

2018

Water Protection Advisory Board

ANNUAL REPORT FOR 2018

**SUBMITTED TO THE
ALBUQUERQUE CITY COUNCIL
BERNALILLO COUNTY COMMISSION
AND THE
ALBUQUERQUE BERNALILLO COUNTY WATER UTILITY
AUTHORITY GOVERNING BOARD**

Annual Report

2018

Prepared by the
Albuquerque and Bernalillo County
Water Protection Advisory Board

Members:

Kerry J. Howe, Ph.D., Chair
Russell Pederson, Vice Chair
Suzanne Busch, P.E.
Steve Glass
Julia Maccini
Roland Penttila
Caroline Scruggs, Ph.D.
Roberto Roibal
John Pietz, P.E.

Acronyms

AMAFCA	Albuquerque Metropolitan Arroyo Flood Control Authority
AOC	Area of Concern
BFF	Bulk Fuels Facility
DBS&A	Daniel B. Stephens & Associates
EDB	Ethylene dibromide
GPPAP	County Ground-Water Protection Policy and Action Plan
KAFB	Kirtland Air Force Base
LALF	Los Angeles Landfill
MCL	Maximum Contaminant Level
MNA	Monitored Natural Attenuation
MRCOG	Mid-Region Council of Governments
MRG	Middle Rio Grande
MS4	Municipal Separate Storm Sewer System
NMBGMR	New Mexico Bureau of Geology and Mineral Resources
NMED	New Mexico Environment Department
NPDES	National Pollutant Discharge Elimination System
PCE	Tetrachloroethene
PCP	Personal Care Product
PIC	Policy Implementation Committee
PSOC	Potential Source of Contamination
RAPP	Rivers and Aquifer Protection Plan
RCRA	Resource Conservation and Recovery Act
SNL	Sandia National Laboratories
SWPA	Source Water Protection Area
TAG	Tijeras Arroyo Groundwater
TA-V	Technical Area - Five
TCE	Trichloroethene
TDS	Total Dissolved Solids
UCMR4	Unregulated Contaminant Monitoring Rule
USGS	United States Geological Survey
VOC	Volatile Organic Compound
WPAB	Water Protection Advisory Board
WQCC	Water Quality Control Commission
WQPPAP	Water Quality Protection Policy and Action Plan

This report presents an overview of the Water Protection Advisory Board's (WPAB) areas of focus, activities, and accomplishments during calendar year 2018. In addition to summarizing WPAB activities, this report offers a list of the threats to water quality in the basin in 2018, and a description of the WPAB's priorities for 2019.

Background

Starting in 1988, the City of Albuquerque (City) and Bernalillo County (County) passed resolutions calling for action to clean up and protect the Middle Rio Grande's (MRG's) shared groundwater resources. After five years of planning and research, the Albuquerque/Bernalillo County Ground-Water Protection Policy and Action Plan (GPPAP) was adopted by the County in November 1993, by the City in August 1994, and subsequently by the Albuquerque Bernalillo County Water Utility Authority (Water Authority) after its creation in 2003.

GPPAP was updated and revised in 2009 to include surface water quality protection activities, resulting in a single Water Quality Protection Policy and Action Plan (WQPPAP). In 2018, the Water Authority began the process of completing updated source water assessments for both groundwater and surface water, as well as an update to the WQPPAP. The updated WQPPAP, referred to as the Rivers and Aquifers Protection Plan (RAPP), is slated to be finalized in early 2019.

The WPAB with community members appointed by the City, County, and Water Authority was established to oversee implementation of the WQPPAP. The WPAB as established by ordinance is to:

- Study and advise the Water Authority, City, and County on surface and groundwater protection concerns;
- Oversee implementation of the WQPPAP;
- Periodically review and evaluate the effectiveness of the WQPPAP and make recommendations for changes, as necessary;
- Promote consistency in Water Authority, City, and County actions to protect surface and groundwater quality; and
- Advocate effective protection of surface and groundwater quality.

Additionally, the WPAB works with members of a Policy Implementation Committee (PIC) through which member agencies provide solutions aimed at improving public health, protecting the environment, water quality, and enhancing area residents' quality of life.

The WPAB consists of nine members: two appointed by the Water Authority; three appointed by the Mayor with the advice and consent of the City Council; and three appointed by the County Commission. One member is appointed jointly by the County Commission and the Mayor with the advice and consent of the City Council. A summary of the current members' qualifications is located in Appendix A.

The PIC is comprised of members from the City, County, and Water Authority staff that are involved in environmental protection, compliance reporting, water quality monitoring, and water resource planning activities. The Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA) is also represented on the PIC. PIC members help the WPAB fulfill its purpose by providing technical assistance, administrative services, and staffing resources. Core PIC entities and agencies that implement activities related to the WQPPAP, in addition to other environmental and public health services, include:

Albuquerque Bernalillo County Water Utility Authority

- Compliance Division
- Water Resources Division

Bernalillo County

- Natural Resource Services

City of Albuquerque

- Environmental Health Department
- Stormwater Management Section
- Solid Waste Management Department

Albuquerque Metropolitan Arroyo Flood Control Authority

- Storm Water Runoff/Storm Water Quality

Water Protection Advisory Board Activities for 2018

The WPAB is required to hold meetings at least once a quarter, but typically meets on the second Friday of each month, addressing specific water quality concerns included on an agenda agreed to by the board members. A work plan is developed and approved by WPAB members at the first meeting of each calendar year. The board receives much of its information from formal presentations by government agencies or environmental advocates conducting investigations or outreach activities on topics of interest. In 2018, the WPAB meeting agenda topics included presentations in the following areas, consistent with the board's established priorities for the year:

- I. Protection of groundwater quality in the Albuquerque Basin;
- II. Protection of surface water quality and watershed health, and;
- III. Fostering intergovernmental coordination, cooperation, and communication.

