Draft Memorandum

To:URGWOM Technical Team MembersDate:March 10, 2022Subject:Notes of the March 8, 2022 URGWOM Technical Team Meeting

These notes summarize the items discussed during the March 8, 2022 meeting of the Upper Rio Grande Water Operations Model (URGWOM) Technical Team. The meeting began at 9:00 am and was conducted as an on-line collaboration hosted by the Corps of Engineers using Microsoft Teams software. All those participating in the meeting introduced themselves and their names and affiliation are listed on the last page of these meeting notes.

This month's meeting agenda includes a discussion on potential itineraries for the Technical Team Spring 2022 inspection trip, modeling of the 2022 MRGCD irrigation operations and general updates on ongoing URGWOM related activities from the Corps of Engineers, the Bureau of Reclamation, the U. S. Geological Survey and the Interstate Stream Commission.

Miller presented to the Tech Team two potential alternative itineraries for the Spring, 2022 Technical Team field inspection. One alternative for inspection it the middle valley between Cochiti Dam and Corrales and the second alternative is the Santa Fe River Basin.

The inspection of the Cochiti to Corrales reach would include MRGCD diversion works at Cochiti and Angostura, USGS stream gage locations at Cochiti and San Felipe, the Sandia Lakes wasteway and other sites. Miller reported that it had been a number of years since the Technical Team visited the features in the Cochiti to Corrales reach; the Technical Team visited the Corrales to Bernardo reach in July, 2021. An inspection tour of the Cochiti to Corrales reach would cross the land of five of the Middle Rio Grande Pueblos and stops on Pueblo land may require that the Pueblo be notified of the Team's visit to the area.

The inspection of sites in the Santa Fe River basin include Nichols and McClure Reservoirs, streamgages above and below McClure Reservoir and the Rio Grande diversion at Buckman. Reclamation has been working with the City of Santa Fe to incorporate City water supply features into the URGWOM model, although the Santa Fe River basin has not yet been added to the official model. Miller proposed that the field inspection take place on the day normally scheduled for the regular Technical Team meeting during May which is May 10, 2022.

Lucas reported that he has been sorting the URGWOM Technical Team files from the myUSGS site for cataloging on the Technical Team SharePoint site. No Technical Team files have been deleted. When the sorting process has been complete Lucas will present a status report to the Technical Team.

Lucas presented the March 1, 2022 AOP model run results. The presentation consisted of hydrographs of storage, inflow and outflow at the major reservoirs and hydrographs of discharge at major stream gages. Lucas highlighted the following:

- Initial San Juan-Chama Project allocation is 65% of full supply;
- Abiquiu Reservoir will store 15,000 acre-feet of Pueblo Prior and Paramount storage;
- Storage of Usable Water in Elephant Butte Reservoir may exceed 400,000 acre-feet for a few days, depending upon the pattern of irrigation demand;
- The official 2022 model will be based on the April 1, 2022 runoff forecast.

Marc reported that he is working on a script that would call for the storage of Prior and Paramount Pueblo water to be made in Abiquiu at or near the time of peak runoff so as to obviate the need for release from Abiquiu Reservoir at channel capacity. Marc suggested a meeting to review existing scripts used in the model especially for the benefit of new model users.

Cindy had no updates from NMISC to present at the meeting, and she asked Nick to brief the Team on the model work that Hydros is performing for NMISC.

Nick reported on the simulation of the MRGCD 2022 irrigation season operations. The principal changes for 2022 include a new irrigation schedule and the limitation of maximum diversion amount to less than 50% of the natural flow, until the river begins to dry. These changes have not yet been incorporated into the official model.

A new slot will be added to implement the updated diversion for MRGCD irrigation start dates, which are April 4th for the Cochiti and Angostura Divisions, March 28th for the Belen Division and March 21st for the Socorro Division. A new rule would also be added to include a diversion pause and resume function.

Nick described the new script that will be added to implement the MRGCD irrigation diversion limitation to 50% of the natural flow. This script could be set to any value and is not limited to the 50% value. Marc suggested that the new irrigation start date schedule could be adopted into a general set of demands that would be based on dry, average and wet conditions. These conditions are currently not in the AOP model that Lucas is using and he requested more information from Marc on that topic.

