2010 MS4 ANNUAL REPORT

SUBMITTED TO
US EPA, REGION 6
1445 ROSS AV
DALLAS, TEXAS 75202-2733

6WQ-P

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AS REQUIRED BY
ALBUQUERQUE MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4)
NPDES PERMIT NO. NMS000101
BY [redacted]

CITY OF ALBUQUERQUE (COA)
DEPARTMENT OF MUNICIPAL DEVELOPMENT
P.O.BOX 1293
ALBUQUERQUE,NM 87103

ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY (AMAFCA)
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FEBRUARY 1, 2011

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2010 MS4 ANNUAL REPORT

CITY OF ALBUQUERQUE

February 11, 2011

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U.S. EPA, Region 6
NPDES Permits and Technical Section
6WQ-PP
ATTN: Ms. Suzanna Perea
1445 Ross Avenue
Dallas, Texas 75202-2733

RE: Albuquerque Municipal Separate Storm Sewer System Permit No. NMS000101

As per Part V. C of the above mentioned MS4 Permit, the following 2010 Annual Report and associated Data Monitoring Reports (DMRs), having a Feb.1 due date, are here-by submitted electronically by all of the co-permittees of the above mentioned MS4 Permit. A hard copy of the report will be sent by certified mail on February 11, 2011.

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Copies of the DMRs were sent by certified mail to Ms. Helen Nguyen, the NetDMR and ICIS-NPDES Coordinator on February 3, 2011. Once the signatory for the City of Albuquerque has registered and been granted access to NetDMR, the outfall data will be entered into the NetDMR production database.

1. Implementation Status of Stormwater Management Programs (SWMP)

1.a North Diversion Channel/Dissolved Oxygen (DO)

The MS4 partners continue to improve the stormwater monitoring program, particularly at the North Diversion Channel (NDC) which drains over 85% of the Albuquerque Metropolitan area. Specifically, the Arroyo Metropolitan Flood Control Authority (AMAFCA) and City of Albuquerque (COA) have continued to fund studies to determine the sources of potential contamination, such as low dissolved oxygen (DO), in the NDC.

AMAFCA contracted with a local consulting firm of Daniel B. Stephens & Associates (DBS&A) to provide a reconnaissance study of the NDC watershed with regard to stormwater quality. The general purpose of the study is to identify various pollutants that occur in the NDC system and determine Best Management Practices (BMPs) to mitigate them. The scope of the study includes hydrologic, hydraulic, chemical, and physical analyses, as well as literature reviews, design engineering, and construction engineering services.

One aspect of the study was to investigate a recently discovered relationship between storm event discharges from the NDC and DO drops in the Rio Grande. This apparent relationship was discovered by a graduate student who was studying water chemistry in the middle Rio Grande for a PhD dissertation. The investigation by DBS&A into the phenomenon determined that the observed short-duration

decreases in Rio Grande DO concentrations are not caused by stormwater DO concentrations or oxygen demand, but rather by river water mixing with the low-DO, stagnant water from the embayment area, the small water body next to the river. The short-term DO decreases appear to be physical processes that result from mixing and are not caused by biochemical oxygen demand. DBS&A concluded that as long as the embayment remained in place and isolated from the Rio Grande, oxygen-depleted water from the embayment would continue to cause short-term decreases in DO concentrations in the Rio Grande. The study recommended the following possible solutions to the problem:

1. Mechanically aerate the embayment to avoid oxygen depletion.
2. Continuously mix water in the embayment with that of the Rio Grande.
3. Remove or fill the embayment.

AMAFCA has proposed the latter solution to the U.S. Army Corps of Engineers (USACE). They requested a wetlands delineation study be conducted and that study was concluded in December of 2010. It determined that there is a very small corner of the embayment that shows wetland characteristics. Concurrently, AMAFCA directed DBS&A to prepare a grading plan for the filling of the embayment. The plan has been prepared and the concept is in review with the USACE.

Another aspect of the study included the identification of the most beneficial locations in or along the NDC where structural BMPs could be installed. This identification effort also included hydraulic modeling of the potential BMPs to determine if their presence would cause deleterious effects to the flood control functionality of the facility.

Three structural BMPs have been identified in the NDC outfall area and three have been identified upstream along the NDC. Their locations are:

1. The Candelaria Channel Inlet to the NDC
2. The Grantline Channel Inlet to the NDC
3. The Hahn Arroyo Channel Inlet to the NDC
4. The Settling Area near the NDC outfall to the river
5. The Equipment Crossing at the lower end of the Settling Area
6. The Embayment Area

The Candelaria and Grantline Stormwater Quality Facilities (Items 1 & 2 above) have been designed and are under construction. They are described below under the stormwater quality improvements section. Items 3 through 6 are still under investigation.

