



WATER MASTER REPORT

GALLINAS RIVER

2008

Luis Pedro Aguirre

Gallinas River Water Master



STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER

Santa Fe

John R. D'Antonio, Jr., P.E.
State Engineer

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March 13, 2009

Mr. John R. D'Antonio, Jr. P.E.
State Engineer
Office of the State Engineer
P.O. Box 25102
Santa Fe, N.M. 87504

Re: 2008 Gallinas River Watermaster Report

Dear Mr. D'Antonio:

Please find attached the 2008 Gallinas River Watermaster Report. The report includes estimated water use, discussions on river and infrastructure conditions, meetings and matters to be addressed in 2009.

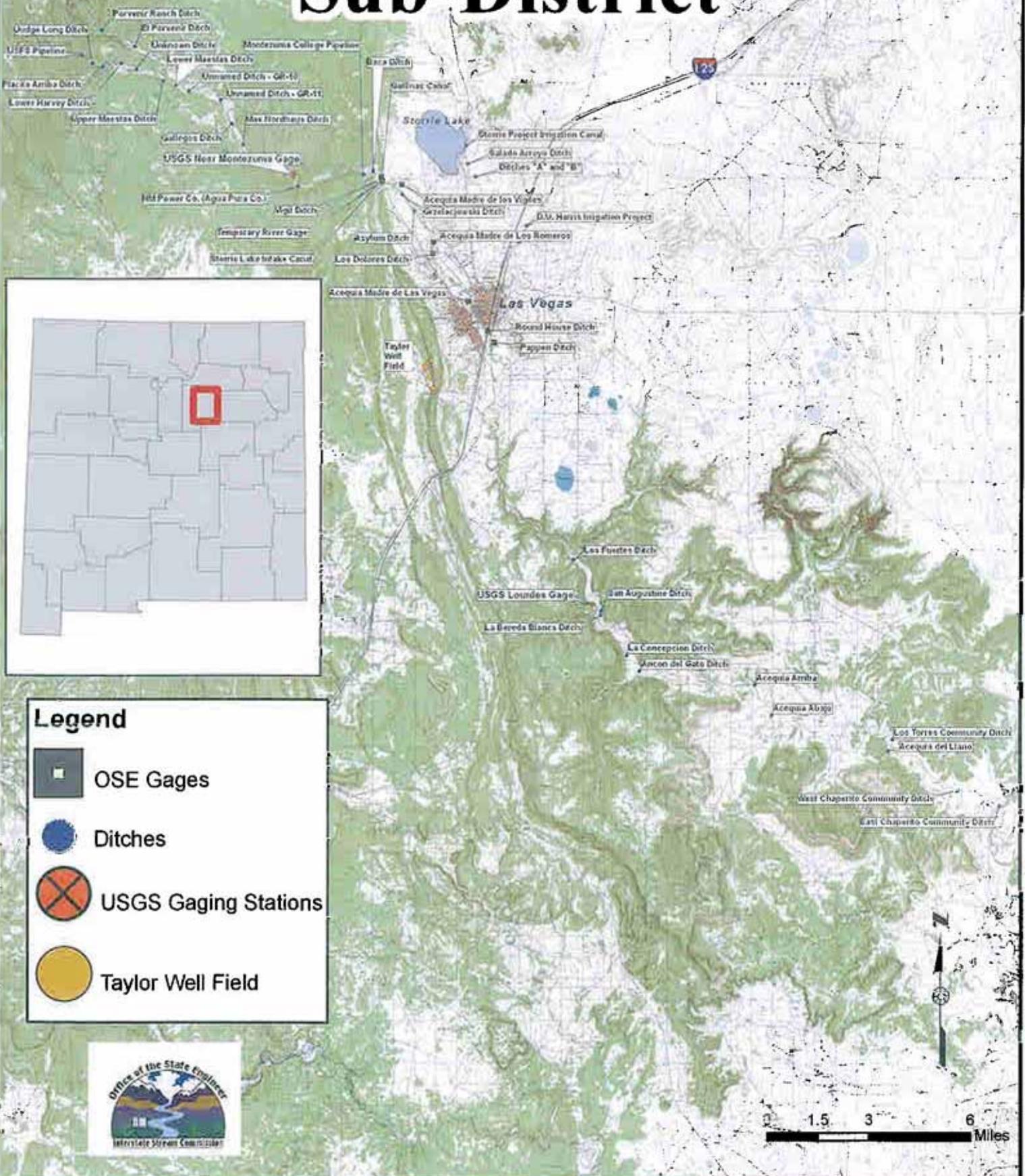
I appreciate your guidance on the diverse water rights challenges we faced in 2008, and, I am thankful for the opportunity to represent the Office of the State Engineer and the State of New Mexico in the Gallinas River basin.

Sincerely,

A handwritten signature in black ink that reads "Luis Pedro Aguirre".

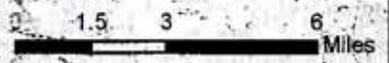
Luis Pedro Aguirre
Gallinas River Watermaster

Rio Gallinas Water Master Sub-District



Legend

-  OSE Gages
-  Ditches
-  USGS Gaging Stations
-  Taylor Well Field



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SUMMARY

In 2008, the Gallinas River experienced above average flows due to a higher than average snow pack and the subsequent spring snowmelt followed by timely rains during the summer. Las Vegas area precipitation during the irrigation season was 13.82 inches in 2008, falling mostly in July and August. The spring snowmelt runoff from April to June and rains from July to September provided average daily flows above 15 cubic feet per second (cfs). Rotation among the diverters in the Las Vegas area (“the middle Gallinas section”) was needed from June 12 to July 15 and after September 21 when flows fell below 15 cfs. The City of Las Vegas stopped diverting several times during the irrigation season for a total of 34 days.

The Office of the State Engineer (OSE) Water Master had numerous meetings throughout 2008. In March two public meetings were held; the first to release the 2007 Water Master Report, and the second was a public forum where other federal and state agencies talked about their assistance programs for diverters. There were multiple meetings with all the diverters, together and individually, to discuss ditch metering agreements, rotations and ditch rehabilitation. The OSE also met with the Rio Gallinas Acequia Association (RGAA) in an attempt to convince more Acequias to sign metering agreements. The OSE is continuing to meet with the RGAA.

At this time the OSE currently has agreements signed by four ditches. Meanwhile, the OSE has installed temporary staff gages in order to obtain an estimate of individual diversions and the Gallinas River water budget. An additional 8 staff gages were installed in 2008 for a total of 21 sites. A total of 1,612 readings were taken at these 21 sites in 2008.

INTRODUCTION

The State Engineer has the broad authority to administer water rights and is specifically provided for the Gallinas River by NMSA 1978, Sections 72-3-1 (1919) and 72-3-2 (1907). Administration in the Gallinas River was established by declaration of the Gallinas River Water Sub-district of the Pecos River Stream System filed as Order 19.26.11, which became effective August 29, 2003.

The Gallinas River basin is located in north-central New Mexico. The Gallinas River headwaters are located on the eastern side of the Sangre de Cristo Mountains, at an elevation of approximately 11,660 feet. From its headwaters, the river traverses southeasterly approximately 85 miles and enters the Pecos River six miles upstream of the Village of Colonias. The City of Las Vegas (COLV) is located in the north-central part of the drainage basin (Page i).

The Gallinas River has no major perennial tributaries. The larger tributaries are the Porvenir Canyon, Trout Springs, Cañon Bonito, the Pecos Arroyo, and Aguilar Creek. The drainage basin of the Gallinas River and its tributaries contains approximately 610 square miles.

The Gallinas River Water Master of the Office of the State Engineer has the responsibility of managing the Gallinas River. For management purposes, the Gallinas River is divided in three separate areas. The following diverters currently recognized are:

The Area below USGS Lourdes gage
(the Lower Gallinas Area):

- San Augustin Comm. Ditch
- Stacey Montano
- Archie Allemand
- La Concepcion Ditch
- Ancon del Gato Ditch
- Acq. Arriba de La Liendre and
- West Chaperito Ditch

The Gallinas Canyon Area
(the Upper Gallinas Area):

- Judge Long Ditch
- Placita Arriba Ditch
- Upper Maestes Ditch
- El Porvenir Ditch
- Gallegos Ditch
- Max Nordhaus Ditch and
- Trout Springs Ranch

The Las Vegas Area
(the Middle Gallinas Area):

- City of Las Vegas
- United World College
- Gallinas Canal
- Agapito Vigil Ditch
- Storrie Project WUA
- Acequia Madre de Los Vigiles
- Grzelachowski Ditch
- Acequia Madre de Los Romeros
- Cleo Fresquez
- Nuestra Senora de los Dolores
- Acequia Madre de Las Vegas
- Roundhouse Ditch and
- Pappen Ditch

There is an ongoing adjudication process in the Gallinas River basin; therefore, this listing of diversions is subject to changes as the court recognizes water rights.

HYDROLOGY

Installation and Measurement of Flow Measuring Gages

In 2008 the OSE expanded the staff gage coverage. In addition to the eleven (11) staff gages that the OSE placed in 2007, the OSE installed eight (8) additional staff gages. Six staff gages were installed in acequias and 1 each were installed in the Gallinas River and Pecos Arroyo. The OSE relocated two (2) previously installed staff gages to other locations on the acequias and reinstalled one (1) staff gage that had been removed to clean their ditch.

On January 17, 2008 the OSE sent a letter to water users encouraging them to read their staff gages and to be able to control their points of diversion (Attachment A-14). During the March 5, 2008, release of the 2007 Water Master Report, and at individual meetings with acequias throughout the year, Alan Cuddy, the OSE Gallinas River Hydrologist, explained how to read the staff gages. As a result, three mayordomos collected and reported a total of 139 readings.

The OSE also contracted with New Mexico Highlands University (NMHU). Under the supervision of Dr. Mike Myers, his students: Bildad Eyong, William Jaremko-Wright, Chemanji Shu-Nyamboli, and Carlos Ray Herrera measured flows at staff gage locations to develop or refine the staff gage rating curves. NMHU also collected 469 staff gage readings throughout the irrigation season. One student, Bildad Eyong, presented a poster on their work at the 2008 New Mexico Water Research Symposium (Attachment A-06). In addition to the above reported readings the Gallinas River Water Master collected 1,004 readings of the staff gages at all 21 sites located in, 17 acequias, 3 in streams and at the USGS Lourdes gage (Attachment A-12). Eight other water users with no staff gauges, self-reported their diversions by different means. The City of Las Vegas is currently the only water user that has a totalizing flow meter at their point of diversion. While staff gages provide us with valuable flow information, the installation of flumes and other flow measuring devices with continuous data recorders will provide more accurate data.