Nick also reported:

- The historical model runs have been extended to include the year 2021 to enable the initialization of the deep aquifer groundwater levels for the start of 2022.
- Hydros has reviewed the San Marcial to Elephant Butte model reach and have found that there are two local inflow slots in this reach. Team members are uncertain about the origin of the second slot but the general consensus of the Team members was to simply turn of the redundant local inflow slot.

In response to an inquiry about an easy way to import or export subbasins, David responded by saying that this could not be easily completed.

Cindy reported that other ongoing NMISC activities includes work on the simulation of fallowing of irrigated land, including exploring the option of leaving water not required because of the fallowing of irrigated land in the canals. Current land fallowing activity includes the return of irrigation water not required for fallow lands to the Rio Grande via wasteways. The Team also discussed options that would make it easier to account for the reduced (fallowed) acreages (e.g., fixed percentage or identification and elimination of individual parcels).

The next meeting of the Technical Team is scheduled for April 12, 2022, beginning at 9:00 am.

There being no additional matters to be brought before the Team, the meeting was adjourned at about 10:20 am.

ATTENDANCE LIST URGWOM TECHNICAL TEAM MEETING March 8, 2022

NAME	<u>REPRESENTING</u>
Marc Sidlow	USACE, Albuquerque District
Prakash Kaini	USACE, Albuquerque District
Gannon Price	USACE, Albuquerque District
William Miller	Southwest Water Design/USACE Contractor
Mike Brown	Tetra Tech/USACE Contractor
Carolyn Donnelly	Bureau of Reclamation
Lucas Barrett	Bureau of Reclamation
Andrew Gelderloos	Bureau of Reclamation
Jerry Melendez	Bureau of Reclamation
David Neumann	CADSWES
Nick Mander	Hydros Consulting
Cindy Stokes	NM Interstate Stream Commission
Dave Moeser	NM Water Science Center
Mark Kelly	Albuquerque Bernalillo County Water Utility
	Authority
Diane Agnew	Albuquerque Bernalillo County Water Utility
	Authority
Steve Schultz	City of Santa Fe
Zhuping Sheng	Paso del Norte Watershed Council
Aaron Beutler	Keller-Bliesner Engineering/BIA Contractor

O GRANDL WATER OPERATIONS MODEL

HNICAL TEAM MEETING

March 7, 2022

2022 SPRING FIELD TRIP PROPOSED ITINERARIES

MRG Cochiti to Conale

Santa Fe River Basin





UPPER RIO GRANDE WATER OPERATIONS MODEL REPORT TO TECHNICAL TEAM Spring, 2022 Field Inspection

Middle Rio Grande, Cochiti Dam to Corrales:

- MRGCD Diversions Cochiti East Side Main Canal and Sili Main Canal
- USGS gage Rio Grande b/l Cochiti Dam
- USGS gage Rio Grande at San Felipe
- MRGCD Angostura Diversion Works
- Corrales Siphon
- AMAFCA North Floodway Channel outfall
- Sandia Lakes wasteway.

Rio Grande below Cochiti DamSili Main Canal Cochiti East Side Main Canal

Rio Grande at San Felipe

MRGCD Angostura Diversion Dam

Corrales Siphon

Sandia Lakes Wasteway

AMAFCA North Diversion Channel Outfall Upper Corrales Riverside Drain Outfall

Santa Fe River Basin

Santa Fe City / County Works:

- 1. McClure Reservoir on Santa Fe River
- 2. USGS Gage Santa Fe River nr. Santa Fe
- 3. Nichols Reservoir on Santa Fe River
- City / County Rio Grande diversion works at Buckman

- Other field inspection ideas?
- Coordination with Pueblo Representatives
- Field inspection schedule proposed as May, 2022 Tech Team meeting.



Modeling 2022 MRGCD Operations in URGWOM

Hydros Consulting, Inc. 3/8/22



Introduction

MRGCD river demands are the same in every year's AOP run.