In addition, two probes placed in the Rio Grande by US Geological Survey (USGS) in 2009 continue to monitor DO: the first at the State Hwy 550 bridge in Bernalillo and the second, below the Rio Bravo Bridge. The data from these probes supplement the DO data currently obtained from three probes installed in the area between the Alameda Bridge and the North Floodway in 2007.

1.b San Jose Drain/Poly-chlorinated Biphenyls (PCBs)

In 2003, the New Mexico Environment Department (NMED) conducted stormwater sampling in the San Jose Drain near Woodward Avenue. Laboratory analyses of the stormwater indicated that one sample was in exceedance of the Wildlife Habitat Standard of 14 nanogram/liter (ng/L) with a concentration of 30 ng/L. Note that the 2003 Albuquerque Metropolitan Area NPDES permit specifies a detection limit of 1000 ng/L for PCB analysis of stormwater. This detection limit has never been exceeded during the permit term.

In response to the testing performed by the NMED, USGS staff collected sediment samples from 5 locations along the San Jose Drain on May 27, 2010 and submitted them to the State of NM Scientific Laboratory Division for PCB analysis. Analysis of the samples by EPA Method SW-846 8082 showed detection of only one PCB congener, Aroclor 1260, in 3 of the 5 samples.

Sediment from Site 2, located directly east of the General Electric (GE) facility, designated as a Superfund Site (ID 0600881) in 1983, was found to have the highest concentration of Aroclor 1260 with a concentration of 130 microgram per kilogram (ug/kg). Anecdotal reports from GE personnel indicate that spent machine lubricants and coolants that may have contained PCBs were sprayed on a dirt parking lot along Woodward Avenue for dust control in the 1960s.

Downstream (south) of the facility concentrations decreased from 58 ug/kg (at the Rio Bravo Bridge) to 46 ug/kg (at the confluence of the concrete lined portion and earthen bottomed portion of the drain) to 0 ug/kg at the mouth of the drain. Sediment from Site 1 (at the Bethel Bridge) upstream (north) of the GE facility was also found to have a PCB concentration of 0 ug/kg.

A map showing the sample locations and results, a tabular summary of the analytical results, and the laboratory analyses are provided in Section 2, San Jose Drain PCB Sediment Screening.

1.c New Educational Initiatives

The MS4 co-permittees have continued to expand ongoing educational programs as discussed later in this report under item 6. In 2010, two new initiatives were developed through the efforts of the Stormwater Quality Team (SWQT), a group consisting of the MS4 partners, Bernalillo County, the Southern Sandoval County Flood Control Authority (SSCAFCA), and the Ciudad Soil and Water Conservation District, as follows:

- The SWQT funded a portion Bosque Ecosystem Monitoring Program (BEMP) to be carried out by students at the Black Institute for Environmental studies at the Bosque School. Under this program, students developed protocols for sampling and monitoring *Escherichia coli* (E-coli) and other water quality parameters at 4 locations in the Rio Grande. Through the ecological monitoring the students are learning how the health of the Rio Grande is tied to the health of the watershed and ways to reduce bacterial levels in the river. See Section 3, New Educational Initiatives, for a copy of the BEMP proposal, and media release prepared by the SWQT public relations firm, Cooney-Watson & Associates, Inc. (CW).

- An Arid Low-Impact Development (LID) workshop, held on March 23-24, 2010, was arranged, in part, by SWQT members. Bernalillo County staff led the planning efforts, complemented by COA, New Mexico Department of Transportation (NMDOT), University of New Mexico (UNM), and AMAFCA personnel along with local consultants. The event was held at a UNM facility and the SWQT, along with AMAFCA, COA, and UNM, provided additional funding. The purpose of the workshop was to educate participants on the principles and policies related to LID and examine how these approaches could be implemented in an arid climate subject to water rights regulations. The second Annual Arid LID workshop, to be held on March 22-23, is currently being planned. Copies of the 2010 Arid LID conference flyer and agenda are provided in Section 3. Information on the speakers at the Arid LID Conference, their abstracts, and the presentations can be found at the archives section of the Arid LID webpage: http://www.aridlid.org

2. Proposed Changes or Revisions to Stormwater Management Programs

At this time, there is one revision to the SWMP implemented by the COA and AMAFCA. There is also one revision to the SWMP implemented by the NMDOT. The signatory authority at each of the three agencies has changed over the past calendar year. The signatory authority for the COA is now David S. Campbell, the CAO. The signatory authority for AMAFCA is Jerry Lovato, the new executive engineer. Tammy Haas, professional engineer, is now the signatory for the District 3 Office of the NMDOT. Copies of letters sent to EPA Region 6 informing personnel of the change are included in Section 4, Signatory Authority Documentation.

3. Summary of Accumulated Data

3.a Annual Bacterial Total Maximum Daily Load (TMDL) Update

The Annual Bacterial TMDL update was emailed to the EPA Region 6 offices on December 1, 2010 and a hard copy was sent by certified mail on December 3, 2010. As discussed in the update, the co-permittees are currently in compliance with the 30-day geometric mean fecal coliform TMDL per part II.B the 2003 draft permit (assumed to be administratively extended). The update has also been included in Section 5, Bacterial TMDL Update.

