

TWENTIETH CENTURY WATER RESOURCES DEVELOPMENT

Robert Gott

There were three major drivers to the enormous expansion of water resources infrastructure in the past century, 1) population growth; 2) industrial development; and 3) expansion of irrigated agriculture. All three factors increased dramatically. Between 1900-1995 the population of the world grew from 1,600 million to nearly 6,000 million people. Land irrigation increased from around 50 million hectares at the turn of the century to over 250 million hectares today. These and other factors have led to a nearly seven-fold increase in freshwater withdrawals. It is estimated that humans already appropriate 54% of accessible runoff on earth and that future population growth and economic development could lead humans to use more than 70% of accessible runoff by 2025.

20th century water resources planning and development relied on projections of future populations per-capita water demand, agriculture production, and economic productivity. Because each of these variables has always been projected to rise, water needs have also been expected to rise. As a result, traditional water planning regularly concludes that future water demands will exceed actual water supplies. Water management issues became exercises in resolving this problem. Prior to the 1980's, these exercises led planners to focus on supply side issues. They assumed that projected shortfalls would be met by taming more of the hydrologic cycle through construction of reservoirs for water storage and new aquaducts and pipelines.

In the United States alone, total capital investment for water over the past century is estimated at \$400 billion, mostly for large scale engineering projects. In the arid western U.S., limited availability and growing demand for water led to the construction of the Central Arizona Project, the California Central Valley and State water projects, and dozens of the worlds most massive dams on the Columbia, Colorado, and Missouri rivers. By the mid 1990's the U.S. had built over 80,000 dams and reservoirs, nearly 90,000 megawatts of hydroelectric capacity, and more that 15,000 wastewater treatment plants. During the same boom in construction, more that 60% of the inland wetlands of the U.S. were lost.

Throughout the century water developments in most countries have relied on government funds. In the U.S., China, former Soviet Union, and India huge investment have been made. In the U.S. two government agencies - the U.S. Bureau of Reclamation (BOR) and the U.S. Army Corps of Engineers (ACOE) - have shared responsibility for implementing national water policies aimed at providing water for cities and agriculture.

The BOR and ACOE have been the most important actors in U.S. water policy. They have built the largest water projects in the country and control far more water than anyone else and sell that water at extremely low prices. The BOR alone has built more that 350 major storage reservoirs, 250 diversion dams, 25,000 kilometers of canals, 2200 kilometers of pipelines, and 50

Continued on page 2

Continued from page 1

hydroelectric dams. Actual current value and replacement costs of these projects exceeds \$100 billion. BOR projects provide over 35 billion cubic meters of water every year, mostly for irrigation.

Although the initial idea was that federal projects would pay for themselves by charging farmers and cities for the water provided, it became clear as early as the 1920's that repayments would not occur as planned. The government eased repayment obligations, institutionalizing large direct water subsidies by relieving farmers of the burden of paying any interest on capital expenditures and by extending the repayment period by many decades. It is now widely acknowledged that many of these projects will never be repaid and will represent a permanent government subsidy.

Official projections of total water demands exceed available supplies by several billion cubic meters - a gap projected in every state water report since 1957. More people now place a higher value on maintaining the integrity of water resources and the societies that have developed around them. There are growing concerns to reevaluate the costs and the benefits of water management to be distributed in a more fair and prudent manner.

A new water era has begun. In contrast to earlier decades of damming, drilling, and diverting to gain control over water, the next generation will be marked by limits and constraints - political, economic, and ecological. Yet numerous opportunities are waiting to be explored. Exploiting the market potential of new water saving technologies is an important avenue to

consider. Better water management will require decentralizing control over water and moving from top-down decision making to greater people participation - a shift absolutely essential for better human and economic development overall.

This article used as its source material:
Gleick, Peter H. The World's Water 1998-1999: The Biennial Report On Fresh Water Resources. Washington, D.C., Covelo, California: Island Press, 1998

Van der Leeden, Frits; Trois, Fred L.; Todd, David Keith. Water Encyclopedia, 2nd Ed. Chelsea, Michigan: Lewis Publishers, 1990

NEWSLETTER DIRECTORY OF CONTACTS

NMSU DABCC Water Utilities Technical Assistance Program

Nancy Gott, Newsletter Editor 505-984-0676
P.O. Box 4192 wutap@qwest.net
Santa Fe, NM 87502 FAX 505-982-3137