MRGCD on-farm demands begin as soon as the CIR goes above 0



Introduction continued



- There is no easy way to model a variable start or end date
- NMISC communications with MRGCD:

	2022 Diversion	2022 Irrigation
Diversion	Start Date	Start Date
Cochiti	March 28th	April 4th
Angostura		
(BlwSanFelipe)	March 28th	April 4th
Isleta	March 7th	March 28th
Socorro (San Acacia)	March 14th	March 21st

- MRGCD river diversions will begin much earlier than irrigation in 2022. Partly to "charge" the canals.
- In 2022, MRGCD is also limiting its diversions <50% of the native flow below Cochiti</p>
 - This limitation will end if the river is going dry anywhere in the Middle Valley

River Demands



1) New river demands developed by NMISC and BOR after talking with MRGCD

		C MRG <u>E</u> ile <u>E</u> di	iCD.SyntheticDiv t <u>R</u> ow <u>⊂</u> olum	ersions n Vie <u>w</u> A <u>d</u> jus	st.							-	
				iversions									
			Value: 0	1461310113									
			cls	EastSideMain	AlbMainCanal cfs	AtriscoFeeder cfs	ChicalLateral cfs	ChicalAcequia cfs	Peralta cfs	CaciqueAcequia cfs	BelenHLC cfs	CanalDiv cfs	LowFlowDiv cfs
		0:00 Mar	4 0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0:00 Mar	5 0.00	7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0:00 Mar	6 0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0:00 Ma	n 7 0.00	д	0.00	0.00	0.00	0.00	47.90	0.00	50.42	0.00	0.00
		0:00 Mar	8 0.00	7	0.00	0.00	0.00	0.00	47.90	0.00	50.42	0.00	0.00
		0:00 Mar	9 0.00	0.00	0.00	0.00	0.00	0.00	47.90	0.00	50.42	0.00	0.00
	Diversion Start	Irrigation Sta	nt 0.00	0.00	0.00	0.00	0.00	0.00	47.90	0.00	50.42	0.00	0.00
Diversion	Dato	Date	0.00	0.00	0.00	0.00	0.00	0.00	47.90	0.00	50.42	0.00	0.00
		Dale	0.00	0.00	0.00	0.00	0.00	0.00	47.90	0.00	50.42	0.00	0.00
Cochiti	March 28th	April 4th	0.00	0.00	0.00	0.00	0.00	0.00	47.90	0.00	50.42	50.42	0.00
Angostura			0.00	0.00	0.00	0.00	0.00	0.00	47.90	0.00	50.42	50.42	0.00
(BlwSanFelipe)	March 28th	April 4th	0.00	0.00	0.00	0.00	0.00	0.00	47.90	0.00	50.42	50.42	0.00
	Marah 7th	Marab 29th	0.00	0.00	0.00	0.00	0.00	0.00	47.90	0.00	50.42	50.42	0.00
ISIEta		IVIAI CIT ZOUT	0.00	0.00	0.00	0.00	0.00	0.00	47.90	0.00	50.42	50.42	0.00
Socorro (San Acacia)	March 14th	March 21st	0.00	0.00	0.00	0.00	0.00	0.00	47.90	0.00	50.42	50.42	0.00
		0:00 Mar	20 0.00	0.00	0.00	0.00	0.00	0.00	47.90	0.00	50.42	50.42	0.00
		0:00 Mar	21 0.00	0.00	0.00	0.00	0.00	0.00	47.90	0.00	50.42	50.42	0.00
		0:00 Mar	22 0.00	0.00	0.00	0.00	0.00	0.00	47.90	0.00	50.42	50.42	0.00
		0:00 Mar	23 0.00	0.00	0.00	0.00	0.00	0.00	47.90	0.00	50.42	50.42	0.00
		0:00 Mar	24 0.00	0.00	0.00	0.00	0.00	0.00	47.90	0.00	50.42	50.42	0.00
		0:00 Mar	25 0.00	0.00	0.00	0.00	0.00	0.00	47.90	0.00	50.42	50.42	0.00
		0:00 Mar	26 0.00	0.00	0.00	0.00	0.00	0.00	47.90	0.00	50.42	50.42	0.00
		0:00 Mar	27 0.00	0.00	0.00	0.00	0.00	0.00	47.90	0.00	50.42	50.42	0.00
		0:00 Ma	ir 28 20.17	30.25	40.33	5.04	0.00	0.00	47.90	0.00	50.42	50.42	0.00
		0:00 Mar	29 20.17	30.25	40.33	5.04	0.00	0.00	47.90	0.00	50.42	50.42	0.00
			2017	50.751	ALC 33	5.114					50.42	50.42	

