446	8,695
16	AN	Above Normal	2	1,149	9,543	6,362	-	15,906	446	17,502
17	ED	Extremely Dry	5	-	7,661	4,858	-	12,519	149	12,668
18	VW	Very Wet	3	1,864	5,225	2,967	-	8,192	2,021	12,077
19	BN	Below Normal	4	58	7,881	5,254	-	13,135	248	13,442
20	BN	Below Normal	5	-	5,597	3,403	-	9,000	99	9,099
21	ED	Extremely Dry	6	-	4,273	1,920	-	6,193	99	6,292
22	BN	Below Normal	6	864	3,519	1,581	-	5,100	286	6,250
23	BN	Below Normal	6	-	3,519	1,581	-	5,100	198	5,298
24	BN	Below Normal	6	182	3,519	1,581	-	5,100	248	5,530
25	BN	Below Normal	6	218	3,519	1,581	-	5,100	298	5,616
26	ED	Extremely Dry	6	47	3,519	1,581	-	5,100	248	5,395
27	VW	Very Wet	3	3,355	5,225	2,967	-	8,192	4,002	15,549
28	AN	Above Normal	2	4,259	9,543	6,362	-	15,906	1,960	22,124
29	VW	Very Wet	1	4,376	10,266	6,844	-	17,110	5,008	26,495
30	AN	Above Normal	2	1,533	10,097	6,726	-	16,823	347	18,704
31	AN	Above Normal	2	1,671	9,847	6,565	-	16,412	645	18,728
32	VW	Very Wet	1	2,745	10,181	6,787	-	16,968	1,830	21,543
33	AN	Above Normal	2	1,681	9,942	6,628	-	16,570	198	18,449
34	AN	Above Normal	2	1,713	9,716	6,477	-	16,193	380	18,286
35	AN	Above Normal	2	1,262	9,748	6,499	-	16,247	545	18,055
36	BN	Below Normal	4	19	8,488	5,659	-	14,147	99	14,265
37	AN	Above Normal	3	522	6,939	4,626	-	11,565	347	12,434
38	BN	Below Normal	4	259	7,881	5,254	-	13,135	178	13,572
39	BN	Below Normal	5	1,705	5,597	3,403	-	9,000	149	10,853
40	VW	Very Wet	3	2,551	5,979	3,306	-	9,285	1,189	13,025
41	AN	Above Normal	2	3,174	9,406	6,271	-	15,677	1,165	20,016
42	VW	Very Wet	1	4,093	10,355	6,904	-	17,259	6,479	27,831
43	AN	Above Normal	2	2,450	10,097	6,726	-	16,823	570	19,843
44	VW	Very Wet	1	3,977	10,266	6,844	-	17,110	4,277	25,365
45	BN	Below Normal	4	1,833	8,974	5,978	-	14,952	198	16,984
46	AN	Above Normal	3	1,513	6,939	4,626	-	11,565	492	13,570
47	VW	Very Wet	1	4,032	9,890	6,593	-	16,483	4,541	25,056
48	BN	Below Normal	4	863	9,014	6,010	-	15,024	-	15,887
49	BN	Below Normal	5	969	5,597	3,403	-	9,000	397	10,365
50	AN	Above Normal	3	1,756	5,979	3,306	-	9,285	438	11,479
Notes:			Min	-	3,137	1,352	-	4,488	-	4,637
Hydrologic Condition: Oct - Apr			Max	4,376	10,355	6,904	-	17,259	6,479	27,831
Model starts after 3+ BN or ED			**Median**	**864**	**6,939**	**4,540**	**-**	**10,951**	**298**	**12,551**
			% of Median Basin Yield	7%	55%	36%	-	87%	2%	
			Average	**1,207**	**6,772**	**4,194**	**-**	**10,966**	**905**	**13,078**
			% of Average Basin Yield	9%	52%	32%	-	84%	7%	

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Table O-1 Run 11 Annual Pumping and Direct Diversion Summary (continued)

Oct-Apr HC Description	HC Count	CPEN Direct DIV (af/y)	UY Total (af/y)	CH Total (af/y)	LY Total (af/y)	GW Total (af/y)	FPUD Direct DIV (af/y)	Total Basin Yield (af/y)
Average Annual								
ED	12	7	4,472	2,255	-	6,727	103	6,838
BN	14	546	6,022	3,680	-	9,702	193	10,441
AN	15	1,629	8,265	5,449	-	13,714	700	16,043
VW	9	3,130	8,518	5,488	-	14,006	3,423	20,559
Median Annual								
ED	12	-	3,519	1,581	-	5,100	99	5,293
BN	14	239	5,597	3,403	-	9,000	198	10,609
AN	15	1,533	9,543	6,362	-	15,906	492	18,055
VW	9	3,355	9,890	6,593	-	16,483	4,002	21,543

Average Monthly Pumping

% Avg Mo Basin Yield	Month	CPEN Direct DIV (af/m)	UY Total (af/m)	CH Total (af/m)	LY Total (af/m)	GW Total (af/m)	FPUD Direct DIV (af/m)	Total Basin Yield (af/m)
7%	Oct	0.4	526	329	-	855	2	858
7%	Nov	-	570	358	-	928	24	952
9%	Dec	-	664	416	-	1,079	36	1,115
10%	Jan	-	776	484	-	1,260	108	1,368
11%	Feb	54	760	467	-	1,226	197	1,477
13%	Mar	264	709	436	-	1,145	291	1,699
11%	Apr	294	579	355	-	933	178	1,405
8%	May	257	477	294	-	772	60	1,089
5%	Jun	58	397	244	-	641	2	702
6%	Jul	90	418	257	-	675	-	765
5%	Aug	100	376	231	-	608	1	708
7%	Sep	90	520	323	-	843	6	939
	Avg Anl	1,207	6,772	4,194	-	10,966	905	13,078

Table O-2 Run 11 Groundwater Well Pumping Summaries

Lower Santa Margarita River Groundwater Model

		Bldg #	State ID #	Label	# mos Q	% of 600 mos	Orig Wells by Subbsn %	80% Utilization af/m	
1	UY	2673	10/4-7A2	7A2	600	100%	25%	142	
2	UY	26072	10/4-8D1	8D1	600	100%	21%	121	
3	UY	2671	10/4-7H2	7H2	600	100%	15%	82	
4	UY	PW-6	PW-6	PW-6	600	100%	19%	110	
5	UY	2603	10/4-7R2	7R2	600	100%	19%	110	
6	UY	UY-1	UY-1	UY-1	271	45%	0%	110	
7	UY	UY-2	UY-2	UY-2	211	35%	0%	110	
8	UY	UY-3	UY-3	UY-3	139	23%	0%	110	
9	UY	UY-4	UY-4	UY-4	86	14%	0%	110	
10	UY	UY-5	UY-5	UY-5	57	9.5%	0%	110	
11	UY	UY-6	UY-6	UY-6	20	3%	0%	110	
12	CH	2393	10/4-18E3	18E4	600	100%	14%	121	
13	CH	2373	10/4-18M4&5	18M5	600	100%	18%	153	
14	CH	2363	10/5-13R2	13R2	600	100%	16%	132	
15	CH	33925	10/5-23G4	23G4	**0**	**0%**	15%	**0**	backup
16	CH	2301	10/5-23J1	23J1	600	100%	20%	164	
17	CH	33924	10/5-23K2	23K2	**0**	**0%**	6%	**0**	backup
18	CH	33923	10/5-23K3	23K3	600	100%	16%	132	
19	CH	CH-1	CH-1	CH-1	**0**	**0%**	0%	88	
20	CH	CH-4	CH-4	CH-4	600	100%	16%	132	Replaces 23G4

% Pumping by Subbasin

		Wet Year Algorithm			Dry Year Management			Max Pumping in Subbasin adding wells as needed				
		60%	40%	0%	69%	31%	0%					
mo	Anl %	UY	CH	LY	UY	CH	LY		UY	CH	LY	Total
OCT	7.9%	4.8%	3.2%	0%	5.5%	2.5%	0%	# exst wells	5	7	-	12
NOV	8.6%	5.2%	3.4%	0%	5.9%	2.7%	0%	af/m (80%)	564	833	-	1,397
DEC	10.0%	6.0%	4.0%	0%	6.9%	3.1%	0%	avg af/well	113	119	-	116
JAN	11.4%	6.9%	4.6%	0%	7.9%	3.5%	0%					
FEB	10.9%	6.6%	4.4%	0%	7.6%	3.4%	0%	1 adntl well	674	921	55	
MAR	10.2%	6.1%	4.1%	0%	7.0%	3.2%	0%	2 adntl well	784	1,008	110	
APR	8.3%	5.0%	3.3%	0%	5.7%	2.6%	0%	3 adntl well	893	1,096	164	
MAY	7.1%	4.3%	2.8%	0%	4.9%	2.2%	0%	4 adntl well	1,003	1,184	219	
JUN	5.9%	3.5%	2.4%	0%	4.1%	1.8%	0%	5 adntl well	1,112	1,271		
JUL	6.2%	3.7%	2.5%	0%	4.3%	1.9%	0%	6 adntl well	1,222			
AUG	5.6%	3.4%	2.2%	0%	3.9%	1.7%	0%	50-yr Avg	6,857	4,244	-	
SEP	7.8%	4.7%	3.1%	0%	5.4%	2.4%	0%	50-yr Med	6,939	4,540	-	

Median Pumping by Hydrologic Condition

	UY af/m	CH af/m	LY af/m	Total af/m	Max Mo Pumping	cfs	new wells
ED	358	162	0	521	1,839	32	6
BN	380	238	0	595	1,988	35	7
AN	663	448	0	1,106	1,988	35	7
VW	682	454	0	1,136	2,045	36	7

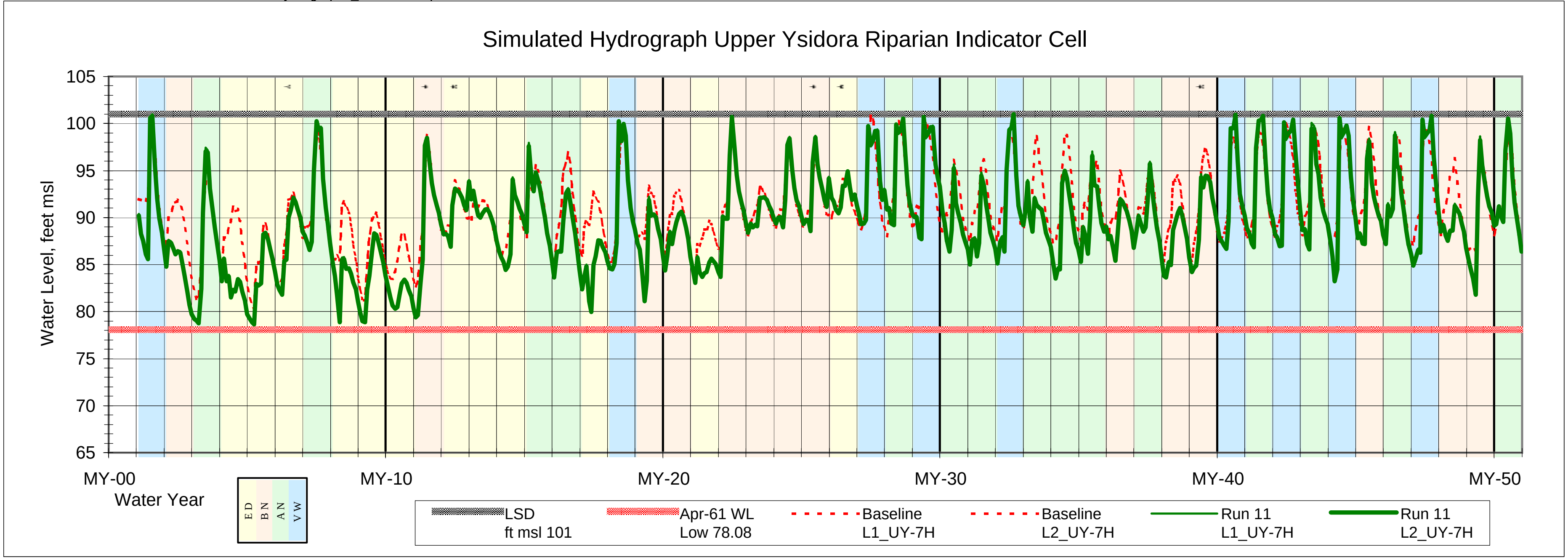
Wet Year Algorithm Monthly Counts

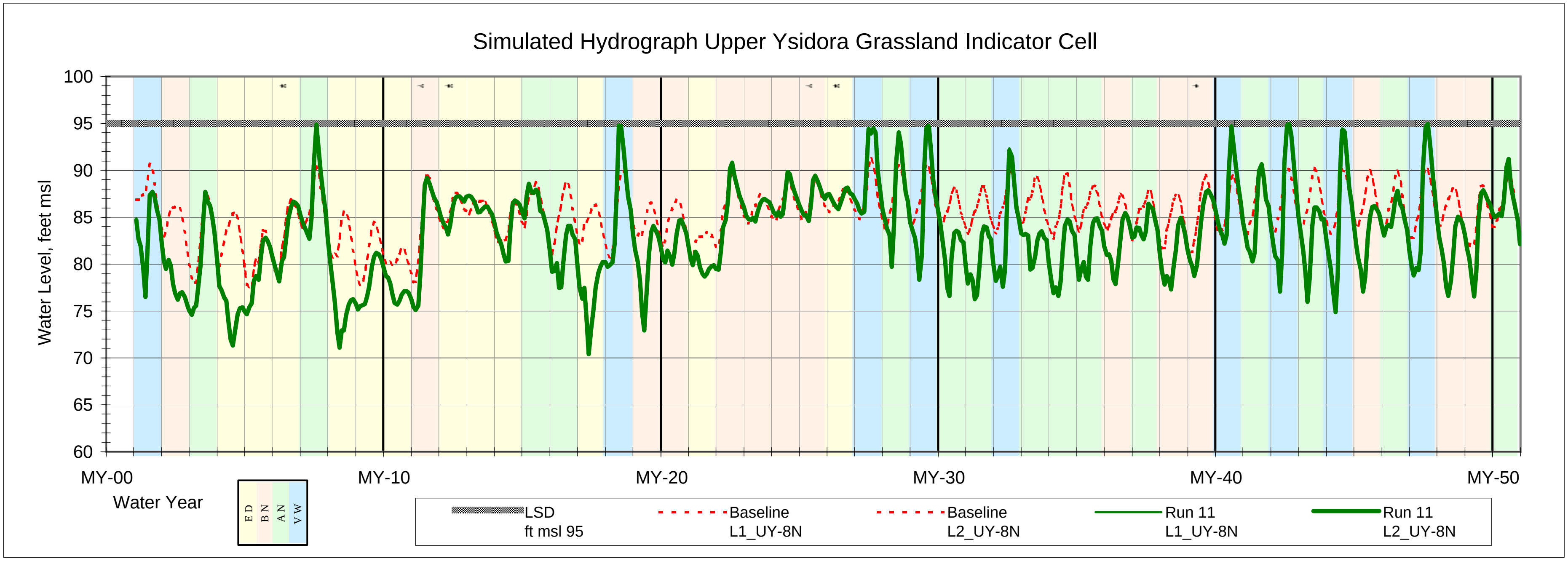
	2,000 af/y	3,300af/y	Total	% 50-yrs
Oct	-	-	-	0%
Nov	-	-	-	0%
Dec	1	-	1	2%
Jan	7	1	8	16%
Feb	7	4	11	22%
Mar	9	5	14	28%
Apr	9	6	15	30%
May	-	-	-	0%
	33	16	49	

		Table O-3. Run11 Annual Pumping by Well										
	Building #:	2673	26072	2671	PW-6	2603	new	new	new	new	new	new
Max Annual Pumping		1,617	1,368	933	1,244	1,244	1,136	940	722	422	309	205
Potential w/ 80% Util		1,710	1,447	986	1,315	1,315	1,315	1,315	1,315	1,315	1,315	1,315
Potential Yield (gpm)		1,300	1,100	750	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
		UY	UY	UY	UY	UY	UY	UY	UY	UY	UY	UY
		10/4-7A2	10/4-8D1	10/4-7H2	PW-6	10/4-7R2	UY-1	UY-2	UY-3	UY-4	UY-5	UY-6
MY	HC	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)
1	VW	1,601	1,355	924	1,232	1,232	931	830	532	318	318	-
2	BN	1,404	1,188	810	1,080	1,080	736	736	432	214	-	-
3	AN	1,319	1,116	761	1,015	1,015	405	95	-	-	-	-
4	ED	1,246	1,054	719	958	958	736	736	432	214	-	-
5	ED	792	670	457	609	609	-	-	-	-	-	-
6	ED	888	752	512	683	683	-	-	-	-	-	-
7	AN	1,245	1,054	718	958	958	196	95	-	-	-	-
8	ED	1,236	1,046	713	951	951	728	728	424	206	-	-
9	ED	869	735	501	668	668	-	-	-	-	-	-
10	ED	888	752	512	683	683	-	-	-	-	-	-
11	BN	888	752	512	683	683	-	-	-	-	-	-
12	ED	888	752	512	683	683	-	-	-	-	-	-
13	ED	888	752	512	683	683	-	-	-	-	-	-
14	ED	888	752	512	683	683	-	-	-	-	-	-
15	AN	1,245	1,054	718	958	958	196	95	-	-	-	-
16	AN	1,582	1,339	913	1,217	1,217	1,112	922	519	310	310	102
17	ED	1,244	1,052	717	957	957	734	734	627	426	213	-
18	VW	1,245	1,054	718	958	958	196	95	-	-	-	-
19	BN	1,455	1,231	839	1,119	1,119	736	736	432	214	-	-
20	BN	1,286	1,088	742	990	990	404	97	-	-	-	-
21	ED	1,079	913	622	830	830	-	-	-	-	-	-
22	BN	888	752	512	683	683	-	-	-	-	-	-
23	BN	888	752	512	683	683	-	-	-	-	-	-
24	BN	888	752	512	683	683	-	-	-	-	-	-
25	BN	888	752	512	683	683	-	-	-	-	-	-
26	ED	888	752	512	683	683	-	-	-	-	-	-
27	VW	1,245	1,054	718	958	958	196	95	-	-	-	-
28	AN	1,582	1,339	913	1,217	1,217	1,112	922	519	310	310	102
29	VW	1,616	1,368	933	1,243	1,243	1,243	943	732	421	315	207
30	AN	1,573	1,331	907	1,210	1,210	1,105	915	714	511	413	209
31	AN	1,599	1,353	922	1,230	1,230	1,125	935	627	415	310	102
32	VW	1,619	1,370	934	1,245	1,245	1,245	945	734	423	317	102
33	AN	1,580	1,337	912	1,216	1,216	1,111	921	720	517	310	102
34	AN	1,593	1,348	919	1,225	1,225	1,121	931	622	419	313	-
35	AN	1,597	1,351	921	1,229	1,229	1,124	934	626	422	316	-
36	BN	1,452	1,229	838	1,117	1,117	734	734	627	426	213	-
37	AN	1,552	1,313	895	1,193	1,193	600	192	-	-	-	-
38	BN	1,455	1,231	839	1,119	1,119	736	736	432	214	-	-
39	BN	1,286	1,088	742	990	990	404	97	-	-	-	-
40	VW	1,436	1,215	828	1,104	1,104	196	95	-	-	-	-
41	AN	1,592	1,347	918	1,225	1,225	1,120	930	526	317	207	-
42	VW	1,615	1,366	932	1,242	1,242	1,242	942	731	449	350	242
43	AN	1,573	1,331	907	1,210	1,210	1,105	915	714	511	413	209
44	VW	1,616	1,368	933	1,243	1,243	1,243	943	732	421	315	207
45	BN	1,433	1,212	826	1,102	1,102	719	719	719	516	417	209
46	AN	1,552	1,313	895	1,193	1,193	600	192	-	-	-	-
47	VW	1,620	1,371	935	1,246	1,246	1,246	946	640	323	213	105
48	BN	1,439	1,218	830	1,107	1,107	724	724	724	516	417	209
49	BN	1,286	1,088	742	990	990	404	97	-	-	-	-
50	AN	1,436	1,215	828	1,104	1,104	196	95	-	-	-	-
	Min	792	670	457	609	609	-	-	-	-	-	-
	Max	1,620	1,371	935	1,246	1,246	1,246	946	734	517	417	242
	Median	1,362	1,152	786	1,047	1,047	600	192	-	-	-	-
	Average	1,299	1,099	750	999	999	555	436	291	181	120	42
		Average Monthly Well Production										
	Month	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)
	Oct	106	89	61	81	81	49	49	10	-	-	-
	Nov	109	93	63	84	84	49	49	28	10	-	-
	Dec	117	99	67	90	90	61	51	51	29	8	-
	Jan	124	105	71	95	95	61	61	51	51	36	26
	Feb	123	104	71	95	95	63	50	50	50	40	17
	Mar	119	101	69	92	92	62	50	50	39	35	-
	Apr	111	94	64	85	85	50	50	40	-	-	-
	May	102	86	59	78	78	48	28	-	-	-	-
	Jun	94	79	54	72	72	27	-	-	-	-	-
	Jul	98	83	57	76	76	28	-	-	-	-	-
	Aug	93	78	53	71	71	9	-	-	-	-	-
Annual Total		1,299	1,099	750	999	999	555	436	291	181	120	42

		Table O-3. Run11 Annual Pumping by Well (Continued)							
	Building #:	2393	2373	2363	2363	2301	33924	33923	new
Max Annual Pumping		1,109	1,412	1,210	0	1,512	0	1,210	1,210
Potential w/ 80% Util		1,447	1,841	1,578	0	1,973	0	1,578	1,578
Potential Yield (gpm)		1,100	1,400	1,200	0	1,500	0	1,200	1,200
		CH	CH	CH	CH	CH	CH	CH	CH
		10/4-18E4	10/4-18M4&5	10/5-13R2	10/5-23G4	10/5-23J1	10/5-23K2	10/5-23K3	CH-4
MY	HC	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)
1	VW	895	1,139	976	-	1,220	-	976	976
2	BN	760	968	830	-	1,037	-	830	830
3	AN	670	852	730	-	913	-	730	730
4	ED	494	629	539	-	674	-	539	539
5	ED	196	249	213	-	267	-	213	213
6	ED	229	291	250	-	312	-	250	250
7	AN	429	547	469	-	586	-	469	469
8	ED	645	820	703	-	879	-	703	703
9	ED	229	291	250	-	312	-	250	250
10	ED	229	291	250	-	312	-	250	250
11	BN	229	291	250	-	312	-	250	250
12	ED	229	291	250	-	312	-	250	250
13	ED	229	291	250	-	312	-	250	250
14	ED	229	291	250	-	312	-	250	250
15	AN	429	547	469	-	586	-	469	469
16	AN	921	1,172	1,005	-	1,256	-	1,005	1,005
17	ED	703	895	767	-	959	-	767	767
18	VW	429	547	469	-	586	-	469	469
19	BN	760	968	830	-	1,037	-	830	830
20	BN	493	627	537	-	672	-	537	537
21	ED	278	354	303	-	379	-	303	303
22	BN	229	291	250	-	312	-	250	250
23	BN	229	291	250	-	312	-	250	250
24	BN	229	291	250	-	312	-	250	250
25	BN	229	291	250	-	312	-	250	250
26	ED	229	291	250	-	312	-	250	250
27	VW	429	547	469	-	586	-	469	469
28	AN	921	1,172	1,005	-	1,256	-	1,005	1,005
29	VW	991	1,261	1,081	-	1,351	-	1,081	1,081
30	AN	974	1,240	1,063	-	1,329	-	1,063	1,057
31	AN	950	1,209	1,037	-	1,296	-	1,037	1,037
32	VW	982	1,250	1,072	-	1,340	-	1,072	1,072
33	AN	959	1,221	1,047	-	1,308	-	1,047	1,047
34	AN	937	1,193	1,023	-	1,278	-	1,023	1,023
35	AN	941	1,197	1,026	-	1,283	-	1,026	1,026
36	BN	819	1,042	893	-	1,117	-	893	893
37	AN	670	852	730	-	913	-	730	730
38	BN	760	968	830	-	1,037	-	830	830
39	BN	493	627	537	-	672	-	537	537
40	VW	479	609	522	-	653	-	522	522
41	AN	908	1,155	990	-	1,238	-	990	990
42	VW	999	1,272	1,090	-	1,363	-	1,090	1,090
43	AN	974	1,240	1,063	-	1,329	-	1,063	1,057
44	VW	991	1,261	1,081	-	1,351	-	1,081	1,081
45	BN	866	1,102	945	-	1,181	-	945	940
46	AN	670	852	730	-	913	-	730	730
47	VW	954	1,215	1,041	-	1,301	-	1,041	1,041
48	BN	870	1,107	949	-	1,186	-	949	949
49	BN	493	627	537	-	672	-	537	537
50	AN	479	609	522	-	653	-	522	522
	Min	196	249	213	-	267	-	213	213
	Max	999	1,272	1,090	-	1,363	-	1,090	1,090
	Median	657	836	717	-	896	-	717	717
	Average	607	773	662	-	828	-	662	662
		Average Monthly Well Production							
	Month	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)
	Oct	48	61	52	-	65	-	52	52
	Nov	52	66	56	-	71	-	56	56
	Dec	60	77	66	-	82	-	66	66
	Jan	70	89	76	-	96	-	76	76
	Feb	68	86	74	-	92	-	74	74
	Mar	63	80	69	-	86	-	69	69
	Apr	51	65	56	-	70	-	56	56
	May	43	54	46	-	58	-	46	46
	Jun	35	45	39	-	48	-	39	39
	Jul	37	47	41	-	51	-	41	41
	Aug	33	43	37	-	46	-	37	37
Annual Total		607	773	662	-	828	-	662	662

C:\LSMRGW Model\Run11\POST\C.IC-hydrographs_Run11.xls / printed 12/5/2006





Emergency Water Called on Years Marked With *

Layer 1 (L1) and Layer 2(L2) simulated groundwater levels are at similar elevations and the graph lines are printed on top of each other.

FIGURE O-1
Run 11 Two Direct Diversions

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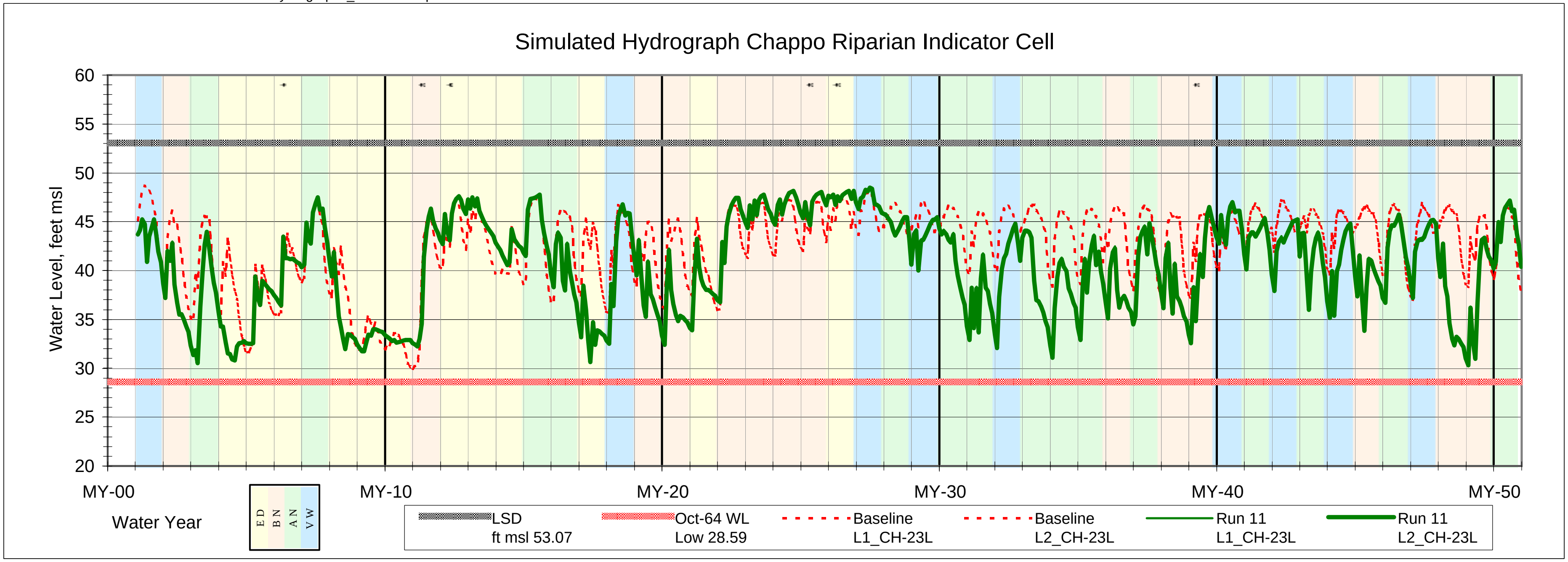
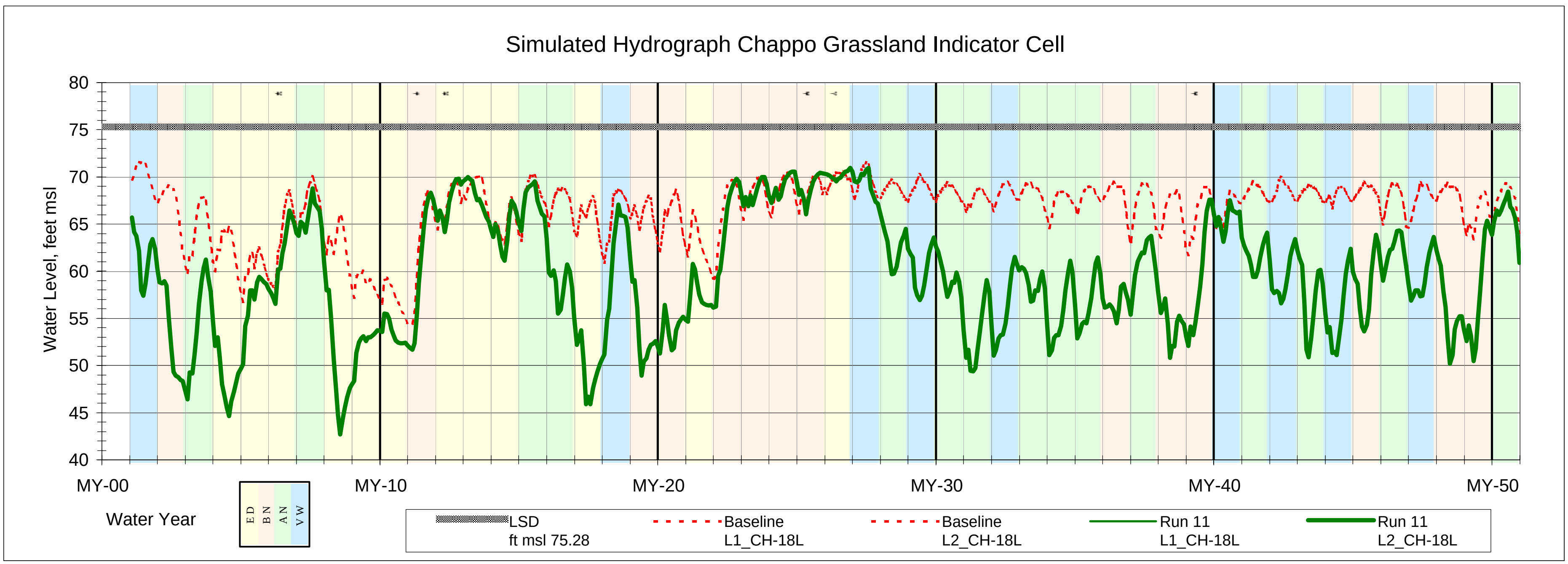




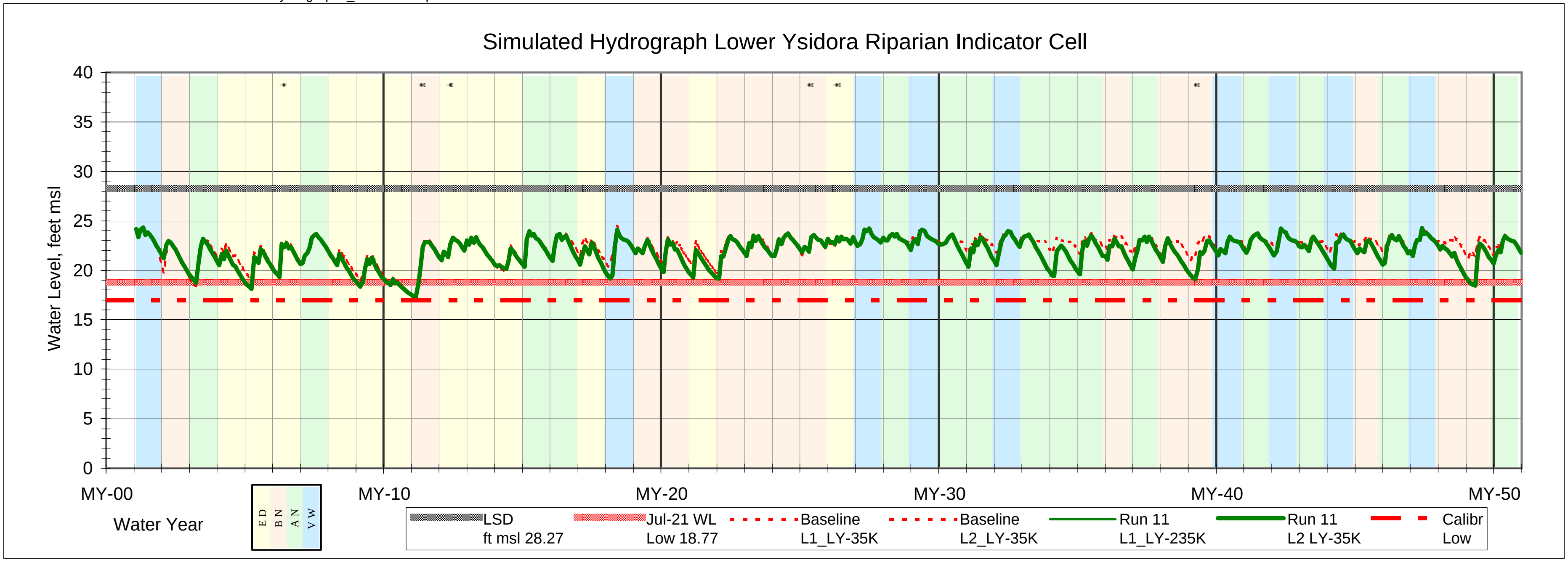
Emergency Water Called on Years Marked With *

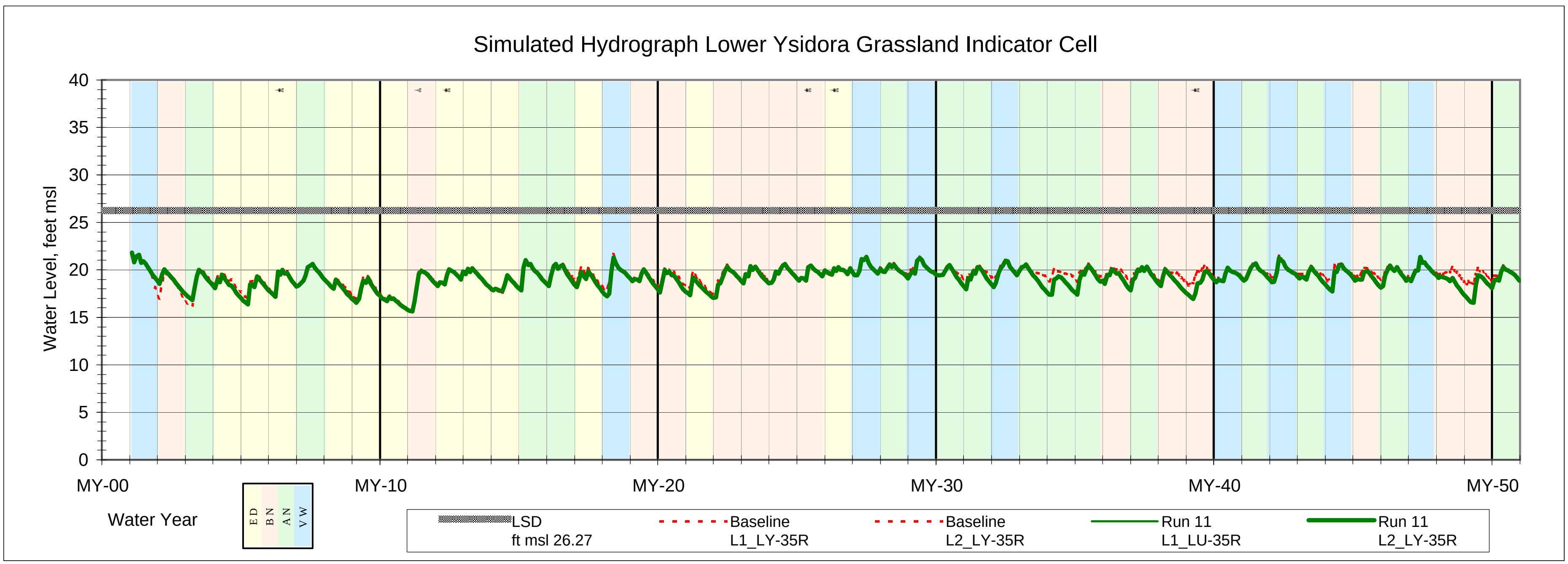
Layer 1 (L1) and Layer 2(L2) simulated groundwater levels are at similar elevations and the graph lines are printed on top of each other.