NM Water & Wastewater Association

Caroline Martinez 505-753-8840
P.O. Box 819 www.nmwwa.org
Española, NM 87532 FAX 505-753-9810

NM Environment Department, Certification & Training Office, NM Utility Operator Certification Advisory Board

Mike Coffman 505-827-0108
P.O. Box 26110 www.nmenv.state.nm.us
Santa Fe, NM 87502 FAX 505-827-0160

ANNUAL SCHOOL HIGHLIGHTS

Annual School was a great success this year. January in Las Cruces was a nice break for those who traveled down from parts northern. There was a great attendance at the Tuesday night "Meet & Greet". Art Torrez warmed up the crowd for Niki Mangin who had us rolling in the aisles with her comedy routine. There were definitely a few red faces when she read her "map" of Northern New Mexico sites. And now we all have a new reference for the NM Environment Department (NMED) - New Month...Everything Different!

Wednesday's Awards Banquet allowed us a glimpse into the Southwest's water future with a very informative talk by Ben Woods of NMSU. The evening was capped by a retrospective slide show as the "Instructor of the Year" award was renamed the "Cynthia Hiers-Robinson Instructor of the Year". Cynthia's mother Jean Hiers was presented a Special Award in her honor and her brother Maurice Hiers Jr. gave a very moving acceptance speech.

Following is a list of all the award recipients:

- Charles Caldwell Award (highest increase in membership for 2001): Southeast Section

■ Good Housekeeping Awards:

City of Aztec, -Surface Water
City of Roswell – Ground Water
City of Rio Rancho – Ground Water
City of Gallup- Activated Sludge
Village of Los Lunas-Activated Sludge

■ Outstanding Operators of the Year:

Lydia Lugo, City of Las Cruces
Mick Jakymiw, City of Rio Rancho
William Rivera, City of Albuquerque
Jeff Burkett, Town of Taos

■ Max Summerlot Awards:

City of Roswell, Water Facility
City of Rio Rancho, Water Facility

■ Section President's Award:

NE - Town of Taos, W/W
NW - City of Farmington, W/W
SE - Village of Ft. Sumner, Water
WC - City of Gallup, Water Production
CT - Town of Bernalillo, W/W
SW - City of T. or C. Wastewater Plant

- Scholarships: Tom Reeves & George La Rose

- Achievement Award: Albert Jackson
- Lifetime Members:
Lu Ann Bustamante, City of Santa Fe
Nelson Edmonds, Los Alamos County
Eddie Lujan, City of Las Cruces
Felix Lujan, City of Santa Fe
Gerald Marquez, Los Alamos Co.
Clyde Medina, Los Alamos County

- Rudy Romero, City of Santa Fe
- Bobby Soto, City of Las Cruces
- John Smith, City of Santa Fe
- Antonio Trujillo, City of Belen
- John Clark Award: Ray Espinoza
- President's Award: Ray Espinoza
- Cynthia Hiers-Robinson Instructor of the Year Award:
John Brown & David Volz



Left: Robert Gott & Eric Lopez applaud as Al Jackson receives a Special Achievement Award from Albert Barela.

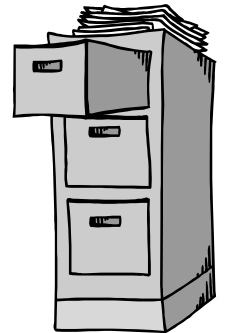


Right: Maurice & Jean Hiers receive a Special Award honoring Cynthia Hiers-Robinson from Albert Barela.

CERTIFICATION NEWS

Address any questions, comments, or requests for information regarding the certification process to the Facility Operations Section (FOS). **Our phone number is (505)827-2804.**
Our mailing address is:

Facility Operations Section
NMED Surface Water Quality Bureau
P.O. Box 26110
Santa Fe, NM 87502



Please be sure to request a current application form (look for the date 02/12/01 in the lower right corner of the back page). Applications should be submitted to the FOS as soon as possible, but they *must be submitted at least 30 days prior to the exam date. All applications for examination received in 2002 must be accompanied by the payment of the examination fee by check or money order. New application forms dated "02/12/01" contain this instruction. We will continue to accept application forms dated "11/00" provided they are submitted with the appropriate exam fee.*

APPLICATION DEADLINE	EXAM DATE	LOCATION	TRAINING EVENT
4/10/02	5/10/02	Farmington	NM W W A NW Section Workshop
5/08/02	6/07/02	Ruidoso	NM W W A SW Section Workshop
6/12/02	7/12/02	Gallup	NM W W A W C Section Workshop
7/10/02	8/09/02	Carlsbad	NM W W A SE Section Workshop
8/14/02	9/13/02	Abuquerque	NM W W A Central Short School
*9/18/02	10/18/02	Española	NM W W A NE Section Workshop
*9/19/02	10/18/02	Coburn	W UTAP Workshop
10/16/02	11/15/02	Abuquerque	NM W W A Central Section Workshop

*Two test sites will be conducted on the same day in two different locations.