Precipitation and Stream flows

The precipitation for the Las Vegas area in 2008 was 15.61 inches (Attachment A-07). For the irrigation season, there were 13.82 inches of precipitation (Attachment A-08) and 11.46 inches of effective precipitation (Attachment A-09). For the irrigation season of April 1 - October 31, the Gallinas River flows measured at the USGS Montezuma gage were 12,548.23 acre-feet. The spring runoff provided average daily flows above 15 cfs, measured at the USGS Montezuma gage, from April 1 – June 11 and timely rains in the summer provided them from July 16 – September 20 (Attachment A-03). There were two events where the stream flow exceeded 250 cfs (Attachment A-04). The first event that occurred on August 11, 2008 recorded flows greater than 250 cfs, which was a 6-month flood event and the second event on September 1, 2008, the flows were greater than 500 cfs, which was a 2.4-year flood event. Prior to 2008, the last time there was a flood event greater than 500 cfs was in August 16, 2001. Also during the irrigation season, the Gallinas River flows measured at the USGS Lourdes gage were 4,638.00 acre-feet.

Observations from 2008 Diversions

Rotation among the diverters in the Las Vegas area (“the middle Gallinas Area”) was implemented from June 12 – July 15 and after September 21 when the average daily flows were below 15 cfs (Attachment A-15). The City of Las Vegas did not divert from the Gallinas River for 34 days during the irrigation season (Attachment A-02). During the two peak events, most of the water was diverted into Storrie Lake.

In order to obtain more accurate diversion measurements, increased cooperation between the acequias and the Water Master is needed. Only two majordomos regularly notified the Water Master when they opened or closed their headgates during the irrigation season. Most of the acequias are poorly maintained with leaky or non-existent headgates. Major improvements are required at their points of diversion and distribution systems. The overall management of the acequias is poor. A number of the acequias leave their

headgates open for convenience or for livestock use. Two acequias made major improvements with backhoes to their headgates and ditches.

According to the 1991 Hydrographic Survey for the Gallinas River, the calculated Farm Delivery Requirement for the Gallinas River is 2 acre-feet per acre (A-13). The study also identified an agricultural growing season that normally runs from May 15 – October 5 in the Gallinas River area. Based on the information presented in Attachment A-01, which includes a conveyance efficiency of 60%, the following diverters appeared to have exceeded their annual diversions in 2008:

Diverters	2008 Measured acre-feet	*Recorded acre-feet
Upper Maestes Ditch	87.49	36.30
El Porvenir Ditch	193.11	150.18
Acq. Md. de Los Vigiles	986.69	588.91
Acq. Md. de Los Romeros	908.27	664.90
Acq. de Nuestra Sra. de los Dolores	126.80	217.78
Acq. Md. de Las Vegas	1,026.04	208.29
Roundhouse Ditch	447.20	306.36
Pappen Ditch	1,604.79	186.48
San Augustin Comm. Ditch	2,447.61	213.12
La Concepcion Ditch	203.43	53.61
City of Las Vegas	2,910.32	2,634.00

*Diversions based on Acreage recognized in 1991 Hydrographic survey

These water users diverted water that could have been used by others.

River Water Budget

Based on measurements taken between April to November of 2008, it appears that in some sections of the river more water was diverted than was measured entering those sections, suggesting that the river is a gaining stream. This possibility was examined by estimating water budgets for three reaches of the river: Montezuma gage to Storrie Diversion, Storrie Diversion to the Pecos Arroyo, and the Pecos Arroyo to the Lourdes gage.

In the upper reach, the Montezuma gage measured 13,010 acre-feet of water between April and November. The City of Las Vegas, Gallinas Canal, Los Vigiles Ditch and Storrie Canal diverted a total of 9,875 acre-feet from the river between the Montezuma gage and the Storrie Canal diversion. Additional water losses may have occurred in this interval due to evapotranspiration by riparian vegetation, however, these additional losses appear to be fairly small and are not included as a loss. An estimated 3,767 acre-feet flowed past the Storrie Canal Diversion.

Six ditches diverted from the river between Storrie Canal and the confluence with the Pecos Arroyo. These diversions, totaling 4,190 acre-feet, were in excess of the amount of water entering this reach of the river of 3,767 acre-feet, suggesting that return flows from

irrigation and/or natural gains to the river provided a substantial additional supply of 1,739 acre-feet of water within this reach. Additional losses occur due to evapotranspiration from riparian vegetation in this reach of the river, however, these losses are not quantified and not included as a loss. Approximately 1,316 acre-feet of water were delivered from this reach of the river to the next downstream reach starting at the confluence of the Pecos Arroyo.

The Pecos Arroyo and discharges from the City's wastewater treatment plant both add water to the river at this lower reach. Aside from evapotranspiration by riparian vegetation, no other depletions take place along the river between the Pecos Arroyo and the Lourdes gage. The Pecos Arroyo and treatment plant alone are insufficient to account for the total quantity of 5,783 acre-feet measured at the Lourdes gage. An additional 2,488 acre-feet of natural gains, from surface or groundwater inflows, contributed flow to this reach of the river and was sufficient to supply the ditches below the Lourdes gage.

MEETINGS

In 2008, the OSE Water Master had 185 documented meetings in the Gallinas River basin.

Two public meetings were held in March to release the 2007 Water Master Report and to provide a forum for other state agencies to explain different assistance programs available to the water users in the basin. Meetings were held with the RGAA (Attachment A-17) as well with the Acequias and Storrie Project individually concerning metering agreements, rehabilitation of their acequias headgates and ditches as well as opening and closing of headgates during rotations. Meetings were held with the City of Las Vegas and the Acequias discussing the rotation.

The OSE proposed a rotation schedule on May 15, 2008 (Attachment A-15) to the Middle Gallinas River diverters. After meeting with the acequias some changes were made to the rotation schedule. The OSE sent out the agreed rotation schedule calendar on June 23, 2009 (Attachment A-16). The City of Las Vegas (COLV) met with the acequias several times between June 20 and August 1, 2008 to coordinate with the acequias when the COLV would come off the river.

The OSE facilitated meetings between all interested parties to talk about improvements to the Storrie Project Point of Diversion (Attachment A-12). A weir designed by the NRCS would allow the high flows to be diverted to Storrie Lake and the low flows to continue downstream to the senior acequias.

PENDING MATTERS AND OUTLOOK FOR 2009

Beginning in 2009, the installation of measurement stations on ditches with signed agreements will commence. The Storrie Project Canal measurement station will be the first to be installed. The OSE is meeting with other ditches with signed agreements, along with the contractor, to establish locations for the measurement stations.

As of February 10, 2009, the outlook for the spring runoff is below average. Most of the snow fell in December 2008; January and February 2009 were warmer and drier than normal (Attachments A-10, A-11).

CONCLUSIONS

The OSE requires that diverters sign ditch measuring agreements prior to installing State-funded flow measuring devices so that the OSE can use the data to make surface water management decisions in the Gallinas River basin. Four ditch measuring agreements were signed in 2008. The OSE is continuing talks with the Rio Gallinas Acequias Association concerning the signing of ditch measuring agreements with the remaining acequias. In the meantime, the OSE has compiled diversion data using staff gages. The OSE will gain more accuracy when measurement stations with continuous data recorders are installed. The OSE has begun the process of installing these stations.

The OSE has facilitated talks among the diverters to make improvements to the Storrie Project Point of Diversion. By making these improvements the high flows would be diverted to Storrie Lake and the low flows would continue downstream to the acequias with senior water rights. The City of Las Vegas will also be making infrastructure improvements to their point of diversion under OSE oversight.

Most of the Gallinas River points of diversion and the main acequias are in poor condition. Some acequias have headgates that leak and some are non-existent. The surface water distribution system infrastructure should be improved, well maintained and properly managed. It would allow irrigation in less time, with less “carrying” water, and would allow more water to be available.

Enforcement issues were mostly administrative: changes of points of diversion, showing beneficial use, and changing places of use (ponds) in the Gallinas River basin in 2008.

The Gallinas River basin diverters must work toward solutions to the challenges that arise from the periodic droughts that occur in this area. For the benefit of all Gallinas River water users, the diverters shall make the effort, as good neighbors and stewards, to limit their diversions to beneficial use and to their water rights per annum.

2008 Diversion Report

Middle Gallinas (all values in acre-feet)

Diverter	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec	Totals	Recorded Acre-feet	Recorded acres
USGS Montezuma**	Ice	Ice	1205.95	1922.98	2474.38	923.70	976.46	2534.88	2950.41	765.42	463.04	Ice	14217.22	2634.00	
City of Las Vegas**	209.15	316.00	254.56	241.85	250.11	165.96	375.11	226.72	253.15	226.30	218.23	173.18	2910.32		
Gallinas Canal*			9.04	97.64	166.97	6.57	97.41	100.14	106.21	0.00	0.00		585.96	2783.31	835.83
Agapito Vigil															7.10
Storrie Project WUA**	100.00	300.00	100.00	1490.00	250.00	0.00	350.00	715.00	2430.00	1116.00	0.00	0.00	6851.00		12225.09
Storrie Lake Levels	6587.50	6588.00	6588.10	6588.80	6587.50	6586.00	6585.50	6585.50	6587.00	6587.20	6586.50	6586.50			
Storrie Lake Storage	11500.00	11900.00	12000.00	12500.00	11500.00	10300.00	9900.00	9900.00	11100.00	11300.00	10800.00	10800.00			
Gallinas below Storrie*	100.33	68.63	113.98	719.51	792.19	433.69	327.80	343.32	545.47	393.20	212.40		4050.52		
A M de Los Vigiles*				243.13	296.67	74.04	192.80	80.17	63.64	36.24	0.00		995.69	588.91	176.85
Grzelachowski*		5.08	5.11	5.94	25.30	17.45	4.40	4.55	5.95	70.00	1.79		145.57	190.14	57.10
A M de Los Romeros*		28.47	20.04	144.71	141.69	103.99	84.61	116.35	210.21	44.79	13.41		908.27	664.90	199.67
A M de Los Dolores*				82.92	104.84	101.97	54.51	17.36	11.43	24.61	25.03		422.67	217.78	65.40
A M de Las Vegas*		91.31	150.45	82.15	89.63	191.22	98.99	66.34	133.23	60.15	62.57		1026.04	208.29	62.55
Roundhouse*				68.64	155.77	83.85	36.93	15.29	85.91	0.20	0.71		447.20	306.36	92.00
Pappen*		40.02	37.67	273.77	72.57	65.27	211.55	280.36	131.66	329.55	162.37		1604.79	186.48	56.00
Gallinas below Pappen*				140.26	766.62	56.15	106.43	45.75	38.68	72.96	89.14		1315.99		
Pecos Arroyo*				37.16	104.60	138.83	310.99	129.88	90.12	74.80	73.53		959.91		
COLV WWTP Returns	125.65	87.27	73.16	82.92	148.01	113.90	155.50	136.74	147.16	119.19	112.96	128.55	1432.46	3.23	0.97
Cibola Presquevoir				0.28	0.74	0.59	0.00	1.18	0.85	0.63	0.00		4.27		10.60
Miller LP-749 (Asylum)															

¹ Potential acres are the number of acres which could have been irrigated with the diverted water using a CIR of 1 foot, an on-farm efficiency of 50% (FDR=2 feet) and a ditch efficiency of 60% (PDR= 3.3 feet)

² Recorded acres are the total acres associated with each ditch as identified in the 1991 Hydrographic Survey and adjusted by permitted transfers and offers made by the current adjudication process.

