SOAH DOCKET NO. 952-19-0705

APPLICATION OF LOWER COLORADO RIVER AUTHORITY FOR OPERATING AND TRANSPORT PERMITS FOR EIGHT WELLS IN BASTROP COUNTY, TEXAS	**§ § § § § §**	**BEFORE THE STATE OFFICE OF ADMINISTRATIVE HEARINGS**

ENVIRONMENTAL STEWARDSHIP'S MOTION FOR LEAVE TO SUPPLEMENT PREFILED TESTIMONY AND EXHIBITS

TO THE HONORABLE ADMINISTRATIVE LAW JUDGES:

Protestant Environmental Stewardship files this motion for leave to supplement the prefiled testimony of their expert witnesses, Mr. George Rice and Mr. Joseph Trungale, and prefiled exhibits.[1] For support, Environmental Stewardship offers the following:

I. Background

On June 28, 2019 Environmental Stewardship submitted prefled testimony of Mr. George Rice and Mr. Joseph Trungale. In his prefiled testimony, Mr. Rice explained that he expected GMA-12 to complete and produce a new pumping file by July. He indicated that once this pumping file became available, he intended to use the updated file to produce new GAM predictions. GMA-12 indeed completed and produced a new pumping file, but that pumping file was not available until the end of September, as explained more fully below.

After Environmental Stewardship submitted its prefiled direct testimony and exhibits, LCRA submitted its prefiled rebuttal evidence. That rebuttal evidence included two new, previously undisclosed witnesses. On September 27, Environmental Stewardship timely filed its objections to the testimony of these two new witnesses, and

[1] *See* Attachment A: Supplemental Direct Testimonies of Mr. Geroge Rice (with exhibits) and Mr. Joseph Trungale (with exhibits).

represented that it would be submitting its own additional prefiled testimony, to address the new opinions expressed by LCRA's new rebuttal witnesses.

By this motion, Environmental Stewardship seeks to admit its supplemental prefiled testimony and exhibits, based on the new pumping file that became available recently and based on the new rebuttal witnesses offered by LCRA.

II. Basis for supplemental evidence and testimony

a. New GAM pumping file

GMA-12 convened a meeting on September 24, 2019, during which it was revealed that a new pumping file had been completed for the Groundwater Availability Model. Shortly after the GMA-12 meeting, the new pumping file was released. The new pumping file represents the most current data for purposes of groundwater availability modeling.

Accordingly, Mr. Rice re-ran the GAM simulations using the new pumping file. Mr. Trungale then took the results from Mr. Rice's latest simulations and used those to re-evaluate impacts on surface water.

Environmental Stewardship offers the supplemental prefiled testimony and exhibits that were prepared by Mr. Rice and Mr. Trungale, based on the results of the GAM simulations that were run using the new pumping file.

b. Untimely disclosure of LCRA witnesses

On August 9, 2019, LCRA served the parties in this matter with its prefiled rebuttal evidence, in accordance with the ALJs' Order No. 3. Among the exhibits offered by LCRA as part of its rebuttal case are: Exhibits 68 and 69, the prefiled testimony and resume of Leonard Oliver; and Exhibits 70 and 71, the prefiled testimony and resume of Bryan Cook. Both of these witnesses offer testimony that is intended to respond to the prefiled testimony offered by Environmental Stewardship's expert witnesses. The testimony offered by Mr. Oliver, in particular, addresses Mr. Trungale's use of the WAM (water availability model) to evaluate impacts on flows in the Colorado, as a result of the proposed LCRA groundwater pumping.

Neither of these 2 rebuttal witnesses had been disclosed to the other parties as expert witnesses in this case before LCRA submitted their rebuttal testimony and exhibits. LCRA identified Mr. Oliver and Mr. Cook as expert witnesses, for the first time, on August 19, via their Third Supplemental Responses to Requests for Disclosure—10 days after Mr. Oliver and Mr. Cook had submitted their prefiled testimony. Further, LCRA offered no substantive testimony regarding predictions of impacts on surface water, based on WAM model runs, before the submission of its rebuttal case.

III. Environmental Stewardship's supplemental new evidence is timely.

GMA-12's new pumping file became available shortly after the GMA-12 meeting held on September 24, 2019. Environmental Stewardship's expert witness, Mr. Rice, promptly reviewed the new pumping file and revised his analysis based on this new information. His revised analysis is being made available today, October 4—less than 2 weeks since the pumping file became available.

Mr. Trungale's supplemental testimony is likewise timely, as it is based, in part, on Mr. Rice's latest GAM simulations, using the newly available pumping file. Mr. Rice completed his analysis only this week, and Mr. Trungale immediately revised his analysis upon receiving Mr. Rice's latest results.

Chapter 36 of the Water Code contemplates the submission of supplemental testimony. It provides as follows:

> If the board has not acted on the application, the presiding officer may allow a person who testifies at the hearing to supplement the testimony given at the hearing by filing additional written materials with the presiding officer not later than the 10th day after the date of the hearing. A person who files additional written material with the presiding officer under this subsection must also provide the material, not later than the 10th day after the date of the hearing, to any person who provided comments on an uncontested application or any party to a contested hearing. A person who receives additional written material under this subsection may file a response to the material with the presiding officer not later than the 10th day after the date the material was received. Tex. Water Code § 36.406(g).

The supplemental prefiled evidence offered by Environmental Stewardship easily complies with the timeframe in Section 36.406. Environmental Stewardship is offering its

supplemental evidence well in advance of the hearing on the merits, allowing all parties to cross-examine Environmental Stewardship's witnesses regarding this supplemental evidence.

IV. Good cause exists to allow supplemental evidence.

Environmental Stewardship has demonstrated that good cause exists, under 1 Tex. Admin. Code § 155.305(b)(1), for the supplemental prefiled testimony. The updated pumping file provides the most recent data for use with the GAM. All parties, and the ALJs, will benefit from opinions based on this more recent data.

Moreover, no party will be prejudiced by the supplemental evidence and the use of this more recent pumping file. All parties have had access to the same updated pumping file.

Similarly, no party will be prejudiced by Environmental Stewardship's supplemental evidence addressing the rebuttal evidence submitted by LCRA. Environmental Stewardship's supplemental evidence does not present any new, previously undisclosed conclusions; it simply addresses the points made in LCRA's rebuttal evidence. In other words, Mr. Rice's and Mr. Trungale's overall opinions and conclusions have not changed; they only offer further support for those opinions and conclusions.

It is also worth noting that LCRA bears the burden in this case, and that includes the burden of satisfying the requirements of Section 36.113 of the Water Code. Among the criteria for issuing a permit, under that section, is whether the proposed permit unreasonably affects existing groundwater and surface water resources and permit holders. Tex. Water Code § 36.113(d). Yet, LCRA offered little, if any, substantive evidence demonstrating that it had evaluated impacts on surface water resources, in its direct case.

By contrast, Environmental Stewardship offered expert testimony, on June 28, based on reliable methodologies, including the groundwater availability model and the water availability model, to demonstrate predicted impacts on surface water resources. Environmental Stewardship has continuously apprised all parties in this case of the theory

of its case. All parties have been on notice that Environmental Stewardship intended to present evidence demonstrating impacts of LCRA's proposed pumping on surface water resources.

Yet, LCRA never supplemented its disclosures, before submitting its prefiled rebuttal evidence, to alert the parties that it intended to offer evidence regarding use of the water availability model for purposes of analyzing impacts on surface water resources. LCRA waited until the eleventh hour (via its rebuttal case) to offer witness testimony regarding use of the water availability model to evaluate impacts on surface water resources.

Environmental Stewardship seeks, via its supplemental prefiled testimony and evidence, to address some of the newly disclosed opinions offered by LCRA in its rebuttal evidence. Environmental Stewardship maintains that the sequence of events described above presents good cause, supporting Environmental Stewardship's request to supplement its evidence.

V. Conclusion and Prayer

For the reasons described above, Environmental Stewardship respectfully seeks leave to file the attached supplemental prefiled testimonies and exhibits of George Rice and Joseph Trungale.

Respectfully submitted,
/s/ Marisa Perales
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CERTIFICATE OF SERVICE

I certify that a copy of Environmental Stewardship's Motion to Leave to Supplement Prefiled Testimony of Expert Witnesses was served on all parties listed below on October 4, 2019.

/s/ Marisa Perales
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ATTACHMENT A

SOAH DOCKET NO. 952-19-0705

APPLICATION OF LOWER	**§**	**BEFORE THE STATE OFFICE**
COLORADO RIVER AUTHORITY	**§**	
FOR OPERATING AND	**§**	**OF**
TRANSPORT PERMITS FOR	**§**	
EIGHT WELLS IN BASTROP	**§**	**ADMINISTRATIVE HEARINGS**
COUNTY, TEXAS	**§**	

SUPPLEMENTAL

PRE-FILED TESTIMONY OF

GEORGE RICE

ON BEHALF OF

ENVIRONMENTAL STEWARDSHIP

EXHIBIT LIST

Number	Exhibit
112	Supplemental Direct Testimony of George Rice
113	Updated Exhibit 102: Old v. New GAM, Groundwater Discharge to Main Stem of Colorado River
114	Updated Exhibit 103: Old v. New GAM, Predictions of Drawdown in Simsboro Aquifer
115	Updated Exhibit 104: New GAM, Groundwater Discharge to Main Stem of Colorado River
116	Updated Exhibit 105: New GAM, Groundwater Discharge to Walnut/Cedar Creeks
117	Updated Exhibit 106: New GAM, Groundwater Discharge to Big Sandy Creek
118	Updated Exhibit 107: New GAM, Groundwater Discharge to Wilbarger Creek
119	Updated Exhibit 108: New GAM, Groundwater Discharge to Piney Creek/Lake Bastrop
120	Updated Exhibit 109: Old v. New GAM, Predictions of Drawdown in Simsboro Aquifer
121	Old v. New GAM, Predictions of Head in Simsboro Aquifer
122	Old v. New GAM, Predictions of Drawdown in the Hooper Aquifer
123	Old v. New GAM, Predictions of Drawdown in the Calvert Bluff Aquifer

Q: Please state your name.

A: George Rice.

Q: On whose behalf are you presenting testimony in this proceeding?

A: Environmental Stewardship.

Q: Have you provided written prefiled testimony in this case, on behalf of Environmental Stewardship?

A: Yes, I prepared written prefiled testimony in this case.