Below is a summary of significant action items taken by the board and technical presentations heard by members during the 2018 calendar year.

JANUARY

Board Actions:

Members elected Dr. Kerry Howe as Chair and Mr. Russ Pederson as Vice Chair. Members passed their Open Meetings Resolution for 2018 and discussed the draft 2018 Work Plan and 2018 Presentation Schedule. Additionally, members discussed the upcoming legislative session.

Discussion Summary:

Board members discussed a draft table highlighting the areas of focus for the 2017 Annual Report. Members discussed specific presentations to include in the 2018 presentation schedule, including the collaboration of intergovernmental agencies and made the topic of oil and gas a priority for the board. Members also added an area of focus on "future risk" in order to identify emerging issues and risk for the board to consider and receive updates on.

FEBRUARY

Board Actions

WPAB members voted to revise and re-issue a 2017 letter on an oil and gas ordinance.

Presentation Summary:

A Drinking Water Issue, Mr. Don Phillips

Mr. Don Phillips, a geologist, presented on conventional and unconventional oil and gas drilling in New Mexico as well as the potential for unconventional fracking to impact water quality. As part of his presentation, Mr. Phillips described the difference between conventional and unconventional fracking methods with additional detail provided on the methods and materials used in unconventional fracking. He went on to describe the geology and hydrology of the Albuquerque/Middle Rio Grande Basin, highlighting the fractured nature of geology and the faults that separate portions of the aquifer. Mr. Phillips argued in his presentation that the fault zones could be potentially preferential pathways for water contaminated by fracking fluids. He highlighted the Mancos Shale in the basin geology as the target formation for fracking and pointed to areas where faulting has placed the Mancos Shale adjacent to drinking water aquifers. Mr. Phillips concluded his presentation with a request that board members do additional research into what is happening in the Albuquerque Basin, suggesting presentations by the University of New Mexico Geology Department, oil and gas representatives, etc.

Water Authority Source Water Assessment Updates, Kelly Baker, Daniel B. Stephens & Associates

Ms. Kelly Baker of Daniel B. Stephens & Associates (DBS&A) provided an update on the surface water and groundwater source water assessments being conducted in support of the Water Authority's 2018 update to the Water Quality Protection Policy and Action Plan (WQPPAP). Ms. Baker explained that for the assessments source water protection areas (SWPAs) were defined for the surface water and groundwater sources. In the case of groundwater, each individual Water Authority supply well was defined as a source and a buffer zone of a ½-mile radius was defined as the SWPA. For surface water, a ½-mile wide buffer area was defined from the Water Authority San Juan-Chama point of diversion and upstream 15 river miles; Abiquiu and Cochiti Reservoirs were also included as surface water sources. Ms. Baker further explained that potential sources of contamination (PSOCs) were identified for each source in the buffer zones and that information was used to determine a source's vulnerability to contamination. She explained that an inventory of PSOCs is being created from various databases for both assessments and will include known contamination sites like the Fruit Avenue Plume Superfund site. Ms. Baker said that the assessments examine vulnerability and

sensitivity which includes infrastructure condition and considers hydrogeology.

Discussion Summary:

Board member Suzanne Busch asked about earthquakes happening in Oklahoma and if something similar could happen in the Rio Grande Rift system. Mr. Phillips replied that given the geology of the Albuquerque Basin combined with the unconventional fracking methods that earthquakes are a real concern. Dr. Scruggs asked about mineral rights purchased by Thrust Energy and if they had stopped activity in the basin following the voting down of the Sandoval County oil and gas ordinance. She also asked Mr. Phillips if fracking had been banned anywhere in the United States and whether or not a ban focused on geology and the protection of groundwater would change the constitutionality of the ban. Mr. Phillips replied that the reason banning is considered unconstitutional is because it prevents a person from accessing their owned mineral rights. Dr. Thacher asked Mr. Phillips if the technology is safe enough to prevent any damage to the aquifers and if there is a need to know what is happening in the aquifers. Mr. Phillips replied there is not enough data in the basin to conclusively state that drinking water is not at risk.

During additional discussion of the oil and gas presentation Dr. Scruggs asked Mr. Phillips if he knew of the current level of horizontal and vertical drilling in the Albuquerque Basin. Mr. Phillips replied that there is no fracking currently occurring in the basin. PIC member Kali Bronson asked how much water is required for fracking and Mr. Phillips estimated that water use ranges from 2 to 8 million gallons per well. Board members discussed potential impacts to water from horizontal and vertical fracking and Dr. Thacher expressed an interest in getting more information on the chemicals used and general practices. Mr. Glass and Dr. Scruggs expressed that they would like the 2017 WPAB letter on an oil and gas ordinance to be revisited with the geology and hydrology information learned during Mr. Phillips' presentation. Mr. Glass stated he felt the letter needed to be sent sooner rather than later in order to keep the City, County, and Water Authority ahead of the curve. Following a discussion of the status of the Sandoval County ordinance the board voted and approved a letter from WPAB to the Mid-Region Council of Governments (MRCOG), City, and County.