*OSE staff gage estimates

**diverter provided estimates

Indicates Pumpout

Lower Gallinas (all values in acre-feet)

Diverter	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec	Totals	Recorded acre-feet	Recorded Acres ²
USGS Lourdes**		282.06	365.85	673.58	1271.40	451.54	569.26	878.58	783.34	673.51	500.55		6429.67		
San Augustin*				202.91	303.88	303.04	186.47	323.24	363.44	399.05	375.58		2447.61	213.12	64.00
La Concepcion*					16.30	45.39	74.03	0.00	1.85	28.77	37.09		203.43	53.61	16.10
Ancón del Gato*					1.23	48.48	21.88	90.40	15.62	4.90	10.00		192.51	215.78	64.80
West Chaperillo**					18.00	22.00	32.00	46.00	42.00	36.00	0.00		196.00	282.38	84.80
Arriba Almaraz**					6.39	3.29	3.09	0.00	0.00	0.00	0.00		12.77	205.79	61.80
A. Arriba de La Llanada**				0.33	0.33	0.33	0.33	0.33	0.33	0.00	0.00		1.98	83.25	25.00

Upper Gallinas (all values in acre-feet)

Diverter	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec	Totals	Recorded acre-feet	Recorded Acres ²
Judge Long**				0.34	0.25	0.18	0.13	0.00	0.00	0.00	0.00		0.90	14.99	4.50
Placita Arriba*					0.00	35.22	0.00	7.24	1.63	0.00	0.00		44.09	145.85	43.80
Lower Harvey															0.00
Upper Maestes*					47.72	37.09	0.00	2.25	0.43	0.00	0.00		87.49	36.30	10.90
El Porvenir*				34.01	77.24	29.72	33.62	11.88	6.00	0.64	0.00		193.11	150.18	45.10
Gallegos Ditch**				1.10	1.08	0.00	0.00	0.00	0.00	0.00	0.00		2.18	96.57	29.00
Max Nordhaus															7.50
Treat Springs Ranch															2.50

¹ Potential acres are the number of acres which could have been irrigated with the diverted water using a CIR of 1 foot, an on-farm efficiency of 50% (FDR=2 feet) and a ditch efficiency of 60% (PDR= 3.3 feet)

² Recorded acres are the total acres associated with each ditch as identified in the 1991 Hydrographic Survey and adjusted by permitted transfers and offers made by the current adjudication process.

*OSE staff gage estimates

**diverter provided estimates

Indicates Diverters

City of Las Vegas*

On/Off Gallinas River

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	On	On	On	On	On	Off	Off	On	On	On	On	On
2	On	On	On	On	On	On	Off	Off	On	On	On	On
3	On	On	On	On	On	On	Off	Off	On	On	On	On
4	On	On	On	On	On	On	On	Off	On	On	On	On
5	On	On	On	On	On	On	On	Off	On	On	On	On
6	On	On	On	On	On	On	On	Off	On	On	On	On
7	On	On	On	On	On	On	On	On	On	On	On	On
8	On	On	On	On	On	On	On	Off	On	On	On	On
9	On	On	On	On	On	On	On	Off	On	On	On	On
10	On	On	On	On	On	On	On	Off	On	On	On	On
11	On	On	On	On	On	On	On	Off	On	On	On	On
12	On	On	On	On	On	On	On	Off	On	On	On	On
13	On	On	On	On	On	On	On	Off	On	On	On	On
14	On	On	On	On	Off	Off	On	On	On	On	On	On
15	On	On	On	On	Off	Off	On	On	On	On	On	On
16	On	On	On	On	On	Off	On	On	On	On	On	On
17	On	On	On	On	On	On	On	On	On	On	On	On
18	On	On	On	On	On	On	On	On	On	On	On	On
19	On	On	On	On	On	On	On	On	On	On	On	Off
20	On	On	On	On	On	Off	On	On	On	On	On	Off
21	On	On	On	On	Off	Off	On	On	On	On	On	Off
22	On	On	On	On	Off	Off	On	On	On	On	On	Off
23	On	On	On	On	On	Off	On	On	On	On	On	Off
24	On	On	On	On	On	Off	On	On	On	On	On	Off
25	On	On	On	On	On	Off	On	On	On	On	On	Off
26	On	On	On	On	On	Off	On	On	On	On	On	Off
27	On	On	On	On	On	Off	On	On	On	On	On	Off
28	On	On	On	On	On	Off	On	On	On	On	On	Off
29	On	On	On	On	On	Off	On	On	On	On	On	Off
30	On		On	On	On	Off	On	On	On	On	On	Off
31	On		On		Off			On		On		On
Count	31.0	29.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
On	31.0	29.0	31.0	30.0	26.0	15.0	28.0	20.0	30.0	31.0	30.0	19.0
Off	0.0	0.0	0.0	0.0	5.0	15.0	3.0	11.0	0.0	0.0	0.0	12.0
	Totals			Irrigation Season								
Count	366.0			214.0								
On	320.0			180.0								
Off	46.0			34.0								
* Information compiled from City of Las Vegas monthly reports to the OSE.												

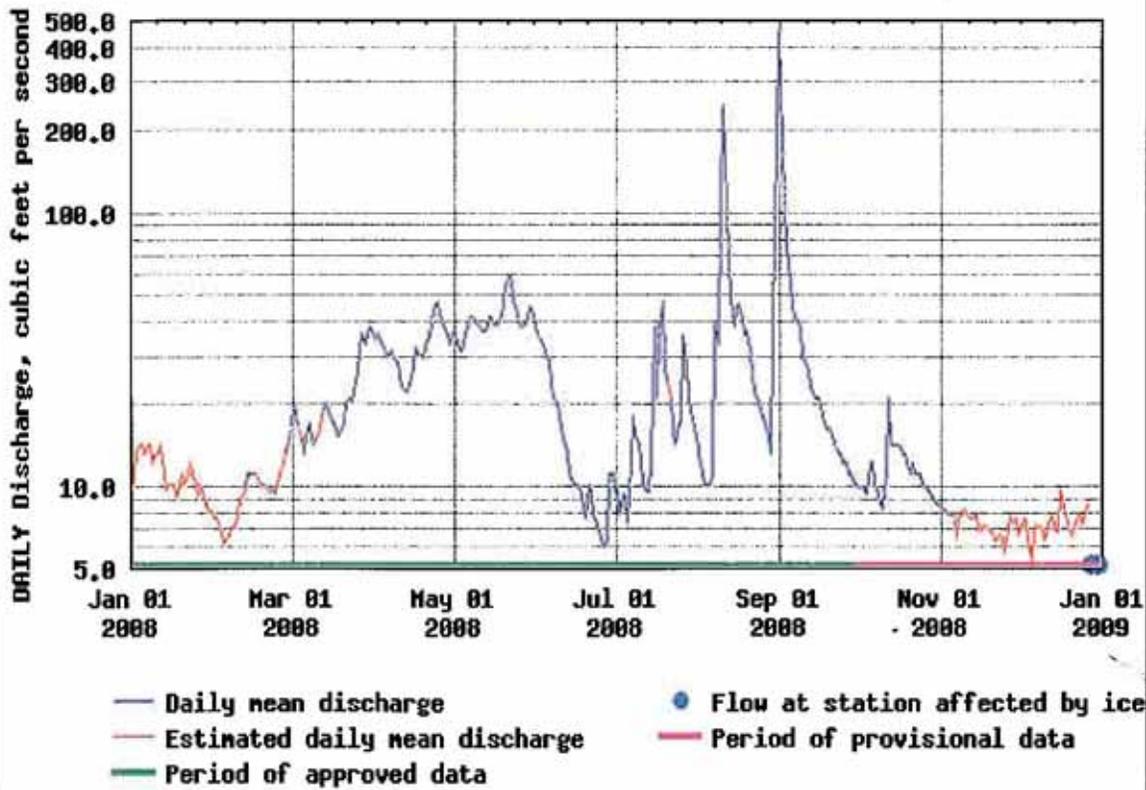
USGS Gallinas River near Montezuma, N.M.