Q: Have your opinions changed since you prepared and submitted your initial prefiled testimony?

A: My overall opinions have not changed, but I have obtained new data that better informs my analysis and opinions. Based on this new information, I re-evaluated and updated some of the exhibits that I prepared and submitted with my initial prefiled testimony. I have also prepared an additional exhibit that illustrates the effect of the new information.

Q: Please describe this new data that you mentioned.

A: In my original prefiled testimony, I explained that an updated pumping file for the new GAM was due to be completed in July. Once available, I intended to use the updated file to produce new GAM predictions.

The updated pumping file became available on September 26th. The file was produced by consultants for the groundwater districts that make up Groundwater Management Area 12 (GMA-12). GMA-12 includes the Lost Pines Groundwater Conservation District.

I have used the updated pumping file to produce new GAM predictions. These new predictions are incorporated in this supplement.

The major differences between the updated file and the previous one are 1) the updated file contains historic pumping data through 2018, and 2) the updated file contains pumping for all permitted pumping, including pumping for large projects such as Vista Ridge, End Op, and Forestar.

Because the three large pumping projects have been included in the new pumping

file, it was not necessary to revisit or revise my Exhibits 110 and 111. This is because the effects of these projects are incorporated in all the GAM predictions.

The effect of including all permitted pumping in the new pumping file is shown in Exhibit 121. This exhibit shows GAM predictions of heads (water levels in wells) in the Simsboro Aquifer that result from 1) using the old pumping file and, 2) using the new pumping file. Water levels predicted with the new pumping file are about 200 feet lower than those predicted with the old file.

It should be noted that at least one other large pumping project may be developed at Alcoa's Sandow Mine. However, this project has not yet received a permit and is not included in any of the GAM simulations that I performed.

Q: You mentioned that you have updated some of the exhibits you prepared and submitted with your initial prefiled written testimony in this case and that you prepared a couple of new exhibits. Please list the exhibits that you have prepared for this supplemental prefiled testimony.

A: I have updated exhibits 102 through 109. The updated versions of these exhibits are labeled Exhibit 113 through 120. I also prepared Exhibit 121, which I described earlier.

Q: Were Exhibits 113-121 prepared by you or under your supervision?

A: Yes.

Environmental Stewardship Offers Exhibits 113-121 into evidence.

Q: How have you used the new GAM pumping file in your evaluation of the impacts of the proposed LCRA permits and the preparation of the new exhibits?

A: As I described in my earlier testimony, I used the GAMs to predict the effects of LCRA's proposed pumping on surface water flows in the Colorado River and its tributaries in Bastrop County, and groundwater levels in wells. I explained that I used both the old GAM and the new GAM and included predictions produced by both GAMs.

I have re-run the new GAM, using the new pumping file I described earlier to see how it might affect my initial analysis and opinions. Based on this new evaluation, I prepared new exhibits that reflect the results of my evaluation using the new pumping file.

Q: Have your opinions changed based on this new data?

A: My overall opinions have not changed. That is, it remains my opinion that LCRA's proposed pumping would reduce the discharge of groundwater to the Colorado River and its tributaries, thereby reducing the amount of water flowing in these streams. The proposed pumping would also reduce water levels in wells that tap the aquifers of the Carrizo-Wilcox.

The GAM still predicts that the Colorado River will eventually become a losing stream. That is, LCRA's pumping would reduce the amount of groundwater discharging to the Colorado River, such that the flows between the aquifers and the Colorado would be reversed, and water from the Colorado River would flow into the aquifers.

Using the latest pumping file, the new GAM predicts that the Colorado River will become a losing stream in about 2040.

Q: Please explain how the new pumping file affects what the new GAM predicts regarding the amount of flow in the Colorado River?

A: As explained in my initial prefiled testimony, I ran two GAM simulations for the main stem of the Colorado River. The first simulated baseline pumping—which is the predicted pumping without LCRA's proposed pumping. The second simulated baseline pumping plus LCRA's proposed pumping.

For the simulation of baseline pumping, using the new pumping file I described earlier, the GAM predicts that between 2010 and 2070, baseline pumping will reduce flow in the river by about 23,000 acre-feet per year.

For the simulation that includes LCRA pumping, the GAM, with the new pumping file, predicts that by 2070, LCRA's pumping will reduce the flow in the Colorado River by approximately 5,000 acre-feet per year, or approximately 7 cubic feet per second. This is a slightly different result than what I testified to in my earlier prefiled testimony.

I have prepared Exhibit 115, which revises my earlier Exhibit 104, to reflect these new results from the GAM simulations.

Q: How does this reduction in flow compare to the flow of the Colorado River at Bastrop?

A: A reduction of 5,000 acre-feet per year represents about 0.35 percent of the average annual flow of the Colorado River at Bastrop (USGS, 2019). However, as I explained in my earlier testimony, the effect during low flows would be greater. For example, between November 1963 and March 1964, the average flow of the river at Bastrop was about 120 cfs (USGS, 2019). During this period, the reduction in flow would be about 6 percent.

I would also note that field measurements of groundwater discharge to the river were conducted between 1999 and 2008. The measurements ranged from about 27 cfs to about 55 cfs. These groundwater discharges are 22 percent and 46 percent, respectively, of the low flows (120 cfs) measured between November 1963 and March 1964.

Q: Please describe revisions, if any, to your earlier opinions regarding the new GAM's predictions regarding impacts to the tributaries to the Colorado River.

A: As I described in my earlier testimony, there are four tributaries: Walnut/Cedar Creeks, Wilbarger Creek, Big Sandy Creek, and Piney Creek/Lake Bastrop. The GAM simulations, for both baseline and LCRA pumping, using the new pumping file, predict that groundwater discharge to all four tributaries will decrease, and all four tributaries will change from gaining to losing streams. This is different from my earlier testimony, wherein I explained that for the simulation that includes LCRA's pumping, the GAM predicts that all of the tributaries except Walnut/Cedar Creeks will become losing streams.

These new results are reflected in Exhibits 116 through 119, which are revised versions of my earlier Exhibits 105, 106, 107, and 108.

Q: Please describe Exhibit 120.

A: Exhibit 120 is a revision to my earlier Exhibit 109. And Exhibit 109 is essentially the same as Exhibit 103. It is a cross-section showing predicted drawdowns in the Simsboro Aquifer in 2060. I have slightly revised my earlier Exhibit 109.

Q: Did you prepare this Exhibit?

A: Yes, I prepared it based on the GAM simulations I performed, as described above.

Q. Looking at Exhibit 120, what does it tell us about predicted declines in the aquifer?

A: As expected, drawdowns are greatest at the wellfield, and decrease with distance from the wellfield. In general, the old GAM predicted greater drawdowns in the Simsboro than the new GAM.

Q: What does the ellipse marked as 'A' in Exhibit 120 show?

A: As with my earlier Exhibit 109, the ellipse marked 'A' in this exhibit shows the predicted drawdowns in a Simsboro well about two miles northwest of the wellfield. The new GAM predicts a water level decline of 180 feet. The old GAM predicts a decline of 247 feet.

Q: Did the GAM simulations, with the new pumping file, predict drawdowns in the other aquifers of the Carrizo-Wilcox?

A: Yes, the GAMs predicted that the proposed pumping would also cause the following drawdowns at the proposed LCRA wellfield: In the Hooper Aquifer, the predicted drawdowns are 22 feet (old GAM) and 37 feet (new GAM). In the Calvert Bluff Aquifer, the predicted drawdowns are 20 feet (old GAM) and 45 feet (new GAM). In the Carrizo Aquifer, the predicted drawdowns are 1 foot (old GAM) and 6 feet (new GAM).

I have prepared Exhibits 122 and 123 to illustrate the greater declines in the Hooper and Calvert Bluff Aquifers, based on the latest simulations using the updated pumping file.

Q: Were Exhibits 122 and 123 prepared by you or by someone under your supervision?

A: Yes, both exhibits were prepared by me, based on the simulations I ran using the updated pumping file.

Environmental Stewardship offers Exhibits 122 and 123.

Q: Do you believe that the trends in discharge predicted by the GAM, using the new pumping file, are reliable?

A: Yes. The GAM, with the new pumping file, predicts that pumping will cause the discharge of groundwater to streams to decrease with time. This is consistent with what groundwater discharges would be expected to do in response to pumping.

As I explained in my earlier prefiled testimony, to determine the reliability of the

old GAM, I examined the response of the old GAM to changes in: pumping rates, pumping duration, and the location of pumping relative to the Colorado River (Rice, 2015). My purpose was to see whether the GAM predictions made sense. And as I explained in my earlier testimony, I concluded that the GAM predictions did make sense and that the trends predicted by the GAM are reliable. I performed the same analyses with the new GAM. The results were the same. So, my conclusion remains that the GAM predictions of trends, using the new pumping file, are reliable.

Q: Second, do you believe that the GAM reliably predicts the amount of groundwater discharged to streams?

A: This question is more difficult to answer. The predictions of the old GAM are not reliable. But the new GAM predictions are more reliable and to date, they are the best available data we have. The new GAM, with the new pumping file, predicted that the groundwater discharge to the Colorado River in 2010 was about 19,000 acre-feet per year. This is much closer to the measured discharge values. This gives us some confidence in the new GAM's predictions.

IV. CONCLUSIONS

Q: Please briefly summarize your major conclusions.

A: My main conclusions have not changed from the conclusions I expressed in my earlier testimony, even after incorporating the new pumping files into the GAM. LCRA's proposed pumping would reduce the amount of groundwater that discharges to the Colorado River and its tributaries in Bastrop County, thereby reducing the amount of water flowing in these streams. LCRA's proposed pumping would reduce water levels in wells that tap the Carrizo-Wilcox aquifers. These aquifers are the Hooper, Simsboro, Calvert Bluff, and Carrizo.

The new pumping file has not changed these conclusions, but they provide new information that further inform and support my opinions.

Q: Does this conclude your testimony?

A: Yes, although I reserve the right to supplement this testimony.