3.b Toxicity Testing

Toxicity testing was performed on fathead minnows and *Daphnia pulex* using a stormwater sample from the NDC outfall and a river sample from the equipment crossing during a storm event on June 30, 2010 per part II.B of the 2003 permit. Bio-Aquatic Testing, Inc., located in Carrollton,TX, performed the 48-hour acute toxicity tests using guidelines as defined in *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms* (EPA, 5th ed., 2002). The test results indicated that both fathead minnows and *Daphnia pulex* passed the acute test at all stormwater and river dilutions. These results were

emailed to EPA Region 6 on Thursday, July 8, 2010 and are also included in Section 6, Toxicity Test Results,

3.c Data Monitoring Reports (DMRs)

Other stormwater quality data, including wet season and dry season general chemical and trace metal analyses are summarized on the Data Monitoring Reports (DMRs) and provided in Section 7. Per Table V.A.1.a(2) of the 2003 permit, which specifies bi-annual sampling requirements, volatile organic compounds (VOCs), pesticide, and base/neutral compound analyses are not required this year since they were provided in the 2009 Annual Report. Electronic copies of the DMRs were emailed to Ms. Helen Nguyen, NetDMR Coordinator for the NPDES Compliance Section of the Water Enforcement Branch of EPA Region 6 offices on February 2, 2011. The email was sent a day late due to inclement weather and resulting closure of COA offices. Original hard copies of the forms were also sent by certified U.S. mail on February 3, 2011.

As required in Table V.A.1.A(1) of the permit, two stormwater samples were collected and analyzed for four of the five outfalls during the wet season. However, only one wet season sample was collected for outfall 001 (North Diversion Channel). In addition, only one outfall, the San Antonio Arroyo at the Mariposa Diversion, was sampled during the dry season. The possible reasons for the lack of stormwater samples are as follows: 1) insufficient rainfall events meeting qualifications specified in part V of the permit, 2) rainfall event occurred during a weekend or holiday when laboratories are closed and holding times would be exceeded, 3) precipitation fell as snow rather than rain, or 4) automated sample collection tubing was disconnected to protect lines from freezing (varies by outfall and weather conditions but typically from the end of November through the end of the March).

3.d Dry Weather Screening

In addition to stormwater sampling, dry season screening of 17 selected outfalls in the Albuquerque metropolitan area was conducted in November and December 2009. These observations are included in Section 8, Dry Weather Screening. Although 12 of the 17 outfalls were dry, nuisance flows were found at 5 of the locations. A stormwater drainage engineer attempted to track the flows. Preliminary results suggest that these flows are likely due to over-irrigation by local neighborhoods or leaks from water supply pipes.

4. Annual Expenditures

4.1 City of Albuquerque (COA) Expenditures

The Stormwater Management Section provides funding for the NPDES Stormwater Program through an ongoing account in the General Obligation Bond Program. Current funding for the project is approximately $250,000 per year. Of this total, roughly $180,000 goes to the cooperative USGS stormwater monitoring program,

$40,000 to laboratory analysis of stormwater samples, $10,000 to NPDES public education efforts, and $20,000 to purchases in support of educational efforts such as mutt mitt restocking, brochures, and storm inlet markers. Funding for this effort may increase in 2011. An increase in the NPDES budget has been requested for the 2011-2012 bond cycle. However city financial constraints due to the recession may result in lower funding support in fiscal years 2011 and 2012 than anticipated.

The Street Maintenance Division of the Department of Municipal Development (DMD) spent more than $8.7 million in labor and equipment costs for street sweeping during 2010 while the Arroyo Maintenance Division of the DMD spent nearly $2.7 million. The level of spending is expected to remain the same for 2011.

The Environmental Health Department (EHD) spent over $600,000 on its Household Hazardous Waste (HHW) program in 2010. Funding for this program is expected to increase slightly or remain at the same level for 2011.

AMAFCA

4.2 Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA) Expenditures

During 2010, AMAFCA paid the following amounts on vendor contracts for the purpose of watershed clean up: $28,300 for manual trash removal (litter pickup), $18,800 for mechanical trash removal using Vactor trucks, $0 for sediment removal (NOTE: All sediment removal was performed by AMAFCA field personnel this year). AMAFCA vendors removed roughly 3,200 bags of trash, 70 dump truck loads of debris and 90 hours of Vactor truck time.

In addition, AMAFCA spent approximately $80,000 for personnel time on contract administration, plan review, and MS4 permit contract activities, $1,214,300 for watershed maintenance with its own crew, $185,400 goes to the cooperative USGS stormwater monitoring program, and $10,000 to NPDES and stormwater quality public education efforts.