Daily Mean Discharge, cubic feet per second for 2008

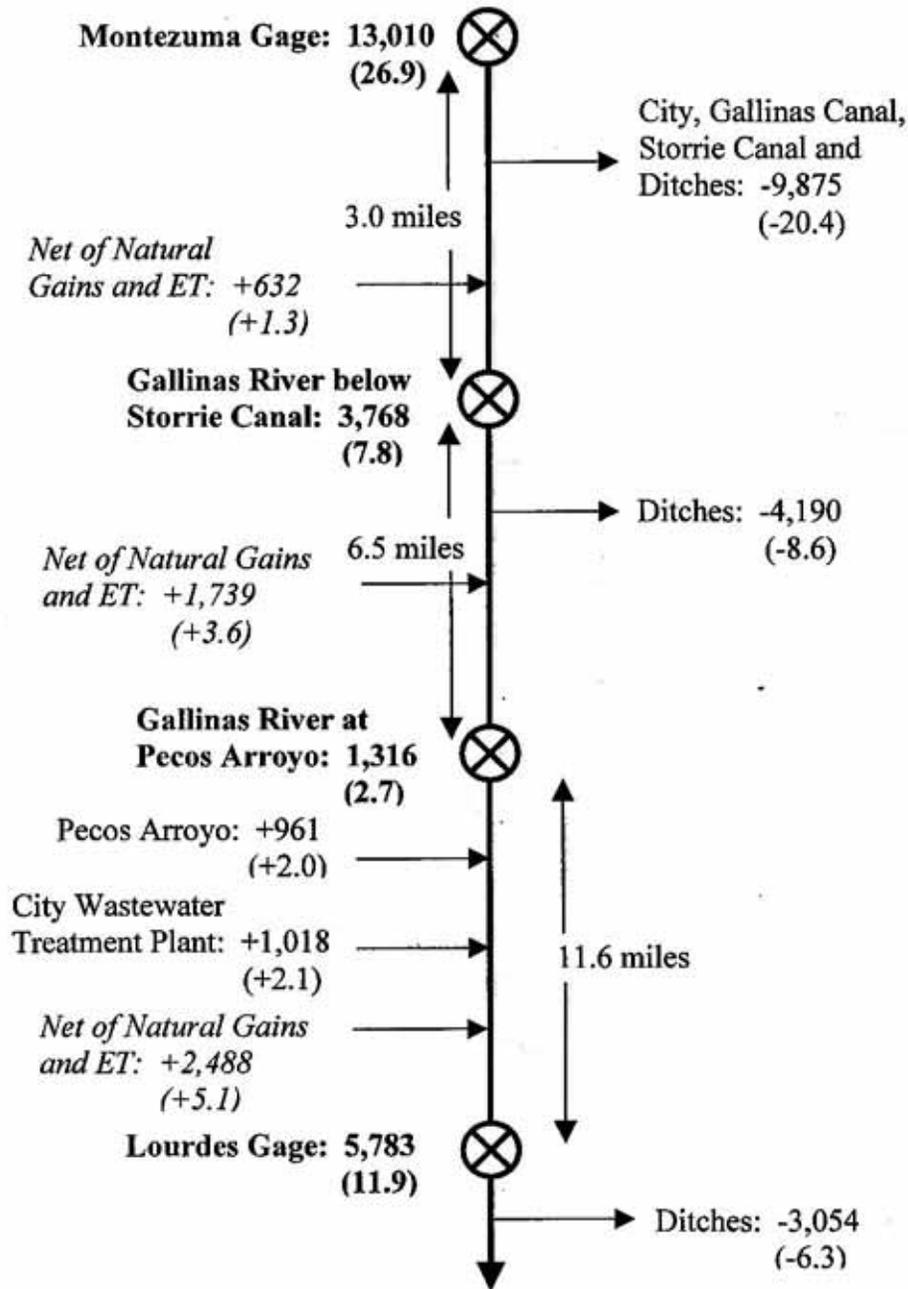
Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	Ice	Ice	16.0	36.0	37.0	37.0	9.5	15.0	457.0	9.5	9.2	6.8
2	Ice	Ice	20.0	34.0	35.0	33.0	9.6	13.0	177.0	9.5	9.0	7.5
3	Ice	Ice	18.0	36.0	33.0	31.0	7.8	11.0	105.0	8.9	8.8	7.2
4	Ice	Ice	16.0	33.0	31.0	29.0	9.3	10.0	75.0	8.7	8.7	6.3
5	Ice	Ice	15.0	32.0	32.0	28.0	8.9	10.0	57.0	12.0	8.6	5.3
6	Ice	Ice	13.0	30.0	36.0	25.0	7.3	10.0	46.0	11.0	8.1	6.7
7	Ice	Ice	15.0	30.0	40.0	21.0	12.0	11.0	40.0	9.9	6.8	7.1
8	Ice	Ice	17.0	31.0	42.0	18.0	18.0	39.0	40.0	9.1	8.9	7.0
9	Ice	Ice	14.0	29.0	41.0	17.0	15.0	33.0	37.0	8.5	8.6	6.8
10	Ice	Ice	14.0	28.0	39.0	16.0	14.0	104.0	30.0	8.2	9.0	6.3
11	Ice	Ice	15.0	25.0	38.0	16.0	12.0	247.0	27.0	12.0	8.4	8.4
12	Ice	Ice	16.0	23.0	37.0	14.0	10.0	103.0	26.0	22.0	8.2	7.7
13	Ice	Ice	18.0	22.0	37.0	13.0	9.5	67.0	23.0	15.0	8.3	7.6
14	Ice	Ice	20.0	22.0	38.0	11.0	9.5	48.0	21.0	15.0	8.5	6.8
15	Ice	Ice	19.0	23.0	42.0	10.0	12.0	38.0	21.0	15.0	7.4	6.6
16	Ice	Ice	18.0	27.0	39.0	10.0	38.0	44.0	21.0	15.0	7.3	9.6
17	Ice	Ice	17.0	32.0	39.0	10.0	21.0	46.0	18.0	15.0	7.7	8.2
18	Ice	Ice	16.0	30.0	39.0	9.2	37.0	41.0	17.0	14.0	7.6	7.8
19	Ice	Ice	15.0	30.0	41.0	8.1	47.0	35.0	16.0	14.0	7.4	7.0
20	Ice	Ice	16.0	29.0	47.0	7.6	27.0	37.0	16.0	13.0	7.2	9.0
21	Ice	Ice	17.0	32.0	53.0	10.0	24.0	31.0	15.0	13.0	6.6	32.0
22	Ice	Ice	20.0	35.0	59.0	9.2	21.0	25.0	14.0	13.0	6.5	34.0
23	Ice	Ice	21.0	39.0	55.0	7.7	16.0	22.0	13.0	12.0	7.0	16.0
24	Ice	Ice	20.0	44.0	47.0	7.1	14.0	20.0	12.0	12.0	6.8	14.0
25	Ice	Ice	22.0	47.0	43.0	6.7	17.0	19.0	12.0	12.0	5.6	16.0
26	Ice	Ice	26.0	43.0	38.0	6.3	17.0	18.0	12.0	11.0	6.9	10.0
27	Ice	Ice	31.0	40.0	36.0	5.9	35.0	16.0	11.0	11.0	7.7	Ice
28	Ice	Ice	36.0	37.0	37.0	6.1	27.0	15.0	10.0	10.0	7.2	Ice
29	Ice	Ice	33.0	35.0	39.0	11.0	21.0	13.0	10.0	10.0	7.5	Ice
30	Ice		35.0	33.0	43.0	11.0	19.0	91.0	10.0	9.6	6.5	Ice
31	Ice		38.0		41.0		16.0	183.0		9.4		Ice
Count	31.0	29.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
Max	Ice	Ice	38.0	47.0	59.0	37.0	47.0	247.0	457.0	22.0	9.2	34.0
Min	Ice	Ice	14.0	22.0	31.0	5.9	7.3	10.0	10.0	8.2	5.6	5.3
Irrigation Season												
Days > 15 cfs				30.0	31.0	11.0	16.0	22.0	20.0	1.0		131.0
Days <= 15 cfs				0.0	0.0	19.0	15.0	9.0	10.0	30.0		83.0



USGS 08380500 GALLINAS CREEK NEAR MONTEZUMA, NM



GALLINAS RIVER



All values given in acre-feet and cubic feet per second in ()
 Calculated values given in *italics*
 Not to scale

GALLINAS RIVER DIVERSIONS AND INFLOWS APRIL - NOVEMBER 2008

Stage-Discharge Rating Curve Development of the Gallinas River and Acequias in the Las Vegas, New Mexico, Area

Bildad Eyoung¹ (bildad_ee@yahoo.com), William Jaremko-Wright¹, Chemanji Shu-Nyamboli¹, Dr. Michael Meyer¹, Luis Aguirre², and Alan Cuddy²
¹Natural Sciences Department, New Mexico Highlands University, Las Vegas, NM, ²Office of the State Engineer, Santa Fe, NM

Abstract

The Office of the State Engineer (OSE) initiated a stage-discharge rating curve development study of the Gallinas River, irrigation ditches, and acequias, with the assistance of New Mexico Highlands University (NMHU) in the Las Vegas, New Mexico area in the spring 2008. Staff gauges were installed in the river, ditches, and acequias at approximately 20 locations extending from the El Porvenir, through the City of Las Vegas, and to San Agustín. Three NMHU students measured discharge and gauge height at one week intervals during the spring snow melt in May to the end of June 2008. Initial results indicate that rating curves were relatively stable and easy to develop at sites with stable cross-sectional geometry and a wide range in discharge. These sites provided the best R² fits to regression analysis. Sites with fill bottoms, unstable cross-sectional geometry, and the potential for the intrusion of plant exhibited rating curves with lower R² values. Further studies will assess the OSE in developing management scenarios for water usage in the Gallinas River Watershed.

Methods

Each acequia has been requested to install a discharge meter on their point of water intake. State funds are available for these stakeholders to apply for. While waiting for these meters to be installed, staff gauges were placed in the various acequias and irrigation ditches along the Gallinas River in July 2007. In order to assure good water distribution according to water rights allocation stream water velocity measurements were performed with a Model 201 Portable Water Current Meter at the most stable cross-sections near the area of emplacement of the staff gauges. Water discharge was then calculated from the cross-sectional area and the velocity obtained, and stage-discharge rating curves were developed. As more measurements are completed, the OSE will develop discharge estimations based on Manning's Equation for each site.

Manning's equation

$$V = (1.49/n) R^{2/3} S^{1/2}$$



Fig. 1. A staff gauge in one of the acequias.



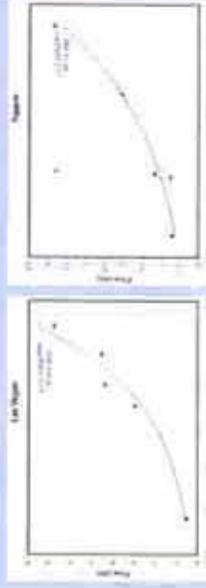
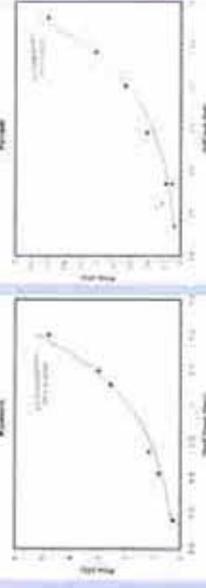
Fig. 2. Los Vigas Dam head gate



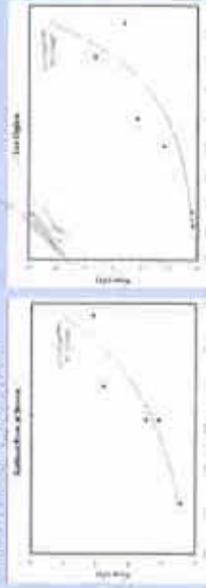
Fig. 3. Silver Lake diversion head gate

Results

Example of sites with best R² fit:



Example of sites with lower R² fit:



Discussion

The Gallinas River, irrigation ditches, and acequias have differences in cross-sectional geometry due to either rock or gravel in the channel, deposition of silt, seasonal plant growth, and irregularity of maintenance by their owners. Of the 20 sites studied, rating curves have not fully developed at nine sites because of short and inconsistent irrigation hours. Another nine, and Concepcion ditches are found in San Agustín, in the lower part of the Gallinas Watershed. Peccos Arroyo, Dolores Garielchowsky, Agapito Vigi and Los Vigas-Romero are found in the mid section and around the city of Las Vegas. Upper Masitas and Piasitas Acea are found in the upper section of the watershed and have relatively smaller widths. Irrigation in these acequias was very brief during the study period and so these ditches were often dry. Consequently, there were not enough data points to produce good rating curves for these sites.