During the discussion of the source water assessments, Dr. Thacher stated that the vulnerability score could miss risks to a source because it adds up the potential risks. Ms. Baker clarified that vulnerability is assessed on a case-by-case basis, with building the inventory as a first step and then an analysis of potential contamination type and proximity to source. Mr. Penttila pointed out that the groundwater assessment radius approach for drinking water supply wells did not account for the migration of contamination in groundwater. Mr. Rick Shean from the Water Authority stated that the

Water Authority is looking at how to define capture zones for the water supply wells so that future source water assessments are a better representation of the groundwater source. Additionally, the Water Authority and DBS&A were in the process of building a map with known groundwater contamination plumes so that plumes that extend into SWPAs could be identified and scored in the analysis.

MARCH

Board Actions:

WPAB Members voted and approved a revision to combine the groundwater and surface water policies from the WQPPAP, now the RAPP, into one document.

Presentation Summary:

Bernalillo County Septic Systems Status Update, Mr. Glenn DeGuzman, Bernalillo County

Mr. Glenn DeGuzman presented board members with information on the liquid waste disposal (septic) system permits in Bernalillo County. He described the process of notifying homeowners that have non-compliant systems. The County has two phases of notification, and the two most common notification issues are obtaining a response from homeowners and refining the database for accuracy. Mr. DeGuzman stated that approximately 60 percent of septic systems fail inspection, which is problematic for fixed-income residents who often cannot afford repairs or replacement. Potential costs associated with inspections may deter residents from soliciting an inspection, or residents may simply be unaware their septic system requires an inspection. The Partners in Improving and Protecting the Environment (PIPE) program can provide assistance to low-income residents, but there are specific requirements to receive assistance.

Board member Dr. Thacher asked what areas pose the greatest risk and Mr. DeGuzman said the County has prioritized the East Mountain area because most residents have private wells and cannot access municipal water and wastewater services. Although the County prioritized the East Mountains, risks are similar in the South Valley of Albuquerque due to potential contamination of domestic wells.

Groundwater Contamination in the Southwest – A Comparison of Five Major Cities, Ms. Diane Agnew, Water Quality Hydrologist

Ms. Diane Agnew, water quality hydrologist with the Water Authority, gave a

presentation on a comparison of groundwater contamination among five major cities in the southwest region. Those cities included Albuquerque (New Mexico), Las Vegas (Nevada), Denver (Colorado), El Paso (Texas), and Phoenix (Arizona). Contaminants were defined as any physical, chemical, biological, or radiological substance or matter in water, consistent with the language used in the Environmental Protection Agency's Safe Drinking Water Act. Ms. Agnew looked at available online data for underground storage tanks, Superfund and abatement sites, and other remediation sites. Ms. Agnew gave an example of a contamination site for each city. The history of industrial development for each city plays a large role in contaminant types and the size and number of contamination sites around a town. Local and state resources, as well as funding for remediation within each city, also varies. Overall, Phoenix has the fewest number of sites per capita and Albuquerque has the lowest density of leaking underground storage tanks, which could be a result of closed sites not being included in the counts or the rigorous inspection process for underground storage tanks in New Mexico. Based on available data, Albuquerque and Denver are the most comparable in terms of identifying contamination sites; however, Denver has more sites in the completion phase of cleanup. Board member Dr. Thacher asked how Albuquerque compared to other cities in regard to receiving and updating groundwater contamination data, and Ms. Kate Mendoza, replied that Nevada has the best database and suggested the New Mexico Environment Department (NMED) adopt their database as a model.

Discussion Summary:

Ms. Agnew presented board members with two letters, one addressed to MRCOG and one to the Bernalillo County Commissioners and the City of Albuquerque Councilors, requesting an ordinance for oil and gas industries to protect water quality in the MRG. Board member Dr. Thacher requested the letter emphasize the WPAB's desire to establish a dedicated, multi-disciplinary advisory board of experts to craft the ordinance. Dr. Thacher also suggested that language be added that indicates how the prices of oil and gas change rapidly based on international market prices and can influence costs of extraction, both of which sway industry activity and can encourage extraction in previously vacant areas when prices are favorable. Chair Howe suggested Ms. Agnew include these revisions, then the board would vote on the letter in the April 2018 meeting.

APRIL

Board Actions:

Members voted and approved two letters (Appendix B) regarding an oil and gas ordinance; one addressed to the MRCOG and one to the Bernalillo County Commissioners and the City of Albuquerque Councilors. The letter outlined key issues identified by the board regarding regional oil and gas activities. Additionally, the letter

requested that a multi-disciplinary advisory board be created to look at oil and gas activities.

Presentation Summary:

Former Municipal Landfill Monitoring, Mr. Ken Zeigler, City of Albuquerque Department of Environmental Health

Mr. Ken Zeigler from the City's Department of Environmental Health provided board members with a presentation on the process for siting and designing a landfill with engineered controls to prevent soil and groundwater contamination. Albuquerque's historical municipal landfills were not constructed with any of those engineered controls. Since then, disposal practices have evolved and improved, including the processes of hazardous waste separation. Old landfills can generate harmful gases including methane, carbon dioxide, hydrogen sulfide, and other vapors including volatile organic compounds (VOCs). Mr. Ziegler explained that landfill gases take the preferential pathways and can follow utility lines as they build up and work their way out of the landfill; however, VOCs remain at the bottom of the landfill and can pose a threat to groundwater.