EXHIBIT 113

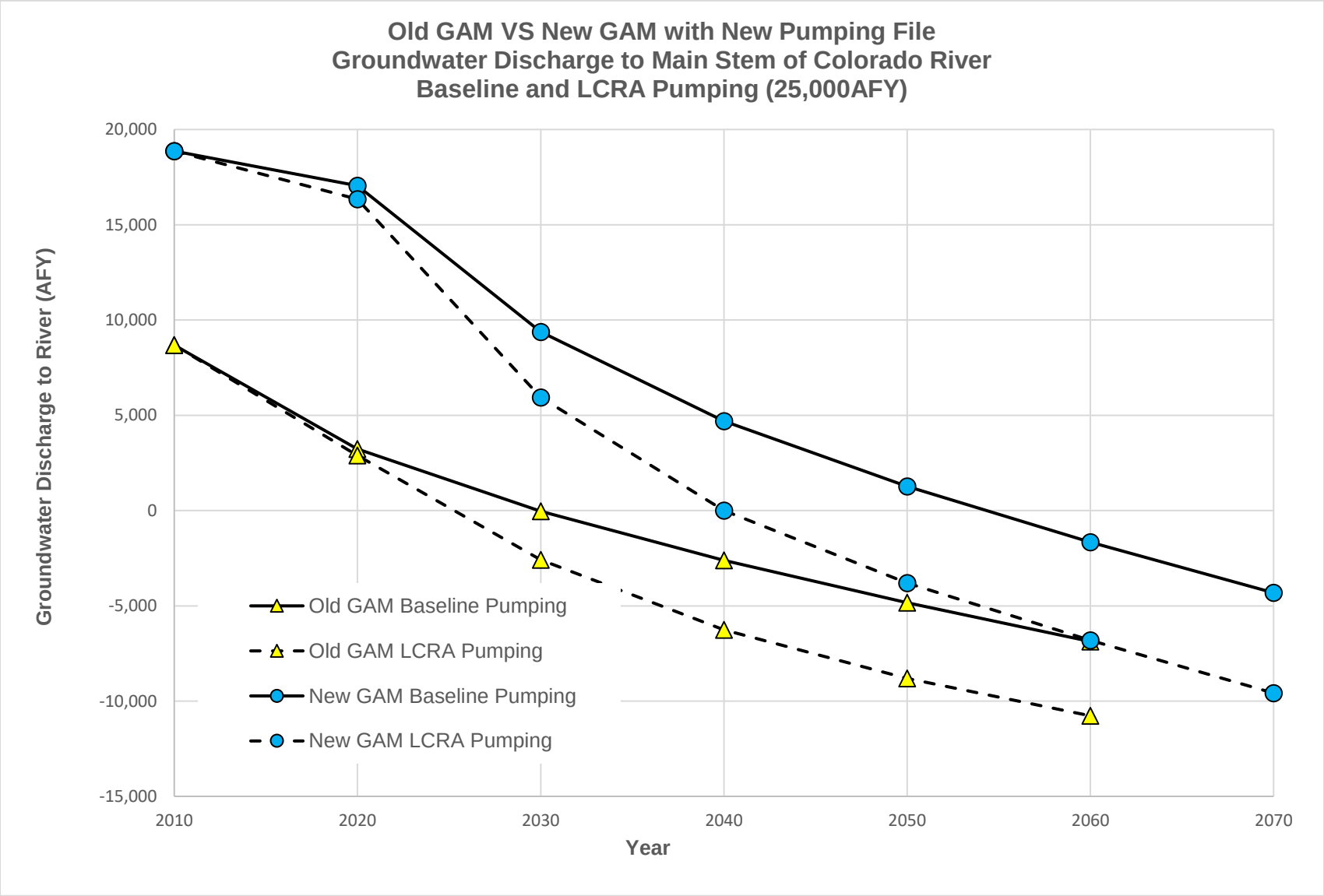

Old GAM VS New GAM with New Pumping File
Groundwater Discharge to Main Stem of Colorado River
Baseline and LCRA Pumping (25,000AFY)
Groundwater Discharge to River (AFY)
20,000
15,000
10,000
5,000
0
-5,000
-10,000
-15,000
2010
2020
2030
2040
2050
2060
2070
Year
Old GAM Baseline Pumping
Old GAM LCRA Pumping
New GAM Baseline Pumping
New GAM LCRA Pumping

EXHIBIT 114

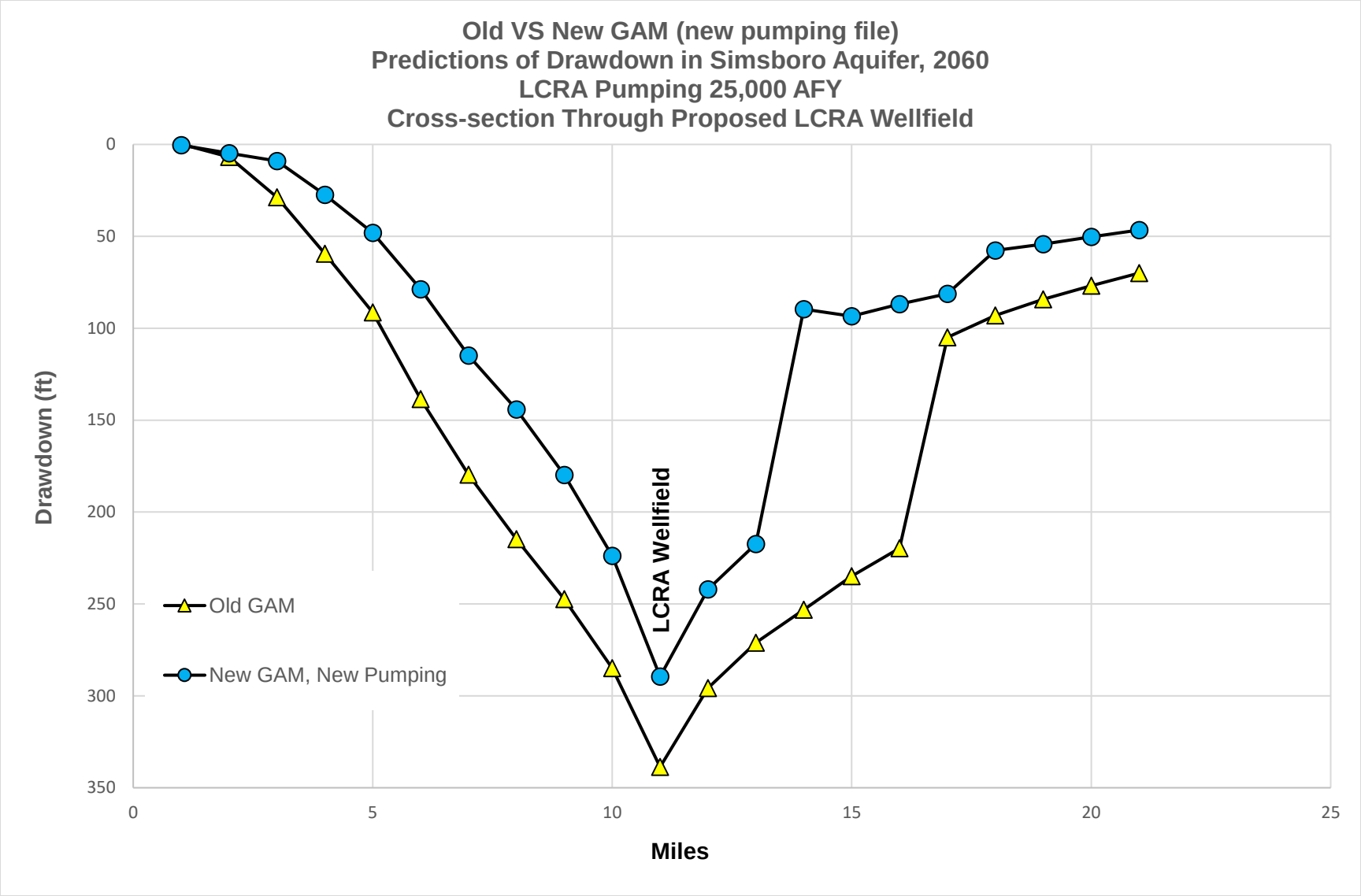

Old VS New GAM (new pumping file)
Predictions of Drawdown in Simsboro Aquifer, 2060
LCRA Pumping 25,000 AFY
Cross-section Through Proposed LCRA Wellfield
Drawdown (ft)
0
50
100
150
200
250
300
350
0
5
10
15
20
25
Miles
LCRA Wellfield
Old GAM
New GAM, New Pumping