Data collected from nine other sites produced R² values greater than 0.9, seven of these sites are located in the mid section while one, Parowiki Ditch, is in the upper section, and the other one, San Agustín Ditch, is in the lower section. Concluding that only two sites with enough data points showed R² values lower than 0.9. The method is a good predictor of the amount of water being diverted by the acequia and could help in adequate water distribution practices.

Conclusion/Future Work

The method used in this study was able to explain variation in stream discharge based on stage in nine out of the eleven sites where sufficient data could be collected following duration of irrigation. Channel morphology, cross-sectional geometry, siltation and plant intrusion could explain the lower success of the model in two of the sites. Moreover, some sites did not provide enough data for any kind of conclusion.

This project will assist irrigators to operate their ditches more efficiently and achieve a more equitable distribution of available water. To achieve adequate modeling of water sharing, more measurements are required.



Fig. 4. Acequia Mestre on Las Vegas



Fig. 5. William measures stream velocity

2008 PRECIPITATION LAS VEGAS NOAA WEATHER DATA (IN INCHES)*

Month	Rain	Effective	Irrigation Season	
January	0.12	0.11		
February	0.55	0.52		
March	0.23	0.22		
April	0.36	0.34	0.36	0.34
May	1.57	1.46	1.57	1.46
June	1.00	0.95	1.00	0.95
July	4.15	3.39	4.15	3.39
August	5.15	3.81	5.15	3.81
September	0.56	0.53	0.56	0.53
October	1.03	0.98	<u>1.03</u>	<u>0.98</u>
November	0.55	0.52		
December	<u>0.34</u>	<u>0.32</u>		
<u>TOTAL</u>	<u>15.61</u>	<u>13.15</u>	<u>13.82</u>	<u>11.46</u>

* Source is the National Weather Service Forecast Office in Albuquerque.
<http://www.weather.gov/climate/xmacis.php?wfo=abq>

USBR Effective Rainfall (R_e)

The amount of rainfall available to crops is influenced by the following factors:

- Duration and intensity of rainfall
- Antecedent moisture condition of soil
- Infiltration capacity of the soil
- Presence of surface seals and crusts
- Slope of fields
- Root development of the crop
- Interception by the plant canopy

The USBR method expresses effective rainfall (R_e) as a percentage of the total monthly rainfall. For each one-inch increment in rainfall, there is a corresponding decrease in the percentage of effective rainfall. This method was originally published as a table of values that has since been changed to a set of equations.

USBR Effective Rainfall Table

Monthly Rainfall (R) (inches)	Effective Rainfall (R_e) (inches)
$1 \leq R$	$R_e = 0.95R$
$1 < R \leq 2$	$R_e = 0.95 + 0.90(R-1)$
$2 < R \leq 3$	$R_e = 1.85 + 0.82(R-2)$
$3 < R \leq 4$	$R_e = 2.67 + 0.65(R-3)$
$4 < R \leq 5$	$R_e = 3.32 + 0.45(R-4)$
$5 < R \leq 6$	$R_e = 3.77 + 0.25(R-5)$
$R > 6$	$R_e = 4.02 + 0.05(R-6)$

Snow Water Equivalent Data Table for Site 854 in the state of New Mexico

Provisional Data - Subject to Revision

(SELECT HERE TO DOWNLOAD THIS DATA)

/cdbs/nm/snot35 09 Snow Water Equivalent

Station : NM05P08S, WESNER SPRINGS

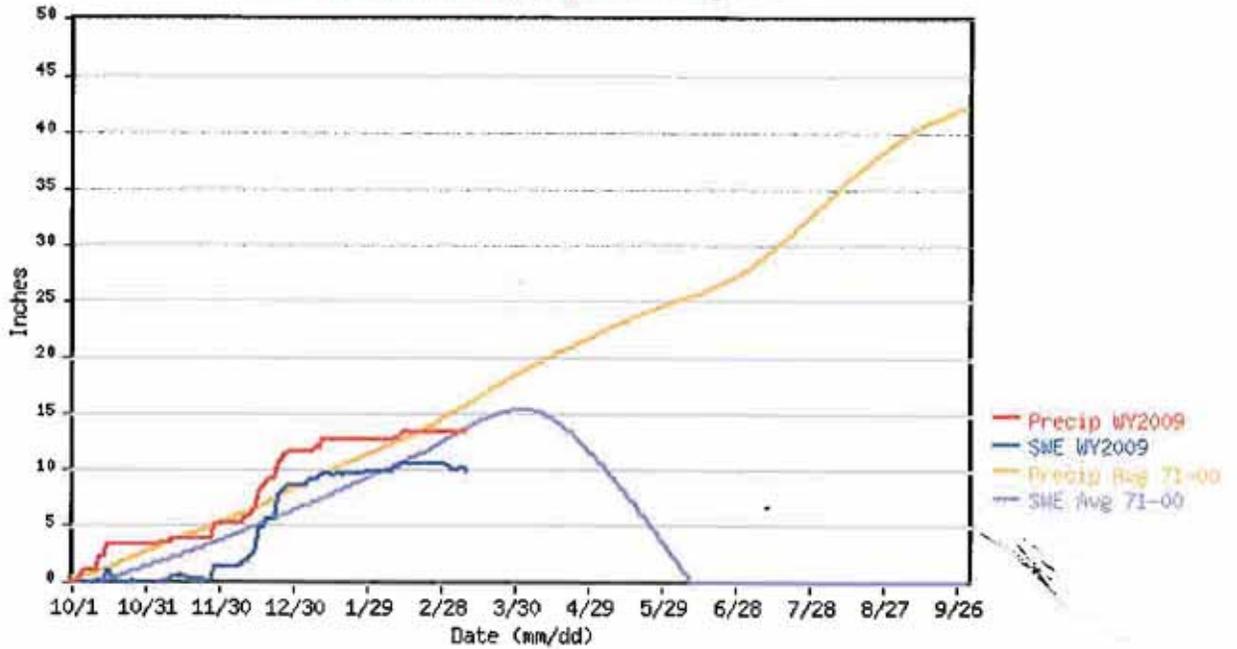
----- Unit = inches

day	oct	nov	dec	jan	feb	mar	apr	may	jun	jul	aug	sep
1	0.00	0.00	1.30	8.60	9.90	10.50						
2	0.00	0.00	1.40	8.60	9.90	10.40						
3	0.00	0.00	1.40	8.60	9.90	10.30						
4	0.00	0.00	1.40	8.60	9.90	10.10						
5	0.00	0.00	1.40	9.00	9.90	10.10						
6	0.00	0.00	1.40	9.10	9.90	10.10						
7	0.00	0.00	1.40	9.10	9.90	10.10						
8	0.00	0.10	1.40	9.10	9.90	10.20						
9	0.00	0.10	1.50	9.20	10.20	10.20						
10	0.00	0.20	1.80	9.50	10.20	9.90						
11	0.00	0.50	1.90	9.50	10.20							
12	0.10	0.50	1.90	9.60	10.50							
13	0.00	0.50	2.30	9.60	10.50							
14	0.00	0.60	2.60	9.60	10.50							
15	0.90	0.40	3.00	9.50	10.50							
16	0.90	0.50	4.40	9.50	10.50							
17	0.70	0.40	4.80	9.60	10.50							
18	0.40	0.30	4.90	9.60	10.50							
19	0.10	0.30	5.50	9.50	10.50							
20	0.00	0.20	5.50	9.60	10.60							
21	0.00	0.10	5.50	9.70	10.60							
22	0.00	0.20	5.50	9.70	10.60							
23	0.00	0.20	6.50	9.70	10.50							
24	0.00	0.10	7.70	9.70	10.50							
25	0.00	0.10	7.90	9.70	10.50							
26	0.10	0.10	8.30	9.70	10.50							
27	0.00	0.20	8.50	9.70	10.50							
28	0.00	1.30	8.60	9.70	10.50							
29	0.00	1.30	8.60	9.80	---							
30	0.00	1.30	8.60	9.80	---							
31	0.00	---	8.60	9.90	---							
mean	0.10	0.32	4.37	9.42	10.31	10.19						
max	0.90	1.30	8.60	9.90	10.60	10.50						
min	0.00	0.00	1.30	8.60	9.90	9.90						

***This data is provisional and subject to change.

WESNER SPRINGS SNOTEL for Water Year 2009

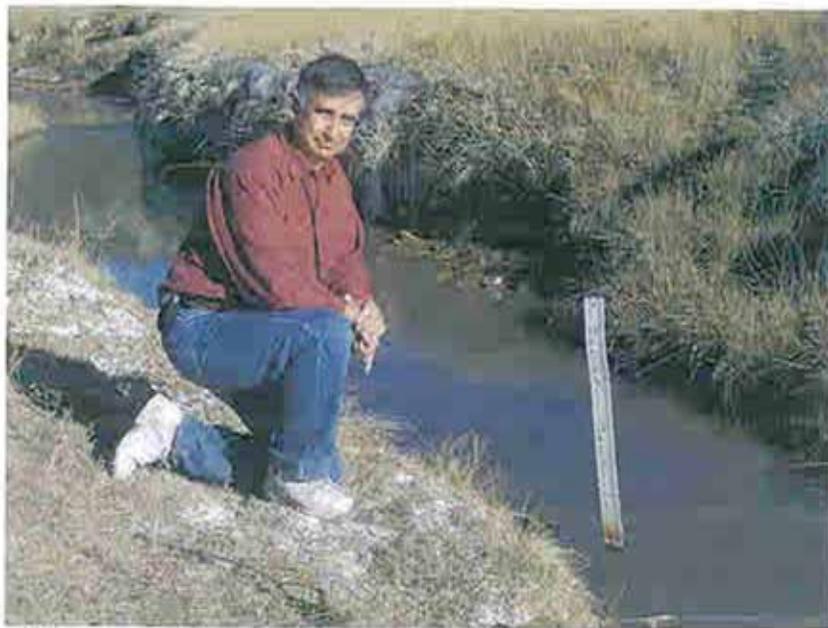
*** Provisional Data, Subject to Change ***



READING STAFF GAUGES



Watermaster cleaning gunk around the Pecos Arroyo staff gauge.



Watermaster in a pensive mode reading the above staff gauge.

STORRIE PROJECT POINT OF DIVERSION



Notice sand bags blocking water flow to Storrie Lake.



Notice sand bags were moved, allowing some flow to go to Storrie Lake.