Mr. Ziegler presented an image of the Los Angeles Landfill (LALF) site near Alameda Boulevard and Jefferson Street in Albuquerque, which was in operation from 1979 to 1984. Mr. Charles Barker of the City discussed the landfill gas flare, the soil gas extraction system, landfill gas monitoring probes, and groundwater monitoring wells at this site. The groundwater near LALF is contaminated with tetrachloroethene (PCE) and the groundwater is moving in the south-southeast direction. The City is remediating this site with soil vapor extraction to target VOCs, landfill gas extraction to target other gases, and air injection, which acts as an engineered barrier to prevent further contamination. The City determined these methods are far more cost effective than the \$1 million needed to remove one acre of trash from the landfill. For the treatment of groundwater, the City will use the "pump and treat" method, but the groundwater treatment system is not in operation at this time.

Bernalillo County Landfills Update, Mr. Dan McGregor, Bernalillo County

Mr. Dan McGregor, County, supplied board members with an inventory of County landfills. Mr. McGregor discussed some of the issues with remediating decommissioned landfill sites. The South Broadway landfill, open from 1981 to 1989, is now in the post-closure care phase and routine monitoring is complete. The 3:1 slope at the site coupled with heavy rain storms led to slope failure, resulting in trash exposure. The

County installed erosion control measures, including drainage inlets and PVC pipes to reroute water. Mr. McGregor also talked about erosion issues at the 9-Mile Hill landfill, which was in operation from 1976 to 1982. Mr. McGregor worked with the East Mountain Transfer Station to obtain mulch to encourage vegetation growth and impede further erosion. Chair Howe asked if there were any concerns at the South Broadway or the 9-Mile Hill landfill and Mr. McGregor said there were no immediate concerns. Mr. McGregor concluded his presentation with an update on a few issues surrounding closed construction landfills. One major concern is new development over these decommissioned construction landfills, especially when new development includes wells and septic tanks.

Discussion Summary:

At the board's request, Ms. Kate Mendoza facilitated a discussion with the WPAB on comments submitted by the Water Authority to NMED on the 2018 Strategic Plan (Plan) for the Kirtland Air Force Base (KAFB) Bulk Fuels Facility (BFF) project. Ms. Mendoza stated that the Water Authority's major concerns were the apparent shift away from aggressive and active remediation of the plume. Board member Dr. Thacher asked the stance of the City and County on the new Plan, and Mr. Faris responded that the City had not submitted any formal comments, but he would appreciate that board members get the perspectives of all entities represented by the WPAB before moving forward with any statement. Mr. Glass asked that the PIC members have a conversation regarding the Plan for board discussion at the next meeting.

MAY

Presentation Summary:

Groundwater Assessment Update, Ms. Diane Agnew, Albuquerque Bernalillo County Water Utility Authority

Ms. Agnew gave an update on the WQPPAP, renamed the RAPP, focusing on the Water Authority's groundwater assessment. Ms. Agnew discussed the Water Authority's process for scoring contamination sites for sensitivity and vulnerability. The sensitivity score considers the well's infrastructure and hydrogeology, and the vulnerability score is based upon the risk of PSOCs. Board member Dr. Scruggs asked if these scores were imposed upon both active and inactive wells and Ms. Agnew explained that these scores were only utilized for active wells or those that have the potential to be used in the near future. Ms. Agnew informed the board that the Water Authority researched existing permitted oil and gas wells and oil and gas resources, in the Albuquerque Basin to include in the discussion of PSOCs in the groundwater assessment. Board member

Dr. Thacher asked how the transportation of hydraulic fracking produced water was incorporated in the assessment and Ms. Agnew responded that it was included in the surface water assessment. Ms. Agnew said the Water Authority will make recommendations to the WPAB based on the results of this assessment.

Presentation: MRG Surface Water Quality Monitoring, Mr. Andre Ritchie, U.S. Geological Survey

Mr. Andre Ritchie, with the U.S. Geological Survey (USGS), gave a presentation on the USGS annual water quality monitoring for the Water Authority. Water quality samples are consistently collected at Cochiti, Jemez, and Alameda. Mr. Ritchie stated the factors that affect water quality include snowmelt, irrigation diversions, rainfall, urban runoff, tributary inputs, wastewater inflows, groundwater inflows, evapotranspiration, and reservoir operations on the Rio Grande. To account for these factors, the USGS established three sampling periods: 1) snowmelt (March – June), 2) irrigation (July – October), and 3) baseflow (November – February). Since beginning sampling in 2004, Mr. Ritchie said there has been no drinking water standards in exceedance of the Maximum Contaminant Levels (MCLs) at the Alameda and Cochiti sites, but there have been some infrequent secondary drinking water standard MCL exceedances for total dissolved solids (TDS), sulfates, pH, and manganese. Samples from the Jemez river regularly exceed the MCL for arsenic, pH, and TDS. Mr. Ritchie added that the concentrations for inorganic compounds are largest during the snowmelt and irrigation season at Alameda (where inorganic compounds have never exceeded the MCL) and largest during the snowmelt and baseflow periods at Cochiti.

Discussion Summary:

Prior to the presentations, Mr. Rick Shean with the Water Authority, led a discussion on the KAFB BFF project and the development of a resolution for the board to adopt. The resolution was jointly prepared by the City, County, and Water Authority based on previously provided input from the board and would memorialize the stance of the WPAB and the entities for which it represents. Ms. Busch asked who the audience would be, and Mr. Shean said it would be forwarded to the City, County, Water Authority, and the New Mexico Environment Department (NMED). The resolution would become available to the public as public record.

After the presentations, the board discussed MRCOG's reaction to the letters regarding oil and gas ordinances. Mr. McGregor attended the May 10, 2018, MRCOG executive meeting and said there were a few questions regarding the aspects of oil and gas production the state regulates and the aspects, if any, local entities can control related

to oil and gas issues.