New Mexico DEPARTMENT OF TRANSPORTATION

4.3 New Mexico Department of Transportation (NMDOT) Expenditures

In 2010 the NMDOT expended approximately $600,000 for contracted weed and litter pickup services in the Albuquerque Metropolitan Area. The contract with the COA for litter pick-up and miscellaneous maintenance activities was re-negotiated from $465,000 in FY10 to $300,000 in FY11 (implemented in December 2010). Contracted inmate labor is utilized in the urban area on an increased basis to make up for the reduction in service within the urban area.

In-house sweeping operations continue, utilizing up to 12 employees to perform day time and night time operations. The annual expenditure for this operation was approximately $417,000, and resulted in 6,540 pass miles swept on the Interstate and Arterial system.

In addition, approximately $650,000 was expended by the District Office for litter pickup and erosion control activities. An Employee from each Patrol continues to be utilized on a daily basis to pick up large debris that creates a hazard for the motorist. The 10-man District Three Litter Crew was discontinued on or before the start of this year due to budget shortfalls. Said activities resulted in the removal of 9,800 cubic yards of debris, 950 structure inlets and outlets cleaned and 40,570 shoulder miles cleaned utilizing in-house forces.

The NMDOT continues to contribute for public outreach and education, and storm water monitoring and testing, with approximately $25,000 contributed in 2010. Lastly, the District is in the process of finalizing a Cooperative Maintenance Agreement with the Village of Corrales for litter pick-up, weed removal and mowing along NM448 within the Village limits. Partnerships are still being pursued with other local agencies. However, due to budget and manpower shortfalls, these partnerships have not yet been implemented.

THE UNIVERSITY of NEW MEXICO

4.4 University of New Mexico's (UNM) Expenditures

In calendar year 2010, UNM's Physical Plant Department (PPD) similarly spent approximately $176,500 on operations and maintenance (O&M) activities to protect storm water quality, e.g., street sweeping, litter pickup, dog waste stations, inlet monitoring and cleaning of the instructional and research areas of the Albuquerque Campus. PPD street- and hardscape-sweeping and other exterior cleaning operations removed a total of 425 cubic yards of debris that would otherwise have ended up in the metro area MS4 system. PPD also spent ~$65,000 on landscaping improvement projects to protect stormwater, such as turf filters, gravel cover, and vehicle wash relocation

UNM's Athletics Department spent approximately $47,600 in 2010 for similar O&M activities at their independently operated campus facilities.

The Department of Safety & Risk Services (SRS) expended approximately $62,000 for compliance work regarding storm water, including $20,000 for storm water quality monitoring activities by the USGS. SRS also paid a $7,000 annual payment for permit-required "Mid Rio Grande Stormwater Quality Team" public education campaign expenses.

Therefore, UNM's estimated grand total 2010 expenditures to protect and monitor storm water quality were approximately $351,000.

Due to continuing economic uncertainty and a record state budget deficit, at this time, it is difficult to forecast UNM's 2011 related expenditures for the above mentioned areas.

5. Enforcement Actions and Inspections

The Stormwater Management Section of the COA is informed of illicit discharges by citizens using the City's 311 hotline. Inspectors speak with the individuals making the complaint (if calls are not anonymous), visit the site, and take appropriate action to resolve the issue. Approximately 90 complaints were addressed in 2010 by the Stormwater Management Section with the primary complaint relating to leaking automotive fluids (75% of the calls). Letters accompanied by brochures describing pollution prevention practices and a list of automotive fluid recyclers were sent to residents suspected of dumping automotive fluids down inlets.

Inspection staff in Ground Water Division of the EHD also addressed about 30 complaints involving abandoned containers of hazardous materials. Of the calls answered by EHD, 10 involved paints or solvents while 20 involved drums of abandoned oil.

In addition, the Air Quality Division (AQD) of the EHD, issued about 160 Site Disturbance and Fugitive Dust permits in conjunction with their air monitoring program for the EPA. These permits require contractors to install BMPs, such as silt fence and graveled entrances, to keep dust and dirt on-site. The AQD employs three full time inspectors to ensure compliance at construction sites. Inspection personnel conducted roughly 1500 inspections and follow-up actions. According to enforcement personnel, about 10 violations related to site disturbance or fugitive dust emissions were issued by the AQD in 2010.