DUTY OR FARM DELIVERY REQUIREMENT

The farm delivery requirement (duty) is the amount of water, delivered at the individual farm headgates (turnouts) from the irrigation ditch or at the irrigation well, necessary to satisfy the consumptive irrigation requirement. It is determined by dividing the consumptive irrigation requirement by the farm irrigation efficiency. The types of soils, the crops, the methods of irrigation, and the slope of the field are major factors affecting farm irrigation efficiency (Blaney and Criddle, 1962). The farm irrigation efficiency for the Gallinas River Stream System was determined to be 50% based on the methodology reported in the New Mexico State Engineer Technical Report No. 32 (Blaney and Hanson, 1965).

The measurement of the farm delivery requirement from surface water is made at the individual farm turnouts from the irrigation lateral ditches. The farm delivery requirement includes allowances from all distribution loss below the farm turnouts.

The Gallinas River Stream System crop distribution was obtained from field survey work conducted by the Hydrographic Survey Section of the New Mexico Office of the State Engineer, in 1988.

Approximately 10.0% of the total lands presently irrigated, being 4,540.3 acres, within the Gallinas River Stream System were found to be fallow. These were ~~adjusted~~ to reflect 7 % fallow for computations.

The Final Decree of the United States District Court, in and for the District of New Mexico, in Cause No. 712, adjudicated amounts of water depending on the segment reach of the Pecos River Stream System. Cause No. 712, page 12, notes a maximum duty of 1.5 acre-feet per acre per annum, delivered on the land for irrigation occurring within the Gallinas River Stream System.

Hydrographic Survey Section staff computed the consumptive use, consumptive irrigation requirements, and the duty based on the cropping patterns for the Gallinas River Stream System found by the 1988 field inspections, and reports those findings in Table 1. Table 2 reflects the consumptive irrigation requirements taken from data in Bulletin No. 531.

TABLE 1 GALLINAS RIVER
 Tabulation of Crops and Farm Delivery Requirements using the 1988 Cropping Patterns
 Average Season Above 32°F: May 15 – October 5*

Crop	Percent of Total	Irrigation Season*	Consumptive Use (in)	Effective Precipitation (in)	CIR (in)	Weighted CIR (in)	Weighted CIR (ft)	Farm Irrigation Efficiency (%)	Farm Delivery Requirement (ft)
Corn (grain)	1.0	5/10 – 10/01**	20.46	10.69	9.77	0.10			
Small Grain (Spring)	5.6	4/01-7/15	13.47	5.56	7.91	0.44			
(Winter)	3.3	9/05 – 7/10	21.21	10.34	10.97	0.36			
Christmas trees	0.1	4/02 – 11/02	26.28	13.01	13.27	0.01			
Turfgrass	0.5	4/02 – 11/02	27.35	13.01	14.29	0.07			
Alfalfa	15.3	4/23 – 10/12	26.01	11.82	14.19	2.17			
New Alfalfa (multi-crop)	3.1	8/25 – 10/12	3.98	3.98	1.01	0.03			
Hay	2.1	4/02 – 11/02	25.94	13.01	12.93	0.27			
Pasture (planted)	55.5	4/02 – 11/02	27.26	13.01	14.28	7.93			
(native)	4.4	4/02 – 11/02	24.56	13.01	11.55	0.51			
Orchard	0.2	4/02 – 11/02	20.98	12.46	8.52	0.02			
Misc. Vegetables	1.9	5/15 – 10/05	18.07	10.60	7.47	0.14			
Fallow	7.0								
TOTAL	100.0					12.05	1.00***	50	2.0

* Irrigation seasons taken from Table 11 of "Consumptive Irrigation Requirements of Selected Irrigated Areas in New Mexico" (Henderson, 1968).

** Includes pre-plant irrigation.

*** WCIR adjusted for multiple-cropped acreage.

TABLE 2. GALLINAS RIVER
Tabulation of Crops and Consumptive Irrigation Requirements
Using Data from Bulletin No. 531

Irrigated areas and selected weather station	Crop	Period of Use and CIR (inches)			Selected crop distribution by area in percent.		
		Frost-free	Other	Total	(A)	(B)	(C)
*(A) Gallinas (B) Storrie Project (C) San Jose *** Weather Station: Las Vegas	Alfalfa	15.14	0.71	15.85	22.0	27.2	22.0
	Other hay	12.24	0.71	12.95	15.0	---	14.9
	Vega	12.24	1.75	13.99	15.0	---	14.9
	Winter small grains	---	---	11.31	13.2	25.0	13.9
	Spring small grains	---	---	08.36	10.8	20.6	10.9
	Sorghums	09.67	0.28**	09.95	---	27.2	---
	Corn	10.84	0.28**	11.12	19.0	---	19.0
	Misc. vegetables and family gardens	---	---	10.20	5.0	---	5.1
					100.0	100.0	100.0
CIR in acre-feet per acre					1.046	0.964	1.045

* Refers to area in column under selected crop distribution by area in percent.

** Pre-plant irrigation.

*** Area encompasses small communities located above Anton Chico.



STATE OF NEW MEXICO

OFFICE OF THE STATE ENGINEER

Santa Fe

John R. D'Antonio Jr., P.E.
State Engineer

BATAAN MEMORIAL BUILDING, ROOM 102
SANTA FE, NEW MEXICO 87504-5102
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FAX: (505) 827-6682

January 17, 2008

Board of the
Rio Gallinas Acequias Association
P. O. Box 1454
Las Vegas, N.M. 87701

Re: Watermaster Management of the Gallinas River in 2008.

Dear Rio Gallinas Acequias Association Board:

Thank you for inviting me to your January 17, 2008 meeting. I would like to discuss the following topics related to the management of the Gallinas River in 2008:

1. Operation of Acequia's headgates.

Each acequia needs to be able to operate their headgates. The Acequias shall only use water for beneficial use. The Acequia whose turn it is to divert water can't get their full amount if some Acequias can't close their gates. Any water flowing through an Acequia will be accounted for in their annual allotment.

The Acequias have until January 31, 2008 to fix their headgates. On February 1, 2008 the watermaster will account for any water flowing in an Acequia against their annual allotment. A monthly water use statement will be provided to each Acequia.

2. Readings of Temporary Gauges.

The Office of the State Engineer has installed "temporary gauges" at each active Acequia. Each Acequia "mayordomo" or the Acequia's designated agent shall read the temporary gauge when the Acequia is diverting water and report it to the watermaster. This will provide a more accurate reading of the water being diverted by each Acequia. The temporary gauges give the watermaster a good idea of how much water is being diverted. There are more convenient and more accurate methods to measure flows.

The watermaster will read the temporary gauges for verification and will consider the options available if there is any gauge tampering or falsification of data.

3. Meetings one-on-one with each Acequia.

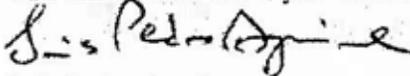
The watermaster is requesting assistance in meeting informally with each Acequia. This will allow the watermaster to listen to the Commissioners, the Mayordomo and any concerned parciantes of the Acequias. The informal meeting would include a tour of the Acequias and their headgates.

4. Rotation in the off-season for stock use.

A formal request to allow diversion to the Acequias for stock use has been received by the watermaster. Any diversion would be accounted for in the Acequia's annual allotment.

We could start a rotation among the interested Acequias beginning tomorrow, Friday, January 18, 2008.

I believe that the above measures will allow us to better manage the Gallinas River and I am looking forward to working with the Rio Gallinas Acequias Association in 2008. You can contact me if you would like to discuss these matters further.



Luis Pedro Aguirre
Gallinas River Watermaster
(505) 827-6120 office

cc: Linda I. Gordan, OSE, WRD District VI Manager, Santa Fe, N.M.
Mel Root, President, Acequia Placita Arriba, Las Vegas, N.M.
Robert Padilla, Chairman, Acequia Upper Maestas, Montezuma, N.M.
Linda Loe, Commissioner, Acequia El Porvenir, Montezuma, N.M.
Jim Lieu, Jim Lieu Ditch, Montezuma, N.M.
Patrick Galligan, Upper and Lower Los Jacales acequias, Montezuma, N.M.
Luis Martinez, Luis Martinez Ditch, Montezuma, N.M.
Prudencio Montaño, Ojo de Prudencio Montaño Ditch, Las Vegas, N.M.
Tony Benavidez, Ojo del Fierro Ditch, Montezuma, N.M.
Carlos Coca, Antonio Ortiz Ditch, Montezuma, N.M.
Carla Gomez, Farmer's Ditch, Commissioner, Las Vegas, N.M.
Ronald Montevarde, President, Agapito Vigil Acequia, Hobbs, N.M.
Leroy Garcia, Montezuma Pipeline, Montezuma, N.M.
Ray Gallegos, Grzelachowski Ditch, Las Vegas, N.M.
Curtis Sollohub, President, Acequia Madre de los Vigiles, Montezuma, N.M.
Pat Romero, Chairman, Acequia Madre de los Romeros, Las Vegas, N.M.

Arthur Ron Archuleta, Mayordomo, Asylum Ditch, Pecos, N.M.
Maria Padilla, Nuestra Señora de los Dolores Ditch, Las Vegas, N.M.
Alfred Lopez, Commissioner, Acequia Madre de las Vegas, Las Vegas, N.M.
Gabe Estrada, Commissioner, Roundhouse Ditch, Las Vegas, N.M.
William Gonzales, Chairman, San Augustine Community Ditch, Las Vegas, N.M.
Archie Allemand Jr., Commissioner, La Bereda Blanca Ditch, Las Vegas, N.M.
Damian Lujan, Commissioner, La Concepcion Ditch, Las Vegas, N.M.
Roman V. Torres, Acequia Arriba at La Liendre, Las Vegas, N.M.



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OFFICE OF THE STATE ENGINEER

John R. D'Antonio, Jr., P.E.
State Engineer

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SANTA FE, NM 87504-5102
(505) 827-6120
Fax: (505) 827-6882

May 15, 2008

«First_Name» «Last_Name»
«Acequia»
«Street»
«City», «State» «ZipCode»

Re: Managing Low Flows in the Gallinas River during the 2008 Irrigation Season.

Dear Mr. «Last_Name»:

We will soon have lower flows in the Gallinas River. The Office of the State Engineer (OSE) proposes the following actions during the 2008 Irrigation Season when flows are below 20 cfs at the USGS Montezuma gauge:

1. Water Conservation

Use water efficiently. Cease diversions until acequia breaks/leaks are repaired.

2. Storrie Project Water Users Association (SPWUA)

SPWUA would not divert below 20 cfs unless all other rights are satisfied.