Ms. Agnew notified board members about the Water Authority's public outreach on source water protection. Ms. Agnew stated that Water Authority customers were concerned upon learning that storm water runoff is not treated before entering the Rio Grande. Customers were informed that pouring things on the street will actually reach the river and they were encouraged to call 311 if they had specific source water protection concerns.

PIC members from both the County and the City highlighted several services they provide in regards to hazardous waste disposal.

JUNE

Presentation Summary:

Groundwater Assessment Update, Ms. Kate Mendoza, Albuquerque Bernalillo County Water Utility Authority

Ms. Kate Mendoza, from the Water Authority, presented an update on the Draft 2019 RAPP, formerly the WQPPAP. The purpose of updating the plan was to inform Water Authority operations, monitoring, and planning efforts to protect source water from potential contamination. Ms. Mendoza discussed the assessment of PSOCs in four buffer zones (A – D), which extend out to 2,640 feet (1/2-mile) around individual water sources. Ms. Mendoza said oil and gas extraction wells were discussed as PSOCs, but because there are currently no oil and gas operations occurring in the Albuquerque Basin, the Water Authority concluded there is no immediate risk. Mr. McGregor, from the County, recommended the Water Authority add wastewater lift stations and related infrastructure to the analysis.

Ms. Mendoza said the Water Authority grouped recommendations, based on the assessment results, into multiple categories including priority contamination sites, monitoring and coordination, ordinance and policies, agency coordination, and source water protection outreach. Ms. Mendoza and Ms. Diane Agnew discussed some lessons they learned developing this assessment, most notably the importance of data quality and the difficulties in combining multiple data sets from different sources. Ms. Mendoza then discussed the assessment's short-term and long-term goals. The short-term goals are 1) keeping datasets updated including septic systems and Water Authority wastewater assets, 2) linking the Groundwater Asset Management Plan with the RAPP, 3) partnering with the City and County to host source water protection days, and 4) presenting the results to the Water Authority Governing Board. The long-term

goals include defining capture zones for each well and establishing formal source water protection areas to be recognized by the City and County.

Discussion Summary:

Board members discussed their review of the KAFB BFF jet fuel leak project resolution. Mr. Shean, of the Water Authority, stated that after the Water Authority met with both the Air Force and NMED about the NMED 2018 Strategic Plan, NMED decided to revise the references to monitored natural attenuation. Members of the board asked that the resolution soften language about stakeholders' input being sidelined. The board agreed to review and vote on the revisions made at the next meeting in July 2018.

JULY

Board Actions:

Members voted and approved the KAFB BFF jet fuel leak project resolution (Appendix B).

Members voted and approved the follow-up letter to MRCOG (Appendix B) regarding the development of an oil and gas ordinance template.

Discussion Summary:

Ms. Kate Lynnes, Air Force, and NMED Secretary Butch Tongate attended the WPAB meeting to discuss the board's approval of the resolution. Secretary Tongate stated his concerns for the public criticism by the Water Authority on the draft 2018 Strategic Plan (Plan) for the KAFB BFF project. Ms. Mendoza stated that the comments were first submitted to Mr. Dennis McQuillan, the KAFB BFF project lead at NMED, prior to appearing in the media. Ms. Lynnes asked the board to hold off on voting on the resolution and first come view the treatment facility to ease their concerns. Ms. Lynnes told board members that she believes the board does not fully understand where the project is in the RCRA process. Secretary Tongate also requested that voting on the resolution be postponed and added that independent advisory board recommendations in the resolution makes the Resource Conservation and Recovery Act (RCRA) process longer and more cumbersome. There was a discussion that many of the Board members have already toured the facility and that the technical background of the board members enabled them to appropriately decide and vote on the resolution. The board members still supported proceeding to a vote on the resolution.

The board also discussed the follow-up letter to MRCOG for the oil and gas regional ordinance template development. Mr. Penttila said he was glad the board was moving forward with this letter to the MRCOG. The board voted in favor of moving forward with the letter.

AUGUST

Board Actions:

Members voted and approved a response letter from the WPAB to the Air Force and NMED, which was in response to letters submitted by both NMED and the Air Force to the WPAB regarding the KAFB BFF jet fuel leak project resolution (Appendix B).

Presentation Summary:

Modified Stage 2 Abatement Plan, Los Angeles Landfill, Mr. Bart Faris and Mr. Ken Ziegler, City of Albuquerque

Mr. Faris and Mr. Ziegler, for the City's Environmental Health Department presented on the current work being done and the proposed modification to the groundwater abatement at the Los Angeles Landfill Site. The landfill follows the New Mexico Water Quality Control Commission (WQCC) standards for groundwater and the City's goal is to meet those requirements. Mr. Faris presented a conceptual model of the landfill that showed the locations of natural gas probe sites, soil vapor extraction wells, gas extraction wells, groundwater monitoring wells, and air injection wells.

Mr. Faris and Mr. Ziegler discussed the hydrogeology in the area surrounding the landfill, and that it is composed of mostly sand with some silt layers, which is important information when determining where to install soil vapor and landfill gas wells. As of June 2018, the groundwater flow was flowing in the north-northwest direction on a fairly flat gradient, resulting in relatively slow movement. Mr. Faris identified Monitored Natural Attenuation (MNA) as the proposed modification to abate groundwater contamination at the site. Chair Howe asked what the projection for the source to be remediated and Mr. Faris responded that a city engineer estimated the source to be eradicated within 50-100 years for MNA. The City sent out notices for public comment on the proposed modification and board members decided it was appropriate to send in collective comments for the WPAB for the City's proposed switch to MNA at this site.