FIGURE O-2

Run 11 Two Direct Diversions

C:\LSMRGW Model\Run11\POST\C.IC-hydrographs_Run11.xls / printed 12/5/2006



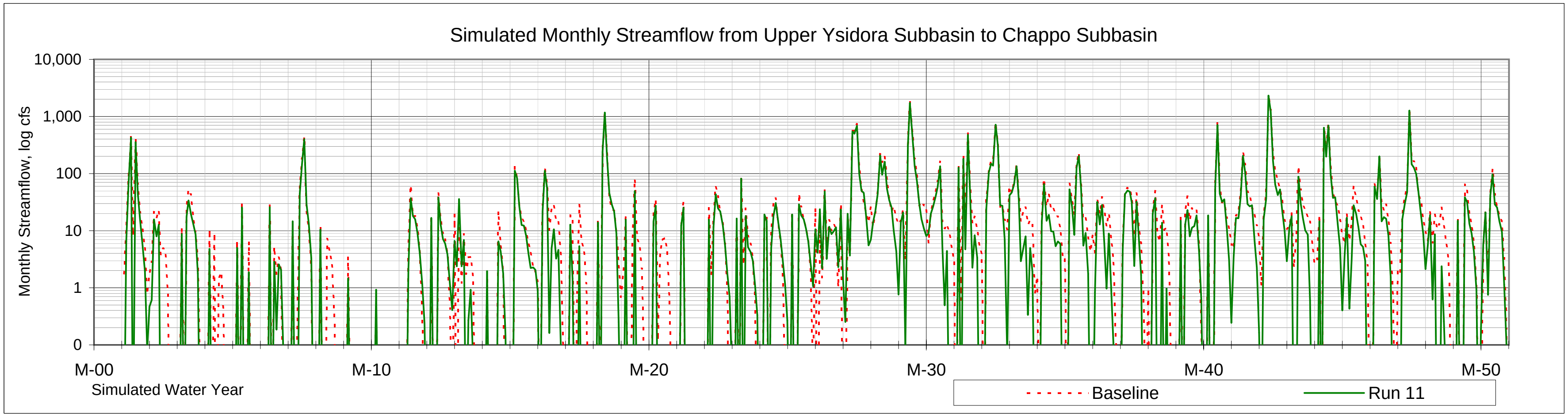


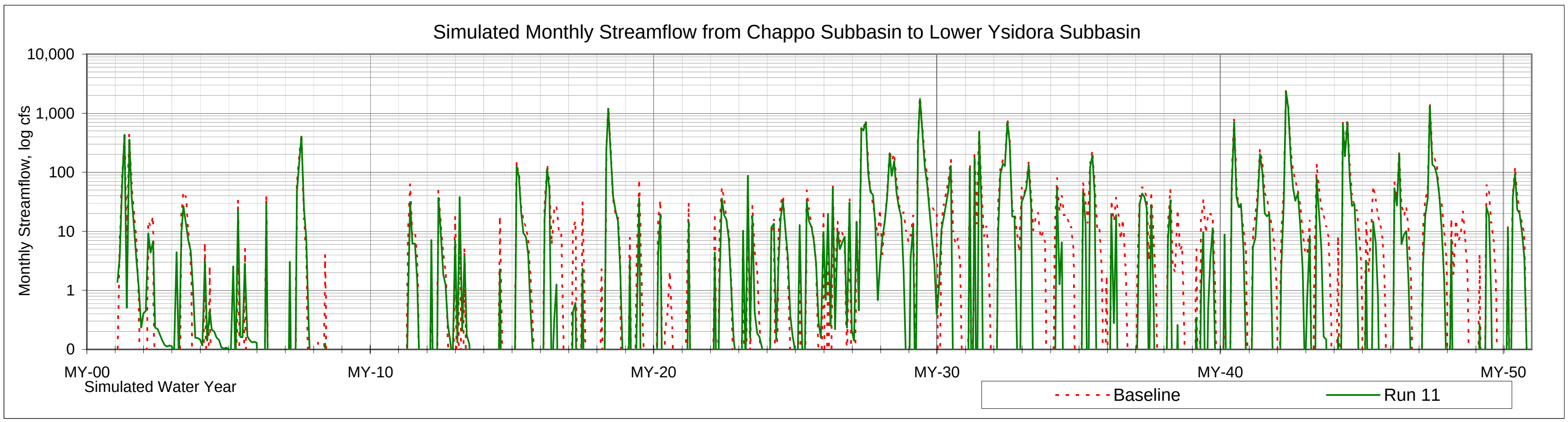
Emergency Water Called on Years Marked With *

Layer 1 (L1) and Layer 2(L2) simulated groundwater levels are at similar elevations and the graph lines are printed on top of each other.

FIGURE O-3

Run 11 Two Direct Diversions





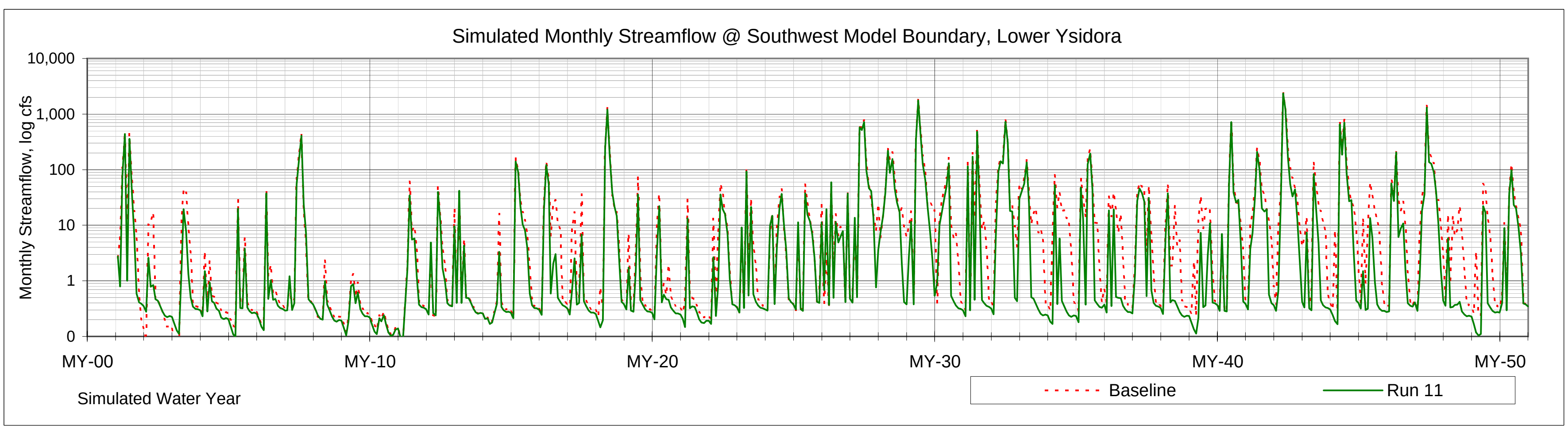


Figure O-4. Simulated Streamflow; Run 11 Two Direct Diversions

Table O-4. Run 11 Two Direct Diversions

Average Hydrologic Condition Water Budget (af/y)

% Time Exceedence	> 76%	76% to 50%	50% to 19%	< 19%
# Years	12	14	15	9
	Extremely Dry	Below Normal	Above Normal	Very Wet
Inflow:				
Santa Margarita River Inflow	7,300	13,100	31,600	123,700
Subsurface Underflow	1,000	900	900	800
Lake O'Neill Spill and Release	800	1,400	1,800	2,200
Fallbrook Creek	100	400	1,400	3,800
Minor Tributary Drainages	1,700	1,400	2,400	4,900
Areal Precipitation	500	500	700	1,600
Total Inflow:	11,400	17,700	38,800	137,000
Outflow:				
Santa Margarita River Outflow	1,900	3,000	19,100	113,200
Subsurface Underflow	100	100	100	100
Groundwater Pumping	6,700	9,700	13,700	14,000
Evapotranspiration	1,900	2,300	2,500	3,000
Diversions to Lake O'Neill	1,200	1,900	2,400	2,700
CPEN Direct Diversion	0	500	1,600	3,100
Total Outflow:	11,800	17,500	39,400	136,100
Net Simulated Change of Groundwater in Storage:	-400	200	-600	900
FPUD Direct Diversion	100	200	700	3,400
	-	-	-	-

Median Hydrologic Condition Water Budget (af/y)

% Time Exceedence	> 76%	76% to 50%	50% to 19%	< 19%
# Years	12	14	15	9
	Extremely Dry	Below Normal	Above Normal	Very Wet
Inflow:				
Santa Margarita River Inflow	6,700	13,000	28,500	115,400
Subsurface Underflow	1,000	900	900	800
Lake O'Neill Spill and Release	900	1,300	2,100	2,300
Fallbrook Creek	100	300	1,100	3,500
Minor Tributary Drainages	1,500	1,400	2,500	4,700
Areal Precipitation	400	300	500	1,500
Outflow:				
Santa Margarita River Outflow	900	2,500	15,900	101,000
Subsurface Underflow	100	100	100	100
Groundwater Pumping	5,100	9,000	15,900	16,500
Evapotranspiration	1,500	2,000	2,400	2,800
Diversions to Lake O'Neill	1,300	1,700	2,700	2,700
CPEN Direct Diversion	0	200	1,500	3,400
Net Simulated Change of Groundwater in Storage:	-200	0	-400	1,100
FPUD Direct Diversion	100	200	500	4,000

Average Subbasin Water Budget (af/y)

	Upper Ysidora	Chappo	Lower Ysidora	SMR Basin	
Inflow:					
Santa Margarita River Inflow	37,100	29,100	26,700	37,100	85%
Subsurface Underflow *	900	1,800	500	900	2%
Lake O'Neill Spill and Release	1,500	-	-	1,500	3%
Fallbrook Creek	1,200	-	-	1,200	3%
Minor Tributary Drainages	600	1,100	700	2,400	5%
Areal Precipitation	200	300	300	800	2%
Total Inflow:	41,500	32,300	28,200	43,900	
Outflow:					
Santa Margarita River Outflow	29,100	26,700	27,300	27,300	62%
Subsurface Underflow *	1,800	500	100	100	0%
Groundwater Pumping	6,800	4,200	0	11,000	25%
Evapotranspiration *	700	900	800	2,400	5%
Diversions to Lake O'Neill	2,000	-	-	2,000	5%
CPEN Direct Diversion	1,200	0	0	1,200	3%
Total Outflow:	41,600	32,300	28,200	44,000	
Net Simulated Change of Groundwater in Storage: *	-100	0	0	-100	
FPUD Direct Diversion				900	
	-	-	-	-	

Note: * Subbasin Medians are based on the last rate of the stress period
Values are rounded to the nearest 100 acre-feet, closest number adjusted to eliminate rounding error

Median Subbasin Water Budget (af/y)

	Upper Ysidora	Chappo	Lower Ysidora	SMR Basin
Inflow:				
Santa Margarita River Inflow	15,800	8,000	5,500	15,800
Subsurface Underflow *	900	1,800	500	900
Lake O'Neill Spill and Release	1,500	-	-	1,500
Fallbrook Creek	600	-	-	600
Minor Tributary Drainages	600	1,100	700	2,100
Areal Precipitation	100	200	200	500
Outflow:				
Santa Margarita River Outflow	8,000	5,500	6,000	6,000
Subsurface Underflow *	1,800	500	100	100
Groundwater Pumping	6,900	4,500	0	11,000
Evapotranspiration *	700	900	800	2,300
Diversions to Lake O'Neill	2,100	-	-	2,100
CPEN Direct Diversion	864	0	0	864
Net Simulated Change of Groundwater in Storage: *	0	0	0	100
FPUD Direct Diversion				300

Note: The sum of median values does not reflect the change of groundwater in storage.
Median values are not cummulative.
* Subbasin Medians are based on the last rate of the stress period
Values are rounded to the nearest 100 acre-feet

Table O-5 Run11 Annual Water budget

Lower Santa Margarita River Groundwater Model

Annual Surface Water Budget

MY		SMR Flow In	LON Diversion	Ponds Diversion	Str Gain+ / Loss-	GAGE SMR @ UY->CH	Str Gain+ / Loss-	SMR @ CH->LY	Str Gain+ / Loss-	SMR Flow Out	LSMR Str Gain+ / Loss-
1	VW	64,975	2,364	9,734	-8,582	56,393	-1,401	54,992	1,831	56,823	-8,152
2	BN	8,737	1,531	3,426	-6,488	2,249	-1,943	306	112	417	-8,320
3	AN	15,056	1,063	6,503	-8,973	6,083	-4,088	1,994	-121	1,873	-13,182
4	ED	6,711	1,323	2,646	-6,426	284	-270	14	300	314	-6,397
5	ED	6,003	337	1,336	-4,027	1,976	-736	1,240	351	1,591	-4,413
6	ED	8,129	1,307	2,764	-6,077	2,052	-256	1,796	771	2,567	-5,561
7	AN	44,777	1,151	10,868	-5,799	38,978	-1,584	37,394	751	38,144	-6,633
8	ED	6,750	1,291	3,474	-6,126	625	-618	7	207	214	-6,536
9	ED	4,840	786	1,820	-4,754	86	-83	3	260	263	-4,578
10	ED	3,399	393	1,216	-3,345	55	-55	0	108	108	-3,291
11	BN	13,430	1,569	6,768	-8,293	5,137	-2,521	2,617	279	2,895	-10,535
12	ED	10,860	1,665	4,794	-5,467	5,393	-1,698	3,695	377	4,072	-6,789
13	ED	4,872	577	1,797	-1,957	2,916	-389	2,527	422	2,948	-1,924
14	ED	5,657	412	2,946	-4,771	887	-751	136	235	371	-5,286
15	AN	21,496	2,748	6,132	-5,474	16,022	-652	15,370	1,335	16,705	-4,791
16	AN	23,399	2,344	7,510	-10,361	13,038	-1,813	11,224	1,184	12,408	-10,991
17	ED	9,956	1,979	3,961	-8,781	1,175	-968	207	582	789	-9,167
18	VW	103,699	2,415	14,062	-5,134	98,565	-2,112	96,452	1,515	97,967	-5,732
19	BN	12,879	2,317	4,573	-8,918	3,961	-1,531	2,430	121	2,551	-10,328
20	BN	8,852	1,263	3,584	-6,325	2,527	-1,099	1,428	349	1,777	-7,076
21	ED	7,639	1,831	1,408	-5,353	2,287	-1,382	905	70	975	-6,665
22	BN	14,519	1,514	8,373	-6,418	8,101	-3,124	4,977	-48	4,929	-9,591
23	BN	12,129	1,607	2,949	-4,209	7,919	-874	7,045	687	7,732	-4,396
24	BN	11,141	1,699	5,702	-4,324	6,817	-1,247	5,570	511	6,081	-5,060
25	BN	12,102	1,733	6,834	-5,299	6,803	-1,384	5,419	422	5,841	-6,260
26	ED	12,488	1,940	4,851	-3,336	9,152	-896	8,256	802	9,058	-3,430
27	VW	122,815	2,792	20,446	-4,267	118,548	587	119,135	2,205	121,340	-1,474
28	AN	53,117	2,721	22,011	-12,534	40,583	-4,063	36,521	596	37,116	-16,001
29	VW	176,345	2,721	24,937	-11,279	165,066	-3,232	161,834	1,934	163,769	-12,576
30	AN	28,467	2,749	8,575	-10,592	17,875	-3,650	14,225	194	14,419	-14,048
31	AN	61,760	2,697	9,046	-10,189	51,571	-3,387	48,185	614	48,799	-12,961
32	VW	103,957	2,720	17,416	-10,595	93,362	-5,206	88,156	885	89,042	-14,916
33	AN	29,414	2,714	10,337	-10,958	18,456	-3,101	15,355	495	15,850	-13,564
34	AN	21,713	2,702	9,761	-12,655	9,058	-5,284	3,774	-29	3,746	-17,967
35	AN	38,768	2,235	9,948	-9,803	28,965	-4,199	24,766	481	25,247	-13,521
36	BN	14,123	2,155	5,089	-8,645	5,478	-3,148	2,329	171	2,501	-11,622
37	AN	18,898	1,923	5,805	-5,554	13,344	-3,450	9,894	497	10,390	-8,508
38	BN	12,476	1,727	4,895	-8,140	4,335	-1,851	2,485	375	2,859	-9,617
39	BN	16,011	2,438	8,959	-9,739	6,272	-4,728	1,545	-159	1,385	-14,626
40	VW	63,245	2,819	14,567	-7,691	55,555	-2,402	53,153	343	53,497	-9,749
41	AN	41,308	2,711	16,680	-12,917	28,391	-4,465	23,926	372	24,298	-17,010
42	VW	245,645	2,723	24,391	-10,120	235,525	-4,121	231,404	1,623	233,027	-12,618
43	AN	23,842	2,751	13,939	-13,211	10,630	-4,075	6,555	229	6,784	-17,058
44	VW	117,210	2,676	21,790	-12,498	104,713	-3,952	100,761	1,240	102,001	-15,210
45	BN	17,806	2,748	10,810	-12,031	5,775	-4,318	1,457	-20	1,437	-16,369
46	AN	29,474	2,138	9,618	-7,946	21,528	-2,865	18,663	593	19,256	-10,218
47	VW	115,400	2,716	23,452	-11,807	103,593	-3,959	99,634	1,387	101,021	-14,379
48	BN	13,181	2,744	7,205	-11,000	2,181	-1,756	425	129	554	-12,627
49	BN	15,505	1,871	7,483	-8,813	6,692	-4,055	2,637	-170	2,467	-13,038
50	AN	22,106	2,607	10,071	-7,671	14,435	-2,859	11,576	149	11,725	-10,381
	avg	37,142	1,999	8,945	**-7,913**	29,228	**-2,340**	26,888	**551**	27,439	**-9,703**
	med	15,758	2,146	7,344	-8,043	8,010	-2,028	5,494	376	5,961	-9,683
AVERAGES											
ED	12	7,275	1,153	2,751	-5,035	2,241	-675	1,565	374	1,939	-5,336
BN	14	13,064	1,923	6,189	-7,760	5,303	-2,399	2,905	197	3,102	-9,962
AN	15	31,573	2,350	10,454	-9,643	21,930	-3,302	18,628	489	19,117	-12,456
VW	9	123,699	2,661	18,977	-9,108	114,591	-2,866	111,725	1,440	113,165	-10,534
MEDIANS											
ED	12	6,730	1,299	2,705	-5,062	1,575	-677	556	325	882	-5,424
BN	14	13,030	1,730	6,235	-8,217	5,626	-1,897	2,457	150	2,526	-9,973
AN	15	28,467	2,697	9,761	-10,189	17,875	-3,450	15,355	495	15,850	-13,182
VW	9	115,400	2,720	20,446	-10,120	103,593	-3,232	99,634	1,515	101,021	-12,576

Table O-5 Run11 Annual Water budget (continued)

Lower Santa Margarita River Groundwater Model

Annual Groundw ater Budget

MY	INFLOW: Storage	Recharge	Stream Leakance	GHB	TOTAL GW IN	OUTFLOW: Storage	Wells	ET	Stream Leakance	GHB	TOTAL GW OUT
1	8,303	9,652	9,567	870	28,392	5,120	15,454	2,787	4,988	66	28,415
2	6,781	3,631	6,232	937	17,582	2,354	12,933	1,710	549	55	17,601
3	5,434	6,199	10,548	988	23,169	8,422	10,354	1,789	2,571	52	23,186
4	6,456	2,951	4,913	958	15,278	3,261	10,468	1,196	311	53	15,289
5	3,480	1,658	6,290	1,125	12,553	6,362	4,488	1,389	284	49	12,571
6	3,363	3,506	5,856	1,012	13,737	5,528	5,101	1,971	1,098	56	13,755
7	6,506	10,328	7,156	898	24,888	6,697	8,191	2,778	7,167	63	24,896
8	8,180	3,632	3,763	942	16,516	3,242	11,435	1,405	410	49	16,540
9	2,647	2,197	4,607	1,027	10,479	4,008	5,023	1,141	253	48	10,474
10	2,782	1,352	2,656	1,056	7,847	1,605	5,101	956	159	41	7,862
11	3,329	6,582	9,194	944	20,048	8,866	5,099	2,095	3,950	50	20,059
12	2,812	4,947	6,754	907	15,421	4,867	5,101	2,857	2,550	57	15,433
13	3,834	2,117	3,969	911	10,831	1,067	5,099	2,860	1,761	59	10,847
14	3,577	3,290	4,649	953	12,469	3,992	5,101	2,204	1,132	52	12,481
15	5,174	7,151	6,458	876	19,659	4,284	8,193	2,918	4,224	66	19,685
16	6,529	7,020	11,019	890	25,458	4,725	15,904	2,241	2,528	64	25,461
17	6,522	4,298	8,099	922	19,841	5,331	12,521	1,435	514	57	19,857
18	6,655	13,283	9,486	862	30,286	10,459	8,191	2,489	9,100	63	30,302
19	7,571	4,826	7,362	900	20,659	4,527	13,136	1,837	1,129	56	20,685
20	4,624	3,974	6,614	914	16,125	4,513	8,999	1,646	921	56	16,135
21	3,299	1,697	5,601	975	11,571	3,545	6,194	1,550	257	49	11,594
22	4,068	7,886	8,033	887	20,873	7,913	5,099	2,688	5,126	58	20,884
23	2,959	3,427	6,033	906	13,326	3,138	5,101	2,978	2,068	60	13,345
24	3,347	5,996	6,499	879	16,721	3,726	5,099	3,159	4,685	64	16,733
25	3,455	7,130	6,205	881	17,671	4,617	5,101	3,154	4,752	63	17,687
26	2,668	5,278	6,173	872	14,991	2,121	5,099	3,338	4,366	67	14,991
27	6,311	18,062	6,965	829	32,167	6,286	8,193	3,437	14,194	75	32,184
28	6,800	18,163	9,674	817	35,455	5,133	15,904	3,012	11,350	68	35,468
29	5,758	21,492	11,589	813	39,651	6,878	17,103	2,909	12,688	72	39,650
30	6,460	7,316	9,798	865	24,440	2,594	16,827	2,424	2,564	62	24,472
31	6,371	7,826	11,676	879	26,752	6,274	16,414	1,878	2,140	61	26,767
32	5,927	15,101	13,981	845	35,854	8,648	16,965	2,431	7,743	68	35,856
33	5,925	9,162	9,114	868	25,069	3,035	16,575	2,259	3,177	61	25,107
34	5,303	8,287	12,397	882	26,869	5,785	16,208	1,908	2,925	52	26,877
35	5,292	9,045	12,443	872	27,652	6,320	16,230	2,204	2,835	61	27,650
36	5,294	5,464	10,124	888	21,770	4,029	14,164	1,970	1,598	58	21,819
37	4,894	5,831	10,331	888	21,944	5,624	11,547	2,422	2,264	63	21,921
38	6,097	4,890	9,068	907	20,962	4,640	13,131	1,807	1,348	55	20,981
39	4,031	7,461	9,894	888	22,275	7,583	8,999	2,220	3,400	52	22,254
40	6,033	12,006	7,277	872	26,189	6,198	9,298	2,867	7,808	60	26,231
41	5,546	13,820	10,859	847	31,072	4,904	15,680	2,778	7,661	64	31,085
42	6,540	21,120	11,777	815	40,253	7,204	17,264	2,780	12,943	67	40,258
43	7,266	11,639	9,826	849	29,580	5,372	16,827	2,420	4,913	59	29,591
44	7,798	18,480	12,098	833	39,210	8,912	17,103	2,397	10,746	62	39,220
45	6,244	9,275	9,917	863	26,299	5,303	14,968	2,197	3,813	57	26,338
46	5,395	8,425	8,999	868	23,687	5,303	11,547	2,562	4,190	62	23,664
47	5,854	20,294	12,190	829	39,167	7,622	16,483	2,739	12,268	70	39,182
48	6,635	6,657	7,484	872	21,648	2,893	15,037	1,850	1,827	56	21,663
49	5,303	6,749	9,114	909	22,075	8,150	8,999	1,887	3,042	48	22,126
50	5,831	8,678	7,668	865	23,042	5,395	9,275	2,842	5,438	61	23,011
avg	5,345	8,185	8,360	899	22,789	5,287	10,966	2,295	4,195	59	22,803
med	5,652	7,075	8,549	884	22,010	5,218	10,952	2,328	2,983	60	22,023
AVERAGES											
ED	4,135	3,077	5,278	972	13,461	3,744	6,728	1,858	1,091	53	13,474
BN	4,981	5,996	7,984	898	19,860	5,161	9,705	2,228	2,729	56	19,879
AN	5,915	9,259	9,864	877	25,916	5,324	13,712	2,429	4,396	61	25,923
VW	6,576	16,610	10,548	841	34,574	7,481	14,006	2,759	10,275	67	34,589
MEDIANS											
ED	3,422	3,121	5,257	956	13,145	3,768	5,101	1,492	462	52	13,163
BN	4,959	6,289	7,758	894	20,766	4,572	8,999	2,032	2,555	56	20,785
AN	5,831	8,425	9,826	872	25,069	5,372	15,904	2,422	3,177	62	25,107
VW	6,311	18,062	11,589	833	35,854	7,204	16,483	2,780	10,746	67	35,856

Table O-5 Run11 Annual Water budget (continued)

Lower Santa Margarita River Groundwater Model

	Balance of Groundwater in Storage				Direct Diversions	
MY	NET Storage	NET Str Lknc	In-Out	% bal	CPEN Direct DIV	FPUD Direct DIV
1	-3,183	-4,579	-23.2	-0.08%	1,179	1,459
2	-4,427	-5,683	-18.6	-0.11%	-	-
3	2,987	-7,977	-17.2	-0.07%	529	593
4	-3,195	-4,601	-10.8	-0.07%	-	50
5	2,882	-6,006	-17.9	-0.14%	-	149
6	2,165	-4,758	-17.8	-0.13%	-	99
7	191	11	-7.7	-0.03%	1,171	1,922
8	-4,938	-3,353	-24.8	-0.15%	-	-
9	1,361	-4,354	4.3	0.04%	-	-
10	-1,178	-2,497	-14.5	-0.18%	-	-
11	5,537	-5,244	-10.7	-0.05%	676	298
12	2,055	-4,204	-12.1	-0.08%	40	198
13	-2,766	-2,208	-15.8	-0.15%	-	98
14	416	-3,517	-12.4	-0.10%	-	149
15	-891	-2,234	-25.7	-0.13%	57	446
16	-1,804	-8,492	-3.4	-0.01%	1,149	446
17	-1,191	-7,585	-16.0	-0.08%	-	149
18	3,804	-386	-15.8	-0.05%	1,864	2,021
19	-3,044	-6,233	-26.4	-0.13%	58	248
20	-110	-5,693	-10.5	-0.06%	-	99
21	246	-5,344	-22.5	-0.19%	-	99
22	3,845	-2,906	-11.4	-0.05%	864	286
23	179	-3,965	-19.3	-0.14%	-	198
24	379	-1,814	-11.8	-0.07%	182	248
25	1,162	-1,453	-15.9	-0.09%	218	298
26	-546	-1,807	-0.4	0.00%	47	248
27	-25	7,229	-17.2	-0.05%	3,355	4,002
28	-1,667	1,676	-13.0	-0.04%	4,259	1,960
29	1,120	1,100	1.0	0.00%	4,376	5,008
30	-3,866	-7,234	-32.3	-0.13%	1,533	347
31	-96	-9,536	-15.1	-0.06%	1,671	645
32	2,720	-6,237	-1.8	-0.01%	2,745	1,830
33	-2,890	-5,937	-38.0	-0.15%	1,681	198
34	482	-9,472	-8.0	-0.03%	1,713	380
35	1,028	-9,607	1.4	0.01%	1,262	545
36	-1,265	-8,526	-49.3	-0.23%	19	99
37	730	-8,067	23.9	0.11%	522	347
38	-1,458	-7,720	-18.6	-0.09%	259	178
39	3,551	-6,494	21.3	0.10%	1,705	149
40	165	530	-41.7	-0.16%	2,551	1,189
41	-643	-3,198	-13.1	-0.04%	3,174	1,165
42	663	1,166	-5.3	-0.01%	4,093	6,479
43	-1,894	-4,913	-10.8	-0.04%	2,450	570
44	1,113	-1,352	-9.6	-0.02%	3,977	4,277
45	-941	-6,104	-38.8	-0.15%	1,833	198
46	-92	-4,809	22.7	0.10%	1,513	492
47	1,768	78	-15.2	-0.04%	4,032	4,541
48	-3,742	-5,657	-14.7	-0.07%	863	-
49	2,847	-6,072	-50.5	-0.23%	969	397
50	-436	-2,229	31.0	0.13%	1,756	438
avg	-58	-4,165	-13.4	-0.07%	1,207	905
med	70	-4,680	-14.6	-0.07%	864	298
AVERAGES						
ED	-391	-4,186	-13.4	-0.10%	7	103
BN	179	-5,255	-19.7	-0.10%	546	193
AN	-591	-5,468	-7.0	-0.03%	1,629	700
VW	905	-272	-14.3	-0.05%	3,130	3,423
MEDIANS						
ED	-150	-4,279	-15.2	-0.11%	-	99
BN	34	-5,688	-17.2	-0.09%	239	198
AN	-436	-5,937	-10.8	-0.04%	1,533	492
VW	1,113	78	-15.2	-0.04%	3,355	4,002

Table O-6 Run 11 Two Direct Diversions Average Monthly Water Budget

Lower Santa Margarita River Groundwater Model — Run 11 Two Direct Diversions

Modflow Volumetric Budget Output and Streamflow — 12/4/06

Avg AF/M	SMR Flow In	Diversion	Str Gain+ / Loss-	SMR @ UY->CH	Str Gain+ / Loss-	SMR @ CH->LY	Str Gain+ / Loss-	SMR Flow Out	LSMR Str Gain+ / Loss-
Oct	524	323	-369	155	-88	67	17	84	-440
Nov	1,276	661	60	1,336	-505	832	-8	824	-453
Dec	1,933	531	-742	1,190	-176	1,014	50	1,064	-868
Jan	8,250	840	-1,063	7,187	-138	7,049	150	7,198	-1,052
Feb	10,083	2,092	-1,797	8,286	-143	8,143	118	8,261	-1,822
Mar	8,557	2,372	-1,522	7,035	-253	6,783	107	6,890	-1,668
Apr	2,983	1,576	-786	2,197	-305	1,892	44	1,936	-1,047
May	1,285	993	-463	822	-269	553	9	562	-723
Jun	754	587	-148	606	-233	373	7	380	-373
Jul	499	344	-284	215	-141	74	11	86	-413
Aug	457	285	-358	99	-51	47	24	71	-386
Sep	541	340	-442	100	-39	61	21	82	-460
Avg Monthly	3,095	912	-659	2,436	-195	2,241	46	2,287	-809
Med Monthly	1,281	624	-453	1,006	-160	692	22	693	-591
Avg Total=Anl	37,142	10,944	-7,913	29,228	-2,340	26,888	551	27,439	-9,703

Lower Santa Margarita River Groundwater Model

Modflow Volumetric Budget Output

Average Monthly Water Budget

	INFLOW:					OUTFLOW:									
Avg AF/M	Storage	Recharge	Stream Leakance	GHB	TOTAL IN	Storage	Wells	ET	Stream Leakance	GHB	TOTAL OUT	NET Storage	NET Str Lknc	In-Out	% bal
Oct	560	109	403	81	1,153	73	856	161	57	8	1,156	-487	-345	-3.0	-0.26%
Nov	142	645	1,256	78	2,122	929	928	168	86	8	2,119	787	-1,170	3.5	0.16%
Dec	542	156	867	79	1,644	288	1,079	184	88	7	1,646	-254	-779	-1.9	-0.11%
Jan	377	366	1,229	78	2,051	513	1,261	187	87	5	2,054	136	-1,142	-3.3	-0.16%
Feb	282	1,919	907	75	3,184	1,424	1,226	183	346	0	3,178	1,142	-561	5.6	0.18%
Mar	184	2,176	938	74	3,372	1,110	1,145	214	902	1	3,372	926	-36	-0.3	-0.01%
Apr	398	1,348	767	68	2,581	445	933	216	977	8	2,579	47	211	1.6	0.06%
May	566	803	561	69	2,000	223	772	222	777	9	2,004	-343	216	-3.7	-0.18%
Jun	643	240	474	69	1,426	133	641	207	440	7	1,428	-510	-34	-1.8	-0.13%
Jul	575	123	382	74	1,154	49	676	201	228	4	1,158	-526	-154	-3.6	-0.31%
Aug	471	121	287	78	956	39	607	186	127	0	959	-432	-160	-2.5	-0.26%
Sep	604	177	290	76	1,147	62	843	166	79	1	1,151	-542	-211	-3.9	-0.34%
Avg Monthly	445	682	697	75	1,899	441	914	191	350	5	1,900	-5	-347	-1.1	-0.11%
Med Monthly	506	303	664	76	1,822	255	892	187	177	6	1,518	-298	-185	-2.2	-0.14%
Avg Total=Anl	5,345	8,185	8,360	899	22,789	5,287	10,966	2,295	4,195	59	22,803	-58	-4,165	-13.4	

Attachment P

Run 12 (Two Direct Diversions with Options) Model Results

Table P-1 Run 12 Annual Pumping and Direct Diversion Summary
LOWER SANTA MARGARITA RIVER GROUNDWATER MODEL

Hydrologic Condition (HC)

HC	Cnt	Oct to Apr Strflw
VW	9	Very Wet > 56,164
AN	15	Above Normal > 13,600
BN	14	Below Normal < 13,600
ED	12	Extremely Dry < 5,840
	50	

Pumping Condition (PC)

PC	HC	Q Adjst	Anl Q	# Years	
1	2+ AN @ VW	5,500	19,600	5	10%
2	2+ AN @ AN	2,400	16,500	9	18%
3	Standard	500	14,600	10	20%
4	1st BN	-2,500	11,600	6	12%
5	2ndBN, 75/25 split	-3,112	10,988	3	6%
6	3+BN/all ED	-7,942	6,158	17	34%

MY	WY	HC	Oct-Apr HC descrip	May to Apr PC	CPEN Direct Diversion (af/y)	UY Total (af/y)	CH Total (af/y)	GW Total (af/y)	FPUD Direct Diversion (af/y)	Total Basin Yield (af/y)	CWRMA Emerg. Water (af/y)	Additional Supply of Water (af/y)
1	1952	VW	Very Wet	3	1,179	8,613	7,337	15,950	1,459	18,587	-	-
2	1953	BN	Below Normal	4	-	7,810	5,814	13,623	-	13,623	-	-
3	1954	AN	Above Normal	3	529	7,320	4,846	12,166	444	13,140	-	1,600
4	1955	ED	Extremely Dry	5	-	6,641	4,052	10,693	50	10,742	-	-
5	1956	ED	Extremely Dry	6	-	4,064	1,938	6,002	149	6,151	-	400
6	1957	ED	Extremely Dry	6	-	4,064	2,094	6,158	99	6,257	2,352	-
7	1958	AN	Above Normal	3	1,171	5,308	3,598	8,906	1,922	11,999	-	-
8	1959	ED	Extremely Dry	5	-	6,641	5,211	11,852	-	11,852	-	-
9	1960	ED	Extremely Dry	6	-	4,064	2,094	6,158	-	6,158	-	-
10	1961	ED	Extremely Dry	6	-	4,064	2,094	6,158	-	6,158	-	200
11	1962	BN	Below Normal	6	676	4,064	2,094	6,158	298	7,132	2,281	400
12	1963	ED	Extremely Dry	6	40	4,064	2,094	6,158	198	6,396	1,813	-
13	1964	ED	Extremely Dry	6	-	4,064	2,094	6,158	98	6,256	-	-
14	1965	ED	Extremely Dry	6	-	4,064	2,094	6,158	-	6,158	-	-
15	1966	AN	Above Normal	3	57	5,308	3,598	8,906	446	9,409	-	-
16	1967	AN	Above Normal	2	1,149	8,748	7,452	16,199	446	17,795	-	-
17	1968	ED	Extremely Dry	5	-	7,333	5,801	13,134	149	13,282	-	-
18	1969	VW	Very Wet	3	1,864	5,308	3,598	8,906	2,021	12,791	-	-
19	1970	BN	Below Normal	4	58	7,810	5,814	13,623	248	13,930	-	-
20	1971	BN	Below Normal	5	-	7,525	3,876	11,401	99	11,500	-	-
21	1972	ED	Extremely Dry	6	-	6,214	3,201	9,416	99	9,515	-	1,400
22	1973	BN	Below Normal	6	864	4,064	2,094	6,158	236	7,258	-	200
23	1974	BN	Below Normal	6	-	4,064	2,094	6,158	198	6,356	-	-
24	1975	BN	Below Normal	6	182	4,064	2,094	6,158	248	6,588	-	-
25	1976	BN	Below Normal	6	218	4,064	2,094	6,158	298	6,674	2,093	-
26	1977	ED	Extremely Dry	6	47	4,064	2,094	6,158	248	6,453	2,417	-
27	1978	VW	Very Wet	3	3,355	5,308	3,598	8,906	4,002	16,262	-	-
28	1979	AN	Above Normal	2	4,259	8,748	7,452	16,199	1,960	22,418	-	-
29	1980	VW	Very Wet	1	4,376	10,058	8,568	18,626	5,008	28,011	-	-
30	1981	AN	Above Normal	2	1,533	9,779	8,331	18,110	347	19,990	-	-
31	1982	AN	Above Normal	2	1,671	9,159	7,802	16,962	645	19,278	-	-
32	1983	VW	Very Wet	1	2,745	9,875	8,412	18,287	1,830	22,862	-	-
33	1984	AN	Above Normal	2	1,681	9,324	7,943	17,268	198	19,147	-	-
34	1985	AN	Above Normal	2	1,713	8,960	7,633	16,593	248	18,554	-	-
35	1986	AN	Above Normal	2	1,262	8,990	7,658	16,647	545	18,455	-	-
36	1987	BN	Below Normal	4	19	8,502	6,403	14,905	99	15,023	-	-
37	1988	AN	Above Normal	3	522	7,730	4,846	12,577	347	13,446	-	-
38	1989	BN	Below Normal	4	259	7,810	5,814	13,623	178	14,061	-	-
39	1990	BN	Below Normal	5	1,705	7,525	3,876	11,401	99	13,205	3,030	-
40	1991	VW	Very Wet	3	2,551	7,458	4,706	12,164	1,189	15,903	-	-
41	1992	AN	Above Normal	2	3,174	8,600	7,326	15,925	1,165	20,264	-	-
42	1993	VW	Very Wet	1	4,093	10,250	8,731	18,981	6,479	29,553	-	-
43	1994	AN	Above Normal	2	2,450	9,779	8,331	18,110	570	21,130	-	-
44	1995	VW	Very Wet	1	3,977	10,058	8,568	18,626	4,277	26,881	-	-
45	1996	BN	Below Normal	4	1,833	9,514	7,266	16,780	149	18,762	-	-
46	1997	AN	Above Normal	3	1,513	7,730	4,846	12,577	492	14,582	-	-
47	1998	VW	Very Wet	1	4,032	9,638	8,210	17,847	4,541	26,420	-	-
48	1999	BN	Below Normal	4	863	9,631	6,575	16,206	-	17,069	-	-
49	2000	BN	Below Normal	5	969	7,525	3,703	11,228	397	12,593	-	-
50	2001	AN	Above Normal	3	1,756	7,458	4,706	12,164	438	14,357	-	-
Notes:				Min	-	4,064	1,938	6,002	-	6,151	-	-
Hydrologic Condition: Oct - Apr				Max	4,376	10,250	8,731	18,981	6,479	29,553	3,030	1,600
Model starts after 3+ BN or ED				**Median**	**864**	**7,525**	**4,846**	**12,165**	**273**	**13,535**	50-Year Average	
			% of Median Basin Yield		6%	56%	36%	90%	2%		280	84
				Average	**1,207**	**7,056**	**5,051**	**12,108**	**893**	**14,208**	**50-Year Total**	
			% of Average Basin Yield		8%	50%	36%	85%	6%		**13,986**	**4,200**