6. Existing Public Education Programs

The MS4 co-permittees devoted a great deal of resources to their Public Education efforts during 2010. The major areas of concentration were:

- Partnerships with local units of government and watershed organizations to further the progress of stormwater quality control in the Middle Rio Grande Watershed. The MS4 partners are participating in workgroup planning activities which will facilitate implementation of the Middle Rio Grande Watershed Based Permit.
- A watershed-wide media campaign conducted by the SWQT contracted public relations firm CW for the reduction of trash and fecal matter in stormwater runoff. This year's efforts consisted of an advertisement campaign using footage from last year's production of a 30-minute video on the challenges to stormwater quality. The ads aired on four major television networks and two radio stations, reaching approximately 1.5 million viewers and 125,000 listeners at a total cost of about $20,000. Details of the media buy and number of people reached can be found in Section 9, Education Program Updates.
- The SWQT webpage www.keeptheriograng.org was updated by CW in Spring 2010. A map showing the storm drainage system in Bernalillo and Sandoval counties, including the Albuquerque and Rio Rancho metropolitan areas, was added to the home page. You Tube videos of last year's stormwater quality production were posted and viewed by about 300

individuals. The website was visited about 800 times. Statistics relating to the number of people accessing the webpage can be found in Section 9.

- The SWQT increased funding levels to a local private educational initiative called River Xchange which has a comprehensive school program to educate fifth graders on the importance of the water cycle and how pollutants can adversely affect local and regional water bodies. While only 2 classes were funded by the SWQT in 2009, the number was increased to 7 and10 classes for the spring and fall semesters of 2010, respectively. An update presented to the SWQT in July 2010 and the accompanying annual report are provided in Section 9.

A table summarizing the major public education activities performed by the co-permittees during 2010 appears below.

Highlights of the 2010 Public Education and Outreach Program

Date	Activity	Description
1/19-5/26	River Xchange School Program	SWQT members agreed to provide funding for the participation of five 4th and 5th grade classes in the River Xchange Program for the Spring semester. This program emphasizes the importance of water resources in the community including storm water.
2/11	Presentation to COA Transportation and Drainage Engineers	A presentation was made by a local consulting firm to COA, UNM, and AMAFCA staff regarding the incorporation of low impact development features into transportation and storm drainage designs.
3/20	Installation of Storm Drain Markers by Local Scout	Eagle scout coordinated with COA engineer and fellow scouts to install over 100 storm inlet markers and distribute approximately 1000 door hangers with pollution prevention tips within their neighborhoods on Albuquerque's west side.
3/23 – 3/24	Arid Low Impact Development (LID) Conference	A LID conference that focused on features that might be successfully installed in arid climates and impediments to their installation including water rights laws, water conservation issues, and perceptions was organized by members of the SWQT.
3/26-ongoing	Bosque Ecosystem Monitoring Program	SWQT members agree to fund a monitoring program to be carried out by grade K through 12 students at the Bosque School. As part of the program, students will learn about water quality issues associated with stormwater. They will also develop, test, and implement procedures to monitor watershed and arroyo health. The students will then conduct weekly monitoring of the Rio Grande at 4 sites for E-coli and temperature according to NMED sampling protocols.

Date	Activity	Description
4/22	Booth at College Sustainability Fair	UNM and COA personnel staffed a booth showcasing storm water pollution prevention practices at UNM's Sustainability Fair. SWQT member, Bernalillo County, provided a watershed model used by the staff to educate participants about water quality issues. Brochures, bumper stickers, pens, and sticky pads were given to attendees to remind them to implement stormwater pollution prevention practices in their homes and communities.
5/15	Dia del Rio - Spring	UNM personnel assisted on river clean up crew. SWQT member, Bernalillo County, staffed a table with educational brochures and other giveaways.
5/17 - ongoing	Watershed Based Permit Meetings	MS4 partners participated in work group meetings (5/17, 6/16, 7/11-7/12, 12/15) to facilitate the implementation of a Watershed Based Pilot Permit tentatively issued by EPA Region 6 in 2012. Subgroups tasked with various aspects of the permit met monthly in September through December.
5/22	Presentation to Humanist Group	COA personnel made presentation to group regarding the area's storm water system, storm water quality issues, and storm water pollution prevention practices.
6/17	River Xchange School Program	The SWQT agreed to sponsor ten River Xchange classes in the APS and Rio Rancho school systems for the Fall semester.
6/21/10-6/25/10	EPA Region 6 MS4 Conference	AMAFCA drainage engineer gave presentation on local water quality features. COA, NMDOT, and UNM staff attended EPA Region 6 MS4 conference in Santa Fe, NM.
6/28-7/24	Media Campaign	Ads promoting stormwater pollution prevention practices such as proper disposal of pet waste and trash appeared on 4 television networks and 2 radio stations for a month immediately prior to the area's "monsoon" season.
8/3-8/5	StormCon	COA storm drainage department manager and engineering division manager attended StormCon in San Antonio, TX. Advertised as the largest storm pollution prevention conference in the world, the event featured a five-track course curriculum with more than 100 educational sessions. Topics focused on BMP case studies, implementing LID, stormwater program management, water-quality monitoring, and research topics.