2002 NEW MEXICO TRAINING CALENDAR 2002

APRIL

NMRWA TRAINING SESSION — SMALL WATER O&M

DATE: April 24-25, Wednesday & Thursday

LOCATION: Deming, TBA

CONTACT: N.M. Rural Water Association, 505-884-1031,
1-800-819-9893, FAX 505-884-1031, www.nmrwa.org

NMWWA SEMINAR —PUMPS O&M

TOPICS: theory of operation, pump components, pump hydraulics, troubleshooting, maintenance-pump packing, mechanical seals, bearings, and positive displacement pumps

DATE: April 26, Friday

TIMES: 8 to 4:30

LOCATION: Anthony, Gadsden Center,
1700 E O'Hara Rd.

REGISTRATION: \$25, *pre-registration is required.*

CREDITS: 7 hours

CONTACT: NMWWA, Caroline Martinez, 505-753-8840,
FAX 505-753-9810

MAY

NMWWA NORTHWEST SECTION WORKSHOPS

TOPICS: Levels 1 & 2, Basic & Adv. Water & Wastewater

DATES: May 6-7, Monday & Tuesday

May 8-9, Wednesday & Thursday

TIMES: 8 to 4:30, each day

LOCATION: Farmington, San Juan College

REGISTRATION: \$60, members; \$80, non-members.

\$100 members; \$140 non-members if attending
BOTH workshops

Advanced registration is requested.

CONTACT: Cindy Huntsman, 505-334-8684

CREDITS: 13 hours for each workshop

NMED EXAM: May 10, 8 to 2:30.

Submit your test application by April 10th at the latest.

NMWWA SEMINAR —PUMPS O&M

TOPICS: theory of operation, pump components, pump hydraulics, troubleshooting, maintenance-pump packing, mechanical seals, bearings, and positive displacement pumps

DATE: May 17, Friday

TIMES: 8 to 4:30

LOCATION: UNM, Taos, Klauer Campus
1157 County Rd. 110, Room 110

REGISTRATION: \$25, *pre-registration is required.*

CREDITS: 7 hours

CONTACT: NMWWA, Caroline Martinez, 505-753-8840,
FAX 505-753-9810

JUNE

NMWWA SOUTHWEST SECTION — JAKE HANDS MEMORIAL WORKSHOP

TOPICS: Levels 1 & 2, Basic water & wastewater

DATE: June 5-6, Wednesday & Thursday

TIMES: 8 to 5 each day

LOCATION: Ruidoso, Swiss Chalet Motel, 1451 Mechem Dr.

REGISTRATION: \$60, members; \$80, non-members

Advanced registration is requested

CREDITS: 13 hours

CONTACT: Louie Gomez, 505-528-3653

NMED EXAM: June 7, 8 to 2:30.

Submit your test application by May 8th at the latest.

NMWWA SEMINAR —PUMPS O&M

TOPICS: theory of operation, pump components, pump hydraulics, troubleshooting, maintenance-pump packing, mechanical seals, bearings, and positive displacement pumps

DATE: June 7, Friday

TIMES: 8 to 4:30

LOCATION: UNM, Continuing Education
1634 University Boulevard

REGISTRATION: \$25, *pre-registration is required.*

CREDITS: 7 hours

CONTACT: NMWWA, Caroline Martinez, 505-753-8840,
FAX 505-753-9810

JULY

NMWWA WEST CENTRAL SECTION WORKSHOP

TOPICS: Levels 1 & 2, Basic Water & Wastewater

DATE: July 10-11, Wednesday & Thursday

TIMES: 8 to 4:30, each day

LOCATION: Gallup, UNM Gallup

REGISTRATION: \$60, members; \$80, non-members.

Advanced registration is requested.