Table P-1 Run 12 Annual Pumping and Direct Diversion Summary (continued)

	Oct-Apr HC Description	HC Count	CPEN Direct Diversion (af/y)	UY Total (af/y)	CH Total (af/y)	GW Total (af/y)	FPUD Direct Diversion (af/y)	Total Basin Yield (af/y)	CWRMA Emerg. Water (af/y)	Additional Supply of Water (af/y)
Average Annual										
	ED	12	7	4,945	2,905	7,850	91	7,948	549	167
	BN	14	546	6,712	4,258	10,970	182	11,698	529	43
	AN	15	1,629	8,196	6,425	14,621	681	16,931	-	107
	VW	9	3,130	8,507	6,859	15,366	3,423	21,919	-	-
Median Annual										
	ED	12	-	4,064	2,094	6,158	98	6,327	-	-
	BN	14	239	7,525	3,876	11,401	188	12,899	-	-
	AN	15	1,533	8,748	7,452	16,199	446	18,455	-	-
	VW	9	3,355	9,638	8,210	17,847	4,002	22,862	-	-

Average Monthly Pumping

% Avg Mo Basin Yield	Month	CPEN Direct Diversion (af/m)	UY Total (af/m)	CH Total (af/m)	GW Total (af/m)	FPUD Direct Diversion (af/m)	Total Basin Yield (af/m)	CWRMA Emerg. Water (af/m)	Additional Supply of Water (af/m)
7%	Oct	0.4	551	395	946	2	948	-	16
7%	Nov	-	598	431	1,030	23	1,052	54	20
9%	Dec	-	694	499	1,193	36	1,229	51	12
11%	Jan	-	809	581	1,389	106	1,495	22	8
11%	Feb	54	792	570	1,362	194	1,610	19	-
13%	Mar	264	740	525	1,264	290	1,817	24	4
11%	Apr	294	603	429	1,032	175	1,500	24	4
8%	May	257	494	354	848	59	1,165	41	4
5%	Jun	58	411	294	705	2	765	40	-
6%	Jul	90	432	309	741	-	831	4	4
5%	Aug	100	390	278	668	1	769	-	4
7%	Sep	90	543	388	931	6	1,027	-	8
	Avg Anl	1,207	7,056	5,051	12,108	893	14,208	280	84

Table P-2 Run 12 Groundwater Well Pumping Summaries

Lower Santa Margarita River Groundwater Model

		Bldg #	State ID #	Label	# mos Q	% of 600 mos	Orig Wells by Subbsn %	80% Utilization af/m	
1	UY	2673	10/4-7A2	7A2	600	100%	25%	142	
2	UY	26072	10/4-8D1	8D1	600	100%	21%	121	
3	UY	2671	10/4-7H2	7H2	600	100%	15%	82	
4	UY	PW-6	PW-6	PW-6	600	100%	19%	110	
5	UY	2603	10/4-7R2	7R2	600	100%	19%	110	
6	UY	UY-1	UY-1	UY-1	291	49%	0%	110	
7	UY	UY-2	UY-2	UY-2	207	35%	0%	110	
8	UY	UY-3	UY-3	UY-3	137	23%	0%	110	
9	UY	UY-4	UY-4	UY-4	87	15%	0%	110	
10	UY	UY-5	UY-5	UY-5	44	7.3%	0%	110	
11	UY	UY-6	UY-6	UY-6	13	2%	0%	110	
12	CH	2393	10/4-18E3	18E4	600	100%	14%	121	
13	CH	2373	10/4-18M4&5	18M5	600	100%	18%	153	
14	CH	2363	10/5-13R2	13R2	600	100%	16%	132	
15	CH	33925	10/5-23G4	23G4	**0**	**0%**	0%	**0**	backup
16	CH	2301	10/5-23J1	23J1	600	100%	20%	164	
17	CH	33924	10/5-23K2	23K2	**0**	**0%**	0%	**0**	backup
18	CH	33923	10/5-23K3	23K3	600	100%	16%	132	
19	CH	CH-1	CH-1	CH-1	43	7%	0%	88	
19	CH	CH-2	CH-2	CH-2	18	3%	0	88	
19	CH	CH-3	CH-3	CH-3	9	2%	0%	88	
20	CH	CH-4	CH-4	CH-4	600	100%	16%	132	Replaces 23G4

% Pumping by Subbasin

		Wet Year Algorithm			Dry Year Management							
		54%	46%	0%	66%	34%	0%	Max Pumping in Subbasin adding wells as needed				
mo	Anl %	UY	CH	LY	UY	CH	LY		UY	CH	LY	Total
OCT	7.9%	4.3%	3.7%	0%	5.2%	2.7%	0%	# exst wells	5	7	-	12
NOV	8.6%	4.7%	4.0%	0%	5.7%	2.9%	0%	af/m (80%)	564	833	-	1,397
DEC	10.0%	5.4%	4.6%	0%	6.6%	3.4%	0%	avg af/well	113	119	-	116
JAN	11.4%	6.2%	5.3%	0%	7.5%	3.9%	0%					
FEB	10.9%	5.9%	5.0%	0%	7.2%	3.7%	0%	1 adntl well	674	921	55	
MAR	10.2%	5.5%	4.7%	0%	6.7%	3.5%	0%	2 adntl well	784	1,008	110	
APR	8.3%	4.5%	3.8%	0%	5.5%	2.8%	0%	3 adntl well	893	1,096	164	
MAY	7.1%	3.8%	3.3%	0%	4.7%	2.4%	0%	4 adntl well	1,003	1,184	219	
JUN	5.9%	3.2%	2.7%	0%	3.9%	2.0%	0%	5 adntl well	1,112	1,271		
JUL	6.2%	3.3%	2.9%	0%	4.1%	2.1%	0%	6 adntl well	1,222			
AUG	5.6%	3.0%	2.6%	0%	3.7%	1.9%	0%	50-yr Avg	6,857	4,244	-	
SEP	7.8%	4.2%	3.6%	0%	5.1%	2.6%	0%	50-yr Med	6,939	4,540	-	

Median Pumping by Hydrologic Condition

	UY af/m	CH af/m	LY af/m	Total af/m	Max Mo Pumping	cfs	new wells
ED	436	220	0	648	1,885	33	7
BN	475	239	0	719	2,239	39	10
AN	634	476	0	1,163	2,239	39	10
VW	668	559	0	1,215	2,296	40	10

Wet Year Algorithm Monthly Counts

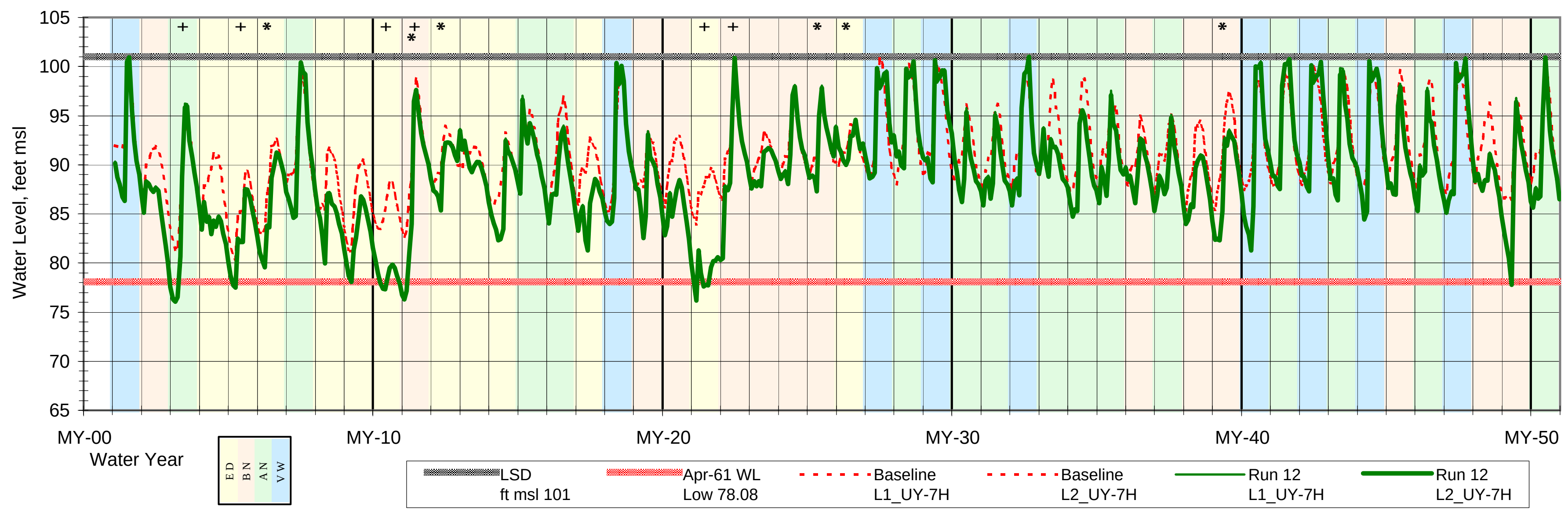
	2400 af/y	5500 af/y	Total	% 50-yrs
Oct	-	-	-	0%
Nov	-	-	-	0%
Dec	1	-	1	2%
Jan	7	1	8	16%
Feb	9	4	13	26%
Mar	10	5	15	30%
Apr	9	6	15	30%
May	-	-	-	0%
	36	16	52	

		Table P-3. Run12 Annual Pumping by Well										
	Building #:	2673	26072	2671	PW-6	2603	new	new	new	new	new	new
	Max Annual Pumping	1,617	1,368	933	1,244	1,244	1,136	940	722	422	309	205
	Potential w/ 80% Util	1,710	1,447	986	1,315	1,315	1,315	1,315	1,315	1,315	1,315	1,315
	Potential Yield (gpm)	1,300	1,100	750	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
		UY	UY	UY	UY	UY	UY	UY	UY	UY	UY	UY
		10/4-7A2	10/4-8D1	10/4-7H2	PW-6	10/4-7R2	UY-1	UY-2	UY-3	UY-4	UY-5	UY-6
MY	HC	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)
1	VW	1,552	1,313	895	1,194	1,194	815	613	518	313	207	-
2	BN	1,519	1,285	876	1,168	1,168	800	495	400	98	-	-
3	AN	1,556	1,317	898	1,197	1,197	626	319	210	-	-	-
4	ED	1,248	1,056	720	960	960	703	495	400	98	-	-
5	ED	1,026	868	592	789	789	-	-	-	-	-	-
6	ED	1,026	868	592	789	789	-	-	-	-	-	-
7	AN	1,315	1,112	758	1,011	1,011	100	-	-	-	-	-
8	ED	1,248	1,056	720	960	960	703	495	400	98	-	-
9	ED	1,026	868	592	789	789	-	-	-	-	-	-
10	ED	1,026	868	592	789	789	-	-	-	-	-	-
11	BN	1,026	868	592	789	789	-	-	-	-	-	-
12	ED	1,026	868	592	789	789	-	-	-	-	-	-
13	ED	1,026	868	592	789	789	-	-	-	-	-	-
14	ED	1,026	868	592	789	789	-	-	-	-	-	-
15	AN	1,315	1,112	758	1,011	1,011	100	-	-	-	-	-
16	AN	1,574	1,332	908	1,211	1,211	905	700	402	305	202	-
17	ED	1,262	1,067	728	970	970	714	714	404	404	100	-
18	VW	1,315	1,112	758	1,011	1,011	100	-	-	-	-	-
19	BN	1,519	1,285	876	1,168	1,168	800	495	400	98	-	-
20	BN	1,530	1,294	883	1,177	1,177	828	427	210	-	-	-
21	ED	1,240	1,050	716	954	954	697	404	199	-	-	-
22	BN	1,026	868	592	789	789	-	-	-	-	-	-
23	BN	1,026	868	592	789	789	-	-	-	-	-	-
24	BN	1,026	868	592	789	789	-	-	-	-	-	-
25	BN	1,026	868	592	789	789	-	-	-	-	-	-
26	ED	1,026	868	592	789	789	-	-	-	-	-	-
27	VW	1,315	1,112	758	1,011	1,011	100	-	-	-	-	-
28	AN	1,574	1,332	908	1,211	1,211	905	700	402	305	202	-
29	VW	1,601	1,355	924	1,232	1,232	1,232	927	616	515	319	107
30	AN	1,604	1,358	926	1,234	1,234	928	826	622	519	317	212
31	AN	1,576	1,334	909	1,213	1,213	907	804	501	501	202	-
32	VW	1,591	1,346	918	1,224	1,224	1,224	920	609	508	311	-
33	AN	1,586	1,342	915	1,220	1,220	914	812	608	505	202	-
34	AN	1,593	1,348	919	1,225	1,225	919	817	407	407	100	-
35	AN	1,583	1,339	913	1,218	1,218	912	809	399	399	199	-
36	BN	1,532	1,297	884	1,179	1,179	810	714	404	404	100	-
37	AN	1,580	1,337	911	1,215	1,215	836	427	210	-	-	-
38	BN	1,519	1,285	876	1,168	1,168	800	495	400	98	-	-
39	BN	1,530	1,294	883	1,177	1,177	828	427	210	-	-	-
40	VW	1,529	1,294	882	1,176	1,176	797	404	199	-	-	-
41	AN	1,567	1,326	904	1,206	1,206	900	695	397	300	99	-
42	VW	1,611	1,363	930	1,239	1,239	1,239	935	624	523	327	218
43	AN	1,604	1,358	926	1,234	1,234	928	826	622	519	317	212
44	VW	1,601	1,355	924	1,232	1,232	1,232	927	616	515	319	107
45	BN	1,557	1,317	898	1,198	1,198	829	733	626	523	423	212
46	AN	1,580	1,337	911	1,215	1,215	836	427	210	-	-	-
47	VW	1,581	1,338	912	1,217	1,217	1,217	811	611	413	216	107
48	BN	1,559	1,319	899	1,199	1,199	831	734	734	523	423	212
49	BN	1,530	1,294	883	1,177	1,177	828	427	210	-	-	-
50	AN	1,529	1,294	882	1,176	1,176	797	404	199	-	-	-
	Min	1,026	868	592	789	789	-	-	-	-	-	-
	Max	1,611	1,363	930	1,239	1,239	1,239	935	734	523	423	218
	Median	1,529	1,294	882	1,176	1,176	800	427	210	-	-	-
	Average	1,379	1,167	796	1,061	1,061	593	423	280	178	92	28
		Average Monthly Well Production										
	Month	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)
	Oct	113	96	65	87	87	64	28	10	-	-	-
	Nov	117	99	68	90	90	65	48	10	10	-	-
	Dec	121	102	70	93	93	66	64	47	28	8	-
	Jan	128	109	74	99	99	68	68	68	49	35	11
	Feb	127	107	73	97	97	68	68	68	39	31	17
	Mar	125	106	72	96	96	69	69	50	40	17	-
	Apr	118	100	68	91	91	68	39	16	12	-	-
	May	115	97	66	88	88	29	10	-	-	-	-
	Jun	101	86	58	78	78	10	-	-	-	-	-
	Jul	106	90	61	82	82	11	-	-	-	-	-
	Aug	96	81	55	74	74	10	-	-	-	-	-
	Sep	111	94	64	86	86	65	28	10	-	-	-
Annual Total		1,379	1,167	796	1,061	1,061	593	423	280	178	92	28

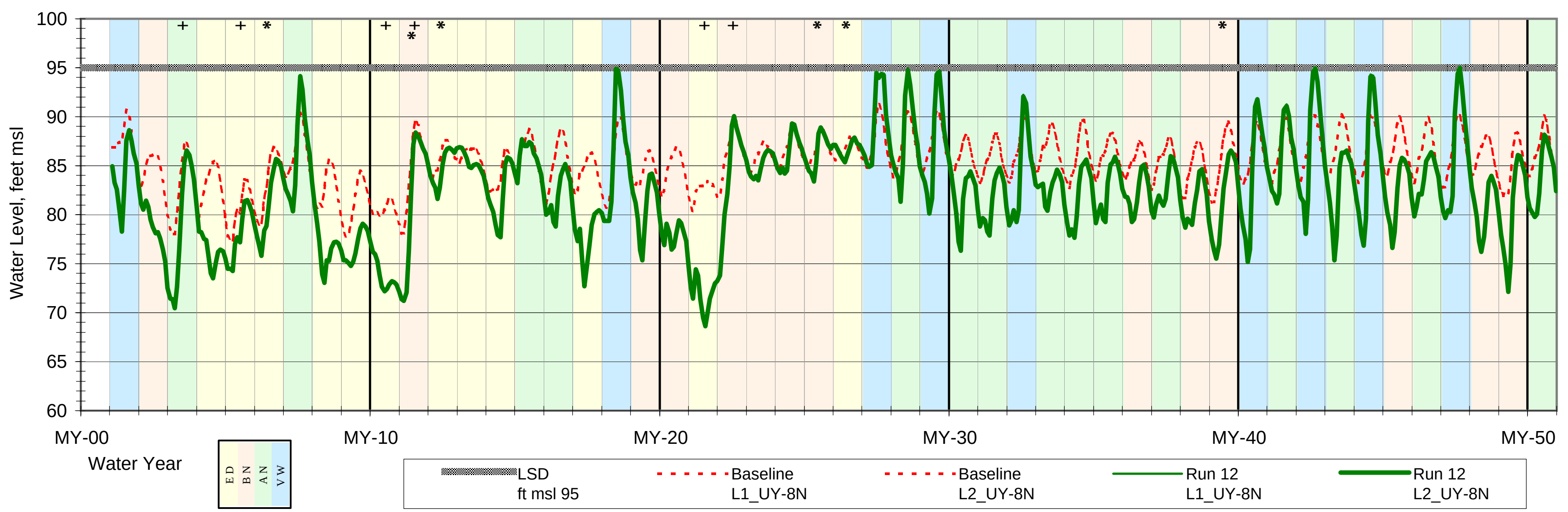
		Table P-3. Run12 Annual Pumping by Well (Continued)										
	Building #:	2393	2373	2363	33925	2301	33924	33923	new	new	new	new
	Max Annual Pumping	1,170	1,489	1,276	1,276	1,595	0	1,276	342	247	165	0
	Potential w/ 80% Util	1,447	1,841	1,578	1,578	1,973	0	1,578	1,052	1,052	1,052	1,052
	Potential Yield (gpm)	1,100	1,400	1,200	1,200	1,500	0	1,200	800	800	800	800
		CH	CH	CH	CH	CH	CH	CH	CH	CH	CH	CH
		10/4-18E3	10/4-18M4&5	10/5-13R2	10/5-23G4	10/5-23J1	10/5-23K2	10/5-23K3	CH-1	CH-2	CH-3	CH-4
MY	HC	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)	(af/y)
1	VW	1,037	1,320	1,132	-	1,415	-	1,132	170	-	-	1,132
2	BN	841	1,071	918	-	1,147	-	918	-	-	-	918
3	AN	701	893	765	-	957	-	765	-	-	-	765
4	ED	586	746	640	-	800	-	640	-	-	-	640
5	ED	280	357	306	-	382	-	306	-	-	-	306
6	ED	303	386	331	-	413	-	331	-	-	-	331
7	AN	521	663	568	-	710	-	568	-	-	-	568
8	ED	754	960	823	-	1,029	-	823	-	-	-	823
9	ED	303	386	331	-	413	-	331	-	-	-	331
10	ED	303	386	331	-	413	-	331	-	-	-	331
11	BN	303	386	331	-	413	-	331	-	-	-	331
12	ED	303	386	331	-	413	-	331	-	-	-	331
13	ED	303	386	331	-	413	-	331	-	-	-	331
14	ED	303	386	331	-	413	-	331	-	-	-	331
15	AN	521	663	568	-	710	-	568	-	-	-	568
16	AN	1,054	1,342	1,150	-	1,438	-	1,150	167	-	-	1,150
17	ED	828	1,053	903	-	1,129	-	903	83	-	-	903
18	VW	521	663	568	-	710	-	568	-	-	-	568
19	BN	841	1,071	918	-	1,147	-	918	-	-	-	918
20	BN	561	714	612	-	765	-	612	-	-	-	612
21	ED	463	590	505	-	632	-	505	-	-	-	505
22	BN	303	386	331	-	413	-	331	-	-	-	331
23	BN	303	386	331	-	413	-	331	-	-	-	331
24	BN	303	386	331	-	413	-	331	-	-	-	331
25	BN	303	386	331	-	413	-	331	-	-	-	331
26	ED	303	386	331	-	413	-	331	-	-	-	331
27	VW	521	663	568	-	710	-	568	-	-	-	568
28	AN	1,054	1,342	1,150	-	1,438	-	1,150	167	-	-	1,150
29	VW	1,169	1,488	1,275	-	1,594	-	1,275	248	163	81	1,275
30	AN	1,133	1,442	1,236	-	1,545	-	1,236	254	168	82	1,236
31	AN	1,105	1,407	1,206	-	1,507	-	1,206	167	-	-	1,206
32	VW	1,170	1,489	1,276	-	1,595	-	1,276	249	82	-	1,276
33	AN	1,126	1,433	1,228	-	1,535	-	1,228	167	-	-	1,228
34	AN	1,093	1,391	1,192	-	1,490	-	1,192	83	-	-	1,192
35	AN	1,085	1,380	1,183	-	1,479	-	1,183	164	-	-	1,183
36	BN	915	1,164	998	-	1,247	-	998	83	-	-	998
37	AN	701	893	765	-	957	-	765	-	-	-	765
38	BN	841	1,071	918	-	1,147	-	918	-	-	-	918
39	BN	561	714	612	-	765	-	612	-	-	-	612
40	VW	681	867	743	-	929	-	743	-	-	-	743
41	AN	1,048	1,334	1,144	-	1,430	-	1,144	82	-	-	1,144
42	VW	1,168	1,487	1,274	-	1,593	-	1,274	247	247	165	1,274
43	AN	1,133	1,442	1,236	-	1,545	-	1,236	254	168	82	1,236
44	VW	1,169	1,488	1,275	-	1,594	-	1,275	248	163	81	1,275
45	BN	966	1,229	1,054	-	1,317	-	1,054	342	168	82	1,054
46	AN	701	893	765	-	957	-	765	-	-	-	765
47	VW	1,129	1,437	1,232	-	1,540	-	1,232	163	163	81	1,232
48	BN	879	1,118	958	-	1,198	-	958	254	168	82	958
49	BN	536	682	585	-	731	-	585	-	-	-	585
50	AN	681	867	743	-	929	-	743	-	-	-	743
	Min	280	357	306	-	382	-	306	-	-	-	306
	Max	1,170	1,489	1,276	-	1,595	-	1,276	342	247	165	1,276
	Median	701	893	765	-	957	-	765	-	-	-	765
	Average	714	909	779	-	974	-	779	72	30	15	779
		Average Monthly Well Production										
	Month	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)	(af/m)
	Oct	57	73	62	-	78	-	62	-	-	-	62
	Nov	62	79	68	-	85	-	68	-	-	-	68
	Dec	71	91	78	-	97	-	78	7	-	-	78
	Jan	78	99	85	-	106	-	85	28	8	8	85
	Feb	76	97	83	-	104	-	83	25	13	6	83
	Mar	73	93	80	-	100	-	80	12	8	-	80
	Apr	62	79	68	-	85	-	68	-	-	-	68
	May	51	65	56	-	70	-	56	-	-	-	56
	Jun	42	54	46	-	58	-	46	-	-	-	46
	Jul	45	57	49	-	61	-	49	-	-	-	49
	Aug	40	51	44	-	55	-	44	-	-	-	44
	Sep	56	71	61	-	77	-	61	-	-	-	61
Annual Total		714	909	779	0	974	0	779	72	30	15	779

I:\DATA\2148\Tech Memos\TechMemo2.2\Attachments\P.Run12\C.IC-hydrographs_Run12.xls / printed 1/11/2007

Simulated Hydrograph Upper Ysidora Riparian Indicator Cell



Simulated Hydrograph Upper Ysidora Grassland Indicator Cell



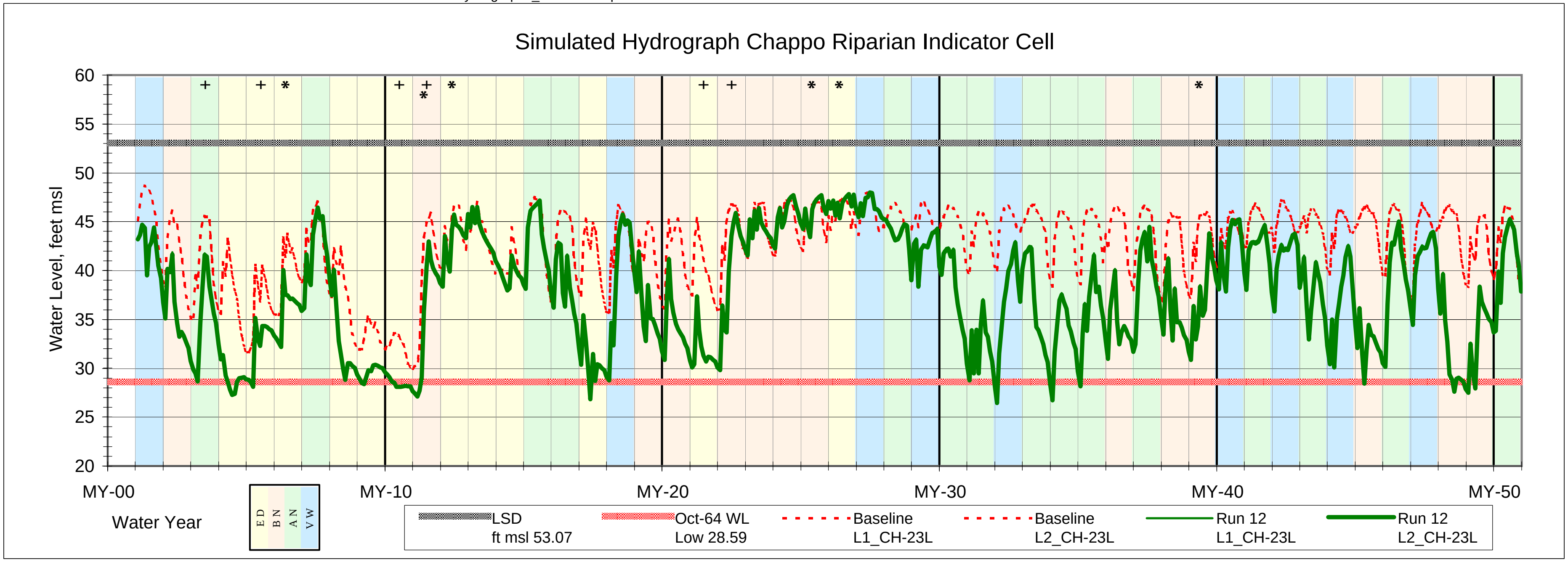
Emergency CWRMA Water Called on Years Marked With *, Additional Water Supply Called on Years Maked With +.

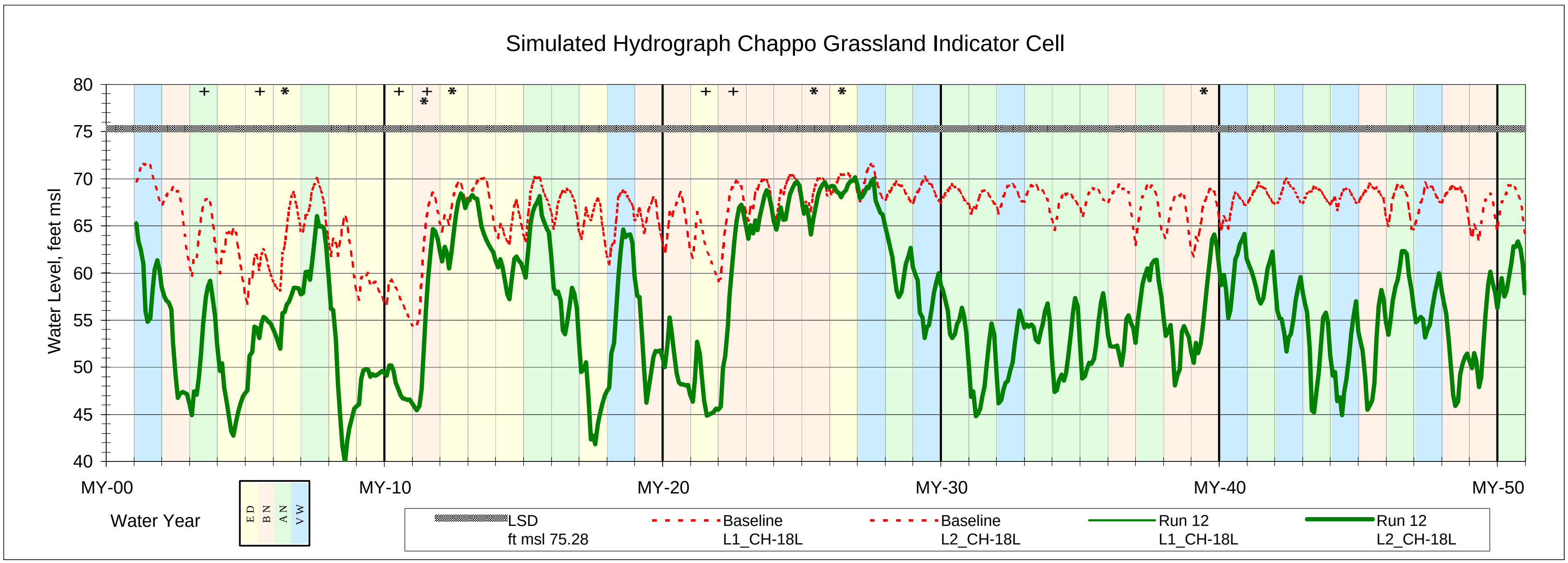
Layer 1 (L1) and Layer 2(L2) simulated groundwater levels are at similar elevations and the graph lines are printed on top of each other.

FIGURE P-1

Run 12 Two Direct Diversions + Options

I:\DATA\2148\Tech Memos\TechMemo2.2\Attachments\P.Run12\C.IC-hydrographs_Run12.xls / printed 1/11/2007

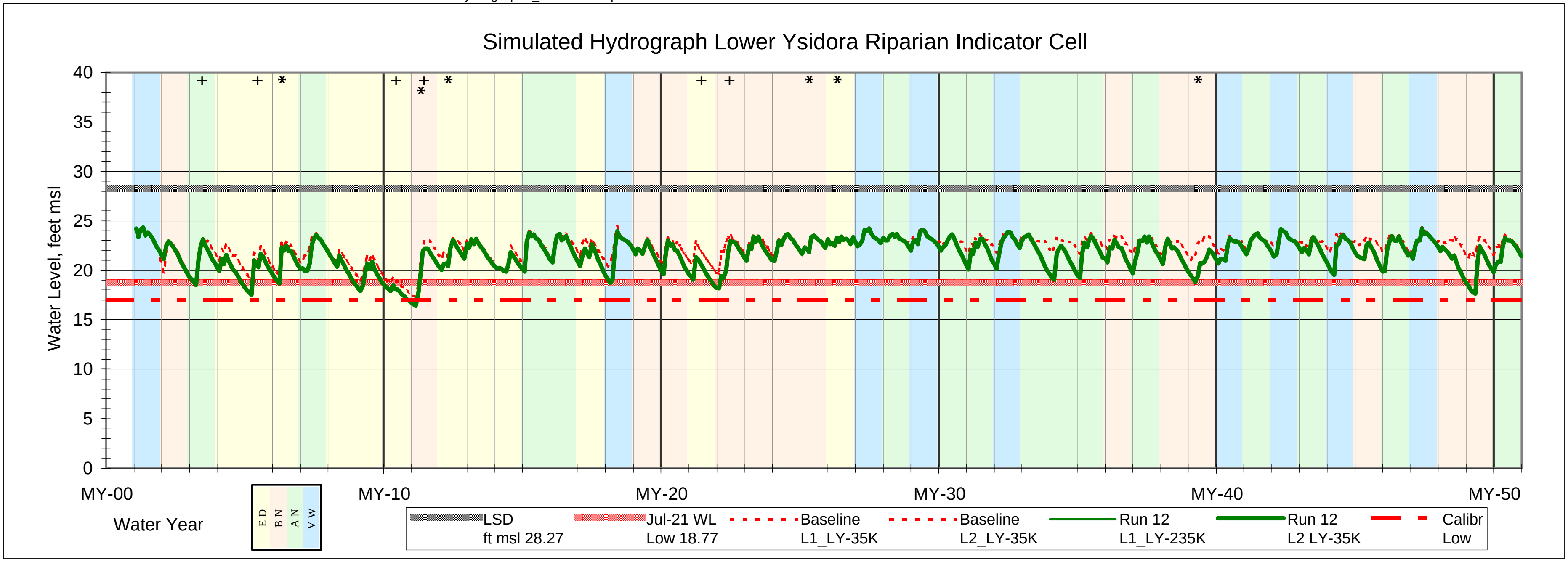


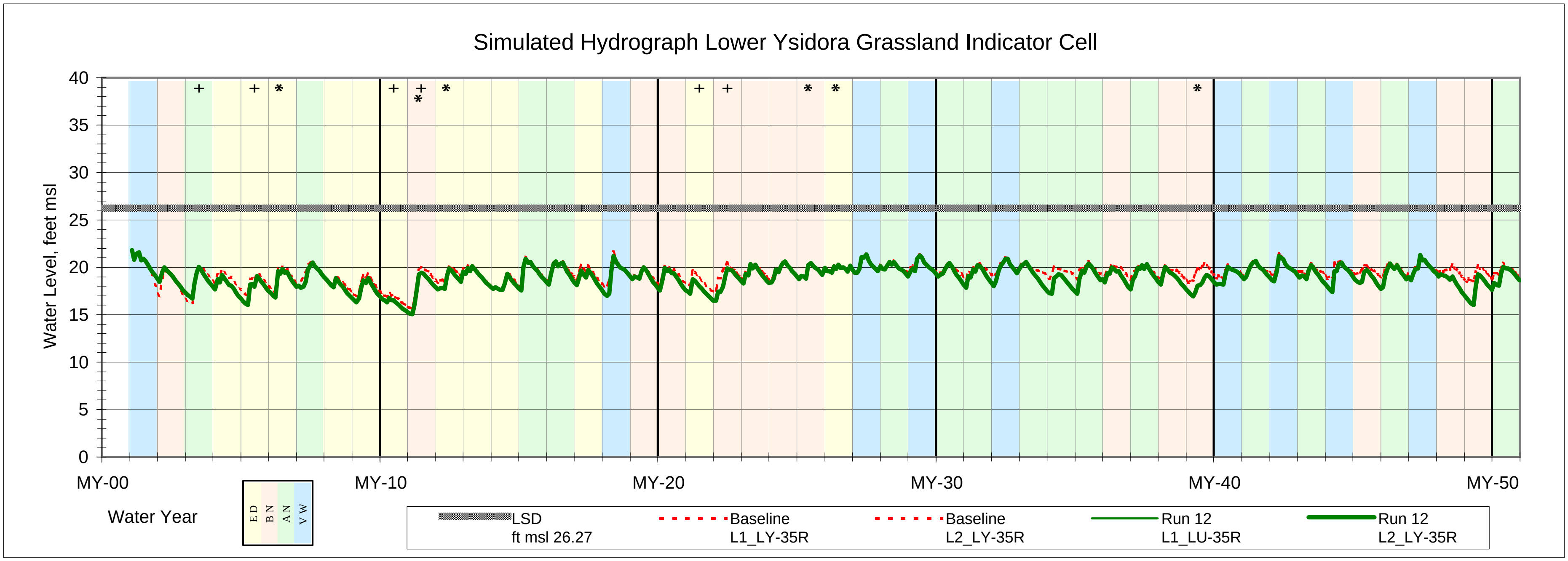


Emergency CWRMA Water Called on Years Marked With *, Additional Water Supply Called on Years Maked With +.

Layer 1 (L1) and Layer 2(L2) simulated groundwater levels are at similar elevations and the graph lines are printed on top of each other.

FIGURE P-2
Run 12 Two Direct Diversions + Options





Emergency CWRMA Water Called on Years Marked With *, Additional Water Supply Called on Years Maked With +.

Layer 1 (L1) and Layer 2(L2) simulated groundwater levels are at similar elevations and the graph lines are printed on top of each other.