P&P Start Date



2) P&P start dates also changed to March 7th:

【 PandP.Daily	/DemandForCall(CalcPeriodic
File Edit Ro	ow Column Vie	ew Adjust
••••	DailyDemandForC	allCalcPeriodic
Valu	e: 20.120000839	2163
	DemandCurve cfs	
0:00 Mar 1	0.00	
0:00 Mar 2	0.00	
0:00 Mar 3	0.00	
0:00 Mar 4	0.00	
0:00 Mar 5	0.00	
0:00 Mar 6	0.00	
0:00 Mar 7	20.12	
0:00 Mar 8	22.71	
0.00 Mar 0	25.11	



Irrigation Start Date



3) New irrigation start dates

Added a new slot to URGWOM:

			2022 Diversion		2022 Irrigatio				
	Diversion		Start Date		Sta	rt Date			
	Cochiti	M	arch 28	th	Ap	oril 4th			
	Angostura								
(E	BlwSanFelipe)	M	arch 28	th	Ap	oril 4th			
	Isleta	N	larch 71	:h	Mar	ch 28th			
Soco	orro (San Acac	ia) Ma	arch 14	th	Mar	rch 21st			
K MRGCD.In	rigationDates					—			
File Edit R	File Edit Row Column View Adjust								
	IrrigationDates								
Valu	ie: 134352000.609375					Mo	nthAnd		
Edit Date/Time	Slot Values:								
1st		~	January			~	App		
	BlwCochitiDepletions MonthAndDay	BlwSanFelipeDe MonthAndDay	pletions	BlwIsletaD MonthAndl	epletions Day	SanAcaciaDepletion MonthAndDay	s		
0: startdate	April 4		April 4		March 28	Man	ch 21		
1: pausedate	December 31	C	ecember 31		December 31	Decemb	er 31		
2: resumedate	December 31	C	ecember 31	I	December 31	Decemb	er 31		



4) New initialization rule to set the start date for irrigation (or pause and resume irrigation in a scenario study)

8 R 43 MRGCDIrrigationDates
Set Value Flag: Rules (R) 🗸
FOR (STRING subbasin IN { "BlwCochitiDepletions" , "BlwSanFelipeDepletions" , "BlwIsletaDepletions" , "SanAcaciaDepletions" }) DO
FOR(OBJECT area IN ListSubbasin(subbasin))DO
WITH (DATETIME DayBeforeStartDate = PreviousTimestep (CompletePartialDate (NumberToDate (MRGCD.IrrigationDates ["startdate", subbasin]), @"t")))DO
WITH (DATETIME PauseDate = CompletePartialDate (NumberToDate (MRGCD.IrrigationDates ["pausedate", subbasin]), @"t"))DO
WITH (DATETIME DayBeforeResumeDate = PreviousTimestep (CompletePartialDate (NumberToDate (MRGCD.IrrigationDates ["resumedate", subbasin]), @"t")))DO
FOR (DATETIME date IN (@"t" TO DayBeforeStartDate) UNION (PauseDate TO DayBeforeResumeDate)) DO
IF (NOT IsInput (area . "Diversion Requested" , date)) THEN
area . "Diversion Requested" [date] = 0.00000000 "cfs"
END IF
END FOR
END WITH
END WITH
END WITH
END FOR
END FOR





Can control what % of native flow below Cochiti MRGCD is limited to:



Added end date for this logic:

【 MRGCD1.DateToEndPercentOfBlwCochitiNativeWaterR — 🛛 🗆	\times
File Edit View	R
DateToEndPercentOfBlwCochitiNativeWaterRule	
Value: December 31//// Month	AndDay
Edit Date/Time Slot Values:	
31st V December V A	pply
Show: Description	
After this date, MRGCD diversions will no longer be restricted if they exceed a % of BlwCochiti native flow.	the