CREDITS: 13 hours

CONTACT: Pat Sanchez, 505-863-1211

NMED EXAM: July 12, 8 to 2:30

Submit your test application by June 12th at the latest.

AUGUST

NMWWA SOUTHEAST SECTION WORKSHOP

TOPICS: Levels 1 & 2, Basic Water & Wastewater

DATE: August 7-8, Wednesday & Thursday

TIMES: 8 to 5, both days

LOCATION: Carlsbad, NMSU-Carlsbad, 1500 University

2001 NEW MEXICO TRAINING CALENDAR 2001

REGISTRATION: \$60, members; \$80, non-members.

Advanced registration is requested.

CREDITS: 13 hours

CONTACT: Debra Edwards, 887-5412

NMED EXAM: August 9, 8 to 2:30.

Submit your test application by July 10th at the latest.

SEPTEMBER

NMWWA CENTRAL SCHOOL

TOPICS: This general water & wastewater operations school is for both basic and advanced, Levels 1-4.

DATES: September 9-12, Monday through Thursday

TIMES: 8 to 5 each day [26 hours credit]

LOCATION: Albuquerque, UNM Continuing Education Bldg.
1634 University Blvd., NE

REGISTRATION: \$200 for members, \$250 for non-members.

Advanced registration is required

CREDITS: 26 hours

CONTACT: Caroline Martinez, 505-753-8840,
FAX 505-753-9810.

NMED EXAM: September 13, 8 to 2:30.

Submit your test application by August 14th at the latest.

OCTOBER

NMWWA NORTHEAST SECTION WORKSHOP

TOPICS: Levels 1 – 2, Basic water & wastewater

DATE: October 16-17, Wednesday & Thursday

TIMES: 7:30 to 4:00 each day

LOCATION: Espanola, National Guard Armory

REGISTRATION: \$60, members; \$80, non-members

Advanced registration is requested

CREDITS: 13 hours

CONTACT: Andrew Medina, 505-662-8142

NMED EXAM: October 18, 8 to 2:30.

Submit your test application by Sept. 18th at the latest.

NOVEMBER

NMWWA CENTRAL SECTION WORKSHOP

TOPICS: Levels 1 & 2, Basic Water & Wastewater

DATE: November 13-14, Wednesday & Thursday

TIMES: 8 to 5, both days

You will note that the registration fees for the three major NMWWA Short Schools have been increased, starting with this year's Central Short School. This price increase is due to increased personnel, overhead, room rental, and equipment costs.

A Grant Committee has been organized to apply for monies to help defray increased training costs. The committee consists of Fred Ragsdale, Eric Lopez, Louis Lujan, Greg Lawrence, and Albert Barela. Anybody else who wishes to get involved in this committee should contact Albert at abarela@nmsu.edu, or give him a call at 505-642-2122.

LOCATION: Albuquerque, UNM Continuing Education Bldg.
1634 University Blvd., NE

REGISTRATION: \$60, members; \$80, non-members.

Advanced registration is requested.

CREDITS: 13 hours

CONTACT: John Kelley, 505-857-8286

ON-GOING TRAINING

NM MEMBERSHIP INVOLVEMENT COMMITTEE ROCKY MOUNTAIN SECTION AWWA/WEA

DATES: 4th Tuesday of each month

TIMES: 11:45 AM to 1 PM

LOCATION: Furr's Family Dining, 109 Montgomery at the
Intersection of Montgomery & San Mateo

CONTACT: Rocky Mountain Section AWWA/WEA, Joel
Rife, 505-243-3200

CALIFORNIA STATE UNIVERSITY, SACRAMENTO

TOPICS: Water, Wastewater, Collections, Distribution

REGISTRATION & MANUAL: various

CONTACT: Kenneth Kerri, 916-278-6142, FAX 278-5959

ARC PUBLICATIONS

TOPICS: Small Water, Small Wastewater, Math, Electrical
Fundamentals, Cave-in Protection and Competent
Person, O&M of Chlorine Systems, Water Distribution
System Construction, Flash Certs™

REGISTRATION: various

CONTACT: 541-928-6199

FIELD TRAINING

The New Mexico State University, Water Utilities Technical Assistance Program (WUTAP) - Robert Gott, Robert George, & Bernie Garcia - can provide on-site, no cost training in operations & maintenance, process control, laboratory, & financial management of water supply or wastewater treatment operations to municipal facilities and Indian Pueblos.
505-984-0676; FAX 505-982-3137; e-mail wutap@swcp.com



PRESIDENT'S CORNER

Albert Barela

First of all, I'd like to start off by thanking all of you for selecting me as your President of the NM Water & Wastewater Association. I will continue to work hard like all the past Presidents have in making sure the operators throughout the state are provided with quality training to enhance their profession.