FIGURE P-3

Run 12 Two Direct Diversions + Options

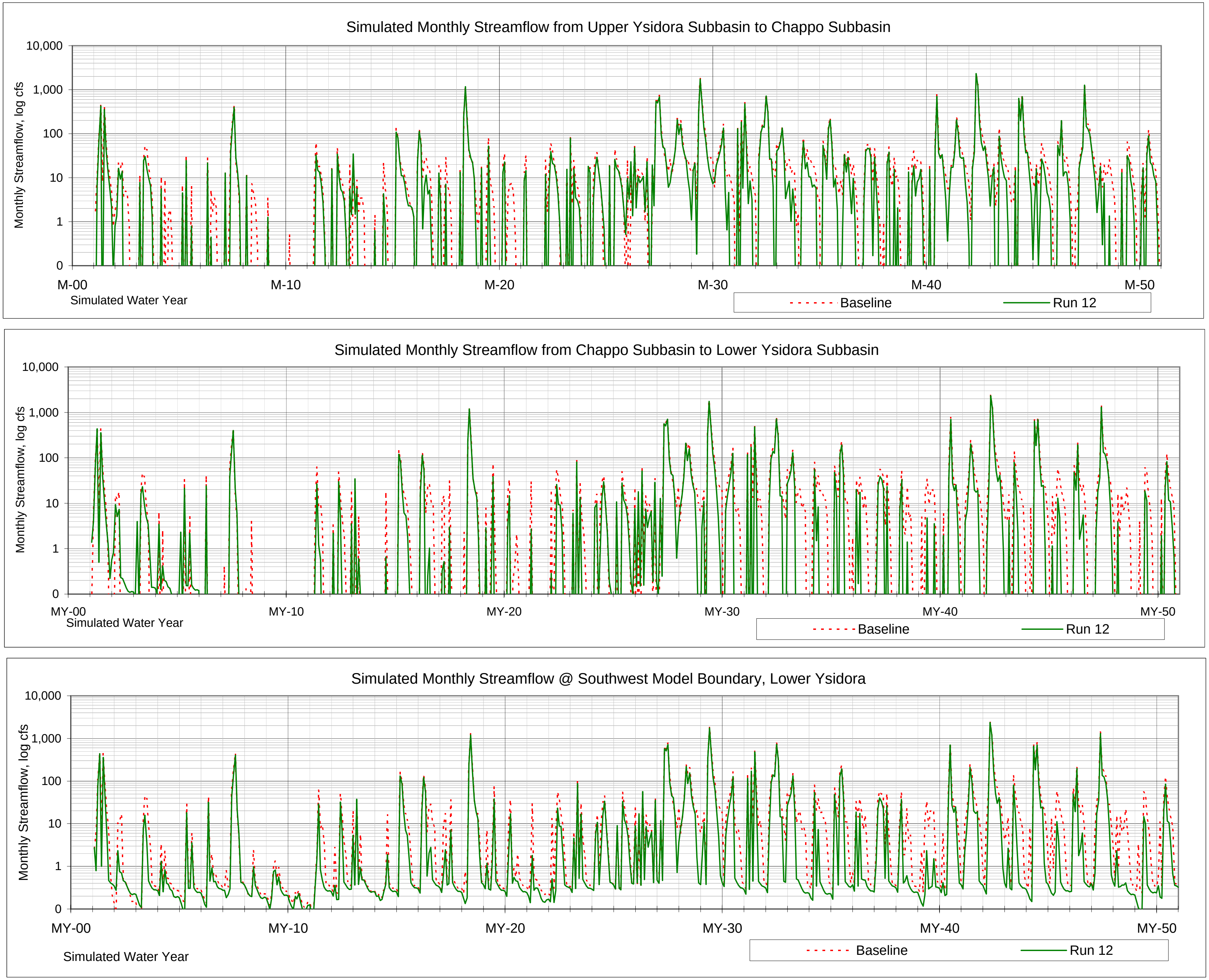


Figure P-4. Simulated Streamflow; Run 12 Two Direct Diversions + Options

Table P-4. Run 12

Average Hydrologic Condition Water Budget (af/y)

% Time Exceedence	> 76%	76% to 50%	50% to 19%	< 19%
# Years	12	14	15	9
	Extremely Dry	Below Normal	Above Normal	Very Wet
Inflow:				
Santa Margarita River Inflow	7,500	13,100	31,700	123,700
Subsurface Underflow	1,000	900	900	800
Lake O'Neill Spill and Release	800	1,400	1,800	2,200
Fallbrook Creek	100	400	1,400	3,800
Minor Tributary Drainages	1,700	1,400	2,400	4,900
Areal Precipitation	500	500	700	1,600
Total Inflow:	11,600	17,700	38,900	137,000
Outflow:				
Santa Margarita River Outflow	1,600	2,300	18,100	112,100
Subsurface Underflow	100	100	100	100
Groundwater Pumping	7,800	11,000	14,600	15,400
Evapotranspiration	1,600	2,000	2,300	2,700
Diversions to Lake O'Neill	1,200	1,900	2,400	2,700
CPEN Direct Diversion	0	500	1,600	3,100
Total Outflow:	12,300	17,800	39,100	136,100
Net Simulated Change of Groundwater in Storage:	-700	-100	-200	900
FPUD Direct Diversion	100	200	700	3,400
	-	-	-	-

Median Hydrologic Condition Water Budget (af/y)

% Time Exceedence	> 76%	76% to 50%	50% to 19%	< 19%
# Years	12	14	15	9
	Extremely Dry	Below Normal	Above Normal	Very Wet
Inflow:				
Santa Margarita River Inflow	6,700	13,000	28,500	115,400
Subsurface Underflow	1,000	900	900	800
Lake O'Neill Spill and Release	900	1,300	2,100	2,300
Fallbrook Creek	100	300	1,100	3,500
Minor Tributary Drainages	1,500	1,400	2,500	4,700
Areal Precipitation	400	300	500	1,500
Outflow:				
Santa Margarita River Outflow	500	2,100	15,000	100,100
Subsurface Underflow	100	100	100	100
Groundwater Pumping	6,200	11,400	16,200	17,900
Evapotranspiration	1,300	1,700	2,200	2,600
Diversions to Lake O'Neill	1,300	1,700	2,700	2,700
CPEN Direct Diversion	0	200	1,500	3,400
Net Simulated Change of Groundwater in Storage:	-400	-700	100	800
FPUD Direct Diversion	100	200	400	4,000

Average Subbasin Water Budget (af/y)

	Upper Ysidora	Chappo	Lower Ysidora	SMR Basin	
Inflow:					
Santa Margarita River Inflow	37,200	28,700	26,000	37,200	85%
Subsurface Underflow *	900	2,000	400	900	2%
Lake O'Neill Spill and Release	1,500	-	-	1,500	3%
Fallbrook Creek	1,200	-	-	1,200	3%
Minor Tributary Drainages	600	1,100	700	2,400	5%
Areal Precipitation	200	300	300	800	2%
Total Inflow:	41,600	32,100	27,400	44,000	
Outflow:					
Santa Margarita River Outflow	28,700	26,000	26,600	26,600	60%
Subsurface Underflow *	2,000	400	100	100	0%
Groundwater Pumping	7,100	5,000	0	12,100	27%
Evapotranspiration *	700	700	800	2,100	5%
Diversions to Lake O'Neill	2,000	-	-	2,000	5%
CPEN Direct Diversion	1,200	0	0	1,200	3%
Total Outflow:	41,700	32,100	27,500	44,100	
Net Simulated Change of Groundwater in Storage: *	-100	0	-100	-100	
FPUD Direct Diversion				900	
	-	-	-	-	

Note: * Subbasin Medians are based on the last rate of the stress period
Values are rounded to the nearest 100 acre-feet, closest number adjusted to eliminate rounding error

Median Subbasin Water Budget (af/y)

	Upper Ysidora	Chappo	Lower Ysidora	SMR Basin
Inflow:				
Santa Margarita River Inflow	16,400	6,900	4,400	16,400
Subsurface Underflow *	900	2,000	400	900
Lake O'Neill Spill and Release	1,500	-	-	1,500
Fallbrook Creek	600	-	-	600
Minor Tributary Drainages	600	1,100	700	2,100
Areal Precipitation	100	200	200	500
Outflow:				
Santa Margarita River Outflow	6,900	4,400	4,800	4,800
Subsurface Underflow *	2,000	400	100	100
Groundwater Pumping	7,500	4,800	0	12,200
Evapotranspiration *	700	600	800	2,100
Diversions to Lake O'Neill	2,100	-	-	2,100
CPEN Direct Diversion	864	0	0	864
Net Simulated Change of Groundwater in Storage: *	0	0	0	200
FPUD Direct Diversion				300

Note: The sum of median values does not reflect the change of groundwater in storage.
Median values are not cummulative.
* Subbasin Medians are based on the last rate of the stress period
Values are rounded to the nearest 100 acre-feet

Table P-5 Run12

Lower Santa Margarita River Groundwater Model — Run 12

Annual Surface Water Budget

MY		SMR Flow In	LON Diversion	Ponds Diversion	Str Gain+ / Loss-	GAGE SMR @ UY->CH	Str Gain+ / Loss-	SMR @ CH->LY	Str Gain+ / Loss-	SMR Flow Out	LSMR Str Gain+ / Loss-
1	VW	64,975	2,364	9,734	-8,285	56,690	-1,834	54,857	1,849	56,706	-8,269
2	BN	8,737	1,531	3,426	-6,246	2,491	-2,198	293	97	389	-8,347
3	AN	16,804	1,063	6,503	-11,181	5,623	-3,800	1,822	-113	1,709	-15,094
4	ED	6,711	1,323	2,646	-6,383	327	-317	10	273	283	-6,428
5	ED	6,403	337	1,336	-4,589	1,814	-658	1,156	309	1,465	-4,938
6	ED	8,129	1,307	2,764	-6,786	1,343	130	1,472	714	2,187	-5,942
7	AN	44,777	1,151	10,868	-6,596	38,181	-2,448	35,733	709	36,442	-8,335
8	ED	6,750	1,291	3,474	-6,088	662	-659	3	204	207	-6,543
9	ED	4,840	786	1,820	-4,766	74	-71	3	242	245	-4,596
10	ED	3,600	393	1,216	-3,599	1	-1	0	99	99	-3,501
11	BN	13,830	1,569	6,768	-9,691	4,138	-2,525	1,614	276	1,890	-11,940
12	ED	10,860	1,665	4,794	-6,293	4,567	-2,263	2,305	357	2,662	-8,198
13	ED	4,872	577	1,797	-2,280	2,593	-503	2,090	410	2,500	-2,373
14	ED	5,802	412	2,946	-5,458	344	-305	39	238	277	-5,525
15	AN	21,496	2,748	6,132	-6,203	15,293	-1,398	13,895	1,308	15,204	-6,293
16	AN	23,399	2,344	7,510	-9,859	13,540	-2,336	11,203	1,162	12,366	-11,033
17	ED	9,956	1,979	3,961	-8,575	1,380	-1,146	235	565	799	-9,156
18	VW	103,699	2,415	14,062	-5,559	98,140	-2,785	95,355	1,350	96,705	-6,994
19	BN	12,879	2,317	4,573	-8,709	4,170	-1,631	2,539	107	2,645	-10,234
20	BN	8,852	1,263	3,584	-6,666	2,186	-1,132	1,055	331	1,386	-7,467
21	ED	9,040	1,831	1,408	-7,641	1,400	-1,235	165	84	249	-8,792
22	BN	14,767	1,514	8,373	-8,124	6,643	-3,940	2,703	-92	2,611	-12,157
23	BN	12,129	1,607	2,949	-4,886	7,243	-1,083	6,159	683	6,843	-5,286
24	BN	11,141	1,699	5,702	-5,007	6,135	-1,752	4,383	477	4,859	-6,282
25	BN	12,102	1,733	6,834	-5,952	6,150	-1,782	4,368	413	4,780	-7,321
26	ED	12,488	1,940	4,851	-3,963	8,524	-1,180	7,345	798	8,143	-4,345
27	VW	122,815	2,792	20,446	-4,585	118,229	126	118,355	2,191	120,546	-2,269
28	AN	53,117	2,721	22,011	-11,974	41,144	-4,661	36,483	603	37,086	-16,032
29	VW	176,345	2,721	24,937	-11,281	165,064	-4,167	160,896	1,893	162,789	-13,556
30	AN	28,467	2,749	8,575	-10,815	17,652	-4,360	13,292	104	13,396	-15,071
31	AN	61,760	2,697	9,046	-9,915	51,845	-3,541	48,304	537	48,841	-12,919
32	VW	103,957	2,720	17,416	-10,637	93,321	-6,124	87,196	811	88,007	-15,950
33	AN	29,414	2,714	10,337	-10,973	18,441	-3,894	14,547	478	15,026	-14,388
34	AN	21,848	2,702	9,761	-12,311	9,536	-5,581	3,955	-81	3,874	-17,974
35	AN	38,768	2,235	9,948	-9,471	29,298	-4,727	24,571	467	25,037	-13,731
36	BN	14,123	2,155	5,089	-8,413	5,710	-3,444	2,266	132	2,398	-11,724
37	AN	18,898	1,923	5,805	-6,984	11,914	-3,460	8,454	458	8,912	-9,986
38	BN	12,476	1,727	4,895	-7,850	4,626	-2,091	2,535	298	2,833	-9,643
39	BN	16,061	2,438	8,959	-11,473	4,588	-4,118	471	-94	377	-15,684
40	VW	63,245	2,819	14,567	-10,016	53,230	-3,703	49,527	263	49,790	-13,455
41	AN	41,308	2,711	16,680	-12,416	28,892	-5,195	23,697	357	24,054	-17,254
42	VW	245,645	2,723	24,391	-10,228	235,417	-5,089	230,328	1,704	232,032	-13,614
43	AN	23,842	2,751	13,939	-13,451	10,390	-4,564	5,827	220	6,046	-17,795
44	VW	117,210	2,676	21,790	-12,642	104,568	-4,620	99,949	1,188	101,137	-16,074
45	BN	17,856	2,748	10,810	-12,736	5,121	-4,014	1,106	-44	1,062	-16,794
46	AN	29,474	2,138	9,618	-9,468	20,006	-3,600	16,407	530	16,937	-12,537
47	VW	115,400	2,716	23,452	-11,837	103,563	-4,775	98,788	1,297	100,086	-15,314
48	BN	13,181	2,744	7,205	-11,262	1,920	-1,693	227	110	337	-12,845
49	BN	15,505	1,871	7,483	-10,482	5,023	-3,249	1,773	-197	1,576	-13,929
50	AN	22,106	2,607	10,071	-10,317	11,789	-4,216	7,574	82	7,655	-14,451
	avg	37,237	1,999	8,945	**-8,418**	28,819	**-2,672**	26,147	**523**	26,670	**-10,568**
	med	16,433	2,146	7,344	-8,494	6,943	-2,487	4,375	357	4,820	-10,633
AVERAGES											
ED	12	7,454	1,153	2,751	-5,535	1,919	-684	1,235	358	1,593	-5,861
BN	14	13,117	1,923	6,189	-8,393	4,724	-2,475	2,249	178	2,428	-10,689
AN	15	31,699	2,350	10,454	-10,129	21,570	-3,852	17,718	455	18,172	-13,526
VW	9	123,699	2,661	18,977	-9,452	114,247	-3,663	110,584	1,394	111,978	-11,722
MEDIANS											
ED	12	6,730	1,299	2,705	-5,773	1,361	-581	200	291	541	-5,734
BN	14	13,030	1,730	6,235	-8,269	4,824	-2,145	2,020	121	2,144	-10,979
AN	15	28,467	2,697	9,761	-10,317	17,652	-3,894	13,895	467	15,026	-14,388
VW	9	115,400	2,720	20,446	-10,228	103,563	-4,167	98,788	1,350	100,086	-13,556

Table P-5 Run12 (continued)

Lower Santa Margarita River Groundwater Model

Annual Groundw ater Budget Model Run: Run 12

MY	INFLOW: Storage	Recharge	Stream Leakance	GHB	TOTAL GW IN	OUTFLOW: Storage	Wells	ET	Stream Leakance	GHB	TOTAL GW OUT
1	8,543	9,652	9,815	869	28,878	5,064	15,950	2,705	5,120	66	28,904
2	7,348	3,631	6,294	935	18,208	2,356	13,623	1,611	582	55	18,226
3	5,550	6,199	12,119	947	24,816	8,792	12,167	1,591	2,229	51	24,830
4	6,433	2,951	4,917	952	15,254	3,145	10,693	1,090	287	51	15,266
5	4,086	1,658	6,791	1,104	13,638	6,231	6,001	1,118	256	47	13,653
6	3,694	3,506	5,762	1,028	13,989	5,661	6,159	1,508	624	55	14,007
7	6,437	10,328	8,359	907	26,031	7,987	8,905	2,413	6,671	61	26,036
8	8,382	3,632	3,818	936	16,767	3,124	11,853	1,308	459	49	16,793
9	3,145	2,197	4,601	1,033	10,976	3,567	6,157	973	230	47	10,974
10	3,253	1,352	2,856	1,101	8,562	1,511	6,159	722	149	39	8,579
11	3,485	6,582	9,885	934	20,886	9,809	6,157	1,653	3,233	45	20,898
12	3,232	4,947	7,454	914	16,548	6,070	6,157	2,446	1,839	52	16,564
13	4,438	2,117	3,845	915	11,315	1,325	6,159	2,595	1,192	58	11,329
14	3,976	3,290	4,401	968	12,635	3,988	6,157	1,812	641	51	12,649
15	5,046	7,151	7,394	879	20,470	5,184	8,907	2,695	3,639	65	20,490
16	6,715	7,020	11,169	887	25,791	4,775	16,198	2,126	2,633	64	25,796
17	6,885	4,298	8,127	918	20,227	5,165	13,134	1,334	553	56	20,242
18	6,591	13,283	10,475	863	31,212	11,081	8,905	2,303	8,871	62	31,222
19	7,934	4,826	7,355	898	21,013	4,415	13,625	1,726	1,214	56	21,037
20	6,244	3,974	6,756	928	17,902	4,364	11,400	1,426	670	56	17,916
21	4,665	1,697	7,686	1,010	15,057	4,382	9,417	1,006	220	47	15,072
22	4,254	7,886	9,750	887	22,776	10,179	6,157	2,117	4,277	54	22,783
23	3,480	3,427	6,366	911	14,185	3,827	6,157	2,649	1,511	59	14,203
24	3,671	5,996	7,137	882	17,686	4,408	6,159	2,964	4,105	63	17,699
25	3,788	7,130	6,676	884	18,478	5,101	6,157	3,012	4,162	63	18,495
26	3,044	5,278	6,552	875	15,748	2,477	6,150	3,214	3,829	67	15,737
27	6,306	18,062	7,539	831	32,739	6,462	8,907	3,338	13,972	75	32,754
28	7,055	18,163	10,108	815	36,141	5,207	16,208	2,943	11,742	68	36,168
29	6,288	21,492	12,486	813	41,079	6,970	18,618	2,759	12,658	72	41,078
30	6,995	7,316	10,705	865	25,882	3,069	18,113	2,185	2,479	61	25,908
31	6,667	7,826	11,692	879	27,064	6,210	16,965	1,632	2,213	61	27,081
32	6,311	15,101	15,014	843	37,268	9,063	18,297	2,110	7,741	68	37,279
33	5,973	9,162	9,986	865	25,987	3,421	17,264	2,043	3,232	61	26,020
34	5,562	8,287	12,557	879	27,287	5,909	16,575	1,641	3,067	51	27,244
35	5,608	9,045	12,810	872	28,336	6,742	16,667	1,926	2,989	60	28,384
36	5,822	5,464	10,262	886	22,433	4,164	14,899	1,708	1,614	58	22,443
37	5,099	5,831	11,478	893	23,301	6,529	12,580	2,188	1,942	63	23,302
38	6,414	4,890	9,183	907	21,393	4,630	13,613	1,674	1,437	56	21,410
39	5,083	7,461	9,894	898	23,336	7,748	11,410	1,779	2,358	49	23,344
40	6,706	12,006	9,871	886	29,470	8,150	12,167	2,427	6,680	57	29,481
41	5,677	13,820	11,387	847	31,731	5,142	15,909	2,670	7,943	63	31,728
42	7,174	21,120	12,718	813	41,825	7,358	18,985	2,608	12,828	67	41,846
43	8,035	11,639	10,491	852	31,017	5,923	18,113	2,075	4,855	58	31,025
44	8,356	18,480	12,902	831	40,569	9,183	18,641	2,055	10,647	62	40,587
45	7,415	9,275	10,078	865	27,633	5,601	16,758	1,662	3,545	54	27,621
46	5,395	8,425	10,698	872	25,390	6,979	12,580	2,220	3,556	61	25,396
47	6,313	20,294	12,994	826	40,427	7,805	17,860	2,562	12,192	70	40,490
48	7,484	6,657	7,576	875	22,592	3,030	16,208	1,582	1,713	55	22,587
49	6,336	6,749	9,068	923	23,076	8,310	11,226	1,426	2,075	46	23,083
50	5,808	8,678	10,399	879	25,764	7,140	12,167	2,323	4,123	57	25,810
avg	5,764	8,185	8,965	902	23,816	5,695	12,108	2,033	3,936	58	23,829
med	6,109	7,075	9,782	886	23,189	5,404	12,167	2,065	2,811	58	23,193
AVERAGES											
ED	4,603	3,077	5,567	980	14,226	3,887	7,850	1,594	857	52	14,239
BN	5,626	5,996	8,306	901	20,828	5,567	10,968	1,928	2,321	55	20,839
AN	6,108	9,259	10,757	876	27,001	5,934	14,621	2,178	4,221	60	27,015
VW	6,954	16,610	11,535	842	35,941	7,904	15,370	2,541	10,079	66	35,960
MEDIANS											
ED	4,031	3,121	5,340	960	14,523	3,778	6,159	1,321	506	51	14,540
BN	6,033	6,289	8,322	898	21,203	4,522	11,405	1,691	1,894	56	21,224
AN	5,808	8,425	10,705	879	25,987	5,923	16,198	2,185	3,232	61	26,020
VW	6,591	18,062	12,486	831	37,268	7,805	17,860	2,562	10,647	67	37,279

Table P-5 Run12 (continued)

Lower Santa Margarita River Groundwater Model

Balance of Groundwater in Storage					Additional Water Supplies			Direct Diversions	
MY	NET Storage	NET Str Lknc	In-Out	% bal	CWRMA Emergency Flows	Additional Water Supply	Total Additional Water	CPEN Direct Div	FPUD Direct Div
1	-3,479	-4,695	-26.0	-0.09%	-	-	-	1,179	1,459
2	-4,993	-5,711	-18.1	-0.10%	-	-	-	-	-
3	3,242	-9,891	-14.7	-0.06%	-	1,600	1,600	529	444
4	-3,288	-4,631	-12.4	-0.08%	-	-	-	-	50
5	2,145	-6,535	-14.3	-0.10%	-	400	400	-	149
6	1,967	-5,138	-17.5	-0.12%	2,352	-	2,352	-	99
7	1,550	-1,688	-5.0	-0.02%	-	-	-	1,171	1,922
8	-5,257	-3,359	-25.3	-0.15%	-	-	-	-	-
9	422	-4,370	1.5	0.01%	-	-	-	-	-
10	-1,742	-2,707	-16.9	-0.20%	-	200	200	-	-
11	6,325	-6,652	-11.7	-0.06%	2,281	400	2,681	676	298
12	2,837	-5,615	-16.0	-0.10%	1,813	-	1,813	40	198
13	-3,113	-2,653	-14.6	-0.13%	-	-	-	-	98
14	11	-3,760	-14.2	-0.11%	-	-	-	-	-
15	138	-3,756	-19.3	-0.09%	-	-	-	57	446
16	-1,940	-8,535	-5.5	-0.02%	-	-	-	1,149	446
17	-1,719	-7,573	-15.2	-0.07%	-	-	-	-	149
18	4,490	-1,605	-9.6	-0.03%	-	-	-	1,864	2,021
19	-3,519	-6,141	-23.7	-0.11%	-	-	-	58	248
20	-1,880	-6,086	-14.0	-0.08%	-	-	-	-	99
21	-282	-7,466	-15.4	-0.10%	-	1,400	1,400	-	99
22	5,925	-5,473	-7.0	-0.03%	-	200	200	864	236
23	347	-4,855	-17.7	-0.12%	-	-	-	-	198
24	737	-3,033	-12.7	-0.07%	-	-	-	182	248
25	1,313	-2,514	-16.5	-0.09%	2,093	-	2,093	218	298
26	-567	-2,723	11.5	0.07%	2,417	-	2,417	47	248
27	156	6,433	-14.8	-0.05%	-	-	-	3,355	4,002
28	-1,848	1,635	-26.7	-0.07%	-	-	-	4,259	1,960
29	682	172	1.3	0.00%	-	-	-	4,376	5,008
30	-3,926	-8,225	-26.5	-0.10%	-	-	-	1,533	347
31	-457	-9,479	-17.0	-0.06%	-	-	-	1,671	645
32	2,753	-7,273	-10.7	-0.03%	-	-	-	2,745	1,830
33	-2,553	-6,754	-33.3	-0.13%	-	-	-	1,681	198
34	347	-9,490	42.9	0.16%	-	-	-	1,713	248
35	1,134	-9,821	-48.6	-0.17%	-	-	-	1,262	545
36	-1,657	-8,648	-9.6	-0.04%	-	-	-	19	99
37	1,430	-9,536	-0.8	0.00%	-	-	-	522	347
38	-1,784	-7,746	-17.0	-0.08%	-	-	-	259	178
39	2,665	-7,537	-8.0	-0.03%	3,030	-	3,030	1,705	99
40	1,444	-3,191	-11.2	-0.04%	-	-	-	2,551	1,189
41	-535	-3,444	3.2	0.01%	-	-	-	3,174	1,165
42	184	110	-20.7	-0.05%	-	-	-	4,093	6,479
43	-2,112	-5,636	-7.6	-0.02%	-	-	-	2,450	570
44	826	-2,254	-17.9	-0.04%	-	-	-	3,977	4,277
45	-1,814	-6,534	12.4	0.04%	-	-	-	1,833	149
46	1,584	-7,142	-6.2	-0.02%	-	-	-	1,513	492
47	1,492	-801	-63.1	-0.16%	-	-	-	4,032	4,541
48	-4,454	-5,863	4.4	0.02%	-	-	-	863	-
49	1,974	-6,993	-7.1	-0.03%	-	-	-	969	397
50	1,331	-6,276	-45.9	-0.18%	-	-	-	1,756	438
avg	-69	-5,029	-13.6	-0.06%	280	84	364	1,207	893
med	170	-5,626	-14.5	-0.07%	-	-	-	864	273
AVERAGES									
ED	-716	-4,711	-12.4	-0.09%	549	167	715	7	91
BN	-58	-5,985	-10.5	-0.06%	529	43	572	546	182
AN	-174	-6,536	-14.1	-0.05%	-	107	107	1,629	681
VW	950	-1,456	-19.2	-0.05%	-	-	-	3,130	3,423
MEDIANS									
ED	-425	-4,501	-14.9	-0.10%	-	-	100	-	98
BN	-655	-6,113	-12.2	-0.06%	-	-	-	239	188
AN	138	-7,142	-14.7	-0.06%	-	-	-	1,533	446
VW	826	-1,605	-14.8	-0.04%	-	-	-	3,355	4,002

Table P-6 Run 12 Average Monthly Water Budget

Lower Santa Margarita River Groundwater Model
Modflow Volumetric Budget Output and Streamflow

Avg AF/M	SMR Flow In	Diversion	Str Gain+ / Loss-	SMR @ UY->CH	Str Gain+ / Loss-	SMR @ CH->LY	Str Gain+ / Loss-	SMR Flow Out	LSMR Str Gain+ / Loss-	Additional Water Supplies: CWRMA Emergency Flows	Additional Water Supplies: Additional Water Supply	Additional Water Supplies: Total Additional Water	Direct Diversions: CPEN Direct Div	Direct Diversions: FPUD Direct Div
Oct	540	323	-395	144	-87	58	18	76	-464	-	16	16	0	2
Nov	1,297	661	-8	1,289	-556	734	-9	724	-573	54	20	74	-	23
Dec	1,945	531	-778	1,167	-210	957	47	1,003	-941	51	12	63	-	36
Jan	8,261	840	-1,110	7,151	-170	6,981	142	7,123	-1,137	22	8	30	-	106
Feb	10,086	2,092	-1,866	8,220	-197	8,023	105	8,128	-1,958	19	-	19	54	194
Mar	8,562	2,372	-1,590	6,973	-316	6,656	98	6,755	-1,808	24	4	28	264	290
Apr	2,990	1,576	-854	2,136	-349	1,787	46	1,833	-1,158	24	4	28	294	175
May	1,290	993	-513	777	-293	484	13	496	-794	41	4	45	257	59
Jun	754	587	-176	577	-253	325	6	331	-423	40	-	40	58	2
Jul	503	344	-304	199	-143	55	13	68	-435	4	4	8	90	-
Aug	461	285	-369	92	-53	39	25	63	-397	-	4	4	100	1
Sep	550	340	-455	94	-45	49	20	69	-481	-	8	8	90	6
Avg Monthly	3,103	912	-702	2,402	-223	2,179	44	2,222	-881	23	7	30	101	74
Med Monthly	1,294	624	-484	972	-203	609	22	610	-683	23	4	28	74	29
Avg Total=Anl	37,237	10,944	-8,418	28,819	-2,672	26,147	523	26,670	-10,568	280	84	364	1,207	893

Lower Santa Margarita River Groundwater Model

Modflow Volumetric Budget Output

Average Monthly Water Budget

Avg AF/M	INFLOW: Storage	INFLOW: Recharge	INFLOW: Stream Leakance	INFLOW: GHB	TOTAL IN	OUTFLOW: Storage	OUTFLOW: Wells	OUTFLOW: ET	OUTFLOW: Stream Leakance	OUTFLOW: GHB	TOTAL OUT	NET Storage	NET Str Lknc	In-Out	% bal
Oct	610	109	418	81	1,219	77	946	140	49	8	1,221	-533	-369	-2.1	-0.17%
Nov	159	645	1,362	79	2,245	988	1,030	146	73	8	2,245	829	-1,289	-0.2	-0.01%
Dec	595	156	927	79	1,758	324	1,191	160	75	7	1,758	-271	-852	0.4	0.02%
Jan	437	366	1,306	78	2,187	553	1,391	164	77	5	2,191	116	-1,229	-3.7	-0.17%
Feb	335	1,919	1,020	75	3,349	1,499	1,361	161	325	0	3,346	1,164	-695	3.4	0.10%
Mar	212	2,176	1,041	74	3,503	1,179	1,264	192	864	1	3,500	967	-177	2.8	0.08%
Apr	405	1,348	834	68	2,655	486	1,032	195	936	8	2,657	81	103	-2.1	-0.08%
May	582	803	592	70	2,047	255	848	200	737	9	2,049	-328	145	-1.5	-0.07%
Jun	659	240	495	69	1,463	156	703	186	412	7	1,463	-503	-83	-0.3	-0.02%
Jul	607	123	383	74	1,187	61	742	179	208	4	1,194	-546	-175	-6.8	-0.57%
Aug	504	121	286	78	989	45	669	164	112	0	990	-459	-174	-0.4	-0.04%
Sep	658	177	302	77	1,213	72	930	145	68	1	1,216	-586	-233	-3.2	-0.26%
Avg Monthly	480	682	747	75	1,985	475	1,009	169	328	5	1,986	-6	-419	-1.1	-0.10%
Med Monthly	543	303	713	76	1,903	289	988	164	160	6	1,608	-299	-205	-0.9	-0.05%
Avg Total=Anl	5,764	8,185	8,965	902	23,816	5,695	12,108	2,033	3,936	58	23,829	-69	-5,029	-13.6	

Attachment Q

Surface Water and ROM

DRAFT MEMORANDUM

2171 E. Francisco Blvd., Suite K • San Rafael, California • 94901
Telephone: (415) 457-0701 Fax: (415) 457-1638
e-mail: stever@stetsonengineers.com

TO:	United States Department of the Interior Bureau of Reclamation	**DATE:**	May 2006
FROM:	Stetson Engineers	**JOB NO:**	2148
RE:	Surface Water to Support Santa Margarita River Groundwater Modeling for the Conjunctive Use Project and TM 2.0		

The Bureau of Reclamation (Reclamation) has begun work on a feasibility-level study of the Santa Margarita River Conjunctive Use Project (CUP). The CUP is intended to utilize surface water from the Santa Margarita River to enhance groundwater supplies in aquifers located within the Marine Corps Base Camp Pendleton (Camp Pendleton or Base). An Environmental Impact Report and Environmental Impact Statement (EIR/EIS) is concurrently being prepared to identify the environmental impact of various alternatives that may be used to achieve the purpose and need of the proposed CUP. The purpose of this technical memorandum is to develop and refine the groundwater model of the lower Santa Margarita River to determine the CUP yield.

Technical Memorandum 1.0 (TM 1.0) was the first in a series of two technical memoranda that described the hydrology and hydrogeology of the Santa Margarita River. TM 1.0 (Jan 31, 2006) addressed the historical variation of flows in the Santa Margarita River over the historical period of record and presented statistics that describe those flows in terms of both total water supply and water available for diversion. Technical Memorandum 2.0 (TM 2.0) reports on the expected groundwater yield from the CUP based on the surface water analysis presented in TM 1.0. The determination of the CUP yield involved an iterative process of optimizing surface and groundwater resources. The groundwater modeling considers enhanced groundwater pumping from the lower Santa Margarita River basin using the available surface water identified in TM 1.0. This technical memorandum describes the monthly and annual volume of water available for production and delivery to the Haybarn Canyon Water Treatment Plant.

Stetson Engineers received authority to proceed from Reclamation on February 17, 2006. Mr. Stephen Reich, Ms. Jean Moran, and Ms. Dawn Taffler of Stetson Engineers met with Reclamation's technical team members and the CUP Planning Team at a kick-off meeting in Fallbrook, California on March 23, 2006. Representatives from Reclamation included Mr. Del Holz, Mr. Tom Bellinger, Mr. Bob Talbot, Mr. Bob Hamilton, and the study team's project manager Ms. Meena Westford. Discussions during the technical team meeting framed the constraints that would be used for the groundwater and surface water modeling over the historical and future period of record. The purpose of simulating the interaction of surface water and groundwater is to determine the ultimate water yield from the CUP. The groundwater model considered management scenarios that maximize groundwater pumping yield from the Base's aquifers.

The following sections describe the surface water analysis performed to support the groundwater modeling of the lower Santa Margarita River Basin. For brevity, the results of TM 1.0 are summarized below, but do not include repetition of the watershed descriptions or an explanation of the historical reconstructed streamflow at the point of diversion described in TM 1.0.

SUMMARY OF TM 1.0

Results of TM 1.0's analyses confirmed the wide variability of surface flows indicative of streams and rivers in the southwestern United States. Large quantities of water are contained in peak flow events that commonly occur in the winter during Above Normal and Very Wet hydrologic conditions. Surface water availability during drier Below Normal and Extremely Dry hydrologic conditions occur from less frequent rainfall events and sustained baseflow releases from springs and groundwater sources.

Review of the 81-year period of record, available for the lower Santa Margarita River watershed showed that total annual surface flow passing the point of diversion for the CUP has ranged between 2,000 AF and 249,500 AF between 1925 and 2005. During the same period, the maximum potential surface diversion available to the proposed CUP would have ranged between 700 AF and 50,200 AF. The maximum potential surface diversion calculated in TM 1.0 assumed a 200-cfs diversion structure, a 3-cfs bypass, and the deflation of the diversion structure during the 10-year or greater event. This maximum potential surface diversion did not take into account overflow spill from the recharge ponds, variable recharge rates, or the capacity of the groundwater basin influenced by groundwater pumping, which are addressed in this memorandum. The surface water results from TM 1.0 highlighted the importance of the groundwater aquifer capacitance to store large surface flow events for use during Extremely Dry and Below Normal hydrologic conditions.

50-YEAR HYDROLOGIC SIMULATION PERIOD

Hydrologic conditions in the lower Santa Margarita River basin were established in order to statistically group each year's water availability into one of four different categories: Very Wet, Above Normal, Below Normal, and Extremely Dry. Due to the influence of winter-time precipitation events on annual streamflow, October through April winter-time total streamflow volume was used to define the limits of four hydrologic conditions. These four hydrologic conditions establish the boundaries that were used to identify historical and future streamflow at the point of diversion in order to establish project yield from the groundwater model.

STREAMFLOW AT THE POINT OF DIVERSION (AT THE MODEL BOUNDARY)

Streamflow in the Santa Margarita River at the CUP's point of diversion was reconstructed using a composite record of observed streamflow data for water years 1925 through 2005. The CUP's proposed point of diversion is expected to be constructed at Camp Pendleton's existing diversion point to O'Neill ditch (Reclamation, 2005). Because no long-term United States Geologic Survey (USGS) gage has ever been established at the existing diversion structure, recorded streamflow data from multiple USGS gages were used to develop a streamflow hydrograph at the diversion point. TM 1.0 described the streamflow reconstruction in greater detail. Additional refinements to streamflow at the point of diversion were made during the groundwater model calibration process. The results from these iterations are included in this technical memorandum.

HISTORICAL RECONSTRUCTED STREAMFLOW

81-year Historical Period of Record

Table A summarizes the quantity of annual streamflow at the point of diversion for the 81-year period of record, categorized by the four hydrologic conditions, based on historical reconstructed streamflow.

TABLE A. SUMMARY OF ANNUAL AVAILABLE STREAMFLOW AT THE POINT OF DIVERSION FOR 81-YEAR PERIOD OF RECORD (WATER YEARS 1925 TO 2005)

Hydrologic Condition	Average [AF]	Median [AF]	MIN [AF]	MAX [AF]
WY 1925 - 2005	**35,000**	**14,100**	**2,000**	**249,500**
Very Wet	122,100	103,600	61,600	249,500
Above Normal	28,000	22,200	14,100	58,200
Below Normal	10,200	9,900	6,500	15,600
Extremely Dry	5,100	5,200	2,000	8,100

25-year Calibration Period

The surface water analysis used to support the groundwater model calibration was based on a 25-year period of record, which includes water years 1980 to 2004. The historical reconstructed streamflow for these years were input into the groundwater model for calibration. Table B summarizes the quantity of annual streamflow at the point of diversion for the 25-year period, categorized by the four hydrologic conditions, based on historical streamflow only. Note that the average and median streamflow over the 25-year calibration period is significantly greater than the 81-year period of record, indicating a prolonged wetting period over the last 25 years.

TABLE B. SUMMARY OF ANNUAL AVAILABLE STREAMFLOW AT THE POINT OF DIVERSION FOR FOR 25-YEAR CALIBRATION PERIOD (WATER YEARS 1980 TO 2004)

Hydrologic Condition	Average [AF]	Median [AF]	MIN [AF]	MAX [AF]
WY 1980 - 2004	**50,600**	**23,800**	**6,300**	**249,500**
Very Wet	138,200	118,700	61,600	249,500
Above Normal	29,600	24,000	15,800	58,200
Below Normal	12,400	12,000	11,000	14,300
Extremely Dry	6,300	6,300	6,300	6,300

50-YEAR HYDROLOGIC SIMULATION PERIOD

Due to the hydrologic variability of the Santa Margarita River basin, the surface water and groundwater analysis for the CUP required the development of a future period of record that is representative of the historical variability of hydrologic conditions. A 50-year period of record was developed to represent future hydrology that captures antecedent conditions over extended dry and wet periods for the groundwater model. The 50-year period is representative of the length of the CUP, as the design life of most of the facilities is 50 years and the economic analysis will be based on a 50-year period. The 50-year period was chosen to begin in the 1950s, thereby excluding the "natural" conditions that existed prior to 1950, which will not be repeated in the future.

The figures in TM 1.0 depicts winter-time reconstructed streamflow and hydrologic condition over the 81-year period of record. Each bar represents the historical reconstructed winter-time streamflow available at the point of diversion, with the hydrologic condition identified on the right axis. For example, the winter-time flow for water year 1952 was approximately 63,500 AF, which falls into the Very Wet hydrologic category. Similarly, the winter-time flow for water year 1953 (6,200 AF) falls into the Below Normal hydrologic category. The future 50-year record (WY 1952-2001), indicated by the red bars, starts with a Very Wet year, followed by an extended drought period, followed by another wet period, and eventually ending with Above Normal hydrologic conditions. Stetson Engineers worked with the Reclamation staff to determine the best 50 years to provide an appropriate hydrologic record that can be used to optimize the design of the CUP's water supply facilities.