Discussion Summary:

Members discussed terms that were soon ending and which representative agencies (i.e., County, City, and Water Authority) had appointed those positions. The board then listed out each member and the representative agency.

SEPTEMBER

Presentation Summary:

Tijeras Arroyo Nitrate Study, Mr. Stuart Norton, United States Geological Survey

Mr. Stuart Norton, a hydrologist with the USGS, delivered a presentation on the ongoing Tijeras Arroyo Nitrate Study (Study). The Study is an Air Force funded an assessment of the sources and fate of nitrate in groundwater on the KAFB and the surrounding regional area, including 60 sampling sites from Tijeras to the South Valley and Isleta Pueblo. The USGS is analyzing the data and reviewing results and indicated that preliminary results are available on the National Water Information System. The USGS utilized stable isotope analysis to determine the sources and age of groundwaters. After reviewing the initial geochemistry results, the USGS requested additional funds to drill cores to support a working hypothesis that the nitrate may be from an atmospheric source. The USGS also identified 13 additional sampling locations to test this theory.

Oil and Gas Potential of Sandoval County, Mr. Ron Broadhead and Dr. Alex Rinehart, New Mexico Bureau of Geology and Mineral Resources

Mr. Ron Broadhead and Dr. Alex Rinehart, New Mexico Bureau of Geology and Mineral Resources (NMBGMR) gave a presentation on the NMBGMR's recent findings from their study on the potential for oil and gas extraction in Sandoval County and the Albuquerque Basin, which has a different geologic potential. Sandoval County, north of Albuquerque, has the potential for oil and gas production, but not nearly as much as the San Juan Basin. Bernalillo County contains natural gas (methane), but the cost to drill very deep wells outweighs the reward at this time. Overall, the west side of the Albuquerque Basin has some potential for natural gas and the east side of the basin has some potential for oil.

Board member Dr. Scruggs asked about proximity of oil and gas wells to potable groundwater and Mr. Broadhead replied the aquifers relied on for drinking water were shallow in comparison to the location of oil and gas production zones and added that the Mancos shale acts as a barrier to upward groundwater flow. Dr. Rhinehart discussed the risk and susceptibilities for groundwater contamination in Sandoval

County. Dr. Rhinehart stated that the susceptibility of contamination in Sandoval and Bernalillo County is low because the fracking occurring in the shales and clays is far below the aquifers and has sealed rock sections. The primary susceptibility in the San Juan and Albuquerque Basin is leaking wells. Dr. Rhinehart reiterated that the risk of upward contamination is low but increases near cities, towns and homesteads. Dr. Rhinehart discussed several findings, including 1) the susceptibility and risk of upward and downward contamination in Sandoval County is low, 2) risk in alluvial valleys, including arroyos and in the Rio Grande Valley, is high, and 3) the groundwater below the Placitas area is moderately to highly susceptible to contamination, but there is no oil and gas production in the area, so risk for contamination is low. Results can be found on Sandoval County's website:

<http://www.sandovalcountynm.gov/wp-content/uploads/2018/06/NMBGMR-SandovalAssessment-June2018.pdf>

Discussion Summary:

The WPAB welcomed new members Mr. John Pietz (Water Authority appointment) and Mr. Roberto Roibal (County appointment) and recognized and thanked Steve Glass for his two full terms.

OCTOBER

Presentation Summary:

Overview of Environmental Restoration Activities and Tijeras Arroyo Groundwater Conceptual Model and Corrective Measures Evaluation, Mr. David Rast and Mr. John Copland, Sandia National Labs

Mr. David Rast and Mr. John Copland, representing the Sandia National Labs (SNL) gave a presentation on three sites currently undergoing remediation by the Environmental Restoration Program.. The sites discussed included the Burn Site, Technical Area V (TA-V), and the Tijeras Arroyo Groundwater (TAG) areas of concern (AOCs). The Burn Site was the used to test explosives and fire survivability and has nitrate contamination above the MCL. SNL conducts semi-annual groundwater monitoring and they are currently creating a new work plan that includes four additional monitoring wells. The TA-V AOC is contaminated by both nitrate and trichloroethene (TCE), but at relatively low levels. SNL enacted a study to test the effectiveness of in-situ bioremediation of groundwater at this site. Bioremediation at the TA-V AOC included injecting bacteria and nutrients using an injection well. Based on the results, SNL will go full-scale with bioremediation.

Mr. Copland discussed the TAG AOC, where groundwater flows in a southeasterly direction under KAFB. The perched aquifer at this site is contaminated with nitrogen and TCE has been detected; although, concentrations were reduced below the MCL. SNL has determined that monitored natural attenuation is the preferred alternative for remediation at this site. Monitored natural attenuation will likely take 40 years for the site to be cleaned, versus 20 years for alternative remediation technologies.

Kirtland Air Force Base, Bulk Fuels Facility Jet Fuel Leak Project Update, Mr. Dennis McQuillan, New Mexico Environment Department, and Ms. Kate Lynnes, Air Force

Mr. Dennis McQuillan, Chief Scientist at NMED gave an update on the KAFB BFF jet fuel leak project and discussed the progress and status of remediation. Mr. McQuillan said the Air Force is developing a capture analysis model to help understand the effectiveness of the groundwater extraction and treatment systems in capturing the dissolved-phase ethylene dibromide (EDB) plume. Mr. McQuillan also discussed the complexity of the site, including rising water tables in the aquifer and the need for multiple treatment technologies. One of the treatment technologies NMED and the Air Force are looking into is bioremediation and there is currently a pilot study in effect. As part of the pilot study, the Air Force planned on performing bioaugmentation of bacteria and in-situ bioremediation. Bioaugmentation has been postponed because of the current success of in-situ bioremediation, where injecting food resources encourages existing bacteria to degrade EDB.