EXHIBIT 115

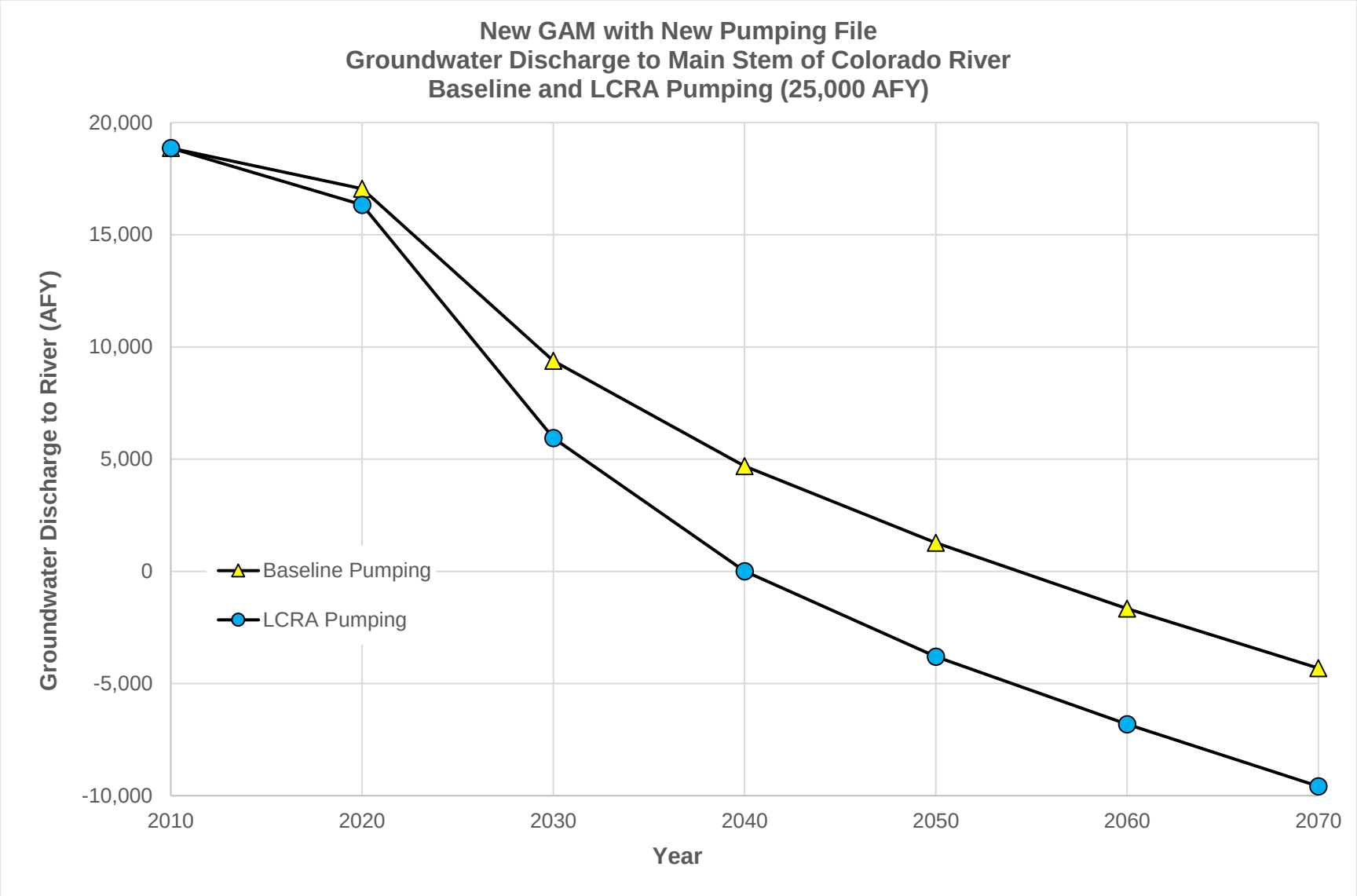

New GAM with New Pumping File
Groundwater Discharge to Main Stem of Colorado River
Baseline and LCRA Pumping (25,000 AFY)
Groundwater Discharge to River (AFY)
20,000
15,000
10,000
5,000
0
-5,000
-10,000
2010
2020
2030
2040
2050
2060
2070
Year
Baseline Pumping
LCRA Pumping

EXHIBIT 116

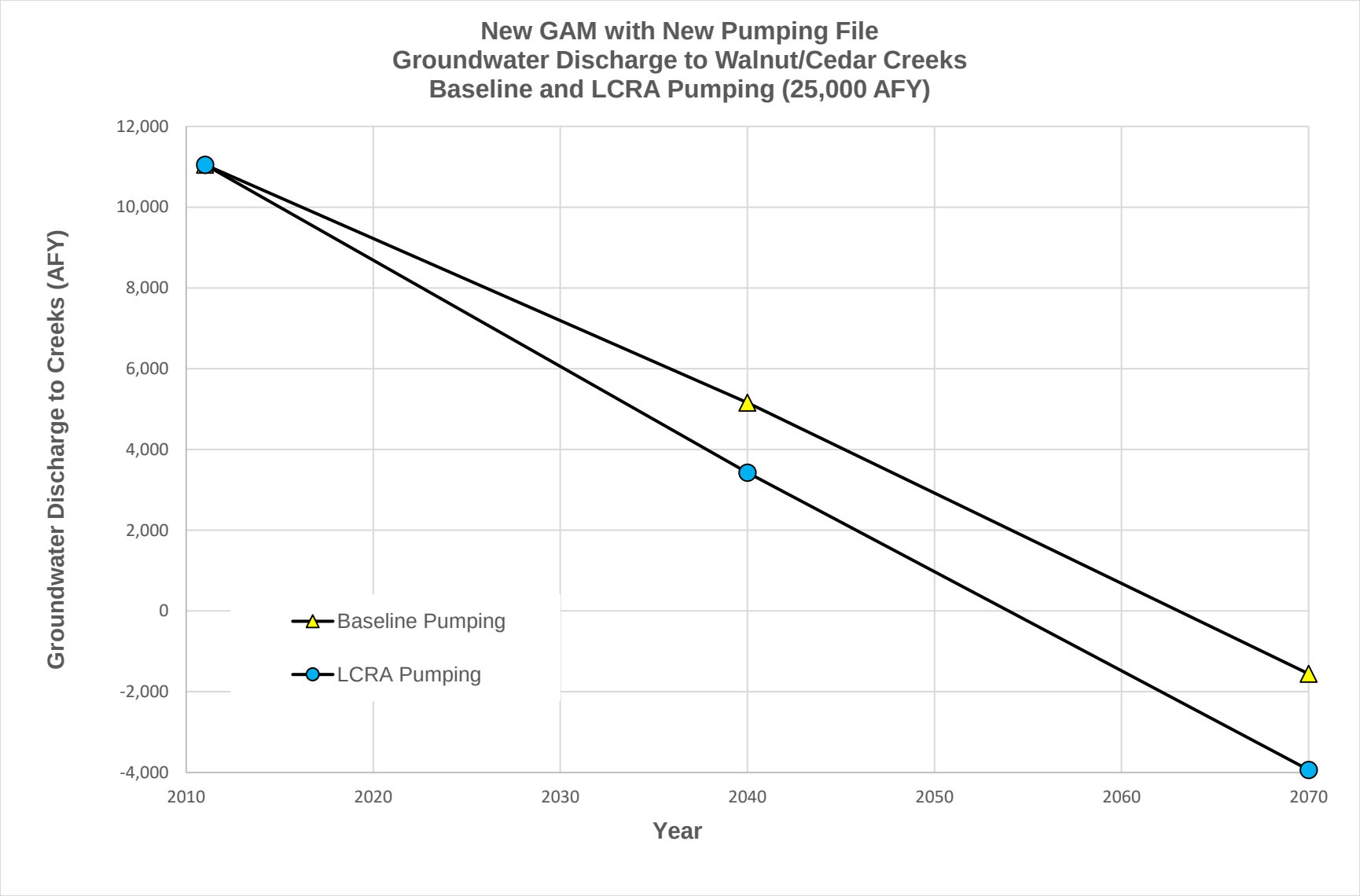

New GAM with New Pumping File
Groundwater Discharge to Walnut/Cedar Creeks
Baseline and LCRA Pumping (25,000 AFY)
Groundwater Discharge to Creeks (AFY)
12,000
10,000
8,000
6,000
4,000
2,000
0
-2,000
-4,000
2010
2020
2030
2040
2050
2060
2070
Year
Baseline Pumping
LCRA Pumping

EXHIBIT 117

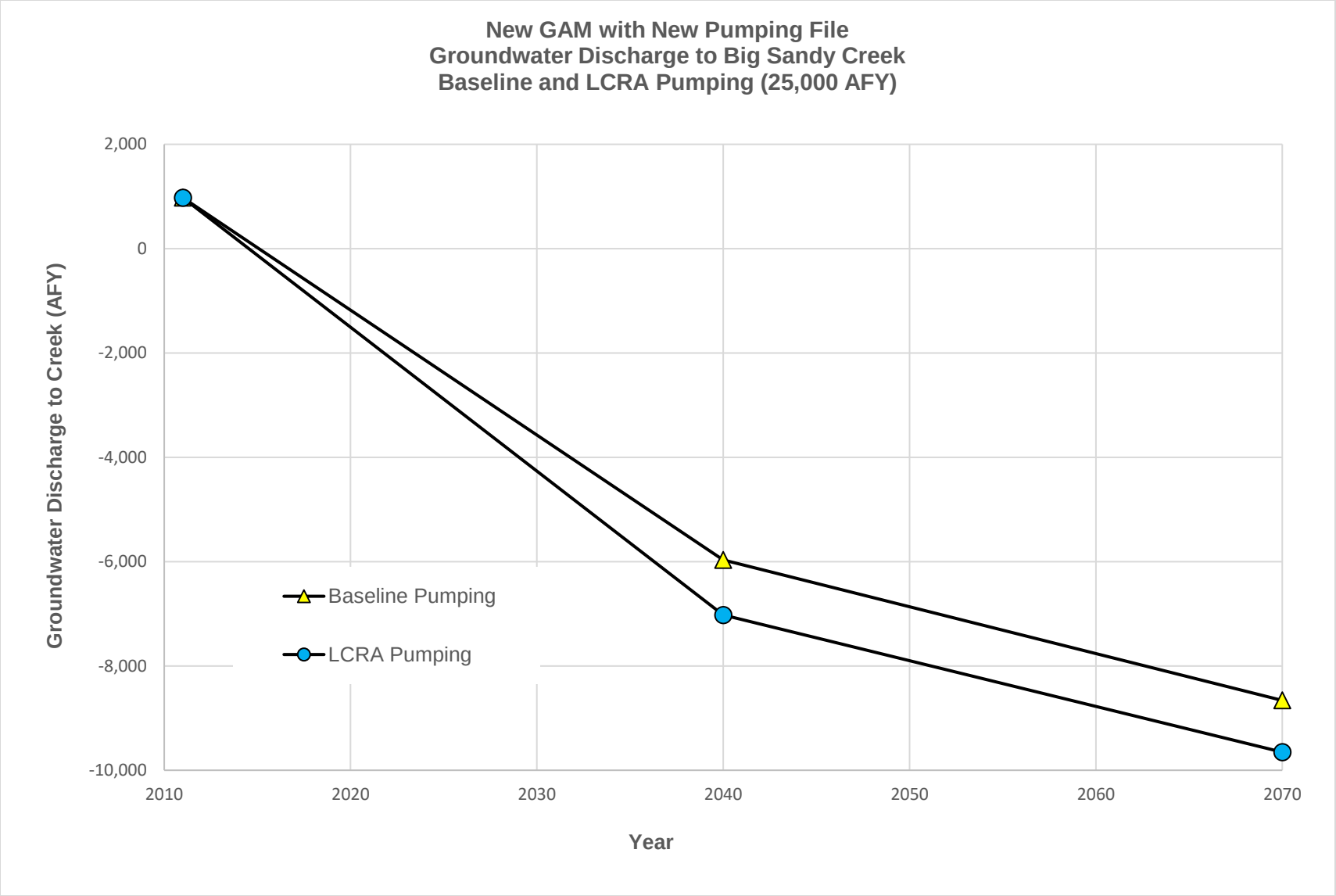

New GAM with New Pumping File
Groundwater Discharge to Big Sandy Creek
Baseline and LCRA Pumping (25,000 AFY)
Groundwater Discharge to Creek (AFY)
2,000
0
-2,000
-4,000
-6,000
-8,000
-10,000
2010
2020
2030
2040
2050
2060
2070
Year
Baseline Pumping
LCRA Pumping