Long-term precipitation datasets can be used to demonstrate hydrologic trends over the historical 81-year period of record for the lower Santa Margarita River basin. TM 1.0 figures show a cumulative departure from the mean curve of annual precipitation at Lake O'Neill for water years

1925 to 2005, developed from monthly precipitation records from Lake O'Neill (MCBCP OWR, 2005). The annual departure from the mean graph depicts wet and dry cycles over an extended period of record. The solid line describes the hydrologic trend, where a downward slope indicates that the trend is to dry conditions and an upward slope indicates that the trend is to wetter conditions. The thin dashed line shows the long-term average annual precipitation at Lake O'Neill (14.2 inches) during the 81-year period of record. The thick dashed line shows the change in the cumulative departure over the chosen 50-year simulation period. The flatness of this line demonstrates that the extended dry period occurred from 1953 to 1978 is balanced by a prolonged wet period in from 1979 to 1984, indicating a hydrologically balanced period of record.

Table C summarizes the quantity of annual streamflow at the point of diversion for the 50-year simulation period categorized by the four hydrologic conditions, based on historical reconstructed streamflow. Note that the average and median values for the 50-year period are the same as for the 81-year period, demonstrating that the 50-year simulation period is representative of long term hydrologic conditions in the basin.

TABLE C. SUMMARY OF ANNUAL AVAILABLE STREAMFLOW AT THE POINT OF DIVERSION FOR FOR 50-YEAR SIMULATION PERIOD (WATER YEARS 1952 TO 2001)

Hydrologic Condition	Average [AF]	Median [AF]	MIN [AF]	MAX [AF]
WY 1952 - 2001	**35,000**	**14,100**	**2,000**	**249,500**
Very Wet	122,100	103,600	61,600	249,500
Above Normal	28,000	22,200	14,100	58,200
Below Normal	10,200	9,900	6,500	15,600
Extremely Dry	5,100	5,200	2,000	8,100

50-YEAR BASELINE

The 50-year Baseline streamflow represents future conditions for the project, based on historical reconstructed streamflow at the point of diversion for water years 1952 to 2001 without historical flow releases in the basin, but including mitigation of the water supply stipulated in the 2002 Cooperative Water Resources Management Agreement (CWRMA).

Historical Flow Releases

Monthly Releases by Rancho California Water District (RCWD) were extracted from SMR Watermaster Reports (WY 1989 to 2002) to quantify historical augmentations to the Santa Margarita

River. The 1940 Stipulated Judgment called for RCWD to release 3-cfs at the Gorge from May 1st to October 31st (WY 1989-2002). RCWD also released effluent in Murrieta Creek as per the 2 MGD Demonstration Project from WY 1998 to 2002. Monthly releases by RCWD were calculated as daily averages and compared with the observed flow at the Gorge. Average daily releases were not allowed to exceed observed average daily flow at the Gorge. RCWD's releases were removed from the historical reconstructed streamflow for the 50-year baseline to represent future flows without the influence of historical agreements.

CWRMA Augmentation

RCWD entered into the 2002 Cooperative Water Resources Management Agreement (CWRMA) to mitigate for losses in water supply due to pumping in the upper Santa Margarita River basin. The CWRMA was implemented in January 2003, when RCWD began discharging water at the Gorge to augment depleted baseflows. The 50-year baseline includes the flow release schedule described in the CWRMA, forecasted over the next 50-years based on the daily releases dictated by the hydrologic index. A provision in the agreement allows for Camp Pendleton to call on emergency flow releases during extended dry periods, which was also included in the 50-year baseline scenario.

Impacts of Urbanization

A sensitivity analysis was performed to evaluate changes in future flow regimes due to urban development. The sensitivity analysis involved modifying historical hydrographs during storm events to mimic the runoff response likely to occur in an urbanized setting. The sensitivity analysis evaluated a range of impacts to assess how increases in impervious areas due to urbanization would likely affect streamflow at the point of diversion and the Maximum Potential Diversion. The master plans from EMWD and RCWD and land use projections from Riverside and San Diego counties were used to identify projected build-out in the upper basin. An algorithm was developed to modify the peak runoff portion of the storm hydrograph while maintaining historical baseflows. The volume of flow over the storm hydrograph was redistributed to reflect that a larger portion of runoff will occur during a shorter period of time due to increases in impervious area.

The results of the sensitivity analysis, shown in Attachment B, were discussed with the technical team to determine if the project will realize a significant impact from urbanization. Though the sensitivity analysis did not evaluate the impact of urbanization on project yield, qualitatively it is likely that the change in project yield would be insignificant due to the following factors. First, the buffering capacitance of the aquifer both above and below the point of diversion will serve to maintain consistent groundwater levels, even as the storm hydrographs are altered. Secondly, actual diversions will not decrease as significantly as the Maximum Potential Diversion decreased due to the limited capacity of the ponds, operational practices of avoiding spill from the ponds, and the limitations due to groundwater mounding. Based on the results of this sensitivity analysis and the available capacity of Camp Pendleton's aquifer to capture peak surface flows, it may be concluded that an increase in peak storm flows and subsequent decrease in the storm's recession due to urbanization are likely to have a de minimis effect on project yield.

50-YEAR BASELINE WITHOUT AUGMENTATION

The 50-year baseline without augmentation is calculated as the 50-year baseline less the CWRMA augmented flow releases.

FALLBROOK CREEK

Discharges from Fallbrook Creek have historically been bypassed through Lake O'Neill, as Camp Pendleton does not hold water rights to store Fallbrook Creek flows. Fallbrook Creek flows will continue to be bypassed through Lake O'Neill, limited only by the diversion capacity of O'Neill Ditch. The USGS has maintained a gage on Fallbrook Creek near Lake O'Neill (11045300) from October 1993 to the present. Fallbrook Creek flows from water years 1952 to 1993 were reconstructed by applying a drainage area ratio to observed and reconstructed streamflow, and calibrating to the period of observed flows.

MINOR TRIBUTARY DRAINAGE

Surface runoff contributions from minor tributaries feeding into the groundwater model were modeled using the SCS Curve Number method to calculate the peak flows occurring during storm events. The calculation of the Curve Number for each delineated drainage area was based on the soil classification information provided by SCS and land uses determined by maps and fieldwork (Stetson, 2001). A California isohyetal map depicting average annual precipitation contours was used to predict the spatial distribution of rainfall in the lower portion of the Santa Margarita River Basin (Daly, 1998). A precipitation ratio, interpreted from the distribution of the average annual isohyetal contours crossing minor tributary drainages, was employed to account for local variability in rainfall when calculating peak flow contributions for each ungaged drainage area. Daily and hourly Oceanside precipitation data were multiplied by the precipitation ratio to calculate precipitation excess, antecedent moisture conditions, and surface runoff during storm events for ungaged drainage areas

RESERVOIR OPERATIONS MODEL

A Reservoir Operations Model (ROM) was developed to calculate the rate of diversion from the Santa Margarita River to Lake O'Neill and the recharge ponds based on diversions schedules dictated by water rights and capacities limited by the CUP facilities. A detailed description of the ROM is provided in Appendix E of the Permit 15000 Study (Stetson, 2001). The capacity of Lake O'Neill was assumed to be 1,600 AFY based the continued maintenance practice of excavating accumulated fines and sediments in the lake as recommended by the Lake O'Neill Rehabilitation feasibility Study (Stetson, 2004). The capacity of the recharge ponds was also increased due to the scraping of ponds 1, 2, and 3 in 2005, and the use of 1-foot contour data, from Reclamation's 2004 aerial photography, to more accurately calculate the storage volumes of ponds 4 and 5. The daily accounting of water spilling from either Lake O'Neill or the recharge ponds calculated in the ROM serves as a monthly input to the groundwater model. The groundwater model uses the results from the ROM to provide a monthly guideline for the maximum potential diversion, while simultaneously considering recharge to the aquifer, spill from the facilities, aquifer storage capacity, and conjunctive use pumping.

The monthly CUP project yield determined by the groundwater model is a function of groundwater pumping. The daily maximum potential diversion calculated in TM 1.0 and the daily diversions calculated in the ROM are a function of surface water availability. The maximum potential diversion calculated in TM 1.0 was limited by the diversion capacity (200 cfs), the assumed year-around bypass requirement (3 cfs), and the deflation of the diversion structure during the 10-year or greater event to allow for sediment to pass from behind the diversion structure. The ROM accounts for the following limitations to the quantity of water diverted which were not considered TM 1.0 surface water analysis: (1) Storage in Lake O'Neill, (2) the capacity of the existing and rehabilitated recharge ponds, (3) infiltration rates, (4) net precipitation and evaporation, (5) spilling from the ponds, and (6) prescribed diversion schedules. The groundwater model assesses the recharge from the ROM and applies further limitations based on the groundwater aquifer's recharge capacity, the pumping schedule, and the groundwater aquifer's storage capacity. Thus, the CUP project yield calculated by the groundwater model is always less than the potential diversions calculated in the surface water analysis.

ERRORS (USE AND LIMITATIONS)

The reliability and usefulness of the reconstructed streamflow is a function of the availability of observed data, the quality of observed data, and a representative period of record. Because no long-term United States Geologic Survey (USGS) gage has ever been established at the existing diversion structure, recorded streamflow data from the USGS gages listed in Table 1 were used to develop a streamflow hydrograph at the diversion point. Missing data from streamflow gages with incomplete periods of record were reconstructed and calibrated using established hydrologic methods and available data. Based on the 81-year period of record, more than 70% of the reconstructed flow in the Santa Margarita River at the point of diversion is based on observed flows at USGS gages. This extensive period of record captures the long-term variability of surface water in the Santa Margarita River at the point of diversion. Remarks from the USGS regarding the quality of the gages used are shown in Table D.

TABLE D: QUALITY OF USGS STREAM GAGING STATIONS USED TO RECONSTRUCT STREAMFLOW IN THE SANTA MARGARITA RIVER AT THE POINT OF DIVERSION

Station Name	Station ID#	Remarks
Santa Margarita River near Temecula (Gorge)	11044000	Records good except for estimated daily discharges, which are fair.
Santa Margarita River at FPUD Sump	11044300	Records fair except for estimated daily discharges, which are poor
Sandia Creek near Fallbrook	11044350	Records are good
Santa Margarita River near Fallbrook	11044500	Records poor
De Luz Creek near De Luz	11044800	Records fair except for estimated daily discharges, which are poor
De Luz Creek near Fallbrook	11044900	Records are fair
Fallbrook Creek near Fallbrook	11045300	Records are good
Santa Margarita River at Ysidora (various locations)	11046000	Records fair to poor (Pre-1980) Records fair except for estimated daily discharges, which are poor (Post 1989)

The accuracy of USGS streamflow records depends on the stability of the stage-discharge relation, the frequency of measurements if the control is unstable, the accuracy of measurements, and the interpretation of records. The USGS indicates accuracy ratings for all daily discharge values defined by the following remarks: “excellent” would mean that about 95 percent of the daily discharges are within 5 percent of the true; “good” within 10 percent; and “fair” within 15 percent. Records that do not meet the criteria mentioned are rated “poor.” Different accuracies may be attributed to different parts of a given record, particularly if the gage has changed location or if the conditions in the channel have been altered. Since the majority of the 81-year reconstructed period relied on published USGS data, the stage-discharge relationship is assumed to have been checked and verified, ensuring a more accurate dataset.

The overall accuracy of the streamflow data has been assessed based on the USGS ratings, the period of record, and the drainage area represented by each gage. The USGS ratings were applied to each gage used to determine streamflow at the point of diversion. Reconstructed daily streamflow that was calculated when observed data was not available was assumed to be rated as “poor” as these records did not meet the criteria mentioned in the USGS quality remarks. The rating (5%, 10%, 15% or 20%) was multiplied by the drainage area above the gage (square miles) and the period of record (water years) that was applied for each gage and divided by the total drainage area above the gage (704.5 square miles) and the period of record (81-years) to get the weighted accuracy rating. According to the weighted accuracy analysis of USGS and reconstructed daily streamflow, about 95 percent of the daily discharges are within 18 percent of the true.

The reconstructed streamflow at the point of diversion serves as a daily input to the ROM and a monthly input to the groundwater model. Daily diversion schedules impacting the surface water supply available to the project were evaluated based on the daily streamflow input to the ROM. Monthly streamflow data was utilized in the historical groundwater model calibration runs to evaluate and improve the reliability of surface water discharges. Since the average daily observed flow have the tendency to oscillate above and below actual values, the aggregation of daily flows into monthly volumes would likely increase the accuracy of the data. Based on the accuracy of the observed daily streamflow data, knowledge of the Santa Margarita River basin, and surface water and groundwater calibration efforts, the reconstructed streamflow at the point of diversion is of sufficient accuracy to determine the water supply available to the project.

Attachment R

Related Technical Memoranda

Technical Team Schedule

2171 E. Francisco Blvd., Suite K • San Rafael, California • 94901
TEL: (415) 457-0701 FAX: (415) 457-1638

TO: USBR/Stetson Technical Team DATE: March 31, 2006

FROM: Jean Moran, PG, CHg JOB NO.: 2146-002-01

RE: Proposed Model Run Schedule; Technical Conference Call Schedule

There is a two month timeframe for finishing model calibration; developing the 50-Year Baseline; and completing four model runs by the end of May. Following is a proposed topic outline for the technical conference calls for the near future. This proposed outline will bring us through establishing the assumptions used for the 50-Year Baseline Model Run and a technical working meeting where we setup the constraints for the first four model runs.

Model calibration results and parameter sensitivity are probably best done in discussions between Bob and Jean. The K and stream conductance sensitivity analysis will be given to Bob by 4/5/06, next Wednesday. The final groundwater review should be completed by mid-April.

4/7/06 Discuss hydrological assumptions for 50-Year Baseline Model Run

- Upstream urbanization effects on streamflow
- CWRMA augmented flows
- Wastewater removed from the subbasins
- Pumping demand buildout
- Agricultural pumping continued
- Initial heads

4/__/06 Discuss Reservoir Operations Model (R.O.M.) assumptions for 50-Year Baseline (Friday, 4/14 is a holiday; recommend 4/12 or 4/17)

- Operation of diversion structure
- Operation of percolation ponds
- Operation of Lake O'Neill

4/21/06 Groundwater Model Input & Output Files for 50-Year Baseline

- Input: ET, Recharge, Pumping, Stream, General Head Boundaries
- Output: Water Levels, Streamflow, Volumetric Budget
- What model output is needed for the Design Team

4/28/06 Discuss Best Management Practices (BMP) for 50-Year Baseline Model Run

- Management decisions for 2nd below normal year
- Management decisions for 3rd below normal year
- Management decisions for 4th, etc. below normal year

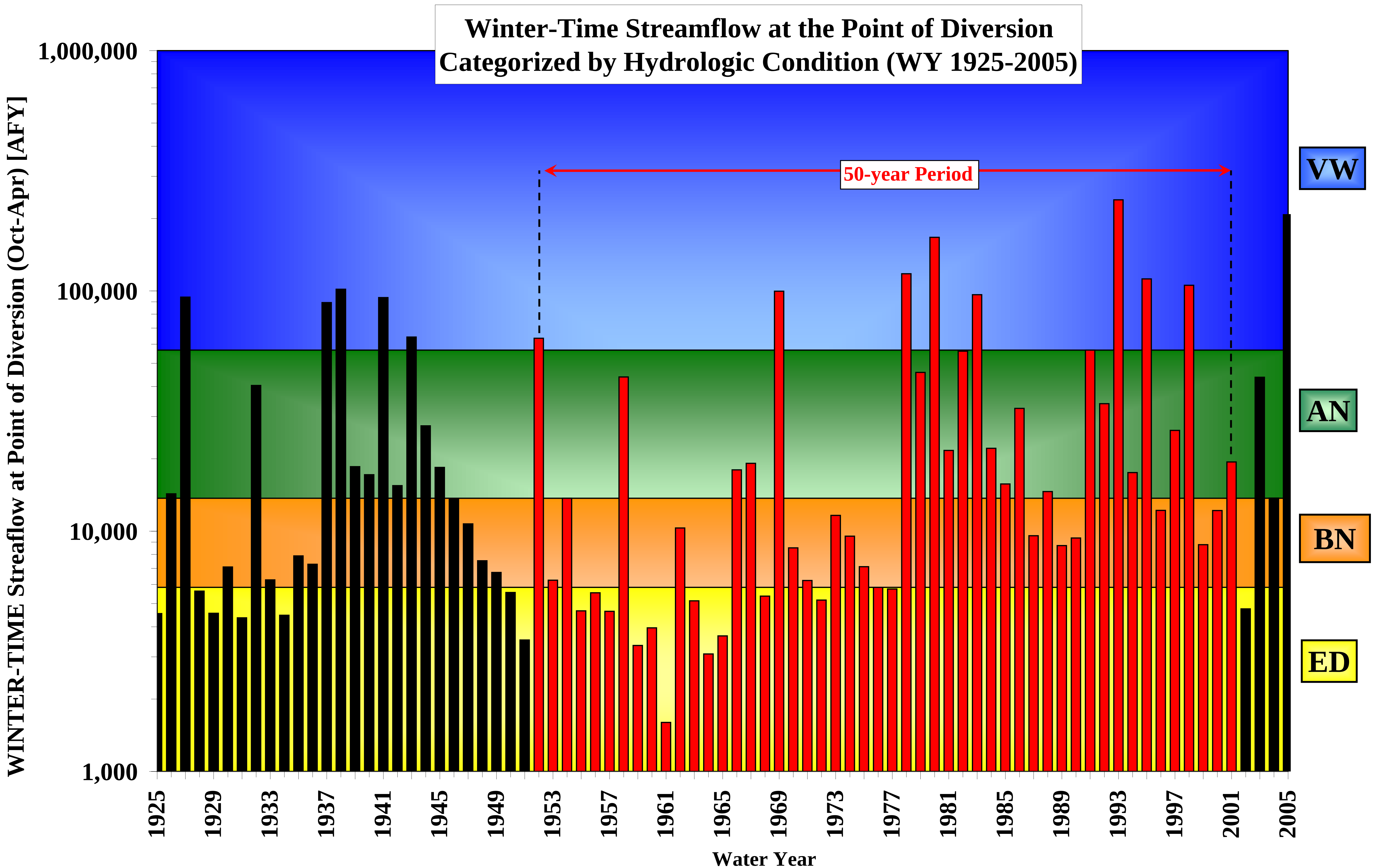
During Week of May 1-5, 2006 Technical Working Meeting in San Rafael, CA

(Thursday, 5/4; or Wednesday, 5/3)

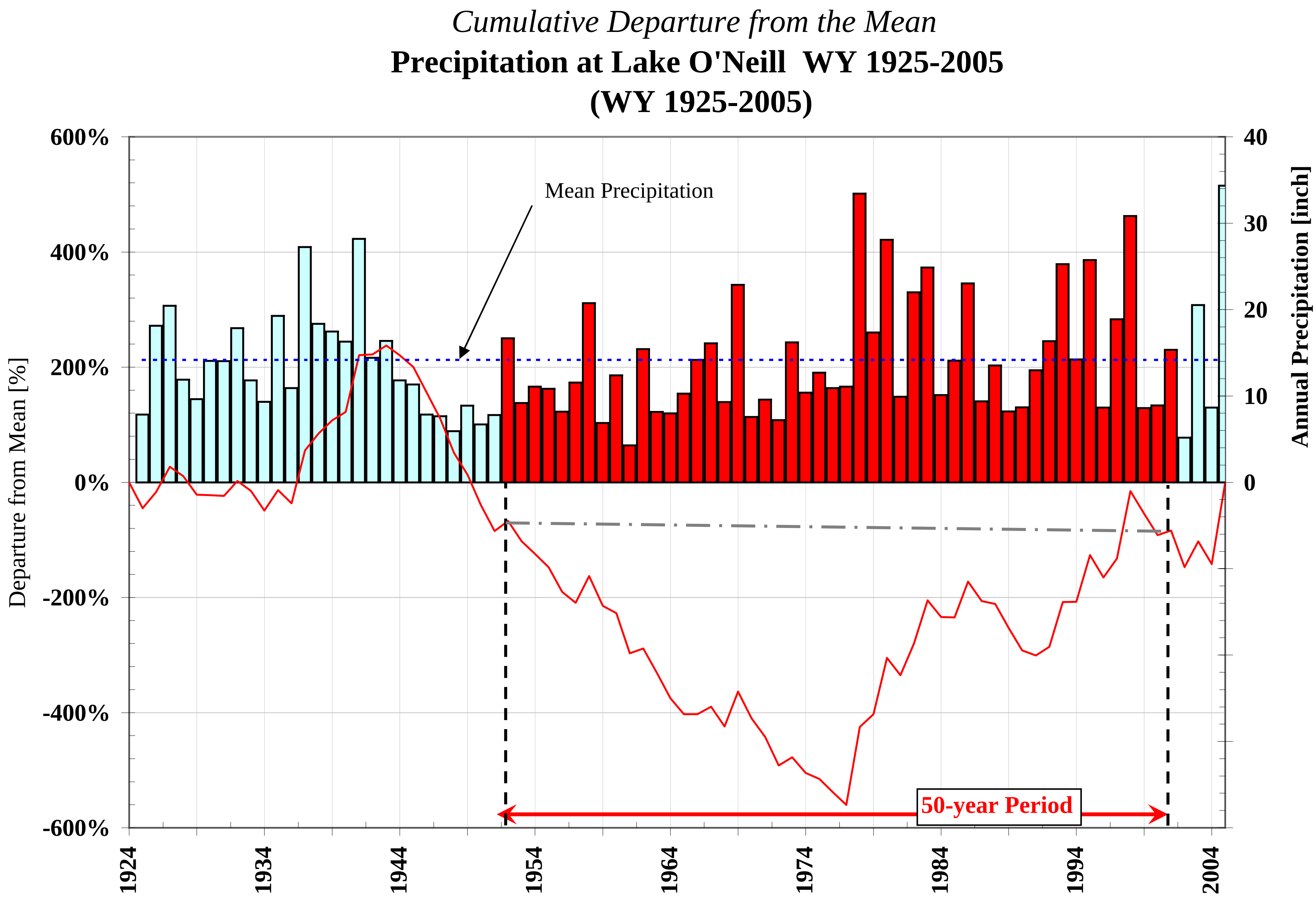
- 50-Year Baseline Model Presentation
- Discussion of Results
- Future Model Scenario Assumptions and Constraints
- Which parameters trigger mitigation

May-06 One Model Scenario each week with processed output.

This is a rigorous timeline that should keep us on track for meeting the mid-June schedule for providing project flows to the USBR Design Team. We can discuss this schedule on the 3/31/06, Friday Technical Team conference call.



Winter-Time Streamflow at the Point of Diversion
Categorized by Hydrologic Condition (WY 1925-2005)
WINTER-TIME Streaflow at Point of Diversion (Oct-Apr) [AFY]
1,000,000
100,000
10,000
1,000
50-year Period
VW
AN
BN
ED
1925
1929
1933
1937
1941
1945
1949
1953
1957
1961
1965
1969
1973
1977
1981
1985
1989
1993
1997
2001
2005
Water Year



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Reconstructed Flow in the SMR at the Point of Diversion for Each Hydrologic Condition

81-Year Period of Record (Water Years 1925 - 2005)

Hydrologic Condition	Average [AF]	Median [AF]	MIN [AF]	MAX [AF]
WY 1925 - 2005	**34,989**	**14,061**	**1,962**	**249,507**
Very Wet	122,060	103,615	61,648	249,507
Above Normal	28,011	22,191	14,061	58,248
Below Normal	10,195	9,897	6,502	15,591
Extremely Dry	5,145	5,210	1,962	8,111

50-Year Hydrologic Simulation Period (Water Years 1952 - 2001)

Hydrologic Condition	Average [AF]	Median [AF]	MIN [AF]	MAX [AF]
WY 1952 - 2001	**35,187**	**14,004**	**1,962**	**249,507**
Very Wet	124,500	118,415	61,648	249,507
Above Normal	29,084	23,824	14,061	58,248
Below Normal	10,293	10,809	6,502	14,252
Extremely Dry	4,875	5,073	1,962	8,111

Summary of Reconstructed Flow in the SMR at the Point of Diversion Compare the 50-Year Hydrologic Simulation Period to the 81-Year POR

Hydrologic Condition	50-yr / 81-yr Average [%]	50-yr / 81-yr Median [%]	50-yr / 81-yr MIN [%]	50-yr / 81-yr MAX [%]
50-year / 81-year	**101%**	**100%**	**100%**	**100%**
Very Wet	102%	114%	100%	100%
Above Normal	104%	107%	100%	100%
Below Normal	101%	109%	100%	91%
Extremely Dry	95%	97%	100%	100%

Summary of Water Available for Diversion in the SMR
81-Year Period of Record (Water Years 1925 - 2005)

Statistics	SMR Streamflow at Point of Diversion [AF]	Maximum Potential Diversion [AF]	200 cfs Diversion [days]	Additional Volume from 10 cfs SW Diversion [AF]	10 cfs Diversion [days]
WY 1925 - 2005	**2,804,337**	**1,034,132**	**881**	**17,026**	**841**
Average	34,621	12,767	11	210	10
Median	14,061	8,674	5	99	5
Maximum	249,507	50,199	60	1,186	59
Minimum	1,962	689	0	0	0

Summary of Water Available for Diversion in the SMR
For Each Hydrologic Condition
81-Year Period of Record (Water Years 1925 - 2005)

Hydrologic Condition	Average [AF]	Median [AF]	Min [AF]	Max [AF]
WY 1925 - 2005	**12,885**	**8,674**	**689**	**50,199**
Very Wet	33,490	34,918	17,333	50,199
Above Normal	14,276	13,129	6,641	31,931
Below Normal	6,765	6,714	4,010	10,269
Extremely Dry	3,048	3,211	689	4,465

Summary of Water Available for Diversion in the SMR
50-Year Hydrologic Simulation Period (Water Years 1952 - 2001)

Statistics	SMR Streamflow at Point of Diversion [AF]	Maximum Potential Diversion [AF]	200 cfs Diversion [days]	Additional Volume from 10 cfs SW Diversion [AF]	10 cfs Diversion [days]
WY 1952 - 2001	**1,759,373**	**621,645**	**579**	**11,204**	**552**
Average	35,187	12,433	12	224	11
Median	14,004	8,645	7	129	7
Maximum	249,507	46,421	54	1,044	51
Minimum	1,962	689	0	0	0

Summary of Water Available for Diversion in the SMR
For Each Hydrologic Condition
50-Year Hydrologic Simulation Period (Water Years 1952 - 2001)

Hydrologic Condition	Average [AF]	Median [AF]	Min [AF]	Max [AF]
WY 1952 - 2001	**12,433**	**8,645**	**689**	**46,421**
Very Wet	32,180	38,651	17,333	46,421
Above Normal	13,669	11,889	7,445	31,931
Below Normal	6,734	6,742	4,010	10,269
Extremely Dry	2,726	2,972	689	4,045

Summary of Water Available for Diversion in the SMR
Compare the 50-Year Hydrologic Simulation Period to the 81-Year POR

Statistics	SMR Streamflow at Point of Diversion [%]	Maximum Potential Diversion [%]	200 cfs Diversion [%]	Additional Volume from 10 cfs SW Diversion [%]	10 cfs Diversion [%]
50-yr / 81-yr					
Average	102%	97%	106%	107%	106%
Median	100%	100%	130%	130%	130%
Maximum	100%	92%	90%	88%	86%
Minimum	100%	100%			

Summary of Water Available for Diversion in the SMR
For Each Hydrologic Condition
Compare the 50-Year Hydrologic Simulation Period to the 81-Year POR

Hydrologic Condition	50-yr / 81-yr Average [%]	50-yr / 81-yr Median [%]	50-yr / 81-yr MIN [%]	50-yr / 81-yr MAX [%]
50-yr / 81-yr	**96%**	**100%**	**100%**	**92%**
Very Wet	96%	111%	100%	92%
Above Normal	96%	91%	112%	100%
Below Normal	100%	100%	100%	100%
Extremely Dry	89%	93%	100%	91%

DRAFT TECHNICAL MEMORANDUM

STETSON ENGINEERS INC.

2171 E. Francisco Blvd., Suite K • San Rafael, California • 94901
TEL: (415) 457-0701   FAX: (415) 457-1638

TO:	Robert Talbot, USBR Denver Office	DATE:	April 6, 2006
FROM:	Stetson Engineers, Inc.	JOB NO.:	2148-002-1
RE:	LSMR Groundwater Model Sensitivity Analysis		

This technical memorandum provides a brief summary of results from the initial sensitivity analysis. This sensitivity analysis provides information needed to select and identify the most sensitive parameters in the Lower Santa Margarita River (LSMR) groundwater model. Results and conclusions from this analysis will be incorporated into the LSMR model calibration. Initial values for the model parameters in this sensitivity analysis are based on previous model runs and field measurements. This work was carried out using the Automated Sensitivity Analysis tool of Groundwater Vistas. A second sensitivity analysis will be performed, after completion of the model calibration, to study the impact of uncertainties in parameter estimates on model predictions and included in Technical Memorandum 2.0.

A total of 1,852 measured water levels from 24 wells were included in the LSMR groundwater model as calibration targets. The simulated water levels were then compared to the actual measured water levels to estimate the "degree of fitness". The difference between the measured value and the simulated value is called the residual (measured – simulated). Residuals can be positive or negative and appear to cancel each other out; so the sum of the squared (Σsq) residuals is used to compare a goodness-of-fit between model simulations. Sensitivity of a model parameter is evaluated by measuring the change in the Σsq residuals of all model targets caused by changes in the studied parameter. The model parameter is changed by applying a multiplier to the current best estimate (initial values).

Model parameters presented in this memorandum are hydraulic conductivity (K) and streambed conductance. Figure 1 shows the eight different K-zones of the model and Figure 2 presents the stream package segments. The sensitivity analysis was performed on all eight K-zones and five streambed conductance terms within the main stem of the simulated Santa Margarita River. Table 1 shows the effect of changes in K-zone values on the Σsq residuals of all model targets. Figure 3 shows the sensitivity curves for each K-zone. Curves of sensitive parameters have higher slopes than curves of less sensitive parameters. Table 2 summarizes the effect of changes in streambed conductance for different stream segments on the Σsq residuals of all model targets. Figure 4 shows the sensitivity curves for each stream segments.

Figure 1

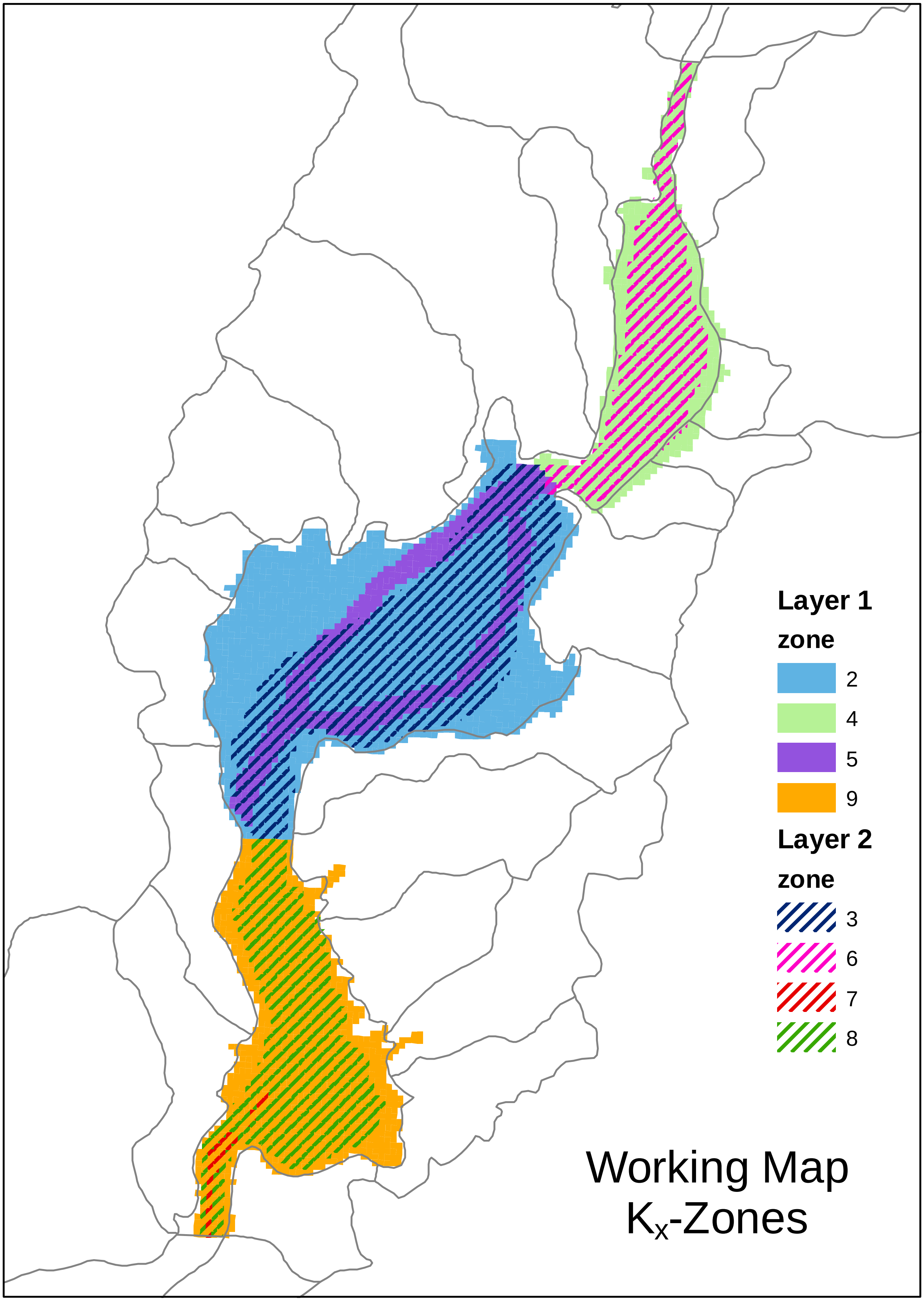

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Figure 2

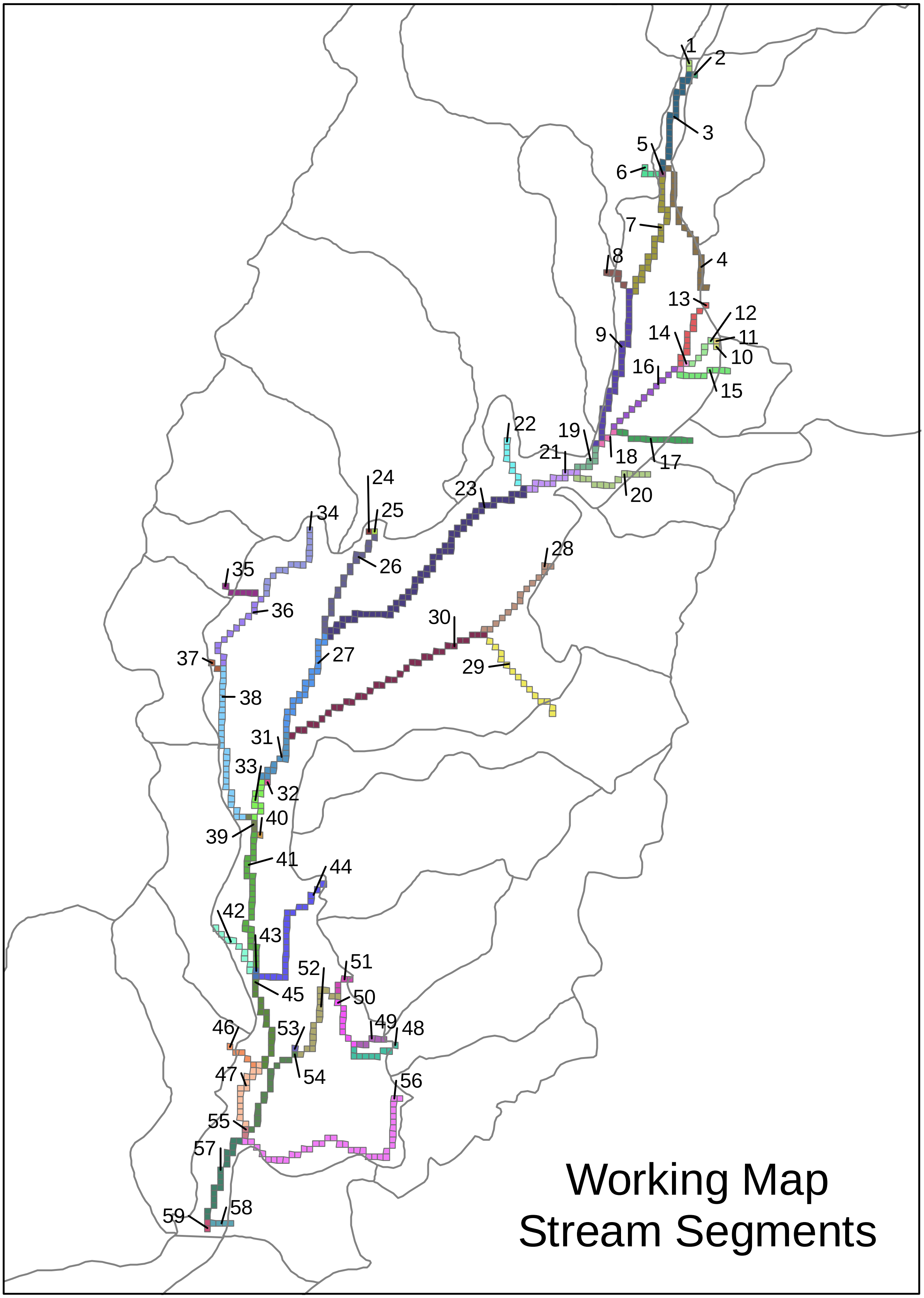

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Table 1 Sensitivity Analysis on Initial Kx Estimates, Sum of Squared Residuals