50% rule continued



R 70 LimitMRGCDDiversionsToPercentOfCochitiNativeFlow S WITH / LIST MRGCDdiversions DO = ListSubbasin ("MiddleRioGrandeDiversions") UNION {SanAcaciaDiversions:CanalDiv} WITH / LIST MRGstreamgages DO = ListSubbasin ("MRG River Gages" WITH / NUMERIC totalMRGCDdiversion DO = Sum (MAPLIST (OBJECT diversion IN MRGCDdiversions) DO diversion . "Diversion" END MAPLIST IF /# check if the sum of all the MRGCD (and San Acacia) diversions are more than a % of the THEN. # BlwCochiti Native water totalMRGCDdiversion > BlwCochitiDiversionsReach^RioGrande.Inflow * MRGCD.PercentOfBlwCochitiNativeWaterAvailableToDivert AND # make sure the river is not dry at ANY of the Middle Valley gages. MinItem / MAPLIST (OBJECT gage IN MRGstreamgages) DO) > 5.0000000 "cfs" gage . "Gage Inflow" END MAPLIST AND # this reduction will only occur before a user-input End Date @"t" <= NumberToDate (MRGCD.DateToEndPercentOfBlwCochitiNativeWaterRule []) WITH / NUMERIC reductionFraction DO = BlwCochitiDiversionsReach^RioGrande.Inflow * MRGCD.PercentOfBlwCochitiNativeWaterAvailableToDivert totalMRGCDdiversion FOR (OBJECT diversion IN MRGCDdiversions) DO diversion . "Diversion Requested" = diversion . "Diversion" * reductionFraction END FOR END WITH END IF END WITH END WITH END WITH

Results



River diversion start dates

Diversion	Diversion Start Date		BlwCochitiDivers :EastSideMain .Diversion Reque	sions 🗵 ested
Cochiti	March 28th	03-25-2022 Eri	0.00	RIR
Angostura (<u>BlwSanFelipe</u>)	March 28th	03-26-2022 Sat	0.00	RIR
Isleta	March 7th	03-27-2022 Sup	0.00	RIR
Socorro (San Acacia)	March 14th	03-28-2022 Mon	60,00	RIR
		03-29-2022 Tue	60.00	RIR

Irrigation start dates

Diversion	Irrigation Start Date	
Cochiti	April 4th 🔪	
Angostura (BlwSanFelipe)	April 4th	
Isleta	March 28th	
Socorro (San Acacia)	March 21st	
ostura (<u>BlwSanFelipe)</u> Isleta ocorro (San Acacia)	April 4th March 28th March 21 <i>s</i> t	

	CochitiWestSideAgDeplet .Total Depletion cfs	ions 🗵
04-01-2022 Fri	0.00	00
04-82-2022 Sat	0.00	0.0
04-03-2022 Sup	0.00	O 181
04-04-2022 Mon	2,75	O 181
04-05-2022 Tue	1.83	O 181

etions 🔝

Results (continued)



Pause and resume irrigation dates (NOT part of 2022 Operations, but testing for future scenario studies):





50% rule:







Adding to AOP Run



A Script can automatically add these features to an AOP run

【 Sc	ript Dashboard: 2022 MRGCD Operations	—		×
*	file Edit			<
2022	MRGCD Operations			^
Sets uj 02162) the 2022 MRGCD operations, as described in the "Draft Memo MRGCD Variable Start Dates a 122.docx" memo	nd 50perce	ent rule	~
	Delete the MRGCD data object			^
	The current action has paused script execution.			
	Import the NEW MRGCD.object			
	which has updated Synthetic Diversions, and new slots: IrrigationDates, PercentOfBlwCochitiNativeWaterAvailableToDivert, DateToEndPercentOfBlwCochitiNativeW	'aterRule sl	lot	
	The current action has paused script execution.			_
	Set the PandP.DailyDemandForCallCalcPeriodic to 0 cfs through March 6th			
	Set DandD DateToReginDandDIrrigation to March 7th			