Date	Activity	Description
8/1- 11/9	COA Good Housekeeping Task Force Meetings	Bi-weekly meetings were conducted by COA storm drainage department manager in an effort to educate COA staff about stormwater quality issues and improve pollution prevention practices on city facilities. Twelve departments participated with the goal of developing a SWPPP for each city facility in an effort to reduce polluted stormwater from leaving municipal property and entering the storm drainage system. The Task force meetings were followed up with 5 minute presentations made by department heads to the CAO on the implementation of the SWPPPs in their facilities.
10/13-10/14	Water Festival	Personnel from the COA and Bernalillo County participated in the 2-day educational event which was sponsored by the Albuquerque Bernalillo County Water Utility Authority and organized by educators of the River Xchange Program. About 1000 4th and 5th grade students participated in hands-on activities that emphasized the importance of water resouces, including watershed health and the importance of pollution prevention. The SWQT provided 5000 "Scoop the Poop" and "Keep the Rio Grand" bumper stickers, 2500 pens and 300 sticky pads with the "Keep the Rio Grand" webpage address, and 300 brochures and rack cards. See Section 9 for a photo montage of the event produced by River Xchange.
Annual/On going	UNM Hydraulics Laboratory	AMAFCA provides $50,000/year to the UNM Hydraulics Laboratory for graduate student research. These projects typically involve analysis of innovative water quality improvement features, such as debris flow filters, *Coanda* screen technology and baffle-weir wall structures (see Item 8.2 I-25 Baffle Chute).

7. Identification of Water Quality Improvements or Degradation

The NMED has listed the Albuquerque Reach of the Middle Rio Grande from the Isleta Pueblo boundary to Alameda Bridge as impaired with respect to bacteria, DO, temperature, and PCBs. Of these four impairments, bacteria, is the only parameter for which a TMDL has been issued (State of NM Clean Water Act 303(d)/305(b) Integrated Report, Appendix A, 2010). A new TMDL was drafted by the NMED that changes the impairment from fecal coliform to E-coli. This new TMDL was presented to the State Water Quality Commission in April of 2010 and subsequently adopted in June 2010.

As discussed in the Annual TMDL Report sent by email to the EPA Region 6 office on December 1, 2010, the co-permittees are in compliance with the Fecal Coliform TMDL of the 2003 MS4 Permit. Although expired, the partners assume that the

permit has been administratively extended. A lack of E-coli data prevented the estimation of an E-coli load this year. Bacterial and sampling efforts have been increased for 2010-2011 to allow for sufficient data to estimate an E-coli load next year. Continued efforts in stormwater pollution prevention as addressed by the Public Information Program is hoped to decrease the amount of E-coli entering the Rio Grande.

Because of recent concerns regarding the DO content at the NDC outfall, an additional monitoring program was developed by the USGS for AMAFCA and the COA in August, 2007. The USGS installed, and will continue to maintain, dissolved oxygen probes at 5 sites between the existing stream gage at the North Floodway near Alameda and the Rio Grande. In addition, as discussed in Item 1, AMAFCA will continue to work with the USACE on the plan to fill in the embayment, the suspected source of low DO concentrations. In the interim, AMAFCA will continue with the construction and design of upstream BMPs designed to reduce trash and vegetation from reaching the NDC.

In addition to the PCBs found in stormwater in the San Jose Drain in 2003, the NMED also discovered PCBs in suspended sediments of the Rio Grande downstream of the NDC but north of the Alameda Bridge following several storm events during the summer of 2009. The NMED has attributed the high concentration of PCBs in the suspended sediment to discharge of the NDC because of the correlation between the high concentrations with the timing of the storm events. The source of the sediment with high PCB concentration in not known at this time. Sediments laden with PCBs on the floor of the Rio Grande could be stirred up during high discharge events. Alternatively, sediments from the embayment area or contaminated areas within the watershed could be carried by stormwater and flushed into the Rio Grande.

The MS4 co-permittees have been monitoring stormwater at the NDC outfall since 2003 as specified in Table V.A.1.a(2) of the 2003 permit and have not found PCBs at a level above the detection limit. However, PCBs have been analyzed per permit requirements by the Arochlor method SW-846 8082. This method, although widely accepted, is unable to discern PCBs at the level of the congener method which was used by the NMED in their 2009 analyses. The partners are currently working with the USGS to implement an appropriate sampling and monitoring program for PCBs. The NMED has requested that EPA Region 6 require the use of the congener method for PCB analysis in the draft permit issued by EPA Region 6 on May 28, 2010.

8. Monitoring of Floatables and Debris and Stormwater Quality Improvements

COA arroyo maintenance personnel removed 2300 cubic yards (CY) of silt, flotables, and vegetation from its storm drainage facilities (storm sewers, arroyos and detention basins). In addition, approximately 7300 CY (6000 tons) of dirt and debris was removed from COA streets during sweeping activities. Through the HHW program, managed by the Ground Water Division of the EHD, almost 278,000 lbs of

HHW were accepted. Approximately 159,000 lbs of these materials were reused or recycled. This 159,000 lbs includes motor oil, of which 130,000 lbs or about 15,000 gallons were recycled.