EXHIBIT 118

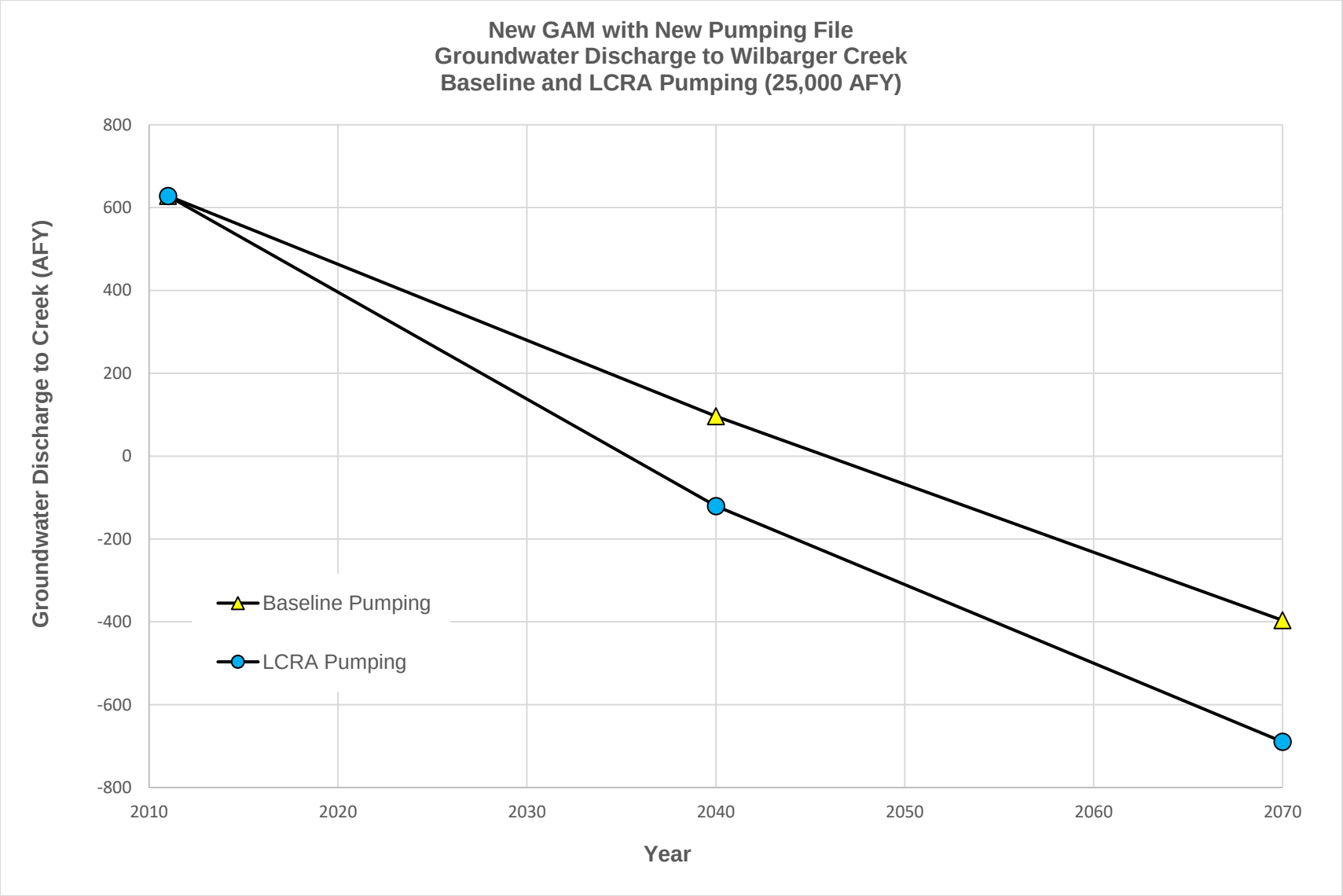

New GAM with New Pumping File
Groundwater Discharge to Wilbarger Creek
Baseline and LCRA Pumping (25,000 AFY)
Groundwater Discharge to Creek (AFY)
800
600
400
200
0
-200
-400
-600
-800
2010
2020
2030
2040
2050
2060
2070
Year
Baseline Pumping
LCRA Pumping

EXHIBIT 119

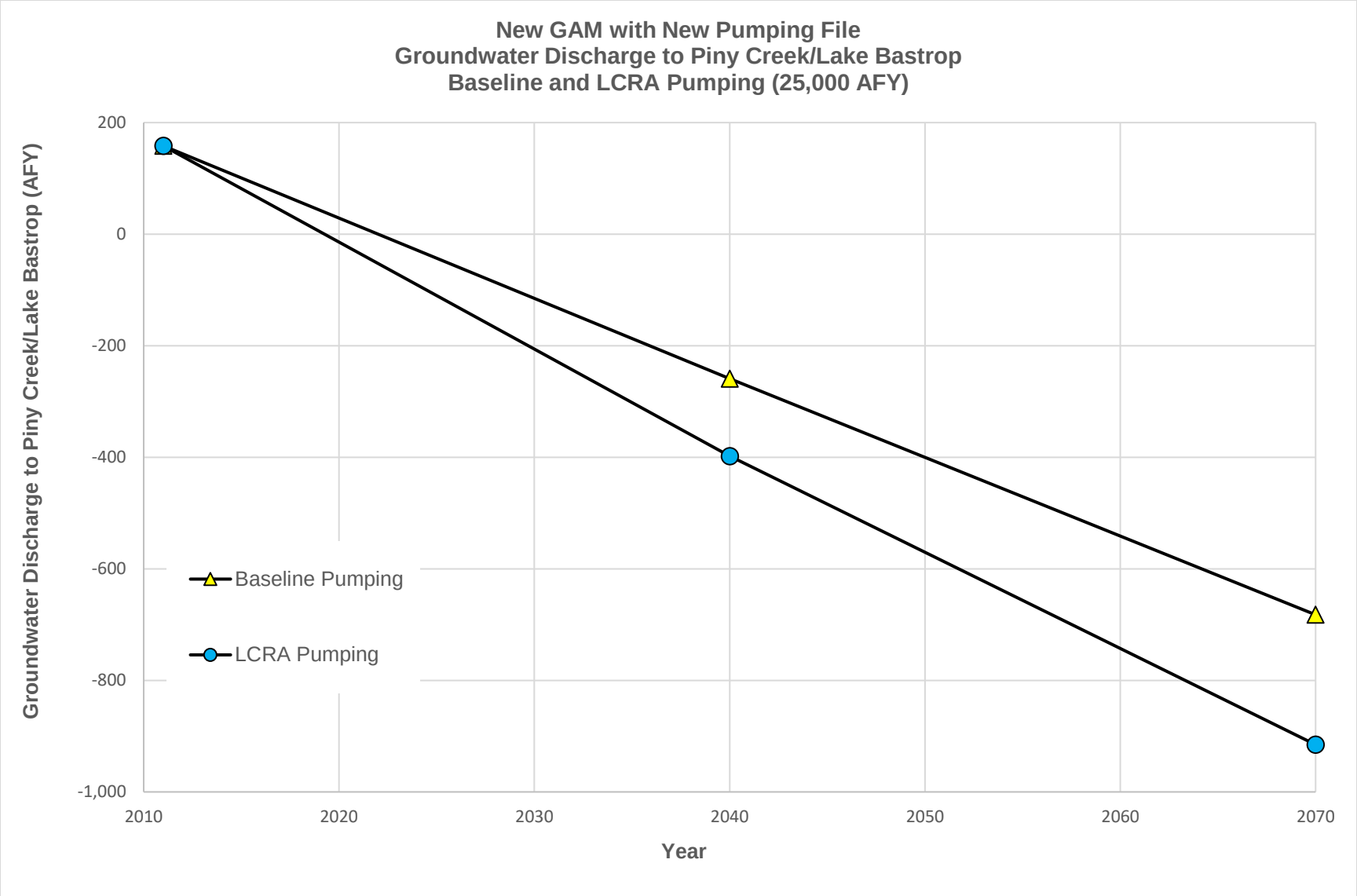

New GAM with New Pumping File
Groundwater Discharge to Piny Creek/Lake Bastrop
Baseline and LCRA Pumping (25,000 AFY)
Groundwater Discharge to Piny Creek/Lake Bastrop (AFY)
200
0
-200
-400
-600
-800
-1,000
2010
2020
2030
2040
2050
2060
2070
Year
Baseline Pumping
LCRA Pumping