3. Gallinas Canal

The Gallinas Canal will adjust their headgates below 20 cfs to allow 15 cfs past their point of diversion. The Gallinas Canal would not divert below 15 cfs unless all other rights, excluding for Storrie Project WUA, are satisfied.

4. Lower Gallinas River area diverters.

The diverters below the USGS Lourdes Gauge could use this gauge to determine if they would like to start a rotation among themselves.

5. Upper Gallinas River area. (The Gallinas River Canyon).

The diverters in the Upper Gallinas River area will be required to reduce their diversions.

6. Middle Gallinas River area.

The Office of the State Engineer (OSE) recommends a rotation that groups the Acequias by their acreage and their point of diversion along the river: (river pumps included)

Two groups of acequias for flows below 15 cfs (USGS Montezuma gauge):
1 week on/ 1 week off

Group A

Acequia Madre de Los Vigiles
Acequia Madre de Los Dolores
Acequia Madre de Las Vegas
Papen Ditch

Group B

Grzelachowski Ditch
Acequia Madre de Los Romeros
Round House Ditch
Asylum

The City of Las Vegas will reduce their diversions (to be determined.).

Three groups of acequias for flows below 10 cfs (USGS Montezuma gauge):
(5 days on/ 10 days off)

Group X

Los Vigiles
Los Dolores

Group Y

Los Romeros
Papen

Group Z

Grzelachowski
Las Vegas
Round House
Asylum

The City of Las Vegas will further reduce their diversions (to be determined).

OSE staff and two students, Bildad Eyong and William Jaremko Wright in Dr. Mike Meyer's program from the New Mexico Highlands University Department of Natural Sciences will be measuring flows in the acequias, the Pecos Arroyo and the Gallinas River through the end of June. Their results will be used to calibrate the staff gages recently installed by the OSE.

The above measures will allow us to better manage the Gallinas River during the 2008 irrigation season. The OSE will consider all your comments to these proposals. If we do not receive any comments, we will proceed with the above proposals with the necessary adjustments.

Luis Pedro Aguirre

Luis Pedro Aguirre
Gallinas River Watermaster
(505) 827-6120 office

cc: John Romero, WRAP Director, Santa Fe, N.M.
Linda I. Gordan, WRD District VI Manager, Gallinas River Project Manager,
Santa Fe, N.M.
Vince Chavez, WRD District VI Staff Manager, Santa Fe, N.M.
Alan Cuddy, Hydrology Bureau, Gallinas River Project Hydrologist, Santa Fe,
N.M.
Jerri Trujillo, Upper Pecos Basin Manager, Santa Fe, N.M.
Hilario Rubio, LAP Acequia Liaison, Santa Fe, N.M.
Richard Trujillo, LAP Community Liaison, Santa Fe, N.M.
John Myers, Judge Long Ditch, Montezuma, N.M.
Mel Root, Placita Arriba Ditch, Las Vegas, N.M.
Robert Padilla, Upper Maestes Ditch, Montezuma, N.M.
Frank Duran, El Porvenir Ditch, Albuquerque, N.M.
Robert Nordhaus, Max Nordhaus Ditch, Washington, D.C.
Frank Davis, Gallegos Ditch, Santa Fe, N.M.
Eddy Smith, Gallegos Ditch, Sapello, N.M.
George DuFour, City of Las Vegas Water Utilities, Las Vegas, N.M.
Lawrence Pino, Gallinas Canal, Las Vegas, N.M.
Ronald Monteverde, Agapito Vigil Ditch, Hobbs, N.M.
Robert Quintana, Storrie Project W.U.A., Las Vegas, N.M.
Curtis Sollohub, Acequia Madre de Los Vigiles, Las Vegas, N.M.
Daniel Romero, Acequia Madre de Los Vigiles, Las Vegas, N.M.
Ray Gallegos, Grzelachowski Ditch, Las Vegas, N.M.
Pat Romero, Acequia Madre de Los Romeros, Las Vegas, N.M.
Cleo Fresquez, Acequia Madre de Los Romeros, Las Vegas, N.M.
Suzanne Gonzales, NMBHI - Acequia Madre de Los Dolores, Las Vegas, N.M.
Gilbert Ulibarri, Acequia Madre de Las Vegas, Las Vegas, N.M.
Mike Estrada, Round House Ditch, Las Vegas, N.M.
Guadalupe Trujillo, Papen Ditch, Las Vegas, N.M.
William Gonzales, San Augustine Community Ditch, Las Vegas, N.M.
Archie Allemand, La Bereda Blanca Ditch, Las Vegas, N.M.
Stacey Montano, La Bereda Blanca Ditch, Las Vegas, N.M.
Damien Lujan, La Concepcion Ditch, Las Vegas, N.M.
Nick Legger, Ancon del Gato Ditch, Las Vegas, N.M.
Bill May, Acequia Arriba de La Liendre, Las Vegas, N.M.
Alex Carone, West Chaperito Ditch, Santa Rosa, N.M.



STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER

John R. D'Antonio, Jr., P.E.
State Engineer

Santa Fe

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Fax: (505) 827-6682

June 23, 2008

Curtis Sollohub
Acequia Madre de Los Vigiles
Montezuma Rt. Box 205 HC80
Las Vegas, NM 87701

Re: 2008 Rotations among the Middle Gallinas River Area Diverters when the
Gallinas River flows are below 15 cfs at the USGS Montezuma gauge.

Dear Mr. Sollohub:

The Gallinas River flows at the USGS Montezuma gauge went below 20 cfs on June 8, 2008 and below 15 cfs on June 12, 2008. After some Acequias expressed concerns with the proposed OSE rotation, we held a meeting on June 20, 2008 with four of the impacted Acequias and the Rio Gallinas Acequias Association. Afterwards, we met with the City of Las Vegas Utilities Department to request that they also participate in a rotation. The Acequias and the City agreed on the following rotation schedule:

The rotations will start on Fridays at 8 a.m.

Starting on June 20 through June 27: (one-week rotation)

Group B: Diverting

Acequia Madre de Los Romeros
Roundhouse Ditch
Grzelachowski Ditch
Asylum Ditch

Group A: (off the river)

Acequia Madre de Los Vigiles
Acequia Madre de Las Vegas
Acequia Madre de Los Dolores
Pappen Ditch

Starting on June 27 through July 11: (two-week rotation)

Group A: Diverting

A.M. de Los Vigiles
A.M. de Las Vegas
A.M. de Los Dolores
Pappen Ditch

Group B: (off the river)

A.M. de Los Romeros
Roundhouse Ditch
Grzelachowski Ditch
Asylum Ditch

Starting on July 11 through July 25: (two-week rotation)

Group B: Diverting

A.M. de Los Romeros
Roundhouse Ditch
Grzelachowski Ditch
Asylum Ditch

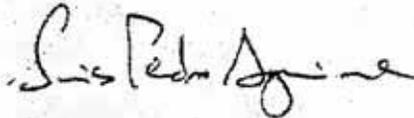
Group A: (off the river)

A.M. de Los Vigiles
A.M. de Las Vegas
A.M. de Los Dolores
Pappen Ditch

Starting June 20 through July 4 (two weeks) at 12:00 noon:

The City of Las Vegas off the river

We will meet on June 27, 2008 at 10:00 a.m. at the COLV Water Utilities offices to discuss the rotation schedules further. We will meet every Friday as necessary.



Luis Pedro Aguirre
Gallinas River Watermaster
(505) 827-6120 office

cc: John Romero, WRAP Director, Santa Fe, N.M.
Linda I. Gordan, WRD Gallinas River Program Manager, Santa Fe, N.M.
Vince Chavez, WRD District VI Staff Manager, Santa Fe, N.M.
Alan Cuddy, TSD Gallinas River Hydrologist, Santa Fe, N.M.
Hilario Rubio, LAP Acequia Liaison, Santa Fe, N.M.
Richard Trujillo, LAP Community Liaison, Santa Fe, N.M.
George DuFour, Utilities Director, City of Las Vegas, Las Vegas, N.M.
Frank Armijo, Water Treatment Plant Supervisor, COLV, Las Vegas, N.M.
Patrick Galligan, RGAA Board member, Las Vegas, N.M.
William Gonzales, RGAA Board member, Las Vegas, N.M.
Curtis Solohub, A.M. de Los Vigiles, Las Vegas, N.M.
Pat Romero, A.M. de Los Romeros, Las Vegas, N.M.
Richard Cozens, A.M. de Los Romeros, Las Vegas, N.M.
Gilbert Ulibarri, A.M. de Las Vegas, Las Vegas, N.M.
Mike Estrada, Roundhouse Ditch, Las Vegas, N.M.
Lupe Trujillo, Pappen Ditch, Las Vegas, N.M.
Suzanne Gonzales, A.M. de Los Dolores, Las Vegas, N.M.
Ray Gallegos, Grzelachowski Ditch, Las Vegas, N.M.
Danny Romero, Danny Romero Ditch, Las Vegas, N.M.
Cleo Fresquez, Cleo Fresquez Point of Diversion, Las Vegas, N.M.
Danny Lopez, Danny Lopez POD, Las Vegas, N.M.



STATE OF NEW MEXICO

OFFICE OF THE STATE ENGINEER

Santa Fe

John R. D'Antonio, Jr., P.E.
State Engineer

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July 22, 2008

Richard Cozens
Acequia Madre de Los Romeros
423 Railroad
Las Vegas, NM 87701

Re: 2008 Rotation Schedules among the Middle Gallinas River Area Diverters when the Gallinas River flows are below 15 cfs at the USGS Montezuma gauge.

Dear Mr. Cozens:

Find attached the complete 2008 rotation schedule from July 25 to October 31, 2008.

Luis Pedro Aguirre
Gallinas River Watermaster
(505) 827-6120 office

- cc: Linda I. Gordan, WRD Gallinas River Program Manager, Santa Fe, N.M.
- Vince Chavez, WRD District VI Staff Manager, Santa Fe, N.M.
- Alan Cuddy, TSD Gallinas River Hydrologist, Santa Fe, N.M.
- Hilario Rubio, LAP Acequia Liaison, Santa Fe, N.M.
- Richard Trujillo, LAP Community Liaison, Santa Fe, N.M.
- George DuFour, City of Las Vegas Utilities Director, Las Vegas, N.M.
- Frank Armijo, Water Treatment Plant Supervisor, COLV, Las Vegas, N.M.
- William Gonzales, RGAA Board President, Las Vegas, N.M.
- Curtis Sollohub, A.M. de Los Vigiles, Las Vegas, N.M.
- Richard Cozens, A.M. de Los Romeros, Las Vegas, N.M.
- Gilbert Ulibarri, A.M. de Las Vegas, Las Vegas, N.M.
- Mike Estrada, Roundhouse Ditch, Las Vegas, N.M.
- Lupe Trujillo, Pappen Ditch, Las Vegas, N.M.
- Suzanne Gonzales, A.M. de Los Dolores, Las Vegas, N.M.
- Ray Gallegos, Grzelachowski Ditch, Las Vegas, N.M.
- Danny Romero, Danny Romero Ditch, Las Vegas, N.M.
- Cleo Fresquez, Cleo Fresquez Point of Diversion (POD), Las Vegas, N.M.
- Danny Lopez, Danny Lopez POD, Las Vegas, N.M.
- Eddy Sanchez, Eddy Sanchez POD, Albuquerque, N.M.