AMAFCA removed 814 CY of trash and 82,945 CY of sediment from all their flood control channels and facilities while UNM's PPD removed a total of 425 cubic yards of debris that would otherwise have ended up in the MS4 system. UNM also installed water quality manholes in several parking lots, posted placards reminding dog walkers to pick up after pets, and erected mutt mitt stations in an effort to reduce pollutants to their storm drainage system. Photographs of these features are provided in Section 10, Stormwater Quality Improvements.

AMAFCA has made major investments during 2010 in the installation or modification of various Structural BMPs in an effort to control sediment, floatables, gross pollutants and bacteria in targeted watersheds. The following notable stormwater quality facilities were constructed in 2009-2011:

8.1. Indian School Bridge over the NDC – This project, completed in 2009, was an attempt to eliminate the high bacterial loading to stormwater from this location. For years the underside of Indian School Bridge was home to a large population of pigeons and a small group of homeless people which caused a significant amount of avian and human waste to be deposited into the channel. The project called for the installation of various devices at key locations to prevent pigeons and people from inhabiting the structure. These devices included "spikes" and "spiders" which are small linear and spherical objects made of wires radiating upwards and outwards from a central point which scare the birds away. Stainless steel slides were also installed along the buttresses to prevent birds from landing there. The slides also covered small openings that were being used as dwellings by homeless people. The Albuquerque Police department's Homeless Division was very much involved with the project and provided outreach services for homeless people that frequented the area. The cost of this BMP was approximately $70,000.

AMAFCA is conducting a study to determine the efficiency of this BMP and obtain measurable results. Accumulations of avian fecal matter post construction are being compared with those prior to construction of the facility.

8.2. I-25 Baffle Chute Storm Water Quality Feature – This project is the result of a study entitled, "South Diversion Channel Storm Water Quality Enhancement Design Concept Investigation". AMAFCA contracted with the consulting firm of WHPacific (formerly Arctic Slope Consulting Group) to identify and prioritize opportunities along the South Diversion Channel (SDC) where storm water quality BMPs could be built. This project is the second such structural BMP to be built along the South Diversion Channel. This site was chosen because it is at the location along the channel where 100% of the urban runoff has been collected into the channel. This project entails retrofitting a USACE baffled concrete drop structure. The 120 feet wide structure drops the channel 30 feet in 60 feet through a baffle field. The proposed BMP will treat up 1200 cfs by diverting flows around both sides of the existing structure through *Coanda* (wedge-wire) screens before returning the flows to the channel. Prior to the diversions, the entire flow from the channel is dropped into a fore bay stilling basin where sediment is dropped out. The flows are then passed

through orifice plates on either side of the structure and directed over *Coanda* screens where trash, organic debris, etc. will be filtered out of the water. A stormwater quality pond and sand filter will further treat stormwater and trickle flows that frequent the channel in this location. Any flows in excess of 1200 cfs will begin to flow over the existing structure per the original USACE design. For example, at 1,800 cfs, 1,200 cfs will be treated while the remaining 600 cfs will bypass the treatment facility and flow over the baffle chute. This project was physically and numerically modeled by the UNM Hydraulics Laboratory.

This project is under construction at this time and will be completed in October of this year. The construction contract amount for the project is $2,699,300. The design survey fee is $3800. The contracted engineering design, construction management and geotechnical testing fees for the project are $235,400, $187,200 and $12,100 respectively. The total cost of the project to date is $3,137,900.

8.3. The Hahn Arroyo Project Phase 1 – The Hahn Arroyo is one of many tributaries to the North Diversion Channel. The Hahn Arroyo is a concrete-lined, trapezoidal channel that was constructed 50 years ago. It has deteriorated greatly, causing it to experience failures during heavy rains so the primary purpose of this rehabilitation project is to replace the aging concrete lining and prevent flooding, damage to property, and loss of life. In addition to addressing flood control, a "Whole Systems Approach" is being undertaken for the project by including stormwater quality facilities, water harvesting strategies, and the use of the area around the channel as a recreational facility.

The design includes a more sinuous, naturalistic channel lined with tinted shotcrete with diversion structures and stormwater quality facilities that remove various pollutants from the stormwater. Some of the treated stormwater is stored in underground cisterns and harvested as irrigation water for the project's landscaping as well as for existing landscaping in Montgomery Park, one of the COA's largest and oldest parks adjacent to the Hahn Arroyo Project. The idea of using treated stormwater to irrigate landscaping came from the desire to incorporate sustainability and LID practices into the project.