EXHIBIT 120

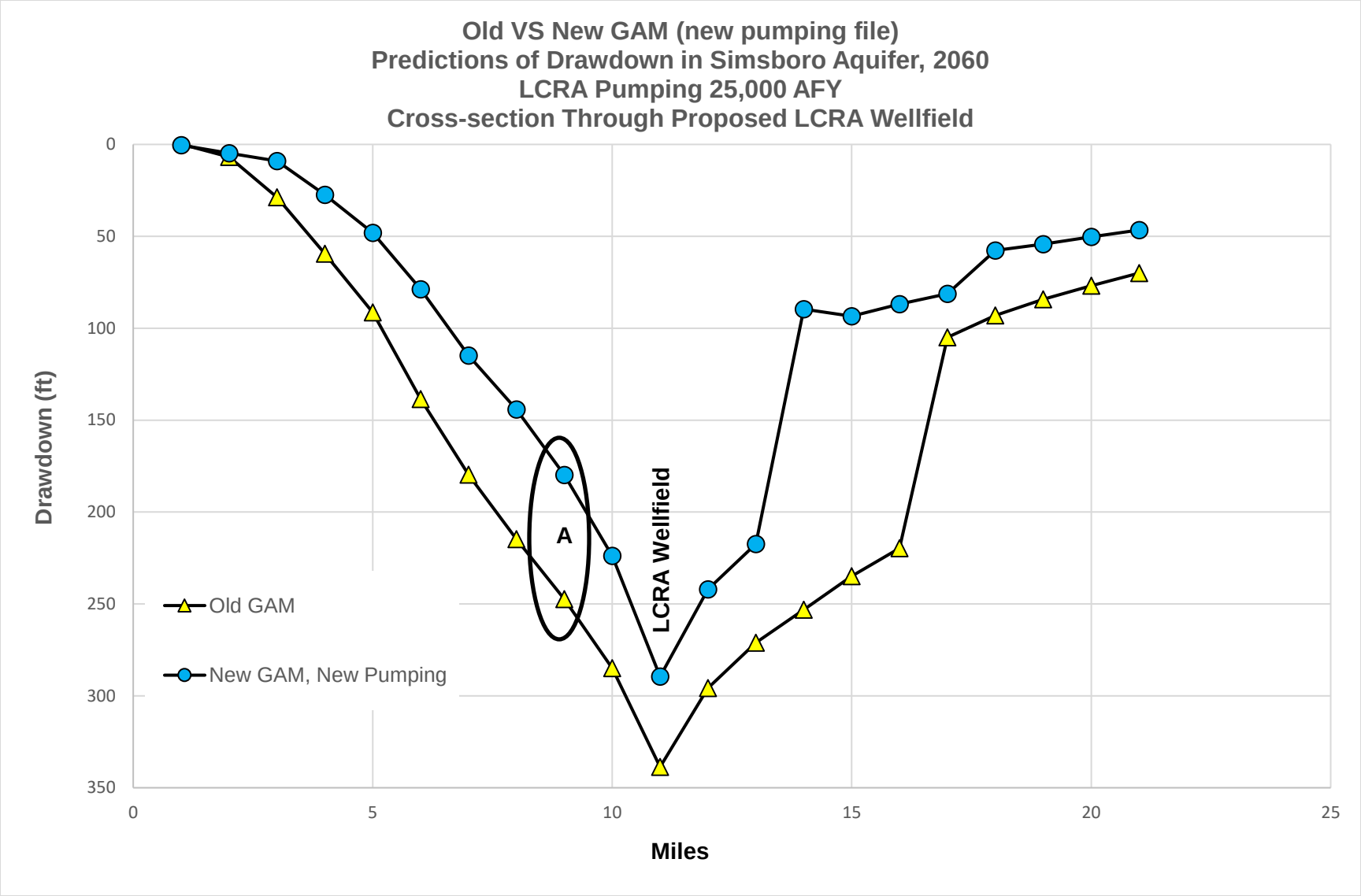

Old VS New GAM (new pumping file)
Predictions of Drawdown in Simsboro Aquifer, 2060
LCRA Pumping 25,000 AFY
Cross-section Through Proposed LCRA Wellfield
Drawdown (ft)
0
50
100
150
200
250
300
350
0
5
10
15
20
25
Miles
A
LCRA Wellfield
Old GAM
New GAM, New Pumping

EXHIBIT 121

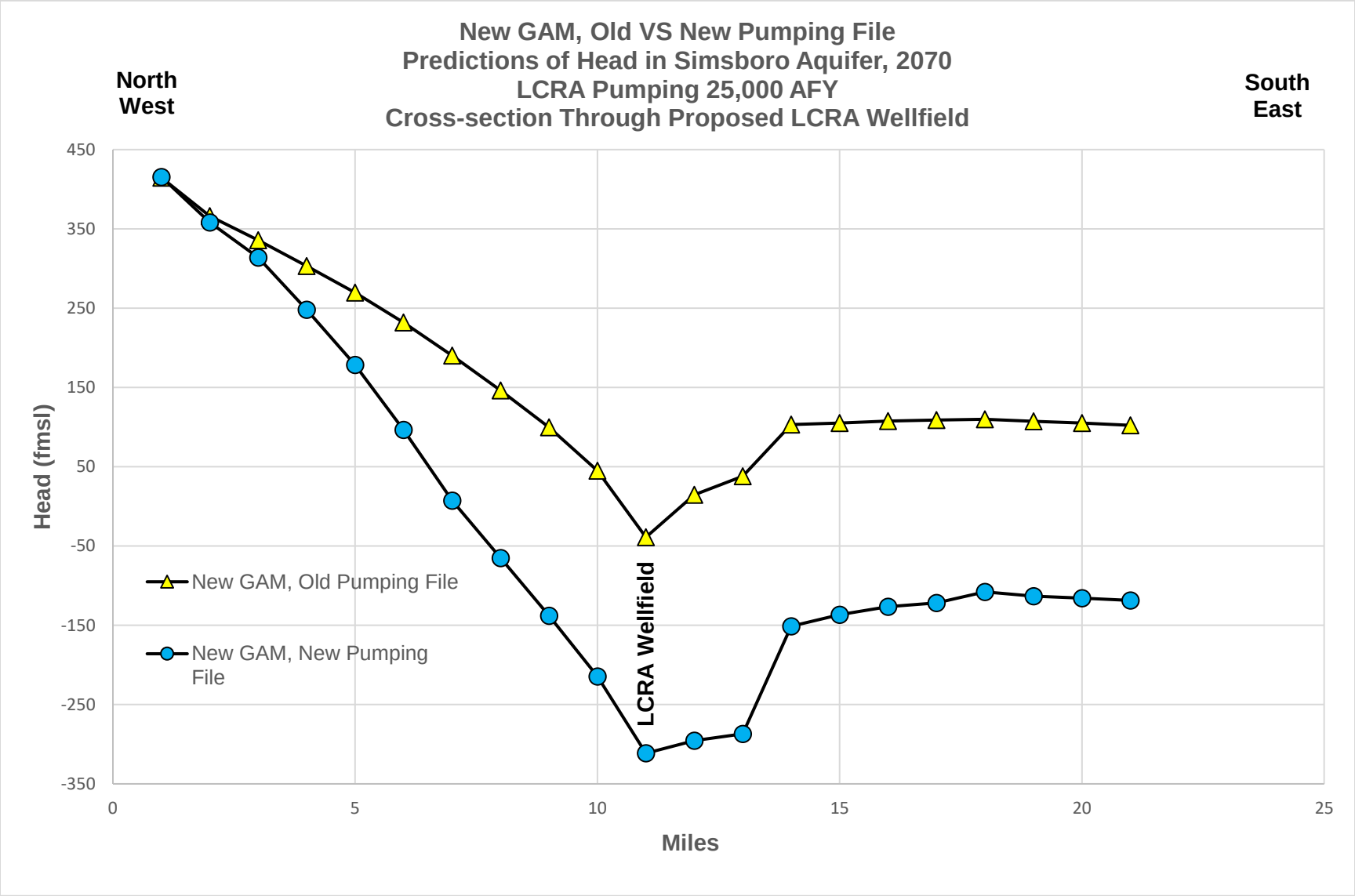

New GAM, Old VS New Pumping File
Predictions of Head in Simsboro Aquifer, 2070
LCRA Pumping 25,000 AFY
Cross-section Through Proposed LCRA Wellfield
North West
South East
Head (fmsl)
450
350
250
150
50
-50
-150
-250
-350
0
5
10
15
20
25
Miles
LCRA Wellfield
New GAM, Old Pumping File
New GAM, New Pumping File