The first school of the year was held in Las Cruces on January 28-31 and like all the other schools was a success. I'm always amazed with the dedication, professionalism, and the quality of training that the volunteer instructors provide for the operators. It was also very encouraging to see all the operators (students) being so attentive and eager to learn. This makes it so motivating and worthwhile for all the instructors, whom we all know, dedicate their time and hard work. Seeing students helping each other to learn and the comradeship that was taking place was like seeing a close net family helping each other. A special thanks to all the instructors and all the students for being so dedicated to their profession.

In addition to training, Tuesday night was set aside for the "meet & greet". The master of ceremonies that night was Cheech (Art Torrez) from Roswell. He raffled off many door prizes that were donated by the vendors who had displays throughout the week. Cheech was very entertaining but, the main event was yet to come. Niki Mangin dazzled us with her comedy act. She brightened everybody's spirit which set the mood for the banquet.



The banquet was on Wednesday night, and as your President, it was my turn to be Master of Ceremonies. To start off, I was to introduce the head table and have my wife lead the ceremonies with a prayer before dinner. Half way through the dinner I remembered that not only did I forget to introduce

my wife, but also our guest speaker and his wife, which by the way is my boss Ben Woods. I also forgot to introduce Louis Lujan our Director. I missed the entire right side of the table, I guess I was just anxious to eat.

After dinner our guest speaker was finally introduced. His speech was very motivating and at the same time he put it very nicely and without panicking anybody that there is a shortage of water. It was reassuring to know that there will be more jobs for operators in purifying wastewater and surface water in the future.

After Mr. Wood's speech the awards were handed out which included. "Operator of the Year", Good House-keeping, Max Summerlot, John Clark, Charles Caldwell, and the last award the "Cynthia Hiers-Robinson Instructor of the Year" was the most moving of all. The award was renamed after Cynthia who passed away this past year. The change brought much joy, tears, and a standing ovation. Cynthia's mother and brother gratefully received an award that was highly deserved in honor of Cynthia. Cynthia was not only our friend; she was a professional and an excellent instructor. She is already greatly missed.

Continued on page 8

NMWWA

PUMPS - TECHNICAL O&M SEMINARS

Pre-payment & Pre-registration Required

Fee: \$25
Credits: 7 Hours
Times: 8:00-4:30
Instructor: Fred Ragsdale

Topics: theory of operation, pump components, pump hydraulics, trouble-shooting, maintenance-pump packing, mechanical seals, and positive displacement pumps.

_____ Gadsden Center
1700 EO'Hara Rd.
Anthony, NM
Friday, April 26, 2002

√Please mark which session you plan to attend

_____ UNM - Taos (Klauer Cam.)
1157 County Rd. 110, Rm 110
Taos, NM
Friday, May 17, 2002

_____ UNM - Continuing Ed.
1634 University Blvd.
Albuquerque, NM
Friday, June 7, 2002

NAME _____ SSN# _____

ADDRESS _____ CITY _____ STATE _____ ZIP _____

EMPLOYED BY _____ EMP. PHONE# _____

IMPORTANT: Classes are limited and pre-registration is required. No registration at the door. Please call Caroline Martinez at 505-753-8840 to confirm registration. Refunds apply only if cancellation is received 1 week before seminar. (Fax: 505-753-9810)

Mail registration form & check to: Caroline Martinez, Executive Manager
NM Water & Wastewater Association
P.O. Box 819
Española, NM 87532

**NEW MEXICO WATER & WASTEWATER ASSOCIATION
CENTRAL SHORT SCHOOL - PRE-REGISTRATION FORM**

CENTRAL SHORT SCHOOL
September 9-12, 2002
UNM Continuing Ed. Building
1634 University Blvd., NE
Albuquerque, NM

Payment in full must accompany this registration form or it will NOT be processed.