Zone	2	3	4	5	6	7	8	9
Initial Value	37 ft/d	192 ft/d	338 ft/d	388 ft/d	600 ft/d	192 ft/d	192 ft/d	37 ft/d
Sub Basin	CH	CH	UY	CH	UY	LY	LY	LY
Multiplier								
0					18,775			
0.01					18,440			
0.05		17,907			17,848			
0.1	17,188	17,279	17,622	16,789	17,518			
0.2	17,192	16,698	17,445	17,006	17,171			
0.3	17,212	16,608	17,362	17,130	16,997			
0.4	17,234	16,674	17,321	17,208	16,918			
0.55	17,269	16,849	17,297	17,279	16,911	17,501	17,702	17,453
0.7	17,300	17,030	17,300	17,319	16,996	17,443	17,577	17,425
0.85	17,329	17,199	17,321	17,342	17,150	17,395	17,461	17,391
1	17,355	17,355	17,355	17,355	17,355	17,355	17,355	17,355
1.15	17,379	17,502	17,398	17,363	17,600	17,320	17,255	17,317
1.3	17,402	17,647	17,449	17,367	17,880	17,289	17,160	17,279
1.45	17,422	17,793	17,508	17,370	18,190	17,262	17,070	17,239
2						17,185	16,773	17,092
3						17,099	16,338	16,825
5						17,025	15,729	16,332

Figure 3

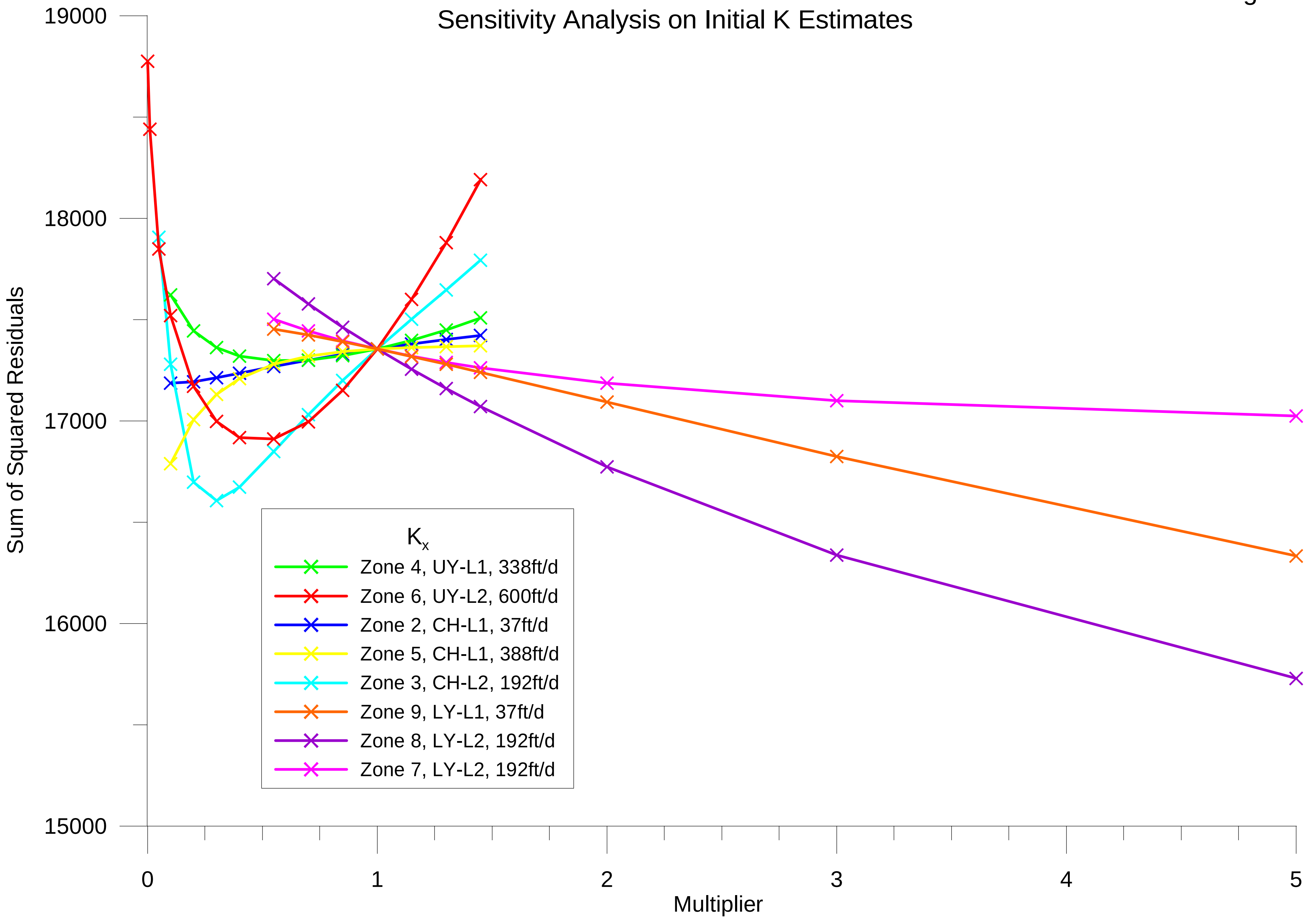

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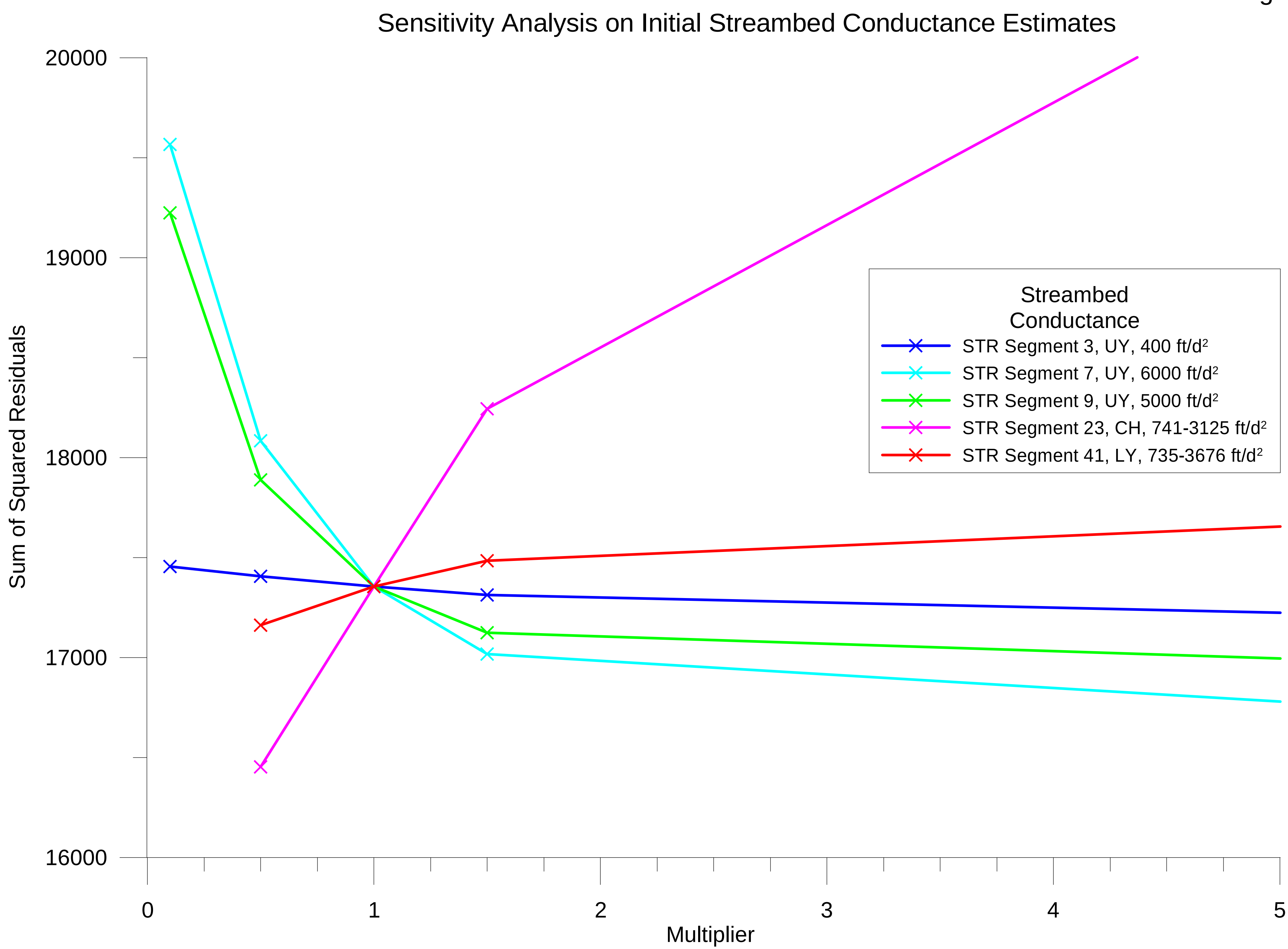
Table 2 Sensitivity Analysis on Initial Streambed Conductance Estimates, Sum of Squared Residuals

Segment	3	7	9	23	41
Initial Value	400 ft^2/d	6000 ft^2/d	5000 ft^2/d	741-3125 ft^2/d	735-3676 ft^2/d
Sub Basin	UY	UY	UY	UY	UY
Multiplier					
0.1	17,456	19,568	19,225		
0.5	17,406	18,084	17,888	16,453	17,162
1	17,355	17,355	17,355	17,355	17,355
1.5	17,312	17,017	17,123	18,244	17,483
10	17,099	16,440	16,813	23,448	17,903
15				24,524	16,903

Figure 4



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STETSON
ENGINEERS INC.

DRAFT TECHNICAL MEMORANDUM

2171 E. Francisco Blvd., Suite K • San Rafael, California • 94901
TEL: (415) 457-0701 FAX: (415) 457-1638

TO: Technical Team DATE: April 13, 2006

FROM: Stetson Engineers JOB NO.:

RE: LSMR Groundwater Model Calibration Attachment for Tech Memo

1.0 LSMR GROUNDWATER MODEL CALIBRATION

The model was calibrated by adjusting sensitive model parameters to minimize the sum of the squared residuals between measured water levels and the model-simulated water levels. Adjusting one model parameter not only changes the sum of the squared residuals, but it also changes the dependency of the sum of the squared residuals on other model parameters. Groundwater model calibration is an iterative process that has to consider the interdependency of model parameters. For the purpose of this study the calibration tool from Groundwater Vistas was used to optimize model parameters. The calibration requires specification of the model parameters which are to be estimated during calibration, as well as the allowable range for each value. Based on the initial sensitivity analysis the most sensitive model parameters were selected to be estimated during calibration. The streambed conductance of the main segments of the Santa Margarita River as well as the most sensitive conductivity zones that were used during calibration are summarized in **Table 1**. Initial values for the model parameters in this sensitivity analysis are based on previous model runs and field measurements. Groundwater Vistas default settings were used for parameters that control the performance of the calibration algorithm.

Table 1 Parameters to be estimated during calibration

Parameter	Sub Basin	Layer	Zone/Segment	Initial Value
Kx	UY	1	4	338 ft/d
Kx	UY	2	6	430 ft/d
Kx	CH	1	5	388 ft/d
Kx	CH	2	3	100 ft/d
Kx	LY	1	9	37 ft/d
Kx	LY	2	8	192 ft/d
Str. Cond.	UY		7	6,000 ft^2/d
Str. Cond.	UY		9	5,000 ft^2/d
Str. Cond.	CH		23	741-3,125 ft^2/d
Str. Cond.	CH		27	2,941-3,448 ft^2/d
Str. Cond.	LY		41	735-3,676 ft^2/d
Str. Cond.	LY		45	1,912-4,412 ft^2/d

At the beginning of each iteration the calibration algorithm conducts one model run with the current parameters and calculates the sum of the squared residuals. The model is then run once for each parameter value being estimated, and one final time with the updated parameter values. Up to three additional model runs can be necessary depending on how quickly the calibration algorithm can reduce the sum of squared residuals from the previous iteration. The calibration was stopped when it could be determined that further iterations would not reduce the sum of the squared residuals effectively.

The calibration was divided into three stages of separate calibrations for each sub basin. Each calibration estimated parameters that are located in one sub basin, with residuals taken into account only of those water level targets that are also located in the same sub basin. This procedure was chosen to increase the sensitivity of the parameters to be estimated and to ensure the effectiveness of the calibration. The Model was calibrated in the sub basin-sequence of Upper Ysidora, then the Chappo and at last the Lower Ysidora. The results of each iteration for the calibration for the Upper Ysidora are summarized in **Table 2**. The relative change of all parameters with each iteration can be seen in **Figure** 1. By the end of the third iteration the sum of the squared residuals was reduced from 3,191 to 2,253, or by 29%. After completion of the first calibration the new estimates for the parameters in the Upper Ysidora were based on the results of the third iteration and held constant during calibration of the Chappo. Only parameters and residuals of water level targets in the Chappo were subject to the second calibration. The results for the calibration of the Chappo are summarized in **Table 3** and graphed in **Figure 2**. By the end of the sixth and last iteration the sum of the squared residuals was reduced from 5,289 to 3,451, or by 35%. The final calibration for the Lower Ysidora was conducted likewise with the new estimates for parameters in the Chappo based on the last iteration being held constant. The parameters of the Upper Ysidora estimated in the first calibration also remained constant. The results for the calibration of the Lower Ysidora are summarized in **Table 4** and graphed in **Figure 3**.

Table 2. Upper Ysidora Calibration results

Iteration	Res. Error	Kx Zone 4	Kx Zone 6	Str. Cond. Segment 7	Str. Cond. Segment 9
0	3,191	1.00	1.00	1.00	1.00
1	2,720	0.51	1.55	3.70	1.55
2	2,411	1.66	1.09	17.11	1.28
3	2,253	3.29	0.53	37.82	2.49
4	2,238	3.10	0.80	60.33	3.89
5	2,238	3.13	0.87	60.87	3.80
6	2,233	3.10	0.89	64.06	3.83

Figure 1. Upper Ysidora Calibration Results

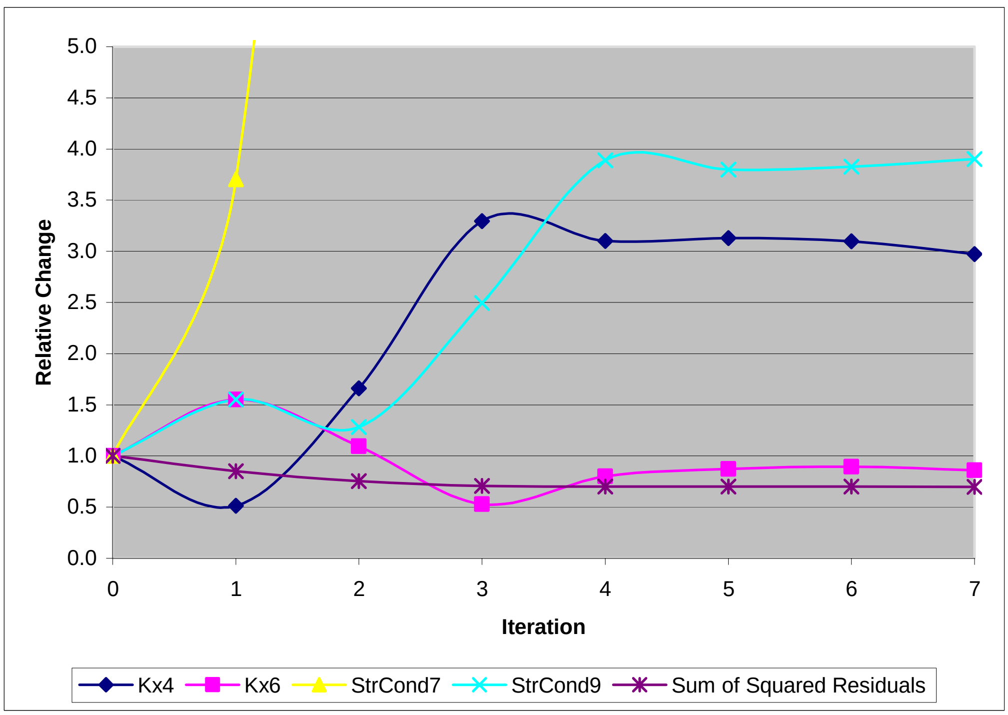


Table 3. Chappo Calibration Results

Iteration	Res. Error	Kx Zone 3	Kx Zone 5	Str. Cond. Segment 23	Str. Cond. Segment 27
0	5,289	1.00	1.00	1.00	1.00
1	4,162	1.34	0.88	0.67	0.08
2	3,679	2.80	0.08	0.79	0.01
3	3,546	2.98	0.21	0.95	0.01
4	3,510	2.95	0.08	1.13	0.01
5	3,481	2.76	0.05	1.09	0.03
6	3,451	2.68	0.12	0.99	0.01

Figure 2. Chappo Calibration Results

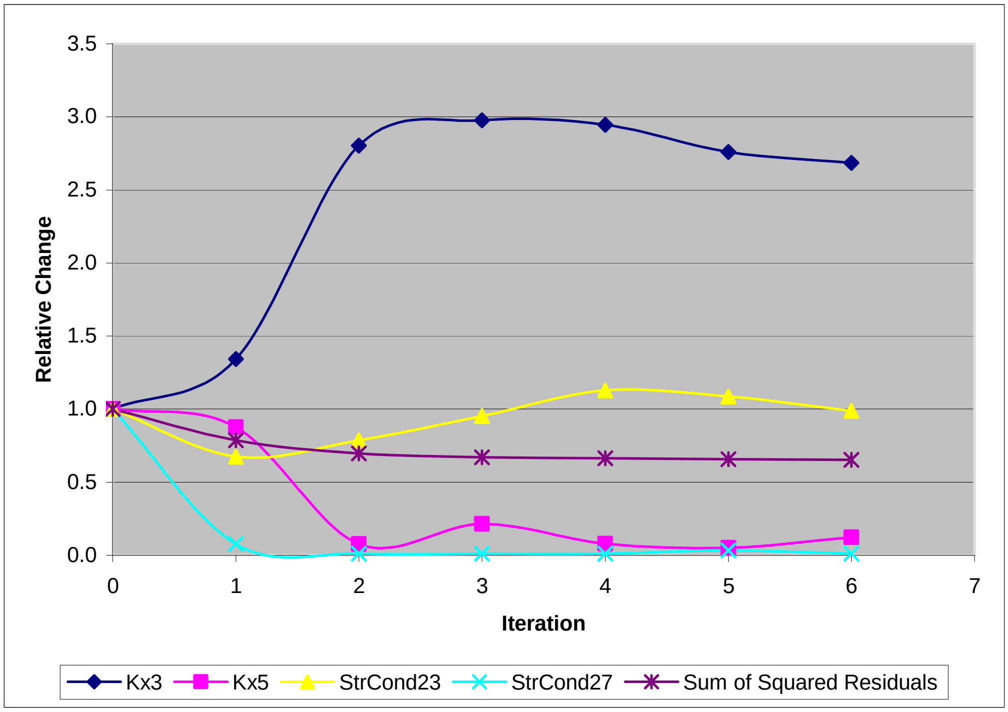


Table 4. Lower Ysidora Calibration Results

Iteration	Res. Error	Kx Zone 8	Kx Zone 9	Str. Cond. Segment 41	Str. Cond. Segment 45
0	5.757	1.00	1.00	1.00	1.00
1	4,940	4.07	0.01	1.48	0.01
2	4,950	4.14	0.05	2.01	0.01
3	4,928	4.51	0.16	1.53	0.01
4	4,952	4.25	0.01	1.65	0.01
5	4,945	4.08	0.02	1.67	0.01
6	4,930	4.23	0.07	1.68	0.01

Figure 3. Lower Ysidora Calibration Results

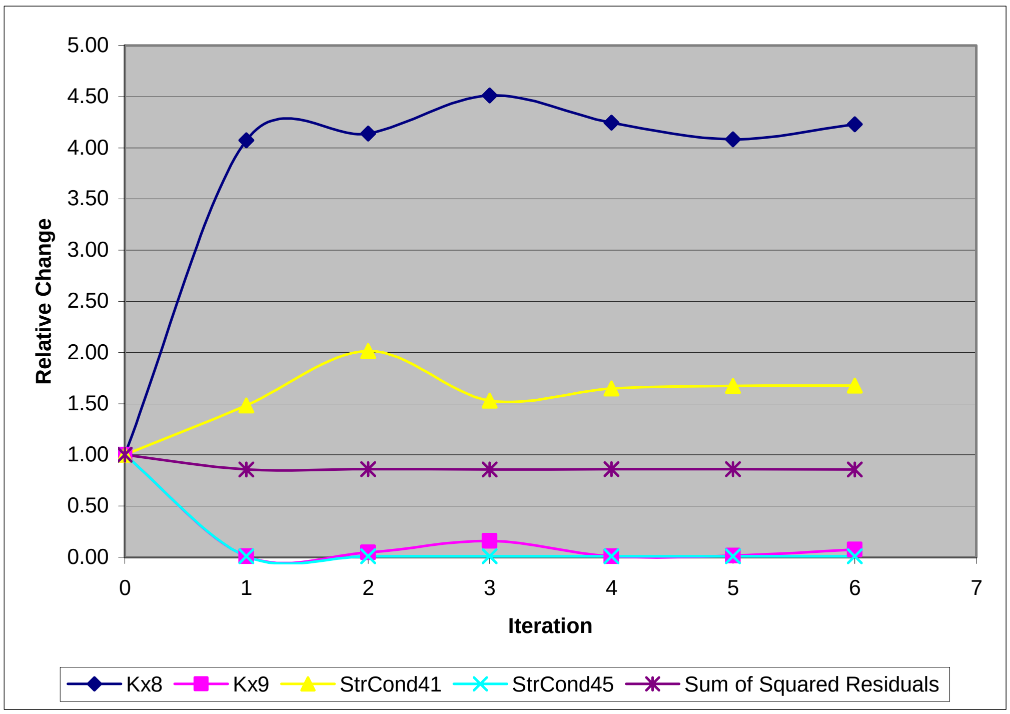
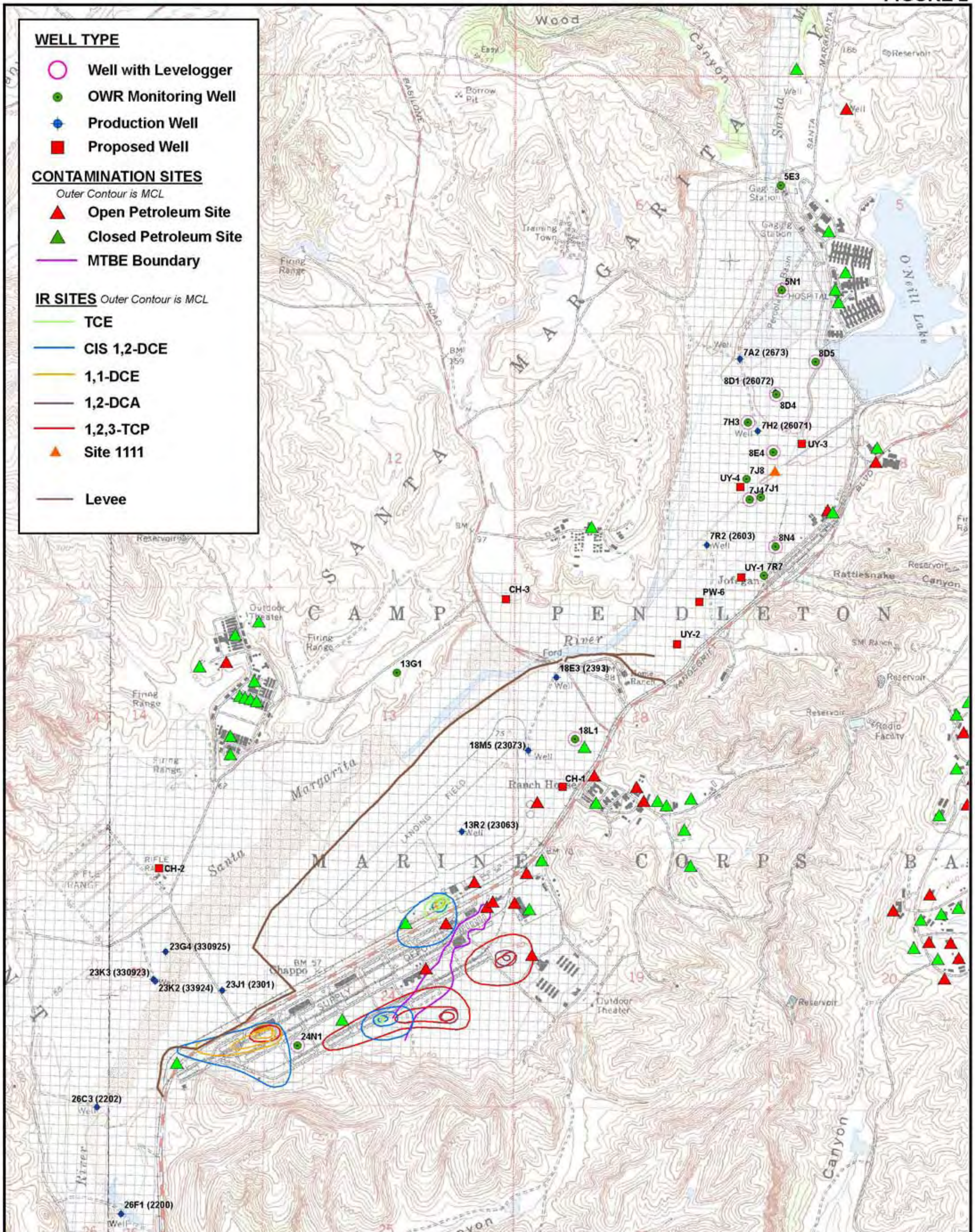


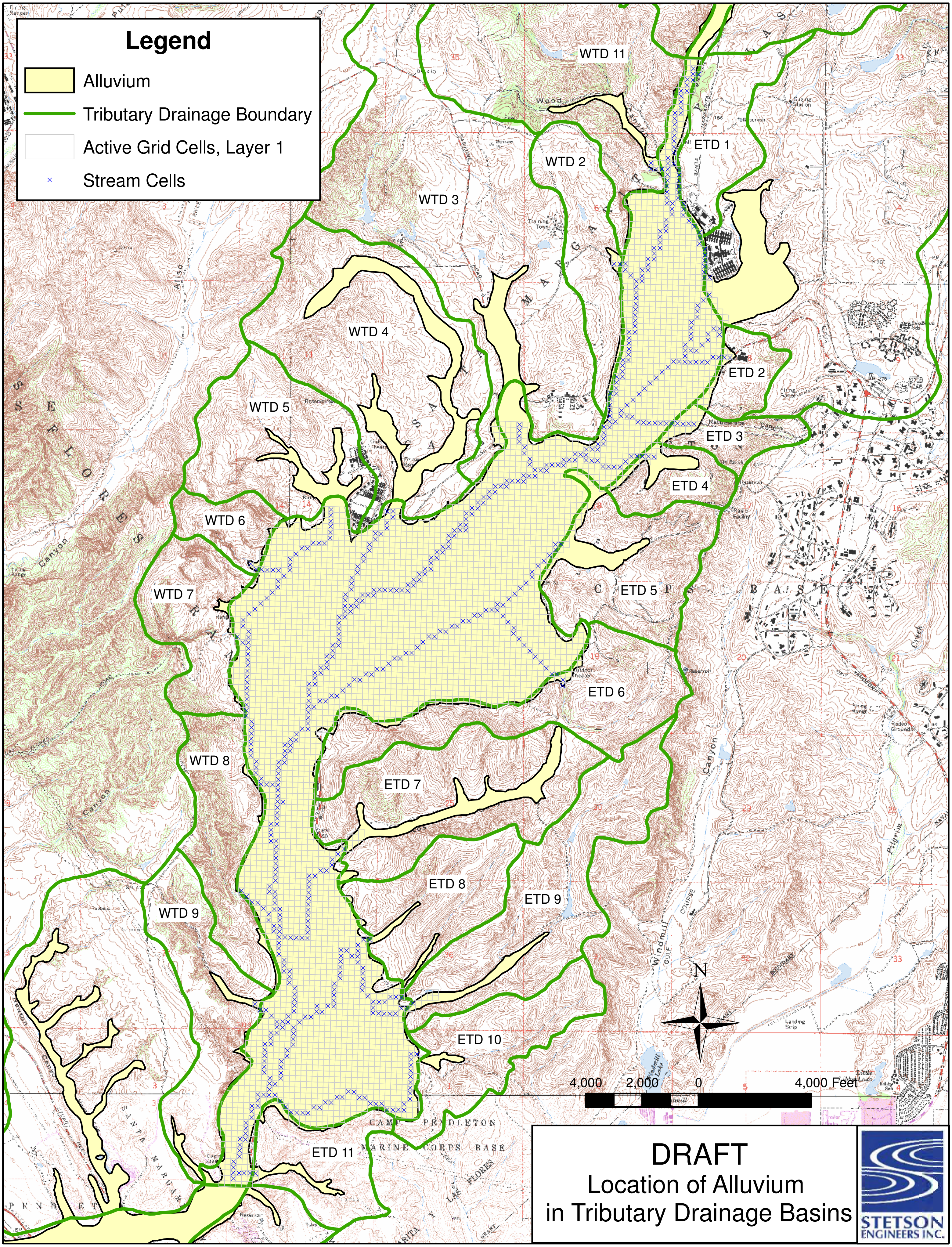
FIGURE 2



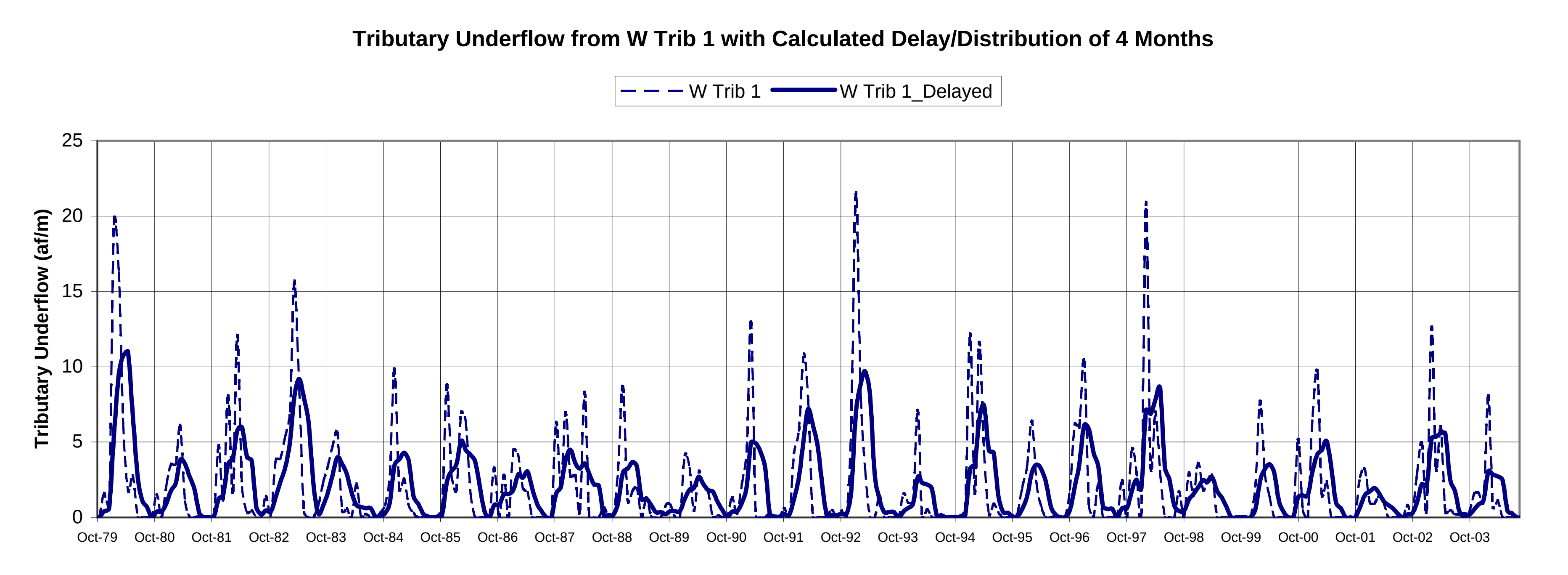
LOCATION OF CONTAMINATED GROUNDWATER SANTA MARGARITA RIVER BASIN

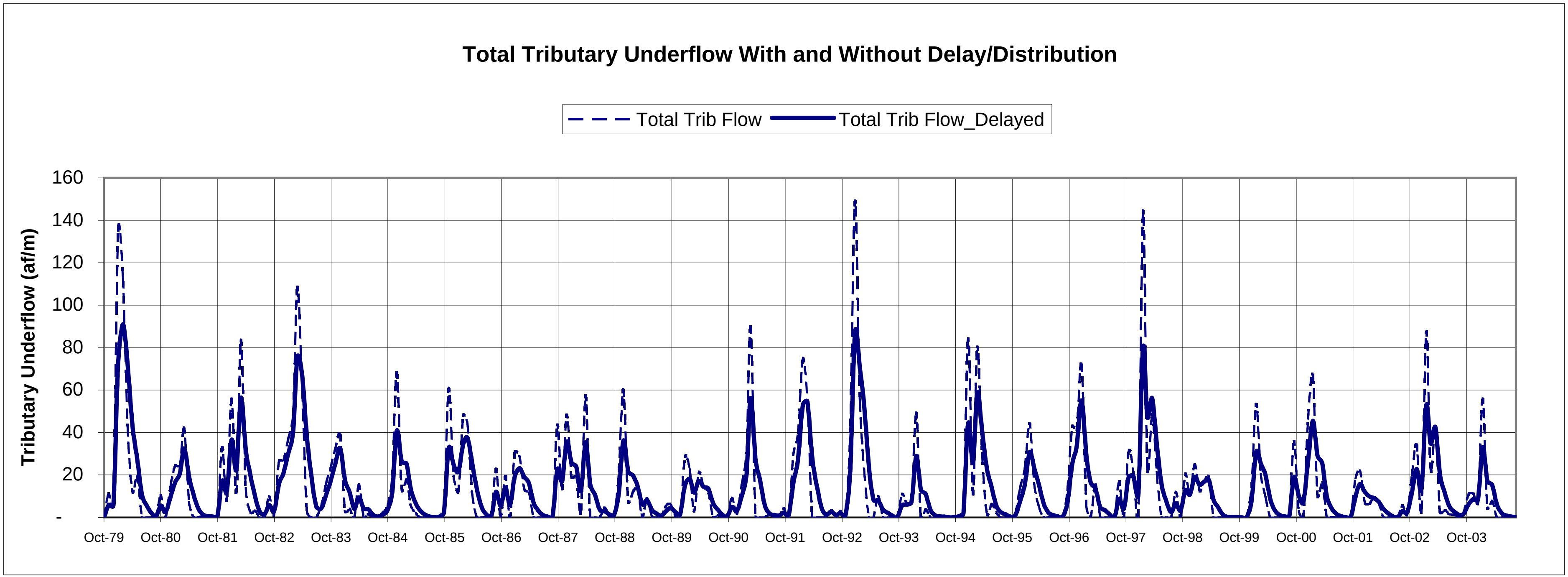
STETSON ENGINEERS INC.

SOURCES: Parsons, 2005 (IR Sites)
MCBCP Environmental Securities, RCRA Division, 2005 (Petroleum Sites)
Shaw Environmental, 2005 (MTBE @ 22 Area)


Legend
Alluvium
Tributary Drainage Boundary
Active Grid Cells, Layer 1
Stream Cells
WTD 11
WTD 2
WTD 3
WTD 4
WTD 5
WTD 6
WTD 7
WTD 8
WTD 9
ETD 1
ETD 2
ETD 3
ETD 4
ETD 5
ETD 6
ETD 7
ETD 8
ETD 9
ETD 10
ETD 11
N
4,000 2,000 0 4,000 Feet
DRAFT
Location of Alluvium
in Tributary Drainage Basins
STETSON ENGINEERS INC.