EXHIBIT 122

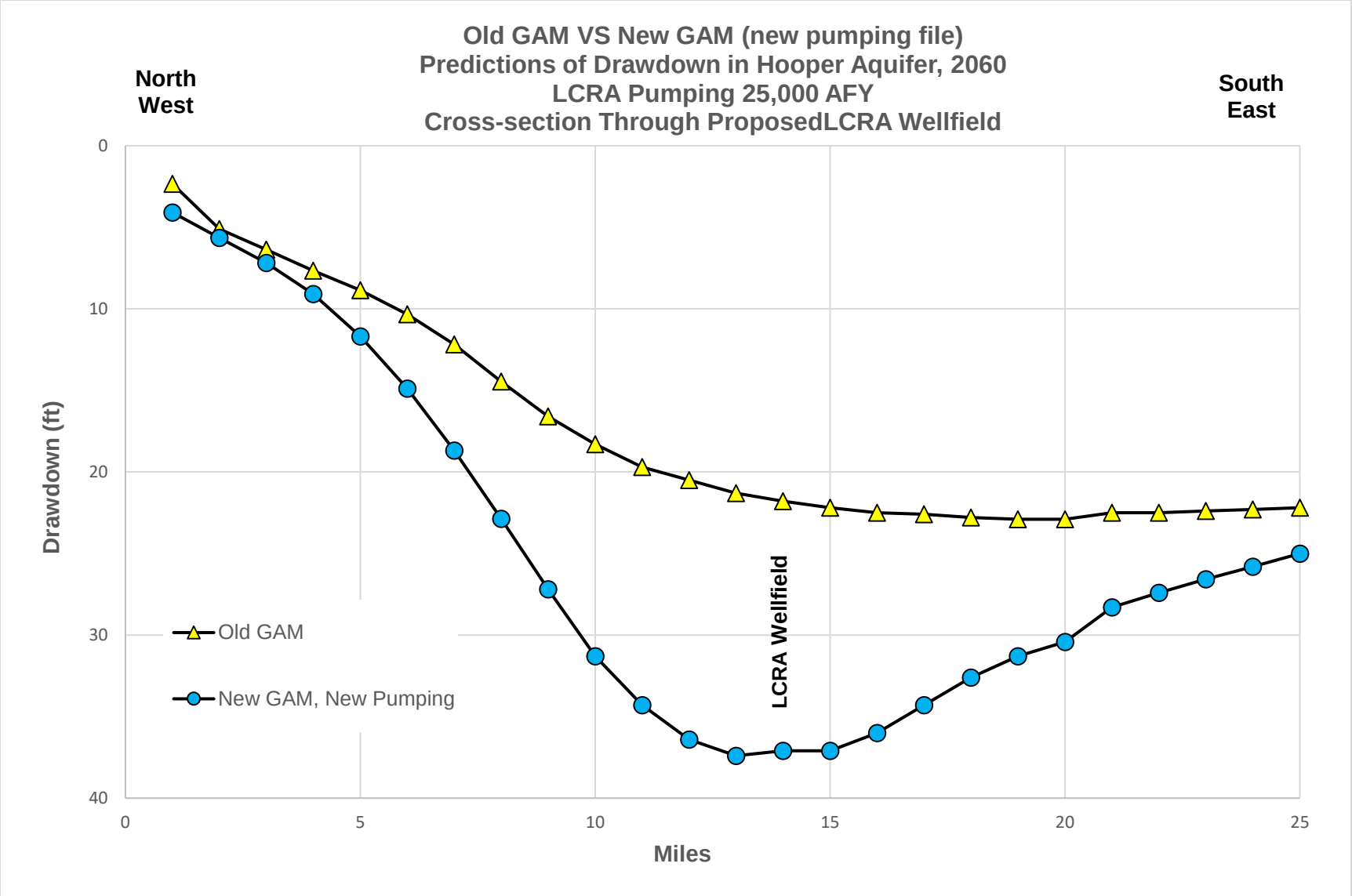
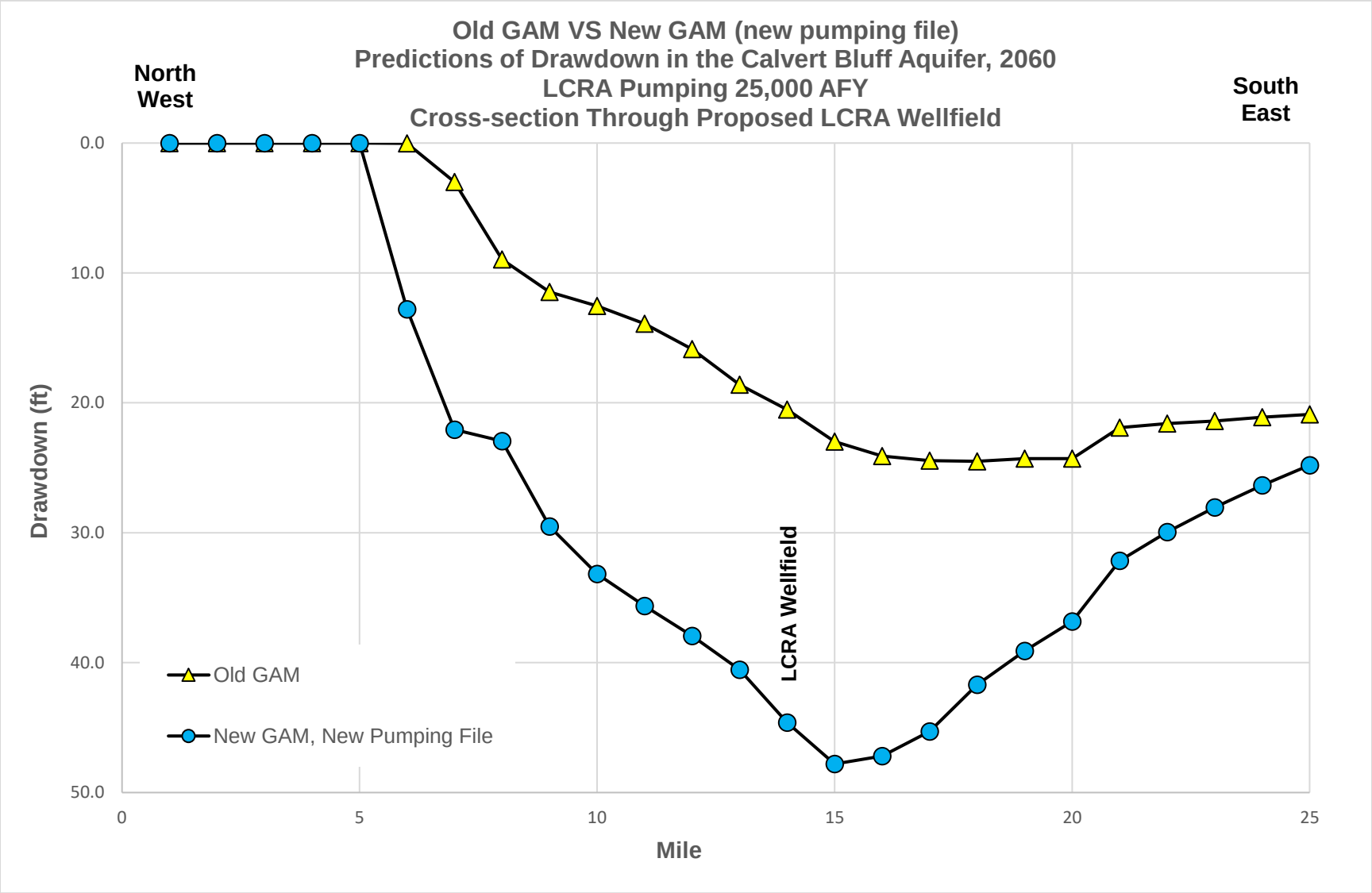

Old GAM VS New GAM (new pumping file)
Predictions of Drawdown in Hooper Aquifer, 2060
LCRA Pumping 25,000 AFY
Cross-section Through ProposedLCRA Wellfield
North West
South East
Drawdown (ft)
0
10
20
30
40
0
5
10
15
20
25
Miles
LCRA Wellfield
Old GAM
New GAM, New Pumping

EXHIBIT 123


Old GAM VS New GAM (new pumping file)
Predictions of Drawdown in the Calvert Bluff Aquifer, 2060
LCRA Pumping 25,000 AFY
Cross-section Through Proposed LCRA Wellfield
North West
South East
Drawdown (ft)
0.0
10.0
20.0
30.0
40.0
50.0
0
5
10
15
20
25
Mile
LCRA Wellfield
Old GAM
New GAM, New Pumping File

SOAH DOCKET NO. 952-19-0705

APPLICATION OF LOWER COLORADO RIVER AUTHORITY (LCRA) FOR EIGHT OPERATING AND TRANSPORT PERMITS IN BASTROP COUNTY, TEXAS	**§ § § § §**	**BEFORE THE STATE OFFICE OF ADMINISTRATIVE HEARINGS**

SUPPLEMENTAL

PRE-FILED DIRECT TESTIMONY

OF

JOSEPH TRUNGALE

ON BEHALF OF

ENVIRONMENTAL STEWARDSHIP

October 4, 2019

EXHIBIT LIST

Number	Exhibit
203	Supplemental Direct Testimony of Joseph Trungale
204	Updated Exhibit 202: Table 1: Attainment Frequencies of BS3 Flow Standards in the Lower Colorado River

SOAH DOCKET NO. 952-19-0705

APPLICATION OF LOWER COLORADO RIVER AUTHORITY FOR OPERATING AND TRANSPORT PERMITS FOR EIGHT WELLS IN BASTROP COUNTY, TEXAS	**§ § § § § §**	**BEFORE THE STATE OFFICE OF ADMINISTRATIVE HEARINGS**

SUPPLEMENTAL PREFILED TESTIMONY OF JOSEPH TRUNGALE
ON BEHALF OF ENVIRONMENTAL STEWARDSHIP

I. INTRODUCTION

Q: Please state your name.

A: Joseph F. Trungale Jr.

Q: On whose behalf are you presenting testimony in this proceeding?

A: Environmental Stewardship.

Q: Did you present prefiled direct testimony in this proceeding?

A: Yes.

II. SCOPE OF SUPPLEMENTAL TESTIMONY

Q: Please describe the general nature of your testimony.

A: I have reviewed the rebuttal testimony submitted by Leonard Oliver and Bryan Cook, on behalf of LCRA. I am offering testimony that addresses some of the points raised by Mr. Oliver regarding my prefiled testimony.

Q: Do you agree with the rebuttal testimony of Mr. Oliver?

A: Generally, the rebuttals to my initial prefiled testimony have no impact on my conclusions. However, I do not disagree with his first point, which was that my analysis failed to account for the fact that tributaries to the Colorado are intermittent, and during those times when they are dry it would be impossible for

groundwater losses to result in decrease in flows. So, I have incorporated this point into my analysis. Mr. Oliver did not limit his critique to the tributaries; however, I believe it only applies to the losses from the tributaries, since the mainstem of the Colorado is not intermittent.

Q: Have you rerun the WAM to address this concern?

A: Yes, I made adjustments to the losses from the tributaries to the groundwater by limiting these losses to the volume flow from these tributaries on a monthly basis. I made these estimates by reviewing the TCEQ naturalized flow workbooks that Mr. Oliver referenced in his testimony.

Q: Have made any other changes to the simulation that you performed?

A: Yes, I received updated estimates of groundwater-surface water exchange from Mr. Rice. These included updated estimates of both the baseline only and the baseline plus LCRA pumping simulation for both the mainstem Colorado and the tributaries. As with my original analysis, I have focused on the full baseline plus LCRA pumping scenarios, and in this simulation, the change in exchange expected to occur between 2011 and 2070.

Also, since I was rerunning the analysis, I addressed Mr. Oliver's second concern, included in his rebuttal testimony. In the new simulations, I modeled the reduction in flows from the river to the groundwater as a "channel loss" rather than as senior water rights. For this run, I modified the flow adjustment file (FAD) rather than simulating the losses as diversions.

Q: Did the results from this revised analysis change your conclusions?

A: No. My overall conclusion is that flow standards are not being met at recommended frequencies, and this permit would result in further reduction in these attainment frequencies. While there were some small changes in the results, the frequencies of meeting the flow standards are still below their recommended levels, and these shortfalls are further exacerbated by the decrease in flow as a result of the groundwater pumping. This reduction continues to be most concerning in the segments below Bastrop during spring when the base average flows, which are important for maintenance of habitat for the state-threatened Blue Sucker, drop further below already undesirable frequencies. Table 1 (Exhibit 204) is a revision of Table 1 from my original prefiled testimony, which includes the results from my original simulations and those described in this supplement.

Environmental Stewardship offers Exhibit 204.

Q: Does this conclude your testimony?

A: Yes, although I reserve the right to supplement my testimony, if new information becomes available.