THE ROTATIONS WILL START ON FRIDAYS AT 8 A.M.

JULY 2008						
SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
20	21	22	23	24	25	26
					<u>TURN TO DIVERT</u> A.M. DE LOS VIGILES A.M. DE LAS VEGAS A.M. DE LOS DOLORES PAPPEN DITCH DANNY ROMERO EDDY SANCHEZ	
27	28	29	30	31		
<u>TURN TO DIVERT</u> ACEQUIA MADRE DE LOS VIGILES ACEQUIA MADRE DE LAS VEGAS ACEQUIA MADRE DE LOS DOLORES PAPPEN DITCH DANNY ROMERO EDDY SANCHEZ						
AUGUST 2008						
SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
					1	2
					<u>TURN TO DIVERT</u> A.M. DE LOS VIGILES A.M. DE LAS VEGAS A.M. DE LOS DOLORES PAPPEN DITCH DANNY ROMERO EDDY SANCHEZ	
3	4	5	6	7	8	9
<u>TURN TO DIVERT</u> ACEQUIA MADRE DE LOS VIGILES ACEQUIA MADRE DE LAS VEGAS ACEQUIA MADRE DE LOS DOLORES PAPPEN DITCH DANNY ROMERO EDDY SANCHEZ						

THE ROTATIONS WILL START ON FRIDAYS AT 8 A.M.

AUGUST 2008						
SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
					8	9
					<u>TURN TO DIVERT</u> A.M. LOS ROMEROS ROUNDHOUSE GRZELACHOWSKI CLEO FRESQUEZ DANNY LOPEZ	
10	11	12	13	14	15	16
<u>TURN TO DIVERT</u> ACEQUIA MADRE DE LOS ROMEROS ROUNDHOUSE DITCH GRZELACHOWSKI DITCH CLEO FRESQUEZ DANNY LOPEZ						
17	18	19	20	21	22	23
<u>TURN TO DIVERT</u> ACEQUIA MADRE DE LOS ROMEROS ROUNDHOUSE DITCH GRZELACHOWSKI DITCH CLEO FRESQUEZ DANNY LOPEZ						

THE ROTATIONS WILL START ON FRIDAYS AT 8 A.M.

AUGUST 2008						
SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
17	18	19	20	21	22	23
					<u>TURN TO DIVERT</u> A.M. DE LOS VIGILES A.M. DE LAS VEGAS A.M. DE LOS DOLORES PAPPEN DITCH DANNY ROMERO EDDY SANCHEZ	
24	25	26	27	28	29	30
<u>TURN TO DIVERT</u> ACEQUIA MADRE DE LOS VIGILES ACEQUIA MADRE DE LAS VEGAS ACEQUIA MADRE DE LOS DOLORES PAPPEN DITCH DANNY ROMERO EDDY SANCHEZ						
SEPTEMBER 2008						
SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
31	1	2	3	4	5	6
<u>TURN TO DIVERT</u> ACEQUIA MADRE DE LOS VIGILES ACEQUIA MADRE DE LAS VEGAS ACEQUIA MADRE DE LOS DOLORES PAPPEN DITCH DANNY ROMERO EDDY SANCHEZ						

THE ROTATIONS WILL START ON FRIDAYS AT 8 A.M.

SEPTEMBER 2008						
SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
31	1	2	3	4	5	6
					<u>TURN TO DIVERT</u> A.M. LOS ROMEROS ROUNDHOUSE GRZELACHOWSKI CLEO FRESQUEZ DANNY LOPEZ	
7	8	9	10	11	12	13
<u>TURN TO DIVERT</u> ACEQUIA MADRE DE LOS ROMEROS ROUNDHOUSE DITCH GRZELACHOWSKI DITCH CLEO FRESQUEZ DANNY LOPEZ						
14	15	16	17	18	19	20
<u>TURN TO DIVERT</u> ACEQUIA MADRE DE LOS ROMEROS ROUNDHOUSE DITCH GRZELACHOWSKI DITCH CLEO FRESQUEZ DANNY LOPEZ						

THE ROTATIONS WILL START ON FRIDAYS AT 8 A.M.

SEPTEMBER 2008						
SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
14	15	16	17	18	19	20
					<u>TURN TO DIVERT</u> A.M. DE LOS VIGILES A.M. DE LAS VEGAS A.M. DE LOS DOLORES PAPPEN DITCH DANNY ROMERO EDDY SANCHEZ	
21	22	23	24	25	26	27
<u>TURN TO DIVERT</u> ACEQUIA MADRE.DE LOS VIGILES ACEQUIA MADRE DE LAS VEGAS ACEQUIA MADRE DE LOS DOLORES PAPPEN DITCH DANNY ROMERO EDDY SANCHEZ						
28	29	30				
<u>TURN TO DIVERT</u> ACEQUIA MADRE DE LOS VIGILES ACEQUIA MADRE DE LAS VEGAS ACEQUIA MADRE DE LOS DOLORES PAPPEN DITCH DANNY ROMERO EDDY SANCHEZ						
OCTOBER 2008						
			1	2	3	4
			<u>TURN TO DIVERT</u> A.M. DE LOS VIGILES A.M. DE LAS VEGAS A.M. DE LOS DOLORES PAPPEN DITCH DANNY ROMERO EDDY SANCHEZ			

THE ROTATIONS WILL START ON FRIDAYS AT 8 A.M.

OCTOBER 2008						
SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
					3	4
					<u>TURN TO DIVERT</u> A.M. LOS ROMEROS ROUNDHOUSE GRZELACHOWSKI CLEO FRESQUEZ DANNY LOPEZ	
5	6	7	8	9	10	11
<u>TURN TO DIVERT</u> ACEQUIA MADRE DE LOS ROMEROS ROUNDHOUSE DITCH GRZELACHOWSKI DITCH CLEO FRESQUEZ DANNY LOPEZ						
12	13	14	15	16		
<u>TURN TO DIVERT</u> ACEQUIA MADRE DE LOS ROMEROS ROUNDHOUSE DITCH GRZELACHOWSKI DITCH CLEO FRESQUEZ DANNY LOPEZ						

THE ROTATIONS WILL START ON FRIDAYS AT 8 A.M.

OCTOBER 2008						
SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
					17	18
					<u>TURN TO DIVERT</u> A.M. DE LOS VIGILES A.M. DE LAS VEGAS A.M. DE LOS DOLORES PAPPEN DITCH DANNY ROMERO EDDY SANCHEZ	
19	20	21	22	23	24	25
<u>TURN TO DIVERT</u> ACEQUIA MADRE DE LOS VIGILES ACEQUIA MADRE DE LAS VEGAS ACEQUIA MADRE DE LOS DOLORES PAPPEN DITCH DANNY ROMERO EDDY SANCHEZ						
26	27	28	29	30		
<u>TURN TO DIVERT</u> ACEQUIA MADRE DE LOS VIGILES ACEQUIA MADRE DE LAS VEGAS ACEQUIA MADRE DE LOS DOLORES PAPPEN DITCH DANNY ROMERO EDDY SANCHEZ						



STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER
SANTA FE

John R. D'Antonio, Jr., P.E.
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(505) 827-6091

September 25, 2008

Curtis Solluhub
Chairman, RGAA Ditch Metering Subcommittee
Montezuma Rt. Box 205 HC 80
Las Vegas, NM 87701

Re: Response to Additional Questions about the Metering or Measurement Agreement

Dear Mr. Solluhub:

On Monday September 22, 2008 we had a telephone conversation in regard to a letter recently sent responding to RGAA recommended amendments to the OSE Metering Agreement. This letter is to follow up on that conversation.

I would like to clarify that the sole purpose of the agreement is to allow OSE to install and maintain measurement stations in each of the acequias, canals, and systems diverting water directly from the Rio Gallinas. The agreement is not to establish the management and distribution of the available water in the stream. That will be done through the Adjudication and the Rio Gallinas Water Master Rules and Regulations. We encourage each acequia and parciente to make comments and suggestions on the existing draft of the Rio Gallinas Water Master Rules and Regulations. The can be found on the OSE Website at www.OSE.state.nm.us under AWRM>Priority Basins> Rio Gallinas> Public Review Draft Rules and Regulations>Guidelines for Water Administration on the Rio Gallinas. Please submit comments to Luis Aguirre.

You expressed concern about measurement stations being constructed in the Rio Gallinas acequias and being immediately utilized to limit deliveries to acequias. As we discussed, and all parties to the current ongoing adjudication will acknowledge, until such time that there is clearly defined rights for all waterusers the Rio Gallinas Watermaster

management of the river is basically for the purposes of collecting data and assisting in the equitable distribution of the annual available supply.

Currently there has been a determination of farm delivery requirement or duty in the adjudication. I acknowledge that the RGAA has filed a Motion in the Adjudication Court to have that amount reconsidered. Until all partials with irrigation rights have been re-adjudicated we also still have the Hope Equity 712 Decree duty of 1.5 acre-feet per acre, which is appurtenant to most irrigated acreage in the river basin at this time.

The Gallinas Water Master will not utilize the measurement stations, once they are installed, to immediately begin limiting diversions. This will not be possible until all irrigated tracts have been adjudicated and there is a final determination of the farm delivery requirement (FDR) and carriage losses that may be awarded to insure delivery of the FDR.

Since the Rio Gallinas Acequias have agreed to share available water supplies for the last three or four years we hope that this is an essential component of how they would like to see the available water managed in the future. The measurement stations will help to insure the equitable delivery of the available supplies from year to year. The data from these stations will also help to inform the parcientes, majordomos and commissioners of the acequias as to how much water is being diverted by their acequias on an annual basis.

Once the adjudication is complete the Rio Gallinas Water Master will implement and enforce all Orders of the Court and the Rio Gallinas Water Master Rules and Regulations.

At that time we hope that the acequias will have utilized the available diversion data to make decisions for improvements in their delivery systems and methods and will have some conservation methods or directives in place to assist in the equitable distribution of diverted water within the acequias themselves.

Should you have further questions or comments please feel free to contact me.

Sincerely,

Linda I. Gordan, Manager
District VI Water Rights Office
Rio Gallinas Project Lead

LIG