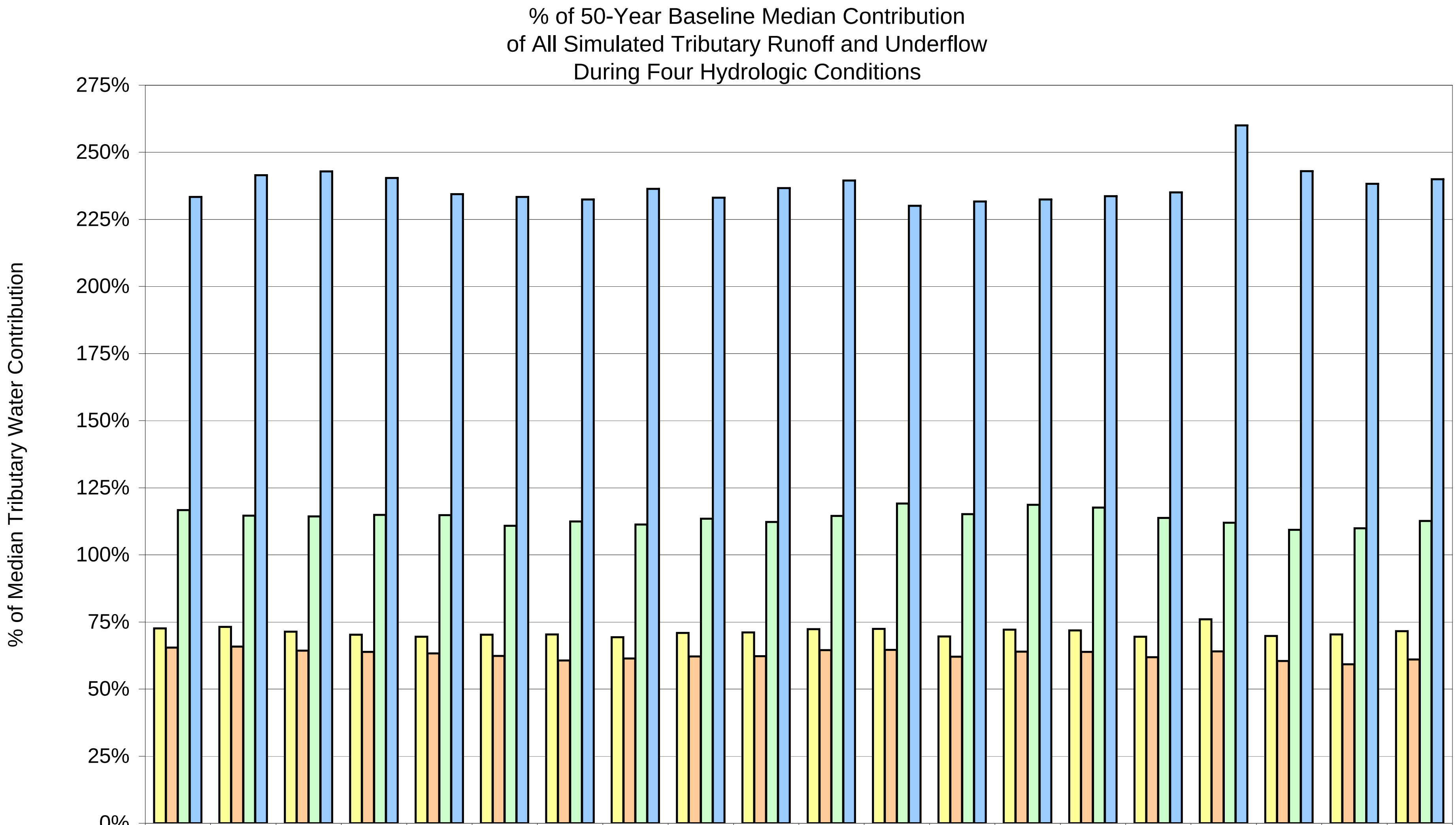
I:\DATA\2148\Project Management\5-5-06 Tech Conf Call\TRIB_GRAPHS.xls / printed 5/4/2006





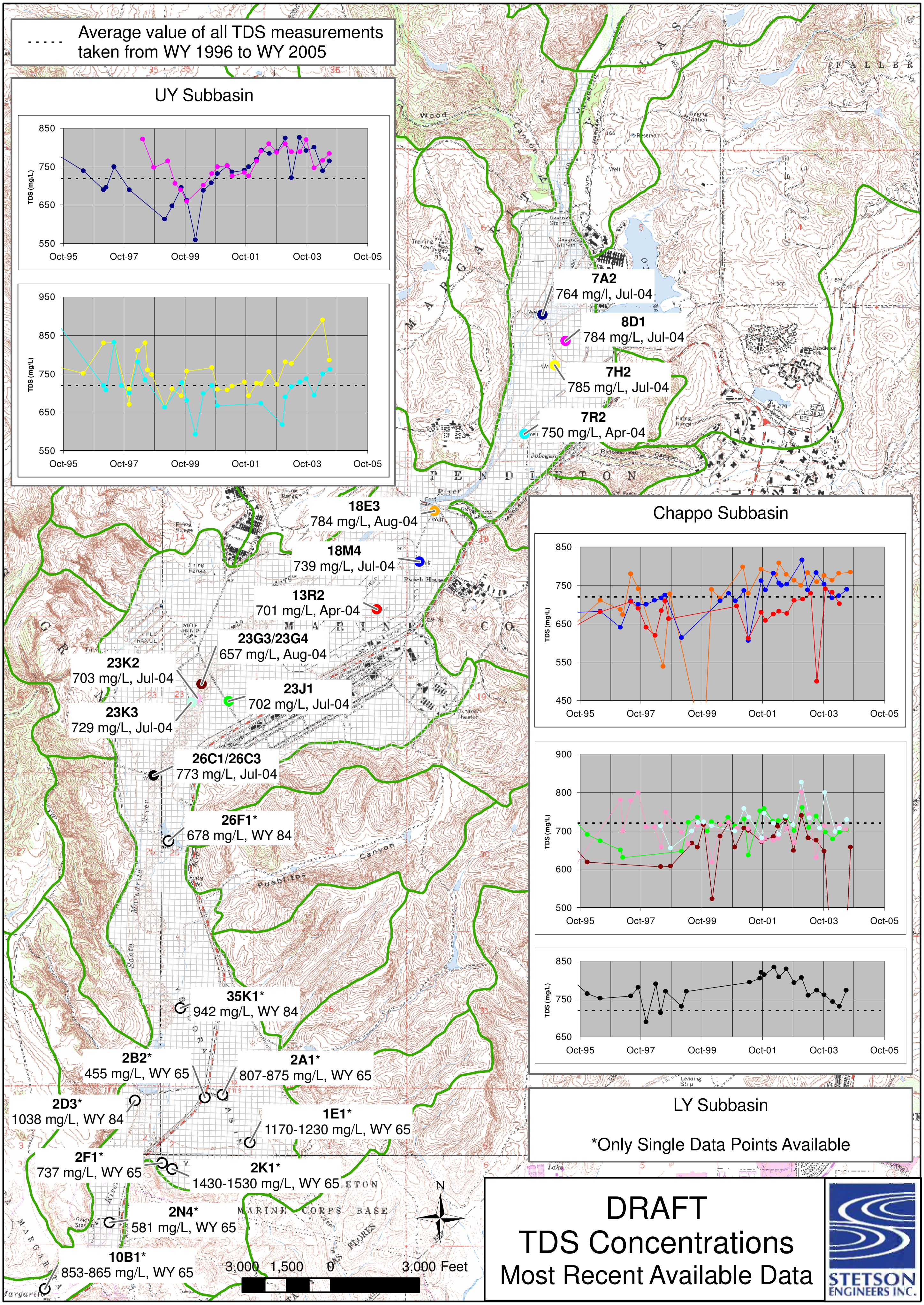
% of 50-Year Median Contribution of All Simulated Tributary Runoff and Underflow

		Tributary Underflow, 50-Year Baseline					**Tributary Runoff, 50-Year Baseline**					**50-Year Baseline % of 50-YearTotal Runoff & Underflow**			
	% Time Excdnc	*> 76%*	*76% to 50%*	*50% to 19%*	*< 19%*	*Tributary*	*> 76%*	*76% to 50%*	*50% to 19%*	*< 19%*	*Tributary*	*> 76%*	*76% to 50%*	*50% to 19%*	*< 19%*
	# Years	*12*	*14*	*15*	*9*	*Underflow*	*12*	*14*	*15*	*9*	*Runoff*	*12*	*14*	*15*	*9*
		Extremely Dry	Below Normal	Above Normal	Very Wet	50-Yr Median	Extremely Dry	Below Normal	Above Normal	Very Wet	50-Yr Median	Extremely Dry	Below Normal	Above Normal	Very Wet
		AFY	AFY	AFY	AFY	AFY	AFY	AFY	AFY	AFY	AFY	AFY	AFY	AFY	AFY
E Trib 1	UY	4	4	6	9	5	57	51	92	187	79	73%	65%	117%	233%
E Trib 2	UY	2	2	3	4	2	28	25	44	95	39	73%	66%	115%	241%
E Trib 3	UY	2	2	3	4	2	28	25	45	98	40	71%	64%	114%	243%
E Trib 4	UY,CH	1	1	2	2	1	32	29	52	111	46	70%	64%	115%	240%
E Trib 5	UY	3	3	5	7	4	86	78	142	293	124	70%	63%	115%	234%
E Trib 6	CH	7	7	11	16	8	90	79	142	306	130	70%	62%	111%	233%
E Trib 7	CH	5	5	8	11	6	97	83	155	326	139	70%	61%	112%	232%
E Trib 8	CH	3	4	6	8	4	58	50	92	200	84	69%	61%	111%	236%
E Trib 9	CH	8	9	14	20	10	97	83	154	325	138	71%	62%	114%	233%
E Trib 10	UY	5	5	8	11	6	59	51	93	202	84	71%	62%	112%	237%
E Trib 11	UY	9	9	14	20	10	46	40	73	162	66	72%	64%	114%	239%
W Trib 1	CH	20	20	28	42	23	211	186	352	692	296	72%	65%	119%	230%
W Trib 2	CH	4	4	7	9	5	51	45	84	174	74	70%	62%	115%	232%
W Trib 3	LY	20	21	30	44	24	216	188	358	716	303	72%	64%	119%	232%
W Trib 4	LY	14	15	21	31	17	157	137	259	525	221	72%	64%	118%	234%
W Trib 5	LY	4	4	6	8	4	87	77	143	300	127	69%	62%	114%	235%
W Trib 6	LY	2	2	3	4	2	36	30	53	126	48	76%	64%	112%	260%
W Trib 7	LY	4	4	7	10	5	56	48	87	199	81	70%	60%	109%	243%
W Trib 8	LY	5	5	8	11	6	52	43	81	182	75	70%	59%	110%	238%
W Trib 9	LY	6	6	9	13	7	62	52	98	215	88	72%	61%	113%	240%
											min	69%	59%	109%	230%
											max	76%	66%	119%	260%
											avg	71%	63%	114%	237%
											med	71%	63%	114%	236%



	UY	UY	UY	UY,CH	UY	CH	CH	CH	CH	UY	UY	CH	CH	LY	LY	LY	LY	LY	LY	LY
	E Trib 1	E Trib 2	E Trib 3	E Trib 4	E Trib 5	E Trib 6	E Trib 7	E Trib 8	E Trib 9	E Trib 10	E Trib 11	W Trib 1	W Trib 2	W Trib 3	W Trib 4	W Trib 5	W Trib 6	W Trib 7	W Trib 8	W Trib 9
Extremely Dry	73%	73%	71%	70%	70%	70%	70%	69%	71%	71%	72%	72%	70%	72%	72%	69%	76%	70%	70%	72%
Below Normal	65%	66%	64%	64%	63%	62%	61%	61%	62%	62%	64%	65%	62%	64%	64%	62%	64%	60%	59%	61%
Above Normal	117%	115%	114%	115%	115%	111%	112%	111%	114%	112%	114%	119%	115%	119%	118%	114%	112%	109%	110%	113%
Very Wet	233%	241%	243%	240%	234%	233%	232%	236%	233%	237%	239%	230%	232%	232%	234%	235%	260%	243%	238%	240%

FIGURE ___



Average value of all TDS measurements taken from WY 1996 to WY 2005
UY Subbasin
TDS (mg/L)
Oct-95
Oct-97
Oct-99
Oct-01
Oct-03
Oct-05
7A2
764 mg/l, Jul-04
8D1
784 mg/L, Jul-04
7H2
785 mg/L, Jul-04
7R2
750 mg/L, Apr-04
18E3
784 mg/L, Aug-04
18M4
739 mg/L, Jul-04
13R2
701 mg/L, Apr-04
23G3/23G4
657 mg/L, Aug-04
23K2
703 mg/L, Jul-04
23J1
702 mg/L, Jul-04
23K3
729 mg/L, Jul-04
26C1/26C3
773 mg/L, Jul-04
26F1*
678 mg/L, WY 84
35K1*
942 mg/L, WY 84
2B2*
455 mg/L, WY 65
2A1*
807-875 mg/L, WY 65
2D3*
1038 mg/L, WY 84
1E1*
1170-1230 mg/L, WY 65
2F1*
737 mg/L, WY 65
2K1*
1430-1530 mg/L, WY 65
2N4*
581 mg/L, WY 65
10B1*
853-865 mg/L, WY 84
Chappo Subbasin
LY Subbasin
*Only Single Data Points Available
3,000 1,500 0 3,000 Feet
N
P E N D L E T O N
M A R I N E C O
MARINE CORPS BASE
DRAFT
TDS Concentrations
Most Recent Available Data
STETSON ENGINEERS INC.

	Historical WY 1980-2004				Hydrologic WY 1952-2001 50 Year Baseline	
	Historical Average		Historical Median		Average	Median
Inflow:						
Santa Margarita River Inflow	50,580	88%	23,820	78%	37,760	15,770
Subsurface Underflow	930	2%	910	3%		
Lake O'Neill Spill and Release	1,730	3%	1,510	5%	1,180	1,220
Minor Tributary Drainages	1,668	3%	0	4%	2,400	2,080
Waste Water Discharge	1,730	3%	2,050	7%	0	0
Areal Precipitation	610	1%	450	1%	600	280
Total Inflow:	57,250	100%	31,070	101%		
Outflow:						
Santa Margarita River Outflow	47,660	83%	20,820	68%		
Subsurface Underflow	100	0.2%	100	0.3%		
Groundwater Pumping	5,760	10%	5,940	19%	8,800	8,800
Evapotranspiration	3,290	6%	3,280	11%		
Diversions to Lake O'Neill	530	1%	570	2%	1,960	1,600
Total Outflow:	57,340	100%	30,710	100%		
Net change of Groundwater in Storage:	-90	-0.2%	-180	-0.6%		

Note: Presentation of Model budget will reflect the four hydrologic conditions: Very Wet, Above Normal, Below Normal, and Extremely Dry

TECHNICAL MEMORANDUM

2171 E. Francisco Blvd., Suite K • San Rafael, California • 94901
TEL: (415) 457-0701 FAX: (415) 457-1638 e-mail: stever@stetsonengineers.com

TO: File DATE: June 27, 2006

FROM: Stetson Engineers Inc. JOB NO: 2148

RE: DRAFT Summary of Model Runs and Groundwater Pumping Management Tables

Stetson Engineers met with the Permit 15000 Santa Margarita River Conjunctive Use Planning Team on May 9th, 2006 at Reclamation's office in Temecula, California. The Technical Team presented the status of the Groundwater Model including: the calibration model, the baseline model, and proposed model Runs 1 through 4. The existing contract with Reclamation identifies four model runs and two un-determined model runs. The purpose of this memorandum is to identify all possible model runs, including the six which are contracted, as well as those additional runs discussed at the May 9th, 2006 meeting.

SUMMARY OF PLANNED AND POSSIBLE MODEL RUNS FOR THE SMR CUP

	Basin Yield			Flows			Constraints	
Run #	UY	CH	LY	CWRMA	By-Pass	Title 22	WQ	Environ [1]
Baseline	✓	✓		✓	✓		✓	✓
Run 1	✓	✓		✓	✓		✓	✓
Run 2	✓	✓	✓	✓	✓		Treat for TDS	✓
Run 3	✓	✓		✓	✓		✓	None
Run 4	✓	✓					✓	✓
Run 5	✓	✓	✓	✓	✓	✓LY	Treat for TDS	✓
Run 6	✓	✓		✓	✓		✓	✓
Possible Future Runs								
Run A (7)	✓	✓		✓	✓		Treat for VOC	✓
Run C (8)	✓	✓		✓- x2	✓		✓	✓
Run D (9)	✓	✓		✓	✓	✓UY/CH	Treat for TDS	✓
Run E (10)	✓	✓		✓	Variable		✓	✓
Run F (11)	✓	✓		✓	✓		✓	✓
Run G (12)	✓	✓		✓	✓		✓	DDN. Rate

Note: 1 – Environmental constraints for all runs, unless otherwise specified, include maintaining water level drawdown within historical limitations in riparian zone

DETAILED SUMMARY OF PLANNED AND POSSIBLE MODEL RUNS FOR THE SMR CUP GROUNDWATER MODEL

Model		Basin Yield			Flows			Constraints		
Run	Name/Yield	UY	CH	LY	CWRMA	By-Pass	Title-22	TDS	VOC	Environ
Baseline	Baseline	8,800 AFY		0*	Yes	Yes	No	Yes	Yes	Yes
Run 1	Project	---Up to 40 cfs---		0	Yes	Yes	No	Yes	Yes	Yes
Run 2	3-Basin	----------Up to 40 cfs-------			Yes	Yes	No	No	Yes	Yes
Run 3	Mitigation	---Up to 40 cfs---		0	Yes	Yes	No	Yes	Yes	No
Run 4	No CWRMA	---Up to 40 cfs---		0	No	No	No	Yes	Yes	Yes
Run 5	Title 22	----------Up to 40 cfs-------			Yes	Yes	Yes-LY	No	Yes	Possible
Run 6	Alternative 2	---Up to 40 cfs---		0	Yes	Yes	No	Yes	Yes	Yes
Possible Future Runs										
Run A	VOC	---Up to 40 cfs---		0	Yes	Yes	No	No	No	Well Head
Run C	Double CWRMA	---Up to 40 cfs---			0	Yes x2	Yes	No	Yes	Yes
Run D	Title 22 Mitigation	---Up to 40 cfs---		0	Yes	Yes	Yes-UY/CH	No	Yes	Possible
Run E	Increased By-Pass	---Up to 40 cfs---		0	Yes	Variable	No	Yes	Yes	Yes
Run F	Existing System	---Up to 40 cfs---		0	Yes	Yes	No	Yes	Yes	Yes
Run G	Draw Down Rate	---Up to 40 cfs---		0	Yes	Yes	No	Yes	Yes	Yes

Notes: Environmental constraints for all runs, unless otherwise specified, include maintaining water level drawdown within historical limitations in riparian zone.

BASIN YIELD SUMMARY

		Basin Yield		
Run	Name/Yield	UY	CH	LY
Baseline	Baseline	✓	✓	
Run 1	Project	✓	✓	
Run 2	3-Basin	✓	✓	✓
Run 3	Mitigation	✓	✓	
Run 4	No CWRMA	✓	✓	
Run 5	Title 22	✓	✓	✓
Run 6	Alternative 2	✓	✓	
Future Runs				
Run A	VOC	✓	✓	
Run C	Double CWRMA	✓	✓	
Run D	Title 22 Mitigation	✓	✓	
Run E	Increased By-Pass	✓	✓	
Run F	Existing System	✓	✓	
Run G	Draw Down Rate	✓	✓	

CWRMA Flow Requirement at the Gorge
(cfs)

	Extremely Dry	Below Normal	Above Normal	Very Wet
January	4.5	8.0	11.5	11.5
February	4.5	8.0	11.5	11.5
March	4.5	8.0	11.5	11.5
April	4.5	8.0	11.5	11.5
May	3.8	5.7	11.5	11.5
June	3.3	4.9	9.4	11.5
July	3.0	4.3	7.8	9.7
August	3.0	4.4	7.6	9.2
September	3.0	4.1	7.4	9.4
October	3.0	3.9	7.7	10.1
November	3.0	4.5	8.8	11.5
December	3.3	5.3	10.4	11.5

Note: CWRMA flow requirement at the Gorge provides the minimum flow requirement. Actual augmentation may be less depending on the availability of naturally occurring streamflow.

CWRMA FLOW REQUIREMENT AT THE GORGE AND
MAXIMUM ADDITIONAL EMERGENCY FLOWS DURING PERIODS OF DROUGHT EMERGENCY
(CFS)

	Extremely Dry	Additional Emergency Flow	Below Normal	Additional Emergency Flow
January	4.5	7.0	8.0	3.0
February	4.5	7.0	8.0	3.0
March	4.5	7.0	8.0	3.0
April	4.5	7.0	8.0	3.0
May	3.8	7.7	5.7	5.8
June	3.3	8.2	4.9	6.6
July	3.0	0	4.3	0
August	3.0	0	4.4	0
September	3.0	0	4.1	0
October	3.0	0	3.9	0
November	3.0	8.0	4.5	7.0
December	3.3	8.2	5.3	6.2

Note: Additional Emergency Flow represents the maximum flow that may be augmented to the stream due to physical limitation of the discharge pipeline. The CWRMA allows for up to 2,200 acre-feet per year to be discharged from Camp Pendleton's emergency groundwater storage bank.

RUN 1
WET YEAR MANAGEMENT ALGORITHM
MAXIMUM PUMPING SCHEDULE
(ACRE-FEET)

Month	Pumping Adjustment Following AN or VW Year		
	Standard Pumping Volume	Additional Pumping During AN	Additional Pumping During VW
May	1,000	+140	+280
June	830	+120	+240
July	870	+120	+250
August	790	+110	+220
September	1,100	+160	+310
October	1,120	+160	+320
November	1,220	+170	+340
December	1,410	+200	+400
January	1,610	+230	+460
February	1,540	+220	+440
March	1,440	+200	+410
April	1,170	+170	+330
Annual	14,100	+2,000	+4,000

Note: Additional groundwater pumping occurs when the cumulative winter-time streamflow surpasses 13,600 acre-feet (Above Normal) or 56,200 acre-feet (Very Wet) conditions during the second consecutive above normal or very wet year.

RUN 1
DRY YEAR MANAGEMENT SCENARIO
PUMPING SCHEDULE
(ACRE-FEET)

	Pumping Adjustment During:			
Month	Standard Pumping Volume	1^{st} BN	2^{nd} BN	3^{rd} BN or 1^{st} DRY
May	1000	-280	-570	-640
June	830	-240	-470	-530
July	870	-250	-500	-560
August	790	-220	-450	-500
September	1100	-310	-620	-700
October	1120	-320	-630	-710
November	1220	-340	-690	-770
December	1410	-400	-800	-900
January	1610	-460	-910	-1030
February	1540	-440	-880	-990
March	1440	-410	-820	-920
April	1170	-330	-660	-750
Annual	14,100	-4,000	-8,000	-9,000

Note: Groundwater pumping reduction during dry years occurs immediately following the hydrologic condition on May 1^{st}.

Run 1 Pumping Scenario - Project

Hydrologic Condition	(1) Exceedance Level (%)	(2) Annual Pumping (AF)	(3) Max Pumping Period (Month)	(4) Max Month Pumping (AFM)	(5) Max Month WTP Delivery (CFS)	(6) New Wells (Qty)	(7) Treat for TDS (Y/N)
Extremely Dry	76	5,400	Jan	1,840	32	7	N
Below Normal	50	8,900	Jan	2,070	36	9	N
Above Normal	19	15,900	Jan	2,070	36	9	N
Very Wet	<19	16,800	Jan	2,120	37	9	N

Run 2 Pumping Scenario – 3-Basin

Hydrologic Condition	(1) Exceedance Level (%)	(2) Annual Pumping (AF)	(3) Max Pumping Period (Month)	(4) Max Month Pumping (AFM)	(5) Max Month WTP Delivery (CFS)	(6) New Wells (Qty)	(7) Treat for TDS (Y/N)
Extremely Dry	76	5,800	Jan	1,960	34	9	Y
Below Normal	50	9,600	Jan	2,200	38	11	Y
Above Normal	19	16,600	Jan	2,200	38	11	Y
Very Wet	<19	17,600	Jan	2,200	38	11	Y

Run 3 Pumping Scenario - Mitigation

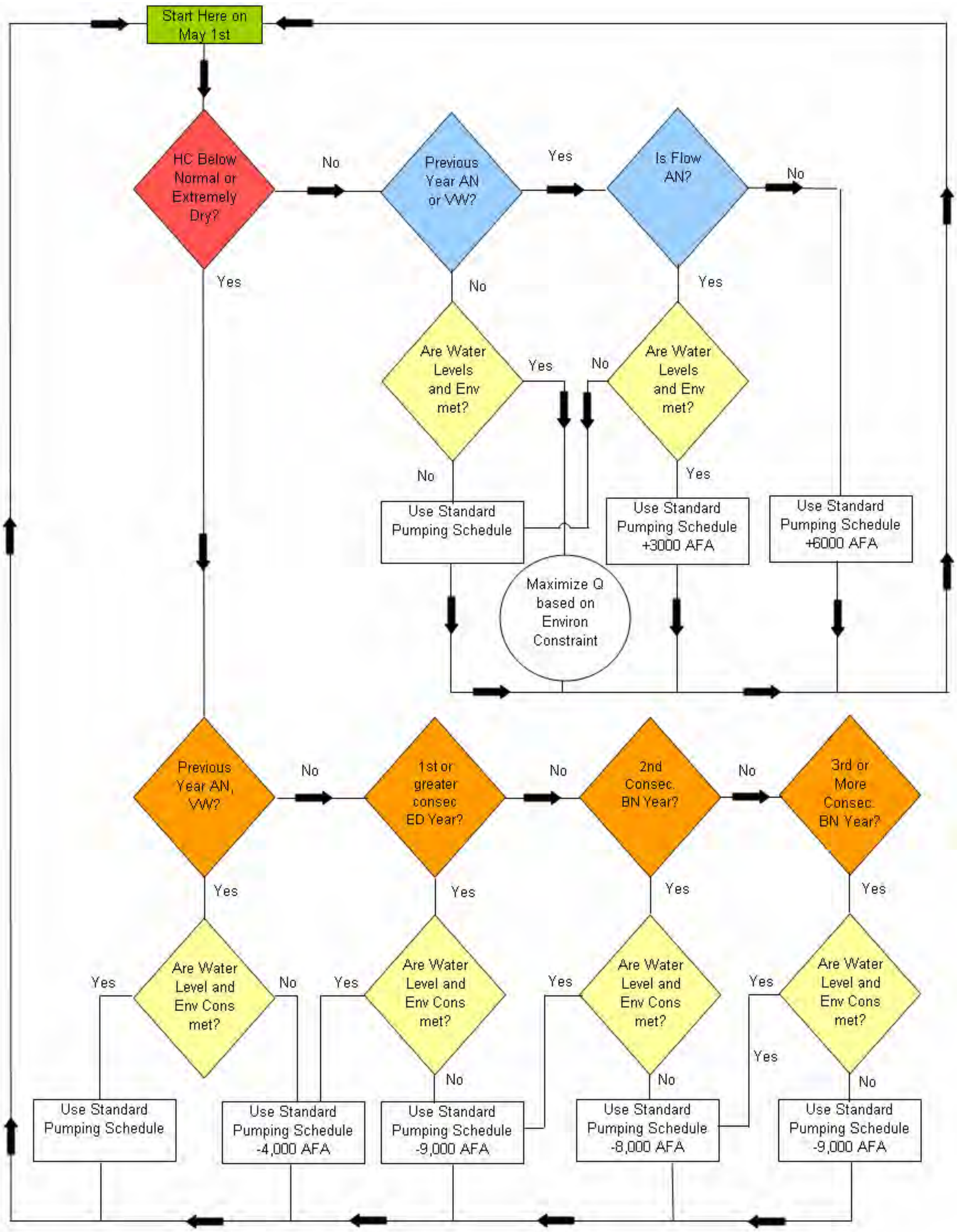
Hydrologic Condition	(1) Exceedence Level (%)	(2) Annual Pumping (AF)	(3) Max Pumping Period (MY-Mon)	(4) Max Month Pumping (AFM)	(5) Max Month WTP Delivery (CFS)	(6) New Wells (Qty)	(7) Treat for TDS (Y/N)
Extremely Dry	76	6,300	Jan	2,000	35	8	N
Below Normal	50	9,800	Jan	2,170	38	10	N
Above Normal	19	17,100	Jan	2,170	38	10	N
Very Wet	<19	17,700	Jan	2,230	39	10	N

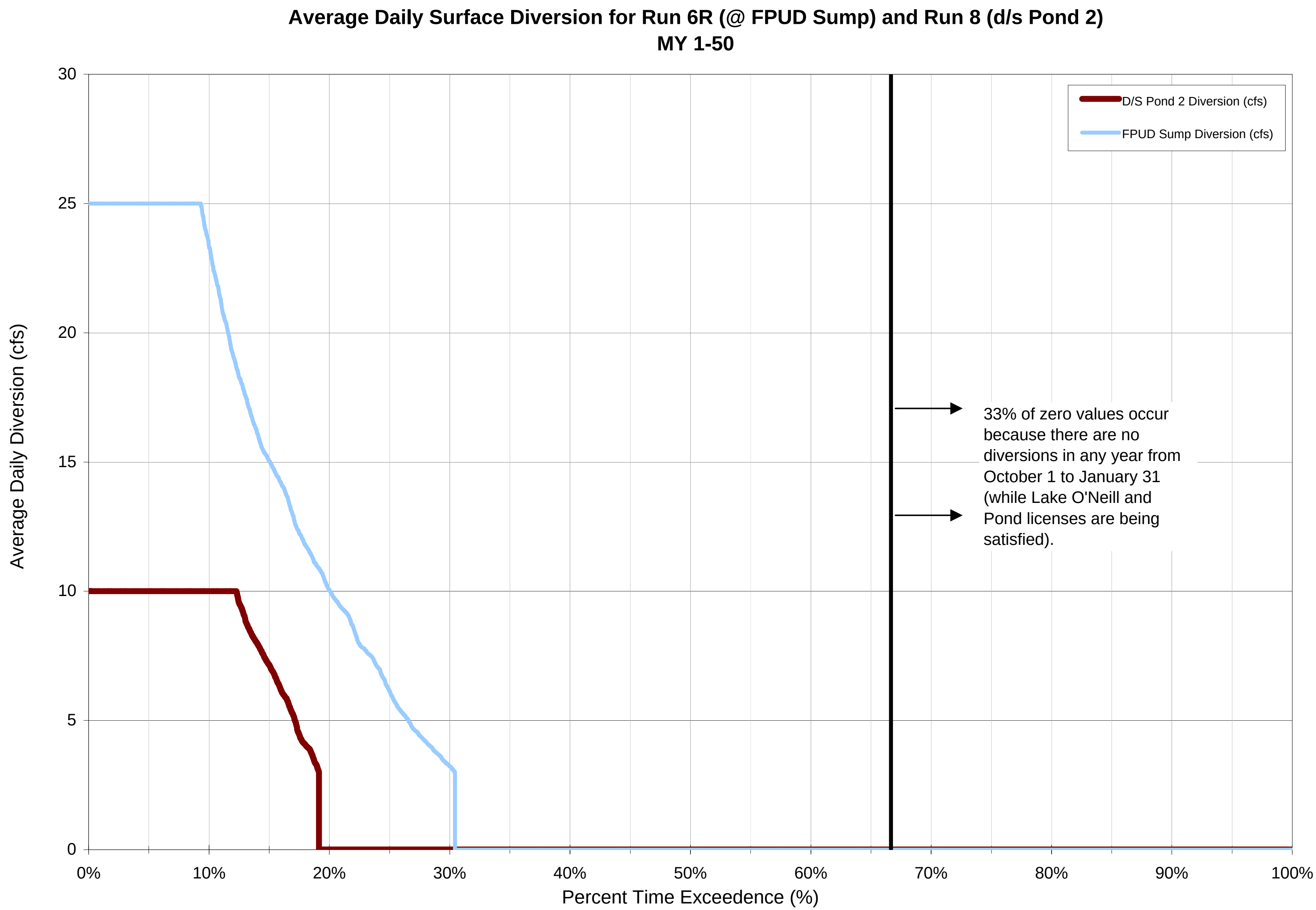
Run 4 Pumping Scenario – No CWRMA							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Hydrologic Condition	Exceedance Level (%)	Annual Pumping (AF)	Max Pumping Period (MY-Mon)	Max Month Pumping (AFM)	Max Month WTP Delivery (CFS)	New Wells (Qty)	Treat for TDS (Y/N)
Extremely Dry	76	5,000	Jan	1,480	26	3	N
Below Normal	50	8,000	Jan	1,710	30	5	N
Above Normal	19	12,800	Jan	1,710	30	5	N
Very Wet	<19	13,800	Jan	1,770	31	6	N

Run 5 Pumping Scenario - Title 22							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Hydrologic Condition	Exceedance Level (%)	Annual Pumping (AF)	Max Pumping Period (MY-Mon)	Max Month Pumping (AFM)	Max Month WTP Delivery (CFS)	New Wells (Qty)	Treat for TDS (Y/N)
Extremely Dry	76	6,100	Jan	1,840	32	7	Y
Below Normal	50	9,800	Jan	2,070	36	9	Y
Above Normal	19	16,600	Jan	2,070	36	9	Y
Very Wet	<19	17,600	Jan	2,120	37	9	Y

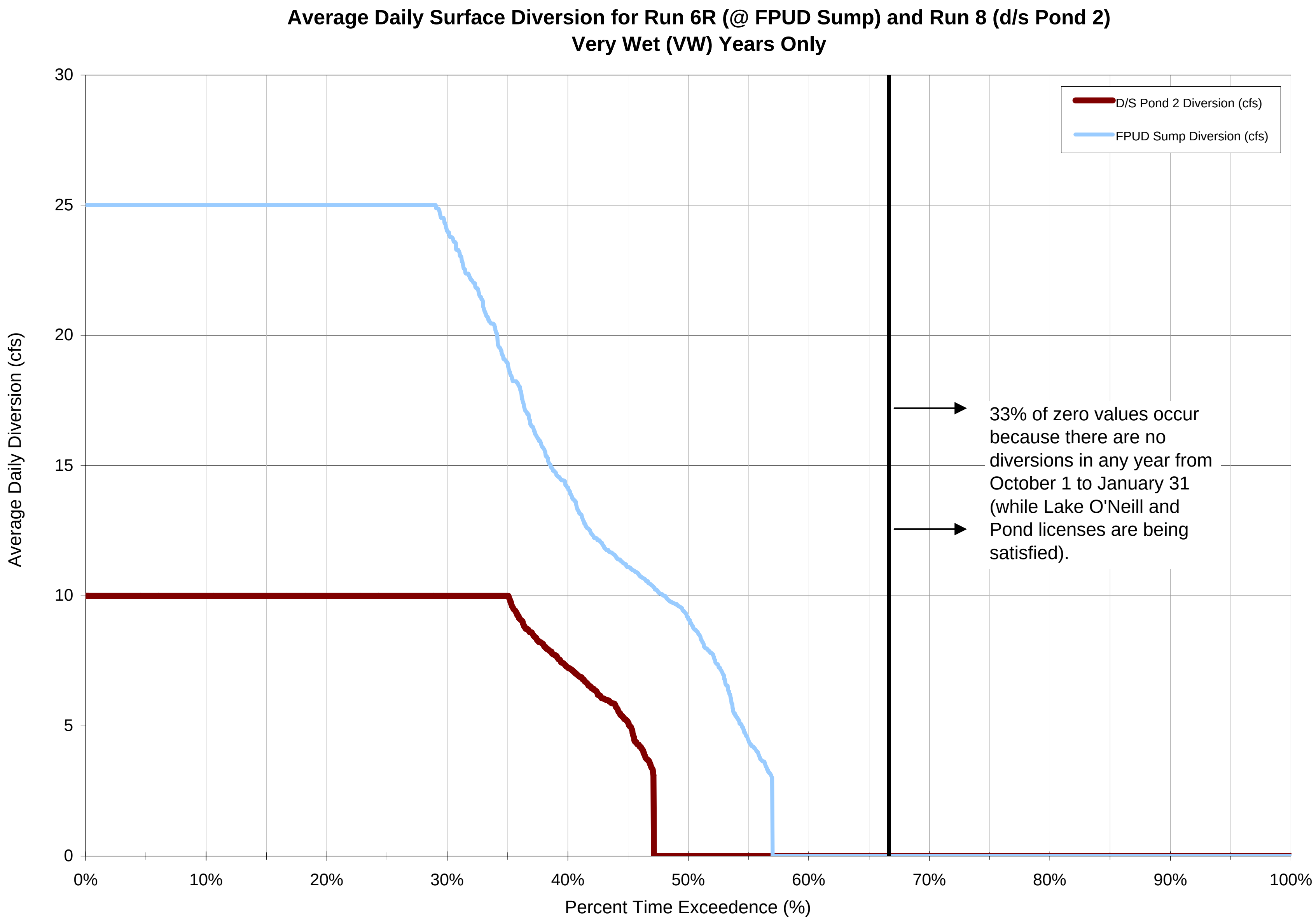
Run 6 Pumping Scenario - Alternative 2							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Hydrologic Condition	Exceedance Level (%)	Annual Pumping (AF)	Max Pumping Period (MY-Mon)	Max Month Pumping (AFM)	Max Month WTP Delivery (CFS)	New Wells (Qty)	Treat for TDS (Y/N)
Extremely Dry	76	5,500	Jan	1,500	26	4	N
Below Normal	50	6,700	Jan	1,700	30	5	N
Above Normal	19	12,500	Jan	1,700	30	5	N
Very Wet	<19	13,500	Jan	1,700	30	5	N

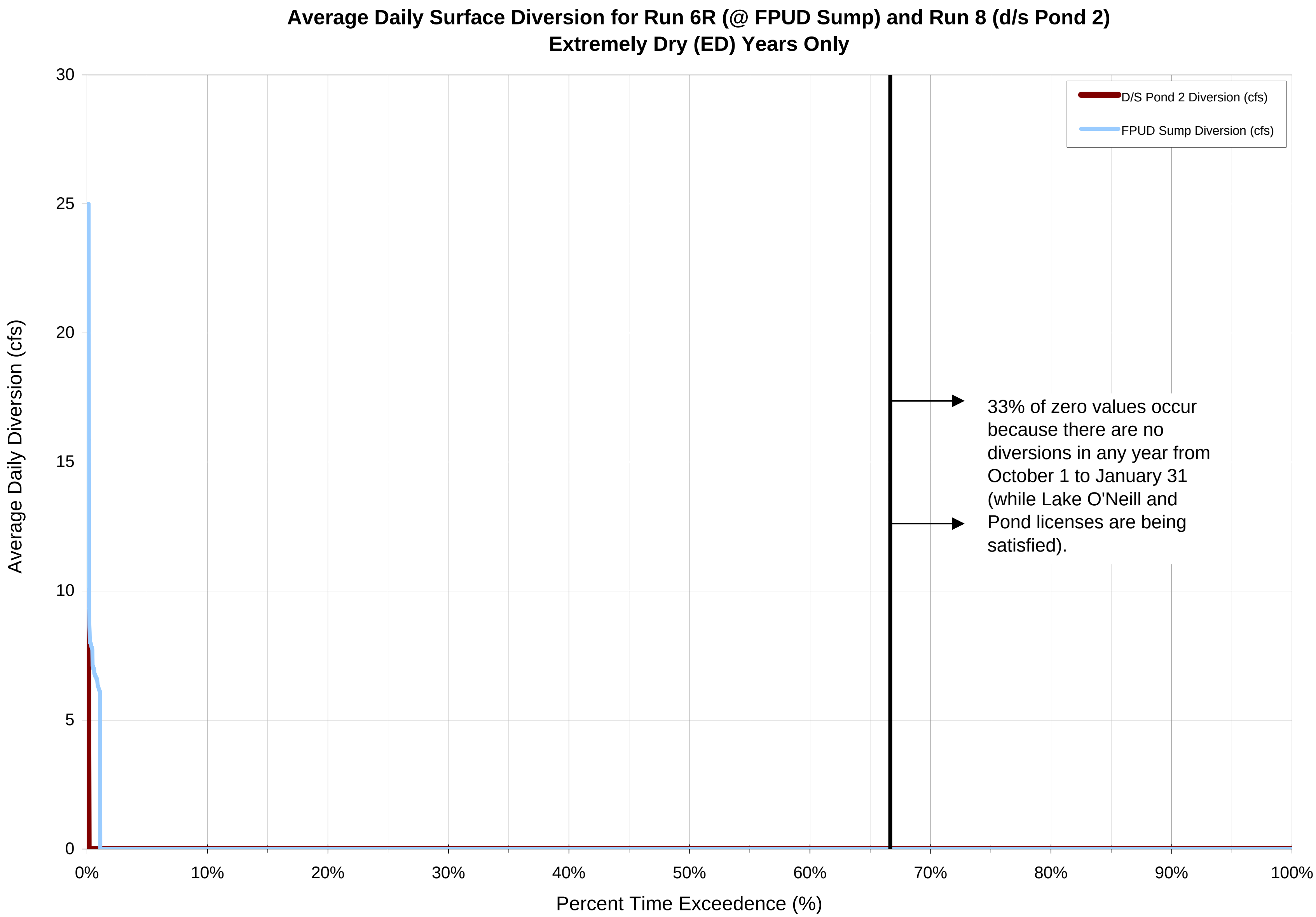
ADAPTIVE MANAGEMENT DECISION TREE FOR OPTIMIZING GROUNDWATER PUMPING





Average Daily Surface Diversion for Run 6R (@ FPUD Sump) and Run 8 (d/s Pond 2)
MY 1-50
D/S Pond 2 Diversion (cfs)
FPUD Sump Diversion (cfs)
33% of zero values occur because there are no diversions in any year from October 1 to January 31 (while Lake O'Neill and Pond licenses are being satisfied).
Average Daily Diversion (cfs)
Percent Time Exceedence (%)
0
5
10
15
20
25
30
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%


Average Daily Surface Diversion for Run 6R (@ FPUD Sump) and Run 8 (d/s Pond 2)
Very Wet (VW) Years Only
Average Daily Diversion (cfs)
Percent Time Exceedence (%)
30
25
20
15
10
5
0
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
D/S Pond 2 Diversion (cfs)
FPUD Sump Diversion (cfs)
33% of zero values occur because there are no diversions in any year from October 1 to January 31 (while Lake O'Neill and Pond licenses are being satisfied).