EXHIBIT 204

Table 1 Attainment Frequencies of SB3 Flow Standards in the Lower Colorado River

		TARGET ATTAINMENT FREQUENCY						TARGET ATTAINMENT FREQUENCY						TARGET ATTAINMENT FREQUENCY					
		100%						80%						60%					
		SUBSISTENCE FLOWS						BASE FLOWS - DRY CONDITIONS						BASE FLOWS - AVERAGE CONDITIONS					
CP J30000	MONTH	FLOW	TCEQ3	GWP_ORG	DIFFERENCE	GWP_SUP	DIFFERENCE	FLOW	TCEQ3	GWP_ORG	DIFFERENCE	GWP_SUP	DIFFERENCE	FLOW	TCEQ3	GWP_ORG	DIFFERENCE	GWP_SUP	DIFFERENCE
		(AC-FT/MO)	% TIME MET	% TIME MET	%	% TIME MET	%	(AC-FT/MO)	% TIME MET	% TIME MET	%	% TIME MET	%	(AC-FT/MO)	% TIME MET	% TIME MET	%	% TIME MET	%
Bastrop	Jan	12,789	94.6%	94.6%	0.0%	94.6%	0.0%	19,246	85.1%	86.5%	1.4%	85.1%	0.0%	26,624	56.8%	56.8%	0.0%	56.8%	0.0%
	Feb	15,217	90.5%	87.8%	-2.7%	89.2%	-1.4%	17,605	83.8%	83.8%	0.0%	85.1%	1.4%	27,602	52.7%	50.0%	-2.7%	51.4%	-1.4%
	Mar	16,848	98.6%	95.9%	-2.7%	98.6%	0.0%	16,848	98.6%	95.9%	-2.7%	98.6%	0.0%	30,559	74.3%	70.3%	-4.1%	67.6%	-6.8%
	Apr	10,949	100.0%	98.6%	-1.4%	100.0%	0.0%	17,078	98.6%	97.3%	-1.4%	98.6%	0.0%	37,785	77.0%	75.7%	-1.4%	75.7%	-1.4%
	May	16,909	97.3%	97.3%	0.0%	97.3%	0.0%	35,601	95.9%	95.9%	0.0%	95.9%	0.0%	50,666	89.2%	90.5%	1.4%	89.2%	0.0%
	Jun	12,020	100.0%	100.0%	0.0%	100.0%	0.0%	24,873	98.6%	98.6%	0.0%	98.6%	0.0%	43,617	93.2%	91.9%	-1.4%	91.9%	-1.4%
	Jul	8,424	100.0%	100.0%	0.0%	100.0%	0.0%	21,336	98.6%	100.0%	1.4%	100.0%	1.4%	37,507	93.2%	93.2%	0.0%	93.2%	0.0%
	Aug	7,563	100.0%	100.0%	0.0%	100.0%	0.0%	11,929	100.0%	100.0%	0.0%	100.0%	0.0%	23,427	97.3%	97.3%	0.0%	97.3%	0.0%
	Sep	7,319	100.0%	100.0%	0.0%	100.0%	0.0%	14,043	98.6%	98.6%	0.0%	98.6%	0.0%	25,170	91.9%	86.5%	-5.4%	87.8%	-4.1%
	Oct	7,809	100.0%	100.0%	0.0%	100.0%	0.0%	15,064	95.9%	94.6%	-1.4%	94.6%	-1.4%	26,624	70.3%	64.9%	-5.4%	63.5%	-6.8%
	Nov	10,711	98.6%	94.6%	-4.1%	97.3%	-1.4%	16,840	70.3%	60.8%	-9.5%	60.8%	-9.5%	25,230	47.3%	45.9%	-1.4%	47.3%	0.0%
	Dec	11,437	95.9%	91.9%	-4.1%	94.6%	-1.4%	19,123	73.0%	73.0%	0.0%	73.0%	0.0%	27,669	47.3%	47.3%	0.0%	47.3%	0.0%
	Non-Attainment		6	7		6			2	2		2			4	4		4	

		SUBSISTENCE FLOWS						BASE FLOWS - DRY CONDITIONS						BASE FLOWS - AVERAGE CONDITIONS					
CP J10000	MONTH	FLOW	TCEQ3	GWP_ORG	DIFFERENCE	GWP_SUP	DIFFERENCE	FLOW	TCEQ3	GWP_ORG	DIFFERENCE	GWP_SUP	DIFFERENCE	FLOW	TCEQ3	GWP_ORG	DIFFERENCE	GWP_SUP	DIFFERENCE
		(AC-FT/MO)	% TIME MET	% TIME MET	%	% TIME MET	%	(AC-FT/MO)	% TIME MET	% TIME MET	%	% TIME MET	%	(AC-FT/MO)	% TIME MET	% TIME MET	%	% TIME MET	%
Columbus	Jan	20,906	100.0%	100.0%	0.0%	100.0%	0.0%	29,944	68.9%	68.9%	0.0%	68.9%	0.0%	50,912	50.0%	50.0%	0.0%	50.0%	0.0%
	Feb	20,826	94.6%	93.2%	-1.4%	94.6%	0.0%	32,767	64.9%	60.8%	-4.1%	60.8%	-4.1%	49,706	45.9%	44.6%	-1.4%	44.6%	-1.4%
	Mar	23,058	98.6%	95.9%	-2.7%	97.3%	-1.4%	32,281	73.0%	70.3%	-2.7%	71.6%	-1.4%	62,717	50.0%	44.6%	-5.4%	45.9%	-4.1%
	Apr	17,792	100.0%	100.0%	0.0%	100.0%	0.0%	32,965	93.2%	91.9%	-1.4%	93.2%	0.0%	58,136	52.7%	47.3%	-5.4%	48.6%	-4.1%
	May	26,132	100.0%	100.0%	0.0%	100.0%	0.0%	59,397	93.2%	94.6%	1.4%	93.2%	0.0%	80,918	86.5%	83.8%	-2.7%	85.1%	-1.4%
	Jun	31,775	100.0%	100.0%	0.0%	100.0%	0.0%	57,540	93.2%	93.2%	0.0%	93.2%	0.0%	85,686	85.1%	85.1%	0.0%	85.1%	0.0%
	Jul	21,029	100.0%	100.0%	0.0%	100.0%	0.0%	35,048	98.6%	98.6%	0.0%	98.6%	0.0%	55,031	87.8%	83.8%	-4.1%	85.1%	-2.7%
	Aug	11,683	100.0%	100.0%	0.0%	100.0%	0.0%	19,061	100.0%	97.3%	-2.7%	100.0%	0.0%	31,728	90.5%	86.5%	-4.1%	85.1%	-5.4%
	Sep	16,602	100.0%	100.0%	0.0%	100.0%	0.0%	24,099	100.0%	98.6%	-1.4%	98.6%	-1.4%	36,298	82.4%	77.0%	-5.4%	78.4%	-4.1%
	Oct	11,683	100.0%	100.0%	0.0%	100.0%	0.0%	21,890	91.9%	86.5%	-5.4%	83.8%	-8.1%	45,562	62.2%	54.1%	-8.1%	56.8%	-5.4%
	Nov	12,020	97.3%	97.3%	0.0%	100.0%	2.7%	28,562	50.0%	44.6%	-5.4%	45.9%	-4.1%	44,926	43.2%	43.2%	0.0%	43.2%	0.0%
	Dec	18,508	94.6%	91.9%	-2.7%	91.9%	-2.7%	28,530	62.2%	58.1%	-4.1%	59.5%	-2.7%	45,316	41.9%	35.1%	-6.8%	36.5%	-5.4%
	Non-Attainment		4	4		3			5	5		5			6	7		7	

		SUBSISTENCE FLOWS						BASE FLOWS - DRY CONDITIONS						BASE FLOWS - AVERAGE CONDITIONS					
CP K20000	MONTH	FLOW	TCEQ3	GWP_ORG	DIFFERENCE	GWP_SUP	DIFFERENCE	FLOW	TCEQ3	GWP_ORG	DIFFERENCE	GWP_SUP	DIFFERENCE	FLOW	TCEQ3	GWP_ORG	DIFFERENCE	GWP_SUP	DIFFERENCE
		(AC-FT/MO)	% TIME MET	% TIME MET	%	% TIME MET	%	(AC-FT/MO)	% TIME MET	% TIME MET	%	% TIME MET	%	(AC-FT/MO)	% TIME MET	% TIME MET	%	% TIME MET	%
Wharton	Jan	19,369	100.0%	100.0%	0.0%	100.0%	0.0%	30,252	73.0%	73.0%	0.0%	73.0%	0.0%	51,527	58.1%	56.8%	-1.4%	56.8%	-1.4%
	Feb	16,828	98.6%	98.6%	0.0%	100.0%	1.4%	33,156	71.6%	63.5%	-8.1%	63.5%	-8.1%	50,317	48.6%	47.3%	-1.4%	47.3%	-1.4%
	Mar	12,543	98.6%	97.3%	-1.4%	98.6%	0.0%	32,650	62.2%	62.2%	0.0%	62.2%	0.0%	63,701	44.6%	43.2%	-1.4%	43.2%	-1.4%
	Apr	16,066	98.6%	98.6%	0.0%	100.0%	1.4%	33,382	59.5%	58.1%	-1.4%	59.5%	0.0%	60,159	48.6%	44.6%	-4.1%	44.6%	-4.1%
	May	18,692	100.0%	100.0%	0.0%	100.0%	0.0%	60,565	54.1%	51.4%	-2.7%	55.4%	1.4%	85,898	44.6%	44.6%	0.0%	44.6%	0.0%
	Jun	22,076	97.3%	94.6%	-2.7%	97.3%	0.0%	58,552	60.8%	56.8%	-4.1%	56.8%	-4.1%	89,970	32.4%	33.8%	1.4%	33.8%	1.4%
	Jul	13,035	97.3%	94.6%	-2.7%	95.9%	-1.4%	35,478	79.7%	75.7%	-4.1%	71.6%	-8.1%	55,708	44.6%	40.5%	-4.1%	37.8%	-6.8%
	Aug	6,579	98.6%	98.6%	0.0%	98.6%	0.0%	19,307	79.7%	77.0%	-2.7%	77.0%	-2.7%	32,097	73.0%	70.3%	-2.7%	70.3%	-2.7%
	Sep	11,187	98.6%	94.6%	-4.1%	97.3%	-1.4%	24,397	73.0%	67.6%	-5.4%	67.6%	-5.4%	36,714	51.4%	50.0%	-1.4%	48.6%	-2.7%
	Oct	9,039	98.6%	98.6%	0.0%	100.0%	1.4%	22,136	71.6%	67.6%	-4.1%	68.9%	-2.7%	46,054	48.6%	44.6%	-4.1%	45.9%	-2.7%
	Nov	10,294	98.6%	97.3%	-1.4%	100.0%	1.4%	28,919	62.2%	58.1%	-4.1%	59.5%	-2.7%	45,461	41.9%	40.5%	-1.4%	40.5%	-1.4%
	Dec	12,420	97.3%	93.2%	-4.1%	94.6%	-2.7%	28,899	68.9%	66.2%	-2.7%	66.2%	-2.7%	45,870	54.1%	48.6%	-5.4%	50.0%	-4.1%
	Non-Attainment		10	10		6			12	12		12			11	11		11	