NAME: _____ **SOCIAL SECURITY #:** _____

HOME ADDRESS: _____ **CITY:** _____ **STATE:** _____ **ZIP:** _____

EMPLOYED BY: _____ **EMPLOYER PHONE #:** _____

ARE YOU A MEMBER OF NEW MEXICO WATER & WASTEWATER ASSOCIATION: YES NO

ARE YOU CURRENTLY CERTIFIED: YES NO

PLEASE NOTE: Pre-registration is *required* and on a “first come - first served” basis. There will be *NO* registration at the door. You must specify which *category* you will attend. When a specific *category* has reached its student capacity, no further registration will be allowed in that area, either at pre-registration or at the time of the school. Registration confirmation will *NOT* be sent. Call (505)753-8840 to confirm registration. Refunds apply *ONLY* if cancellation instructions are received one week before the specified short school and there will be a \$25 processing fee for all cancellations.

REGISTRATION FEES:

Member Fee: \$200
 Non-Member Fee: \$250

NMWWA State & Section Dues (if not yet paid):

Active: \$30
 Corporate: \$28
 Associate: \$25
 Student: \$20
 Total: _____

CLASSES:

You **MUST** mark the *category* of classes that you will be attending in order for this form to be complete. You may attend one or two categories of classes. 26 credits each category:

ENROLLMENT	CATEGORY
50 people	Basic Water (I - II) _____
50 people	Basic Wastewater (I-II) _____
50 people	Advanced Water(III-IV) _____
50 people	Adv. Wastewater (III-IV) _____
30 people	Workshops (III-IV) _____

Make check payable to:

N.M. Water & Wastewater Association

Mail form & check to:

Caroline Martinez, Executive Manager
 P.O. Box 819
 Española, NM 87532

Pre-Registration Deadline: Sept. 1, 2002

Accommodations:

Make your motel reservations before Aug. 1st. Be sure to tell them you're with NMWWA.

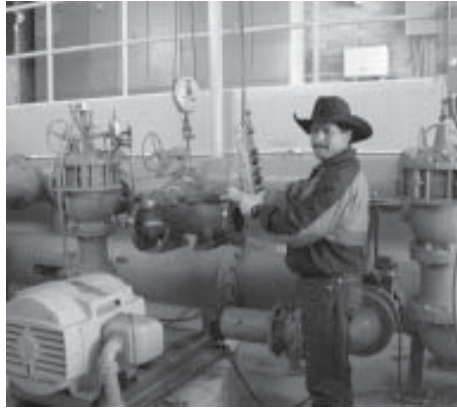
- Super 8 Motel, 2500 University Blvd.
30 single, \$36 double 1-505-888-4884
- LeBaron Inn, 2120 Menaul Blvd. NE
\$42 single, \$47 double 1-800-444-7378
- Roadway Inn, 2108 Menaul Blvd. NE
\$38 single, \$46 double 1-800-601-1873

OPERATOR SPOTLIGHT

GEORGE CASTILLO

Louie Gomez

George Castillo has been employed with the City of Las Cruces for 17 years. George transferred from the Parks Department to become a water crewman for the Water Production Department. After obtaining his Water Certification Level IV, he was promoted to Water Production Operator in January of 1998. In addition to his regular duties, he is also responsible for all the welding projects. He is a great asset to this department and will not leave a job until it is complete. George is a member of NMWWA and enjoys fishing, hunting and spending time with his family.



President's Corner - continued from page 6

In closing, I would like to thank our new state officers who were present at the school which include, Eric Lopez, Armando Cordero, Rick Griego, Art Torrez, & Louis Lujan and also Gene Salazar, Nancy Gott, Maria Ortiz, & Violet Miera for all their help during the week in helping to make the school a success. Caroline was not able to be with us that week because of an illness in her family. She was greatly missed. We really missed her smile and our prayers go out to her and her family.

NMWWA MONTHLY SECTION MEETINGS

- Southeast Section
 - ⊕ 1st Wednesday, rotating
 - ☎ Mark Earnest, 505-624-6731
- Southwest Section
 - ⊕ 3rd Wednesday, Las Cruces
 - ☎ Louie Gomez, 505-528-3653
- West Central Section
 - ⊕ 4th Wednesday, Gallup
 - ☎ Ray Espinoza, 505-863-1210
- Central Section
 - ⊕ 1st Monday, Albuquerque
 - ☎ John Kelley, 505-857-8286
- Northeast Section
 - ⊕ 2nd Monday, rotating
 - ☎ Andrew Medina, 505-662-8142
- Northwest Section
 - ⊕ 1st Tuesday, rotating
 - ☎ Gary Lawrence, 505-632-2866