Ms. Lynnes, with the Air Force, discussed the Air Force's most recent drilling operations, in which six groundwater monitoring wells were installed. The Air Force also collected eight soil cores to determine the extent of remaining light non-aqueous phase liquids in the source area. As part of soil remediation, the Air Force is performing a bioventing pilot test, which would be followed by soil vapor extraction. Ms. Lynnes further discussed the ongoing in-situ biodegradation pilot test, stating that the geologic material in the test area is permeable and that there is good circulation to support the bio-stimulation phase successfully. The results of the pilot test will be incorporated into evaluations made in the Corrective Measures Evaluation. The Air Force is doing this research to get the information needed to make an informed decision to select the final remedies for the site. The Phase II of the RCRA Facility Investigation will include data collected from 2015 to 2019.

NOVEMBER

Presentation Summary:

Update on New Mexico Environment Department Ground Water Quality Bureau State Cleanup Program, Mr. Justin Ball. New Mexico Environment Department

Mr. Justin Ball with the NMED Ground Water Quality Bureau Remediation Oversight Section, told board members about the three main types of remediation sites the department regulates. The first is where petroleum has leaked out of large above ground storage tanks, in which there has been a release to the ground but are not included in the NMED Petroleum Storage Tank Bureau regulations. The second is sites where there was a microchip manufacturer and the major contaminant of concern is TCE. The difficulty with this site type is that as TCE removal is almost complete, cleanup becomes less effective and more expensive. The third site category is emerging contaminants. Mr. Ball provided an example using the Spartan site, where 1,1,1-Trichloroethane was being removed through “pump and treat” technology, but they did not realize 1,4-dioxane was also present. Now, there is a 1,4-dioxane plume in the aquifer. Mr. Ball emphasized that this category does not pertain to new spills, but rather from old spills.

Chair Howe asked if there were any other major concerns with emerging contaminants that the WPAB should be aware of and Mr. Ball responded that the unknown contamination at the Spartan Site and the COC 1,4-dioxane are notable.

Discussion Summary:

Board members discussed concern for the upcoming decisions for the City’s General Obligation Bond Program. Board member Mr. Penttila stated that funding for the City’s Storm Water Management group was proposed to be cut by approximately 80 percent. Representative PIC members from the City and County discussed the effects that reduced funding would have on their ability to comply with the City’s National Pollutant Discharge Elimination System (NPDES) municipal separate storm sewer system (MS4) permit. It was also noted that reduced funding would also have negative impacts on AMAFCA and the County, because the City would no longer be able to contribute adequate funding for joint projects. Board members decided that there was a lack of understanding of how storm water is handled by the new mayor’s office and the necessities of storm water compliance. Board members decided to draft a letter to Mayor Keller and the City Council regarding their concerns of potential adverse impacts on water quality, including the Water Authority, County Manager and Chair, and AMAFCA as recipients.

NOVEMBER – SUPPLEMENTAL MEETING

Board Actions:

Members voted and approved the letter (Appendix B) to Mayor Keller and the City Council on the importance of storm water management.

Members voted and approved the 2019 WPAB work plan.

Discussion Summary:

Board members first discussed compliance with the Open Meetings Act, after a concerned PIC member told the board that editing letters via email functions as a rolling quorum, which is potentially prohibited by the Open Meetings Act. Board members opted to review and revise the draft letter in regard to storm water protection, NPDES MS4 permit compliance, and water quality protection. During the review, board members discussed that the letter should serve as an educational tool, and WPAB should avoid directing the City on budgets or funding.

Board members discussed the upcoming 2019 WPAB work plan.

DECEMBER – NO MEETING WAS HELD

Top Areas of Focus for Water Quality Protection in 2019

Members of the WPAB and PIC evaluated several identified threats as well as actions to improve water quality in the MRG using the following criteria:

1. Nature and extent of contamination;
2. Proximity to drinking water supplies;
3. Regulatory effectiveness and efficiency;
4. Costs associated with not eliminating the threat; and
5. Efforts to improve and prevent water quality impairment

Below is a table of the topics of significant concern to the WPAB.

Area of Focus	Explanation
KAFB BFF Project	Several production wells are downgradient of known extent of contamination and corrective action activities should be monitored.
SNL Environmental	The mixed waste landfill contains a mixture of toxic

Restoration	chemical and radioactive wastes in a legacy unlined disposal pit. SNL is currently implementing a long-term maintenance and management plan for this impoundment, of which the WPAB is pursuing regular updates. Since 2019 is the 5-year review period for the Mixed Waste Landfill, WPAB would like an update on the site.
Groundwater Contamination Sites	Several groundwater contamination sites are being investigated / remediated in the basin, including leaking underground storage sites, Superfund sites, and former industrial sites. These sites are regulated by the NMED under the Petroleum Storage Tank Bureau, Ground Water Quality Bureau, or the Hazardous Waste Bureau.
Stormwater Quality	Large stormwater discharge above the Water Authority's San Juan-Chama Drinking Water Project water diversion. MS4 permit compliance and studies associated with the MS4 Permit and stormwater management and protection.
Watershed Health	Primary threat to surface water quality. No regulatory requirements for prevention activities but debris flowing to drinking water plant diversion can be eliminated. Support of initiative for a Fire Protection and Rio Grande Water Fund. Understanding of stormwater effects and healthy watersheds.
Septic Systems	Septic systems are designed to seep contaminants; however, local ordinances are in place to minimize impacts.
Oil and Gas Operations in the MRG basin	Review the environmental risks to water quality associated with oil and gas operations in the MRG basin and understand the regulatory process and compliance structure for this industry. Continue receiving regular updates on the development of a regional oil and gas ordinance template by the MRCOG Water Resources Board sub-committee.
USGS Studies	Review USGS Albuquerque Basin groundwater model and how it can be utilized for understanding groundwater dynamics in current and future scenarios. Review the potential sources of nitrate contamination to the groundwater below Tijeras Arroyo as presented