A second stormwater quality device is designed for the project. It is an in-channel steel structure that is designed to capture floatables, trash and organic debris from the additional stormwater in the channel that cannot be diverted to the cisterns. This structure utilizes a system of weir walls, baffle walls and screens to trap these constituents within its confines. The design was modeled and refined at the Hydraulics Laboratory at UNM. The structure will be cleaned on a regular basis with skid steers to remove the accumulated trash and debris. The structure, which sits in the center of the channel, will also act as a benefit to public safety in the event that someone falls into the channel during a large flow event. It is designed to lift a person up out of the channel using the force of the fast moving water to push the person up on top of the structure.

The Hahn Arroyo Project includes recreational amenities such as a pedestrian trail, an asphalt bike path, small patio gathering areas (plazas) with bench seating, shade structures, drinking fountains, dog watering stations, way-finding signage, bicycle

airing stations, wildlife drinkers and explanatory signage about the project's stormwater quality and water harvesting aspects.

As part of the project, the COA's Arts Board contributed $110,000 towards providing public art for the project in the form of tile/glass mosaics for the concrete patio areas. Through collaboration with the Harwood Arts School, children from several public schools for grades K-5 will be involved in the actual design of the mosaics. In addition, The Public Academy for Performing Arts (PAPA), a local public charter school for grades 6-12, will also participate in the design process. As part of this collaboration, AMAFCA and the COA are speaking to the students about stormwater quality.

The project was bid and awarded for construction in December 2010. Three public meetings were held in the last year and a half and another meeting is scheduled for February 2011. Several art workshops are planned to be held as well.

The project is currently under construction and will be completed in October of 2011. The construction contract amount for the project is $2,987,000. Survey and PNM utility relocations fees are $10,400 and $7,100. The contracted engineering design, construction management and geotechnical testing fees for the project are $278,800, $161,100 and $52,100, respectively. The total cost of the project to date is $3,496,000 not including project art which is estimated to be $110,000. The project is funded jointly by the COA ($800,000) and AMAFCA ($2,700,000).

A formal groundbreaking was recently held for The Hahn Arroyo Project. Dignitaries from the COA and AMAFCA were in attendance including Mayor Berry, City Counselor Cooke and AMAFCA Directors Eichenberg and Hernandez. School children from PAPA Charter School were also in attendance as were COA staff members from the Parks, Trails, Planning and Municipal Development Departments. AMAFCA's full staff was in attendance. Local TV and radio stations were also in attendance to cover the event.

8.4. The Candelaria-Grantline Stormwater Quality Structures – This AMAFCA project consists of retrofitting the two tributary open channel inlets to the NDC for stormwater quality. At each location, the existing open channel will be retrofitted with a steel baffle wall and concrete weir wall combination which collectively divert tributary stormwater into extended detention linear ponds alongside and running parallel to the NDC. The Candelaria pond has a sand filter bottom, a ported riser outlet structure and emergency overflow spillway. The Grantline pond has a ported riser outlet structure and emergency overflow spillway. The two facilities will remove gross pollutants such as floatables, trash, organic debris and sediment as well as providing bacterial removal through extended detention and media filtration.

The project was bid and awarded for construction in December 2010 and is currently under construction. It is planned for completion on May 15, 2011. The construction contract amount for the project is $460,900. The contracted engineering design, construction management and geotechnical testing fees for the project are $113,500, $39,600, and $12,800 respectively. The total cost of the project to date is $626,700.

8.5. The La Cueva Inlet Stormwater Quality Facility - The project, constructed by AMAFCA in 2009, consists of a very large box culvert installed between the La Cueva Channel and the NDC that diverts approximately 1500 cfs into a water quality structure that separates floatables, organic debris and sediment from the storm water prior to discharging into the NDC. The facility is underground to allow multiuse on the surface and is maintained from both the upstream entrance on the La Cueva Channel and the downstream discharge point. The design allows storage of debris between storm events if required. The construction cost of this facility was $1,200,000.

Photographs of the structures described in Items 8.1 through 8.5 during the construction phase or upon completion are provided in Section 10.

THE UNIVERSITY *of*
NEW MEXICO

CERTIFICATE LETTER

I, the undersigned, certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

David W. Harris
Executive Vice President
for Administration
University of New Mexico

AMAFCA

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I, the undersigned, certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Jerry Lovato, P.E.
Executive Engineer
Albuquerque Metropolitan Arroyo
Flood Control Authority

New Mexico DEPARTMENT OF
TRANSPORTATION
MOBILITY FOR EVERYONE

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Tammy Haas

Tammy Haas, P.E.
District 3 Engineer
NM Department of Transportation

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David S. Campbell
Chief Administrative Officer
City of Albuquerque, New Mexico

Attachments

PDF-CC:
- Kathy Verhage, COA
- Roland Penttila, COA
- Kevin Daggett, AMAFCA
- KatherineTrujillo, NMDOT
- Reza Afaghpour, NMDOT
- Vern Hershberger, UNM
- Richard Powell, NMED
- Scott Bulgrin, Pueblo of Sandia
- Jim Piatt, Pueblo of Isleta