Average Daily Surface Diversion for Run 6R (@ FPUD Sump) and Run 8 (d/s Pond 2)
Extremely Dry (ED) Years Only
30
25
20
15
10
5
0
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Average Daily Diversion (cfs)
Percent Time Exceedence (%)
D/S Pond 2 Diversion (cfs)
FPUD Sump Diversion (cfs)
33% of zero values occur because there are no diversions in any year from October 1 to January 31 (while Lake O'Neill and Pond licenses are being satisfied).

AVERAGE Annual Water Budget Comparison

Inflow:	Baseline		Run 1		Run 2		Run 3		Run 4		Run 5		Run 6R	
Santa Margarita River Inflow	38,000	85%	38,000	85%	38,000	85%	38,000	85%	34,900	85%	38,000	82%	34,600	84%
Subsurface Underflow	900	2%	900	2%	900	2%	900	2%	1,000	2%	900	2%	900	2%
Lake O'Neill Spill and Release	1,500	3%	1,500	3%	1,500	3%	1,500	3%	1,000	2%	1,500	3%	1,200	3%
Fallbrook Creek	1,200	3%	1,200	3%	1,200	3%	1,200	3%	1,200	3%	1,200	3%	1,200	3%
Title 22 Water	NA		NA		NA		NA		NA		1,800	4%	NA	
Minor Tributary Drainages	2,400	5%	2,400	5%	2,400	5%	2,400	5%	2,400	6%	2,400	5%	2,400	6%
Areal Precipitation	800	2%	800	2%	800	2%	800	2%	800	2%	800	2%	800	2%
	44,800	100%	44,800	100%	44,800	100%	44,800	100%	41,300	100%	46,600	100%	41,100	100%
Outflow:														
Santa Margarita River Outflow	32,600	73%	29,100	65%	28,800	64%	28,400	63%	28,300	68%	30,000	64%	26,800	65%
Subsurface Underflow	100	0%	100	0%	100	0%	100	0%	100	0%	100	0%	100	0%
Groundwater Pumping	7,300	16%	11,100	25%	11,700	26%	12,100	27%	9,300	23%	11,900	26%	10,400	25%
Evapotranspiration	2,800	6%	2,500	6%	2,300	5%	2,300	5%	2,300	6%	2,600	6%	2,200	6%
Diversions to Lake O'Neill	2,000	5%	2,000	4%	2,000	5%	2,000	5%	1,300	3%	2,000	4%	1,700	4%
	44,800	100%	44,800	100%	44,900	100%	44,900	100%	41,300	100%	46,600	100%	41,200	100%
Net Simulated Change of Groundwater in Storage:														
	0	0%	0	0%	-100	0%	-100	0%	0	0%	0	0%	-100	0%
Fallbrook Surface Diversion	NA		NA		NA		NA		NA		NA		3,400	8%

Inflow:	Run 7		Run 8		Run 9		Run 10 -1cfs		Run 10 -3cfs*		Run 10 -6cfs		Run 10 -9cfs	
Santa Margarita River Inflow	37,900	85%	38,000	85%	38,000	85%	38,000	84%	38,000	85%	38,000	85%	38,000	85%
Subsurface Underflow	900	2%	900	2%	900	2%	900	2%	900	2%	900	2%	900	2%
Lake O'Neill Spill and Release	1,500	3%	1,500	3%	1,500	3%	1,800	4%	1,500	3%	1,500	3%	1,400	3%
Fallbrook Creek	1,200	3%	1,200	3%	1,200	3%	1,200	3%	1,200	3%	1,200	3%	1,200	3%
Title 22 Water	NA		NA		NA		NA		NA		NA		NA	
Minor Tributary Drainages	2,400	5%	2,400	5%	2,400	5%	2,400	5%	2,400	5%	2,400	5%	2,400	5%
Areal Precipitation	800	2%	800	2%	800	2%	800	2%	800	2%	800	2%	800	2%
	44,700	100%	44,800	100%	44,800	100%	45,100	100%	44,800	100%	44,800	100%	44,700	100%
Outflow:														
Santa Margarita River Outflow	28,400	63%	28,200	64%	28,800	65%	29,100	65%	29,100	65%	29,300	66%	29,300	65%
Subsurface Underflow	100	0%	100	0%	100	0%	100	0%	100	0%	100	0%	100	0%
Groundwater Pumping	12,100	27%	11,000	25%	11,700	26%	11,100	25%	11,100	25%	11,100	25%	11,100	25%
Evapotranspiration	2,300	5%	2,400	6%	2,300	5%	2,500	6%	2,500	6%	2,400	5%	2,400	6%
Diversions to Lake O'Neill	1,900	5%	2,000	5%	2,000	4%	2,300	5%	2,000	4%	2,000	4%	1,900	4%
	44,800	100%	43,700	100%	44,900	100%	45,100	100%	44,800	100%	44,900	100%	44,800	100%
Net Simulated Change of Groundwater in Storage:														
	-100	0%	-100	0%	-100	0%	0	0%	0	0%	-100	0%	-100	0%
Fallbrook Surface Diversion	NA		1,200	3%	NA		NA		NA		NA		NA	

* Run 10-3cfs is identical to Run 1

NA - Not Applicable

Values are rounded to the nearest 100 AF,closest number adjusted to elimate rounding error. This is within the accuracy and tolerance of the groundwater model.

MEDIAN Annual Water Budget Comparison

Inflow:	Baseline	Run 1	Run 2	Run 3	Run 4	Run 5	Run 6R
Santa Margarita River Inflow	15,900 74%	16,000 74%	16,000 74%	16,000 74%	12,700 72%	16,000 68%	13,100 71%
Subsurface Underflow	900 4%	900 4%	900 4%	900 4%	900 5%	900 4%	900 5%
Lake O'Neill Spill and Release	1,500 7%	1,500 7%	1,500 7%	1,500 7%	800 5%	1,500 6%	1,200 7%
Fallbrook Creek	600 3%	600 3%	600 3%	600 3%	600 3%	600 3%	600 3%
Title 22 Water	NA	NA	NA	NA	NA	1,800 8%	NA
Minor Tributary Drainages	2,100 10%	2,100 10%	2,100 10%	2,100 10%	2,100 12%	2,100 9%	2,100 11%
Areal Precipitation	500 2%	500 2%	500 2%	500 2%	500 3%	500 2%	500 3%
	21,500 100%	21,600 100%	21,600 100%	21,600 100%	17,600 100%	23,400 100%	18,400 100%
Outflow:							
Santa Margarita River Outflow	8,500 39%	6,500 29%	6,000 27%	5,500 25%	3,800 22%	7,600 31%	5,400 28%
Subsurface Underflow	100 0%	100 0%	100 0%	100 0%	100 1%	100 0%	100 1%
Groundwater Pumping	8,300 38%	11,300 50%	11,700 52%	12,100 55%	9,300 55%	12,300 50%	10,400 53%
Evapotranspiration	2,900 13%	2,500 11%	2,300 10%	2,300 10%	2,400 14%	2,500 10%	2,000 10%
Diversions to Lake O'Neill	2,200 10%	2,200 10%	2,200 10%	2,200 10%	1,300 8%	2,200 9%	1,700 9%
	22,000 100%	22,600 100%	22,300 100%	22,200 100%	16,900 100%	24,700 100%	19,600 100%
Net Simulated Change of Groundwater in Storage:							
	100 0%	-100 0%	-100 0%	-100 0%	0 0%	-100 0%	200 1%
Fallbrook Surface Diversion	NA	NA	NA	NA	NA	NA	2,800

Inflow:	Run 7	Run 8	Run 9	Run 10 1cfs	Run 10 3cfs*	Run 10 6cfs	Run 10 9cfs
Santa Margarita River Inflow	16,100 74%	16,000 74%	16,000 74%	16,000 72%	16,000 74%	16,000 75%	16,000 75%
Subsurface Underflow	900 4%	900 4%	900 4%	900 4%	900 4%	900 4%	900 4%
Lake O'Neill Spill and Release	1,500 7%	1,500 7%	1,500 7%	2,000 9%	1,500 7%	1,300 6%	1,200 6%
Fallbrook Creek	600 3%	600 3%	600 3%	600 3%	600 3%	600 3%	600 3%
Title 22 Water	NA	NA	NA	NA	NA	NA	NA
Minor Tributary Drainages	2,100 10%	2,100 10%	2,100 10%	2,100 10%	2,100 10%	2,100 10%	2,100 10%
Areal Precipitation	500 2%	500 2%	500 2%	500 2%	500 2%	500 2%	500 2%
	21,700 100%	21,600 100%	21,600 100%	22,100 100%	21,600 100%	21,400 100%	21,300 100%
Outflow:							
Santa Margarita River Outflow	4,800 22%	6,200 29%	6,100 28%	6,600 29%	6,500 29%	6,600 30%	6,800 31%
Subsurface Underflow	100 0%	100 0%	100 0%	100 0%	100 0%	100 0%	100 0%
Groundwater Pumping	12,200 57%	11,000 51%	11,300 51%	11,100 48%	11,300 50%	10,900 50%	10,900 50%
Evapotranspiration	2,300 11%	2,300 11%	2,300 10%	2,500 11%	2,500 11%	2,400 11%	2,400 11%
Diversions to Lake O'Neill	2,100 10%	2,100 10%	2,200 10%	2,600 11%	2,200 10%	1,800 8%	1,800 8%
	21,500 100%	21,700 100%	22,000 100%	22,900 100%	22,600 100%	21,800 100%	22,000 100%
Net Simulated Change of Groundwater in Storage:							
	300 1%	200 1%	-100 0%	-100 0%	-100 0%	-100 0%	-100 0%
Fallbrook Surface Diversion	NA	900 4%	NA	NA	NA	NA	NA

* Run 10-3 cfs is identical to Run 1

NA - Not Applicable

Values are rounded to the nearest 100 AF. This is within the accuracy and tolerance of the groundwater model.

note: Medians are not cummulative. The sum of median values does not reflect the change of gourdwater in storage.

Summary of Simulated CUP Well Operations
Lower Santa Margarita River Groundwater Model

Subbasin	Production Well	80% Utilization Pumping Rate af/m	Number of Months Operating												
			Run 1	Run 2	Run 3	Run 4	Run 5	Run 6	Run 7	Run 8	Run 9	Run 10	Run 11	Run 12	
UY	7A2	142	600	600	600	600	600	600	600	600	600	600	600	600	
UY	8D1	121	600	600	600	600	600	600	600	600	600	600	600	600	
UY	7H2	82	600	600	600	600	600	600	600	600	600	600	600	600	
UY	PW-6	110	600	600	600	600	600	600	600	600	600	600	600	600	
UY	7R2	110	600	600	600	600	600	600	600	600	600	600	600	600	
UY	UY-1	110	244	260	281	153	183	254	307	271	244	244	271	291	*new well*
UY	UY-2	110	172	173	202	89	128	153	222	211	172	172	211	207	*new well*
UY	UY-3	110	114	119	139	37	76	115	147	139	114	114	139	137	*new well*
UY	UY-4	110	68	77	87	13	33	36	84	86	68	67	86	87	*new well*
UY	UY-5	110	33	37	58	0	5	20	44	57	33	33	57	44	*new well*
UY	UY-6	110	9	13	21	0	0	5	12	18	9	9	20	13	*new well*
CH	18 E3	121	600	600	600	600	600	599	600	600	571	599	600	600	
CH	18M4&5	153	600	600	600	600	600	599	600	600	600	599	600	600	
CH	13R2	132	600	600	600	600	600	599	600	600	599	599	600	600	
CH	23G4	132	0	0	0	0	0	0	0	0	0	0	0	0	
CH	23J1	164	600	600	600	600	600	599	600	600	600	599	600	600	
CH	23K2	132	0	0	0	0	0	0	0	0	0	0	0	0	
CH	23K3	132	600	600	600	600	600	599	600	600	571	599	600	600	
CH	CH-1	88	85	85	96	0	48	10	23	0	58	85	0	43	*new well*
CH	CH-2	88	47	47	75	0	13	4	5	0	33	47	0	18	*new well*
CH	CH-3	88	13	13	37	0	0	0	0	0	9	13	0	9	*new well*
CH	CH-4	132	0	0	5*	0	600	599	600	600	572	0	600	600	*new well*
LY	LY-1	55	0	564	0	0	600	0	0	0	0	0	0	0	*new well*
LY	LY-2	55	0	139	0	0	566	0	0	0	0	0	0	0	*new well*
LY	LY-3	55	0	0	0	0	189	0	0	0	0	0	0	0	*new well*
LY	LY-4	55	0	0	0	0	48	0	0	0	0	0	0	0	*new well*

*Well CH-4 Pumps 88 af/m in Run 3 conditions
23G4 and 23K2 can be used as backup wells to minimize pumping interference.

Attachment S

Response to Comments for
Technical Memoranda 2.0 and 2.1

Comment/Response Matrix

November 2006

Draft Technical Memorandum 2.1 (September 22, 2006; Comments 1 through 35) and Draft Technical Memorandum 2.0 (July 3, 2006; Comments 36 through 41) Surface Water and Groundwater Modeling Analyses to Determine Santa Margarita River Conjunctive Use Project Yield

#	PAGE	SECTION	REVIEWER	COMMENT	RESPONSE
1.		General	Glenn Howard	The report fails to address the other key component of the well system, water quality.	Except for environmental constraints, water quality is outside the scope of this report. Stetson Engineers prepared a map of historical TDS values that was included in the last attachment 'Related Technical Memoranda'.
2.		General	Glenn Howard	The report fails to discuss the representative TDS concentrations in the 3 basins or if this parameter changes at different hydrologic conditions (ED, BN...) A key to the operation of the system is mix and match production wells in all basins to get the desired TDS at the groundwater treatment plant.	See Response to Comment 1.
3.		General	Glenn Howard	The report is not consistent in using Acre feet per year and CFS. Ideally all instantaneous of Acre feet per year should be followed by the (CFS equivalent).	Acre-feet per year is used when discussing monthly and annual quantities and is a common volume in water supply. CFS is used when discussing instantaneous diversion rates or well pumping rates. Because it could be misleading in some cases - we will review the report and add CFS equivalent when appropriate
4.	4	Overview; 5th ¶,	Glenn Howard	last sentence; Should not this read, "Subsequently, modeled groundwater levels and storage was increased and groundwater pumping……"	Will change to "Subsequently, modeled groundwater levels and water in storage recovered to support hydrologic and riparian demands from reduced groundwater pumping during the summer months.
5.	16	Run 1 – Project; 3rd ¶,	Glenn Howard	This first sentence indicates that Chappo Sub basin contains twice the storage capacity as the Upper Ysidora Sub basin. But the report indicates that in all cases the Upper Ysidora provides more water. Maybe additional information is required to explain why this is so and potential long term impacts using the Chappo basin wells.	Reworded to: "The aquifer in the Chappo Subbasin contains approximately twice the storage capacity as the aquifer in the Upper Ysidora Subbasin, but provides an equivalent usable storage due to hydraulic conductivity, additional recharge from the percolation ponds, and other constraints. A table will be added to the last attachment 'Related Technical Memoranda', outlining simulated aquifer storage in each subbasin.

#	PAGE	SECTION	REVIEWER	COMMENT	RESPONSE
6.	17, 18	Run 2 – 3 Basin; 1st & 3rd ¶,	Glenn Howard	The impact of using the Lower Ysidora with respect to the quality (TDS) of the water needs to be discussed. Also more information on the groundwater gradient close to the estuary and salt water intrusion is required. The word risk means nothing to me can it be expanded in to potential change in water quality (TDS) when using the wells in this sub-basin during ED, BN…, storm events or tidal variations.	The purpose and scope of this report is to quantify the availability of water for each model run given certain constraints. Because there was no constraint for water quality in the Lower Ysidora, only for seawater intrusion, there is no discussion. Detailed discussion of water quality is outside the scope of this report. The word "risk" appears in the second paragraph. The word loosely means the possibility of suffering loss or harm. In paragraph 2, the word refers to the possibility of suffering harm from salt water intrusion.
7.	23, 24	Run 5 – Title 22	Glenn Howard	This section fails to mention the impact of TDS when using Title 22 water.	Assessing water quality impacts from the use of Title 22 water are outside the scope of work.
8.	29	Run 8 – Proposed Action	Glenn Howard	First sentence should read, "…direct diversion of surface water to a surface water treatment plant followed by treatment as required by the advanced water treatment plant to meet the required 425 mg/L TDS goal of the treated water."	Reworded to: "The draft Decision Memorandum prepared by Reclamation (October 2005) supports a proposed action that includes diversion to groundwater storage and direct diversion of surface water for beneficial use. Surface water directly diverted for beneficial use will be treated as required by the advanced water treatment plant to meet the required 425 mg/L TDS goal of the treated water.
9.	30, 31	Run 9 – Maximize Chappo	Glenn Howard	A detailed description of the Contaminant of Concern or VOC is required as well as the proposed methods and consequence of the so called well head treatment. A discussion is also required as to the characteristics and size of the VOC plume and the required well operation to reduce its rate of migration. The contaminant plume and potential long term impacts appear to be ignored in this report but the fact that contamination may be long term player in the success this project should not be ignored by the author or Reclamation.	The contaminants of concern are mostly VOCs. Methods of wellhead treatment, necessary blending rates, and all other methods of remediation are outside the scope of this report. AC/S Environmental Security at Camp Pendleton has mapped the plume and can provide detailed information. To the best of our knowledge, CPEN has relied on natural attenuation to remediate the site. We will reference the appropriate document(s) for your review.
10.	10	Figure 2	Jeff Baysinger	Figure 2 is missing from the printed and distributed Tech Memo 2.1 reports	We will check all reports on the next version.
11.	15	Run 1 – Project; 2nd ¶	Jeff Baysinger	Page 15 mentions that some new wells are a replacement for existing wells. Which new wells are replacing which existing wells? A table would clarify. Would the replacement wells be connected to the existing manifold collection pipe system or to a new manifold system?	A table will be added to to the last attachment 'Related Technical Memoranda' discussing replacement and new well locations.

#	PAGE	SECTION	REVIEWER	COMMENT	RESPONSE
12.	29	Run 8 – Proposed Action	Jeff Baysinger	Page 29 discusses Run 8. This run has about 100 ac-ft less groundwater pumping on the median but about 1200 ac-ft more surface water diversion. A net median increase is 1100 ac-ft per year. Apparently 7 new wells were suggested. What is the groundwater pumping rate, 36 cfs? What would be the overall peak sizing total for the water treatment and pipe/pumping transmission system flow rate, 46 cfs?	The peak sizing will be for maximum groundwater pumping (36 cfs) and maximum surface water diversion (10 cfs) occurring in either January or February of VW years. We will check the appropriate attachment (for all runs) to make sure this detail is clear.
13.		General	Jeff Baysinger	(The cost of adding a surface diversion and changing the water treatment train should be compared to the gain of 1100 ac-ft and over sizing the water treatment plant and transmission pipe system. The assumption is that all three pumping plants (Haybarn and booster 1 and 2) will follow the logic presented at the September meeting. That is, the main Haybarn pumping plant to Reservoir Ridge would then be about 43 cfs. This is 46 cfs incoming minus about 3 cfs brine loss. Booster pumping plant 1 would be about 37 cfs and booster pumping plant 2 about 31 cfs.)	Costs and details regarding which water goes to which treatment plant and ultimately to which storage site is outside the scope of the modeling.
14.	43	Recommen -dations	Jeff Baysinger	Page 43 makes a recommendation to explore the diversion sizing. This should be explored in context with the number of recharge ponds needed as well as ditch sizing.	Note taken. The recommended model run to explore the sensitivity of the diversion rate will be compatible with all facilities associated with the diversion.
15.		General	Jeff Baysinger	A set of figures showing the new wells suggested by model runs would be helpful.	This is available through the appendices and comparison to the map of all wells.
16.		General	Mike McPherson	1. The Misused Term Problem; misuse of the term "project yield"	The report mistakenly addresses Basin Yield, not Project Yield as discussed throughout the entire report. While the report identified Baseline Yield to include Camp Pendleton's prior rights, it failed to address Project Yield. The entire report will be re-written to only reflect "Total Basin Yield", relying on Recommendation 3 (page 44) to investigate and report on "Project Yield". The subject title (page 1) will also be changed to "Surface Water and Groundwater Modeling Analyses to Determine Lower Santa Margarita River Basin Total Yield, Including Impacts From the Proposed Santa Margarita River Conjunctive Use Project Yield

#	PAGE	SECTION	REVIEWER	COMMENT	RESPONSE
17.		Run 6R – Alt 2	Mike McPherson	2. The Alternative No. 2 Pass-Through Problem; A. Run 6R; show diverted water would have been "wast[ed] past the estuary" B. "Mix and match" approach C. Combination of Runs 2, 3, 7, and 8 D. Full account and exercise of Water Rights E. Increase in flows from CWRMA water due to "wetted perimeter"	Model Run 6R was run to according to the January 2005 Pre-Feasibility Report and the October 2006 Draft Decision Memorandum. Additional Model Runs have been proposed to address this request.
18.		General; Baseline	Mike McPherson	3. The Recharged Sewage Effluent Question; no mention of long history of sewage effluent recharge to Camp Pendleton's aquifers.	A sentence will be added to the first paragraph of the "Calibration and Baseline Model Runs" section that states: "The 25-year Calibration Model simulated Camp Pendleton's median annual release of 1,480 acre-feet per year of treated wastewater at four different locations in the Lower Santa Margarita River Subbasin." The volumetric water budget for Attachment C will include a column for treated water recharged by Camp Pendleton between water years 1980 and 2004.
19.		General	Mike McPherson	4. The CWRMA Question; some question as to the effect of the CUP allocations on the CWRMA obligation; potential ten-year limit on the term of the agreement.	The Report has prepared a run labeled the "No CWRMA Run" to identify this potential issue. Any impact as to the CUP allocation from CWRMA should be addressed in the quantification of water rights recommend on page 44 of the Report. The Feasibility Study economists should account for the possible cessation of the agreement after 10 years and include those costs. Legal determination of water rights is outside the scope of this report.
20.	1	1st ¶, 2nd sentence	Mike McPherson	5. Sundry Other Comments 5 (1) As for the purpose of the project, it is much more finely focused than to "reduce southern California's demand on imported water from the Colorado River and the State Water Project." The far less lofty but historically more accurate purpose of the project is to provide the long sought for "physical solution" to the Case No. 1247 water rights dispute between Camp Pendleton and FPUD. This aspect of the project's purpose needs clear mention upfront, particularly in light of the more than half-century that has already been invested in that search.	Rewritten to: "The purpose of the project is to perfect existing water rights permits previously issued by the State of California and to provide a possible physical solution to the *United States v. Fallbrook PUD* litigation.

#	PAGE	SECTION	REVIEWER	COMMENT	RESPONSE
21.	3	2nd ¶, 2ndsentence	Mike McPherson	5 (2) As identified in the foregoing remarks, we first commented on a "7/3 draft" of this report, but no July 3rd draft is identified in this latest September 22nd draft of the report. The copy of the "Draft Final Technical Memorandum 2.0" that we reviewed in preparing those earlier remarks is clearly dated "July 3, 2006," not "June 2006" as specified in the latest draft. This incongruity is confusing and needs clarification.	The sentence will be rewritten to "The resulting documentation for this effort occurred in July 2006 (Draft Technical Memorandum 2.0).
22.	9	3rd ¶, 3rd sentence	Mike McPherson	5 (3) Noting that each of the four hydrologic conditions "do [sic] not occur one fourth of the time" begs the question of how frequently, as a percentage of the 50-year period, each of the four hydrologic conditions does occur.	Sentence added: The frequency of occurrence for each hydrologic condition is provided in the attachments and TM 1.0. A new sentence has been added to this paragraph: "ED, BN, AN, and VW conditions are described by recurrence intervals of <19%, 19-50%, 50-76%, and >76%, respectively. "
23.	11	top ¶; last sentence	Mike McPherson	5 (4) The meaning of the phrase "anticipated annual demand" is unclear. The anticipated annual demand from the Santa Margarita River at "buildout" in Camp Pendleton's southern system, which is projected to occur within the baseline's future 50-year period, is estimated to be over 11,000 acre feet per year, not 8,800 acre feet as stated.	Sentence reworded to: "Hydrological, environmental, and water quality constraints during the 50-year Baseline period prevented Camp Pendleton from fully exercising their prior rights of 8,800 acre-feet per year."
24.	11	bottom ¶	Mike McPherson	5 (5) For edification of the lay reader, it would be helpful to know how the particular cutback quantities were determined, *i.e.* 4,000 acre feet during the first below-normal year, then 8,000 and 9,000 acre feet, respectively, during the second and third consecutive below-normal years, and 9,000 acre feet for an extremely dry year.	The cutbacks were established based on an optimization of groundwater pumping during the 7-year drought. A sentence has been added: "The annual cutback quantities were determined based on the optimization of groundwater pumping during the 7-year drought using a trial and error technique."
25.	12	top ¶	Mike McPherson	5 (6) Likewise, it would be helpful to know how the particular quantities for the wet-year increases were determined.	A sentence has been added: "The annual increases during wet years were determined from an optimization of groundwater pumping based on historical hydrologic conditions. The total pumping was optimized so as not to cause negative impact during subsequent BN and ED years following consecutive wet years."

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26.	15	top ¶; 1st sentence	Mike McPherson	5 (7) Please describe in more detail the "environmental constraint" that limited drawdown in the riparian corridor to no lower than historical levels (except for Run 3), the implication being that farther drawdown of whatever incremental distance as would produce something more than trivial in the way of groundwater quantity was deemed to cause an adverse environmental impact of some sort. The third sentence of the next paragraph on that page does state that a drawdown below riparian root zone, though producing an additional 4,800 acre feet per year on average, would likely impact negatively the riparian vegetation. This begs the question as to whether there is some drawdown less than that but more than just to historic levels which might help this water-short project. An answer of sorts is found in Run 3, where a two-foot drawdown below historic low appears to provide 1,100 acre feet per year more pumping than for the Proposed Project, conceding that some balancing offset against the direct diversion would most likely be required. The question here then becomes, of course, whether the downstream direct diversion could still skim off some high flows, leaving a net advantage to the project to be realized by merely dropping water levels two feet below historic lows.	Page 7 states: "Reclamation also provided their NEPA expert and consultant (North State Resources) to review the environmental limitations and constraints that were followed to develop the groundwater yield during the model simulation of the six management runs." During a meeting in spring 2006 between Reclamation, North State Resources, and Stetson, decision was made not to draw groundwater levels below historical minima. Based on comments from the environmental experts, it was determined that consultation with resource agencies would be hampered if the project was clearly causing negative impacts t the environment. The impact of the Base's existing Riparian BO, and its ability to mitigate such negative impact, was not discussed during this meeting. The groundwater model can estimate negative impact to the riparian environment as a reduction in ET, a reduction in streamflow, and a reduction in subflow out of the model. It is the purpose of the adaptive management program to maximize water production without causing harm to the environment. If necessary, a model run could be performed that identifies the sensitivity of lowering the water levels between those defined by Runs 1 and 3. A new proposed model Run would address your question regarding the impact to project yield from both direct diversion and drawdown of water levels below historical minima.

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27.	15	top ¶; last sentence	Mike McPherson	5 (8) Likewise, please describe exactly the particular limitations that were imposed on groundwater pumping "so as not to cause compaction or induce seawater intrusion."	Sentences added: "In order to prevent compaction to the aquifer, minimum groundwater levels were not allowed to drop below the top elevation of known clay sequences in both the Lower Ysidora and Chappo Subbasins. Similarly, in order to prevent seawater intrusion, groundwater levels were constrained to maintain minimum subflow out of the model boundary toward the Santa Margarita River Estuary.
28.	16	Figure 3	Mike McPherson	5 (9) Note is made that no wells are proposed for location upstream of the weir, although at least one well up there was contemplated earlier. Please explain this change in plans.	Based on water quality and hydrogeologic data gathered during 2004 and 2005 by Stetson Engineers, it was determined that the upper well location was no longer necessary to maximize basin yield. The high permeability of the Upper Ysidora Subbasin allows for development of maximum basin yield, even during AN conditions.
29.	17	Table 5	Mike McPherson	5 (10) With respect to the table inflow entries for "Minor Tributary Drainages" and "Areal Precipitation," which on average appear[s] to total 3,200 acre feet per year, it is pertinent from a water rights perspective to know how much of this inflow enters the system below the weir.	The surface water model accounts for minor tributary inflow and aerial precipitation. A section could be added to Attachment O or Attachment C that shows a summary of tributary inflow during each of the 50 years. A sentence will also be added that states: "The 50-year average annual tributary inflow and precipitation recharge below the weir is 2,300 acre-feet and 700 acre feet, respectively."

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30.	17	Table 5	Mike McPherson	5 (11) With respect to the table outflow entry for "Subsurface Underflow," which is listed as 100 acre feet per year without regard to whether on average or median by hydrologic condition, please explain how this figure was determined. Although Boss & Wortz calculated that figure plus-or-minus for prevention of salt water intrusion, there has been bandied about by someone a figure of 1,500 acre feet per year to maintain the barrier mound if aggressive groundwater development were to be pursued, a figure also raise in the argument against export of our treated wastewater. In any event, an explanation for the entry would be credibility enhancing given the arguable impression that it was arbitrarily chosen.	The 1,500 acre-feet per year is based on the amount of water that is necessary to support surface flow, underflow directly influenced by surface flow, and subsurface outflow from the aquifer. Accounting for ET, groundwater pumping, and the physical parameters described above, 100 acre-feet per year from the aquifer (Table 5) is consistent with an estimate of 1,500 acre-feet per year of all surface, subsurface, and biological demands in order to establish mounding and prevent seawater intrusion. A sentence to this section, or footnote to every table, will be added: "The quantity of surface water and groundwater necessary to prevent seawater intrusion by creating a positive flow gradient to the ocean is dependent upon surface flow, underflow, subsurface flow in the aquifer, pumping, and upstream biological demands. Subsurface Underflow identified as Outflow in the groundwater and surface water budget is an indicator of flow direction and does not necessarily represent the quantity of water necessary to prevent seawater intrusion"
31.	29	1st ¶, 2nd sentence	Mike McPherson	5 (12) At the risk of seeming too "picky," the pre-1914 Lake O'Neill water right is not a license.	Agreed. The sentence is rewritten to: "….optimize direct surface water diversions while supporting Camp Pendleton's existing pre-1914 Lake O'Neill water right and 4,000 acre-foot per year license."
32.	5	General	CPEN, OWR	5 (13) The Conclusions and Recommendations sections of the Memorandum discuss "adaptive management" strategies that might be added to any of the selected modeled scenarios to increase production levels. Another table should be added on page 5 following Table 1 that lists the model runs and the possible additional management strategies and the corresponding increases to production. Table 1 alone, leads the reader to conclude that the operating scenarios available for consideration (runs 1-10) are fixed and will produce set amounts of water. As the Memorandum points out, this is not the case as incorporating additional management practices to any model run can, in some cases, increase production levels.	Agreed. Tables 1B and 18 (attached) have been added to address this concern.

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33.		General	CPEN, OWR	5 (14) Camp Pendleton can not approve this document without at least two more model runs; one combining Runs 6R2 and 8; and second, Run 8 with all reasonable additional management scenarios (for example Run 3) producing all possible water and then Run 6R developing what it can out of what would waste to the ocean.	Proposed model runs have been identified on the attached Table A.
34.	3	1st ¶	CPEN, ES	Condense last sentence to read: "*Most recently during the fall of 2005, Camp Pendleton used the groundwater model to identify optimal locations for the replacement of groundwater production wells*." (Rational: requirement to situate replacement wells involved more than just absent annular seals.)	Sentence changed to: "Most recently during the fall of 2005, Camp Pendleton used the groundwater model to identify optimal locations for the replacement of groundwater production wells."
35.		General	CPEN, ES	[The following two concerns do not require a response to comments for TM 2.1 but do merit discussion during follow-on CUP meetings: <u>Page 39, last paragraph</u>: Last sentence indicates that all model runs demonstrate less stream flow going into the SMR estuary. This may prove problematic if TMDL development demonstrates that fresh water flows are beneficial to dissolved oxygen levels in the estuary, which is allegedly impaired for eutrophic conditions. <u>Global</u>: Regarding *Environmental Constraints* (i.e., water table drawdown to within historical limits in riparian areas) considered in the TM: (1) The USFWS may have its own opinion on acceptable drawdown for riparian habitat when afforded the opportunity to comment. Does the study effort intend to evaluate nutrient fate and transport associated with Run 5? Concurrent TMDL development may result in additional environmental constraints if the GW model indicates nutrient migration to surface waters or the estuary.	Page 39…Noted General….Noted. The only fate and transport study performed was for P002 as reported in Stetson's Treatment Wetland Engineering report. The movement of nutrients and TDS are outside the scope of this report.
36.	1 2	1st ¶ 2nd ¶	Mike McPherson; 7/3/06 TM 2.0	The terms "Project Yield" and "yield of the project" have specific legal meaning in the context of the Case No. 1247 "physical solution" sought by Camp Pendleton and Fallbrook Public Utility District ("FPUD"). In effect, the terms mean the amount of water delivered through the project less the amount of "non-Project Water" allocated to Camp Pendleton. It appears that these terms have a different meaning in the Stetson report, where they are apparently sometimes also called "groundwater yield." In any event, the distinction needs to be made clear.	Agreed. The term basin yield will be used when appropriate. It will be clear that the report does not distinguish between project and non-project water. Recommendation in the 9/2006 report is to identify the water rights associated with the total basin yield. A great amount of attention will be focused on this issue on the next draft. See response to Comment 17.

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37.	21 and 22	Run 6 – Alt 2	Mike McPherson; 7/3/06 TM 2.0	Given FPUD's current position with respect to Alternative 2, which is in breach of the 2001 MOU, Camp Pendleton has no choice but to oppose Alternative 2. Even if, however, FPUD decides to comply with the provisions of the 2001 MOU, there appears to be several substantial technical problems with the presentation of Alternative 2 in the Stetson 7/3/06 report. First, there needs to be a breakdown between the two separate diversion structures so that an analysis can be made of the respective deliveries at each. An important consideration here is to assure that there is passed through at the upper diversion sufficient flows for maintenance of both the salt water barrier and the riparian habitat (in addition to the other non-Project Water pass-throughs for Camp Pendleton). It is not clear from the information provided in the report whether these pass-throughs were taken into account when calculating the various figures arrived at in the report. For example, does the average 4,600 acre-feet per year diversion at FPUD Sump provide for the pass-throughs, including the pass-throughs for maintenance of the salt water barrier and the riparian habitat downstream of the lower diversion? If so, please explain in more detail. If not, please explain why not. Second, it appears that the Alternative 2 upper diversion used for the presentation in the report was envisioned as a direct diversion, but Mr. Lewinger at a meeting on June 28th advised Camp Pendleton that the FPUD Sump facilities did not require a direct diversion permit, comprising instead some sort of "lagoon" arrangement so that his surface impound permits sufficed. This being so, the figures presented in the report need correction not only for the required pass-throughs but also for the different method of diversion, a surface impound in that confined location most likely delivering less than a direct diversion. There are other problems with the presentation of Alternative 2 in the Stetson report, but they need not be raised at this point given, as mentioned above, FPUD's current position with respect thereto	First…..A "Diversion for Direct Use" line item was added to identify diversions under each diversion. The First…..Agreed, the September report revised Run 6 to Run 6R to assure all pass-throughs. Second…The diversion was modeled as a direct diversion as per the 2005 Pre-Feasibility Report and the October 2006 Draft Decision Memorandum. Additional engineering data is required to support another type of diversion. Last…..Proposed model runs 11 through 14 will hopefully address all points of concern regarding Alternative 2.
38.			Mike McPherson; 7/3/06 TM 2.0	Page 26, 2nd full ¶: With respect to the statement regarding the need for a call on the CWRMA groundwater bank, a prudent person probably would make sure that a call would be successful before relying on the extra water, there being some question as to the effect of the CUP allocations on the CWRMA obligation.	A sensitivity analysis of the call on emergency water was included in TM 2.1. Additional language will be added to TM 2.1 on page 36, last paragraph: "While this analysis assumes that Emergency Flows will be provided by RCWD as per the CWRMA, no calls have been historically made to substantiate that deliveries will occur."

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39.			Mike McPherson; 7/3/06 TM 2.0	Page 27, 1st full ¶, 6th line: The term "yield of the project" is again incorrectly used. And again, the terms "yield of the project" and "project yield," as used in the context of the negotiations to find a Case No. 1247 physical solution have meant since 1971 the amount of water delivered through the project less the amount of "non-Project Water" allocated to Camp Pendleton.	Noted. Please see Response to Comments 17 and 37 above.
40.			Mike McPherson; 7/3/06 TM 2.0	Page 29, 2nd full ¶: The term "yield of the project" is again incorrectly used. See above comment. In this regard, the above comment applies wherever in the report the terms "yield of the project" or "project yield" are used, it appearing that wherever they are used, they are used incorrectly.	Noted. Please see Response to Comments 17 and 37 above.
41.			Mike McPherson; 7/3/06 TM 2.0	Page 30, 1st ¶, 2nd line, and 3rd ¶, 1st and 2nd lines: Incorrect use of the term "yield of the project," see above comments.	Noted. Please see Response to Comments 17 and 37 above.