	in a study being prepared by the USGS and funded by the U.S. Air Force. Review USGS surface water and stormwater monitoring studies in the MRG.
Intergovernmental Collaboration	Provide a forum to foster communication between local, state, and federal agencies. Review how agencies coordinate regulatory efforts, the status of the NPDES MS4 permit, and interaction between local and federal agencies. Advocate for continued communication across and within agencies to ensure successful implementation of adopted policies.
Future Water Quality Issues	Receive presentations and updates on emerging contaminants and issues related to water quality. Identification of “future risk” and recommendation of actions to be taken.

Summary of Board Priority Activities for 2019

Based on the study and analysis of the topics and issues described above, the Board identified three areas of focus as priorities for calendar year 2019.

PROTECTION OF GROUNDWATER QUALITY

WPAB will continue to monitor the progress of groundwater remediation and investigation projects in the MRG, including the Kirtland AFB BFF leak, Superfund sites, and other contamination sites that threaten the Water Authority water supply. Additionally, WPAB will be updated on SNL environmental restoration activities including the TAG AOC, TA-V Groundwater AOC, and mixed waste landfill. Board members will monitor oil and gas operation activities in the MRG basin along with understanding the regulatory process and compliance structure and tracking of regional ordinance(s). The USGS will update Board Members on the nitrate study along the Tijeras Arroyo in addition to a presentation on the USGS Albuquerque Basin groundwater model.

PROTECTION OF SURFACE WATER QUALITY AND WATERSHED HEALTH

WPAB will monitor projects and progress on watershed health, implementation of

the NPDES MS4 permit, and impacts of fire-scarred lands on surface water quality will be examined during the year. The Board will review and be updated on the results of surface water and stormwater monitoring results including the USGS studies, permit compliance activities related to the MS4 permit, the MRG *E. coli* study, and the Safe Drinking Water Act PCP and UCMR4 sampling effort.

FOSTER INTERGOVERNMENTAL COORDINATION, COOPERATION, AND COMMUNICATION

The Board intends to continue to serve as a forum and advocate for communication among these groups. Board members will review how agencies coordinate regulatory efforts, the status of the NPDES MS4 permit, and interaction between local and federal agencies on resolving current and potential future threats to water quality in the basin.

APPENDIX A

Summary of Member Qualifications

Kerry J. Howe, Ph.D., Chair

- Joint City/County appointment
- Second Term – January 2017 to January 2020
- Ph.D., Environmental Engineering; over 28 years of experience in water treatment technologies and professional engineering.

J. Steve Glass, Vice Chair

- County appointment
- Third term – November 2018 to November 2021; County ordinance allows additional terms to be served beyond the two terms in the WPAB establishing ordinance
- Master of Science, Environmental Science; 40 years of professional experience in environmental chemistry and biology applications in environmental science and regulation.

Caroline Scruggs, Ph.D.

- Water Authority appointment
- First Term – November 2018 to November 2021
- County appointment: October 2015 to October 2018
- Ph.D., Environment and Resources; over 20 years of experience in civil and environmental engineering and water resource planning.

John Pietz, P.E.

- Water Authority appointment
- First term – September 2018 to September 2021
- Master of Science, Chemical Engineering; over 35 years of chemical and environmental engineering experience including soil and groundwater remediation, pollution prevention, and risk assessments.

Julia Maccini, JD

- County appointment
- First term – August 2018 to August 2021
- Doctor of Law; 10 years of experience in policy, legal, and real estate development.

Roland Penttila, P.E.

- City appointment
- First term – August 2016 to August 2019
- Bachelor of Science, Civil Engineering; retired after 33 years of experience as a register professional engineer, former supervising engineer for the City in Storm Water Management including compliance with EPA Municipal Separate Storm Sewer Systems Permit.

Suzanne Busch, P.E.

- City appointment
- First term – August 2016 to August 2019
- Bachelor of Science, Civil Engineering; over 25 years as municipal professional engineer and project manager.

Roberto Roibal

- County appointment
- First term – August 2018 to August 2021
- Bachelor of Arts, Anthropology, Fine Art, and History; over 20 years in community organizing, committees, and coalitions

Russel D. Pederson, P.E. (*former member*)

- (Former) City Appointment
- First Term – December 2015 to December 2018
- Master of Science, Civil Engineering; over 20 years of experience as a professional engineer manager and environmental health support.

Jennifer Thacher, Ph.D. (*former member*)

- Water Authority appointment
- Second term – September 2015 to September 2018
- Ph.D., Economics; 17 years of experience in environmental economics, international water utility infrastructure, and watershed management.

Matthew Earthman (*former member*)

- Water Authority appointment
- First term – May 2017 to May 2020
- Masters of Science, Geochemistry; 7 years of experience in environmental site assessments, investigations, and remediation projects as well as analysis of production well data and preparation of discharge permits.

APPENDIX B

Board Correspondence and Resolutions